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# **Country of Origin Advertising and US Demand of Imported Wine: An Empirical Analysis**

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# Country of Origin Advertising and US Demand of Imported Wine: An Empirical Analysis

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## Abstract

We investigate the impact of media advertising on the US consumption of imported wine. Panel data from six countries over fifteen years (1994 to 2008) are used to estimate an aggregate demand function for US wine imports. Our empirical analysis reveals evidence of important effects of advertising of domestic and imported wines on imported quantities; the advertising of imported wines significantly increases the quantity of imports for most countries while the advertising of domestic wines has a mixed effect on imported wine volumes. Other determinants such as price and real income are also found significant

## Introduction

### Consumption:

- Wine consumption in the United states was 9.4 litres per capita in 2008, up 42% since 1994 (Fig.1)
- The proportion of imported wines increased from 12.9% (in 1994) to 26.2% (in 2008)
- Annual growth in imports is more than three times the growth of domestic wines.
- Geographical origin of imports has also changed. From 1994-08, New World wines (e.g. Australian wine and Chilean wines increased from 14% to 28%) while Old World wines decreased (France, Italy, Portugal and Spain fell from 74% to 55%).

### Advertising:

- To capture market share in the U.S., countries seek to inform consumers and differentiate their wines.
- The import share of total media advertising has averaged some 40% since 2000 (Fig.2).

**Purpose:** To investigate the effect of advertising on wine imports. In doing so, we:

- seek to distinguish the advertising effects of domestically produced wine from that of imported wine
- statistically estimate a U.S. wine import demand function of which both foreign and domestic advertising expenditures are arguments

## Empirical Framework

### Data:

- Panel data for the period 1994-2008
- Annual volume of wine from the seven largest exporting countries to the U.S. (France, Italy, Spain, Portugal, Australia, Chile and the ROW)
- U.S. imports, GDP, population data from WINEFACTS; Media advertising expenditures (branded and generic) from *IMPACT DATABANK*

### The model:

- We consider the following empirical model for wine imports:

$$\log(M_{it}) = b_{i0} + b_{i1} * \log(M_{it-1}) + b_{i2} * \log(ADM_{it}) + b_{i3} * \log(ADD_{it}) + b_{i4} * \log(PM_{it}) + b_{i5} * \log(PD_{it}) + b_{i6} * \log(GDP_{it}) + e_{it}$$

where,  $i$  indexes the country of origin of the imported wine,  $t$  indexes the year of imports.  $M$  measures the per capita volume of wine imports into the US,  $ADM$  represents per capita foreign advertising expenditures of imported wine,  $ADD$  is per capita advertising expenditure of domestically produced wine,  $PM$  and  $PD$  are, respectively, the price of imported and locally produced wine and  $GDP$  is the per capita gross domestic product of the US. The US consumer price index is used to deflate the nominal values of the price, advertising and GDP.

### Estimation Procedure:

- We estimate a system of individual (country) regressions instead of a panel data model in order to distinguish the price and advertising elasticities among countries
- Using lagged values of the exogenous variables as identifying instruments for the lagged dependent variable, an IV approach is employed to obtain consistent parameter estimates.
- A granger causality test failed to reject the null that imports (M) do not cause advertising (ADD and ADM). An ADF test on imports (M) rejected the null of nonstationarity.

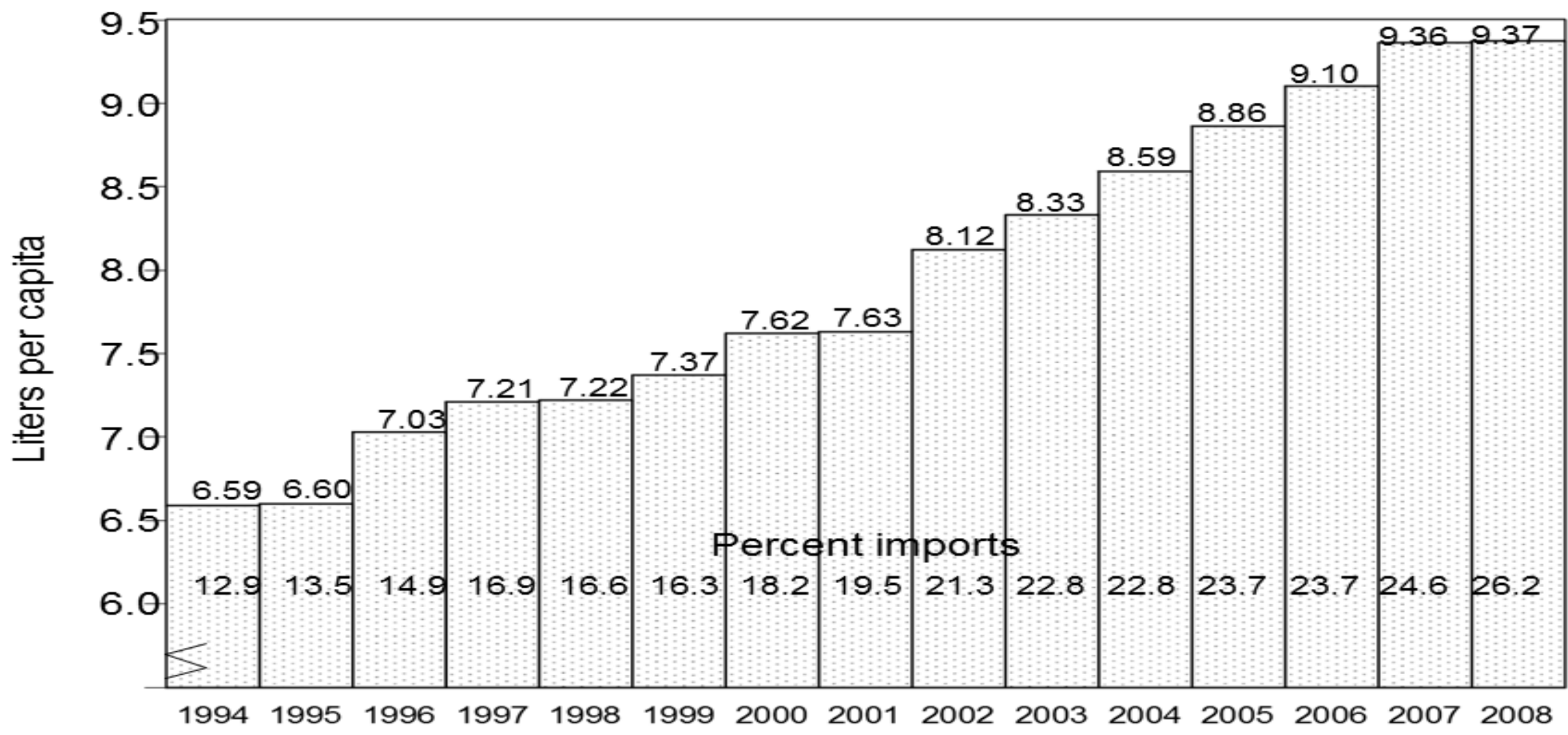


Fig. 1. US wine consumption and percent imports (liters/capita)

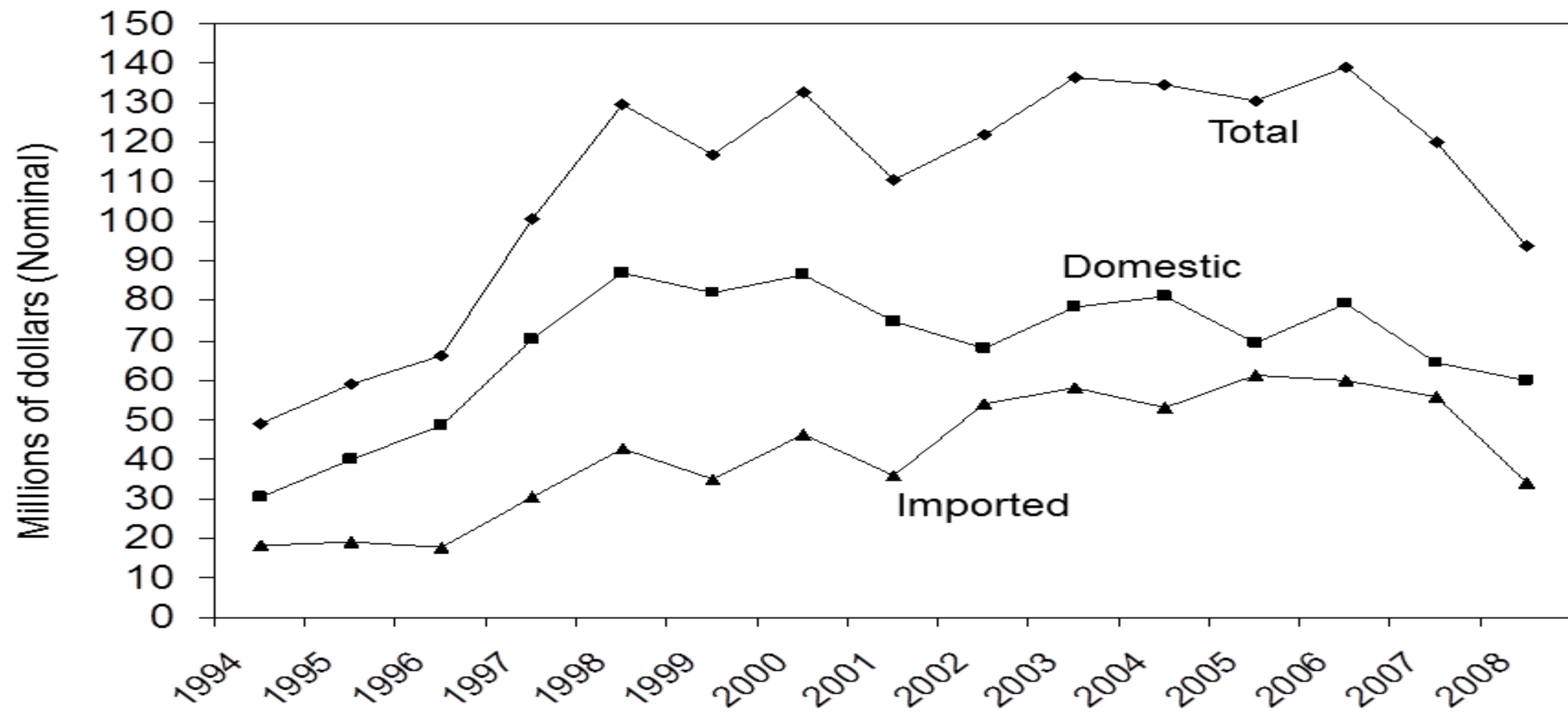


Fig. 2. Wine media advertising expenditures by origin

Table 1. Price, income and advertising elasticity estimates of import wine

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARIABLES	Australia	Chile	France	Italy	Portugal	Spain	ROW
$\text{Log}(M_{t-1})$	0.244** (0.108)	-0.0373 (0.102)	0.202 (0.222)	0.815*** (0.181)	0.663*** (0.241)	0.840*** (0.0663)	0.481*** (0.140)
$\text{Log}(PM)$	-2.747*** (0.384)	-0.185 (0.152)	-0.168 (0.149)	-0.520*** (0.122)	-0.368** (0.183)	-1.123*** (0.137)	-0.776*** (0.106)
$\text{Log}(PD)$	3.112*** (0.409)	2.313*** (0.424)	2.091*** (0.648)	0.286 (0.523)	0.971* (0.578)	1.164** (0.561)	-1.015** (0.411)
$\text{Log}(ADM)$	0.137*** (0.0179)	0.0287* (0.0164)	0.124*** (0.0434)	-0.00225 (0.0357)	0.00399 (0.0242)	0.217** (0.0954)	0.0566*** (0.0185)
$\text{Log}(ADD)$	0.458*** (0.0835)	0.133*** (0.0597)	-0.118 (0.0922)	-0.0989 (0.0881)	-0.190*** (0.0435)	-0.187* (0.102)	-0.362*** (0.117)
$\text{Log}(GDP)$	-1.253** (0.568)	1.126*** (0.339)	-1.255*** (0.464)	0.959 (0.649)	-0.212 (0.284)	0.821** (0.321)	4.006*** (0.728)
Constant	10.53* (5.690)	-18.37*** (3.180)	7.934** (3.317)	-10.17 (6.376)	-0.715 (3.423)	-9.105*** (2.992)	-39.68*** (7.566)
R-squared	0.991	0.910	0.857	0.978	0.897	0.994	0.977

Notes: Number of Observations: 98; \*Robust SE in parentheses; \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

## Results

• **Own-price elasticities:** Our average own-price elasticity of import wine is -0.861, which is in line with previously reported own-price elasticities of wine demand of -0.67 (Nelson, 1999), -0.55 (Pompelli and Hein, 1991) and -0.60 for red wine imports (Seale *et al.*, 2003).

• **Cross-price elasticities:** All cross price elasticities are positive indicating that domestic (U.S.) wine is a substitute for import wines.

• **Own-advertising elasticities:** The size of the average elasticity of own advertising (0.08) is similar in magnitude to other reported advertising elasticities of domestic wine demand: 0.07 by Nelson (1999) and 0.08 by Franke and Wilcox (1987).

• **Cross- advertising elasticities:** Advertising by U.S. wine producers generates positive spillover effects for Australia and Chilean wines but depresses demand for wines made in Portugal, Spain and ROW.

## Conclusions

- Foreign wines are taking an increasing portion of the rapidly growing U.S. bottled wine market.
- We investigate how domestic (U.S.) wine sales are impacted by both the foreign and domestic advertising expenditures.
- Using nominal panel data (1994-2008) we estimate a system of dynamic equations of wine imports into the U.S. market.
- Advertising of imported wines significantly increases the quantity of imports for all countries (except Italy and Portugal).
- Domestic advertising generates positive spillovers for wines imported from Australia and Chile but has the expected negative effect for wines from Portugal, Spain and the rest of the world.
- Our average own-advertising elasticity estimate is similar in size to previously reported advertising elasticities for domestic wines.

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