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WHY IS THERE A HOME BIAS? A CASE STUDY OF WINE

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Why is there a home bias? A case study of Wine.[♣]

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Abstract

Domestic products have a disproportionately high market share on many goods markets. We examine the contribution of preferences to such "home bias", using detailed data on wine sales in New Hampshire (weekly sales by brand by store for one year). In counterfactual simulations, where we use the same set of products as currently available, the U.S. market share falls from 58 percent to 38 percent if all country-of-origin effects are set equal. Home bias on this market is not explained by higher marginal costs for imports or by lesser store coverage of imported brands. The evidence rather points to higher foreign fixed costs of entry, coupled with a preference for U.S. wines, as the main sources for the high domestic market share.

Keywords: Home bias, border effects, trade barriers.
JEL codes: F12, F14, L13, L66.

1 Introduction.

U.S. consumers mainly buy U.S. wines and French consumers mainly buy French wine[1]. Indeed, a disproportionate market share for domestic products characterizes many goods

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markets – a phenomenon often referred to as home bias.[2] Is the observed home bias an effect of preferences for domestic goods or are trade costs the cause? Home bias due to trade costs, leading to very different consumption baskets in different countries, is associated with substantial welfare losses under the standard assumption in international economics that preferences are the same in all locations (unless home and foreign goods are very close substitutes). In the present paper we try to gauge the relative contribution of preferences to home bias for one market. The previous literature has, with few exceptions, explored home bias at the level of overall trade (McCallum (1995), Anderson and Van Wincoop (2003)) or for industry level trade data (for instance Evans (2003)). However, it is very hard to distinguish the effects of trade costs from differences in preferences using aggregate data. In their survey, Anderson and van Wincoop (2004, p 734) for instance note that "Differences in preferences are [in a standard gravity framework], however, empirically indistinguishable from trade costs."

We explore these questions in detail using an extensive database of wine sales in New Hampshire. The data, obtained through the state's Liquor Commission, cover store-level sales of all bottles of red wine under $25 sold during a one-year period. We begin by describing the overall patterns in the data and then estimate preferences for country of origin using discrete choice methods following Berry (1994). Using these estimated preferences we then perform a counterfactual simulation where we use the same choice set as today and calculate market shares under the assumption that all countries of origin are valued as highly as a U.S. origin by consumers. We also examine the role of trade costs using other counterfactual simulations. We examine three potential ways through which trade costs can lead to a home bias:

i) Trade costs may lead to higher marginal costs which in turn are reflected in higher prices for imported brands.

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[1] The International Organisation of Vine and Wine (2004).

[2] A greater home bias in goods consumption may lead agents to choose less international diversification in their financial investments, which is at the core of several international finance puzzles (such as "low" levels of current account imbalances and "high" savings-investment correlations within countries). The results of the literature that examine this link have been contradictory - an influential study by Obstfeld and Rogoff (2000) pointed to an important role for home bias in goods in generating financial home bias. Van Wincoop and Warnock (2008) survey the previous literature and stress that the results of the general equilibrium literature exploring this question are very sensitive to modeling assumptions. They find little support home bias in goods causing financial home bias.

ii) Foreign products may be distributed in a smaller set of stores and therefore fewer consumers have access to them – major domestic brands frequently have a stronger distribution network.

iii) Many foreign products may not be distributed at all – recent literature has found evidence of important fixed costs of being present on foreign markets (see for instance Tybout (2003), Das et al (2007) or Crozet et al (2009) who examine export behavior of Champagne producers).

We are not aware of any other work that employs similar methodology for the counterfactuals. Perhaps the closest precursor to our work is Brooks (2003), who examines prices of brands of wine sold in the U.S. She finds that wines from the main European producers tend to have higher prices (except Spain) and Argentinean, Chilean and Australian wines tend to have lower prices, after controlling for blind tested results, grape varietal and vintage. Country-of-origin effects are thus reflected in prices, but these results provide limited information in terms of the specific questions we pose. For example, higher prices for some brands can easily reflect a different pricing strategy for those producers or different intensity of competition in different segments of the market.[3] Our suggested solution for isolating the effect of preferences on sales is to rely on very detailed micro data (e.g. store level, at a high temporal frequency). Another closely related paper is Chung and Song (2006) that examines consumer preferences in the Korean cinema market.[4] They find that the probability of watching a foreign movie would increase by more than 80 percent if the film's cultural elements were Korean. If we are to observe differences in preferences in any market it would most likely be for

[3] In a study of the Swedish wine market, Nerlove (1995) finds that the valuation of attributes from a standard hedonic regression of price on attributes is very different from the valuation of attributes that result from using quantity as dependent variable. The explanation in this case is, he argues, that when prices are largely exogenous to a group of consumers (as they are in a small open economy), and tastes of that group differ from those in the world at large, the valuation of attributes from a standard hedonic regression will be misleading for that group. More generally Nerlove stresses that great care has to be taken in how supply- and demand conditions affect prices and quantities for hedonic regressions to inform us about preferences. Another prominent example of hedonic regressions on wine is Combris et al (1997) who find that the market price of Bourdeaux wines can be largely explained by objective characteristics appearing on the label of the bottle. Bajari and Benkard (2005) make precise some conditions under which we can draw inferences on preferences from hedonic regressions.

[4] Somewhat related are also two papers that try to measure the effects of calls for a boycott of French wine in the U.S. following French opposition to the Iraq war. Chavis and Leslie (2007) estimate that the boycott lowered sales by 13 to 26 percent whereas Ashenfelter et al (2007) argue that if one appropriately accounts for seasonal patterns the boycott had no significant effect. To the extent that the boycott bites it is a clear sign of preferences for wine being linked to country of origin.

cultural goods like movies.[5] Here, we ask whether the same kind of biases exist for consumption goods markets.[6] Our work also has some relation to Goldberg and Verboven (2001, 2005) who examine a number of European car markets and the how price differences can be explained by preferences and trade costs. They find that high prices of cars in Italy for instance can be largely explained by a strong preference for home goods which allows the local dominant, Fiat, to set high markups.

An important aspect of our study lies in our explicit incorporation of the fact that not all brands are distributed in all stores. Lately this issue has come to the fore in estimation of discrete choice models – Bruno and Vilcassim (2008), for instance, show that failure to account for this non-uniform distribution of brands will lead to biased results with regard to preferences (Conlon and Mortimer (2009) make a similar point). This is particularly important to account for if there are systematic differences across countries-of-origin in the share of retailers that carry the products. Controlling for other factors, wines with wider distribution are likely to have higher sales, which would appear as a preference for home goods when it may instead reflect tight links between domestic producers and retailers. Indeed, competition policy offers several examples of how incumbents have used contracts with retailers to try to limit the market share of entrants.[7]

Our results point to that preferences for home goods explain an important part of the home bias. Simulations where all source countries are attached the same valuation show a fall in the domestic market share from 58 percent to 38 percent. This result holds when we restrict attention to the brands that currently retail in New Hampshire. In a counterfactual experiment when we confront New Hampshire consumers with an exogenous set of products (the Swedish assortment) the estimated preference for U.S.

[5] There is no generally agreed upon definition of cultural goods, see Unesco (2004) for a discussion. Films are nevertheless the quintessential examples of cultural goods; see for instance Francois and van Ypersele (2002) or Rauch and Trindade (2005). Differences in preferences for such goods across countries can be used to motivate a role for public policy – making the measurement of preferences an important issue. Many argue that food products such as wine and cheese should also be seen as cultural goods, see Broude (2005) for a summary of the debate.

[6] Preliminary work reported in Lopez and Matschke (2007) is also related: They examine sales of 30 brands of beer in 12 U.S. cities over the period 1988-1992 and find evidence of a home bias in the sense that U.S. beers are valued more highly by consumers. In contrast to the present work they do not use information on the store coverage of products or perform counterfactual simulations.

[7] See for instance the Irish case on Unilever vs Mars. There is a rich literature on the use of contracts as barriers to entry, see for instance Aghion and Bolton (1987). There is also a large literature examining how shelf space is allocated in retailing, see for instance Bloom et al (2000).

wines falls short of being able to generate a home bias on par with the current situation. Under the hypotheses that trade costs affect the availability of brands to consumers, the evidence is therefore also consistent with an important role for trade costs in explaining home bias. Even though French and Italian wines tend to have higher quality adjusted prices than U.S. wines, the evidence on balance does not point to that higher prices of imports (which we would predict if trade costs mainly affected marginal costs) is an important reason for the home bias. This is also supported by a comparison with national market shares in Canadian provinces that are close to New Hampshire. Imported brands being available in fewer stores also does not appear as an important explanation for home bias on this market – simulations where all brands (that are sold in at least one New Hampshire store) are available in all stores yield a home bias close to the one observed. The evidence rather points to high fixed costs of entry for foreign brands, coupled with a preference for US wines, as the main sources of home bias.

The next section describes the data and market, as well as some initial, basic analyses to explore home bias. In section 3 we describe our formal econometric model, and in section 4 we report results on demand for wine in New Hampshire. In section 5 we describe our counterfactual simulations. Section 6 concludes.

2. Country of origin and sales - a first look.

New Hampshire is a small, New England state in the northeastern United States, with a population of 1.3 million. The south-eastern corner of the state is far more urban than sparsely populated northern remainder of the state (population density < 25 people per square mile). Sale of alcohol in New Hampshire is regulated by the New Hampshire Liquor Commission, which operates 75 retail outlets that sell wine and spirits across the state. While some independent retail outlets (including supermarkets) also sell wine, the state-run stores are unquestionably the dominant force in the market.[8] Here, we use

[8] See http://www.nh.gov/liquor/index.shtml for more information on the Liquor Commission. We also know the sales figures from the independent outlets (these are licensed through the state retail stores). The country composition of sales is very similar but since we know much less about these figures (in particular we do not know if they stem from one store or several and pricing policy may in practice differ) we focus on retail sales through the state stores. Almost 90 percent of bottled wine is sold through the state retail

weekly store level data on prices and quantities for all bottles of red wine that sell for $25 or less through the retail channel between the beginning of July 2005 and the end of June 2006. These are the actual sales figures, obtained directly from the Liquor Commission (rather than estimates of total sales as is frequently the case with data from marketing firms such as AC Nielsen). From the same source we obtained information on the country of origin, alcohol content, dominant grape varietal (or if it is a mix of several) and the region of origin (such as Bordeaux or Rioja). We integrated these data with wine ratings published by a leading wine rating site, Wine Spectator Online (www.WineSpectator.com), so that we could link price and volume data to some standard (if subjective) measure of "quality".

[Table 1 here]

Table 1 reports means and standard deviations for a number of variables by country of origin for the eight largest source countries (the wines in the data set come from a total of 16 countries). We report statistics both for all the wines in the data set and for the subset of wines were we have been able to match the wine to a Wine Spectator rating – the simulations will be performed using this subset. There is home bias in the sense that 55 percent of wine sold is of U.S. origin. By comparison, in the preceding year, U.S. production accounted for around 7 percent of world production.[9] Australia, France and Italy are the leading exporters to the New Hampshire market; none of the remaining countries has more than a 5 percent share.

The regular prices of wine are in effect set by the wholesaler/supplier since the Liquor Commission adds a predetermined markup (in Section 3 we discuss in some detail how prices are determined for temporary sales).[10] The second row of Table 1 presents quantity weighted average prices: U.S. wines sell at a higher average price than wines from other countries, which makes lower prices of U.S. wines an unlikely reason for the

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stores and thus included in our analysis. Some wine is also sold in larger containers, 1.5 liters or 5 liters. These are not included in the data set.

[9] The International Organisation of Vine and Wine (2004), see Table 4 for the share of world production for other source countries.

[10] The markups of the state liqor commission that are used during the period of study have been in effect since July 1999. In an audit (State of New Hampshire, 2006, p 16) the markup rules are critiziced "The Commission was unable to provide documentation of how the percentages in the July 1999 pamphlet were set or documentation to support that the percentages had been reviewed for continued apppropriateness since 1999". These comments prompted the Commission to address these issues during 2007.

observed home bias. In the third row we give the means and standard deviations (across brands) for the quality measure we have. Using a two sided t-test we reject the hypotheses (at the 5-percent level) of equal means for U.S. and Australian, French and Argentinean wines which all have higher mean quality. The other source countries do not have significantly different quality from U.S. wines. Only France has significantly higher quality adjusted mean prices. Thus, also adjusting for quality, the evidence does not suggest that a higher price for imported products is the reason for the high market share of domestic wines.

We now explore whether a wider distribution of domestic wines can explain the large share of domestic sales?[11] Based on the marketing literature we expect an increasing relation between sales and distribution (see for instance Reibstein and Farris (1995)). Causality is likely to go both ways: Products that are sold in a large share of stores sell well, but at the same time they are available in a large number of stores precisely because they are expected to sell well. As seen in Table 1 U.S. wines are on average distributed in a larger share of stores than those of most other source countries. The differences are minor however. "Rate-of-sales" (market share over distribution) is a measure sometimes used in marketing to examine the role of distribution. If imported brands systematically have a higher "rate-of-sales" this would indicate that imported brands are discriminated against in the sense that, given their attractiveness to consumers, they are distributed in fewer stores. As seen in Table 1 there is no indication of this in the mean "rate-of-sales". Apart from Australian and Spanish wines the mean "rate-of-sales" is higher for domestic wines than for the other leading countries of origin. This exercise thus provides no support for the notion that imported brands have unfavorable distribution across stores.

Might lower transport costs for U.S. wines, due to physical distance, explain the home bias? If the wine market features strong competition there is little room for imported brands to have a higher price even though they potentially face higher transport costs than domestic firms. All else equal they would thus have slimmer margins to cover

[11] The median store carries 580 brands at some point over the year (minimum 98 and maximum 1246). Mean 650 and standard deviation 307.

fixed costs and fewer firms would be present.[12] One way to explore this is to examine data from Canadian provinces, where we have sales figures for different countries of origin.[13] To the north New Hampshire is bordered by Quebec. In 2003, 77 percent of wine sold in this province was imported – of the imports, 66 percent came from France. U.S. imports came after Italy and Portugal with a share of 6 percent. Arguably, Quebec (about 3/4 of the population are French-speaking) is a very special case and perhaps it is not surprising that such a high share of imports come from France. As an alternative consider English speaking New Brunswick, Quebec's neighbor to the east. Even in New Brunswick, where 57 percent of wine was imported from another country, France still accounted for almost a third of all imports (29 percent). In fact, both Australian (26 percent) and Italian (18 percent) imports, which rounded out the top three, accounted for a larger share than U.S. imports, which had only a 10 percent share. Clearly physical distance between producer and consumer (given that New Brunswick borders the U.S.) does not fully explain these patterns.

The data from closely located Canadian provinces suggest that different national preferences are important. But we do not know the prices in Canada and can not conclusively say why there is this marked difference with respect to country of origin compared to New Hampshire. To examine this issue more closely, note that the northern most liquor store is located in Colebrook, less than 20 miles from the Canadian border. It is reasonable to expect that a share of their sales is generated by Canadian customers (see for example Campbell and Lapham (2004) for an analysis of cross-border shopping between Canada and the U.S.).[14] This should be even more pronounced around large Canadian holidays that do not directly coincide with U.S. holidays. One such occasion is St Jean Baptiste day on June 24 (patron saint of Quebec) followed by Canada day (a national holiday marking the anniversary of the creation of the Dominion of Canada in 1867) on July 1. Sales in Colebrook are indeed abnormally high compared to other stores

[12] A related point would be that small wineries find it more difficult to cover fixed costs of operating on an additional market. This was the focus in the 2005 Supreme Court case on whether U.S. states had the right to ban direct interstate shipments to consumers, see Akerlof et al (2004) or McFadden (2006) for discussions.

[13] Source: Canadian Vintners Association/Statistics Canada. www.canadianvintners.com

[14] The strength of this mechanism is limited by import restrictions, in that people can legally only bring back 1 bottle of wine into Canada (1 L of spirits, or 24 cans of beer) – and even then , they must be out of the country for more than 48 hours to bring any alcoholic beverages at all back into the Canada.

in the week of St Jean Baptiste day and the market shares for country of origin are very different from the means. French wines sell much more and U.S. wines much less in relative terms (U.S. wines have a market share of 35 percent in Colebrook in this week compared to an overall market share for U.S. wines of 53 percent in this particular week).

The evidence presented this far does not point to higher marginal costs of imports (implying higher quality adjusted prices), or imports being distributed in fewer stores, as major contributors to home bias. Rather, the analysis is suggestive that preferences play an important part in explaining the home bias. Which brands are available should be jointly determined with preferences – it is striking that out of a whopping 1906 different brands 45 percent come from the U.S. (see last row of Table 1) and we will return with attempts to disentangle the effects of preferences and the choice set. To get further than the descriptive evidence, we now proceed to estimate a model of demand in an attempt to measure consumers' valuation of different attributes of wine.

3 Demand for wine – identifying national preferences in a regression framework

We use a discrete choice model of demand, following Berry (1994) closely (see also Reiss and Wolak (2007)). We assume that the utility of consumer *i* of buying product *j* in store *k* at time *t* can be expressed as

$$u_{ijkt} = \underbrace{X_j\beta - \alpha p_{jt} + \xi_j + \Delta\xi_{jkt}}_{\delta_{jkt}} + \varepsilon_{ijkt} \tag{1}$$

where X is observable product characteristics (such as country of origin), p is price per bottle in dollars, ξ is the component of mean product quality that is unobserved (by us) and the same to all consumers and $\Delta\xi_{jkt}$ is the deviation from this mean unobserved product quality in market k at time t. A product is here defined as a particular brand and grape (for example Wolf Blass Cabernet Sauvignon Yellow Label). Finally, ε is an individual specific valuation that is i.i.d. across products and consumers following a type 1 extreme value distribution. This distributional assumption on the individual specific valuation implies that the market share of product j in market k at time t is given by the logit formula

$$s_{jkt} = \frac{e^{\delta_{jkt}}}{\sum_{n=0}^{N} e^{\delta_{nkt}}}. \quad (2)$$

Consumers will buy the product that gives them the highest utility, or not buying red wine and instead buying an outside good. As the outside good we use all other sales of bottled wine (that retail for below $ 25) in the state retail store and we normalize the utility of this to zero.[15] Use s_o to denote the market share of the outside good. We can then rewrite (2) to arrive at

$$\ln(s_{jkt}) - \ln(s_{0kt}) = \underbrace{X_j\beta + \xi_j}_{d_j} - \alpha p_{jt} + \Delta\xi_{jkt}. \quad (3)$$

Equation (3) can be estimated, and as seen from a comparison with (1) be used to inform us about consumers' preferences for the attributes contained in *X*. In estimating (3) we have to confront that products with higher unobserved mean valuation (ξ) will carry a higher price if prices are set to maximize profits. Following Nevo (2001) we use product fixed effects (d_j) to capture the effect of observed and unobserved components of mean valuations. In a regression of (3) the deviation from the mean valuation, $\Delta\xi$, will function as an error term. Notably, the price for a particular wine is the same in all stores and there is thus no correlation between the price and the error term in the cross-section when we use product fixed effects in the estimation.[16]

In a second stage we regress the product fixed effects (d_j) on observable product characteristics,

$$\hat{d} = \gamma_c + \beta_{ws} * WS + \beta_{alco} * Alco + \beta_{doc} * DOC + \beta_{nonvar} * Nonvar + \xi,$$

[15] The outside good thus largely consists of white wine. Frequently the number of consumers times some amount of personal consumption is used as outside good (as for instance in Berry et al (1995)). In the case of liquor stores this is likely to be less suitable because of partly overlapping market boundaries and a large share of out of state consumers in many of the stores. We were therefore attracted by the a measure of the outside good that stemmed from the store level data.

[16] This is the policy of the Liqour Commission. At the 90th percentile the mean absolute deviation of price per bottle from the mean price in a given week is 0, close to 1 cent at the 95th percentile and 20 cents at the 99th percentile.

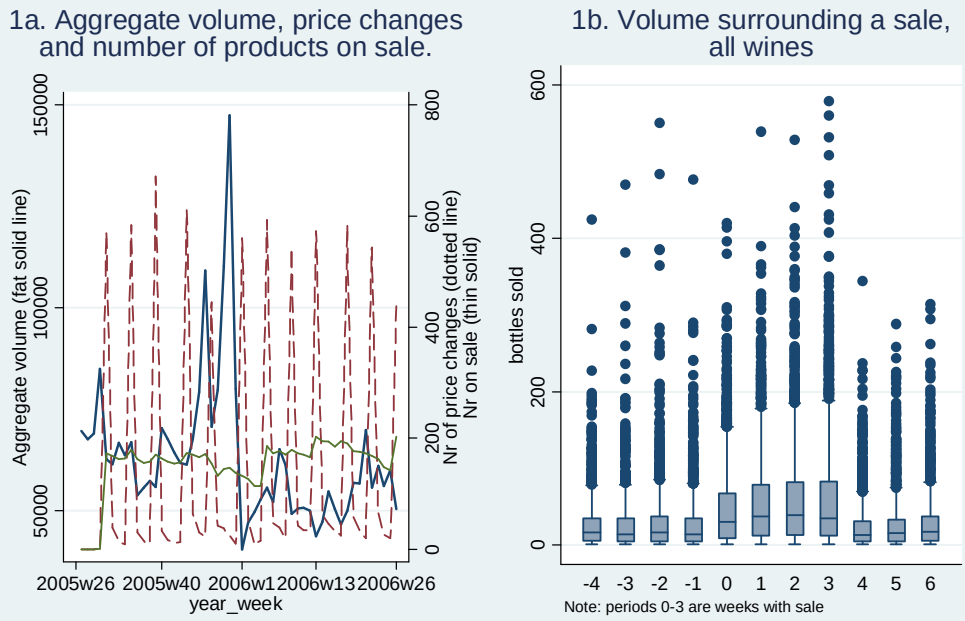
where γ_c are source country effects, WS is Wine Spectator rating and Alco is alcohol by volume. As a base for later counterfactuals we also include a dummy, DOC, that takes the value 1 if the brand is produced according to European region of origin rules (in France Appelation d'Origine Controlleé for instance), such as Bordeaux or Rioja. We also include a dummy for wines that are not DOC and are made from several unnamed grape varietals. Our expectation is that DOC adds value whereas we expect non-varietal wines to be lower valued. These latter dummies are highly correlated with country of origin however and are not included in all specifications. ξ is as before the brand specific mean valuation that is unexplained by the above observables.

While observing 75 stores over 52 weeks allow us to use product fixed effects to avoid price endogeneity in the cross section, the time series dimension is a potential concern. Most production costs in wine making are borne a year or more before a wine reaches the retail stage, making a search for brand specific cost shocks, that might otherwise provide a good instrument, challenging. However, exchange rates shift the opportunity cost of selling to the U.S. and we use the dollar exchange rate vis-à-vis the source country as an instrument for the time series variation in price (see for instance Goldberg and Hellerstein (2008) for a discussion of the relation between prices and exchange rates). However we do not expect a strong effect of changes in the value of the dollar on the marginal costs of U.S. producers so we want additional instruments for the time series variation and therefore turn to a close examination of the price dynamics in this market. Figure 1a shows that price changes are heavily concentrated to 12 of the 52 weeks – the first week of every month.[17] 49.1 percent of the price changes are due to temporary sales (we define a sale as a period of up to 5 weeks with a price that is at least 50 cents lower than price before and after this period). Whether to place a product on sale can be determined both by the Liquor Commission and by the wholesaler. As seen in Figure 1a the number of wines on sale is rather stable around 150-200 in a given week. In Figure 1b we show the sales volume for all wines surrounding each time they have a temporary sale (up to 4 weeks before, period 0 to 3 are weeks of the sale (where period 3

[17] The median brand changes price three times during the year. Conditional on the price changing, the mean price change is a decrease of 4.2 cents (1st percentile -$4, median -$0.5 and 99th percentile $3.50). Overwhelmingly, price changes are $1 or $2.

is both weeks 4 and 5 if the sale continues 5 weeks) and periods 4-6 are post sale periods. As seen (and confirmed by ttests), volume is much higher during a sale.[18]

Figure 1. Price changes and volumes, New Hampshire red wines

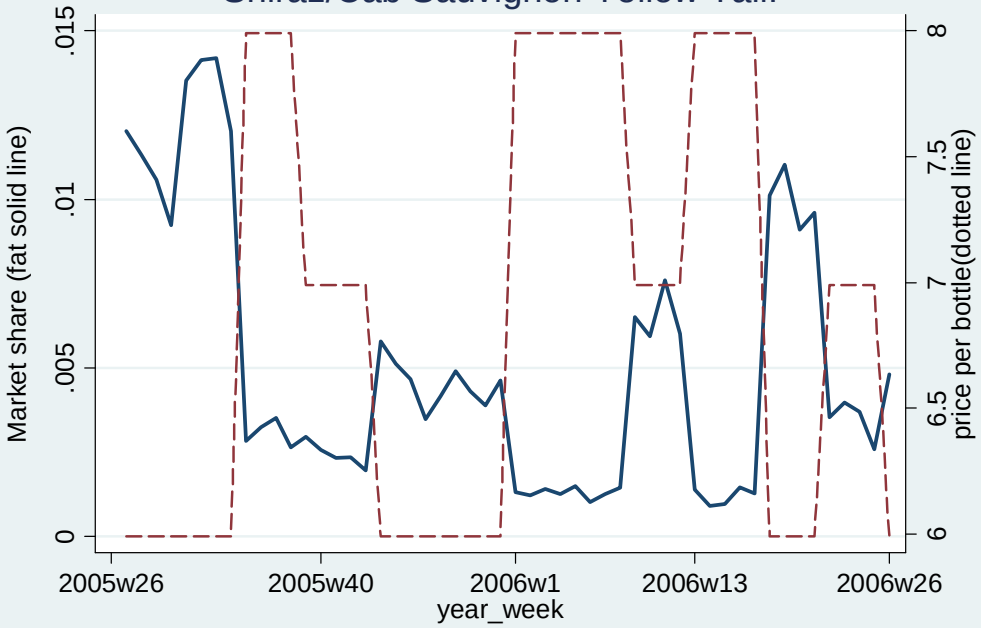


Thus, the decision to put a wine on sale does not primarily seem to be an endogenous response to a surge in demand for a particular wine, rather the evidence is consistent with a setting where wines "take turns" in being on sale. A sale is trivially correlated with price at the brand level, price is correlated with volume, and we see little evidence that the sale is caused by demand shifts. This is also the pattern that emerges when we examine prices and volumes for individual wines, an example of which we provide in Figure 2. The examination above supports the notion that a dummy for a wine that is on sale is a valid instrument for price. A complicating factor is that we do not observe for instance changes in shelf placement that are correlated with a wine being on sale and that can be expected to raise volume. To the extent that other sales promoting activities are positively correlated with sales, any bias is expected to be in the direction of finding a

[18] Another potential instrument for the time series variation is to use prices from another market (see for instance Nevo (2001). However there remains the concern of nationwide demand shocks. In section 5 we use Swedish data for simulations and we experimented with using Swedish prices as instruments for the New Hampshire prices. Results were similar as in the specification above, but there are only 82 red wines that are also in the Swedish data (as compared to more than 1400 in the other specifications), we therefore do not use this as our main approach.

greater sensitivity of demand to price (note however that the sale affects the price of a wine in all stores). As seen below there is only a moderate increase in the estimated sensitivity of demand when we use sales as an instrument. Using our regression results in the next section we test for overidentifying restrictions and can't reject the hypotheses that the instruments (ln(fx) and sale) are exogenous. In robustness checks we also run regressions with the exchange rate as the only instrument.

Figure 2. Price and market share in New Hampshire Shiraz/Cab Sauvignon Yellow Tail.



Finally, let us note that Hendel and Nevo (2006) show that the short run demand response to a sale of a storable good may be large as a result of consumer hoarding. In other words, when wine prices are reduced, consumers may take advantage of the opportunity for savings on this particular brand, and stock up, thereby building their own private reserves. By comparison, when prices are then increased when the sale ends, stocks at home tend to be consumed before new purchases are made. As seen in Figure 1a, the share of brands that are on sale are roughly constant on this market. Therefore this mechanism is expected to have a major impact only if consumers have a strong preference for the particular brand that is one sale. In robustness checks below we exclude periods surrounding sales from the regression analysis.

4 Country of origin effects in wine demand – results from estimation.

We now report results from estimation of mean utility of different brands as outlined in the previous section. We report rankings for country of origin for the 8 countries with at least 1 percent of volume – the full results from estimation are available in table A1 in the appendix. [19] In column (1) of Table 2 we report the results from a hedonic regression of ln(price) on country of origin dummies, Wine Spectator rating and alcohol content. After controlling for quality rating and alcohol content French and Italian wines have the highest prices, followed by U.S. wines. Australia and the South American producers have the lowest quality adjusted prices. Brooks (2003) finds a similar ranking with French and Italian wines on top, U.S. wines among the more expensive, and Argentinian wines among the cheapest. As noted different producers may be using different price setting strategies and we can therefore not be assured that there is a one-to-one link between price and consumers' valuation of countries of origin.

[Table 2 here]

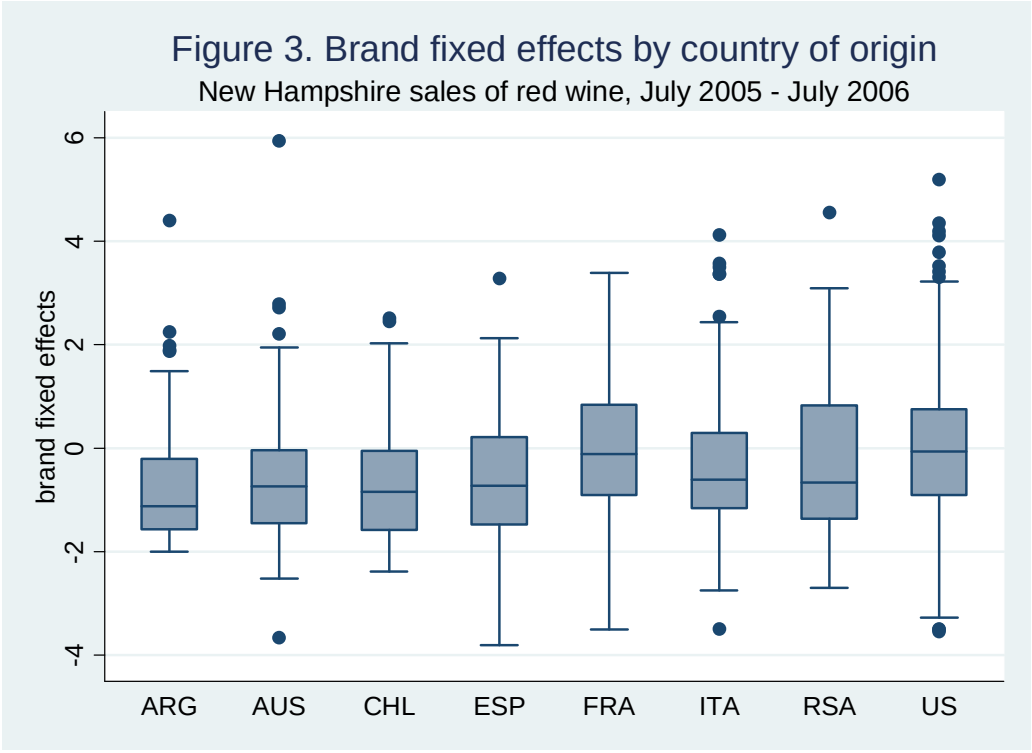
In column (2) we therefore estimate demand using equation (3). We use brand and week fixed effects. The coefficient on price is negative and quite precisely estimated. In column (4) we use the log of the source country exchange rate and a dummy for the wine being on sale as instruments for price. As expected, instrumenting for the time series variation in price is associated with a greater estimated sensitivity of demand to price changes – the point estimate on price falls from -0.22 to -0.25. One simple check on whether the model yields reasonable results is to examine the ownprice elasticities that are implied by the demand structure. In the logit case they are $\alpha p_j(1-s_j)$: Using the coefficient on price from the instrumented regression (Table 2, column 4) yields a median own price elasticity of demand of -2.23 (first percentile -5.78 and 99th percentile -1.42). These are quite reasonable numbers.[20] Cross-price elasticities are low and the logit

[19] We do this since for the smaller countries the country-of-origin effects are driven by just one or a few wines. While we want to include them it would be misleading to interpret them as source country effects. In the specification in column (1) for instance the U.S. source country effect is second to that for Hungary – there is only one brand imported for Hungary however (Egri Bikaver). As seen in Table 1 there are at least 30 brands from each of the source countries reported in Table 2.

[20] We are not aware of any comprehensive studies of brand level elasticities that we can compare to. Cook and More (2000) and Gallett (2007) survey estimates of the market price elasticity of demand for wine.

assumption implies that an increase in the price of one brand by 1 percent implies the same percentage impact on volume of all other brands (median estimate of 0.0038). With more than 1900 brands that are in many ways very similar it does not seem strange, *a priori*, that an increase in price of one brand is going to have a small impact on sales of many other brands.

In Figure 3 below we show the point estimates for the brand fixed effects (from the regression reported in column (4), across the major source countries.[21] As seen there is considerable variation across all countries, but consistent with the hedonic results from column (1), French and U.S. wines show higher median valuations.



In column (5) we regress the brand fixed effects on country of origin dummies, Wine Spectator rating and alcohol content as in eq (3). French wines are associated with the highest valuation, followed by U.S. wines. At the 5 percent level a t-test can not reject that the coefficient on U.S. origin is the same as coefficients for French, Italian or South

Gallett for instance reports a median point estimate of -0.7 for wine across 300 estimates. Given that brand level estimates should be more elastic than market level the coefficients seem plausible.

[21] In the simulations we perform in Section 5 we will want point estimates for all the countries-of-origin. We therefore include a full set of country of origin effects and no constant is reported. Rankings are unchanged if we instead include a constant and use the U.S. as the base country.

African origin however. Column (3) reports the corresponding specification for the regression where price is not instrumented for. As seen, the ranking of source countries is the same in both (3) and (5), i.e. not dependent on whether we instrument for the time series variation in price or not. A higher Wine Spectator rating and higher alcohol content are associated with a higher valuation of the brand in question, and the magnitudes are very similar in (3) and (5). An R-squared of around 0.15 points to that brand specific characteristics other than the observables included in (5) explain much of a wine's valuation.

We add the DOC and non-varietal dummies as additional brand characteristics in column (6). Inclusion of these characteristics changes the rankings of source countries with U.S. origin valued more highly than French or Italian origin. This shows that valuation of European origin is importantly tied to the regions rather than to the source country per se. In later counterfactuals we will use the specification in (6) as our benchmark.

Are U.S. wines highly valued because consumers value U.S. production *per se* or is it because U.S. wines provide a good match for U.S. tastes? While difficult to disentangle for wines, we note that grape varietal is a correlate of taste for wines[22] and in column (7) we therefore include dummies for the major grape varietals (Cabernet Sauvignon, Merlot, Shiraz, Pinot Noir and Zinfandel).[23] From inspection of (7) it is clear that the grape varietals are not the explanation for the higher valuation of U.S. wines compared to for instance Chilean or Australian wines.

In Table 3 we examine the robustness of the previous results in some dimensions. Columns (1) and (2) examine wines with a price above and below the median price (13 dollars) respectively. Country of origin ratings are similar with U.S. origin valued highly

[22] There are some differences across sources in the dominant grapes used. Australian sales are largely of the Shiraz variety and South African largely Cabernet Sauvignon, whereas for the U.S. varietals Cabernet Sauvignon, Merlot and Zinfandel each have somewhat more than 20 percent. Chilean wines are largely Cabernet Sauvignon and Argentinean Malbec. Taking this further one may note that different regions are differentially suited for producing quality wines from a particular grape varietal.

[23] When DOC=1 we do not have information on the grape content. This reflects that even when DOC wines are made from just one or two grape varietals that information is typically not a very visible product characteristic. The region of Crozes-Hermitage for instance is known for its Syrah(Shiraz) wines and a wine such as Les Jalets is made exclusively from Syrah, but this is not indicated in the name or on the label. This is in contrast to new world wines that are typically made by one or two grape varietals which figure prominently on the label.

in both settings. Wine Spectator ratings are not significant for sales in the lower price range (see Goldstein et al (2008) or Plassman et al (2008) for experimental evidence on links between prices and perceived quality of wines). As noted before, temporary sales may affect the parameter estimates. In column (6) we therefore drop a wine from the sample for the two weeks before it is on sale, during the sale and two weeks after it is on sale. As seen, the estimated price sensitivity is similar to the benchmark and the ranking of source countries is almost identical to the benchmark (compare column Table 3, column (7) to Table 2, column (5)). Columns (3) shows the impact of using ln(fx) as an instrument and column (5) shows the impact of using the smaller sample that results from dropping the observations with sales.

[Table 3 here]

In column 8 we report results from a demand estimation without brand fixed effects. In this case the correlation between price and unobserved quality may bias coefficient estimates. Estimates are indeed materially different from the preferred specification, with a coefficient on price closer to zero and U.S. wines significantly higher valued than other countries of origin. Australia now emerges as the source with the second highest valuation – a likely reason is that the low prices of Australian wines appears as a high valuation of Australian wines when we do not control for the cross-sectional endogeneity of price.

As discussed in the introduction, another potential source of mismeasurement of valuation of different source countries comes from differences in distribution levels. In column (9) we report the equivalent of the regression in column (8) but now using New Hampshire level data – thus not including any information about store coverage of different products. U.S. and Australia are at the top here as well but further down the list we see some changes. The fall in rank for South Africa in column (9), compared to column (8), is an indication that some brands may appear to have a low valuation using aggregate data because of limited distribution across stores.

This section has thus showed that U.S. origin is consistently valued among the highest and in no case can we reject that the valuation is the same as for the highest valued origin (France in the cases where U.S. is not the highest).

5. Preferences and market shares – some counterfactuals.

Above we established that country of origin affects consumer's valuation of a wine. Now we use counterfactual simulations to examine the quantitative importance of preferences for domestic wines for observed home bias. We make use of demand estimates reported in Table 2 (column 6) to predict counterfactual market shares by country of origin. To avoid clutter we do calculations for one representative week.[24] Row 1) in Table 4 gives the market share of the leading source countries in this week. The home bias is evident with the 57.8 percent market share of U.S. wines. In the first counterfactual we examine the role of distribution across stores. We use the estimated mean utility for each wine, $\delta_j^a = X_j\beta - \alpha p_{jt} + \xi_j$, and use equation (2) to calculate counterfactual market shares under the assumption that all wines are available in all stores. Equation (2) gives the predicted market shares including the outside good –we use this to calculate volume for each brand in each store and then sum volume by source country across all stores to generate counterfactual market shares of red wine. Row A) in Table 4 gives the predicted market shares from this exercise. While there are some differences with respect to the current situation, depicted in row 1), the main message is that the market share of U.S. wines only falls by some 2 percentage points. Imported brands being available in fewer (or smaller) stores is therefore not an important contributing factor to the home bias on this market.

[Table 4 about here]

As discussed, another potential reason for the home bias is higher marginal costs of imported brands, which would be reflected in higher quality adjusted prices. If firms set price independently for each product, and marginal cost is independent of quantity, the first order condition for profit maximization (assuming static Nash/Bertrand behavior, see for instance Berry (1994)) can be used to back out marginal costs.

$p_{jt} = \frac{1}{\alpha(1-s_{jt})} + c_{jt}$.

[24] We choose the second week in November 2005 which is roughly in the middle of the period for which we have data and has a sales volume (61.3 thousand bottles) between the mean (62.9) and median (60.0) weekly volumes.

We use the estimated α (Table 2, column 4) together with market shares in all of New Hampshire to back out the implied marginal costs. Denote the average (across all periods) marginal cost for each brand by $\hat{c}_j$. The median implied percentage markup, (p-c)/p, is 39.7 percent (1st percentile 17.3 percent, 99th 69.9 percent). There is no overall pattern that imports have higher marginal cost. To exemplify we show the mean estimated marginal cost for wines that have the same "quality" (they all have the median rating in Wine Spectator, 84 points, in row 6). France has the highest estimated marginal cost – but the U.S. comes second. The pattern is broadly consistent with factor prices in the production location, rather than import status or transport cost dependent on distance, as the driving factor behind the estimated differences in marginal costs. There are many potential complexities in the price setting and we do not want to put too much emphasis on these estimates – nevertheless they reinforce the impression from Section 2 that higher marginal costs leading to higher quality adjusted prices for imports is not the main factor behind the home bias.

We now turn to examine the role of preferences and calculate counterfactuals where we set the preference for country of origin equal to the U.S. valuation for all the wines. The mean predicted valuation for a wine is then given by

$$\delta_j^* = \hat{\gamma}_{US} + \hat{\beta}_{ws} * WS_j + \hat{\beta}_{alco} * Alco_j + \hat{\beta}_{doc} * DOC_j + \hat{\beta}_{\text{nonvar}} * \text{nonvar}_j - \hat{\alpha} p^*_j + \hat{\xi}_j \qquad (4)$$

,

We use the estimated coefficients reported in our baseline specification Table 2, column 6. Counterfactual market shares per brand in store *k* is then given by

$$s^*_{jk} = \frac{e^{\delta^*_j}}{\sum_{n_k=0}^{N_k} e^{\delta_n^*}}. \qquad (5)$$

As we change valuations we take account of that optimal prices change. Using the backed out marginal costs from above we assume that prices are set in a Nash equilibrium to solve the following maximization problem for each brand,

$$\max_{p_j^*} \sum_{k=1}^{75} (p_j^* - \hat{c}_j) s_{jk}^* M_k. \qquad (6)$$

Inserting the counterfactual prices that solve the system of equations in (6) into equations (4) and (5), and then summing up market shares by country of origin for the whole of

New Hampshire, gives us the counterfactual market shares that we report in row B) of Table 4. Comparing the counterfactual with all country of origin effects equal to the actual market share in row 1) we see a substantial fall in the U.S. market share: It falls from 58 percent to 38 percent. Thus, preferences are an important source of the home bias – holding the assortment constant, equating country of origin effects is associated with a fall in the domestic market share by 20 percentage points.[25] The differences between the counterfactual prices and actual prices are on average low and row C) reports the results of the same exercise as in row B), but using actual prices.[26] In the simulations we include the brand specific valuation that is not linked to observable characteristics, ξ. In row D) we set ξ equal to 0 for all wines and let country of origin effects be the same as for the U.S. Comparing rows C) and D), the stand out feature is that Australia's market share almost halves. This indicates that Australian origin per se is not valued highly by New Hampshire consumers, but that there are a number of highly valued brands from Australia.

The exercises reported above assume the same assortment as in the current situation – as seen in row 3), 48 percent of brands are from the U.S. The high share of domestic brands can be a reflection of tastes in a world with inconsequential trade costs (brands that are favored by consumers are more likely to be distributed). In this case the home bias on this particular market should provide little cause for concern for a trade economist. But the large share of domestic brands may also reflect important trade costs. If we allow for the possibility that the current choice set is largely determined by trade costs - what would consumers choose with a different choice set? And how should that alternative choice set be formulated? [27]

[25] This counterfactual (which uses coefficent estimates from Table 2, column 6) includes the dummy for DOC: A Bordeaux wine will therefore be given a higher value than an otherwise comparable U.S. wine. If we instead use a specification without DOC (Table 2, column 5) the predicted market share of the European producers falls somewhat (for France to 8.1 percent for instanceand the U.S. counterfactual is somewhat higher at 42 percent.

[26] The mean reoptimized price is 2.2 percent lower (1st percentile: -24.9 percent, 10th percentile: -12.4 percent, median: 0, 90th percentile:8.3 percent, 99th percentile: 25.0 percent).

[27] Several papers have pointed out that the costs of entering foreign markets with a differentiated product are largely sunk (see Besedes and Prusa (2006) or Das et al. (2007)). The current choice set for consumers will therefore depend on history, expectations of future developments of profits by brand managers as well as whether the brand is sold in other parts of the U.S. (there are likely to be some costs of entering the U.S. market with an additional component of entering the New Hampshire market specifically). In a recent study of Champagne producers, Crozet et al (2009), provide an interesting examination of links between quality

A natural benchmark for the role of preferences for home bias is to consider a hypothetical situation where all consumers in the world face a common set of products at a common set of prices. Any observed home bias in this case would clearly be due to preferences for home goods rather than trade costs. Using this as motivation we now perform simulations where we use the estimated consumer preferences reported in Table 2 but let consumers face an exogenous set of products and prices. We use the assortment and prices from Sweden. Sweden is located in northern Europe (population 9 million) and has a state retail monopoly (www.systembolaget.se). It provides an appealing benchmark since it has no domestic production of red wine (thus we can disregard home bias in its assortment), transparent rules for product introductions and price setting (see Systembolaget (2006)). The motivation for the Swedish retail monopoly is to limit negative health consequences of alcohol consumption. Following European Union rules the product assortment rules aim to guarantee that all producers are treated fairly and irrespective of national origin. The Swedish Competition Authority monitors the assortment and writes a report twice a year for the European Commission (see for instance Konkurrensverket (2006)). The selection in Sweden reflects major wine producers from around the world. For red wines with a price below the equivalent of $25 per bottle the volume shares for 2005 are: Spain and Italy each accounted for 19 percent, Chile for 16 percent, Australia for 14 percent, South Africa for 11 percent, France for 9 percent, the U.S. for 5 percent and Portugal for 3 percent.

We take the full set of Swedish products available in the same week (red wines that retail for less than the kronor equivalent of $25 per bottle) and use the estimated coefficients from Table 2 (column 6) to generate counterfactual market shares by source country. We use the same explanatory variables as above (country of origin, alcohol content, non-varietal, DOC, quality from Wine Spectator).[28] For each wine available in Sweden we thus calculate the predicted mean valuation (denoted δ^*) of New Hampshire consumers for this particular wine. Most of these wines are not available in New

of a firm's wines and which markets that firms are present on. Estimating a dynamic process of counterfactual entry and exit of brands will have to remain outside the scope of the present paper.

[28] For the quality measure we do not have Wine Spectator ratings for all the wines that are available in Sweden. In the cases where ratings are missing we use a predicted value from regressions on region of origin effects, alcohol content and measures of the degree of "oak" and richness of taste (each from Systembolaget on a scale from 0-12). These regressions are available as supplementary material from the authors.

Hampshire and we therefore set the unobserved component in mean valuation (ξ_j) to zero. Letting X_{jS} denote observable characteristics of the wines available in Sweden, p_{jS} the price of this wine in U.S. dollars we thus calculate

$$\delta_{jS}^{*} = X_{jS}\hat{\beta} - \hat{\alpha}p_{jS} + \underbrace{\xi_j}_{=0}$$

and counterfactual market shares per brand are given by the equivalent of equation (5). We report the country of origin market shares from these counterfactual volumes in row E) of Table 4. The market share of U.S. producers falls to less than 10 percent in this counterfactual. The largest winner in this counterfactual is Spain, which also has the greatest number of brands on the Swedish market. Another way of quantifying the national preferences is to let all country of origin preferences be the same as for the U.S. and recalculate market shares for the Swedish assortment, as reported on row F). The U.S. market share in this case falls to 4.8 percent. In a counterfactual with exogenous prices and exogenous assortment, that arguably well reflects a "level playing field", preferences for U.S. wines are strong enough to almost double the U.S. market share (albeit from a very low level).

6. Concluding remarks

Our investigation of the New Hampshire wine market leads to the conclusion that preferences for domestic goods is an important contributor to home bias on this market. We also show that the available set of products is an important covariate of the home bias. Faced with an exogenous set of goods the estimated preferences for home goods are far too weak to generate a market share for home goods similar to the current one. The importance of the choice set rhymes well with other studies that stress the entry and exit of source countries and products for the analysis of trade flows (see for instance Feenstra (1994), Eaton et al (2004), Hummels and Klenow (2005), Broda and Weinstein (2006) or Ghironi and Melitz (2007)).

In keeping with standard assumptions in economics we have taken preferences as given, at a deeper level one may conjecture that preferences for different products are

partly endogenous and exposure to a certain type of products generate a preference for those products (there is a growing literature trying to determine how preferences evolve, see for instance Stigler and Becker (1977) or Bowles (1998) and references thereto). Pursuing the origins of home bias with consumer level data will be an interesting avenue for future research on these and related issues.

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Table 1. Summary statistics on retail sales of red wine New Hampshire Liquor commission stores July 2005-July 2006 by country of origin.

	All	U.S.	Australia	France	Italy	Spain	Chile	Argentina	South Africa
Market share by volume (all wines)		54.63	14.58	10.63	9.30	4.62	2.49	1.89	1.37
Market share by volume (WS nonmissing only)		56.32	15.26	9.95	7.63	4.73	2.71	1.91	
Price (quantity weighted)	10.77	11.32	9.41	11.16	10.78	9.87	9.24	9.00	8.53
Wine Spectator rating	83.58	83.03	85.12*	84.71*	82.98	83.84	83.72	84.59*	82.40
	(4.40)	(3.97)	(3.02)	(3.95)	(6.27)	(4.14)	(3.55)	(3.93)	(4.21)
Price/Wine Spectator rating*100	16.22	16.66	14.17*	18.35*	17.11	14.46*	12.70*	13.44*	14.23*
	(7.42)	(6.94)	(5.08)	(7.16)	(12.13)	(5.05)	(4.60)	(4.45)	(4.97)
Share of stores that a wine is distributed in (all wines)	22.21	26.50	25.77	22.22*	18.40*	23.68	20.83*	17.27*	15.29*
	(27.87)	(30.32)	(30.32)	(27.62)	(24.33)	(25.27)	(25.94)	(18.10)	(25.39)
Share of stores that a wine is distributed in (WS nonmissing only)	25.53	29.93	17.33	23.37*	18.89*	25.29	22.84	17.33*	11.73*
	(29.36)	(31.88)	(19.97)	(28.84)	(23.49)	(25.93)	(26.71)	(19.97)	(21.25)
Rate of sales (market share/distribution)*1000 (all)	1.04	1.16	1.34	0.75*	0.88*	1.21	0.99	1.00	0.89
	(1.48)	(1.61)	(2.43)	(0.95)	(0.97)	(1.17)	(0.96)	(0.98)	(1.44)
Rate of sales (market share/distribution)*1000 (WS nonmissing only)	1.32	1.49	1.63	0.94*	1.05*	1.52	1.23	1.22	0.89
	(1.86)	(2.02)	(2.95)	(1.20)	(1.07)	(1.41)	(1.15)	(1.24)	(1.66)
Market share in Colebrook week of June 18 2006.		34.78	14.67	31.52	8.70	0.54	2.17	6.52	1.09
Nr of brands (all)	1906	852	181	289	289	91	72	64	30
Nr of brands (WS nonmissing only)	1444	645	156	202	211	70	61	49	25

Data is all red wines sold in bottles for $25 or less. WS nonmissing is subset for which we have been able to map a wine to a Wine Specator rating for that wine. Summary statistics reported for all countries of origin with at least 1 percent of the volume. Countries thus not reported are Austria, Greece, Hungary, Israel, New Zealand, Portugal, Romania and Slovenia. Summary statistics are for the whole time period when not indicated otherwise. Standard deviations in parentheses. * denote the cases where a two-sided t-test rejects equal means between the column country and the U.S. for the respective variable. For instance we reject that the mean Wine Spectator rating for Australian wines is the same as the mean for U.S. wines.

Table 2. Country of origin effects in sales of wine, New Hampshire July 2005-July 2006.

	(1) OLS $Ln(p_{jt})$	(2) OLS $Ln(s_{jkt}/s_{okt})$	(3) OLS d_j(brand f.e)	(4) 2sls $Ln(s_{jkt}/s_{okt})$	(5) OLS d_j(brand f.e)	(6) OLS d_j(brand f.e)	(7) OLS d_j(brand f.e)
Country effects, ranking	1 FRA♣ 2 ITL♣ 3 USA 4 ESP♣ 5 RSA♣ 6 AUS♣ 7 CHL♣ 8 ARG♣		1 FRA 2 USA 3 ITL 4 RSA 5 ESP♣ 6 ARG♣ 7 CHL♣ 8 AUS♣		1 FRA 2 USA 3 ITL 4 RSA 5 ESP♣ 6 ARG♣ 7 CHL♣ 8 AUS♣	1 USA 2 RSA 3 FRA♣ 4 ARG♣ 5 ITL♣ 6 CHL♣ 7 ESP♣ 8 AUS♣	1 USA 2 RSA 3 FRA 4 AUS♣ 5 ARG♣ 6 ITL♣ 7 CHL♣ 8 ESP♣
Price		-0.2245*** (0.0080)		-0.2521*** (0.0028)			
Wine Spectator	0.0158*** (0.0007)		0.0434*** (0.0113)		0.0503*** (0.0128)	0.0508*** (0.0128)	0.0476*** (0.0122)
Alcohol	0.1182*** (0.0020)		0.2811*** (0.0384)		0.3300*** (0.0414)	0.3344*** (0.0411)	0.3433*** (0.0417)
DOC						0.6006*** (0.1798)	0.5887*** (0.1811)
Non-varietal						-8.4275*** (0.9586)	-8.3072*** (1.0252)
Cabernet Sauvignon							-0.0307 (0.1185)
Merlot							-0.2373** (0.1123)
Shiraz							-0.4422*** (0.1324)
Pinot Noir							0.5627*** (0.1460)
Zinfandel							-0.0939
Instruments				Ln(fx) Sale			
Observations	48237	673164	1441	673164	1441	1441	1441
Nr brands	1441	1903	1441	1903	1441	1441	1441
R-squared	0.170	0.422	0.132		0.145	0.154	0.183
Rmse	0.332	0.909	1.088		1.169	1.164	1.146

Robust standard errors in parentheses *** variables are significant at the 1 percent level of significance and ** at the 5 percent level. The ranking of country effects based on point estimates (see Table A1). In this table we report the rankings for the 8 source countries with at least 1 percent of total volume (the set reported in Table 1). There is a total of 16 source countries. A ♣ denotes that the country effect for the respective country is different from that for the U.S. at the 5 percent level. Standard errors in Col 2 clustered at country of origin level. Columns 2 and 4 include full set of week fixed effects. First stage regression for column 4 in Appendix A1.

Table 3. Country of origin effects in sales of wine, New Hampshire July 2005-July 2006. Robustness results.

	(1)OLS d_j(brand f.e)	(2) OLS d_j(brand f.e)	(3) 2sls $Ln(s_{jkt}/s_{okt})$	(4) OLS d_j(brand f.e)	(5)OLS $Ln(s_{jkt}/s_{okt})$	(6)2sls $Ln(s_{jkt}/s_{okt})$	(7)OLS d_j(brand f.e)	(8) OLS $Ln(s_{jkt}/s_{okt})$	(9) OLS $Ln(s_{jt}/s_{ot})$
Country effects, Ranking	1 FRA 2 RSA 3 USA 4 ITL 5 CHL 6 AUS♣ 7 ARG♣ 8 ESP♣	1 USA 2 ARG♣ 3 FRA 4 ESP♣ 5 RSA 6 ITL♣ 7 AUS♣ 8 CHL♣		1 FRA 2 USA 3 ITL 4 RSA 5 ESP♣ 6 ARG♣ 7 CHL♣ 8 AUS♣			1 FRA 2 USA 3 RSA 4 ITL 5 ESP♣ 6 ARG♣ 7 CHL♣ 8 AUS♣	1 USA 2 AUS♣ 3 RSA♣ 4 FRA♣ 5 ESP♣ 6 ARG♣ 7 ITL♣ 8 CHL♣	1 USA 2 AUS♣ 3 FRA♣ 4 ESP♣ 5 ARG♣ 6 ITL♣ 7 CHL♣ 8 RSA♣
Price			-0.2906*** (0.0251)		-0.2055*** (0.0147)	-0.2639*** (0.0307)		-0.0839*** (0.0068)	-0.1014*** (0.0128)
Wine Spectator	0.0036 (0.0071)	0.0394*** (0.0097)		0.0601*** (0.0149)			0.0521*** (0.0133)	0.0079 (0.0055)	-0.0001 (0.0076)
Alcohol	0.1549*** (0.0435)	0.1368** (0.0545)		0.3978*** (0.0458)			0.3612*** (0.0437)	-0.1115** (0.0471)	-0.1524 (0.1126)
Sample	Price<13	Price ≥13	all	all	No sales	No sales	all	all	all
Instrument			Ln(fx)			Ln(fx)			
Observations	708	733	673164	1441	334358	334358	1409	572445	48237
Nr brands	708	733	1903	1441	1861	1861	1409	1441	1441
Rmse	0.931	1.027		1.293	0.903		1.226	1.133	1.610
R-squared	0.062	0.083		0.160	0.470		0.149	0.108	0.106

Robust standard errors in parentheses *** variables are significant at the 1 percent level of significance and ** at the 5 percent level. The ranking of country effects based on point estimates (see Table A2). In this table we report the rankings for the 8 source countries with at least 1 percent of total volume (the set reported in Table 1). There is a total of 16 source countries. A ♣ denotes that the country effect for the respective country is different from that for the U.S. at the 5 percent level. Standard errors in Col 5 clustered at country of origin level. Columns 3,5 and 6 include full set of week fixed effects. First stage regression for column 4 in Appendix A2.

Table 4 Counterfactual simulations of source country market shares.

Market share: Actual	U.S.	Australia	France	Italy	Spain	Chile	Argentina	South Africa
1) Actual: N.H.	57.82	17.09	7.48	8.47	3.99	2.47	1.51	0.75
2) Actual: Sweden	4.85	13.30	8.86	19.30	19.67	15.69	1.94	11.29
3) Share of brands (N.H.)	48.14	10.35	12.53	13.66	5.80	4.24	2.70	1.03
4) Share of brands (Sweden)	8.05	8.41	17.35	18.42	20.21	8.05	2.86	8.05
5) Share of world production in 2004	6.74	4.63	19.24	17.78	14.42	2.11	5.19	3.11
6) marginal cost in $| (Winespectaror points=84)	9.16	6.05	9.98	8.90	7.02	5.62	5.59	6.01
Market share: Counter-factual								
A) All wines available in all stores	55.34	11.77	10.36	9.61	5.00	3.65	2.42	0.99
B) All country effects equal to U.S. effect and reoptimize price	37.87	20.45	11.69	12.95	8.21	5.58	1.91	0.44
C) same as B) but actual price	38.05	22.27	10.94	13.41	7.03	5.45	1.61	0.41
D) same as C) but ξ=0	36.42	11.69	15.41	19.66	7.35	5.09	2.51	0.65
E) N.H. using Swedish assortment	8.67	5.49	21.48	17.27	23.01	6.59	2.25	10.37
F) N.H. using Swedish assortment with all country effects equal to U.S.	4.81	7.09	17.39	19.19	25.39	7.78	2.76	6.94

All data for second week of November 2005. Actual market share and share of brands for New Hampshire calculated on wines with nonmissing observations of Wine Spectator ranking only. The number of brands in New Hampshire is 966 and in Swedish counterfactual 559.

Table A1. Country of origin effects in sales of wine, New Hampshire July 2005-July 2006. Full results for results reported in Table 2.

	(1) OLS	(2) OLS	(3) OLS	(4a) First stage of (4)	(4) 2sls	(5) OLS	(6) OLS	(7) OLS
	$Ln(p_{jt})$	$Ln(s_{jkt}/s_{okt})$	d_j(brand f.e)	p_{jkt}	$Ln(s_{jkt}/s_{okt})$	d_j(brand f.e)	d_j(brand f.e)	d_j(brand f.e)
Sale=1				-1.1491***				
				(.0032)				
Ln (fx)				3.3580***				
				(.0752)				
Price		-0.2245***			-0.2521***			
		(0.0080)			(0.0028)			
Argentina	-0.6002***		-7.9707***			-9.2210***	-0.8911***	-0.8181***
	(0.0610)		(0.9548)			(1.0676)	(0.1967)	(0.2164)
Australia	-0.5091***		-8.1341***			-9.3728***	-1.0441***	-0.7745***
	(0.0610)		(0.9586)			(1.0726)	(0.1417)	(0.1721)
Austria	0.1527**		-6.8199***			-7.8163***	0.5198***	0.0000
	(0.0620)		(0.9336)			(1.0471)	(0.1097)	(0.0000)
Chile	-0.5553***		-8.0407***			-9.2850***	-0.9533***	-0.8411***
	(0.0602)		(0.9477)			(1.0597)	(0.1553)	(0.1726)
Spain	-0.4379***		-7.9313***			-9.1284***	-0.9595***	-0.9191***
	(0.0599)		(0.9476)			(1.0601)	(0.1703)	(0.2036)
France	-0.2235***		-7.3049***			-8.4171***	-0.5753***	-0.5199**
	(0.0604)		(0.9523)			(1.0660)	(0.2095)	(0.2243)
Greece	-0.9077***		-6.9589***			-8.1424***	0.1914	0.2135
	(0.0636)		(1.5423)			(1.6716)	(1.3335)	(1.3409)
Hungary	-0.5243***		-8.0595***			-9.2750***	-0.9356***	-0.9153***
	(0.0558)		(0.8651)			(0.9684)	(0.0271)	(0.1716)
Israel	-0.1535**		-7.8644***			-9.0036***	-0.6715***	-0.5067***
	(0.0598)		(0.9333)			(1.0446)	(0.0868)	(0.1463)
Italy	-0.2679***		-7.5106***			-8.6506***	-0.8921***	-0.8260***
	(0.0599)		(0.9410)			(1.0541)	(0.2176)	(0.2327)
New Zealand	-0.2214***		-7.5170***			-8.6299***	-0.2994	-0.5512
	(0.0617)		(0.9959)			(1.1126)	(0.3605)	(0.3378)
Portugal	-0.4242***		-8.5522***			-9.7379***	-1.5376***	-1.4955***
	(0.0646)		(0.9805)			(1.0993)	(0.3029)	(0.3185)
Romania	-0.3953***		-7.1535***			-8.3376***	0.0000	0.2500
	(0.0550)		(0.8609)			(0.9624)	(0.0000)	(0.1609)
USA	-0.3355***		-7.3570***			-8.5260***	-0.1974**	-0.1416
	(0.0594)		(0.9407)			(1.0520)	(0.1004)	(0.1240)
South Africa	-0.4861***		-7.5156***			-8.7169***	-0.3850	-0.2144
	(0.0594)		(0.9502)			(1.0577)	(0.3173)	(0.3297)
Winespec	0.0158***		0.0434***			0.0503***	0.0508***	0.0476***
	(0.0007)		(0.0113)			(0.0128)	(0.0128)	(0.0122)
Alcohol	0.1182***		0.2811***			0.3300***	0.3344***	0.3433***
	(0.0020)		(0.0384)			(0.0414)	(0.0411)	(0.0417)
							0.6006***	0.5887***
DOC							(0.1798)	(0.1811)
							-8.4275***	-8.3072***
Nonvarietal							(0.9586)	(1.0252)
								-0.0307
Cabernet Sauv.								(0.1185)
								-0.2373**
Merlot								(0.1123)
								-0.4422***
Shiraz								(0.1324)
								0.5627***
Pinot Noir								(0.1460)
								-0.0939
Zinfandel								(0.1441)
Observations	48237	673164	1441	673164	673164	1441	1441	1441
R-squared	0.170	0.422	0.132	0.199		0.145	0.154	0.183
Rmse	0.332	0.909	1.088			1.169	1.164	1.146

For explanatory notes see Table 2. *** p<0.01, ** p<0.05, * p<0.1

Table A2. Country of origin effects in sales of wine, New Hampshire July 2005-July 2006. Full results for results reported in Table 3.

	(1)OLS	(2) OLS	(3) 2sls	(4) OLS	(5)OLS	(6a) first stage of (6)	(6)2sls	(7)OLS	(8) OLS	(9) OLS
	d_j(brand f.e)	d_j(brand f.e)	Ln(s_{jkt}/s_{okt})	d_j(brand f.e)	Ln(s_{jkt}/s_{okt})	p_{jkt}	Ln(s_{jkt}/s_{okt})	d_j(brand f.e)	Ln(s_{jkt}/s_{okt})	Ln(s_{jt}/s_{ot})
Ln(exchange rate)						3.063***				
						(.0821)				
Price			-0.2906***		-0.2055***		-0.2639***		-0.0839***	-0.1014***
			(0.0251)		(0.0147)		(0.0307)		(0.0068)	(0.0128)
Argentina	-3.5260***	-4.4525***		-1.7575***				-9.8320***	0.4691***	0.3017***
	(0.7213)	(1.1103)		(0.1946)				(1.1201)	(0.1098)	(0.0637)
Australia	-3.4915***	-5.0821***		-1.8933***				-9.9681***	0.9225***	0.5909***
	(0.7303)	(1.0616)		(0.1184)				(1.1264)	(0.0928)	(0.0527)
Austria		-4.5804***						-8.1557***	0.0000	-0.9419***
		(0.9887)						(1.0983)	(0.0000)	(0.1800)
Chile	-3.4216***	-5.1573***		-1.8132***				-9.8798***	0.4107***	0.0274
	(0.7088)	(1.0640)		(0.1413)				(1.1117)	(0.0806)	(0.0374)
Spain	-3.5751***	-4.6683***		-1.5911***				-9.7413***	0.5269***	0.3899***
	(0.7201)	(1.0438)		(0.1585)				(1.1124)	(0.0783)	(0.0322)
France	-2.9887***	-4.5903***		-0.7617***				-8.9639***	0.7072***	0.4296***
	(0.7116)	(1.0304)		(0.0995)				(1.1186)	(0.0674)	(0.0591)
Greece	-3.3827***	-0.8211		-0.5859				-8.7262***	-0.2083	-0.3982**
	(1.0963)	(0.9401)		(1.4456)				(1.7260)	(0.1697)	(0.1677)
Hungary	-3.5732***			-1.7631***				-9.8646***	-0.1523**	0.8208***
	(0.6543)			(0.1043)				(1.0162)	(0.0562)	(0.0520)
Israel		-5.5854***		-1.3858***				-9.5416***	-0.1634**	-0.7743***
		(1.0140)		(0.0537)				(1.0974)	(0.0648)	(0.0383)
Italy	-3.1454***	-4.7206***		-1.0337***				-9.1868***	0.4603***	0.2121***
	(0.6944)	(1.0264)		(0.0900)				(1.1067)	(0.0647)	(0.0529)
New Zealand	-3.1572***	-4.8237***		-0.9753**				-9.1910***	0.3391***	0.2769***
	(0.7201)	(1.1103)		(0.3957)				(1.1660)	(0.0870)	(0.0309)
Portugal	-4.1339***	-5.3422***		-2.1847***				-10.3212***	-0.4837***	-1.0603***
	(0.7163)	(1.0919)		(0.3592)				(1.1534)	(0.0638)	(0.0786)
Romania	-2.5951***	0.0000		-0.7821***				-8.9672***	0.6514***	0.0000
	(0.6629)	(0.0000)		(0.1278)				(1.0102)	(0.0702)	(0.0000)
USA	-3.1093***	-4.4208***		-0.9496***				-9.0903***	0.9723***	0.7660***
	(0.7137)	(1.0418)		(0.0877)				(1.1045)	(0.0810)	(0.0309)
South Africa	-3.0144***	-4.6700***		-1.1852***				-9.1728***	0.8772***	-0.2762***
	(0.7376)	(1.1608)		(0.3321)				(1.1183)	(0.1103)	(0.0295)
Wine Spectator	0.0036	0.0394***		0.0601***				0.0521***	0.0079	-0.0001
	(0.0071)	(0.0097)		(0.0149)				(0.0133)	(0.0055)	(0.0076)
Alcohol	0.1549***	0.1368**		0.3978***				0.3612***	-0.1115**	-0.1524
	(0.0435)	(0.0545)		(0.0458)				(0.0437)	(0.0471)	(0.1126)
Instrument			Ln(fx)				Ln(fx)			
Observations	708	733	673164	1441	334358	673164	334358	1409	572445	48237
R-squared	0.062	0.083		0.160	0.470	0.069		0.149	0.108	0.106

For notes see Table 3. *** p<0.01, ** p<0.05, * p<0.1