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ARTICLE

Uncorking the impact of tourism on wine consumption in Europe: Insights from a 17-year analysis

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Abstract
This study explores the relationship between tourism demand, both domestic and international, wine price, and wine consumption across European countries. Recognizing the cultural and economic significance of wine, particularly within Europe, this research examines how tourism spending influences wine consumption over time. Using panel data from 19 European countries between 2005 and 2021, the study finds that foreign tourism spending displays a nonlinear effect on wine consumption, initially decreasing but increasing at higher levels. Specifically, foreign spending initially reduces wine consumption but increases once spending crosses a critical threshold. Additionally, wine price shows a significant impact on consumption. These insights provide valuable implications for wine tourism stakeholders seeking to leverage tourism demand to support the wine sector and local economies.

JEL classifications: L66; Z32; C33; D12

Keywords: wine consumption; tourism demand; European wine markets; domestic tourism; foreign tourism; wine tourism economics

I. Introduction

Europe's role as a historical center of wine culture, production, and consumption is immense. Grape wine (produced from varieties of the *Vitis vinifera* species) originated in Georgia, West Azerbaijan, and North Armenia (McGovern et al., 2017) and spread from the Caucasus Valley to Europe and beyond. Trade routes, expanded plantings, quality improvements, religious significance, and social interactions have all contributed to wine's cultural and agricultural importance (McGovern et al., 2003). Today, wine remains central to contemporary culture and gastronomy, sustaining its economic influence.

The wine industry is vital to the European Union's (EU) economy. Between 2016 and 2020, the EU produced an average of 165 million hectoliters of wine, representing 45% of the global wine-growing area, 64% of global production, and 48% of global consumption (European Commission, n.d.). However, EU wine consumption has declined from 130 million hectoliters in 2005 to around 100 million in 2023 (European Commission, 2023). This downward trend highlights the need for new strategies to revive wine consumption and industry growth.

One approach to supporting the wine sector and boosting local economies is through wine tourism, a specialized but growing industry. Defined as a "special-interest travel based on the desire to visit wine-producing regions, or in which travelers are induced to visit wine-producing regions, and wineries in particular, while traveling for other reasons" (Getz et al., 2007, p. 246), wine tourism has well-documented economic impacts. However, limited research focuses on its effect on regional wine consumption.

This study addresses the gap by examining the relationship between tourism demand, both domestic and international, and wine consumption across 19[1] European countries (see Appendix). It explores how factors like spending and pricing influence consumption in wine tourism destinations. The study aims to assess whether wine tourism can help counter the decline in wine consumption and provide actionable insights for industry stakeholders. While Vicente et al. (2021) explored wine tourism's economic impact within a single country, this study advances the discussion by using longitudinal panel data to examine how both domestic and international tourism affect wine consumption in 19 European countries. This cross-national, long-run focus enables broader generalization of tourism's effect on wine consumption. By employing panel data, this research offers a more nuanced view of these dynamics over time, contributing valuable insights to both academia and the wine industry.

II. Literature review

a. Trends in the European wine industry

Wine is a cornerstone of European culture and commerce. Despite declining exports due to increased competition from the New World, Europe still produces around 68% of the world's wine exports (Balogh & Jambor, 2017). Italy, France, and Spain lead global production, and the EU wine industry generates nearly 130 billion euros in annually (The Brussels Times, 2024, March 27).

In recent decades, alcohol consumption has declined in many regions. While European wine consumption has fallen, new markets like the U.S. and China have driven global growth (Castellini and Samoggia, 2018). Although the EU has seen a modest recent increase, consumption remains far below peak levels. In Italy, per capita wine consumption dropped from 93.5 L in 1977 to 38.01 L in 2014, and rose modestly to 42.1 L in 2023 (Barker, 2024, April 25; Sellers and Alampi-Sottini, 2016).

The decline in European wine consumption has spurred innovation among wineries. Vergamini et al. (2019) note that combining innovation with an understanding of societal and cultural factors can enhance firm performance. Obermayer et al. (2022)

[1]Twenty European countries are included, but Belgium and Luxembourg are treated as a single unit in the panel data.

highlight production methods and marketing as key areas for innovation, with many small and medium enterprises leveraging social media and wine tourism (e.g., trails and festivals) to differentiate themselves. In smaller regions, wine tourism allows consumers to connect with the terroir, and geographic indication designations help these areas stand out in a competitive market (Vergamini et al., 2019). Given wine's importance in European history, culture, and economy, wine tourism can be a valuable driver of economic growth (Vicente et al., 2021).

b. Wine and tourism demand

Tourism demand research has expanded significantly over the past two decades. Cooper et al. (1993) define tourism demand as travel to access tourist facilities and services. Tourism demand varies across regions and time periods. It has become a key element in many nations' economic growth strategies. Research on this topic has grown substantially, Zhang et al. (2020) note that fewer than 10 articles published in the early 2000s, rising to 40 by 2018.

Rising incomes have fueled increased spending on travel, transforming tourism into a discretionary, luxury experience. Turner and Witt (2001) emphasize that Gross Domestic Product (GDP) typically reflects the levels of economic development, which strongly affect demand across tourism segments. Supporting this, Peng et al. (2015) note that international tourism is often income elastic, particularly among visitors from developed regions, suggesting that foreign tourism functions as a luxury product.

Wine tourism, a subcategory of gastronomy tourism (UNWTO, 2016), is influenced by similar economic dynamics. Hall and Macionis (1998) define wine tourism as visits to vineyards, wineries, or wine festivals where tourists can enjoy wine tasting and experience the attributes of a wine region. Wine tourism helps regions build brand awareness, educate consumers, gather marketing insights, and promote local wine styles (Lee et al., 2022). Its benefits are felt not only at wineries but also in related sectors like lodging and restaurants (Storchmann, 2010) and positively influence the competitiveness of wine-producing regions (Sun and Drakeman, 2022).

Wine tourists are typically more affluent and spend more on premium experiences, such as winery tours, tastings, unique culinary experiences, and extended stays compared to general tourists (Gómez-Carmona et al., 2023; Mitchell and Hall, 2006). These experiences support economic development by creating jobs in rural areas and attracting investment in hospitality infrastructure (Quadri-Felitti and Fiore, 2012; Vicente et al., 2021). Beyond its economic impact, wine tourism helps preserve cultural heritage through storytelling and education about regional traditions (Frost et al., 2020; Hall et al., 2009).

Despite its growing importance, research connecting tourism and wine consumption, especially with panel data, remains limited. Vicente et al. (2021) examine Spain and show that wine tourism positively contributed to local economic growth, but broader multicountry longitudinal analyses are scant. Given its potential as a driver of regional development and revenue, there is a need for a deeper understanding of wine tourism's effects on local economies and consumption behavior.

c. Veblen goods

Veblen goods are high-priced items where demand may rise with price due to their symbolic value. Consumers are motivated by either invidious comparison (to stand out from lower groups) or pecuniary emulation (to fit in with higher groups), using luxury products to signal prestige (Bagwell and Bernheim, 1996; O'Regan et al., 2019). Veblen goods illustrate the complexity of consumer purchasing behavior. Their appeal lies in the price itself, which signals desirability, a characteristic that is common in luxury categories like fashion, art, and wine (Wright et al., 2023).

The Veblen effect is evident in the wine industry, where wine consumers are willing to increase consumption even as prices rise, treating wine as a luxury good rather than a commodity (Rousselière et al., 2022). This dynamic supports wine tourism, as demand increases for high-end winery experiences (Heine et al., 2016). To address diverse market segments, producers offer wines ranging from affordable to ultra-premium tiers. Some producers achieve luxury status through small production runs, exclusive vineyard sourcing, renowned winemakers, and high ratings from critics, allowing them to command higher prices and prestige (Horowitz, 2012). These luxury or "Veblen" wines enhance regional brand identity and attract tourists eager for premium experiences.

d. Hypothesis development

While previous research examines the effect of tourism on economic development using cross-sectional data (Pablo-Romero and Molina, 2013), studies specifically investigating the impact of tourism demand on wine consumption remain limited. Tourism has long been a source of local income, driving development in many destinations. The literature frequently highlights a positive relationship between tourism spending and regional economic growth (e.g., Contini et al., 2009; Rachão et al., 2019), with many viewing tourism as a remedy for economic stagnation and an alternative to traditional industries (Meyer and Meyer, 2015). In rural areas, tourism can boost agricultural tourism, including the consumption of local products like wine. Saayman et al. (2001) note that the economic impact of tourism varies by the origin of tourists. Studies by Lee (2021) and Goh et al. (2015) show that domestic tourism-led growth strategies can positively affect regional economies. Since domestic tourists are likely to engage directly with local wine products through tastings, tours, and purchases, this study proposes a positive link between domestic tourism and wine consumption.

H_{1a}: Domestic tourism spending will positively impact wine consumption.

Although a linear relationship is expected at lower levels of tourism, the effect may diminish as spending increases. For instance, when a region's wineries and tourism infrastructure operate near their limits, more spending may not increase wine-related engagement. This logic aligns with the concept of diminishing marginal returns, where tourism's benefits taper off once spending exceeds a certain threshold (Zhang and Cheng, 2019). Similarly, smaller local contexts often experience a tapering effect when infrastructure is reaches its limit (Chiu and Yeh, 2017). In this setting, a nonlinear relationship may appear, especially if market saturation or overloaded infrastructure limits further gains.

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H_{1b}: Domestic tourism spending will have a nonlinear effect on wine consumption.

International tourism is crucial for regional economies, particularly in high-value segments like luxury wine tourism. Foreign tourists seeking unique luxury experiences, such as vineyard tours, wine tastings, and wine pairing dinners, often make significant contributions to local economic development (Akinboade and Braimoh, 2010). These visitors tend to spend more on local goods, including luxury items like wine (Hung et al., 2021). Given wine's dual role as a local product and a luxury good, this study proposes that foreign tourism spending will positively impact wine consumption, as foreign tourists tend to favor high-end offerings.

H_{2a}: Foreign tourism spending will positively impact wine consumption.

Similar to domestic tourism, the relationship between foreign tourism spending and wine consumption may be nonlinear. At lower spending levels, tourists might prioritize other activities, like sightseeing or general attractions, over wine consumption. However, once spending reaches a certain threshold, tourists are more likely to engage in experiences like winery tours, tastings, and pairing dinners. Researchers have documented this threshold-driven shift, with more intense consumption emerging after higher financial and experiential investment (Chiang et al., 2017). Ridderstaat et al. (2014) note that the economic impact of tourism may be nonlinear, with strong effects occurring when tourism spending reaches higher levels. This change in tourist behavior stems from greater investment in local development and high tourism expenditure.

H_{2b}: Foreign tourism spending will have a nonlinear effect on wine consumption.

Wine price is a key factor in consumers' decision to purchase. According to the law of demand, higher prices generally reduce demand for a product. This inverse relationship between price and consumption is common with commodities, including mid-range and affordable wines (Jiang and Livingston, 2015). However, in the luxury segment, wine can behave as a Veblen good, where high prices signal status and prestige, potentially increasing demand (Sjostrom et al., 2016; Wright et al., 2023). While high prices typically deter consumers, luxury wines may attract buyers who view price as a marker of quality. Nevertheless, since mid-range and affordable wines make up most of the market, the traditional demand relationship likely holds, with higher prices leading to lower consumption.

H_{3a}: The wine price index will negatively affect wine consumption.

As with the previous relationships, wine price and consumption may be nonlinear. While higher prices usually translate to reduced demand, premium wines may attract consumers who perceive price as a signal for prestige or exclusivity. This counterintuitive response reflects Veblen goods, where higher prices translate to increased rather than decreased appeal (Bagwell and Bernheim, 1996). Similar studies on conspicuous consumption show that demand can increase when the price is publicly displayed

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Table 1. Variable definitions and sources

Variable	Measure	Definition	Data source	Years	No. of countries
Real Wine Consumption	Kiloliters	Volume of wine consumed in kL	Anderson and Pinilla, 2024)	2005–2021	19
Domestic Tourism Spending	Real USD	Tourism spending by a country's residents for both business and leisure trips	World Bank & Eurostat	2005–2021	19
Foreign Tourist Spending	Real USD	Tourism spending by the residents of a foreign country for both business and leisure trips	World Bank & OECD	2005–2021	19
Harmonized Wine Price Index	Index (base year = 100)	An economic indicator that measures the change over time in the prices of wine-related goods and services acquired by households.	Eurostat	2005–2021	19

and associated with a certain identity (Heffetz, 2011). Therefore, the wine price index may follow a nonlinear pattern, dependent on consumers' perception of wine as a commodity or a status symbol.

H_{3b}: The wine price index will have a nonlinear effect on wine consumption.

III. Method

a. Data collection and variables used

The data for this study are sourced from various sources for 19[2] European countries, as shown in Table 1 and detailed in Appendix A. Specifically, the wine consumption data are drawn from the University of Adelaide's Wine Economics Research Centre, which aims to produce and promote high-quality research in the field of wine economics (Anderson and Pinilla, 2024). In this study, Belgium and Luxembourg are grouped together, to match the structure in the original dataset. Data on domestic tourism spending originate from the World Bank (World Bank, n.d.) and Eurostat (Eurostat, n.d-b.). International tourism spending data come from the World Bank (World Bank, n.d.) and Organization for Economic Co-operation and Development (OECD) (OECD, 2024, October 17). Eurostat is the source for the Harmonized Wine Price Index (Eurostat, n.d-a.). The full list of countries appears in Appendix A.

The authors log-transformed each variable to improve stability and interpretability, accounting for potential nonlinear relationships. The dataset includes 12[3] Eurozone

[2]Thirteen Eurozone countries are included, but Belgium and Luxembourg are treated as a single unit in the panel data.

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Table 2. Elasticity effects

Variables	Relationship
$b_x > 0$ & $c_x > 0$	Nonlinear convex (positive and increasing)
$b_x < 0$ & $c_x > 0$	Nonlinear convex (negative and increasing)
$b_x < 0$ & $c_x < 0$	Nonlinear concave (negative and decreasing)
$b_x > 0$ & $c_x < 0$	Nonlinear concave (positive and decreasing)

where
b_x is the coefficient of the variable
c_x is the squared version of the variable's coefficient

countries and 7 non-Eurozone countries (see Appendix). Panel data are appropriate because they allow for tracking changes over time across multiple countries, offering greater precision and nuance than cross-sectional data (Hsiao, 1985, 2007).

b. The model

This study develops a model to examine the effects of domestic tourism spending, foreign tourism spending, and price on a country's wine consumption. The model includes both linear and nonlinear terms to account for elasticity effects and test for the presence of the Veblen effect in wine tourism. These relationships are modeled with the following equation:

$$\mathrm{wc}_{it} = a + b_x X_{it} + c_x X^2{}_{it} + e_{it} \tag{1}$$

where:

wc = Wine consumption
i = Cross-sectional component of the panel (i.e., country)
t = The time component of the panel
X = A vector of independent variables
X^2 = A squared vector of variables identified by the U-test as nonlinear
a = Intercept
b_x, c_x = Coefficients
e = Residual error terms

The inclusion of squared terms allows the model to test for possible nonlinear relationships, similar to Veblen goods, where high prices do not reduce demand. To validate these relationships, this study applies the U-test for elasticity effects (Lind and Mehlum, 2010). The U-test assesses whether spending increases have a consistent or varied effect on wine consumption, helping to identify turning points in demand. The U-test examines U-shaped and inverted U-shaped relationships by assessing values on both the low and high ends of the curve. A U-shape indicates a convex (nonlinear) relationship, while an inverted U-shape suggests a concave relationship. The framework for interpreting elasticity effects, based on Renshaw (2009), is shown in Table 2. In addition to the elasticity test, a threshold regression model is implemented to examine whether structural breaks arise in the relationship between foreign tourism spending and wine consumption. Further explanation is provided in the following section.

c. Methods and procedures

The first step in preparing the panel data is to check for cross-sectional dependence, which identifies correlations across countries. Dependent cross-sections can lead to inaccurate inferences and spurious estimates (Pesaran, 2015), often due to significant events affecting multiple countries. To address this, the analysis applies a Pesaran CD-test (Pesaran, 2004, August).

To evaluate stationarity, this study applies three panel unit root tests: Fisher-type - Augmented Dickey–Fuller (ADF) and Phillips-Perron (PP) (Choi, 2001; Maddala and Wu, 1999) and IPS (Im et al., 2003), at both the level and first difference. Stationarity enables long-term inferences and reduces the risk of spurious results. These tests help determine the integration of the variables. Additionally, the study applies Kao (McCoskey and Kao, 1998) and Pedroni (1999) tests to assess long-term cointegration, determining whether a long-term equilibrium exists among the variables.

Model specification tests identify the appropriate estimation method. This involved the Hausman test, which determines whether fixed or random effects models are most appropriate. An F-test confirms the presence of country-level fixed effects. To address potential autocorrelation and heteroscedasticity, this study applies a Wooldridge test (Wooldridge, 2002). In panel data, autocorrelation occurs when error terms are correlated over time, while heteroscedasticity refers to nonconstant variance across observations (Bollerslev, 1986). Given the potential for these issues, the analysis applies a fixed effects regression with Driscoll–Kraay standard errors to generate robust estimates (Driscoll and Kraay, 1998).

Finally, the analysis conducts a threshold regression to examine nonlinear relationships (Hansen, 1999). A grid search method identifies the optimal threshold value. Afterward, the model is estimated with interaction terms to examine effects above and below the threshold.

IV. Findings

a. Cross-sectional dependence

Cross-sectional dependence is a common issue in panel regression analysis, as it indicates interference between units (in this case, countries). As shown in Table 3, all variables except wine consumption exhibit cross-sectional dependence, indicating significant correlations across countries for domestic tourism spending, foreign tourism spending, and the harmonized wine price index. This suggests that European countries share economic and cultural factors influencing tourism and pricing behaviors. To address this, the study uses panel analysis with robust standard errors to improve the reliability and accuracy of estimates.

b. Unit root tests

Unit root tests, including ADF, PP, and Im–Pesaran–Shin, assess stationarity across all variables (Table 4). These tests are chosen for their ability to handle unbalanced panels. To account for between-subject variability, the variables are adjusted to the cross-sectional mean. Results indicate that each variable is stationary at first difference, with domestic tourism spending showing stationarity at both level and first difference.

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Table 3. Cross-sectional dependence tests

Variable	CD test statistic
Wine Consumption	0.13
Domestic Tourism Spending	19.55***
Foreign Tourism Spending	42.11***
Harmonized Wine Price Index	39.68***

Note: Statistical significance is indicated by asterisks:
*at the 10% level, ** at the 5% level, and *** at the 1% level.

Stationarity is essential for ensuring long-term reliability of interpretations, suggesting that the variables are well suited for further analysis.

c. Cointegration tests

The current study uses the Kao (using ADF and Unadjusted Dickey–Fuller tests) and Pedroni (using Modified PP and ADF tests) methods to assess potential long-run relationships among the variables. Table 5 presents the results, including overall and between-variable assessments. The significance of the tests supports the presence of cointegration, indicating stable long-term relationships between tourism spending, wine consumption, and price changes. These results suggest that the analysis can proceed using the level form of the variables rather than their first differences.

d. Elasticity effects

Elasticity effects are evaluated to identify potential nonlinear relationships typical of Veblen goods. Hausman specification tests assess whether squared terms improved the model. The results suggest that foreign tourism spending exhibits a nonlinear relationship, while domestic tourism spending and the harmonized price index do not. Specifically, the insignificant results for domestic tourism spending ($t = 0.61; p > .10$) and wine price ($t = 1.21; p > .10$) indicate no elasticity effects for these variables. However, the significant result for foreign tourism spending ($t = 6.83; p < .10$) indicates a nonlinear relationship in which foreign tourism spending initially decreases wine consumption but later increases it at higher levels. Thus, the regression model includes foreign tourism spending as a squared term. Hypotheses H_{1b} and H_{3b} are not supported.

e. Linear panel regression and robust estimation

The panel regression analysis (Table 6) sheds light on the relationships between domestic tourism spending, foreign tourism spending, the harmonized wine price index, and wine consumption. The insignificant positive coefficient for domestic tourism spending ($\beta = 0.046; p > .10$) does not support H_{1a}, indicating that domestic tourists do not influence wine consumption in their home markets. This finding suggests that wine may already be integrated into domestic culture, making tourism-related consumption less pronounced. As mentioned previously, no nonlinear elasticity effects appear

Table 4. Unit root tests

Variable	Fisher (Level)	Fisher (1st Diff)	PP (Level)	PP (1st Diff)	IPS (Level)	IPS (1st Diff)	Cointegration
Wine Consumption	45.39	235.72***	45.39	301.03***	−0.60	−11.86***	I(1)
Domestic Tourism Spending	112.95***	92.30***	112.95***	252.68***	1.85	−4.46***	I(0) & I(1)
Foreign Tourism Spending	22.64	139.59***	22.64	135.48***	1.04	−6.02***	I(1)
Harmonized Wine Price Index	41.40	115.74***	41.40	112.27***	0.14	−4.77***	I(1)

Note: Statistical significance is indicated by asterisks:
*at the 10% level, ** at the 5% level, and *** at the 1% level.

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Table 5. Cointegration tests

Variable relationship	Kao ADF	Kao UDF	Kao cointegration	Pedroni MPP	Pedroni ADF	Pedroni cointegration
Overall	0.45	−5.43***	Yes	1.49**	−7.93***	Yes
Wine Consumption → Domestic Tourism Spending	1.43*	−4.89***	Yes	−1.11	−5.76***	Yes
Domestic Tourism Spending → Wine Consumption	1.67*	0.27	Yes	1.55*	0.43	Yes
Wine Consumption → Foreign Tourism Spending	1.14	−5.10***	Yes	1.39*	−7.00***	Yes
Foreign Tourism Spending → Wine Consumption	3.90***	4.14***	Yes	2.82***	3.70***	Yes
Wine Consumption → Harmonized Wine Price Index	1.29*	−5.31***	Yes	−1.39*	−6.07***	Yes
Harmonized Wine Price Index → Wine Consumption	−1.06	−2.09**	Yes	2.90***	−0.53	Yes

Note: Statistical significance is indicated by asterisks:
*at the 10% level, ** at the 5% level, and *** at the 1% level.

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Table 6. Fixed effects panel regression of wine consumption with Driscoll–Kraay standard errors

Variable	Coefficients
Domestic Tourism Spending	0.046
Foreign Tourism Spending	−0.209*
Foreign Tourism Spending (squared)	0.044***
Harmonized Wine Price Index	−0.328***
Intercept	14.421***
N	310
Within R^2	0.093

Note: Statistical significance is indicated by asterisks:
*at the 10% level, ** at the 5% level, and *** at the 1% level.

for this relationship ($t = .052$; $p > .10$), indicating a linear impact of domestic tourism spending on wine consumption. Thus, H_{1b} is not supported.

Foreign tourism spending shows a more complex relationship with wine consumption. The significant negative linear coefficient ($\beta = –0.209$; $p < .10$) and significant positive convex elasticity effect ($\beta = 0.044$; $p < .01$) suggest that foreign tourist spending initially reduces wine consumption, possibly due to supply constraints or lack of familiarity with local wines. However, beyond a certain threshold, wine consumption begins to rise, likely due to increased engagement with local products, indicating a shift toward wine tourism. These findings support H_{2a} and H_{2b}.

The harmonized wine price index shows a significant negative relationship with wine consumption ($\beta = –0.328$; $p < .01$), suggesting some level of price sensitivity in overall wine consumption. Thus, hypothesis H_{3a} is supported.

f. Nonlinear threshold regression

To determine the appropriate model, the authors conduct both an *F*-test and Hausman specification test. The *F*-test ($F = 8.88$, $p = 0.0031$) reveals significant country-level effects. In addition, the Hausman test (χ^2 (3) $= 20.02$, $p = 0.0002$) confirms that the fixed effects model is preferred over random effects. These results support the use of the fixed effects specification throughout the analysis.

To account for the cross-sectional dependence in the initial Cross sectional dependence tests, Driscoll–Kraay standard errors, which are robust to cross-sectional dependence, autocorrelation, and heteroscedasticity, are incorporated into the analyses. The model confirms the presence of nonlinear relationships between foreign tourism spending and wine consumption. Specifically, the linear effect of foreign tourism spending is negative ($\beta = -0.210$, $p = 0.071$), while the squared version is positive and significant ($\beta = 0.044$, $p = 0.007$), supporting a *U*-shaped relationship between foreign tourism spending and wine consumption.

Taking a more detailed look at the nonlinearity, this study conducts a threshold regression that designates foreign tourism spending's squared term as the threshold variable. A grid search reveals that the optimum threshold is 5.55, which minimized residual sum of squares. The results suggest that foreign tourism spending has a significant negative effect below the threshold ($\beta = –0.114$, $p = 0.021$), while the same

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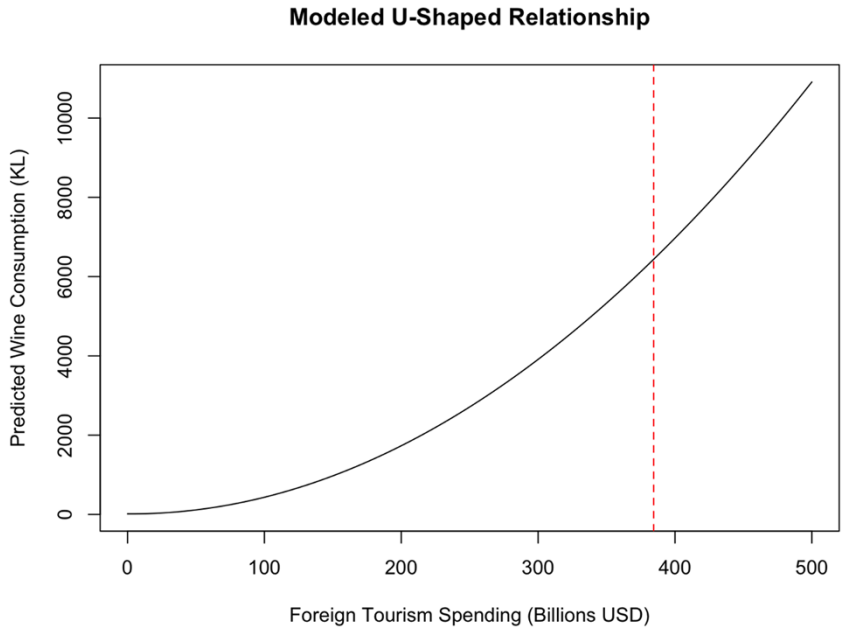

Figure 1. Wine consumption (in kiloliters) as a function of foreign tourism spending (in billions USD). The dashed vertical line indicates the estimated threshold.

effect becomes weaker and insignificant above the threshold ($\beta = -0.050$, $p = 0.242$). This result (Figure 1) illustrates the dynamic that initial increases in foreign tourism may displace local wine consumption behaviors. However, beyond a critical point, consumption increases, which may be due to further development of the destination and its infrastructure. In all, these findings suggest that foreign tourism spending has a nonlinear effect on wine consumption, which is context-dependent.

V. Conclusions

a. Summary of findings

This study aims to understand the relationship between tourism demand (both foreign and domestic) and wine consumption in Europe. Using panel data from 19 countries over 17 years, the analysis (Table 7) reveals distinct dynamics. Domestic tourism spending has no effect on wine consumption, in either linear or nonlinear form. Foreign tourism spending displays a more complex relationship, with both linear and nonlinear effects showing significance. Specifically, foreign tourism spending initially reduces consumption but begins to increase it once a certain threshold is reached, suggesting that a substantial influx of foreign visitors is needed to sustain wine demand. Wine price significantly impacts consumption, revealing a significant linear relationship. However, there is no evidence of nonlinear or Veblen-style patterns. This suggests that tourists remain price-sensitive despite wine's luxury positioning, thus pointing to other factors beyond price that may influence tourists' consumption behavior.

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Table 7. Summary of hypotheses and findings

Hypothesis	Relationship	Results
H_{1a}	Domestic tourism spending → Wine consumption (linear)	Not supported
H_{1b}	Domestic tourism spending → Wine consumption (nonlinear)	Not supported
H_{2a}	Foreign tourism spending → Wine consumption (linear)	Supported
H_{2b}	Foreign tourism spending → Wine consumption (nonlinear)	Supported
H_{3a}	Wine price → Wine consumption (linear)	Supported
H_{3b}	Wine price → Wine consumption (nonlinear)	Not supported

b. Theoretical implications

This study contributes to the wine economics and tourism literature by providing empirical evidence that foreign tourism affects culturally embedded products like wine. While previous research focuses on tourism's broader economic impact on local economies (Narayan, 2004; Schubert et al., 2011), this study provides a specific demand-driven impact on a regional product. The finding of a nonlinear relationship between foreign tourism spending and wine consumption extends earlier research (Gupta et al., 2022; Ma et al., 2015), suggesting that foreign tourists may not initially engage with wine experiences. This may be due to factors such as cultural unfamiliarity, competing priorities, or underdeveloped infrastructure. However, foreign tourists eventually contribute positively once tourism infrastructure is established and wine-related offerings are more developed. This finding aligns with studies by Akinboade and Braimoh (2010), Yan and Wall (2002), and Goh et al. (2015), which show that both domestic and international tourism affect the consumption of local products, with broader benefits for the local economy. While this study does not include robustness checks or subgroup analysis by country, the explanation is consistent with previous cross-national tourism research.

In reference to price sensitivity, the significant negative relationship for the harmonized wine price index indicates that wine tourists do respond to pricing. This finding challenges the assumption that wine consumption by tourists follows a Veblen pattern. Instead, price sensitivity remains relevant even for experiential goods (Rousselière et al., 2022). While certain wine consumers might be driven by status, the broader market, which includes tourists, is influenced by price. This may be because wine consumption is integrated into larger travel experiences (Bagwell and Bernheim, 1996; Horowitz, 2012). These results imply that wine tourists are affected by price, but the experiential factors should also be considered (Eaton and Eswaran, 2009).

c. Practical implications

The findings of this study offer valuable insights for destination managers, policymakers, and wineries. Major wine-producing countries have faced declining consumption due to inflation, surplus production (Del Rey and Loose, 2023), and decreasing demand (European Commission, 2023a). Tourism provides an opportunity to stimulate demand. Regions with emerging tourism industries and less-known wine destinations, such as Bulgaria and Hungary, should prioritize building local demand through

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domestic tourism. In 2021, more than half of EU residents opted for short domestic trips (Eurostat, n.d-b.), indicating a significant opportunity. While this study finds no significant impact of domestic tourism at the aggregate level, localized efforts may lead to better results for newer wine destinations (Lee, 2021).

For international tourism, the *U*-shaped relationship between foreign tourist spending and wine consumption suggests that wine consumption may decline at lower levels of foreign spending and increase once a threshold is met. Destinations must develop robust offerings that integrate wine-related experiences with the local culture, which may increase customer engagement and the duration of their stay. In established wine destinations like Italy and France, managers should continue differentiating their offerings through quality, heritage, and storytelling to increase interest and demand. Given the price sensitivity of tourists, these efforts should focus on value-driven experiences over luxury, especially for mid-tier market segments.

d. Limitations and future research

Country-level scope limits this analysis, which may mask regional differences in infrastructure and consumption. Similarly, the aggregate wine consumption data do not differentiate between wines at different price points, preventing analysis of how varying price points affect consumption. Focusing on established wine regions may limit the generalizability of the findings, as results could differ in areas where the wine industry and tourism infrastructure are still developing. Additionally, although this research examines tourism arrivals and price, other factors, such as GDP, cultural attributes, and seasonality, may also influence wine consumption (Agnoli and Outreville, 2021).

Future research should build on this study by examining specific wine types (red, white, sparkling, rosé) and vintages to assess their impact on tourism demand. This study identifies a threshold at which foreign spending begins to positively affect consumption, offering a valuable benchmark for developing wine regions. Future research could validate this threshold across other contexts or refine it using more granular data. Studies should also consider emerging trends in tourist behavior, such as changes following the COVID-19 pandemic and the rise of Gen-Z tourists. Lastly, a more disaggregated dataset could better reveal which type of wine and price points drive tourist wine consumption.

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Appendix

#	Country	$\bar{x}_{dom}$ [2]	$\bar{x}_{for}$ [3]	$\bar{x}_{pri}$ [4]	$\bar{x}_{consu}$ [5]
1	Austria*	23.52	21.17	93.25	241,521
2	Bel/Lux (Belgium and Luxembourg)*[1]	9.9	14.42	97.26	300,598
3	Bulgaria	0.63	4.17	93.19	91,843
4	Croatia*	2.0	9.61	96.15	178,986
5	Denmark	9.21	6.98	93.91	160,254
6	Finland*	13.34	4.08	95.09	62,862
7	France*	123.74	51.2	95.43	2,781,372
8	Germany*	321.77	46.88	95.71	1,897,472
9	Greece*	11.51	18.02	95.12	323,494
10	Hungary	2.55	5.66	92.36	239,790
11	Ireland*	3.16	10.21	92.74	87,349
12	Italy*	130.13	41.94	94.08	2,197,815
13	Netherlands*	19.62	16.62	95.17	366,072
14	Portugal*	7.14	15.92	97.68	540,898
15	Romania	3.76	2.29	94.64	434,350
16	Spain*	57.52	64.89	100.56	1,086,894
17	Sweden	22.1	13.05	97.49	208,494
18	Switzerland**	26.24	19.37	100.53	268,658
19	United Kingdom**	155.4	31.92	93.12	1,235,767

Note: Spending in billions (USD); consumption in kiloliters.
*Eurozone countries; **Non-EU countries.
[1]Belgium and Luxembourg are reported as a single unit in the panel data. [2]$\bar{x}_{dom}$ = Mean Domestic Tourism Spending. [3]$\bar{x}_{for}$ = Mean Foreign Tourism Spending. [4]$\bar{x}_{pri}$ = Mean Harmonized Wine Price Index. [5]$\bar{x}_{consu}$ = Mean Wine Consumption.

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