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

Richard Friberg, Stockholm School of Economics and CEPR
Robert W. Paterson, Industrial Economics inc.
Andrew D. Richardson, Complex Systems Research Center, University of New Hampshire

This version: Jan 10, 2008
PRELIMINARY – PLEASE DO NOT QUOTE

Abstract

Many goods markets are characterized by domestic products having a disproportionate market share. Taking the set of products available on a market as given, the main candidates for creating this “home bias” are preferences for home goods or trade cost reflected in higher prices of imports or weaker distribution networks for imported goods. We explore the contribution to home bias of these factors using a structural model of demand on very detailed data on wine sales in New Hampshire (brand per week per store over a one year period). Preferences rather than trade costs are the main force behind the home bias. Simulations where we confront New Hampshire consumers with an exogenous set of products (equally detailed data from Sweden) points to that the preferences for home goods fall far short of generating important home bias with this alternative choice set. Our findings reinforce recent work that stresses the extensive margin (new products and new suppliers) of trade.

JEL codes: F12, F14, L13, L66.

* We are grateful to the New Hampshire State Liquor Commission (in particular John Bunnell, Korene French, and Nicole Brassard) and Systembolaget (Karin Lundberg) for making the data available to us. This analysis would not have been possible otherwise. Friberg thanks the Swedish Competition Authority and Vetenskapsrådet for Financial Support. Nathalie Gibas provided excellent research assistance and seminar audiences at IFN provided useful input.
* Corresponding author: Stockholm School of Economics, PO box 6501, SE-113 83 Stockholm, Sweden. nerf@hhs.se
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 markets – a phenomenon often referred to as home bias. A stark illustration of this is McCallum’s (1995) finding that trade between two Canadian provinces is some 20 times greater than trade between a Canadian province and a U.S. state (see Anderson and Van Wincoop (2004) for an overview of the literature that has followed, and that finds less extreme, but still important, effects than McCallum).\(^2\)

Is the observed home bias an effect of preferences for domestic goods or are trade costs the cause? Consider the case of differentiated consumer products. If preferences are such that consumers prefer domestically produced goods we would see a home bias even if consumers in all countries faced the same set of goods and the same relative prices. Trade costs can lead to a home bias through three channels:

i) Trade costs may be reflected in higher prices for imported brands.

ii) Foreign products may be distributed in a smaller set of stores and therefore a smaller share of 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) or Das et al (2007)).

The question we pose in this paper is the following: is it prices, brand availability, or tastes that explain the home bias? The previous literature has, with few exceptions, explored home bias at the level of overall trade (as McCallum) or for industry level trade data (for instance Evans (2003)).\(^3\) However, it is very hard to distinguish the effects of

---

\(^1\) The International Organisation of Vine and Wine (2004).

\(^2\) Home bias in goods is of interest not only to international trade. Obstfeld and Rogoff (2000) argue that home bias in traded goods (in their setup due to trade costs and a high elasticity of substitution between home and foreign goods) can explain many of the puzzles in international finance. By affecting the consumption baskets the home bias also changes the financial choices of agents – leading to less international diversification which is at the core of several international finance puzzles (such as “low” correlation between consumption in different countries, “low” levels of current account imbalances and high savings-investment correlations within countries).

\(^3\) A related set of papers examine home bias within countries – for instance documenting that U.S. state borders also impede trade, see Wolf (2000) or Hillberry and Hummels (2003).
trade costs from differences in preferences using aggregate data.\textsuperscript{4} We explore these questions in detail using an extensive database of wine sales in New Hampshire.\textsuperscript{5} The data, obtained through the state’s Liquor Commission, cover store-level sales of all red wines under $25 sold during a one-year period. We begin by describing the overall patterns in the data and then attempt to estimate preferences for country of origin using discrete choice methods inspired by Berry (1994) and Berry, Levinsohn and Pakes (1995). This allows us to examine the contribution of preferences, prices and distribution across stores to observed home bias. To explore the consequences of a potentially biased choice set we use the taste preference parameters estimated for New Hampshire consumers and confront them with an exogenous set of products and prices. We use equally detailed product level data from a completely separate market for wine, Sweden, to generate counterfactual market shares by country-of-origin. We are not aware of any other work that employs a similar methodology for this last counterfactual.

Perhaps the closest precursor to our work is Brooks (2003), who examined 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 Argentinian, 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.\textsuperscript{6} Our suggested solution for isolating the effect of preferences on sales is to rely on very detailed micro

\textsuperscript{4} 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." They go on to note that a type of gravity model developed in Bergstrand (1985) or time series evidence might help distinguish the two (under the assumption that preferences are stable over time but trade costs change).

\textsuperscript{5} Our focus on the wine market can also be seen as a tribute to Ricardo (1817) – the very first example of comparative advantage concerned the import of wine into the U.K.

\textsuperscript{6} 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.
data (e.g. store level, at a high temporal frequency). We are aware of two papers that employ a similar methodology and examine preferences for national origin of goods.\textsuperscript{7} Chung and Song (2006) examine consumer preferences in the Korean cinema market. 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 in cultural goods like movies.\textsuperscript{8} Here, we ask whether the same kind of biases exist for consumption goods markets. Lopez and Matscke (2007) examine sales of 30 brands of beer in 12 US cities over the period 1988-1992 and find evidence of a home bias in the sense that U.S. beers are associated with a higher mean utility from consumption of that brand.

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 (2006), 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 (2007) 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. What shows up as a higher valuation of domestic goods may simply reflect that domestic brands have tighter ties to the retailers and are distributed in more stores. Controlling for other factors, wines with wider distribution are likely to have higher sales, which would appear as a preference for home goods when in fact it represents retailer, not consumer, choice.

The home bias that we observe in the alcoholic beverage market appears to be the result of consumer preferences for home goods – rather than trade barriers reflected in higher prices or more narrow distribution. This result holds when we restrict attention to

\textsuperscript{7} 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 they boycott bites it a clear sign of preferences for wine being linked to country of origin.

\textsuperscript{8} 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.
the brands that currently retail in New Hampshire. In a counterfactual experiment we confront New Hampshire consumers with an exogenous set of products the estimated preference for U.S. wines falls far short of being able to generate a home bias on par with the current situation. The evidence is consistent with an important role for the extensive margin (new brands) rather than the intensive margin (more trade in already traded brands) also at this detailed level. The one sentence summary of the conclusions is that preferences and higher fixed costs of entry for foreign brands are the main explanations for home bias on this market.

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 report results from the counterfactual where we let New Hampshire consumers face the Swedish assortment. 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 the northern remainder of the state, which is largely rural and sparsely populated (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. Here, we use weekly store level data on prices and quantities for all brands of red wine sold 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

---

9 See [http://www.nh.gov/liquor/index.shtml](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 retail stores. Almost 90 percent of sales volume are through the state retail stores and thus included in our analysis.
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 Bourdeaux 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” (see the Appendix for further details on the variables used).

Table 1 reports means and standard deviations for a number of variables by country of origin. There is home bias in the sense that 55 percent of wine sold is of U.S. origin. By comparison, in the preceeding year, U.S. production accounted for around 7 percent of world production.\(^\text{10}\) Australia, France and Italy are the leading exporters to the New Hampshire market; none of the remaining countries has more than a 5% share (and in fact, there are no imports of red wine from neighboring Canada). U.S. wines sell at a higher average price than wines from other countries, so lower prices are not the main reason for the observed home bias. Examining the quality adjusted (based on Wine Spectator ratings) price does not change this interpretation; quality adjusted prices for U.S. wines are similar to those for other countries of origin.\(^\text{11}\) For the wines that have wider distribution within the state there is also little in terms of evident patterns – even though U.S. wines tend to be distributed in a larger share of stores than those of other countries, the differences in the means are minor.

We now explore if a wider distribution of domestic wines can explain the large share of domestic sales?\(^\text{12}\) Based on the marketing literature we expect a convex relationship between sales and distribution, i.e., the more sales the greater is the increase in sales associated with wider distribution. Causality is likely to go both ways, products that are sold in a large share of stores also sell well, but at the same time they are available in a large number of stores precisely because they are expected to sell well (see

\(^{10}\) The International Organisation of Vine and Wine (2004), also see Table 4.

\(^{11}\) Note that if we believe that these U.S. test results are likely to reflect U.S. tastes, which may be different than in other countries (i.e., American drinkers prefer a different style of wine from French drinkers) we would expect quality-adjusted prices to be lower for U.S. wines. The reason is the sense that for a given price U.S. wines would be given a higher quality rating which would lowers the quality adjusted price.

\(^{12}\) The median store carries 580 brands at some point over the year (minimum 98 and maximum 1246). Mean 650 and standard deviation 307.
for instance Reibstein and Farris (1995)). “Rate-of-sales” (market share over distribution) is a measure sometimes used in marketing to examine the role of distribution. If imported brands systematically had a higher “rate-of-sales” this would indicate that imported brands are discriminated against in the sense that, given their attractiveness to consumers they were distributed in fewer stores. As seen in Table 1 there is no indication of this in the mean rates of sales. Apart from Australian wines the rate of sales is higher for domestic wines than for the leading countries of origin. To explore this in some more detail, Figure 1 shows brand sales relative to the share of stores that each brand is distributed in for US and imported wines.

![Figure 1 about here]

One way to test for differences is to run the following regression, which corresponds to the relationship plotted in Figure 1 (we exclude the brands with full distribution in this regression) (bottles sold is the number of bottles sold of a particular brand in New Hampshire over the period of study; the variable distr is the share of stores (0-1) that carries the particular brand and distr$^2$ is distr squared, t-statistics on estimated coefficients are given in parentheses).

$$
\text{Bottles sold} = -45 + 2432 \times \text{distr} + 6028 \times \text{distr}^2 + \text{error} \quad (1)
$$

$$
(-1.43) \quad (4.52) \quad (6.56) \quad \text{R}\text{2}=0.74
$$

A t-test can not reject the null hypothesis that the residuals are the same for U.S. and imported wines.\textsuperscript{13} Significantly lower residuals for U.S. wines would imply that U.S. brands were favored in the sense that for a given distribution they sold less – failure to reject that the mean residuals are equal means that we do not find evidence of this type of discrimination.

Might physical distance explain the pattern in the sense that U.S. brands have lower transport costs? As noted this is not evident from the (quality adjusted) prices. Fixed costs of entry into an export market could be another explanation: A firm needs to make sufficient profits from selling a brand to cover the fixed costs of operating on an

\textsuperscript{13} Mean residual for U.S. wines is 9.34 with a standard error of 38.02 and mean residual for Imports is -7.19 with a standard error of 29.27.
export market. 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 fixed costs and fewer firms would be present.\textsuperscript{14} One way to explore this is to examine data from Canadian provinces, where we have sales figures for different countries of origin.\textsuperscript{15} To the north New Hampshire borders Quebec. In Quebec in 2003 77 percent of wine 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 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% share. Clearly physical distance between producer and consumer (given that New Brunswick borders the U.S.) does not fully explain these patterns.

It thus seems as though prices and limited store-coverage for imported brands do not adequately explain the home market bias in this market. This suggests that consumers have a preference for domestically produced goods. In the next section we will explore this using a structural model.

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 are generated by Canadian customers (see for example Campbell and Lapham (2004) for an analysis of cross-border shopping

\textsuperscript{14} 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.

\textsuperscript{15} Source: Canadian Vintners Association/Statistics Canada, www.canadianvintners.com
between Canada and the U.S.). 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 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 (a market share of 35 percent in Colebrook in this week compared to an overall market share of 53 percent in this particular week).

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

$$ u_{ijkt} = X_{jkt} \beta - \alpha p_{jkt} + \xi_{jkt} + \epsilon_{ijkt} $$

(1)

where $X$ is a matrix of observable product characteristics (in this study, Wine Spectator quality rankings, alcohol content, whether the wine is produced from at most two types of grape (“a varietal wine”, this is classified according to grapes included in the name of the wine), country of origin, and whether the wine is produced according to European region of origin rules (such as a ”Bourdeaux” or a “Rioja” – we use this information to generate a dummy variable that we denote d.o.c)). This corresponds to “Denominazione di Origine Controllata” for Italian wines, “Appellation d'Origine Controlée” for French wines and so forth. $p$ is price per bottle in U.S. dollars, $\xi$ is the component of mean product quality that is unobserved (by us) and $\epsilon$ is an individual specific valuation that varies across products following a type 1 extreme value distribution. In our regression we also include a full set

---

16 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 h to bring any alcoholic beverages at all back into the Canada.
of weekly effects (see the Appendix for further details on the variables used). We use $\delta$ to denote the mean utility of consumer product $j$. The market share of product $j$ is then

$$s_{jkt} = \frac{e^{\delta_{jkt}}}{\sum_{n=0}^{N} e^{\delta_n}}$$

(2)

Consumers will buy the product that gives them the highest utility, or not buying red wine and instead buying the outside good. As the outside good we use all other sales of wine in the state retail stores and we normalize the utility of this to zero.\(^{17}\) Use $s_o$ to denote the market share of the outside good. We can then rewrite (2) to arrive at our estimating equation

$$\ln(s_{jkt}) - \ln(s_{0kt}) = X_{jkt} \beta - \alpha \varphi_{jkt} + \xi_{jkt}$$

(3)

Before we proceed to the estimation, we will briefly describe how prices at the state-run stores are set in New Hampshire. The price for a particular wine is the same in all stores.\(^{18}\) Prices are in effect set by the wholesaler/supplier since the Liquor Commission adds a predetermined markup, which can be changed four times per year.\(^{19}\) Whether to place a product on sale can be determined both by the Liquor Commission and by the wholesaler. The median brand changes price three times during the year that we analyze but there is considerable variation as seen in Figure 2a, which gives the distribution of price changes across brands. Conditional on the price changing, the mean price change is a decrease of 4.2 cents (mean -0.042 dollars, std dev 1.95, $1^{st}$ percentile -4 dollars, median -0.5 dollars and $99^{th}$ percentile 3.50 dollars). In Figure 2b we show the

---

\(^{17}\) 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.

\(^{18}\) This is the policy of the Liquor Commission. At the 90$^{th}$ 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 95$^{th}$ percentile and 20 cents at the 99$^{th}$ percentile.

\(^{19}\) The markups of the state liquor commission that were 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 criticized “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 appropriateness since 1999”. These comments prompted the Commission to address these issues during 2007.
distribution of these changes (between 1st and 99th percentile). A stand out feature is the large size of changes, typical price changes are 1 or 2 dollars. There are thus a large number of substantial price changes that can help us identify substitution patterns across brands.

[Figure 2 about here]

In the regression analyses that follow, price changes will be one important way of identifying substitution patterns. There are two issues that we need to consider here: one is that we ask if these price changes can be viewed as exogenous – if price changes as a response to changes in demand, then this will bias the estimated coefficients. Visual inspection of the data does not appear to suggest that this kind of endogeneity is pronounced (see Figure 3 for an example). Because price changes are associated with substantial, simultaneous, responses in volumes sold, there is little to indicate that price changes occur in response to shifts in demand. We do nevertheless have a suitable instrument for the price for a small set of the products (the price in Sweden) and as a robustness check we use instrumental variables in some specifications.

A second issue is 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 take advantage of the opportunity for savings, 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 (see Hendel and Nevo (2007)). Aggregating over longer time periods is one way of dealing with this. We explore this in detail in the following.

4 Home bias in wine – results from structural demand estimation.

We now report results from estimation of mean utility of different brands as outlined in the previous section. The first column reports results from a regression of market share (or rather ln(s/s0)) on price, country of origin effects, alcohol content and a full set of time effects. In column (1) data are aggregated to the New Hamsphire level. More negative values are associated with higher valuation, and we see that apart from Hungary (which is a miniscule supplier of red wine) the U.S. has the highest country of origin
effect. Using a Wald test we reject at the 5 percent level the null hypothesis that the U.S. country of origin effect is equal to any of the other country of origin effects.

[Table 2 about here]

As discussed, distribution may play a role in generating these patterns. In column (2) we restrict attention to the wines that are sold in all the stores. In this sample Australian wines have the highest valuation and we can not reject (at the 5 percent level) that the valuation for South African wines is the same as for U.S. wines. This is one indication that it is important to also consider distribution when examining country of origin effects: The preference for U.S. wines in column (1) may merely reflect wider distribution of U.S. wines. Column (3) reports results from a hedonic regression of prices where we in addition control for quality from winespectator and for whether the wine is a varietal wine or a d.o.c. Our findings here are similar to those of Brooks (2003): U.S. wines are among the more expensive and Argentinian are among the cheapest (although we note that Brooks examines fewer source countries than we do and her sample is dominated by expensive wines, the average bottle in her study retails for 31 dollars).

After this initial analysis we turn to the analysis of store level data. Column (4) corresponds to column (1), but now examines demand at the store level. The highest preference is again for U.S. wines (apart from Slovenia which just supplies 1 wine). The country of origin effect for the U.S. is now not significantly different at the 5 percent level from that of Australia or South Africa (or from Romania, another miniscule supplier). In column (5) we add Wine Spectator rankings as well as dummies indicating whether the wine in question is a varietal or is produced in a specific wine growing region (classified as a d.o.c.). This causes the country dummies to fall somewhat, reflecting that they are now picking up wines that are typically of lower quality (“vin du table”). The largest effect is seen in France, which should not come as a surprise given the strong French d.o.c. regions such as Bourdeaux. The ranking of the countries of origin is largely unchanged (and in particular the U.S. occupies the top spot) but again we can

---

20 In the simulations we perform in Section 5 we will want point estimates for all the countries-of-origin. We therefore use STATA’s “hascons” command which means that we get estimates for all the origin dummies and need not exclude any country as a base category. Results for the ranking of countries of origin in the present section are unchanged if we instead set U.S. as the base country.
not reject the hypothesis that the preference for U.S. wine is the same as that for
Australian or South African wines.

As noted before, temporary sales may affect the parameter estimates. Hendel and
Nevo (2007) show that this has important effects when examining own and cross-price
elasticities of detergents. In column (6) we aggregate the data from monthly to quarterly
level and use the median price over the quarter as an explanatory variable. We see only
small effects on the estimates as compared to column (5); in particular U.S. occupies the
top spot, followed by Australia and South Africa (they are significantly different at the 5
percent level).

A common concern when estimating demand is that price is endogenous.
Increases in demand should in theory be associated with price increases. We suggest that
identical prices in all stores somewhat alleviates these concerns, in that prices do not
respond to purely local conditions. Price changes are typically large (1 or 2 dollars up or
down, as seen in Figure 2) and as discussed do not seem to be preceded by increases in
sales. Even so, there remains the possibility of a correlation between the error term and
the price coefficient, which would lead to biased coefficient estimates. Finding suitable
instruments that are correlated with prices but not with demand and that vary at the brand
level is a challenge for much of the literature that estimates demand. The two main
approaches that have been used are to use variables affecting the markup (as in Berry,
Levinsohn and Pakes (1995)) and prices in other markets (see for instance Nevo (2000)).
Typically prices in other cities are used as instruments. In the case of nationwide or
statewide demand shocks endogeneity would still remain a concern. We instead use
prices from a totally separate market located on another continent – Sweden. It is hard to
think of important concerns as to why the Swedish price should be correlated with the
error term in New Hampshire demand regressions. The second requirement for a valid
instrument is that the Swedish price should be correlated with the U.S. price, which
indeed it is.\footnote{A first stage linear regression of the U.S. price on the Swedish price and the other variables in column (8)
gives an estimated coefficient of 0.19 on the Swedish price, significantly different from zero at the 1 percent level.} In column (7) we instrument for price using prices from Sweden for the
same week, for the subset of wines that are available both in New Hampshire and
Sweden.\textsuperscript{22} This results in a much smaller sample and close to all the French and Italian wines are d.o.c. in this sample, we therefore do not include d.o.c. and variety in this specification.\textsuperscript{23} The U.S. again has a source country effect that is among the highest, even though we can not reject that the point estimate for Italy is significantly higher than the U.S. effect at the 5 percent level in this specification. The sample is much smaller and it may be that the wines that are present from each country are not representative. To explore this column (8) reports the results from an OLS regression on the sample in (7). The country of origin effects in terms of ranking are similar to the other columns where we do not instrument. Now Australia gets the highest country of origin effect followed by the U.S. and the U.S. effect is significantly higher than that of other source countries. Using instrumental variables affects all the estimated coefficients and it is somewhat puzzling that the Italian source effect changes so much relative to the others when we instrument for price. Overall the pattern with a strong valuation for U.S. wines appears also in the instrumented regression however. A priori one expects d.o.c. and whether the wine is varietal to influence valuation and we therefore want to control for this. Given the limited sample in (7) and (8) d.o.c. was nearly collinear with Italian and French origin however and we therefore excluded d.o.c. and varietal in these specifications. For comparison column (9) reports the corresponding regression as in column (5) but with d.o.c. and varietal not included as explanatory variables. Again the U.S. comes out as the highest country-of-origin effect, at the 5 percent level of significance we can not however reject that it is equal to the Australia and South African country of origin effects. This ranking, while there are some differences across specifications, appears quite robust.

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? The small differences between valuation of U.S., Australian and South African wines point to the latter explanation. It is frequently recognized by wine aficionados that “new world” wines are different in style than “old world” wines – typically more muscular and with a strong role for the grape variety (for instance Shiraz, Merlot, Zinfandel) rather than the region of origin (Burgundy, Rioja and so forth, see Wilson (1998) for a discussion of the role of

\textsuperscript{22} Sweden has a state retail monopoly on wine, see \url{www.systembolaget.se}.

\textsuperscript{23} In this sample there are 3 wines from Argentina, 16 from Australia, 4 from Chile, 9 from Spain, 8 from France, 1 from Greece, 20 from Italy, 1 from Portugal, 22 from the U.S. and 5 from South Africa.
terroir in the making of French wines). This is likely to be playing some role – in Table 3 we give the share of varietal wines and d.o.c. wines from the largest source countries. A wine is classified as varietal here if the grape variety is included in the name and there are not more than two grape varieties. As seen in the first row of Table 3 there is a great difference in this respect between the European producers and the rest of the world. Note that some of the European wines will have only one grape even though it is not noted in the name. Crozes-Hermitage for instance is known for its Syrah wines and a wine such as Les Jalets is made exclusively from Syrah, but this is not indicated in the name (or indeed on the label). In our data it is therefore not marked as varietal.

[Table 3 about here]
Another difference between the Europeans and the rest of the producers is that the supply side is much more fragmented – France for instance has some 150,000 winegrowers that market their own wine whereas Australia has about 2,000 wineries.24 Also in New Hampshire we note (in Table 1) that Australia has a higher market share with its 186 brands than does either France or Italy with more 300 brands each.

As to differences in the country of origin effects outside Europe, the different grape varieties do not offer an immediate explanation. 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. In regressions (not reported) where we include dummies for the grape variety, the ranking of country of origin effects is similar to the cases reported in Table 2. One potential reason for why Australian and South African wines seem to be valued higher than Chilean or Argentinian are that the former countries are English speaking. Why this could matter is not clear to us, and we merely note the coincidence.25

Given the estimated source country effects will now turn to examining a counterfactual with a different set of products in the next section. Clearly the exact predictions are sensitive to the estimated coefficients and the assumptions we have made

---

25 Some wines from non-English speaking countries do have English names – we have run regressions where we include a dummy for an English name of the wine. Indeed, an English name was associated with a higher valuation. There are relatively few of these however and in several cases the English name reflects that they are house brands of U.S. importers or exports from U.S. owned vineyards – pointing to mechanisms other than an English name as the driving factors.
about the demand side. The simple form of demand that we use assumes that brand
specific valuation is uncorrelated across brands for a specific individual. This is known as
the logit assumption in the discrete choice literature and as seen generates simple closed
form solutions for market shares. 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 \( \alpha_p (1-s_i) \): Using the coefficient on price from the
instrumented regression (Table 2, column 7) yields a median own price elasticity of
demand of -3.2 (first percentile -7.3 and 99\textsuperscript{th} percentile -1.8). These are quite reasonable
numbers.\textsuperscript{26} Cross-price elasticities are low and the logit 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 0.005). This feature is typically seen as
disqualifying the logit assumption for the study of, for example, car markets. Here
though, with more than 2000 brands that are in many ways very similar it does not seem
strange, \textit{a priori}, that an increase in price of one brand is going to have a small impact on
many other brands.

This is not to deny that the finer details of the results would in all likelihood be
affected by our choice of underlying model. One could for instance have opted for
estimating demand using a random coefficients approach following Nevo (2000). The
discrete choice assumption (consumers buy one unit or none) is not fulfilled here, casual
empiricism suggests that many wine consumers buy several bottles and several brands at
one shopping occasion. Taking this seriously one might leave the discrete choice
framework and opt for the distance metric methods of Pinkse et al (2002)). Such
alternative methods are much more computationally intense however we were attracted
by the simplicity and transparency of the logit model. We would also argue that the
intended use of the demand model will be of importance for which the correct estimation
procedure should be. If we were interested in predicting the effects of a merger between
two brands other choices might have been motivated. Now our interest is instead in

\textsuperscript{26} We are not aware of any comprehensive surveys of brand level elasticities that we can compare to. Cook
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 our seem reasonable.
finding the valuation of country of origin and of using those predictions to generate counterfactual market shares at the country level, something that we turn to now.

5. The wines that are not there – a counterfactual supply side.

We have thus documented that preferences, rather than higher prices of imported wines or distribution in fewer stores, are the main explanation for observed home bias among the set of brands that are present in the New Hampshire market. This points to that the home bias on this particular market should provide little cause for concern for a trade economist. Note though that almost half of the brands that are in the choice set of New Hampshire consumers are from the U.S. Again, this pattern could arise because of preferences (brands that are favored by consumers are more likely to be distributed) or because of trade costs (if there are important fixed costs of being present on a foreign market foreign brands are less likely to be distributed). High, policy induced, fixed costs for foreign wines of entering the New Hampshire market would cause concern about the large share of U.S. brands. The higher fixed costs of entry, the greater do operating profits have to be to induce entry. In a static setting we would therefore expect foreign brands, to have greater operating profits since they would have to cover larger fixed costs than domestic brands.27 Several papers have however 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)) and a static framework is therefore inappropriate. 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). Estimating the dynamic process of entry and exit of for thousands of brands will have to remain outside the scope of the present paper.

Let us instead approach the endogeneity of brand availability in another way. A natural benchmark for the role of preferences for home bias is to consider a hypothetical

27 We have examined this prediction but found no support for it. There is no clear pattern that U.S. wines have lower revenue per brand.
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 a reasonable benchmark since it has no domestic production of red wine (thus we can disregard home bias in this case), transparent rules for product introductions and price setting (the retailer applies the same percentage markup to all wines). The selection in Sweden reflects major wine producers from around the world. In 2006 Spain accounted for 16 percent of wine volume, Italy and South Africa for 15 percent each, Australia for 13 percent, France for 10 percent, Chile for 7 and the U.S. for 6 percent.

We take the full set of Swedish products available (that retail for less than the kronor equivalent of 25 U.S. dollars) in the last week of 2005, and the Swedish price for each product translated into U.S. dollars in this period, and use the estimated coefficients from Table 2 to generate counterfactual market shares by source country (we use the point estimates from two different specifications, column (5) and column (7)). We use the same explanatory variables (country of origin, alcohol content, varietal, d.o.c., quality from winespectator). This allows us to estimate a average product quality for New Hampshire consumers for each wine distributed in Sweden which we denote by $\delta^*$ (under the assumption that the unobserved product quality ($\xi_j$) is 0 for all wines). We then calculate the counterfactual market shares per brand as

$$S_j = \frac{e^{\delta^*_j}}{\sum_{n=0}^{N} e^{\delta^*_n}}. \quad (4)$$

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.
We report the sum of these counterfactual market shares by country of origin and in rows 2 and 3 of Table 4 (excluding the market share for the outside good – the first row gives actual market shares for reference). As noted in the discussion of the point estimates in Table 2 there were some differences across the specification where we used instruments (column (7) in Table 2) and the one where we did not use instrumental variables (column (5) in Table 2). We report results simulations from both specifications and qualititatively the differences are minor with respect to the predicted market market shares of countries. 
The differences in market share between the first row (which gives actual market share) and the counterfactuals are striking. The predicted U.S. market share is only around 10 percent in the counterfactuals as opposed to more than 50 percent in actual situation. The market shares of France, Italy Spain increase to about 15-20 percent in the simulations. The preference for U.S. wines that we reported in Table 2 is far too low to generate a market share of around 50 percent when the share of U.S. brands is so low as it is in the counterfactual. Taking the estimates that form the base for row 3 for instance the country of origin effect for the U.S. would have to increase by some 30 percent, holding the other effects constant to generate a market share for U.S. wines that is close to the one observed in the data. This is far outside the range of country of origin effects observed in this specification – the difference between the highest (US) and lowest (Portugal) is only 13 percent in this specification.

The differences in the number of brands from different source countries between New Hampshire and Sweden is an important factor in driving the difference between the actual situation and the counterfactual. In the actual situation U.S. wines make up 44 percent of brands whereas in the Swedish data only 8 percent of brands are from the U.S.

In Figure 4 we illustrate of the relation between the number of brands from different source countries against market shares in terms of volume for the leading source countries in our simulations (triangles) and actual data (squares). We also draw the estimated linear relation between source country share of brands and market share. This line can not be given a causal interpretation as the brands which are distributed and market shares are determined jointly. The relation is remarkably tight however. In our counterfactuals however the number of brands are exogenous and market shares
endogenous. The counterfactuals are not too far off from a naïve prediction based on the relation between the number of brands and market shares (i.e. interpreting the estimated relation in the data as causal).

Ultimately the interest in the effects of trade barriers depends on their effects of welfare. Lower barriers are expected to lead to higher consumer surplus through lower prices (because of scale economies and/or stronger competition) and a wider choice. Under the assumptions in the paper we can calculate consumer surplus. For a representative consumer the consumer surplus of having access to a particular set of $N$ products is given by (including the outside good, see Small and Rosen (1981) for a derivation)

$$CS = \frac{1}{\alpha} \ln \left( \sum_{n=0}^{N} e^{\tilde{\delta}_n} \right).$$

(5)

The variable $\tilde{\delta}_n$ denotes the mean utility of product $n$ with the unobservable component of utility set to 0 (this is done to be able to compare results to the case when we use the Swedish assortment and lack estimate of $\xi_n$). Consider for instance the consumer surplus from the current choice set – using the products available in the store with the largest assortment (in Nashua with 1246 brands) we get a value of 8.85 U.S. dollars (using parameters from Column (5) in Table 2). Using the Swedish assortment and prices we instead reach a consumer surplus of 7.22 U.S. dollars. Thus, while a move to the Swedish assortment would provide a more level playing field it would under this example not raise consumer surplus. An important reason for this is that although the supply of the Liquor Commission is tilted towards U.S. wines the Liquor Commission already has a very wide assortment (compared to the Swedish assortment of 559 brands) with relatively low prices.

6. Concluding remarks

Our investigation of the New Hampshire wine market leads to the conclusion that preferences for home goods rather than trade costs is the explanation for 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. Our findings can thus be seen as pointing in the same direction as much evidence using more aggregated data: That entry and exit of new source countries and new products is of great importance for the analysis of trade flows (see for instance Feenstra (1994), Hummels and Klenow (2005), Broda and Weinstein (2006) or Ghironi and Melitz (2007)). The investigations have focused on quantifying the role of the extensive (new goods or new source countries) vs intensive (more trade in the same goods with the same source countries) margins of trade. These margins are typically measured at the level of country pairs (the extensive margin being when Bolivia starts importing from Senegal for instance) or at the product level (a new 10-digit category being imported from a particular country). One of the few studies that use firm level data is Eaton et al (2004). As we do, they find an important role for the extensive margin. They note that (p. 153) “The implication is that, given market size, a higher French market share in a destination typically reflects 88 percent more firms selling there and 12 percent more sales per firm.” Our case study can thus be seen as providing street level support for this conclusion, here at the brand rather than firm level. In contrast to the studies that use trade data we are also able to analyze the variety of domestic products.

A final question regards the nature of costs of entering foreign markets. A comparison with the market shares for different source countries in neighboring Canadian provinces point to that it is higher fixed costs for the imported brands rather than slimmer margins because of costs directly related to distance (such as transport costs) that explain the lower market share of imports. What those fixed costs are will be the focus of future research.

References


the border puzzle,’ American Economic Review 93, 170–92


Chung, Chul and Minjae Song, (2006), Preference for Cultural Goods: The Case of Korea Film Market, manuscript, Georgia Institute of Technology.


Conlon, Cristopher and Julie Mortimer, (2007), Demand Estimation Under Incomplete Product Availability, manuscript, Harvard University.


Das, Sanghamitra, Mark Roberts and James R. Tybout (2007), Market Entry Costs, Producer Heterogeneity, and Export Dynamics, with, Econometrica XXXXX.


Hummels, David and Peter Klenow (2005), The variety and quality of a nation's Exports, American Economic Review 95, 704-723.


Nerlove, Marc (1995), Hedonic price functions and the measurement of preferences: The case of Swedish wine consumers, European Economic Review 39, 1697-1716


Sales and distribution: US wines.

Sales and distribution: Imported wines.

Fig 1 Sales of wine and distribution, New Hampshire 2005-2006.
Fig 2 The number and size of price changes, New Hampshire 2005-2006.

2a. Number of price changes per brand

2b. The size of price changes
Figure 3. Price and market share Shiraz Yellow Tail, New Hampshire.
Figure 4. Share of brands from major source countries and market share. Actual and simulated using Swedish assortment.

$y = 1.2227x - 2.5198$

$R^2 = 0.937$
<table>
<thead>
<tr>
<th></th>
<th>All</th>
<th>US</th>
<th>Australia</th>
<th>France</th>
<th>Italy</th>
<th>Spain</th>
<th>Chile</th>
<th>Argentina</th>
<th>South Africa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price (quantity weighted)</td>
<td>10.77</td>
<td>11.32</td>
<td>9.41</td>
<td>11.16</td>
<td>10.78</td>
<td>9.87</td>
<td>9.24</td>
<td>9.00</td>
<td>8.53</td>
</tr>
<tr>
<td>Market share by volume</td>
<td>54.63</td>
<td>14.58</td>
<td>10.63</td>
<td>9.30</td>
<td>4.62</td>
<td>2.49</td>
<td>1.89</td>
<td>1.37</td>
<td></td>
</tr>
<tr>
<td>Share of stores that a wine is</td>
<td>22.21</td>
<td>25.32</td>
<td>25.11</td>
<td>20.56</td>
<td>16.94</td>
<td>22.76</td>
<td>20.07</td>
<td>16.10</td>
<td>14.84</td>
</tr>
<tr>
<td>distributed in</td>
<td>(27.87)</td>
<td>(30.06)</td>
<td>(30.16)</td>
<td>(27.10)</td>
<td>(23.70)</td>
<td>(25.11)</td>
<td>(25.69)</td>
<td>(17.92)</td>
<td>(25.10)</td>
</tr>
<tr>
<td>Nr of brands</td>
<td>2024</td>
<td>894</td>
<td>186</td>
<td>314</td>
<td>317</td>
<td>95</td>
<td>75</td>
<td>69</td>
<td>31</td>
</tr>
<tr>
<td>Rate of sales (market share/distribution)*1000</td>
<td>0.98</td>
<td>1.11</td>
<td>1.31</td>
<td>0.69</td>
<td>0.80</td>
<td>1.16</td>
<td>0.95</td>
<td>0.94</td>
<td>0.86</td>
</tr>
<tr>
<td>Wine spectator rating</td>
<td>83.55</td>
<td>83.02</td>
<td>85.07</td>
<td>84.54</td>
<td>82.98</td>
<td>83.82</td>
<td>83.78</td>
<td>84.49</td>
<td>82.27</td>
</tr>
<tr>
<td></td>
<td>(4.42)</td>
<td>(3.98)</td>
<td>(3.06)</td>
<td>(4.17)</td>
<td>(6.27)</td>
<td>(4.12)</td>
<td>(3.60)</td>
<td>(3.94)</td>
<td>(4.18)</td>
</tr>
<tr>
<td></td>
<td>(7.42)</td>
<td>(6.95)</td>
<td>(5.12)</td>
<td>(7.16)</td>
<td>(11.11)</td>
<td>(4.76)</td>
<td>(4.59)</td>
<td>(4.40)</td>
<td>(4.82)</td>
</tr>
<tr>
<td>Market share in Colebrook week of June 18 2006.</td>
<td>34.78</td>
<td>14.67</td>
<td>31.52</td>
<td>8.70</td>
<td>0.54</td>
<td>2.17</td>
<td>6.52</td>
<td>1.09</td>
<td></td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Country</th>
<th>1(OLS) Ln(s/$s_0$)</th>
<th>2(OLS) Ln(s/$s_0$)</th>
<th>3(OLS) Ln(p)</th>
<th>4(OLS) Ln(s/$s_0$)</th>
<th>5(OLS) Ln(s/$s_0$)</th>
<th>6(OLS) Ln(s/$s_0$)</th>
<th>7(2SLS) Ln(s/$s_0$)</th>
<th>8(OLS) Ln(s/$s_0$)</th>
<th>9(OLS) Ln(s/$s_0$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price</td>
<td>-0.986</td>
<td>-0.112</td>
<td>-0.082</td>
<td>-0.087</td>
<td>-0.096</td>
<td>-0.319</td>
<td>-0.118</td>
<td>-0.118</td>
<td>-0.085</td>
</tr>
<tr>
<td>Argentina</td>
<td>0.135*</td>
<td>0.002*</td>
<td>0.026*</td>
<td>0.004*</td>
<td>0.026*</td>
<td>0.006*</td>
<td>0.000*</td>
<td>0.000*</td>
<td>0.000*</td>
</tr>
<tr>
<td>Australia</td>
<td>0.135*</td>
<td>0.132*</td>
<td>0.159*</td>
<td>0.164*</td>
<td>0.158*</td>
<td>0.092*</td>
<td>0.348*</td>
<td>0.182*</td>
<td>0.182*</td>
</tr>
<tr>
<td>Austria</td>
<td>0.151*</td>
<td>0.161*</td>
<td>0.158*</td>
<td>0.158*</td>
<td>0.285*</td>
<td>0.009*</td>
<td>0.009*</td>
<td>0.009*</td>
<td>0.009*</td>
</tr>
<tr>
<td>Chile</td>
<td>-0.885</td>
<td>-0.946</td>
<td>0.049</td>
<td>-0.043</td>
<td>-0.043</td>
<td>-0.043</td>
<td>-0.043</td>
<td>-0.043</td>
<td>-0.043</td>
</tr>
<tr>
<td>Greece</td>
<td>0.147*</td>
<td>0.147*</td>
<td>0.152*</td>
<td>0.152*</td>
<td>0.152*</td>
<td>0.152*</td>
<td>0.152*</td>
<td>0.152*</td>
<td>0.152*</td>
</tr>
<tr>
<td>Hungary</td>
<td>-0.319</td>
<td>-0.319</td>
<td>0.017</td>
<td>0.017</td>
<td>0.017</td>
<td>0.017</td>
<td>0.017</td>
<td>0.017</td>
<td>0.017</td>
</tr>
<tr>
<td>Israel</td>
<td>-0.147</td>
<td>0.010</td>
<td>0.010</td>
<td>0.010</td>
<td>0.010</td>
<td>0.010</td>
<td>0.010</td>
<td>0.010</td>
<td>0.010</td>
</tr>
<tr>
<td>Italy</td>
<td>-0.658</td>
<td>-0.658</td>
<td>0.367</td>
<td>0.367</td>
<td>0.367</td>
<td>0.367</td>
<td>0.367</td>
<td>0.367</td>
<td>0.367</td>
</tr>
<tr>
<td>New Zealand</td>
<td>-0.152</td>
<td>-0.152</td>
<td>0.015</td>
<td>0.015</td>
<td>0.015</td>
<td>0.015</td>
<td>0.015</td>
<td>0.015</td>
<td>0.015</td>
</tr>
<tr>
<td>Portugal</td>
<td>-0.145</td>
<td>0.016</td>
<td>0.016</td>
<td>0.016</td>
<td>0.016</td>
<td>0.016</td>
<td>0.016</td>
<td>0.016</td>
<td>0.016</td>
</tr>
<tr>
<td>Romania</td>
<td>-0.138</td>
<td>-0.138</td>
<td>0.171</td>
<td>0.171</td>
<td>0.171</td>
<td>0.171</td>
<td>0.171</td>
<td>0.171</td>
<td>0.171</td>
</tr>
<tr>
<td>Slovenia</td>
<td>-0.324</td>
<td>-0.324</td>
<td>0.218</td>
<td>0.218</td>
<td>0.218</td>
<td>0.218</td>
<td>0.218</td>
<td>0.218</td>
<td>0.218</td>
</tr>
<tr>
<td>U.S.</td>
<td>-0.549</td>
<td>-0.549</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>South Africa</td>
<td>-0.319</td>
<td>-0.319</td>
<td>0.017</td>
<td>0.017</td>
<td>0.017</td>
<td>0.017</td>
<td>0.017</td>
<td>0.017</td>
<td>0.017</td>
</tr>
<tr>
<td>Alcohol</td>
<td>-0.136</td>
<td>-0.136</td>
<td>0.171</td>
<td>0.171</td>
<td>0.171</td>
<td>0.171</td>
<td>0.171</td>
<td>0.171</td>
<td>0.171</td>
</tr>
<tr>
<td>Winespectator</td>
<td>0.016</td>
<td>0.016</td>
<td>0.016</td>
<td>0.016</td>
<td>0.016</td>
<td>0.016</td>
<td>0.016</td>
<td>0.016</td>
<td>0.016</td>
</tr>
<tr>
<td>Varietal wine</td>
<td>-0.092</td>
<td>-0.092</td>
<td>0.021</td>
<td>0.021</td>
<td>0.021</td>
<td>0.021</td>
<td>0.021</td>
<td>0.021</td>
<td>0.021</td>
</tr>
<tr>
<td>D.O.C.</td>
<td>0.264</td>
<td>0.264</td>
<td>0.367</td>
<td>0.367</td>
<td>0.367</td>
<td>0.367</td>
<td>0.367</td>
<td>0.367</td>
<td>0.367</td>
</tr>
<tr>
<td>Frequency Sample</td>
<td>week</td>
<td>week</td>
<td>week</td>
<td>week</td>
<td>week</td>
<td>week</td>
<td>week</td>
<td>week</td>
<td>week</td>
</tr>
<tr>
<td>Store level</td>
<td>Store level</td>
<td>Store level</td>
<td>Store level</td>
<td>Store level</td>
<td>Store level</td>
<td>Store level</td>
<td>Store level</td>
<td>Store level</td>
<td>Store level</td>
</tr>
<tr>
<td>Store level</td>
<td>Store level</td>
<td>Store level</td>
<td>Store level</td>
<td>Store level</td>
<td>Store level</td>
<td>Store level</td>
<td>Store level</td>
<td>Store level</td>
<td>Store level</td>
</tr>
<tr>
<td>Price in Sweden</td>
<td>55179</td>
<td>55179</td>
<td>572458</td>
<td>84479</td>
<td>55179</td>
<td>55179</td>
<td>572458</td>
<td>572458</td>
<td>572458</td>
</tr>
</tbody>
</table>

Robust standard errors in parenthesis. Standard errors in columns (4)-(9) clustered at store level. * variables are significant at the 1 percent level of significance. Time effects (weekly or quarterly dummies) included in all specifications.
Table 3 Some characteristics of red wine sold in New Hampshire Liquor commission stores July 2005-June 2006 by country of origin (by volume).

<table>
<thead>
<tr>
<th></th>
<th>All</th>
<th>US</th>
<th>Australia</th>
<th>France</th>
<th>Italy</th>
<th>Spain</th>
<th>Chile</th>
<th>Argentina</th>
<th>South Africa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share varietal</td>
<td>77.29</td>
<td>94.02</td>
<td>99.57</td>
<td>8.68</td>
<td>2.68</td>
<td>27.71</td>
<td>95.79</td>
<td>99.81</td>
<td>70.53</td>
</tr>
<tr>
<td>Share D.O.C.</td>
<td>18.16</td>
<td>0*</td>
<td>90.83</td>
<td>96.10</td>
<td>41.43</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Share Cabernet Sauvignon</td>
<td>23.78</td>
<td>28.77</td>
<td>9.18</td>
<td>0.38</td>
<td>0.01</td>
<td>0</td>
<td>49</td>
<td>5.34</td>
<td>47.98</td>
</tr>
<tr>
<td>Share Merlot</td>
<td>18.18</td>
<td>23.69</td>
<td>9.1</td>
<td>5.06</td>
<td>2.81</td>
<td>0.12</td>
<td>22.99</td>
<td>0.40</td>
<td>4.23</td>
</tr>
<tr>
<td>Share Shiraz (Syrah)</td>
<td>10.47</td>
<td>2.63</td>
<td>47.85</td>
<td>3.28</td>
<td>0.03</td>
<td>0.43</td>
<td>0.34</td>
<td>1.07</td>
<td>9.16</td>
</tr>
<tr>
<td>Share Pinot Noir</td>
<td>9.15</td>
<td>15.38</td>
<td>0</td>
<td>1.92</td>
<td>0.11</td>
<td>0</td>
<td>16.75</td>
<td>0.46</td>
<td>0.02</td>
</tr>
<tr>
<td>Share Zinfandel</td>
<td>5.45</td>
<td>21.89</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

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. The * refers to that 0.24 of U.S. wines is “Meritage”.
Table 4 Counterfactual simulation of source country market shares letting New Hampshire consumers meet Swedish assortment and Swedish prices.

<table>
<thead>
<tr>
<th></th>
<th>US</th>
<th>Australia</th>
<th>France</th>
<th>Italy</th>
<th>Spain</th>
<th>Chile</th>
<th>Argentina</th>
<th>South Africa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simulated market share (based on Table 2, col 7)</td>
<td>7.70</td>
<td>10.87</td>
<td>18.52</td>
<td>23.79</td>
<td>17.86</td>
<td>7.02</td>
<td>3.23</td>
<td>5.85</td>
</tr>
<tr>
<td>Simulated market share (based on Table 2, col 5)</td>
<td>10.08</td>
<td>11.11</td>
<td>19.11</td>
<td>14.92</td>
<td>23.36</td>
<td>6.80</td>
<td>2.33</td>
<td>9.06</td>
</tr>
<tr>
<td>Naïve counterfactual</td>
<td>7.32</td>
<td>7.76</td>
<td>18.69</td>
<td>20.01</td>
<td>22.20</td>
<td>7.32</td>
<td>0.97</td>
<td>7.32</td>
</tr>
<tr>
<td>Share of brands (actual)</td>
<td>44.17</td>
<td>9.19</td>
<td>15.52</td>
<td>15.66</td>
<td>4.69</td>
<td>3.71</td>
<td>3.41</td>
<td>1.53</td>
</tr>
<tr>
<td>Share of brands (Swedish counterfactual)</td>
<td>8.05</td>
<td>8.41</td>
<td>17.35</td>
<td>18.42</td>
<td>20.21</td>
<td>8.05</td>
<td>2.86</td>
<td>8.05</td>
</tr>
<tr>
<td>Share of world production in 2004</td>
<td>6.74</td>
<td>4.63</td>
<td>19.24</td>
<td>17.78</td>
<td>14.42</td>
<td>2.11</td>
<td>5.19</td>
<td>3.11</td>
</tr>
</tbody>
</table>

The naïve counterfactual is the predicted market share using Swedish distribution figures. Prediction is generated using coefficients from a linear regression of market share on share of brands (reported in Figure 4) in actual data. Total number of brands in New Hampshire is 2024 and in Swedish counterfactual 559.
Appendix. The data.
To be completed.