The Economics of Direct Wine Shipping

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Draft – July 6, 2006

Abstract

The most significant barriers to online wine sales are state laws that prohibit direct-to-consumer wine shipping. In 2003, Virginia legalized interstate direct shipment, providing an opportunity to test whether these laws significantly affect competition. Previous analyses found that Virginia's direct shipment ban deprived consumers of greater variety and lower prices available online; legalization reduced the spread between online prices and prices at bricks-and-mortar retailers in Northern Virginia. We compare online and offline prices from 2002 and 2004 that include shipping and transportation costs, and we find that after accounting for these costs, the online-offline price difference had fallen but not disappeared. On average, substantial price savings were still available online for the more expensive wines, which constitute almost half the sample. It is unclear whether the remaining price difference reflects a lag in adjustment to the change in law, legitimate competitive advantages of bricks-and-mortar wine shops, or aspects of Virginia's law that make online competition less robust than it could be.

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INTRODUCTION

The most significant barriers to online wine sales are state laws that prohibit direct-to-consumer wine shipping.[1] *Granholm v. Heald* established that states cannot ban interstate direct wine shipping if they permit intrastate direct wine shipping. Since the decision was announced in June 2005, many states have liberalized their wine shipping laws, and debate is ongoing in other state capitols. As of May 2006, interstate direct wine shipping was prohibited in 18 states, permitted on a limited basis in 21 states and DC, and permitted on a reciprocal basis in 11 states.[2]

States that choose to allow interstate direct wine shipping can attach a variety of conditions that may hamper online competition. They can require out-of-state shippers to buy licenses or permits, require shippers to notify their in-state wholesalers before selling direct to consumers, require registration of individual brands or labels eligible for direct shipment, limit volumes shipped by a winery or received by individual consumers, permit shipping only for wines not handled by an in-state distributor, limit direct shipment to wineries instead of retailers, require shippers or consumers to remit sales and excise taxes, prohibit ordering via the Internet, prohibit or require shipment via common carrier, or require various kinds of recordkeeping.[3]

Different state laws may have different effects. At one extreme, a state may nominally be open to direct shipping but impose such severe restrictions that few shippers find it economical or practical. On the other hand, at some point a state's law is

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[1] POSSIBLE ANTICOMPETITIVE BARRIERS TO E-COMMERCE: WINE, A REPORT FROM THE STAFF OF THE FEDERAL TRADE COMMISSION 3 (July 2003). In the interest of full disclosure, we should note that we were two of the coauthors of the FTC staff report.

[2] A "reciprocal" state permits direct shipment only from states that also allow its wineries or retailers to ship to their consumers. "Limited" states allow direct shipment from shippers in any state as long as they meet other qualifications in the law. For examples, see http://www.wineinstitute.org/shipwine/.

[3] See http://www.wineinstitute.org/shipwine/ for a comprehensive list.

liberal enough that most shippers can comply at minimal cost, and most adult consumers in the state can order the types and quantities of wines they desire.

At what point is a state's law liberal enough that consumers get most of the benefits obtainable from e-commerce in wine? One way of answering this question is to analyze price convergence.

If laws prohibiting interstate direct shipping actually reduce competition, then we would expect prices in bricks-and-mortar stores to be higher than online prices when interstate direct shipping is illegal. If a state then legalizes direct shipping and the law effectively increases competition, the online-offline price spread should narrow as bricks-and-mortar stores adjust their prices to become more competitive with online sellers. The less burdensome is the law, the more likely that the price spread will become negligible in the face of robust competition between online and offline sellers.

Virginia's legalization of interstate direct wine shipping in 2003 provides a natural experiment for analyzing the price effects of direct shipping laws. In 2002 and 2004, we gathered price data on a sample of highly popular wines sold online and in Northern Virginia stores. The 2002 data revealed that Virginia's prohibition of interstate direct shipment deprived consumers of some significant cost savings available online.[4] Legalization of direct shipment in 2003 reduced the average 2004 retail price difference between the lowest-priced online sellers and bricks-and-mortar stores in Northern Virginia by about 40 percent.[5] Shipping costs, however, may account for some of the remaining price difference. Thus, online and offline prices may be as close together as is

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[4] Alan E. Wiseman and Jerry Ellig, *Market and Nonmarket Barriers to Internet Wine Sales: The Case of Virginia*, 6 Business and Politics 24-27 (2004).

[5] Alan E. Wiseman and Jerry Ellig, "Legislative Action and Market Responses: Results of Virginia's Natural Experiment with Direct Wine Shipment," Working Paper, Mercatus Center at George Mason University (December 2005), available at http://www.mercatus.org/regulatorystudies/article.php/1481.html.

possible, given the shipping costs associated with online purchases. In this Article, we analyze whether legalization of interstate direct shipment has caused online and offline prices to converge, once shipping and transportation costs are taken into account.

1. LEGAL BACKGROUND ON DIRECT SHIPMENT

After the 21st amendment repealed prohibition in 1933, states quickly moved to establish legal and regulatory frameworks for handling the distribution and sale of alcohol within and across state lines. The pattern that most states adopted has come to be known as the "three-tier" system. Under this system, all alcohol coming into a state would have to come from the producer (tier one) to a distributor (tier two) and finally to a retailer (tier three) before arriving in the hands of any potential consumers. Vertical integration between the tiers was generally prohibited; a winery could not set up its own distribution network or establish its own retail centers that bypassed existing distribution systems.[6] By the 1980s, almost every state in the U.S. had adopted some variant of the three-tier distribution system, and with the exception of Alaska, California, and Rhode Island, interstate direct shipments of wine to consumers were generally illegal.

The legal landscape of direct shipment changed dramatically in 1986 when the state of California passed legislation prohibiting direct shipment of wine from other states to California residents, unless exporting states allowed their residents to receive direct shipments from California wineries. This legislation paved the way for the current "reciprocity" agreements between 11 states for direct interstate shipments of wine from

[6] There are some exceptions to this ban on vertical integration. In certain states, state-owned liquor stores also perform the wholesaling function, receiving shipments direct from distillers. Many states permit wineries and breweries to sell to the public for on- or off-premises consumption in tasting rooms, brew-pubs, or at festivals, but this exception is not broad enough to permit them to establish their own retail networks. Finally, some states, such as California, allow wineries to bypass the distributors and deal directly with retailers.

producer and/or retailer to consumer.[7] Other states (and the District of Columbia) eventually relaxed their prohibitions on interstate direct shipments to allow limited quantities of wine and alcohol to be imported without going through the state sanctioned (or administered) distribution system.[8] By 2000, interstate direct shipment was legal in about half the states and illegal in the others.

A handful of states banned interstate direct shipment while permitting intrastate direct shipment. Claiming that Section 2 of the 21st Amendment gave them complete autonomy over alcohol within their borders, these states allowed in-state wineries (and sometimes retailers) to ship directly to in-state consumers, while prohibiting out-of-state sellers from engaging in similar activities. Proponents of these laws argued that they were necessary and appropriate, given that in-state wine sellers were easier to monitor for taxation and other law-compliance purposes. Alternatively, shipping ban opponents argued that they were a clear violation of the commerce clause.[9]

These competing views met in court with mixed results. In 2002 and 2003, federal courts found that such laws in Michigan, Texas, North Carolina, and Virginia were unconstitutional violations of the commerce clause.[10] In contrast, the 2nd circuit decided in 2003 to uphold New York's discriminatory direct shipment ban.[11] Texas, North Carolina, and Virginia subsequently legalized interstate direct shipping to comply

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[7] Reciprocity states recognize two-way shipping rights between jurisdictions and guarantee that shipping from other reciprocal states are acknowledged. The particular shipping rights depend on the kind of wines being shipped, relative alcohol contents, etc.

[8] Non-reciprocity states that still allow interstate shipment typically allow limited direct wine shipments through personal importation laws that allow consumers to receive wine from another state, subject to certain conditions.

[9] U.S. Constitution, Article I, Sec. 8.

[10] See *Heald v. Engler*, No. 00-CV-71438-DT (E.D. Mich. Sept. 28, 2001); *Dickerson v. Bailey*, 336 F.3d 388 (5th Cir. 2003); *Beskind v. Easley*, 325 F.3d 506 (4th Cir. 2003), *Bolick v. Danielson*, 330 F.3d 274 (4th Cir. 2003).

[11] *Swedenburg v. Kelly*, 358 F.3d 223 (2nd Cir. 2003).

with the federal court decisions. Michigan, on the other hand, petitioned the Supreme Court for certiori, as did the plaintiffs in the New York case.

These contradictory federal circuit decisions were resolved in May 2005, when the U.S. Supreme Court ruled in a 5-4 vote that such discriminatory laws were, indeed, an unconstitutional violation of the commerce clause. In its decision, the Court stated that "Section 2 [of the 21st Amendment] does not allow States to regulate direct shipment of wine on terms that discriminate in favor of in-state producers."[12] The decision placed the onus on those states with discriminatory laws to re-evaluate them and decide how best to synchronize their practices across in-state and out-of-state sellers.

Virginia's legislature had already done so in 2003, rather than appeal its case. As of July 2003, interstate direct shipment of beer and wine to Virginia consumers became legal for licensed shippers. Wineries, breweries, and "anyone authorized to sell beer or wine at retail in their state of domicile" can apply for a license to ship directly to Virginia consumers, and applications must identify the particular brands for which permission is sought. An applicant who does not "own or have the right to control" distribution of the brands in the application must provide the written consent of the winery or brewery, and any winery or brewery whose brands are distributed by a Virginia wholesaler must notify the wholesaler when they seek a license to ship those brands or grant another applicant permission to ship.[13]

With respect to shipments, a licensee can ship no more than two cases per month to a Virginia customer, and they must be made via a common carrier approved by the

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[12] 544 US 12 2005. Unlike Michigan, New York allowed out-of-state wineries to ship to New York consumers if they opened an in-state branch office and warehouse, but this policy was still considered discriminatory because it forced out-of-state firms to bear additional costs in comparison to in-state firms.
[13] Virginia Code Sec. 4.1-112.1.A and 4.1-112.1.B, available at http://leg1.state.va.us/cgi-bin/legp504.exe?000+cod+4.1-112.1.

Virginia Board of Alcoholic Beverage Control.[14] Packages containing alcohol must be labeled as such in 16 point type or larger, and the recipient must show proof that he is at least 21 years old and sign an acknowledgement of receipt. Finally, the common carrier must refuse delivery to any recipient who appears to be under 21 and refuses to present proof of age.[15]

Under the law, licensees must also remit sales and excise taxes to the state.[16] Virginia taxes retail sales at a rate of 4 percent[17], and the excise tax on wine is 40 cents per liter, or 30 cents for a 750 ml bottle.[18] The excise tax on liquor, in contrast, is equal to 20 percent of the sales price.[19]

2. WINE DATA AND PREVIOUS FINDINGS

This study uses price data on two comparable samples of highly popular wines. While sales and market share data for individual wines are not publicly available, *Wine and Spirits* magazine surveys restaurants annually to identify the top-selling wines, publishing the results in its April issue each year. The wines in our sample come from the magazine's 13th and 15th annual polls, published in 2002 and 2004, respectively. *Wine and Spirits* surveys approximately 2000 restaurants to find out their top ten selling wines in the last quarter of the year. For each of the ten wines listed in the restaurant's response, *Wine and Spirits* assigns a point value ranging from ten for the best-selling wine to one for the tenth best-selling wine, and identifies the "Top 50" wines as those

[14] Virginia Code Sec. 4.1-112.1.A.
[15] Virginia Code Sec. 4.1-112.1.C.
[16] Virginia Code Sec. 4.1-112.1.D.
[17] Virginia Code Sec. 58.1-603
[18] Virginia Code Sec. 4.1-234.A.
[19] Virginia Code Sec. 4.1-234.B.

that receive the most mentions per 100 responses, with the point values used to break ties.[20]

By using the point values assigned to wines, we were able to generate a list of the "Top 50" most popular wines based on the 50 highest-point recipients. Creating such a list actually yields a sample of more than 50 bottles – 83 in 2002 and 78 in 2004. The difference follows from the fact that *Wine and Spirits* recognizes all relevant bottles that fall under a given winery's varietal when it identifies the most popular Chardonnays, Merlots, and so forth.[21] After eliminating bottles that were no longer available for sale, not available both online and offline, or misnamed, we had 67 bottles for 2002 price comparisons and 63 bottles for 2004 price comparisons.

Our research teams collected price data during the summers of 2002 and 2004. Bricks-and-mortar prices were gathered by searching web pages or personal visits to every Virginia "wine retailer" listed in the Yahoo! Yellow Pages within 10 miles of McLean, Virginia, a relatively affluent area in the middle of the Northern Virginia suburbs of Washington, DC.[22] Online prices were gathered by visiting each winery's web site and also by employing Winesearcher.com, a shopbot with access to prices at hundreds of online wine retailers. Our price comparisons compare the lowest available online price with the lowest bricks-and-mortar price for each bottle, and the 2004 online price is the lowest price charged by an online seller who actually ships to Virginia.

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[20] More details on each sample can be found in Wiseman and Ellig, *supra* notes 4 and 5.

[21] For example, Kendall-Jackson Vineyards' Chardonnay received 226 points for 2004, making it the second most popular wine overall, but Wine and Spirits recognized two bottles, the "California Grand Reserve" and the "California Vintners Reserve," and hence both were included in our sample.

[22] Contrary to Milyo and Waldfogel's experience in gathering liquor price data, store managers were generally cooperative and often curious about the study, so our research team was able to gather the data without being asked to leave the stores. See Jeffrey Milyo and Joel Waldfogel, *The Effect of Price Advertising on Prices: Evidence in the Wake of 44 Liquormart*, 89 AMERICAN ECONOMIC REVIEW 1084 (1999).

Taxes and transportation costs could potentially affect the online-offline price differential, and the comparisons account for these. In 2004, any seller shipping legally into Virginia from out-of-state was expected to remit sales and excise taxes. We therefore performed the comparison without sales taxes (since sales taxes would be equal for online and offline retailers) and assumed that both online and offline retail prices incorporate excise taxes. For 2002, when interstate direct shipping was illegal, we opted to compare all prices without sales taxes, to ensure that tax differentials would not drive the results. The price differentials we calculated in 2002 do not adjust for Virginia's 40 cents/liter excise tax on wine, but this tax is quite small compared to the price differentials we found.

We adjusted the prices to reflect transportation and shipping costs for both online and offline purchases. For each bottle available online, data were collected from United Parcel Service[23] on the cost of shipping boxes of the appropriate size and weight to represent a single bottle, a half case, and a case of wine to McLean, Virginia from the zip code where the online vendor offering the lowest price was located via standard ground, 2nd day air, and 3rd day air shipping services. For bricks-and-mortar stores, transportation costs were calculated using the standard government mileage reimbursement rate for automobile travel. Such calculations may overstate travel costs to the extent that consumers combine multiple errands in one car trip, or they may significantly understate

[23] www.ups.com.

transportation costs because they ignore the opportunity cost of the consumer's travel time.[24] Tables 1a and 1b provide descriptive statistics for each year's prices.

Table 1a: Descriptive Statistics, 2002

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

[24] Research in transportation economics reveals that individuals attach widely varying valuations of travel time, suggesting that opportunity costs of travel may vary widely across consumers. See Kenneth A. Small, Clifford Winston, and Jia Yan, *Uncovering the Distribution of Motorists' Preferences for Travel Time and Reliability: Implications for Road Pricing* (2002). Working Paper, University of California, Irvine.

Table 1b: Descriptive Statistics, 2004

Variable	Mean	Std. Dev.	Min	Max	Obs.
Lowest Online Price	21.997	15.115	7.69	99.99	72
Lowest Offline Price	24.214	15.882	7.99	89.99	63
Transportation Costs (Buying 1 Bottle)	1.743	2.423	0.075	7.50	63
Transportation Costs per Bottle (Buying 6 Bottles)	0.290	0.404	0.013	1.250	63
Transportation Costs per Bottle (Buying 12 Bottles)	0.145	0.202	0.006	0.625	63
Ground Shipment Costs (Buying 1 Bottle)	6.246	0.705	5.040	6.890	72
3rd Day Air Shipment Costs (Buying 1 Bottle)	10.008	3.401	5.040	13.03	72
2nd Day Air Shipment Costs (Buying 1 Bottle)	14.423	2.962	5.040	16.97	72
Ground Shipment Costs per Bottle (Buying 6 Bottles)	1.890	0.573	1.167	2.428	72
3rd Day Air Shipment Costs per Bottle (Buying 6 Bottles)	3.966	1.957	1.167	5.693	72
2nd Day Air Shipment Costs per Bottle (Buying 6 Bottles)	6.277	2.111	1.167	8.176	72
Ground Shipment Costs per Bottle (Buying 12 Bottles)	1.597	0.596	0.801	2.156	72
3rd Day Air Shipment Costs per Bottle (Buying 12 Bottles)	3.339	1.734	0.801	4.863	72
2nd Day Air Shipment Costs per Bottle (Buying 12 Bottles)	5.386	1.989	0.801	7.191	72

In a previously-published study, we found noticeable and statistically significant differences between online and offline prices in 2002, when interstate direct shipment to Virginia was illegal.[25] Tables 2a-d calculate the 2002 cost savings or price premium associated with online purchase of the entire sample and various sub-samples: bottles costing at least $20, bottles costing at least $40, and bottles costing less than $20 (offline prices). All of these differentials include transportation costs for purchases at bricks-and-mortar stores and shipping costs for online purchases.

Several generalizations emerge from the tables. First, a consumer buying the entire sample could have saved more than $3.00 per bottle in 2002 by purchasing online

[25] For more extensive discussion, see Wiseman and Ellig, *supra* note 4. Tables 2a-e are drawn from this source.

and shipping via ground, the least expensive method.[26] Second, the price savings are even larger for the expensive wines costing more than $20 or $40 per bottle offline. For these wines, significant savings are available even when shipping via air. Third, shipping costs impose a heavy price penalty for online purchases of the less expensive bottles, priced under $20 offline.

Table 2e calculates the cost savings a consumer could have achieved in 2002 by comparison shopping and purchasing each bottle from the cheapest source, online or offline. Since some bottles were less expensive in bricks-and-mortar stores, the savings from comparison shopping are larger than the savings from buying exclusively online. The comparison shopper could have saved an average of $2.21-$4.30 per bottle, or 8-15 percent of the average bottle price. The $2.21 per bottle savings from comparison shopping and shipping online purchases via 3rd day air contrasts markedly with the $2.44 price premium paid when purchasing one of each bottle online and shipping by 3rd day air.

Clearly, Virginia's prohibition of interstate direct shipment deprived consumers of access to price savings that were both noticeable and statistically significant.

[26] This price difference is obviously much larger than Virginia's excise tax of 30 cents per 750 ml bottle, which would be reflected in the bricks-and-mortar price but not in the online price.

Table 2a: 2002 Cost Savings (Extra Expenses) per Bottle When Shopping Online for Entire Sample (N = 67)[27]

Category	Mean	Std. Dev.	Min.	Max.
Online Savings (no transportation costs)	5.838**	10.579	-2.200	83.000
Online Savings (UPS Ground Service - Buying 1 Bottle)	1.507	11.560	-8.427	82.686
Online Savings (UPS 3rd Day Air – 1 Bottle)	-2.443*	11.518	13.107	78.006
Online Savings (UPS 2nd Day Air - 1 Bottle)	-7.256**	10.556	16.510	68.690
Online Savings per Bottle (UPS Ground Service – 6 Bottles)	3.342**	10.701	-5.436	80.749
Online Savings per Bottle (UPS 3rd Day Air - 6 Bottles)	0.7066	10.720	-8.475	77.711
Online Savings per Bottle (UPS 2nd Day Air - 6 Bottles)	-0.767	10.748	-10.128	76.058
Online Savings per Bottle (UPS Ground Service - 12 Bottles)	3.543**	10.633	-5.126	80.567
Online Savings per Bottle (UPS 3rd Day Air - 12 Bottles)	1.353	10.644	-7.598	78.095
Online Savings per Bottle (UPS 2nd Day Air - 12 Bottles)	0.11	10.668	-9.176	76.517

Table 2b: 2002 Cost Savings (Extra Expenses) per Bottle When Shopping Online for Wines Greater or Equal to $20.00 (Offline Price) (N = 36)

Category	Mean	Std. Dev.	Min.	Max.
Online Savings (no transportation costs)	9.435**	13.376	-2.000	83.000
Online Savings (UPS Ground Service - 1 Bottle)	5.512**	14.348	-8.008	82.686
Online Savings (UPS 3rd Day Air – 1 Bottle)	1.526	14.268	-12.688	78.006
Online Savings (UPS 2nd Day Air - 1 Bottle)	-3.693	13.234	-16.310	68.690
Online Savings per Bottle (UPS Ground Service – 6 Bottles)	7.027**	13.446	-5.200	80.749
Online Savings per Bottle (UPS 3rd Day Air - 6 Bottles)	4.396*	13.432	-8.238	77.711
Online Savings per Bottle (UPS 2nd Day Air - 6 Bottles)	2.912	13.45	-9.891	76.058
Online Savings per Bottle (UPS Ground Service –12 Bottles)	7.194**	13.371	-4.907	80.567
Online Savings per Bottle (UPS 3rd Day Air - 12 Bottles)	5.005**	13.361	-7.380	78.095
Online Savings per Bottle (UPS 2nd Day Air – 12 Bottles)	3.654	13.367	-8.957	76.517

[27] 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 2c: 2002 Cost Savings (Extra Expenses) per Bottle When Shopping Online for Wines Greater or Equal to $40.00 (Offline Price) (N = 9)

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

Table 2d: 2002 Cost Savings (Extra Expenses) per Bottle When Shopping Online for Wines Less than $20.00 (Offline Price) (N = 31)

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

Table 2e: 2002 Cost Savings (Extra Expenses) per Bottle When "Comparison Shopping" for Entire Sample (N = 67)

Category	Mean	Std. Dev.	Max.
Online Savings (no transportation costs)	5.974**	10.509	83.000
Online Savings (UPS Ground Service - Buying 1 Bottle)	3.569**	10.582	82.686
Online Savings (UPS 3rd Day Air – 1 Bottle)	2.207*	9.762	78.006
Online Savings (UPS 2nd Day Air - 1 Bottle)	1.629	9.224	74.676
Online Savings per Bottle (UPS Ground Service – 6 Bottles)	4.201**	10.249	80.749
Online Savings per Bottle (UPS 3rd Day Air - 6 Bottles)	2.752**	9.828	77.711
Online Savings per Bottle (UPS 2nd Day Air - 6 Bottles)	2.276*	9.571	76.058
Online Savings per Bottle (UPS Ground Service – 12 Bottles)	4.303**	10.225	80.567
Online Savings per Bottle (UPS 3rd Day Air - 12 Bottles)	3.020**	9.886	78.095
Online Savings per Bottle (UPS 2nd Day Air – 12 Bottles)	2.477**	9.655	76.517

Further analysis reveals that Virginia's legalization of interstate direct shipment increased competition. In a 2005 paper, we compared posted online and offline retail prices in 2002 and 2004, excluding transportation and shipping costs. Comparing the percentage difference between the lowest online and offline prices, the price spread fell by 6.9 percentage points, or almost 40 percent, between 2002 and 2004. Comparing the percentage difference between the lowest online price and the average offline price, the spread fell by 5-6 percentage points, or about 26 percent. Both analyses control for average bricks and mortar bottle price and popularity; the reduction in the percentage price spread appears to be uniform, regardless of average bricks and mortar bottle price or popularity.[28]

Legalization of interstate direct shipping in Virginia clearly benefited consumers – not just by giving consumers access to out-of-state sellers, but also by placing competitive pressure on in-state bricks-and-mortar sellers. But is the price convergence

[28] Wiseman and Ellig, *supra* note 5.

full or partial? On average, the wines in our sample are still less expensive online. Shipping costs may, however, eat up much of the apparent savings. Resolving this issue requires an analysis that includes transportation and shipping costs, analogous to our 2002 study.

3. HAVE PRICES FULLY CONVERGED IN VIRGINIA?

Tables 3a-e calculate the online-offline price differentials in 2004, including transportation and shipping costs. As in Table 2a-e, transportation costs are calculated using the standard mileage rate, and shipping costs are calculated from the United Parcel Service web site.

The calculation of shipping costs for online purchases introduces a potential complication into the analysis for 2004. Since interstate direct shipment is now legal, it would be more accurate to use actual shipping costs charged by sellers rather than estimating them from the UPS web site. In theory, this would also allow us to account for any markups, handling fees, insurance, or other charges added by online sellers. In practice, however, it was not possible to obtain actual shipping costs from most sellers' web sites without actually placing an order. Needless to say, we did not have the requisite research funding for online purchase of a bottle, half-case, and case of 67 different wines. A research assistant followed up with many online sellers by phone to find out if they imposed additional handling or insurance charges; few said that they did. In any case, the virtue of using the UPS web site to calculate shipping costs in both years is that it helps ensure that any differences in results for 2002 and 2004 reflect real price differences rather than merely different methods for estimating shipping costs.

The 2004 results are qualitatively similar to the 2002 results. Table 3a shows that the consumer could achieve some savings by purchasing the entire sample online and shipping it via ground, the least expensive option. Air shipment raises the price of online purchase, so that online purchase costs about the same as or more than purchase in a bricks-and-mortar store. From Tables 3b and 3c, it is again apparent that the price savings on the more expensive wines are large enough that the online shopper can save money even if the wine is shipped via air. Table 3d shows that, in 2004 as in 2002, shipping costs impose a substantial price penalty for online purchases of wines costing less than $20 offline. Finally, Table 3e reveals that one can achieve substantial savings by comparison shopping and purchasing each bottle from the lowest-cost source, online or offline, instead of buying everything in local stores.

In most cases, the dollar cost savings for 2004 in Tables 3a-e are less than the dollar cost savings for 2002 in Tables 2a-e. A direct comparison of these dollar figures, however, is not quite appropriate. The 2002 and 2004 samples are comparable, but not identical, and hence, differences in the dollar cost savings may simply reflect a slight difference in the price distributions in the two years, rather than a true change in the price spread.[29] Nevertheless, we are quite confident that much of the reduction in the online savings stems from price convergence, because the percentage differences between online and offline retail prices fell between 2002 and 2004.[30] Comparing Table 2e to 3e, the average dollar cost savings from comparison shopping has also decreased following the legalization of direct shipment. Whereas in 2002 these cost savings were approximately 8-15 percent of the average bricks and mortar bottle price, the cost savings

[29] It is important to note that price distributions of the online samples (with regard to mean and variance) are not statistically different between 2002 and 2004.
[30] See Wiseman and Ellig, *supra* note 5.

in Table 3e amount to approximately 0-7.6 percent of the average bricks and mortar bottle price, depending on the quantity purchased and shipping method employed.

While the difference between online and offline prices has decreased substantially following legalization of direct shipment in Virginia, online and offline prices had clearly not fully converged as of 2004. On average, substantial price savings were still available online for the more expensive wines, which constitute almost half the sample. There are several possible explanations for this incomplete convergence.

First, it may take more than one year for both the online and offline markets to fully adjust to interstate direct shipment. All of the lowest 2004 online prices came from vendors who ship to Virginia, so the transition issue raised by our price results is not simply one of waiting for more online sellers to get Virginia permits. Rather, it may just take more time for prices to reach some sort of equilibrium. Testing this explanation would require gathering a new data set in a subsequent year to see if the price differentials have eroded further.

Second, bricks-and-mortar wine shops may be able to charge a sustainable price premium due to legitimate competitive advantages. Bricks-and-mortar retailers might provide information, tastings, or other services that consumers value, or perhaps many consumers are willing to pay more in order to get their wine immediately from the store instead of waiting for delivery. The absence of online price savings for less expensive wines is consistent with this explanation, as it is likely that information or services may be more important in connection with more expensive wines. Faced with the possibility of paying more than $20 for an entire bottle that may not match his own tastes, the

consumer may treat an expensive wine as more of a "search good" than an "experience good."

Third, there may be some aspects of Virginia's direct shipment law that make online retailers a less potent competitive threat than they could be. As a result, bricks-and-mortar stores may receive a price premium because they perceive that they will lose little business to online sellers charging a noticeably lower price.

Many provisions of Virginia's law, such as the requirement that wineries notify their Virginia distributors if they or another party has applied for a direct shipping permit for a brand handled by that distributor, affect which and how many sellers will seek to ship to Virginia consumers. While such provisions might affect the competitiveness of the wine market, they could not obviously explain the price differentials calculated from our 2004 data, because the online price data are from sellers who actually ship to Virginia.[31]

The quantity limits are the most likely provision in Virginia's law that might help explain our price results. An out-of-state seller cannot ship more than two cases of wine per month to an individual Virginia consumer. This constraint may be especially binding on out-of-state retailers, who might otherwise sell more than two cases at a time to a consumer who seeks to stock up on several different bottles in the same order. If this type of consumer makes up a substantial portion of the market for wines costing more than $20, then the bricks-and-mortar retailer may be able to charge a higher price than the online vendor because the consumer can bring home more than two cases at a time from

[31] One possibility, however, is that the current online market that ships into Virginia is less competitive than it otherwise would be in the absence of any regulations, because certain aggressive competitors are kept out of the market, and the exclusion of these competitors leads to higher bricks and mortar prices that what would otherwise be obtained. Given the large number of retailers that do currently ship into Virginia, however, we find such a scenario relatively implausible.

the local retailer. Consistent with this argument, it is worth noting that in almost every case, the least expensive online source for each wine was a retailer, not the winery.

Further research would be required to substantiate or reject any of these three explanations. Our intuition is that the first two explanations are quite plausible. The third one may be, but only if a substantial number of customers who visit local wine stores buy substantial amounts of wine (more than two cases per visit).

Table 3a: 2004 Cost Savings (Extra Expenses) per Bottle When Shopping Online for Entire Sample (N=63)

Category	Mean	Std. Dev.	Min.	Max.
Online Savings (no transportation costs)	3.048**	5.608	-11.00	25.99
Online Savings (UPS Ground Service - 1 Bottle)	-1.450*	6.674	-13.590	26.525
Online Savings (UPS 3rd Day Air -1 Bottle)	-5.170**	6.746	-19.73	20.385
Online Savings (UPS 2nd Day Air - 1 Bottle)	-9.588**	6.640	-23.670	16.445
Online Savings per Bottle (UPS Ground Service - 6 Bottles)	1.453**	5.594	-11.297	24.799
Online Savings per Bottle (UPS 3rd Day Air – 6 Bottles)	-0.599	5.480	-12.643	21.534
Online Savings per Bottle (UPS 2nd Day Air – 6 Bottles)	-2.913**	5.457	-15.127	19.051
Online Savings per Bottle (UPS Ground Service - 12 Bottles)	1.601**	5.508	-11.441	24.453
Online Savings per Bottle (UPS 3rd Day Air – 12 Bottles)	-0.120	5.400	-11.838	21.745
Online Savings per Bottle (UPS 2nd Day Air – 12 Bottles)	-2.169**	5.366	-14.166	19.418

Table 3b: 2004 Cost Savings (Extra Expenses) per Bottle When Shopping Online for Wines Greater or Equal to $20.00 (Offline Price) (N=27)

Category	Mean	Std. Dev.	Min.	Max.
Online Savings (no transportation costs)	5.884**	7.245	-11.00	25.99
Online Savings (UPS Ground Service - 1 Bottle)	2.251	8.031	-10.460	26.525
Online Savings (UPS 3rd Day Air - 1 Bottle)	-1.481	7.315	-12.675	20.385
Online Savings (UPS 2nd Day Air - 1 Bottle)	-5.909**	7.275	-16.615	16.445
Online Savings per Bottle (UPS Ground Service - 6 Bottles)	4.403**	7.080	-11.297	24.799
Online Savings per Bottle (UPS 3rd Day Air – 6 Bottles)	2.372*	6.548	-11.297	21.534
Online Savings per Bottle (UPS 2nd Day Air – 6 Bottles)	0.034	6.449	-13.840	19.051
Online Savings per Bottle (UPS Ground Service - 12 Bottles)	4.482**	6.994	-11.441	24.453
Online Savings per Bottle (UPS 3rd Day Air – 12 Bottles)	2.786**	6.544	-11.441	21.745
Online Savings per Bottle (UPS 2nd Day Air – 12 Bottles)	0.698	6.413	-13.597	19.418

Table 3c: 2004 Cost Savings (Extra Expenses) per Bottle When Shopping Online for Wines Greater or Equal to $40.00 (Offline Price) (N=7)

Category	Mean	Std. Dev.	Min.	Max.
Online Savings (no transportation costs)	12.869**	6.535	5	25.99
Online Savings (UPS Ground Service - 1 Bottle)	10.405**	8.309	-0.685	26.525
Online Savings (UPS 3rd Day Air - 1 Bottle)	5.606*	8.299	-3.575	20.385
Online Savings (UPS 2nd Day Air - 1 Bottle)	1.376	8.017	-7.515	16.445
Online Savings per Bottle (UPS Ground Service - 6 Bottles)	11.438**	6.568	3.701	24.799
Online Savings per Bottle (UPS 3rd Day Air – 6 Bottles)	8.827**	6.461	1.746	21.534
Online Savings per Bottle (UPS 2nd Day Air – 6 Bottles)	6.471**	6/291	0.212	19.051
Online Savings per Bottle (UPS Ground Service - 12 Bottles)	11.386**	6.430	3.980	24.453
Online Savings per Bottle (UPS 3rd Day Air – 12 Bottles)	9.205**	6.341	2.250	21.745
Online Savings per Bottle (UPS 2nd Day Air – 12 Bottles)	7.069**	6.150	1.091	19.418

Table 3d: 2004 Cost Savings (Extra Expenses) per Bottle When Shopping Online for Wines Less than $20.00 (Offline Price) (N=36)

Category	Mean	Std. Dev.	Min.	Max.
Online Savings (no transportation costs)	0.921**	2.418	-7.00	6.00
Online Savings (UPS Ground Service - 1 Bottle)	-4.225**	3.537	-13.590	5.240
Online Savings (UPS 3rd Day Air – 1 Bottle)	-7.938**	4.743	-19.730	2.35
Online Savings (UPS 2nd Day Air – 1 Bottle)	-12.347**	4.529	-23.670	-1.590
Online Savings per Bottle (UPS Ground Service - 6 Bottles)	-0.760***	2.538	-9.378	5.251
Online Savings per Bottle (UPS 3rd Day Air - 6 Bottles)	-2.827**	3.071	-12.643	3.296
Online Savings per Bottle (UPS 2nd Day Air – 6 Bottles)	-5.124**	3.181	-15.127	1.763
Online Savings per Bottle (UPS Ground Service - 12 Bottles)	-0.560	2.488	-9.131	5.255
Online Savings per Bottle (UPS 3rd Day Air – 12 Bottles)	-2.299**	2.904	-11.838	3.525
Online Savings per Bottle (UPS 2nd Day Air – 12 Bottles)	-4.320**	3.059	-14.166	2.366

Table 3e: 2004 Cost Savings (Extra Expenses) per Bottle When "Comparison Shopping" for Entire Sample (N = 63)

Category	Mean	Std. Dev.	Max.
Online Savings (no transportation costs)	3.720**	4.769	25.990
Online Savings (UPS Ground Service - 1 Bottle)	1.991**	4.431	26.525
Online Savings (UPS 3rd Day Air – 1 Bottle)	1.991**	4.431	26.525
Online Savings (UPS 2nd Day Air – 1 Bottle)	0.413	2.259	16.445
Online Savings per Bottle (UPS Ground Service - 6 Bottles)	2.635**	4.464	24.799
Online Savings per Bottle (UPS 3rd Day Air - 6 Bottles)	1.737**	3.661	21.534
Online Savings per Bottle (UPS 2nd Day Air - 6 Bottles)	1.007**	2.944	19.051
Online Savings per Bottle (UPS Ground Service - 12 Bottles)	2.671**	4.427	24.453
Online Savings per Bottle (UPS 3rd Day Air – 12 Bottles)	1.871**	3.766	21.745
Online Savings per Bottle (UPS 2nd Day Air – 12 Bottles)	1.203**	3.071	19.418

4. CONSUMER WELFARE CAVEATS

This study has examined only the price effects of direct-to-consumer wine shipment. A full analysis of consumer benefits would also include variety, convenience, and other factors that affect consumer welfare.

For example, analysis of both the 2002 and 2004 samples reveals that some of the wines available online could not be found in Northern Virginia stores. In 2002, 15 percent of wines available online could not be found in the stores; in 2004 it was 12.5 percent.[32] We did not inquire whether some or all of these wines might be available from bricks-and-mortar retailers via special order, as our goal was to find out whether a consumer could simply walk into the store and buy the wine without additional effort. Our result confirms what intuition suggests: it is not physically possible for a retailer to stock every wine a consumer might want to buy, even from a sample of top-selling wines. E-commerce thus expands the product variety available to consumers.

If anything, our results understate the extent of the variety benefit, because our sample consists only of top-selling wines in restaurants. Thousands of wines produced in smaller volumes are even less likely to find their way onto store shelves due to distributors' hesitation to carry wines from smaller producers.[33]

Our price results do not account for the value of convenience. To the extent that some consumers find it more convenient to search for and order wines online rather than visit a store, this is also a consumer benefit attributable to direct shipment.

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[32] See Wiseman and Ellig, *supra* note 4, at 20, and Wiseman and Ellig, *supra* note 5, at 12.
[33] See Wiseman and Ellig, *supra* note 4 at 5.

Finally, we should note that our analysis of consumer welfare is not necessarily the same as an analysis of social welfare. To the extent that alcohol consumption involves various negative or positive externalities, lower wine prices and more convenient purchasing options could affect the level of these externalities. An analysis of direct shipment's effects on social welfare would need to take these effects into account, in addition to the benefits it confers on wine consumers.

Strident assertions about underage drinking to the contrary[34], we know of no controlled analysis that examines whether direct wine shipment has any effect on the level of alcohol-related externalities. A much-touted 2000 study of "home delivery" of alcohol, based on surveys in small communities in Wisconsin and Minnesota, actually says nothing about whether home delivery is a significant source of alcohol for minors.[35] The study does not specifically deal with Internet sales or direct shipping; indeed, much of the "home delivery" in the study appears to be delivery of keg beer by local bricks-and-mortar merchants. In 2003, the Federal Trade Commission staff carefully examined the relevant literature and data as part of a comprehensive analysis of Internet wine sales. The FTC staff report found that states could deal with policy concerns such as underage drinking by requiring age verification and an adult's signature upon delivery, rather than banning direct shipment.[36] In 2004, a committee of the National Academy of Sciences recommended that states permitting Internet sales and home delivery of alcohol should

- Require all packages for delivery containing alcohol to be clearly labeled as such;

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[34] See, e.g., http://www.wswa.org/public/media/cyberbuzz/.
[35] Linda A. Fletcher et. al., *Alcohol Home Delivery Services: A Source of Alcohol for Underage Drinkers* 61 J. STUD. ALCOHOL 81 (2000).
[36] FTC Staff Report, *supra* note 1, at 31-38.

- Require persons who deliver alcohol to record the recipient's age identification information from a valid government-issued document (such as a driver's license or ID card); and
- Require recipients of home delivery of alcohol to sign a statement verifying receipt of alcohol and attesting that they are of legal age to purchase alcohol.[37]

The best available evidence, therefore, suggests that underage access or alcohol-related externalities can be controlled through measures that are much less restrictive than an outright ban on direct shipment. Legalization of Internet sales and direct shipment would thus likely be a net positive for overall social welfare as well as the welfare of wine consumers.

5. CONCLUSIONS

Legalization of interstate direct wine shipment to Virginia consumers has narrowed, but not eliminated, the differences between online and offline prices for a sample of highly popular wines. For wines costing less than $20 per bottle, shipping costs make online purchase more expensive than purchase in local stores. For wines costing $20 or more, bricks-and-mortar stores collect a price premium that exceeds the shipping costs associated with online sales.

There are three possible explanations for this result: (1) Wine markets and prices have not yet fully adjusted to legalization of interstate direct shipment in Virginia, (2) Bricks-and-mortar stores offer information and services for which consumers are willing to pay a premium, and/or (3) Some aspects of Virginia's law, such as the two case per

[37] Richard J. Bonnie and Mary Ellen O'Connell (eds.), REDUCING UNDERAGE DRINKING: A COLLECTIVE RESPONSIBILITY 174-75 (2004), available at http://fermat.nap.edu/catalog/10729.html.

consumer per month shipping limit, give local retailers an advantage over out-of-state shippers.

Our findings are consistent with economic theories that emphasize the potential for e-commerce to increase the competitiveness of markets, reduce prices, and enhance consumer welfare.[38] Regardless of which explanation accounts for the remaining price differences, it is clear that legalization of interstate direct shipment has generated substantial benefits for Virginia consumers.

[38] See, e.g., research summarized in Alan E. Wiseman, THE INTERNET ECONOMY: ACCESS, TAXES, AND MARKET STRUCTURE (2000) and Michael D. Smith, Joseph Bailey, and Erik Brynjolfsson, *Understanding Digital markets: Review and Assessment* in UNDERSTANDING THE DIGITAL ECONOMY: DATA, TOOLS, AND RESEARCH (2000). For specific applications to Internet wine sales, see Alan E. Wiseman and Jerry Ellig, HOW MANY BOTTLES MAKE A CASE AGAINST PROHIBITION? ONLINE WINE AND VIRGINIA' DIRECT SHIPMENT BAN, Federal Trade Commission, Bureau of Economics Working Paper #258 (2003).