How Many Bottles Make a Case Against Prohibition?

Online Wine and Virginia's Direct Shipment Ban[1]

Alan E. Wiseman
Assistant Professor of Political Science
Ohio State University
wiseman.69@osu.edu

Jerry Ellig
Acting Director
Office of Policy Planning, Federal Trade Commission
jellig@ftc.gov

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Do current legal regimes encourage or prevent consumers from extracting various benefits from electronic commerce? A growing literature examines how electronic commerce affects the prices and availability of numerous physical goods. Economic theory provides reasons that online prices could be either higher or lower than offline prices, with empirical scholarship reporting mixed results. Online commerce also may increase the variety of products available to consumers, because the products that are not available in bricks-and-mortar stores that are within a reasonable distance or with reasonable search costs may be available online. As with prices, however, the size of the variety effect is an empirical question.

Even if consumers can benefit from cost savings and/or greater variety by shopping online, the current regulatory and legal landscape that governs electronic commerce may affect the degree to which consumers can realize these benefits. This paper tries to assess the manner in which the current legal framework governing wine and alcohol distribution and sales might affect electronic commerce in wine. We provide a modest empirical examination of the potential cost savings and product selection that might be available online to consumers in a particular state in the absence of certain legal restrictions.

The paper is organized as follows. Section 1 provides a brief discussion of the existing literature and commentary on potential cost savings of electronic commerce as well as the policy implications of Internet wine sales. Section 2 discusses, in more detail, the current legal framework that governs interstate alcohol sales and outlines theoretical expectations about what (if any) differences should exist between online and offline wine prices and product inventories. Section 3 discusses the data collection methods employed

for our price and product variety comparison between online and offline retail channels, and Section 4 presents the findings. Section 5 concludes with a summary, some caveats, and a brief discussion of prospects for future research.

Section 1: Literature and Policy Issues

This study adds to the quickly growing body of scholarship that investigates whether consumers can realize nontrivial benefits by shopping online rather than, or in addition to, bricks-and-mortar outlets. Considering the body of existing research, empirical findings are mixed. In auto retailing, for example, users of a referral site that

and virtually all types of secondhand merchandise.[2] A better understanding of the costs and benefits of these regulations to consumers could lead to a more informed policy debate.

Along these lines, perhaps no e-commerce topic generates as much controversy as online wine sales. In this debate traditional consumer concerns, such as price and variety, are commonly balanced against other significant public policy goals. In many states, laws prevent or hamper online wine sales by prohibiting out-of-state retailers or wineries from shipping wine directly to customers. Proponents of these laws argue that the economic harm to consumers is slight, and that these laws are necessary to promote temperance, collect alcohol taxes, and prevent underage drinking. (Gray 2002, Hurd 2002, Mead 2002, Painter 2002) Opponents claim that consumers suffer significant harm, and that legitimate concerns about taxation and alcoholic beverage control can be addressed through policies that are less restrictive than an outright ban on direct shipment. (Genesen 2002, Gross 2002, McFadden 2002, Sloane 2002)

Despite a wide array of arguments on both sides, no substantial data (or analysis) has been offered that would allow policymakers to assess the impact of alternative policies on consumers. We seek to remedy part of this gap by comparing online and offline wine prices and product variety for a political jurisdiction where direct shipment from out-of-state wine sellers is prohibited: McLean, Virginia. At the time the data for this study were gathered, the Commonwealth of Virginia banned direct shipment of

[2] See http://www.ftc.gov/opp/ecommerce/anticompetitive/index.htm.

winery can ship wine directly to an in-state customer, but that same customer cannot legally have wine shipped to his residence from another state.[7] Appendix A provides a state-by-state breakdown of direct wine sales laws as of July 2002.

Online Prices and Variety: Hypotheses

Laws that permit direct shipment of wine allow wineries and other merchants to compete with in-state bricks-and-mortar retailers who are supplied by wholesalers under the three-tier system. Direct shipment facilitates Internet wine sales by making it possible for these competitors to send their products directly to consumers instead of through the three-tier system of the state in which the customer lives. Both proponents and opponents seem to regard legal direct shipment as a necessary condition for e-commerce in wine.

Therefore, legalized direct shipping offers consumers access to hundreds of wineries and retailers across the nation, rather than the limited number that a typical consumer would likely seek out and visit in the course of shopping offline. Even if a local bricks-and-mortar retail wine market is highly competitive and includes retailers

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such state bans have been upheld in legal challenges, three have been overturned, and two are pending. *Bainbridge v. Bush*, 148 F. Supp. 2d 1306 (M.D. Fl. 2001), *vacated on other grounds*, *Bainbridge v.*

offering large inventories, we would expect that a consumer could find some additional varieties and better prices when given the option of searching several hundred retailers nationwide.

Nevertheless, economic theory provides several, often conflicting, expectations regarding whether online prices may be higher or lower than offline prices, and whether online shopping gives consumers access to varieties of products that are not available offline within a reasonable distance of the customer. The following section provides a brief discussion of these different perspectives.

Potential price effects

Why online prices may be lower

There are four possible reasons why online wine prices generally might be lower than offline wine prices: many more sellers, lower search costs, less market power, and lower cost of the online sales channel. (Smith, Bailey, and Brynjolfsson 1999).

The first, and most obvious, explanation for why consumers are sometimes likely to find lower prices by searching online is that the number of online sellers greatly exceeds the number of local retail sellers – particularly the number of local retail sellers whose inventories a consumer could check with reasonable search costs. The online shopbot we used to gather wine prices, Winesearcher.com, can access more than 700 online retailers and a number of wineries – many more than a consumer likely would visit in person. Even if average prices were the same online and offline, the opportunity to search many more retailers online means that the consumer is more likely to encounter a lower price online.

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high-profile litigation, court findings in that litigation, and the push to remove the ban in the 2003 legislative session.

Another explanation for why online prices may be lower than offline prices is based on search costs. By reducing the cost of searching price and nonprice attributes, e-commerce could lead to low retail margins and prices online. (Bakos 1997, 2001:71; Wiseman 2001: 28-29) Previous empirical research in other industries has found that online purchases are highly elastic with respect to both online and offline prices (Goolsbee 2001, 2000; Ellison and Ellison 2001; Goolsbee and Chevalier 2002).[8] If wine consumers are price-sensitive, then price-cutting could be a viable business strategy for an electronic wine retailer.

A third economic explanation for why online wine sellers might charge lower prices is that they may be able to circumvent the wholesaler markup paid by offline retailers without incurring substantial alternative costs. Critics of the three-tier system often argue that it may create inefficiencies or create market power for wholesalers by creating barriers to entry (state licensing) and limiting intrabrand competition by requiring producers to give exclusive territories to wholesalers. (Gross 2002:3; Sloane 2002:2) Staff of federal antitrust agencies has often opposed state efforts to strengthen the three-tier system on similar grounds.[9]

In the case of Virginia, for example, licensing may create barriers to entry in several ways. One type of entrant -- the out-of-state business -- simply cannot obtain a Virginia wine wholesaler's license. In addition, the Alcoholic Beverage Control Board

[8] Contrary to this research, Degeratu, Rangaswamy, and Wu (1998) found that online grocery purchasers are less price sensitive than offline grocery purchasers

[9] See, e.g., comments of Federal Trade Commission Staff on proposals in Illinois, North Carolina, and Massachusetts at http://www.ftc.gov/be/v990005.htm, http://www.ftc.gov/be/v990003.htm, and http://www.ftc.gov/be/v960012.htm.

may decline to grant any type of alcohol license for a variety of reasons, including one that appears to grant substantial discretion; a license can be denied if:

> The number of licenses existent in the locality is such that the granting of a license is detrimental to the interest, morals, safety or welfare of the public. (VA Code Sec. 4.1-222 A.3)

Most available empirical studies find that laws permitting or requiring territorial exclusivity for wholesalers of alcoholic beverages do indeed raise prices. (See, e.g., Jordan and Jaffee 1987, Culbertson and Bradford 1991, Sass and Saurman 1996.) While Virginia law bans exclusive territories, it requires the winery to designate a "primary area of responsibility" for each wholesaler to whom it sells, and the winery can have only one

fundamentally different business model that incurs less of the traditional retail costs (stores, sales personnel, etc.)[10] A winery that sells direct to consumers can also bypass transaction cost inefficiencies created by state alcohol franchise laws, which often make it prohibitively costly for a winery to switch wholesalers.

Considering Virginia again, state law specifies that a winery cannot terminate its agreement with a wholesaler in the absence of "good cause," such as state revocation of the wholesaler's license, bankruptcy of the wholesaler, failure to maintain a sales volume or trend for the brand comparable to that of other Virginia wholesalers that carry the

selling direct via the Internet. In either case, the retail price of wine on the Internet could be lower.

Online wine prices might also be lower due to direct sales from wineries that enjoy transaction cost efficiencies as a result of vertical integration. Two economics papers (Gertner 1999, Gertner and Stillman 2001) suggest that vertically integrated retailers are more likely to sell direct online because vertical integration can lower coordination costs, help solve externality problems, and mitigate channel conflict. Empirical evidence from retailing is consistent with the hypothesis that manufacturers who are already integrated into retailing initiate direct online sales more quickly than non-integrated apparel producers. If vertical integration produces transaction cost efficiencies for wineries, it is also plausible that some of those efficiencies may be passed through to consumers in the form of lower prices. Wineries selling direct may charge lower prices than bricks-and-mortar retailers, and other online merchants may even feel compelled to match these prices.[11]

Why online prices may be higher

The literature on e-commerce offers two hypotheses suggesting why online wine prices could be higher than offline prices: value of consumers' time, and reduced search costs for quality attributes.

If Internet wine sellers are not the lowest-cost suppliers, they may charge a higher price and survive because their customers find the convenience worth the extra cost. In

[11] In Virginia, direct shipment provides the only avenue by which out-of-state wineries could integrate forward into retailing, because all out-of-state wine sold in bricks-and-mortar stores must first pass through independent wholesalers. Indeed, one of the explicitly stated purposes of Virginia's Alcoholic Beverage Control laws is to prevent vertical integration. (The only exception is for in-state wineries, which can make retail sales to customers who visit the winery and can ship directly to customers in Virginia.)

their discussion of price dispersion, Smith, Bailey, and Brynjolffson (1999: 109) suggest that e-retailers who "make it easier to find and evaluate products may be able to charge a price premium to time-sensitive customers." A similar theory could be advanced to explain why Internet prices could exceed offline prices for identical products. Assume that a subset of consumers have a high value of time and thus incur high search costs if they attempt to compare prices at bricks and mortar stores. These customers would likely be willing to pay a premium for the privilege of not having to search multiple physical stores – and not even having to travel to a single store -- to get their wine. Customers with low search and travel costs might still check the Internet prices as part of their search, but they would likely patronize the lower-priced bricks-and-mortar stores.

Perceived product differentiation presents an alternative reason that online wine sales could be higher than offline prices. By reducing the cost of obtaining information on quality attributes, online sales could increase customers' ability to perceive differences between different varieties of wine. As customers are better able to select wines that match their individual tastes, they become less price-sensitive. Experimental evidence is consistent with this theory (Lynch and Ariely 2000). If online wine buyers make greater use of such information than offline buyers, then online buyers may be less price-sensitive and online prices could be higher.

For either of these theories to work, there must be some impediment that prevents online retailers from competing away their profit margins by offering lower prices to consumers or paying higher prices for their wine supplies. For this reason, these theories may more accurately describe how online pricing works when an electronic market is in

its infancy and there are few competitors, or when some other barrier prevents the emergence of significant online competition.

Potential variety effects

Why online variety may be greater

There are three principal reasons that consumers may have access to a greater variety of wines online: larger numbers of retailers, intentional product differentiation, and lower fixed costs of marketing and distribution.

The number of online retailers whose products a consumer could search greatly exceeds the number of local retailers that a consumer could reasonably search. One would expect that access to a substantially larger number of retailers would expand the

Even if wineries and e-retailers do not consciously seek to increase differentiation in order to reduce price competition, online wine sales could increase variety simply due to the relative costs of selling wine online vs. through bricks-and-mortar stores. Advocates of direct shipping frequently assert that online wine sales give consumers access to a greater variety of wines than they can obtain by visiting the local retailer (Genesen 2002, Gross 2002, McFadden 2002, Sloane 2002). Even with the best distribution system possible, there are several products that wine producers simply will not sell through channels beyond their tasting rooms (or by other direct means). If a consumer who lives in a state that bans interstate direct wine shipments finds himself in a Napa Valley 0.2982 Tw Tb,

Why online variety may be no greater

An alternative product variety hypothesis is offered by wine wholesalers and alcoholic beverage regulators: any product for which there is customer demand can make its way into the existing distribution system. As evidence they cite public opinion polls revealing that the vast majority of alcohol drinkers are satisfied with the selection of beer and wine available in from local retailers (Gray 2002: 4), and relatively little utilization by wineries of legal direct shipping laws enacted by some states (Painter 2002). In economic terms, these parties are suggesting that fixed costs of getting a particular label into the three-tier system are not high enough to reduce variety to any meaningful extent; therefore, if a winery cannot find wholesalers to carry its wines, consumer demand must be negligible.

Section 3: Data Sources and Calculations

There is little empirical information on how access to out-of-state wine sellers through the Internet affects the prices and varieties of wines available to consumers. To address this void, this study analyzes the prices and wine selections offered by stores that identify themselves as wine retailers in the greater McLean, Virginia, area for a pre-identified market bundle of popular wines. McLean was chosen as the relevant retail area for several reasons. First, Virginia bans direct sales, and hence it is an appropriate state for which to consider the effects of direct sales laws on product selection and price. Second, given the socio-economic status of many residents in McLean (and Northern Virginia, generally), it seemed likely that several bricks-and-mortar outlets could be found locally that catered to the needs of a sophisticated wine drinking population. As a result, any estimate of the "variety effect" would likely be conservative and could not be

dismissed as driven by the choice of a location where few fine wines would likely be available.[13] Due to the choice of locality, our results should be interpreted as a comparison of the

list of the most popular wines (which were arranged by varietal). For example, if Winery X held spots 1-3 on Restaurant Y's wine list for its Chardonnay, Cabernet Sauvignon, and Merlot, respectively, then its Chardonnay would receive 10 points, its Cabernet would receive 9 points, and its Merlot would receive 8 points, respectively. The ranking of each wine was determined, then, by summing the scores across all respondents.[14]

Given the list of most popular wines, arranged by varietal, the 50 highest point recipients were selected for price comparisons from the collection of Sauvignon Blancs, Chardonnays, Cabernet Sauvignons, Merlots, Pinot Noirs, and Zinfandels produced by American winemakers. The highest ranked wine in this sample is the Sonoma-Cutrer Vineyards Chardonnay, with 464 points, while the 50th-most popular wine is a five-way tie between Caymus Vineyards' and Kendall Jackson Vineyards' Cabernet Sauvignon, Rodney Strong Vineyards' Merlot, La Crema's Pinot Noir, and Murphy-Goode's Sauvignon Blanc with 41 points each. The complete sample of wines analyzed is listed in Appendix B. As can be seen, focusing our attention on the top 50 point recipients actually identifies 83 individual bottles. The difference between ordinal rankings (the Top 50) and sample size (83) follows from the fact that *Wine and Sprits* recognizes all relevant bottles that fall under a given wineries' varietal when it identifies the most popular Chardonnays, Merlots, etc. For example, Cakebread's chardonnay received 244 points, making it the third most popular wine overall, but Wine and Spirits recognized two bottles, the "Napa Valley" and the "Napa Valley Reserve," as "Cakebread Chardonnay," and hence both were included in our sample.

[14] Questions might be raised over whether this list truly represents the most popular wines in the United States, as some of the best selling wines overall (i.e., "jug" wines) are not in this list. While it may be true that certain best selling (and lower quality) wines are not represented in this sample, we find it unlikely that

Taking this list of 83 bottles, the relevant wineries were contacted, either by phone or Internet, to determine whether all bottlings were available for retail sale, as well as the year of the most recent vintage. Appendix B identifies four bottles with an asterisk that were either unavailable for retail sale to consumers (i.e., they were only sold to restaurants), had been misnamed by *Wine and Spirits*, or could otherwise not be found online. The remaining 79 bottles, which were identified as being currently available vintages, were used for price comparisons between offline and online retail channels.

Price and variety searches

We designed our study so that it would reasonably simulate how a serious wine consumer might shop. The online shopper, of course, can access hundreds of retailers and wineries; the shopbot we used to gather prices, "Winesearcher.com," had access to more than 700 wine stores with online inventory access and also listed wine price data from some wineries. We assumed that legalized direct shipping would permit the McLean consumer to order from any of these online sources.

For offline shopping, it is doubtful that a consumer would physically visit (or even phone) every possible source of wine in the area. Consulting "Yahoo! Yellow Pages," we collected a list of every store identifying itself as a "wine retailer" located within a ten-mile radius of McLean.[15] We assumed that a McLean consumer would search several nearby stores that carry large inventories at attractive prices. To guard against the possibility that even large retailers might not always carry a full array of

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these wines would be among those that serious wine drinkers might consider for regular purchase/consumption.

[15] Because Virginia state law expressly bans the importation of alcohol from other states, we only focused our attention on those stores within the ten-mile radius that were located in Virginia. Several reviewers of this paper who drink wine and live in Northern Virginia doubted that a wine consumer would search all 13 wine retailers we identified. If they are correct, then our price and variety findings likely under-estimate the potential benefits of legalized direct shipping.

lesser-known wines that they could obtain from wholesalers, we also assumed that the consumer might check a number of smaller, specialty wine shops. The list that emerged consisted of the 13 retail outlets identified in Appendix C; it includes several "wine megastores" (Total Beverage) as well as smaller wine shops.

Our sample does not include general grocery stores (e.g., Giant, Safeway) or club stores (e.g., Costco). However, two of the bricks-and-mortar stores searched were beverage megastores known for carrying very large selections at competitive prices. In the personal shopping experience of the authors and several reviewers of this paper, these megastores' everyday prices tend to be lower than or equal to those of grocery stores, but the grocery stores often beat the megastores' prices on lower-priced wines advertised as weekly specials. Hence, if the exclusion of grocery stores affects our price data, it likely overstates the offline prices for some of the less expensive wines that may have been offered by a grocer at a special, lower price at some point during the period when we collected our data. To assess whether the absence of grocery stores affects our results on variety, we made followup visits to several large grocery stores in McLean to see if they carried any of the wines that were unavailable at the stores in our sample that were listed as wine retailers in the Yellow Pages. They did not.

The first step in collecting price information was to contact the wineries directly and find out what prices the wineries were charging for their bottles. It is obvious, however, that there may be other retail channels available through the Internet that might sell wine for prices lower than those available at wineries.

To collect price data from other Internet-based stores, we engaged Winesearcher.com to collect the lowest online retail prices for each bottle in our sample.

The store name where each bottle was found, as well as its zip code, was also collected and used in calculating transportation costs. Using the shopbot, prices could be found for each of the 79 bottles. Comparing the Winesearcher.com price and the prices collected directly from the wineries, the least expensive price for each bottle was identified as the "best online price" at the time of data collection.

After collecting price data from out-of-state vendors, our next step was to collect price data for our sample from bricks-and-mortar stores. Prices for the bottles in our sample were collected from the 13 bricks-and-mortar retail outlets in one of two ways. Where the retai

prices with the same frequency). Our findings thus may overstate price savings for the customer who is content to wait until a sought-after wine comes on sale in a bricks-and-mortar store. On the other hand, any portion of our results that may stem from the increased probability of finding a wine on sale online counts as a legitimate cost saving for the customer who is unwilling to "time the market" and wait until a desired wine comes on sale offline.

Taxes and transportation costs

Retail sales and excise tax differentials could affect our price comparisons. We opted to compare prices without sales taxes, in order to ascertain whether Virginians who comply with all state sales and use tax laws (and would therefore pay these taxes both on wine purchased from out-of-state and on wine purchased locally) can save money buying wine online. While it is possible that shoppers in Virginia would try to evade sales taxes if they were allowed to buy online from out-of-state vendors, Virginia's legislation to remove the direct shipment ban requires shippers to obtain a state permit and remit

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Some of the online prices may include excise taxes imposed by other states, depending

possibility that a single retailer might be the lowest-cost seller of more than one wine, and so even a customer who wanted only one or two bottles of a particular wine might reap economies of scale in shipping by ordering several different wines simultaneously from the same seller.

The calculation method also ignores the possibility that online wine retailers might impose handling charges in addition to the shipping costs. Since Virginia bans direct shipment, most of the online retailers do not quote shipping rates to McLean. In addition, most of the online retailers in our sample calculate shipping charges after the order is placed, so we do not have good information about additional handling charges or other markups on shipping charges for any delivery location. Several, however, do post shipping and handling information that is accessible without placing an order, and we checked the shipping and handling costs for ground delivery to Washington, DC, the jurisdiction closest to Northern Virginia that permits direct shipment (albeit limited). None of the online vendors who post such information imposes an additional handling

addition, a random search of online retailers listed in the Winesearcher.com database revealed several that do not charge a significant premium above UPS rates when shipping to the reciprocity states. Thus, it is possible that some online retailers charge more for shipping than our estimates indicate, but this may be offset by the other two factors that tend to inflate our online cost estimates. In any event, the per bottle difference is not very large for six- and 12-bottle orders.

For bricks-and-mortar stores, transportation costs were calculated using the standard government reimbursement for automobile travel ($0.365 per mile), multiplied by the round-trip distance of the store from McLean, Virginia, as indicated by Yahoo! Maps. These costs were divided by the various numbers of bottles (1, 6, or 12) we assumed the customer purchases. Readers might argue that this method also might overstate transportation costs because consumers might combine their shopping trips for wine with other errands. While this concern may be valid, it is our belief that this method might actually *understate* the relative costs associated with driving around Northern

procedure understates the true expenses associated with transporting wines in Northern Virginia, the reader should take this matter into account when considering the following results.

Using this imputed transportation cost data, we were able to calculate the total price for each bottle on our list, purchased in various quantities.[21] The total price is the sum of the lowest retail price (online or offline) and the relevant transportation cost associated with delivering it to a home residence (via shipping or driving reimbursement). Descriptive statistics for wine prices and transportation costs are presented in Table 1.[22]

Section 4: Findings

The price and availability data do not permit us to make a comprehensive analysis of the effect of the direct shipment ban on consumer welfare. A measurement of overall consumer welfare would require quantity data that are not available, data on factors other than price and variety that consumers value, and data on consumer search patterns. Nor should our calculations be viewed as a "comparative static" analysis of the online and offline market equilibria in the presence and absence of the direct shipping ban. Online prices and variety currently may differ from offline prices and variety, but it is possible that the long-run equilibrium in the absence of the direct shipping ban could involve a different set of prices or different selection as bricks-and-mortar stores alter their prices

[21] We ignore quantity discounts, based on our experience that online and offline retailers usually offer similar quantity discounts for purchase of a whole case.

[22] An interesting feature of the data is that the lowest online prices overwhelmingly come not from wineries, but from out-of-state retail outlets that have web-accessible inventories and are listed on winesearcher.com.

and product selection in response to online competition. A comprehensive long-run analysis would need to take any such changes into account.

Nevertheless, our data do help us assess whether the direct shipping ban in the short run prevents consumers from accessing various wines or prices they could not otherwise receive. In that sense, our study is similar to the pre-deregulation studies that compared air fares in unregulated intrastate markets with regulated interstate fares for flights of similar length. (See, e.g., Levine 1965.) Our results should be interpreted as an indicator of the potential for direct shipment to offer price and variety benefits to consumers, rather than a quantitative prediction of the size of these benefits if the direct shipment ban were lifted.

Selection

While we are considering a relatively small product sample in this study, it is instructive to investigate whether consumers' choices are limited because they are not able to shop online for wine from out-of-state vendors. Table 2 lists the wines that were unavailable in Virginia bricks-and-mortar wine retailers within a 10-mile radius of McLean. In total, 15 of the 83 wines in our sample (approximately 18 percent) are unavailable through the Virginia retail outlets searched. In comparison, only 4 of the 83 wines in our sample (approximately 5 percent) could not be found through retail channels online. When excluding from consideration the one wine unavailable online and the three wines that could not be found online or offline, we find that 12 of the 79 wines available online (15 percent) are not available in bricks-and-mortar stores within ten miles of McLean.[23]

[23] Three of the four wines that were unavailable online could also not be found in bricks-and-mortar outlets

An additional issue emerges when considering the characteristics of some of the bottles that are unavailable in the McLean vicinity. The last column of Table 2 presents the *Wine and Spirits* popularity ranking for each bottle. For the bottles that are unavailable in the McLean vicinity, 8 out of 15 (approximately 53 percent) come from among the 20 most popular bottles, according to *Wine and Spirits'* restaurant poll. This finding may mean that some wineries have neglected to gain state approval for sale of popular labels in Virginia, or that wholesalers or retailers in McLean have neglected to carry some wines that would be popular with the region's consumers, or merely that there are regional differences in demand for various wines.

Clearly, though, the McLean consumers who want to purchase these wines are adversely affected by the direct sales ban. For McLean consumers to acquire these bottles, they would have to either widen their search perimeter beyond the 10-mile radius employed here, request special orders through their local retailers (if such arrangements could be made), or risk breaking the law by having wine shipped directly to their residences by merchants employing 3rd-party shipping agents. Regardless of which avenue they chose, it likely would be less convenient for consumers (from a search cost standpoint) to acquire these bottles through bricks-and-mortar outlets than to use the Internet.

Price

Virginia's ban on out-of-state direct wine shipments might also affect the prices available to consumers. To assess the cost differences between shopping online and offline, Table 3a presents the average cost savings and/or cost penalties from shopping online for the entire sample of 67 wines that could be found in Virginia bricks-and-mortar

outlets. Cost differences were calculated first as the difference between the lowest offline price and the lowest online price found via winesearcher.com, or at a given winery's website. We then recalculated cost differences including transportation costs for a variety of shipping options.

The average figures reported in the tables usually reflect a combination of cost savings for online purchase of some wines and cost penalties for online purchase of other wines. Except for the tables reporting results for the most expensive wines, there are always at least a few wines that are cheaper offline, regardless of shipping method. A consumer who purchased each wine from the least expensive source could thus enjoy greater cost savings than our average percentage figures imply.

As is evident from Table 3a, price comparisons between the Internet and bricks-and-mortar stores favor the Internet, where the average price of a bottle in the sample (not accounting for transportation/shipping and handling costs) is $5.84 less if purchased online.[24] The picture changes, however, if one considers shipping expenses, and the lowest-cost option depends on the quantity ordered and shipping method. Depending on the quantity and shipping method, an online customer might save as much as $3.54 per bottle on average when buying a whole case and shipping via ground, or pay as much as $7.26 per bottle more on average if shipping a single bottle via 2nd Day Air. For the most likely quantities – 6 or 12 bottles – the online consumer saves several dollars per bottle if shipping via ground, but the cost difference when shipping via air is not statistically significant.

[24] We opted to exclude Virginia's 40 cents/liter excise tax on wine from the analysis, because the size of these price differences makes it clear that the excise tax would not significantly alter the results.

Given that wine is a somewhat perishable product (in the sense that a consumer would not want to expose his bottles to extreme heat or cold) it is likely that many shipments would occur through the faster shipping channels such as 3rd Day or 2nd Day Air, in comparison to standard ground service.[25] Hence, while consumers could obviously acquire some wine cheaper online, the incorporation of transportation costs makes it less clear which channel is dominant for consumers who wish to acquire all of the wines in our sample. Nevertheless, it is worth noting that consumers consistently pay more online only when ordering single bottles.

Another perspective can be gained by considering the cost differences between online and offline sales for the more expensive bottles in the sample. Tables 3b and 3c present the average cost savings from shopping online for wines that have offline retail prices equal to or greater than $20.00 and $40.00, respectively.[26] While the sample size decreases when considering these sub samples, dropping from 67 to 36 for bottles equal to or greater than $20.00, and from 36 to 9 for bottles equal to or greater than $40.00, the potential gains from shopping online increase. For the sample of bottles equal to or greater than $20.00, a McLean consumer has the opportunity to save anywhere from $4.40 to $7.19 per bottle on average by shopping online, depending on the quantity purchased and shipping method employed. (After taking shipping costs into account, only two wines priced at or above $20 are less expensive purchased by the case offline.)

[25] The extent to which consumers would prefer to use a faster shipping method will be affected, in large part, by the time of the year that the wine is being purchased.

Cost differences for 2nd Day Air, and for purchase of a single bottle via 3d Day Air, are not significantly different from zero.

Alternatively, for bottles that are equal to or greater than $40.00 in price, a McLean consumer can save an average of between $15.00 and $18.45 per bottle by shopping online rather than offline.

case would be at least 7 percent more expensive if shipped via air. Alternatively, for the wines priced at $20 and above, it would cost an average of 7 percent to 13 percent less (depending on the quantity) to purchase them online and ship via ground service. Savings are negligible or nonexistent if the consumer chooses 2nd or 3d Day Air. Finally, the consumer can save an average of 13 percent to 21 percent on the "$40 and up" wines, depending on the quantity and shipping method. Once again, this result supports the notion that the typical consumer who seeks higher-priced wines could pay less if the direct sales ban were removed.

Table 4d presents the extra cost of buying bottles less than $20.00 online versus offline. While purchasing the lower priced bottles online can save consumers almost 10 percent of what they would pay in bricks-and-mortar stores, this saving evaporates once shipping and handling costs are incorporated into the equation. Consumers would find themselves paying between 8 percent and 83 percent more when purchasing wine online, depending on the quantity and shipping method.

Section 5: Conclusion

While electronic commerce has grown to encompass many business-to-consumer transactions, existing laws and regulations prevent certain industries from carrying out their activities on the Web. Current bans on direct shipment prevent a nationwide virtual wine store from emerging anytime in the near future. This study has discussed the legal framework currently governing alcohol sales and has made a modest attempt to assess whether Virginia's prohibition on interstate direct shipment affects the prices and variety available to Virginia consumers.

individual wines; even for the least expensive shipping method, some individual wines priced below $40 are always less expensive offline.

Similar to the findings on variety, it is important to remember that these results likely understate the potential cost savings that come from shopping online. The method employed for calculating shipping costs from remote vendors was conservative. If wine drinkers obtain economies of scale in shipping by ordering more than one wine at a time from the same online retailer, then the available savings from shopping online are usually larger for the consumer who wants only one or two bottles of a given wine.

It is not clear from the data whether these price savings result from lower search costs, mitigation of market power, or lower costs of online retailers. The price savings are largest for the most expensive wines – precisely the ones more likely to be purchased by wealthy individuals with high search costs or connoisseurs for whom product differentiation would matter most. If online wine retailers succeeded in charging a premium for convenience or for product differentiation, then we would expect to see higher online prices for the more expensive bottles.

In considering these conclusions, a few caveats should be noted. First, it is important to emphasize that these findings are based on a short-run partial equilibrium analysis that does not address how online and offline vendors might alter their prices and product selection if the direct sales ban were lifted. If interstate direct shipment into Virginia were legalized, it is possible that offline retailers would reduce prices or offer access to greater inventory, which would benefit consumers but reduce or eliminate the disparity between online and offline variety and price. It is also conceivable that competition from online retailers might reduce variety available offline if the offline

segment of the market contracts significantly. (But see McFadden 2002.) Further research, in the form of some sort of event history analysis, could try to address this issue more completely by comparing changes in prices and product variety before and after a state altered its alcohol sales and importation laws.[27] Studies comparing similar geographic markets in states with different alcohol laws would also help to provide information about the differences in marketing and retail institutions under different legal regimes. Our findings suggest that such studies may well be worth pursuing.

Second, given the small sample size and the limited scope of the geographic market being analyzed, one should be aware of the limits on generalizing from these results. Future research could easily address this issue by replicating this analysis with other geographic markets that are subject to restrictive alcohol sales and importation laws, as well as using a larger sample of wines.

Finally, we should emphasize that our results reflect assumptions about consumer search behavior that we believe are plausible, but different assumptions might lead to different results. For example, if serious wine consumers include grocery stores in their search, then it is possible that they might find some lower offline prices than we found – especially if they time their purchases to coincide with grocery stores' weekly advertised specials. If a McLean wine drinker is unlikely to travel as much as 10 miles to some of the specialty wine shops in Northern Virginia, then average offline prices might be higher or variety lesser than our results indicate.

[27] Virginia's governor is currently considering a bill that would legalize interstate direct shipping, and interstate direct shipment bans have also been overturned by courts in North Carolina, New York and Texas. If these states change their policies, their experience could provide data for such analysis.

These caveats aside, this study adds to the debate over the benefits to consumers from legalizing interstate alcohol sales, which would be necessary to facilitate the development of widespread electronic commerce in wine. Further research will only enhance our understanding of the size and scope of the benefits that consumers stand to gain by the development of an additional electronic marketplace.

Table 1: Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max	Obs.
Lowest Online Price	25.969	20.980	7.970	129.990	79
Lowest Offline Price	28.290	23.916	8.490	169.990	68
Transportation Costs (Buying 1 Bottle)	1.655	2.512	0.073	7.3	68
Transportation Costs per Bottle (Buying 6 Bottles)	0.276	0.419	0.122	1.217	68
Transportation Costs per Bottle (Buying 12 Bottles)	0.138	0.209	0.006	0.608	68
Ground Shipment Costs (Buying 1 Bottle)	5.960	0.583	4.530	6.300	79
3rd Day Air Shipment Costs (Buying 1 Bottle)	9.985	1.714	6.350	10.980	79
2nd Day Air Shipment Costs (Buying 1 Bottle)	13.215	1.943	8.560	14.310	79
Ground Shipment Costs per Bottle (Buying 6 Bottles)	2.834	0.685	1.493	3.248	79
3rd Day Air Shipment Costs per Bottle (Buying 6 Bottles)	5.532	1.294	2.557	6.287	79
2nd Day Air Shipment Costs per Bottle (Buying 6 Bottles)	7.033	1.617	3.232	7.940	79
Ground Shipment Costs per Bottle (Buying 12 Bottles)	2.504	0.711	1.051	2.932	79
3rd Day Air Shipment Costs per Bottle (Buying 12 Bottles)	4.737	1.150	2.072	5.404	79
2nd Day Air Shipment Costs per Bottle (Buying 12 Bottles)	6.115	1.532	2.594	6.982	79

Table 2: Wines Unavailable at Bricks and Mortar Retail Outlets

Winery	Varietal[28]	Wine Label	Bottle Rank
Cakebread Cellars	CA	Napa Valley	16
Caymus Vineyards	CA	Napa Vly. Special Selection	49
Duckhorn Vineyards	M	Three Palms	8
Ferrari-Carano Winery	CH	Alexander Vly. Reserve	7
Ferrari-Carano Winery	M	Alexander Valley	22
Ferrari-Carano Winery	SB	Alexander Valley Fume	40
Jordan Vineyard & Winery	CA	Alexander Valley Estate	24
Kendall-Jackson Vineyards*	CA	Calif. Proprietors Reserve	49
Kendall-Jackson Vineyards*	M	Calif. Proprietors Reserve	15
La Crema (Kendall-Jackson)	P	Russian River Valley	49
Murphy Goode Estate	SB	Fume Reserve	49
Robert Mondavi Winery	CA	Napa Valley	19
Stag's Leap Wine Cellars	CA	SLD Fay	11
Sterling Vineyards*	M	Central Coast – Vintners Collection	66

Table 3a: Cost Savings (Extra Expenses) per Bottle When Shopping Online for Entire Sample[29]

Category	Mean	Std. Dev.	Min.

Table 3c: Cost Savings (Extra Expenses) per Bottle When Shopping Online for Wines Greater or Equal to $40.00 (Offline Price)

Category	Mean	Std. Dev.	Min.	Max.	Obs.
Online Savings (no transportation costs)	20.607**	23.817	7.000	83.000	9
Online Savings (UPS Ground Service - 1 Bottle)	17.881*	24.827	2.263	82.686	9
Online Savings (UPS 3rd Day Air - 1 Bottle)	13.573	24.596	-1.678	78.006	9
Online Savings (UPS 2nd Day Air - 1 Bottle)	6.969	23.461	-6.310	68.690	9
Online Savings per Bottle (UPS Ground Service - 6 Bottles)	18.388**	23.804	5.376	80.749	9
Online Savings per Bottle (UPS 3rd Day Air - 6 Bottles)	15.762*	23.683	2.772	77.771	9
Online Savings per Bottle (UPS 2nd Day Air - 6 Bottles)	14.28	23.648	1.119	76.057	9
Online Savings per Bottle (UPS Ground Service - 12 Bottles)	18.448**	23.711	5.677	80.567	9
Online Savings per Bottle (UPS 3rd Day Air - 12 Bottles)	16.262*	23.628	3.204	78.095	9
Online Savings per Bottle (UPS 2nd Day Air - 12 Bottles)	14.990*	23.572	1.627	76.517	9

Table 3d: Cost Savings (Extra Expenses) per Bottle When Shopping Online for Wines Less than $20.00 (Offline Price)

Category	Mean	Std. Dev.	Min.	Max.	Obs.
Online Savings (no transportation costs)	1.661**	2.183	-2.200	6.000	31
Online Savings (UPS Ground Service - 1 Bottle)	-3.144**	3.496	-8.427	6.000	31
Online Savings (UPS 3rd Day Air - 1 Bottle)	-7.053**	3.67	-13.107	1.32	31
Online Savings (UPS 2nd Day Air - 1 Bottle)	-11.393**	2.807	-16.510	-5.580	31
Online Savings per Bottle (UPS Ground Service - 6 Bottles)	-0.934**	2.414	-5.436	3.316	31
Online Savings per Bottle (UPS 3rd Day Air - 6 Bottles)	-3.578**	2.656	-8.475	1.392	31
Online Savings per Bottle (UPS 2nd Day Air - 6 Bottles)	-5.039**	2.824	-10.128	2.455	31
Online Savings per Bottle (UPS Ground Service - 12 Bottles)	-0.697	2.362	-5.126	3.644	31
Online Savings per Bottle (UPS 3rd Day Air - 12 Bottles)	-2.888**	2.532	-7.598	1.948	31
Online Savings per Bottle (UPS 2nd Day Air - 12 Bottles)	-4.220**	2.742	-9.176	1.112	31

Table 4a: Proportional Cost Savings (Extra Expenses) per Bottle When Shopping Online for Entire Sample[30]

Category	Mean	Std. Dev.	Min.	Max.	Obs.
Online Savings (no transportation costs)	0.158**	0.13	-0.187	0.488	67
Online Savings (UPS Ground Service - 1 Bottle)	-0.085**	0.272	-0.753	0.470	67
Online Savings (UPS 3rd Day Air - 1 Bottle)	-0.272**	0.368	-1.270	0.443	67
Online Savings (UPS 2nd Day Air - 1 Bottle)	-0.481**	0.430	-1.645	0.390	67
Online Savings per Bottle (UPS Ground Service - 6 Bottles)	0.024	0.184	-0.500	0.459	67
Online Savings per Bottle (UPS 3rd Day Air - 6 Bottles)	-0.103**	0.251	-0.846	0.442	67
Online Savings per Bottle (UPS 2nd Day Air - 6 Bottles)	-0.181**	0.298	-1.038	0.447	67
Online Savings per Bottle (UPS Ground Service - 12 Bottles)	0.036*	0.176	-0.465	0.458	67
Online Savings per Bottle (UPS 3rd Day Air - 12 Bottles)	-0.070**	0.230	-0.744	0.444	67
Online Savings per Bottle (UPS 2nd Day Air - 12 Bottles)	-0.134**	0.266	-0.922	0.435	67

Table 4b: Proportional Cost Savings (Extra Expenses) per Bottle When Shopping Online for Wines Greater or Equal to $20.00 (Offline Price)

Category	Mean	Std. Dev.	Min.	Max.	Obs.
Online Savings (no transportation costs)	0.211**	0.099	-0.061	0.488	36
Online Savings (UPS Ground Service - 1 Bottle)	0.076**	0.143	-0.241	0.470	36
Online Savings (UPS 3rd Day Air - 1 Bottle)	-0.039	0.174	-0.381	0.443	36
Online Savings (UPS 2nd Day Air - 1 Bottle)	-0.182**	0.185	-0.490	0.390	36
Online Savings per Bottle (UPS Ground Service - 6 Bottles)	0.129**	0.106	-0.156	0.459	36
Online Savings per Bottle (UPS 3rd Day Air - 6 Bottles)	0.052**	0.125	-0.248	0.442	36
Online Savings per Bottle (UPS 2nd Day Air - 6 Bottles)	0.008	0.137	-0.297	0.432	36
Online Savings per Bottle (UPS Ground Service - 12 Bottles)	0.134**	0.104	-0.147	0.458	36
Online Savings per Bottle (UPS 3rd Day Air - 12 Bottles)	0.070**	0.118	-0.222	0.444	36
Online Savings per Bottle (UPS 2nd Day Air - 12 Bottles)	0.031	0.13	-0.269	0.435	36

[30] For Tables 4a, 4b, 4c and 4d, a double asterisk (**) indicates significance greater than the 95% confidence level. A single asterisk (*) indicates significance greater than the 90% confidence level (two-tailed test).

Table 4c: Proportional Cost Savings (Extra Expenses) per Bottle When Shopping Online for Wines Greater or Equal to $40.00 (Offline Price)

Category	Mean	Std. Dev.	Min.	Max.	Obs.
Online Savings (no transportation costs)	0.253**	0.122	0.078	0.488	9
Online Savings (UPS Ground Service - 1 Bottle)	0.196**	0.136	0.025	0.470	9
Online Savings (UPS 3rd Day Air - 1 Bottle)	0.129**	0.142	-0.034	0.443	9
Online Savings (UPS 2nd Day Air - 1 Bottle)	0.03	0.147	-0.107	0.390	9
Online Savings per Bottle (UPS Ground Service - 6 Bottles)	0.206**	0.121	0.060	0.459	9
Online Savings per Bottle (UPS 3rd Day Air - 6 Bottles)	0.166**	0.128	0.038	0.442	9
Online Savings per Bottle (UPS 2nd Day Air - 6 Bottles)	0.143**	0.133	0.017	0.432	9
Online Savings per Bottle (UPS Ground Service - 12 Bottles)	0.207**	0.12	0.064	0.458	9
Online Savings per Bottle (UPS 3rd Day Air - 12 Bottles)	0.173**	0.126	0.041	0.444	9
Online Savings per Bottle (UPS 2nd Day Air - 12 Bottles)	0.152**	0.13	0.021	0.435	9

Table 4d: Proportional Cost Savings (Extra Expenses) per Bottle When Shopping Online for Wines Less than $20.00 (Offline Price)

Category	Mean	Std. Dev.	Min.	Max.	Obs.
Online Savings (no transportation costs)	0.097**	0.136	-0.187	0.334	31
Online Savings (UPS Ground Service - 1 Bottle)	-0.272**	0.267	-0.753	0.228	31
Online Savings (UPS 3rd Day Air - 1 Bottle)	-0.543**	0.347	-1.270	0.050	31
Online Savings (UPS 2nd Day Air - 1 Bottle)	-0.828**	0.365	-1.650	-0.278	31
Online Savings per Bottle (UPS Ground Service - 6 Bottles)	-0.097**	0.181	-0.501	0.165	31
Online Savings per Bottle (UPS 3rd Day Air - 6 Bottles)	-0.283**	0.242	-0.843	0.070	31
Online Savings per Bottle (UPS 2nd Day Air - 6 Bottles)	-0.385**	0.277	-1.030	0.012	31
Online Savings per Bottle (UPS Ground Service - 12 Bottles)	-0.078**	0.174	-0.465	0.182	31
Online Savings per Bottle (UPS 3rd Day Air - 12 Bottles)	-0.232**	0.222	-0.744	0.097	31
Online Savings per Bottle (UPS 2nd Day Air - 12 Bottles)	-0.326**	0.257	-0.922	0.056	31

Appendix A: States and Direct Wine Shipment Laws [31]

Reciprocal States

California	Colorado
Hawaii	Idaho
Illinois	Iowa
Minnesota	Missouri
New Mexico	Oregon
Washington	Wisconsin
West Virginia	

Direct Shipments Prohibited (Non-Felony)

Alabama	Arizona
Arkansas	Delaware
Kansas	Maine
Massachusetts	Michigan
Mississippi	New Jersey
New York	

Appendix B: Wine and Spirits "Top Fifty" Wines

Winery	Varietal[32]	Wine Label
Beaulieu Vineyard	CA	Napa Valley Tapestry
Beaulieu Vineyard	CA	Napa Valley Rutherford
Benziger Family Winery	CH	Carneros
Beringer Vineyards	CA	Knights Valley
Beringer Vineyards	CA	Napa Valley Private Reserve
Beringer Vineyards	CH	Napa Vly. Private Reserve
Beringer Vineyards	CH	Napa Valley
Blackstone Winery	M	California
Blackstone Winery	M	Napa Valley
Cakebread Cellars	CA	Napa Valley
Cakebread Cellars	CH	Napa Valley
Cakebread Cellars	CH	Napa Valley Reserve

4.230 Td (CH)Tj 0 Tc 0.2816-0 m30
3247 Tw 134.224 Td (CH)Tj 0 Tc 0.2816-0.m24

0.2895 TM-0.0012 Tc 1.0407 Tw 90.55825328.25c 1363f BTellarsMM
v 13.5 0 Td ( )T32c 0.252 Tc 0.3247 Tw 134.232c 0.2895 Tw 13.5 0 T16-0.m32c 0.252 53.25 0 Td ( )Tj ET 832c 0.2

La Crema (Kendall-Jackson)	P	Russian River Valley
Landmark Vineyards	CH	Sonoma Overlook
Markham Winery	M	Napa Valley
Murphy Goode Estate	SB	Fume
Murphy Goode Estate	SB	Fume Reserve
Ravenswood	Z	Sonoma Vitners Blend
Ravenswood	Z	Lodi
Ridge Vineyards	Z	Napa Valley

Appendix C: Bricks and Mortar Retailers Searched[33]

1. Total Beverage*
   1451 Chain Bridge Road
   McLean, VA
   703-749-0011
   Mileage: 0.1

2. Sutton Place Gourmet
   6655 Old Dominion Dr
   McLean, VA
   703-448-3828
   Mileage: 0.2

3. Cecile's Wine Cellar
   1351 Chain Bridge Road
   McLean, VA
   703-356-6500
   Mileage: 0.4

4. Arrowine
   4508 Lee Highway
   Arlington, VA
   703-525-0990
   Mileage: 4.0

5. International Wine and Beverage
   4040 Lee Highway
   Arlington, VA
   703-528-2800
   Mileage: 4.5

6. Norm's Beer and Wine
   136 Branch Road SE
   Vienna, VA
   703-242-0100
   Mileage: 4.6

7. Vienna Vintner
   233 Maple Ave E
   Vienna, VA
   703-242-9463
   Mileage: 4.9

8. Classic Wine Tc 0.0r0 -14( )Tj ----------f 312 3 2289Td (144 ET Q 36f

9912 Georgetown Pike #C
Great Falls, VA
703-759-0430
Mileage: 7.4

9. Total Beverage Landmark*
6240 Little River Turnpike
Alexandria, VA
703-941-1133
Mileage: 8.2

10. Botstetter's Wine and Gourmet

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