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COMPETITIVE EXCLUSION WITH HETEROGENOUS SELLERS: The Case of State Wine Shipping Laws

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Abstract

Several states impede direct-to-consumer wine shipment from out-of-state sellers by excluding out-of-state retailers from direct shipment or by enacting production caps that prevent direct shipment of wines from wineries with annual production above a designated number of gallons. We explore the economic effects of these two barriers to competition by combining new data on winery prices and production with price data employed in previously published research. Principal findings include: (1) Direct shipment by out-of-state wineries is sufficient to maximize the variety of wines available to consumers. (2) Excluding online retailers from direct shipment deprives consumers of access to significant online price savings and reduces competitive pressure on local wine merchants by reducing the number of wines for which online savings are available. (3) Low production caps in the 20,000–30,000 gallon range are tantamount to a ban on direct shipment of the wines in our sample. Higher production caps of 150,000–250,000 gallons allow direct shipment of wines with significant online price savings but, paradoxically, prevent direct shipment of the wines most likely to induce price-cutting by offline stores. (4) Combining exclusion of retailers with a production cap can either be redundant or more restrictive than either policy alone, depending on the level of the cap.

Keywords: wine, direct shipment, commerce clause, alcohol, three-tier system

JEL categories: D04, D61, D78, H77, K20, L11, L43

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1. Introduction

In *Granholm v. Heald*, the U.S. Supreme Court ruled that a state cannot prohibit out-of-state wineries from shipping wine directly to in-state consumers if it permits in-state wineries to do so. Though the case involved wineries, the court noted, "States may not enact laws that burden out-of-state producers *or shippers* simply to give a competitive advantage to in-state businesses" (544 US 460, 2005, emphasis added). Issued in 2005, *Granholm* is the court's latest attempt to square the 21st Amendment—which gives states primary authority to regulate alcohol—with the "dormant Commerce Clause," which holds that when Congress declines to restrict interstate commerce in a particular area, states cannot do so either. In response, many states passed laws permitting both in-state and out-of-state wineries to ship directly to consumers. Some states extended the direct shipment privilege to retailers, and some also allowed direct shipment of beer.

But not all state direct shipment laws are created equal. Many states leveled the playing field "upward" by permitting more direct shipment. None explicitly leveled the playing field "downward" by banning direct shipment for all. Several legal commentators, however, point out that some states leveled the playing field "sideways" with laws that surely restrict competition—by extending direct shipment privileges as narrowly as possible—and arguably violate the *Granholm* decision by subtly discriminating against at least some out-of-state sellers (Ohlhausen and Luib 2008, Tanford 2007). "Sideways" restrictions that disadvantage some or all potential direct shippers include:

- requirements that consumers must purchase the wine in person at the winery,
- production caps that prohibit direct shipment of wines from wineries above a certain size,

- volume limits that cap an individual seller's direct shipments to a consumer or total direct shipments into a state,
- laws that permit out-of-state wineries but not retailers to ship directly,
- laws that permit in-state retailers but not out-of-state retailers to ship directly,
- fees for direct shipment permits that are prohibitively expensive for small sellers,
- regulations that require wineries to deliver wine using their own vehicles rather than a common carrier, or
- requirements that common carriers must obtain separate state permits for each vehicle that might be used to deliver wine.

The Supreme Court's majority opinion in the *Granholm* decision relied heavily on an empirical study undertaken by the Federal Trade Commission staff that demonstrated that Virginia's pre-2003 discriminatory state wine shipping law denied in-state consumers access to price savings from out-of-state, online wine sellers (FTC 2003). Two years prior to the *Granholm* decision, Virginia lost its appeal of a federal circuit court decision that declared its discriminatory direct shipment law unconstitutional.[1] In 2003, the state adopted a permit system that allowed any person licensed to sell wine or beer in his home state to sell and ship directly to Virginia consumers, provided that the seller registers with the state, pays a registration fee, agrees to remit sales and excise taxes, and ships via a common carrier that verifies the recipient's age and requires an adult's signature at delivery. Subsequent economic studies found that legalization of out-of-state direct wine shipment delivered two types of price benefits to Virginia consumers. First, direct shipment gave consumers access to online wine prices that were lower than those available in Northern Virginia stores (Ellig and Wiseman 2007). Second, direct

[1] Bolick v. Roberts, 199 F.Supp.2d 397 (E.D. Va. 2002), *vacated*, Bolick v. Danielson, 330 F.3d 274 (4th Cir. 2003).

shipment prompted Northern Virginia wine stores to make their own prices more competitive with those of online sellers. More specifically, legalizing direct shipment corresponded to a decrease in the percentage price spread between online and offline prices of 26–40 percent (Wiseman and Ellig 2007).

Despite the recent controversy over "sideways" direct shipment laws, we know of no empirical study that examines the economic impacts of these new regulations. This paper seeks to fill this gap by assessing the price effects of two significant restrictions on direct wine shipment: exclusion of retailers and production caps that restrict direct shipment to wines produced by wineries under a certain size (usually designated as gallons produced annually). We also examine the combined effects of these measures, as when a state permits direct shipment only by wineries under a designated size.s In light of the wide body of laws that have been proposed and passed in the aftermath of *Granholm*, such analyses can help to inform the contemporary public-policy debate about the effects (both intended, and perhaps unintentional) of limiting free trade in wine across the states.

To undertake these analyses we expand on the data set employed in the FTC study and several subsequent empirical studies so that our results are directly comparable to those in previously published research. Exclusion of retailers and production caps both have noticeable effects on price competition, but in different ways. Exclusion of retailers mostly affects the availability of online price savings. Because wineries usually charge higher prices than online retailers, excluding retailers limits the price savings available online. Production caps can have different effects, depending on the scope of the production limit. Relatively low caps are tantamount to banning direct shipment for most of the wines in our sample. But even a relatively high cap effectively bans direct shipment of wines from larger wineries. As it turns out, wines

produced by these larger wineries are precisely the wines for which direct shipment narrows the price spread between online and bricks-and-mortar sellers. Therefore, even though a high production cap allows direct shipment of some wines, it protects bricks-and-mortar retailers from the competitors most likely to induce price-cutting.

These findings demonstrate that seemingly innocuous details in state direct shipment laws can have big effects on the prices consumers pay for wine. Consequently, these laws deserve careful scrutiny to see if they produce any social benefits that would justify the consumer costs. Federal legislation that would confer substantial constitutional immunity on such state laws also deserves scrutiny, for the same reason.

2. Background

Production caps and exclusion of retailers from direct shipment have both fueled acrimonious lobbying battles in state capitols, encouraged litigation, and even prompted the introduction of federal legislation. The fight over Massachusetts's production cap provides an instructive example of all three. At the time of the *Granholm* decision, Massachusetts allowed in-state wineries to ship directly to consumers but prohibited out-of-state wineries from doing so. After *Granholm*, a federal district court declared Massachusetts's law unconstitutional. The Massachusetts legislature responded by passing House Bill No. 4498 over Gov. Mitt Romney's veto on February 15, 2006. Initially drafted by the Wine and Spirits Wholesalers of Massachusetts, the law allowed in-state and out-of-state wineries producing less than 30,000 gallons to ship directly to consumers. A winery could also direct ship if it had no wholesaler distributing its wines in Massachusetts. In vetoing the bill, Romney noted, "This bill does not give wine lovers the opportunity to purchase the bottlings they want. It creates artificial barriers

to protect Massachusetts wholesalers at the expense of a free market" (Ohlhausen and Luib 2008, 513). The legislature declined to enact a competing bill Romney introduced that did not include the production cap.

Family Winemakers of California, a trade association representing small California wineries, sued the state of Massachusetts, arguing that the production cap discriminated against interstate commerce. In November 2008, Federal District Judge Rya Zobel ruled in favor of the plaintiffs:

> It is undisputed that in calendar year 2007 the 11% of wineries nationwide which produced more than 30,000 gallons of wine accounted for 98% of the total volume of wine production . . . for these "large" wineries there is, as a practical matter, no real choice between direct shipping and a wholesaler relationship. Therefore, the Massachusetts statute in practice prevents direct shipping of approximately 98% of out-of-state wine while allowing 100% of Massachusetts wineries to sell direct (2008 U.S. Dist. Lexis 112074, 33).

The U.S Court of Appeals for the First Circuit upheld the district court's decision on January 14, 2010. The court noted, "Section 2 of the Twenty-First Amendment does not exempt or otherwise immunize facially neutral but discriminatory state alcohol laws . . . from scrutiny under the Commerce Clause" (592 F.3d 1, 6). On April 13, 2010, the day before the deadline to appeal to the Supreme Court, Massachusetts Attorney General Martha Coakley decided not to file an appeal (Goodison 2010).

Two days later, Massachusetts Rep. Bill Delahunt introduced H.R. 5034, which sought to overturn *Family Winemakers* by shielding most state alcohol laws from challenge under the Commerce Clause or any other federal law, such as the antitrust laws. In particular, Section 3(b) of the bill said that "State or territorial regulations may not facially discriminate, without justification, against out-of-state producers of alcoholic beverages in favor of in-state producers," which would seem to imply that states or territories may facially discriminate as long as they can

offer some justification. The section also seems to imply that states could pass laws with impunity that are "facially" neutral but discriminatory in intent and effect. Section 3(c)(2) then reversed the burden of proof in litigation involving alcohol, so that states would no longer have to demonstrate that they have justification for protectionist laws. Instead, the party challenging the state law would have to prove that the state has no justification for potentially protectionist measures. Finally, Section 3(c)(3) required that the party challenging a state alcohol law must prove that the law has "no effect on the promotion of temperance, the establishment or maintenance of orderly alcoholic beverage markets, the collection of alcoholic beverage taxes, the structure of the state alcoholic beverage distribution system, or the restriction of access to alcoholic beverages by those under the legal drinking age." Hence, any state alcohol law, enacted for whatever purpose, would be upheld unless the challenger could prove the law has no effect at all on any of the matters considered in these sections.

Laws that prevent out-of-state retailers from direct shipping have also generated significant legal and political controversy. Twenty-eight states allow out-of-state wineries to direct ship but prohibit out-of-state retailers from doing so.[2] Twelve states and the District of Columbia currently allow out-of-state retailers as well as wineries to ship directly to consumers.[3] Several states have recently considered legislation allowing out-of-state retailers to direct ship, including Illinois, Maryland, Michigan, and Tennessee. Arizona currently allows direct shipment only by wineries that produce 20,000 gallons or less annually. Kentucky imposes a 50,000 gallon

[2] In some cases, a state that is nominally open to out-of-state direct shipment severely curtails it with other restrictions, such as requirements that customers must obtain a "wine connoisseur's license" or physically visit the winery to place the order. A state-by-state guide to direct shipment laws as they affect wineries is available at www.wineinstitute.com.

[3] Alaska, California, Louisiana, Nebraska, Nevada, New Hampshire, New Mexico, North Dakota, Oregon, Virginia, West Virginia, and Wyoming.

cap. At one time Ohio had a 150,000 gallon cap; now it has a 250,000 gallon cap. Florida legislators have considered a 250,000 gallon cap several times (FTC 2006).

Courts have also considered whether *Granholm* requires states to treat out-of-state retailers the same as in-state retailers for direct shipment purposes. In *Siesta Village Market v. Granholm* (2008), the U.S. District Court for the Eastern District of Michigan struck down a Michigan law that required out-of-state retailers to establish a Michigan location and purchase wine from Michigan wholesalers if they wanted to ship directly to Michigan consumers. The court decided that Michigan's law was clearly discriminatory, and the state failed to offer evidence of compelling state policy reasons to permit the discrimination. But in *Arnold v. Boyle* (571 F.3d. 185, 2nd Cir.2009), the U.S. Court of Appeals for the Second Circuit held that a New York law that allowed in-state retailers to deliver alcohol to consumers and required out-of-state retailers to obtain a New York license if they wanted to do so was not discriminatory because it imposed the same requirements on out-of-state retailers as on in-state retailers.

Similar issues arose in a Texas case, where Texas currently allows in-state retailers to deliver wine to consumers in limited local areas but prohibits out-of-state retailers from delivering wine to in-state consumers. Wine Country, a California retailer, and some Texas wine consumers sued the state, arguing that this law discriminated against interstate commerce. The federal district court agreed, but its remedy was a phyrric victory for retailers. Out-of-state retailers could deliver to consumers, but they had to obtain Texas retail licenses and obtain the wine from Texas wholesalers. Wine Country appealed the remedy, the state cross-appealed the district court's decision, and the Fifth Circuit Court of Appeals sided with the state. According to the appeals court, the *Granholm* decision only prevents discrimination against out-of-state wine producers, not retailers:

> Because of *Granholm* and its approval of three-tier systems, we know that Texas may authorize its in-state, permit-holding retailers to make sales and may prohibit out-of-state retailers from doing the same. Such an authorization is therefore not discrimination in *Granholm* terms (Wine Country v. Steen 2010).

Wine Country appealed this decision to the U.S. Supreme Court in November 2010, arguing that *Granholm* does not allow states to permit direct shipment by in-state retailers while prohibiting it for out-of-state retailers (Wine Country 2010).

Exclusion of retailers and production caps, therefore, remain highly controversial. States will continue to debate relevant legislation, and there has been no absence of litigation. Ultimately, either the U.S. Congress or the Supreme Court may end up settling these issues.

3. Data

This study employs price data on two comparable samples of highly popular wines that have been used in several previous studies of direct shipment. To assess the effects of "sideways" restrictions on direct shipment, this study introduces two new data series that have not been used in prior studies. First, we employ a complete set of online prices charged by wineries to see if laws that restrict direct shipment to wineries have different effects than laws that also permit retailers to direct ship. Second, we use production data from each winery in 2002 and 2004 to assess the effects of production caps at various levels. Most of the production data were purchased from winesandvines.com, an industry data source, and we phoned several wineries directly to obtain production data not in the Wines and Vines database.

The sample of wines is derived from *Wine and Spirits* magazine's annual restaurant surveys, which identifies the top-selling wines. The wines in this sample come from the magazine's 13th and 15th annual polls, published in April 2002 and 2004. *Wine and Spirits*

surveys approximately 2,000 restaurants to find 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 that receive the most mentions per 100 responses, with the point values used to break ties.[4]

A list of the "Top 50" wines 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.[5] After eliminating bottles that were no longer available for sale or misnamed, there are 79 bottles available online for 2002 and 72 bottles for 2004. Of these, 67 bottles were available both online and in Northern Virginia stores in 2002, and 63 bottles were available both online and offline in 2004.

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.[6] Online prices were gathered by visiting each winery's website and also by employing Winesearcher.com, a shopbot with access to prices at hundreds of online wine retailers.

Some of the sections below employ direct price comparisons to see if different online sellers—wineries and retailers—offer consumers the same price savings compared to bricks-and-

[4] More details on each sample can be found in Wiseman and Ellig (2007, 2004).
[5] 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.
[6] Contrary to Milyo and Waldfogel's (1999) 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.

mortar stores, with and without production caps. Taxes and transportation costs could affect the online-offline price differential, and the comparisons account for these differences. We exclude taxes in 2004 because any seller shipping legally into Virginia from out-of-state was expected to pay sales and excise taxes; taxes would thus be equal for online and offline retailers. For 2002, when interstate direct shipping was illegal, we compare all prices without sales taxes to ensure that tax differentials do not drive the results. The 2002 price differentials do not adjust for Virginia's 40 cents/liter excise tax on wine, but this tax is inconsequential compared to the price differentials we found.

To account for transportation and shipping costs for both online and offline purchases, for each bottle available online, data were collected from United Parcel Service 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.[7] Shipping options included standard ground, 2nd-day air, and 3rd-day air. For bricks-and-mortar stores, transportation costs were calculated using the standard government mileage reimbursement rate for automobile travel. Calculating local travel costs in such a way may overstate travel costs to the extent that consumers combine multiple errands in one car trip, or it may significantly understate transportation costs because it ignores the opportunity cost of the consumer's travel time.

Table 1 provides descriptive statistics for each year's data. For 2002, out of a total of 83 bottles, 79 were available online and 68 were available offline. For 2004, out of a total of 78 bottles, 72 were available online and 68 were available offline.

Drawing on these data, we seek to assess how exclusion of online retailers and production caps affect three outcomes of interest to consumers: (1) the variety of wines available

[7] www.ups.com.

to consumers, (2) the availability of price savings online, and (3) prices of wine at bricks-and-mortar stores.

Table 1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
2002					
Lowest price in offline wine store	68	28.29	23.92	8.49	169.99
Average price in offline wine stores	68	30.37	25.26	8.79	169.99
Lowest online price	79	25.96	20.98	7.97	129.99
Winery price	79	30.55	22.07	9.95	136
Rank	83	24.35	14.86	1	48
Winery production (cases)	83	910,239	1,638,518	25,000	8,000,000
Shipping cost 1 bottle ground	79	5.96	0.58	4.53	6.30
Shipping cost 1 bottle 3rd-day air	79	9.99	1.71	6.35	10.98
Shipping cost 1 bottle 2nd-day air	79	13.21	1.94	8.56	14.31
Shipping cost 6 bottles ground	79	17.00	4.11	8.96	19.49
Shipping cost 6 bottles 3rd-day air	79	33.19	7.77	15.34	37.72
Shipping cost 6 bottles 2nd-day air	79	42.20	9.70	19.39	47.64
Shipping cost 12 bottles ground	79	30.05	8.54	12.61	35.18
Shipping cost 12 bottles 3rd-day air	79	56.85	13.79	24.86	64.85
Shipping cost 12 bottles 2nd-day air	79	73.38	18.38	31.13	83.78
2004					
Lowest price in offline wine store	68	24.64	15.80	7.99	89.99
Average price in offline wine stores	68	26.22	15.04	10.14	84.99
Lowest online price	72	22.00	15.11	7.69	99.99
Winery price	72	26.12	15.42	9.95	100.00
Rank	78	24.42	14.80	1.00	46.00
Winery production (cases)	78	554,348	885,738	8,000	4,000,000
Shipping cost 1 bottle ground	72	6.25	0.70	5.04	6.89
Shipping cost 1 bottle 3rd-day air	72	10.01	3.40	5.04	13.03
Shipping cost 1 bottle 2nd-day air	72	14.42	2.96	5.04	16.97
Shipping cost 6 bottles ground	72	11.34	3.44	7.00	14.57
Shipping cost 6 bottles 3rd-day air	72	23.80	11.74	7.00	34.16
Shipping cost 6 bottles 2nd-day air	72	37.66	12.66	7.00	49.06
Shipping cost 12 bottles ground	72	19.17	7.15	9.61	25.87
Shipping cost 12 bottles 3rd-day air	72	40.07	20.81	9.61	58.36
Shipping cost 12 bottles 2nd-day air	72	64.63	23.87	9.61	86.29

4. Variety Effects

First, in regards to variety, laws that prevent or curtail direct shipment obviously affect the selection of wines available to consumers by excluding some or all wines that are not readily available in bricks-and-mortar stores. Wiseman and Ellig (2007, 866) found that in 2002, 12 of the 79 wines available online were not available in bricks-and-mortar stores. In 2004, 9 of the 72 bottles available online were not available in offline stores. Reviewing the winery price data, we find that every bottle available online was available from the winery. Therefore, allowing only wineries to direct ship is sufficient to make all 151 bottles available online to consumers. Extending direct shipment to retailers does not increase the proportion of the sample available online.

Production caps eliminate online competition in the sale of wines from wineries whose annual production exceeds the cap. Table 2 shows one effect of production caps by tabulating the number and percentage of bottles in the sample that would be excluded by production caps at various levels. The sample covers 151 bottles of wine available online in 2002 or 2004. One hundred thirty of the bottles were available both online and in Northern Virginia stores. The other 21 bottles were only available online. Very low production caps, such as 20,000 or 30,000 cases annually, outlaw direct shipment for virtually all of the bottles in the sample. Either cap has the same effect. The 150,000 gallon cap excludes about 80 percent of the bottles in the sample in both years. The 250,000 gallon cap excludes about 60 percent of the bottles in the sample.

Table 2: How Many Bottles Would Production Caps Exclude from Direct Shipment?

Year	Total	Production cap (annual gallons) 20,000	30,000	150,000	250,000
2002 – Available online	79	79 100%	79 100%	64 81%	49 62%
2002 – Available both online and offline	67	67 100%	67 100%	55 82%	42 63%
2002 – Available online only	12	12 100%	12 100%	9 75%	7 58%
2004 – Available online	72	71 99%	71 99%	59 82%	42 58%
2004 – Available both online and offline	63	62 98%	62 98%	51 81%	37 59%
2004 – Available online only	9	9 100%	9 100%	8 89%	5 56%

To understand the effect of production caps on variety, we need to know how the caps affect the portion of the sample that is available online but not offline. The "Available online only" row for each year identifies that production caps affect these bottles in about the same way that they affect the entire sample. Very low caps ban online sale of all the wines that are only available online. The 150,000 gallon cap bans direct shipment for 75–89 percent of these bottles, and the 250,000 gallon cap does so for 56–58 percent. In sum, low caps are tantamount to a ban; higher caps still curtail selection noticeably. Since all of the wines available online can be purchased from wineries, production caps have this effect regardless of whether retailers or just wineries are permitted to direct ship.

5. Price Effects

5.1 Retailer vs. Winery Direct Shipment

Online Price Savings

Moving on to a consideration of price effects of various laws, prior studies have documented that consumers can save money by purchasing wine online (Wiseman and Ellig 2004; Ellig and Wiseman 2007). These studies compared the lowest available online price with prices available in bricks-and-mortar stores. For every bottle, the lowest online price was offered by a retailer, not a winery. Do wineries also offer online price savings, or are online price savings only available when a state allows retailers as well as wineries to ship directly to consumers?

Table 3 shows that, on average, wineries and the lowest-priced bricks-and-mortar stores charged about the same prices in both 2002 and 2004.[8] Once transportation costs are included, wineries face a significant price disadvantage in both years under almost all shipping methods. The only exception occurs for 6 or 12 bottles purchased in 2002 and shipped via ground; the mean winery price is statistically indistinguishable from the mean price at the lowest-priced wine store. Wineries face a similar disadvantage when their prices are compared to average prices at bricks-and-mortar stores.

[8] For each column, the dependent variable is (Lowest price offered in bricks-and-mortar store – Lowest price available through other channel). Hence, positive values indicate that bricks-and-mortar store prices are higher than other options, whereas negative values indicate that the lowest prices can be found in bricks-and-mortar stores.

Table 3: Mean Cost Savings (– Extra Expenses) per Bottle When Shopping Online for Entire Sample

Category	Winery v. Lowest Store	Lowest Online v. Lowest Store	Winery v. Lowest Store	Lowest Online v. Lowest Store
	2002 (67 bottles)		**2004 (63 bottles)**	
No transportation costs	1.01	5.87***	-1.12	3.05***
1 Bottle – UPS Ground	-3.70***	1.51	-6.27***	-1.45*
1 Bottle – UPS 3rd-Day Air	-8.37***	-2.44*	-12.31***	-5.17***
1 Bottle – UPS 2nd-Day Air	-11.71***	-7.26***	-16.35***	-9.59***
6 Bottles – UPS Ground	-1.98	3.34***	-3.26***	1.45***
6 Bottles – UPS 3rd-Day Air	-5.02***	0.71	-6.53***	-0.60
6 Bottles – UPS 2nd-Day Air	-6.67***	-0.77	-9.01***	-2.91***
12 Bottles – UPS Ground	-1.79	3.54***	-3.14***	1.60***
12 Bottles – UPS 3rd-Day Air	-4.27***	1.35	-5.84***	-0.12
12 Bottles – UPS 2nd-Day Air	-5.84***	0.01	-8.17***	-2.17**

Category	Winery v. Store Avg.	Lowest Online v. Store Avg.	Winery v. Store Avg.	Lowest Online v. Store Avg.
	2002 (67 bottles)		**2004 (63 bottles)**	
No transportation costs	3.12**	7.95***	0.55	4.73***
1 Bottle – UPS Ground	-3.18**	2.03	-6.34***	-1.51
1 Bottle – UPS 3rd-Day Air	-7.85***	-1.92	-12.48***	-5.23***
1 Bottle – UPS 2nd-Day Air	-11.19***	-5.14***	-16.41***	-9.65***
6 Bottles – UPS Ground	-0.13	5.19***	-1.87*	2.84***
6 Bottles – UPS 3rd-Day Air	-3.17**	2.55*	-5.14***	0.79
6 Bottles – UPS 2nd-Day Air	-4.82***	1.08	-7.62***	-1.52*
12 Bottles – UPS Ground	0.19	5.52***	-1.60	3.13***
12 Bottles – UPS 3rd-Day Air	-2.29*	3.33**	-4.31***	1.41
12 Bottles – UPS 2nd-Day Air	-3.86***	1.99	-6.64***	-0.64

Statistical significance: ***99 percent **95 percent *90 percent

This contrasts with the comparison of the lowest online price against Northern Virginia wine store prices. On average, a consumer could save money by buying 6 or 12 bottles from the lowest online seller and shipping via ground. Shipping via third-day air also keeps the lowest online seller competitive with the wine stores, as long as the consumer buys six bottles or a case.

Comparing average prices for the entire sample from different types of sellers sheds some light on general price trends. Few consumers who are not wine collectors or especially dedicated statisticians, however, are likely to buy the entire sample to reap the average savings. Calculating the number and percentage of bottles for which wineries offer price savings provides additional information about the extent of online savings available if only wineries could direct ship.

To simplify the exposition, table 4 focuses on two highly plausible shipping scenarios: shipping a case via UPS ground and shipping a case via next-day air. Sending a case via UPS ground is the least expensive shipping method. Highly price-conscious customers might be expected to use this method. In addition, since it is the cheapest shipping option, the resulting estimates present the "best case" that maximizes the price competitiveness of online retailers or wineries. Customers who are very concerned about preserving their wine's quality would likely opt to ship via next-day air. Shipping by the case is the most economical way to do this.

Regardless of the year or the offline price used for comparison, allowing only wineries to direct ship eliminates much online price competition for the bricks-and-mortar stores. Shipping via ground, wineries offer price savings on only about one-quarter of the sample when compared to the lowest wine shop price and one-third of the sample when compared to the average store price. Shipping via second-day air, wineries offer price savings on no more than 14 percent of the bottles. Online retailers consistently offered price savings on much higher percentages of the bottles in each year—between 57 and 81 percent of the bottles when shipped via ground and between 32 and 48 percent when shipped via air. Excluding retailers from direct shipment thus substantially reduces—but does not completely eliminate—the price savings available from purchasing wine online.

Table 4: Retailers Offer Online Savings on Many More Bottles than Wineries

	Online retailer offers lower price		Online winery offers lower price	
Comparison	**Ground**	**Air**	**Ground**	**Air**
2002 (67 bottles)				
Online vs.	46	24	15	4
Lowest store price	69%	36%	22%	6%
Online vs.	54	32	21	8
Average store price	81%	48%	31%	12%
2004 (63 bottles)				
Online vs.	36	20	15	4
Lowest store price	57%	32%	24%	6%
Online vs.	46	27	23	9
Average store price	73%	43%	37%	14%

These figures do not include the 21 bottles that were not available offline in 2002 or 2004, because there is no bricks-and-mortar price to which the online price can be compared. Excluding retailers from direct shipment, however, does deprive consumers of some price savings on these wines, because online retailers usually offer lower prices than wineries. In 2002, consumers could save an average of $3.22 on the 12 bottles available from both wineries and online retailers, but not offline. In 2004, the average savings was $3.80 per bottle on the nine bottles that were only available online. Both differences are statistically significant at the 99 percent confidence level. These figures are based on posted prices, because all of the wineries and most of the lowest-priced retailers are in the same shipping zones on the West Coast.

Effects on Bricks-and-Mortar Prices

Wiseman and Ellig (2007) found that direct shipment reduced the percentage price spread between the lowest online and offline prices by about 40 percent. The percentage price spread between the lowest online and average offline price fell by about 26 percent. Since Virginia legalized direct shipment from out-of-state retailers as well as wineries, we cannot perform a counterfactual analysis that would tell us how bricks-and-mortar retailers would price their wines if they faced online competition only from wineries. We might reasonably surmise, however, that bricks-and-mortar stores would cut prices on the wines for which the wineries offer online price savings.

Table 4 above shows the number and percent of bottles for which online savings are available from wineries, compared to offline stores. Wineries offer savings on 22–37 percent of the bottles if purchased by the case and shipped via ground. They offer savings on 6–14 percent of the bottles if purchased by the case and shipped via second-day air. If Virginia had passed a law that allowed only wineries to direct ship, it would have substantially reduced competitive pressure on local wine merchants, thus likely depriving Virginia consumers of price savings on a substantial number of bottles in bricks-and-mortar stores.

5.2 Production Caps

Online Price Savings

Not all wines are less expensive online. It is possible that the wines excluded by production caps are the wines for which there were no significant price savings anyway. Since the very low production caps ban virtually all of the sample, we focus on the 250,000- and 150,000-gallon caps for more detailed analysis.

Table 5 calculates the potential online price savings for wines produced by wineries above and below the 250,000-gallon cap. When shipping costs are included, the average price of the wines excluded by the 250,000-gallon cap is almost always the same as or higher than the price in bricks-and-mortar stores. The only exception occurs when online prices are compared to average store prices in 2002; a consumer could save about $2.00–2.50 per bottle (7–8 percent) by buying 6 or 12 bottles and shipping via ground. The wines that can still be shipped directly under the 250,000-gallon cap are often less expensive online. This is especially true when one compares the delivered cost of these wines with average wine store prices. Thus, although smaller caps exclude most or all of the wines in our sample, the 250,000-gallon cap preserves consumers' access to most of the wines that offer online price savings.

Table 6 demonstrates that somewhat similar results are obtained for the 150,000-gallon cap. For the 24 bottles under the production cap, statistically significant price savings are available if the customer purchases 6 or 12 bottles and ships them via ground or third-day air. For the bottles over the cap, average price savings occur only with ground shipment in 2002.

Comparing results in the two tables, average price savings are larger for the wines excluded by the more restrictive 150,000-gallon cap than for the 250,000-gallon cap. This occurs because the 150,000-gallon cap excludes a larger number of bottles that offer online price savings. However, both tables show that production caps in the 150,000–250,000 gallon range tend to allow direct shipment of wines that offer significant online price savings and prevent direct shipment of wines that offer little or no price savings.

Table 5: Effect of 250,000-Gallon Cap on Availability of Online Price Savings

Lowest Online vs. Lowest Bricks-and-Mortar Price

	Production ≤ 250,000 Gallons		Production > 250,000 Gallons	
Category	**2002 25 bottles**	**2004 26 bottles**	**2002 42 bottles**	**2004 37 bottles**
No transportation costs	10.35***	6.74***	3.25***	0.45
1 Bottle – UPS Ground	6.21*	2.99**	-1.29	-4.57***
1 Bottle – UPS 3rd-Day Air	1.89	-1.23	-5.02***	-7.95***
1 Bottle – UPS 2nd-Day Air	-1.42	-5.45***	-8.20***	-12.50***
6 Bottles – UPS Ground	7.69**	5.19***	0.75	-1.17**
6 Bottles – UPS 3rd-Day Air	4.82	2.88**	-1.74**	-3.04***
6 Bottles – UPS 2nd-Day Air	3.21	0.59	-3.14***	-5.37***
12 Bottles – UPS Ground	7.85**	5.26***	0.98	-0.97
12 Bottles – UPS 3rd-Day Air	5.48*	3.33***	-1.10	-2.54***
12 Bottles – UPS 2nd-Day Air	3.99	1.27	-2.36***	-4.59***

Lowest Online vs. Average Bricks-and-Mortar Price

	Production ≤ 250,000 Gallons		Production > 250,000 Gallons	
Category	**2002 25 bottles**	**2004 26 bottles**	**2002 42 bottles**	**2004 37 bottles**
No transportation costs	13.26***	8.77***	4.79***	1.89**
1 Bottle – UPS Ground	7.15*	2.41	-1.02	-4.27***
1 Bottle – UPS 3rd-Day Air	2.83	-1.81	-4.75***	-7.64***
1 Bottle – UPS 2nd-Day Air	-0.47	-6.03***	-7.92***	-12.20***
6 Bottles – UPS Ground	10.25***	6.78**	2.17**	0.07
6 Bottles – UPS 3rd-Day Air	7.39**	4.47**	-0.33	-1.80**
6 Bottles – UPS 2nd-Day Air	5.79*	2.18	-1.72*	-4.13***
12 Bottles – UPS Ground	10.59***	7.07***	2.51***	0.37
12 Bottles – UPS 3rd-Day Air	8.22**	5.13**	0.42	-1.20
12 Bottles – UPS 2nd-Day Air	6.73**	3.08***	-0.83	-3.25***

Statistical significance: ***99 percent **95 percent *90 percent

Table 6: Effect of 150,000-Gallon Cap on Availability of Online Price Savings

Lowest Online vs. Lowest Bricks-and-Mortar Price

	Production ≤ 150,000 Gallons		Production > 150,000 Gallons	
Category	**2002 12 bottles**	**2004 12 bottles**	**2002 55 bottles**	**2004 51 bottles**
No transportation costs	7.42***	6.06***	5.49***	2.34***
1 Bottle – UPS Ground	2.95*	2.33	1.19	-2.34***
1 Bottle – UPS 3rd-Day Air	-0.98	-0.20	-2.76	-6.34***
1 Bottle – UPS 2nd-Day Air	-4.25**	-4.73**	-5.97***	-10.73***
6 Bottles – UPS Ground	4.95*	4.77***	2.99*	0.67
6 Bottles – UPS 3rd-Day Air	2.26**	3.35**	0.37	-1.53**
6 Bottles – UPS 2nd-Day Air	0.70	1.13	-1.09	-3.87***
12 Bottles – UPS Ground	5.16***	4.89***	3.19**	0.83
12 Bottles – UPS 3rd-Day Air	2.91***	3.70**	1.01	-1.02
12 Bottles – UPS 2nd-Day Air	1.51	1.77	-0.32	-3.10***

Lowest Online vs. Average Bricks-and-Mortar Price

	Production ≤ 150,000 Gallons		Production > 150,000 Gallons	
Category	**2002 12 bottles**	**2004 12 bottles**	**2002 55 bottles**	**2004 51 bottles**
No transportation costs	8.80***	8.87***	7.76***	3.75***
1 Bottle – UPS Ground	2.90**	2.94*	1.84	-2.56**
1 Bottle – UPS 3rd-Day Air	-1.02	0.42	-2.12	-6.56***
1 Bottle – UPS 2nd-Day Air	-4.30***	-4.11**	-5.33***	-10.95***
6 Bottles – UPS Ground	6.09***	7.21***	4.99***	1.81
6 Bottles – UPS 3rd-Day Air	3.40***	5.80***	2.37	-0.39
6 Bottles – UPS 2nd-Day Air	1.84	3.58**	0.91	-2.73**
12 Bottles – UPS Ground	5.33***	6.42***	5.33***	2.10*
12 Bottles – UPS 3rd-Day Air	3.15*	4.17***	3.15*	0.26
12 Bottles – UPS 2nd-Day Air	1.82	2.77***	1.82	-1.82

Statistical significance: ***99 percent **95 percent *90 percent

Effect on Bricks-and-Mortar Prices

Production caps could affect bricks-and-mortar stores' prices by eliminating some online competition. Wiseman and Ellig (2007) reported that the percentage price spread between store prices and the lowest online price fell in 2004, after direct shipment became legal. This implies that bricks-and-mortar retailers set prices closer to those of online competitors once the competitors could legally ship to Virginia residents. In addition, after direct shipment became legal, the price spread became positively correlated with online sellers' shipping costs. This implies that after legalization of direct shipment, bricks-and-mortar retailers started taking the online sellers' shipping costs into account when setting their own prices. Together, these two results suggest that legalization of direct shipment prompted Northern Virginia wine stores to respond to online competition. To see how production caps might have affected these results, we use the same econometric specifications as Wiseman and Ellig but segment the sample based on either the 250,000- or 150,000-gallon cap.

Table 7 presents the results for the 250,000-gallon cap. For the wines from larger wineries excluded by the cap, models 1 and 2 show that legalization of direct shipment in 2004 reduced the offline-online price spread by 8 or 9 percentage points. In model 1, the constant indicates that offline prices exceeded online prices by 13 percent in the absence of direct shipment. Thus, direct shipment reduced the price spread by about 69 percent. Subsequent regressions control for the average bottle price, average shipping cost per bottle when shipping a case via next-day air, and the bottle's popularity, measured by its rank in the *Wine and Spirits* survey. Interacting bottle price and shipping cost with the 2004 dummy variable allows us to test whether the size of these effects changed when direct shipment became legal. In models 3–5,

when we use the mean 2004 values of the interaction variables to calculate the net effect of direct shipment in 2004, direct shipment reduces the price spread by 7–10 percentage points.

The Year 2004 variable is statistically significant at conventional levels in models 1,2, and 4, yet it falls dramatically in models 3 and 5, which is likely an artifact of the collinearity between the Year 2004 dummy variable and the Average Bottle Price x Year 2004 interaction variable. Bottle price and shipping costs do not appear to have much of an effect on the price spread for this sub-sample of wines, contrary to Wiseman and Ellig's (2007) results.

Models 6–10 estimate how direct shipment affects the price spread on the wines from the smaller wineries with production at or below the 250,000-gallon cap. For these wines, direct shipment has a much smaller effect. Model 6 indicates that direct shipment reduced the price spread by only 5 percentage points. The constant indicates that offline prices exceeded online prices by an average of 21 percent in the absence of direct shipment. Thus, direct shipment reduced the price spread on wines from smaller wineries by only about 24 percent. When we use the mean 2004 values of the interaction variables to calculate the net effect of direct shipment, models 8–10 estimate that direct shipment reduced the spread by 3–4 percentage points.

Taken together, these results suggest that for wines from larger wineries, direct shipment led to large reductions in the price spread that did not vary with bottle price, shipping cost, or bottle popularity. For wines from smaller wineries, direct shipment produced much smaller price savings, and the size of these savings varied with bottle price, shipping costs, and bottle popularity. The 250,000-gallon cap, therefore, appears to exclude the wines that placed the most competitive pressure on the bricks-and-mortar retailers. It permits direct shipment only of wines for which the bricks-and-mortar retailers offered smaller and more finely-targeted price reductions.

Table 7: Effect of 250,000-Gallon Cap on Price Competition

	Dependent Variable: Percentage Difference in Lowest Offline Lowest Online Price									
	Winery production > 250,000 gallons					Winery production =< 250,000 gallons				
Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**
Year 2004	-0.09	-0.08	0.07	-0.20	-0.003	-0.05	-0.03	-0.11	-0.20	-0.25
	[2.46]	[2.18]	[0.59]	[1.93]	[0.02]	[1.43]	[1.15]	[1.80]	[2.32]	[2.85]
Average Bottle Price		0.002	0.002		0.002		0 .002	0.002		0.002
		[1.05]	[1.10]		[1.06]		[4.29]	[2.75]		[2.74]
Average Bottle Price x Year 2004			-0.009		-0.007			0.002		0.001
			[1.22]		[0.88]			[1.61]	[1.20]	
Shipping Cost Per Bottle				-0.007	0.0003				0.002	-0.003
				[0.65]	[0.03]				[0.27]	[0.40]
Shipping Cost Per Bottle x Year 2004				0.02	0.007				0.03	0.03
				[1.13]	[0.88]				[1.90]	[2.11]
Bottle Rank			-0.0005		-0.0006			0.002		0.002
			[0.35]		[0.41]			[1.54]		[1.76]
Constant	0.13	0.09	0.07	0.17	0.09	0.21	0.13	0.09	0.20	0.11
	[6.13]	[2.14]	[1.51]	[2.73]	[1.01]	[10.15]	[4.60]	[1.77]	[6.14]	[2.25]
N	79	79	79	79	79	51	51	51	51	51
Adjusted R^2	0.06	0.07	0.07	0.06	0.05	0.02	0.17	0.20	0.12	.28

Ordinary least squares regressions. T-statistics, based on Huber-White standard errors, in parentheses.

Table 8 offers a similar analysis of the 150,000-gallon cap, which excludes from direct shipment 106 bottles of the 130-bottle sample. For the excluded wines, direct shipment in 2004 reduces the price spread by 7–8 percentage points in models 1 and 2. When we use the mean 2004 values of the interaction variables to calculate the net effect of direct shipment in 2004, direct shipment reduces the price spread by 5–8 percentage points in models 3–5. Comparing the size of the direct shipment effect to the size of the constant, direct shipment reduced the price spread by between 36 and 100 percent, depending on the model, and this effect is statistically significant. It is clear that the price spread is highly correlated with average bottle price.

For the 24 wines permitted direct shipment under the 150,000-gallon cap, the effect of direct shipment on the price spread is very small—1 or 2 percentage points in models 6 and 7, and between 1 and 5 percentage points in models 8, 9, and 10 (again using mean 2004 values of the interaction variables to calculate the net effect). These reductions translate into a 4–28 percent drop in the price spread. Direct shipment does not have a statistically significant effect on the spread until we include the additional control variables in models 8–10. More expensive bottles have higher price spreads only in 2004, and shipping costs affect the price spread only in 2004.

The number of wines eligible for direct shipment under the 150,000-gallon cap is quite small. Because of the small sample size, we performed a robustness check by running bootstrap regressions with 10,000 replications, which yielded virtually the same coefficients, with the Year 2004 dummy attaining more modest statistical significance levels in the models with the control variables. Thus, the effect of direct shipment on the price spread for wines below the 150,000-gallon cap is questionable.

All said, however, the 150,000-gallon cap has substantively similar effects to the 250,000 gallon cap. It excludes the wines that saw the biggest reduction in the price spread under direct shipment. Price spreads on the 24 wines still permitted direct shipment fell by a smaller amount, and the reductions were more carefully targeted based on the bottle price and shipping cost.

Table 8: Effect of 150,000-Gallon Cap on Price Competition

	Dependent Variable: Percentage Difference in Lowest Offline and Lowest Online Price									
	Winery production > 150,000 gallons					Winery production =< 150,000 gallons				
Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**
Year 2004	-0.08	-0.07	0.09	-0.22	-0.20	-0.02	-0.01	-0.31	-0.22	-0.36
	[2.61]	[2.42]	[2.00]	[2.21]	[1.99]	[0.49]	[0.29]	[2.67]	[2.66]	[4.13]
Average Bottle Price		0.002	0.002		0.002		0.002	-0.0006		0.001
		[5.02]	[3.75]		[3.78]		[0.89]	[0.32]		[0.48]
Average Bottle Price x Year 2004			0.0008		0.0004			0.008		0.005
			[0.74]		[0.36]			[2.89]	[1.67]	
Shipping Cost Per Bottle				0.002	0.002				-0.002	0.0005
				[0.20]	[0.20]				[0.24]	[0.04]
Shipping Cost Per Bottle x Year 2004				0.03	0.02				0.04	0.04
				[1.52]	[1.27]				[2.99]	[1.88]
Bottle Rank			-0.0005		-0.0004			0.002		-0.0006
			[0.53]		[0.33]			[1.15]		[0.45]
Constant	0.15	0.08	0.10	0.14	0.08	0.20	0.14	0.18	0.21	0.24
	[7.96]	[3.54]	[2.75]	[2.28]	[1.38]	[11.63]	[2.00]	[2.11]	[6.65]	[4.90]
N	106	106	106	106	106	24	24	24	24	24
Adjusted R^2	0.05	0.16	0.15	0.09	0.17	-0.03	-0.04	0.11	0.27	0.26

Ordinary least squares regressions. T-statistics, based on Huber-White standard errors, in parentheses.

As the previous section demonstrates, production caps in the 150,000–250,000-gallon range allow direct shipment of the wines that offer the largest online price savings. Yet the regression analyses above show that these production caps exclude the wines that create the most significant impetus for price reductions in bricks-and-mortar stores. These two results seem like a paradox, until we examine the average prices of wines in the two groups. Table 9 shows summary statistics for the prices of wines above and below the production caps. Regardless of which price one uses, it is clear that the wines from the smaller wineries are more expensive than

the wines from the larger wineries. The potential online price savings are larger for these (presumably higher-quality) wines from the smaller wineries. The bricks-and-mortar stores, however, apparently feel more pressure to cut prices on the more mass-marketed, lower-cost wines sold by the larger wineries.

If Virginia had enacted a production cap in the 150,000–250,000-gallon range, it would have excluded precisely those competitors that prompted bricks-and-mortar stores to cut their prices most vigorously. The cap would have deprived Northern Virginia consumers of most of the savings they currently enjoy in bricks-and-mortar stores due to the presence of online competition.

Table 9: Average Prices for Wines Above and Below Production Caps

Price	Obs	Mean	Std. Dev.	Min	Max
≥ 150,000 gallons					
Lowest price in offline wine store	106	24.58	21.65	7.99	169.99
Average price in offline wine stores	106	26.44	22.27	8.79	169.99
Lowest online price	106	20.61	14.57	7.69	86.99
Winery price	106	24.98	15.89	9.95	100.00
< 150,000 gallons					
Lowest price in offline wine store	24	33.90	12.49	16.99	69.99
Average price in offline wine stores	24	35.99	12.71	17.32	74.99
Lowest online price	24	27.16	10.28	14.99	61.99
Winery price	24	32.30	11.52	16.99	70.00
≥ 250,000 gallons					
Lowest price in offline wine store	79	18.16	11.06	7.99	89.99
Average price in offline wine stores	79	19.71	11.87	8.79	99.99
Lowest online price	79	16.28	9.87	7.69	82.99
Winery price	79	20.78	11.51	9.95	100.00
< 250,000 gallons					
Lowest price in offline wine store	51	38.91	25.14	16.99	169.99
Average price in offline wine stores	51	41.36	25.33	17.32	169.99
Lowest online price	51	30.40	15.35	13.99	86.99
Winery price	51	34.92	16.77	16.00	100.00

5.3 Exclusion of Retailers Plus Production Caps

Online Price Savings

As a final point of analysis, it is useful to consider how these two types of restrictions might work together to affect price. One would think that exclusion of retailers plus production caps could deprive consumers of price savings if the larger wineries offer online savings compared to bricks-and-mortar stores. Table 10 addresses this possibility by calculating the average online price savings from wineries above and below the 250,000-gallon cap. Neither

group of wineries offers much potential for online savings. The most compelling argument might be that the smaller wineries' average delivered prices were competitive with, but no lower than, those in bricks-and-mortar stores. The larger wineries excluded by the production cap have much higher prices than the offline retailers, regardless of shipping method.

The results for the 150,000-gallon cap in table 11 are similar but not quite as clear cut. The small number of wineries below the cap offers competitive (but not lower) prices only if the customer orders 6 or 12 bottles and ships via ground. The wineries above the cap also offer delivered prices that are in some cases comparable to those offered in stores. This difference between the effects of the 250,000- and 150,000-gallon caps probably occurs because the lower cap excludes more wineries that offer prices competitive with store prices.

In neither case, however, does any group of wineries offer average delivered prices below the store prices. Thus, when a state combines a 150,000- or 250,000-gallon production cap with the exclusion of retailers, the main factor depriving consumers of online price savings is the exclusion of retailers, not the exclusion of larger wineries.

Table 10: Effect of 250,000-Gallon Cap on Price Savings If Only Wineries Direct Ship

Winery Price vs. Lowest Bricks-and-Mortar Price

	Production ≤ 250,000 Gallons		Production > 250,000 Gallons	
Category	**2002 25 bottles**	**2004 26 bottles**	**2002 42 bottles**	**2004 37 bottles**
No transportation costs	5.27*	2.74**	-1.53**	-3.84***
1 Bottle – UPS Ground	0.93	-1.54	-6.46***	-9.60***
1 Bottle – UPS 3rd-Day Air	-3.74	-7.68***	-11.13***	-15.74***
1 Bottle – UPS 2nd-Day Air	-7.08**	-12.62***	-14.47***	-19.68***
6 Bottles – UPS Ground	2.35	0.75	-4.55***	-6.08***
6 Bottles – UPS 3rd-Day Air	-0.69	-2.52**	-7.59***	-9.35***
6 Bottles – UPS 2nd-Day Air	-2.34	-5.00***	-9.25***	-11.83***
12 Bottles – UPS Ground	2.50	0.80	-4.35***	-5.90***
12 Bottles – UPS 3rd-Day Air	0.03	-1.90	-6.82***	-8.61***
12 Bottles – UPS 2nd-Day Air	1.55	-4.23**	-8.40***	-10.94***

Winery Price vs. Average Bricks-and-Mortar Price

	Production ≤ 250,000 Gallons		Production > 250,000 Gallons	
Category	**2002 25 bottles**	**2004 27 bottles**	**2002 42 bottles**	**2004 37 bottles**
No transportation costs	8.18**	4.77**	0.11	-2.41***
1 Bottle – UPS Ground	1.86	-2.12	-6.19***	-9.29***
1 Bottle – UPS 3rd-Day Air	-2.79	-8.26***	-10.86***	-15.44***
1 Bottle – UPS 2nd-Day Air	-6.13*	-12.20***	-14.20***	-19.38***
6 Bottles – UPS Ground	4.93	2.34	-3.14***	-4.83***
6 Bottles – UPS 3rd-Day Air	1.89	-0.92	-6.17***	-8.10***
6 Bottles – UPS 2nd-Day Air	0.24	-3.41	-7.83***	-10.59***
12 Bottles – UPS Ground	5.24	2.61	-2.82***	-4.57***
12 Bottles – UPS 3rd-Day Air	2.77	-0.09	-5.30***	-7.27***
12 Bottles – UPS 2nd-Day Air	1.19	-2.42	-6.87***	-9.60***

Statistical significance: ***99 percent **95 percent *90 percent

Table 11: Effect of 150,000-Gallon Cap on Price Savings If Only Wineries Direct Ship

Winery Price vs. Lowest Bricks-and-Mortar Price

	Production ≤ 150,000 Gallons		Production > 150,000 Gallons	
Category	**2002 12 bottles**	**2004 12 bottles**	**2002 55 bottles**	**2004 51 bottles**
No transportation costs	1.20	1.99	0.96	-1.86**
1 Bottle – UPS Ground	-3.67***	-2.70	-3.71**	-7.11***
1 Bottle – UPS 3rd-Day Air	-8.33***	-8.84***	-8.38***	-13.25***
1 Bottle – UPS 2nd-Day Air	-11.68***	-12.78***	-11.72***	-17.19***
6 Bottles – UPS Ground	-1.81**	-0.07	-2.01	-4.02***
6 Bottles – UPS 3rd-Day Air	-4.85***	-3.33*	-5.05***	-7.28***
6 Bottles – UPS 2nd-Day Air	-6.50***	-5.81***	-6.71***	-9.77***
12 Bottles – UPS Ground	-1.61**	-0.02	-1.83	-3.87***
12 Bottles – UPS 3rd-Day Air	-4.08***	-2.68	-4.31***	-6.59***
12 Bottles – UPS 2nd-Day Air	-5.66***	-5.01**	-5.88***	-8.91***

Winery Price vs. Average Bricks-and-Mortar Price

	Production ≤ 150,000 Gallons		Production > 150,000 Gallons	
Category	**2002 12 bottles**	**2004 12 bottles**	**2002 55 bottles**	**2004 51 bottles**
No transportation costs	2.58***	4.81**	3.23	-0.45
1 Bottle – UPS Ground	-3.72***	-2.08	-3.07*	-7.34***
1 Bottle – UPS 3rd-Day Air	-8.39***	-8.22***	-7.74***	-13.48***
1 Bottle – UPS 2nd-Day Air	-11.73***	-12.16***	-11.08***	-17.42***
6 Bottles – UPS Ground	-0.67	2.38	-0.01	-2.87**
6 Bottles – UPS 3rd-Day Air	-3.70***	-0.89	-3.05*	-6.14***
6 Bottles – UPS 2nd-Day Air	-5.36***	-3.37*	-4.71***	-8.62***
12 Bottles – UPS Ground	-0.35	2.65	0.30	-2.60**
12 Bottles – UPS 3rd-Day Air	-2.82***	-0.06	-2.17	-5.31***
12 Bottles – UPS 2nd-Day Air	-4.40***	-2.39	-3.75**	-7.64***

Statistical significance: ***99 percent **95 percent *90 percent

Note that the tables above do not include any price savings on the 21 wines that are only available online, because there is no offline price with which to compare the online price. Excluding online retailers in the presence of production caps deprives consumers of some price savings they otherwise could have achieved by purchasing from retailers online. Table 4 above demonstrated that low production caps exclude direct shipment of all the wines that are only available online. Likewise, table 12 demonstrates that exclusion of retailers in the presence of higher production caps deprives consumers of statistically significant price savings on wines from wineries above the caps. Like Table 4, this table does not control for shipping costs because most of the lowest-priced online stores ship from the same West Coast shipping zones as the wineries.

Table 12: Price Savings Offered by Online Retailers vs. Wineries for Bottles Available Only Online

	Winery Production			
	<=150,000 Gallons	**>150,000 Gallons**	**<=250,000 Gallons**	**>250,000 Gallons**
Bottles	3	9	5	7
2002	6.01	2.28**	3.61	2.94**
Bottles	1	8	4	5
2004	10.00	3.02***	5.01*	2.83***

Statistical significance: ***99 percent **95 percent *90 percent

Effect on Bricks-and-Mortar Prices

The analysis in section 5.2 found that direct shipment reduced the price spread between online and bricks-and-mortar prices only for wines from wineries producing more than 150,000 or 250,000 gallons. As we noted earlier, because Virginia legalized direct shipment by out-of-state retailers, we cannot perform a counterfactual analysis that shows how bricks-and-mortar

stores would have altered their prices under production caps if only wineries had been allowed to direct ship. As in section 5.1 above, however, we can calculate the number and percentage of bottles offered at lower prices by wineries of various sizes, and it seems reasonable to argue that price spreads would likely fall on the bottles offered at lower delivered prices by wineries.

Table 13 reveals that if only wineries could direct ship, the two different production caps would have somewhat different effects on the number and percentage of bottles that would place price pressure on retailers. A 250,000-gallon cap still allows direct shipment on most of the bottles for which wineries offer lower delivered prices than stores, while a 150,000-gallon cap comes close to reversing this result. Thus, a state law that allows only wineries producing 150,000 gallons or less to direct ship is doubly restrictive of competition. It excludes the most aggressive competitors—online retailers—and also excludes most of the wineries that would underprice the bricks-and-mortar stores.

Table 13: Effects of Price Caps on Incidence of Online Price Savings If Only Wineries Direct Ship

Winery Size	**<=250,000**		**>250,000**		**<=150,000**		**>150,000**	
	Ground	**Air**	**Ground**	**Air**	**Ground**	**Air**	**Ground**	**Air**
2002 (67 bottles)								
Winery online vs.	11	3	4	1	3	0	12	4
Lowest store price	16%	4%	6%	1%	4%	0%	18%	6%
Winery online vs.	15	6	6	2	5	0	16	8
Average store price	22%	9%	9%	3%	7%	0%	24%	12%
2004 (63 bottles)								
Winery online vs.	13	4	2	0	6	2	9	2
Lowest store price	21%	6%	3%	0%	10%	3%	14%	3%
Winery online vs.	18	9	5	0	8	4	15	5
Average store price	29%	14%	8%	0%	13%	6%	24%	8%

Of course, this discussion assumes that a bricks-and-mortar store would only feel compelled to cut its price on a bottle of wine that is less expensive when purchased from the winery. To the extent that direct shipment by wineries offers other consumer benefits, such as convenience, direct shipment may motivate stores to cut their prices even if wineries sell at a higher price.

6. Conclusions

Given findings reported above, we are not surprised that "sideways" direct-shipping laws have generated substantial lobbying and litigation. Seemingly small details, such as whether retailers or wineries of a certain size can direct ship, significantly affect the competitive positions of multiple players. In-state wholesalers and retailers have significant profits at stake, and the conventional public choice logic suggests that state policy will often concentrate benefits on these interest groups at the expense of out-of-state sellers and in-state consumers. But by altering price competition, these laws also affect wine consumers—an interest group typically under-represented in lobbying and litigation. We hope the results of this study will raise awareness of the consumer's stake in the sideways wine wars.

Some states allow only wineries to ship directly to consumers. Direct shipment by wineries is sufficient to give consumers access to all the wines in our sample that are available online, but excluding retailers from direct shipment deprives consumers of access to substantial online price savings. This occurs because wineries' online prices plus shipping costs usually exceed those of the bricks-and-mortar stores. Our data do not permit us to perform a counterfactual analysis showing how retailers would price their wines if wineries were their only online competitors. However, online retailers do appear to be the more significant source of price

competition for bricks-and-mortar stores. Excluding retailers from direct shipment may, therefore, reduce the competitive pressure on bricks-and-mortar stores to cut their own prices.

Some states prohibit direct shipment of wines produced by wineries whose annual production exceeds a specified cap. The competitive effects of a production cap depend on the level of the cap. Relatively low caps, such as 20,000–30,000 gallons per year, effectively ban direct shipment for almost all of the wines in our sample. Low caps deprive consumers of both the price savings they could achieve online and the price savings they could receive when bricks-and-mortar stores cut prices to compete with online sellers. Higher caps, such as 150,000 gallons annually, exclude about 80 percent of the wines in our sample. A much higher cap, such as 250,000 gallons, preserves consumers' access to most of the online price savings available for our sample of wines. However, caps in the 150,000–250,000 gallon range harm consumers by preventing direct shipment of the wines that elicit the most vigorous price response from bricks-and-mortar stores. Thus, these caps would deprive consumers of significant price reductions in bricks-and-mortar stores.

Other states have combined production caps with exclusion of retailers, which is the most restrictive of all, and it ultimately deprives consumers of access to lower prices online. If the production cap is 150,000 gallons or lower, it additionally blocks access to most of the lower prices offered by wineries. In contrast, if the production cap is high it deprives consumers of few online bargains, as the wineries excluded by a 250,000-gallon production cap (for example) tend to charge prices much higher than the offline stores, once shipping costs are included. A state law that excludes online retailers while imposing a production cap effectively gives bricks-and-mortar retailers greater freedom from competitive pressure to cut their own prices. Offline retailers only face online competition from those wineries that aren't affected by the production

cap, most of which tend to charge higher prices once shipping costs are included. Exclusion of online retailers ensures that bricks-and-mortar retailers only face competition from those competitors least likely to influence their prices—smaller wineries.

Our findings on winery vs. retailer direct shipment have implications for the claim that legalized direct shipment invites an end-run around the three-tier alcohol distribution system. If an out-of-state winery ships wine to a Virginia consumer, the wine does not pass through a wholesaler. But if an out-of-state retailer ships wine to a Virginia consumer, a wholesaler in the retailer's state handles the wine *if* that state's law requires retailers to obtain wine from wholesalers. Thus, wine shipped by retailers, the most price-competitive online sellers, does not necessarily represent an end-run around the three-tier system.[9] The wine gets handled by a wholesaler in the retailer's state instead of being handled by a wholesaler in the consumer's state. In this way, interstate direct shipment puts different states' three-tier systems more directly in competition with each other, but it does not necessarily eliminate the three-tier system.[10]

Our findings on production caps suggest that even high production caps should not escape court scrutiny. A low production cap represents a not-so-transparent attempt to ban direct shipment of most of the wines in our sample. This is the primary type of anticompetitive effect the federal courts noted in the *Family Winemakers* case. We find, however, that even a relatively high production cap can have noticeable anticompetitive effects. The effect occurs not just because high production caps sometimes deprive consumers of better prices online, but because

[9] Some states, such as California, allow wineries the option of dealing directly with retailers. (Ellig and Wiseman 2004).

[10] Note that our current analysis does not allow us to engage the likely price effects of mandating that out-of-state retailers clear their shipments through a wholesaler before engaging in interstate direct shipment, as the analysis above implicitly assumes that wine is sent directly from retailer to consumer (or through a wholesaler who doesn't add any additional costs to the wine).

even a high cap prevents direct shipment of the wines most likely to provoke a price-cutting response by in-state retailers.

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