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Price Effects and the Commerce Clause: The Case of State Wine Shipping Laws

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Abstract

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In the wake of *Granholm v. Heald*, numerous states passed new laws to regulate interstate direct shipment of alcohol that would seem to contradict the spirit, if not the explicit content, of the Commerce Clause. We build on existing scholarship analyzing the empirical impacts of direct shipment barriers to identify how these new laws are likely to influence local market conditions. Drawing on new data that measure posted winery prices and aggregate production levels in 2002 and 2004, we demonstrate how many of these new laws would be expected to effectively diminish, if not altogether remove, the benefits that would normally accrue to consumers from legalized interstate direct shipment of wine. While empirical analysis of price effects currently plays a very limited role in dormant Commerce Clause cases, our analysis suggests how price data can be used to ascertain whether a state restriction constitutes discrimination against out-of-state economic interests.

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"The Commerce Clause forbids discrimination, whether forthright or ingenious."

Best v. Maxwell, 311 U.S. 455 (1940)

Introduction

The dormant Commerce Clause aims to prevent states from enacting barriers to interstate commerce. A 2005 Supreme Court case, *Granholm v. Heald* (544 US 460, 2005), reaffirms that the dormant Commerce Clause applies to alcohol, even though the 21st amendment gave states wide latitude to regulate alcohol. More specifically, *Granholm* clarified that states cannot permit in-state wineries to ship directly to consumers while prohibiting out-of-state wineries from doing 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). While the court ruled that state laws separating alcohol production, wholesaling, and retailing into three separate tiers are "unquestionably legitimate," states cannot regulate alcohol in a way that discriminates against interstate economic interests.

Over the past seven years, the *Granholm* decision has spawned confusion and litigation as various segments of the alcohol industry have fought over which aspects of state alcohol regulation are now discriminatory and which are "unquestionably legitimate." Indeed, most legal commentary on the post-*Granholm* wine cases has discussed their implications for the relationship between the Commerce Clause and the 21st amendment (e.g., Perkins 2010, Slaybaugh 2011, Quigley 2011, Ohlhausen and Luib 2008, Tanford 2007).

While such analyses are important to study, we focus on a different aspect of the "wine wars": the implications of post-*Granholm* direct wine shipping cases for the analysis of discriminatory effects in Commerce Clause cases generally. The generic question we address is how to assess, empirically, the effects of state laws that exclude some especially strong out-of-

state competitors from a market, while remaining arguably neutral because they do not exclude all out-of-state competitors. We propose that direct assessment of price effects can help reveal whether a purportedly discriminatory law actually alters marketplace outcomes.

Courts sometimes take price effects into account when assessing whether a law discriminates against interstate commerce. Major decisions that do so, however, usually involve fairly straightforward examples like discriminatory taxes or fees (e.g., *Best v. Maxwell*, 311 US 454; *Bacchus Imports v. Dias*, 468 US 263; *Houlton Citizens' Coalition v. Town of Houlton*, 175 F.3d 178; *C&A Carbone v. Town of Clarkstown*, 511 US 383; *West Lynn Creamery v. Healy*, 512 US 186). These price effects result from "facially" discriminatory laws for which empirical analysis of actual effects is not necessary. Even in *Granholm*, where the Supreme Court's majority decision extensively cited a Federal Trade Commission (2003) staff study of direct wine shipment, the court did not cite the price effects identified in the FTC study.[2] Direct measurement of price effects does not currently play a prominent role in Commerce Clause cases.

To demonstrate how price effects could inform Commerce Clause decisions, we present an empirical analysis of two types of state laws that have been challenged subsequent to *Granholm*: restrictions on the size of wineries that may ship directly to consumers, and laws that permit out-of-state wineries, but not out-of-state retailers, to ship alcohol directly to consumers.[3]

[2] The majority relied heavily on the FTC report's findings that states have less restrictive options available to prevent underage access to alcohol and collect tax revenues.

[3] These are but two types of restrictions that have generated litigation after *Granholm*. Other restrictions include in-person purchase requirements, volume limits that cap an individual seller's direct shipments to a consumer or total direct shipments into a state, 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. For summary and discussion, see Ohlhausen and Luib (2008) and Tanford (2007).

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.

Our analysis demonstrates that exclusion of retailers and the imposition of production caps on wines that can be shipped both have noticeable effects on price competition in local markets, but in different ways. Prohibiting retailers from selling in certain states mostly affects whether consumers in those states will have access to the greatest online price savings. Because wineries usually charge higher prices than online retailers, excluding out-of-state retailers limits the price savings that are available online. Production caps on wineries 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, and we find that wines produced by these larger wineries are precisely the wines for which legalized direct shipment narrows the price spread between online and bricks-and-mortar sellers in local markets. Therefore, even though a high production cap allows direct shipment of some wines, it protects bricks-and-mortar retailers from precisely those competitors that are most likely to induce price-cutting.

Besides providing insight about the empirical effects of a wide range of laws that were passed in the wake of *Granholm v. Heald*, our approach may be useful in illustrating a method by which courts might seek to ascertain whether a partial restriction on interstate competition is innocuous from a Commerce Clause perspective, or if it has a discriminatory effect. Moreover, our findings also have implications for state legislators who might consider advancing laws that affect consumers by disadvantaging some, or all, interstate competitors.

1. Commerce Clause Controversies[4]

In Commerce Clause jurisprudence, a state restriction is suspect if it discriminates against out-of-state interests. The restriction might be discriminatory on its face, in its effects, or in its intentions. Commerce Clause analysis typically starts by asking whether a challenged restriction is "facially" discriminatory. If so, the restriction is unconstitutional, unless the state can prove that no less restrictive means are available to accomplish a legitimate state purpose. In only one case has the Supreme Court upheld a facially discriminatory state statute under this test (*Maine v. Taylor*, 477 US 131 (1986)).[5]

If the restriction is not facially discriminatory, courts then ask whether it discriminates in its effects or its purpose. This type of inquiry requires some kind of evidence. For example, in *Family Winemakers v. Jenkins* (592 F.3d 1 (2010)), the fact that the Massachusetts production cap prohibited direct shipment by out-of-state wineries that produced 98 percent of the nation's wine was sufficient to demonstrate discriminatory effects. Legislators' avowed intention to exclude out-of-state wineries, while permitting all in-state wineries to direct ship, was evidence of discriminatory intent. Evidence of effects sometimes also supports a claim of discriminatory intent (*Family Winemakers v. Jenkins*, 592 F.3d 1). Analysis of price effects can provide a powerful tool to demonstrate the presence or absence of discriminatory effects.

A restriction with discriminatory effects or purpose, however, is not automatically unconstitutional. Rather, the discrimination triggers heightened scrutiny to determine whether the restriction advances a legitimate state purpose and is no more discriminatory than necessary to accomplish the purpose. (*Hunt v. Washington*, 432 US 333, 353 (1977)).

[4] For a more detailed explication, see Denning and Lary (2005) or Zywicki and Agarwal (2005).
[5] This case involved a ban on imported baitfish, intended to protect native fish from parasites. The court found that this purpose was legitimate and that no less restrictive means of accomplishing it existed.

A final potential role for evidence of price effects occurs when a restriction is discriminatory neither in effect nor in practice, but it nevertheless imposes a burden on interstate commerce. Under the Pike test, courts inquire whether the effect on interstate commerce "is clearly excessive in relation to the putative local benefits." (*Pike v. Bruce Church, Inc.*, 397 US 137, 142 (1970)). As the Seventh Circuit Court of Appeals noted in *Baude v. Heath* (538 F.3d 608, 612 (2008)), "It is impossible to tell whether a burden on interstate commerce is 'clearly excessive in relation to the putative local benefits' without understanding the magnitude of both burdens and benefits." Evidence of price effects could aid in determining the size of the burden associated with a restriction, to be weighed against the local benefit under the Pike test.

For alcohol, the 21st amendment has sometimes shielded otherwise discriminatory state laws from invalidation under the dormant Commerce Clause. Below, we outline some major recent wine cases addressing these kinds of laws and explain the generic issues that are relevant to Commerce Clause cases involving goods other than alcohol.

1.1 Size Limits

At the time of this writing, several states allow only "small" wineries to ship direct to consumers, where the definition of small is established by the state. Arizona, for example, currently allows direct shipment only by wineries that produce 20,000 gallons or less annually. Kentucky imposes a 50,000 gallon cap. At one time Ohio had a 150,000 gallon cap, yet it now has a 250,000 gallon cap. New Jersey's direct shipping bill, enacted in January 2012, contains a 250,000 gallon cap (*Wine Spectator* 2012). Florida legislators have considered a 250,000 gallon cap several times, though it was never enacted (FTC 2006). As a practical matter, production caps (and particularly lower ones) can prevent a large portion of the wine market from entering into a state. Indeed, as of 2010, approximately 94 percent of wineries in North America

produced less than 75,000 gallons a year (Firstenfeld 2010).[6] These types of production caps have been the subject of litigation, and the two principal cases on gallonage caps have reached different results.

In 2006, Massachusetts passed a law allowing all wineries producing less than 30,000 gallons of wine per year to sell through wholesalers and also ship directly to consumers. Wineries producing above this cap could ship direct to consumers only if they did not sell to wholesalers. At that time, *no* Massachusetts wineries produced more than 30,000 gallons of wine annually. The court found that the Massachusetts gallonage cap was a discriminatory barrier because it prevented 98 percent of all wine produced in the US from direct shipment, unless the winery had no wholesaler representation and hence, no presence in retail stores. All Massachusetts wineries could sell to wholesalers and direct to consumers, but most of the out-of-state wineries could not do so. The court concluded that the law was unconstitutional because Massachusetts presented no evidence that the law advanced a legitimate local purpose that could not be achieved by less discriminatory means. The 21st amendment could not save the law, because historical evidence suggested the 21st amendment does not protect facially neutral laws that are discriminatory in practice.

The Massachusetts wine decision can be read not just as a commentary on the effects of banning large out-of-state competitors, but as an analysis of the effects of banning the most effective out-of-state competitors. The court noted that the cap excluded many relatively smaller "large" wineries who cannot obtain wholesale representation for most of their wines. The appeals court asserted (though without citing evidence), "Importantly, these are also the wineries that would otherwise be most competitive in the market for boutique wines: their size affords them

[6] Moreover, the remaining 6% of the wineries produced nearly 93% of the wine produced in North America (Firstenfield 2010).

otherwise considerable advantages in terms of marketing, volume, transportation, and brand recognition." The law "burdens all the large out-of-state competitors and impedes their ability to effectively use their natural advantages" (*Family Winemakers v. Jenkins*, 592 F.3d 28-29).[7] Thus, a size-based restriction can significantly affect interstate commerce even if some out-of-state competitors are still permitted to sell to in-state consumers.

In contrast to the Massachusetts decision, courts upheld a production cap in Arizona whereby only those wineries producing 20,000 gallons or less per year could ship directly to Arizona consumers. At the time that the law was passed, only one Arizona winery exceeded this cap. The court decided that the Arizona law was not subject to heightened scrutiny because more than half of all US wineries produce less than the Arizona gallonage cap (*Black Star Farms v. Oliver*, 544 F.Supp. 2d 913, 926 (2008). On that basis, the court concluded that the cap would not likely allow in-state wineries to capture sales at the expense of out-of-state wineries. This runs directly contrary to the Massachusetts court's approach, which noted that 98 percent of all wine was ineligible for direct shipment from out of state. The Arizona court arguably would have found otherwise if there was stronger evidence of discriminatory effect.

Moving beyond alcohol, the Commerce Clause implications of regulations that bar some but not all interstate competitors are less clear. In *Hunt v. Washington*, the Washington State Apple Advertising Commission challenged a North Carolina regulation that prohibited display of any grade other than the US government's grade on closed containers of apples. Washington had developed an apple inspection and grading system that was recognized as superior to the federal grade. Washington apples thus possessed a significant competitive advantage versus apples from

[7] It is not clear whether size is the only "natural advantage" the court had in mind. But it is well-established in industrial organization literature that while large size can be an advantage, large size might also be the result of a firm's other competitive advantages (e.g., Barney 2001, Demsetz 1973). Thus, exclusion of large competitors may equate to exclusion of the most effective competitors, even if their competitive advantage flows from a factor other than size.

other states, and for various reasons it would be prohibitively costly for Washington apple growers to remove the grade only from crates going to North Carolina. "[T]he statute has the effect of stripping away from the Washington apple industry the competitive and economic advantages it had earned for itself through its expensive inspection and grading system" (432 US 351 (1977)). The court found the regulation discriminatory even though it may not have discriminated against all out-of-state apples. Twelve states other than Washington shipped apples to North Carolina, and six of those states did not have their own grading systems (432 US 2444 (1977)).

On the other hand, local ordinances banning "big box" retailers have been found to be non-discriminatory when challenged under the Commerce Clause, even though their principal effect is to prevent competition from out-of-state retailers. In *The Great Atlantic & Pacific Tea Company v. East Hampton*, for example, the Great Atlantic and Pacific Tea Company challenged a local ordinance that capped the size of supermarkets at 25,000 square feet. A&P had proposed to build a store of approximately 34,000 square feet, and it argued that the ordinance violated the Commerce Clause because it discriminated against large, out-of-state retailers. The court found the ordinance constitutional because "both intrastate and out-of-state large retailers are equally affected" and A&P presented no evidence proving otherwise (997 F.Supp. 351 (1998)).[8]

A threshold question in these kinds of situations is whether the excluded competitors would actually compete and alter the flow of commerce if they were not excluded. One obvious way of engaging this inquiry is to assess whether the presence of these competitors would affect in-state firms' prices. Such evidence would be stronger than that which the Massachusetts court

[8] Denning and Lary (2005, 951) point out that there were no large retailers in East Hampton before A&P proposed to build a large store, and the relevant issue was whether a large, out-of-state firm would be permitted to compete with smaller local retailers. Their description of big box retailers' competitive advantages suggests that similar-sized, purely local retailers were highly unlikely to emerge and compete as successfully as large interstate retailers.

relied upon in its decision, and it would be more likely to satisfy the Ninth Circuit's call for evidence in the Arizona case. More generally, the presence of price effects could be used as a viable test to establish whether a subset of excluded competitors would affect the local market.

1.2 Retailer Restrictions

Besides (or in addition to) the establishment of production-cap-based direct shipment, at the time of this writing, several states permit in-state wine retailers to ship direct to consumers but prohibit out-of-state retailers from engaging in the same practice. Alternatively, some states allow out-of-state wineries to ship directly to consumers, but don't provide out-of-state retailers with the same privileges. Similar to the challenges to production caps, these laws have met a mixed fate in the courts.

A Michigan law that permitted only in-state retailers to ship to consumers, and required out-of-state retailers to establish a physical location on Michigan to obtain a direct shipping license, was overturned in 2008. The U.S. District Court concluded, "Under a Commerce Clause analysis, the added burden of opening a new location in Michigan is differential and discriminatory treatment of out-of-state interests," analogous to New York's physical presence requirement that the Supreme Court invalidated in *Granholm* (*Siesta Village Market v. Granholm*, 596 F.Supp. 1040 (2008)). The 21st amendment did not save the law, because "The Supreme Court made it clear in [Granholm] that a state's power under the Twenty First Amendment is not above the Supreme Court's nondiscrimination requirement." (*Siesta Village Market v. Granholm*, 596 F.Supp. 1039 (2008)) Finally, the court struck down the law because the state failed to offer evidence that it accomplished a legitimate local purpose that could not be accomplished by less discriminatory means.

New York had a similar law that allowed in-state retailers to deliver alcohol direct to consumers' homes, yet out-of-state retailers without an in-state operation could not obtain a license. The District Court for the Southern district of New York and the Second Circuit Court of Appeals both held that the New York law was constitutional, because it treated liquor produced in-state and out-of-state evenhandedly, and allowing only in-state retailers to direct ship is "an integral part of New York's three-tier system" (*Arnold's Wines v. Boyle,* 571 F.3d 191-92 (2009)). The district court explicitly noted that the New York law mandates "differential treatment of in-state and out-of-state economic interests" that would normally count as discrimination under the Commerce Clause; only the 21st amendment saved the law (515 F.Supp.2d 404-05 (2007)).

Texas offers an example that is unusual in several ways. The state originally had a law that, like Michigan's and New York's, allowed in-state retailers to ship directly to consumers statewide. Wine Country Gift Baskets, a California retailer, and some Texas wine consumers sued the state, arguing that this law discriminated against interstate commerce. While litigation was underway, Texas amended the law to permit only local direct shipment, roughly in the retailer's county. The federal district court gave the plaintiffs a phyrric victory. It found the Texas law was discriminatory and not saved by the 21st amendment. 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 and the state cross-appealed the district court's decision.

The Fifth Circuit Court of Appeals upheld the Texas law because *Granholm* reiterated that the three tier system is "unquestionably legitimate." But the law only permitted retailers to make local deliveries, not statewide deliveries. The court was willing to declare local delivery "a

constitutionally benign incident of an acceptable three-tier system," but it declined to offer an opinion on further restrictions, such as the original law that authorized statewide direct shipment for in-state retailers but not out-of-state retailers (*Wine Country Gift Baskets v. Steen*, 612 F.3d 819-20 (2010)).

In all three cases, the decision turned on whether the 21st amendment could rescue facially discriminatory state laws affecting retailers. Thus, the presence or absence of discriminatory effects was not an explicit part of the analysis. While analysis of price effects may not be able to settle the 21st amendment issue, it can make two contributions to the debate over direct shipment by retailers. First, if out-of-state retailers offer lower (delivered) prices, then we can be more confident that state laws which *appear* to be discriminatory on their face also have discriminatory effects in practice; they exclude competitors who really *could* capture market share by offering consumers a better deal. Second, such findings can inform the broader debate in state legislatures over whether such provisions should be adopted in the first place.

Here again, our analysis has implications beyond alcohol regulation. Wineries that direct ship are vertically integrating into retailing; allowing only wineries to direct ship mandates vertical integration for direct shipment purposes. Several prominent cases in other industries have found that state laws affecting vertical integration are not discriminatory, even if the disadvantaged firms all happen to be out-of-state firms. For example, *Ford v. Texas Department of Transportation* (264 F.3D 493 (2001)) and *Exxon v. Maryland* (437 US 117 (1978)) permitted states to exclude auto manufacturers and oil refiners from selling at retail, while permitting other interstate competitors to enter retail markets. Manufacturers and producers are arguably the most potent out-of-state competitors in automobile and gasoline sales. In these cases, the state laws were considered nondiscriminatory because they prohibited all producers (who all happened to

be interstate firms) from selling at retail but allowed other interstate competitors to do so. States sought to prevent vertical integration, and the distinction between retailers and producers allowed courts to conclude that they are not "similarly situated" competitors. Nevertheless, the methods we use in this paper may well shed light on the consumer impact of the kinds of law challenged in those cases.

Finally, an analysis of the political details underlying the promulgation of many of the laws that were passed in the wake of *Granholm* points to several textbook examples of interest-group competition, and the ways in which the more mobilized and well-organized interests effectively carried the day. In Illinois, as noted in Wiseman and Ellig (2007), legislation was introduced into the Illinois General Assembly in 2006 that would have banned interstate and intrastate direct shipment by retailers. The bill sailed through the Illinois Senate by a 52-0 vote, but ran into major roadblocks in the Illinois House when the 20,000 member Illinois Retail Merchants Association, in conjunction with the Specialty Wine Retailers Association, mobilized more than 50,000 consumers to oppose the legislation (leading to its demise). Unfortunately for direct shipping advocates, however, a year later an alternative bill was introduced into the General Assembly that prohibited interstate direct shipment by out-of-state retailers, but allowed intrastate direct shipment by Illinois retailers. With one of the largest opponents to the earlier bill, namely Illinois retailers, no longer a problem, the legislation easily passed through both chambers of the General Assembly, and was signed into law in October 2007.

A different pattern of activity emerged in the case of Massachusetts. As alluded to above, in the wake of *Granholm*, the Massachusetts legislature passed House Bill No. 4498 (over Gov. Mitt Romney's veto) that was initially drafted by the Wine and Spirits Wholesalers of Massachusetts, and 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. This law was ultimately struck down by the courts (i.e., the *Family Winemakers* case). Two days after the Massachusetts attorney general decided not to file an appeal to the Supreme Court, Massachusetts Rep. Bill Delahunt introduced H.R. 5034 into the United States House of Representatives that 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 seemed 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 had 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 had "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 had no effect at all on any of the matters considered in these sections.

While H.R. 5034 died in the 111th Congress, similar legislation was introduced by Utah Rep. Jason Chaffetz in the 112th Congress (H.R. 1161), signaling that the interest group debates that have thus far been focused on state legislatures will likely continue in the U.S. Congress in the future. Taken together, these and other cases suggests that our analysis in this paper also illustrates the manner in which interest group competition can facilitate policies that might enhance and/or undermine the substantive impact of the rulings of the Court.

2. Analyzing Alcohol Regulation: The Devil is in the Details, Not the Bottle

We are not the first to demonstrate the impacts of regulation (or lack thereof) on alcohol markets. Indeed, an extensive literature suggests that seemingly small details in law can map into substantial differences in outcomes when considering prices, consumer demand, and other aspects of alcohol consumption, production, and the like. In a Commerce Clause setting, therefore, courts are right to insist on evidence, not just logic or analogy, to demonstrate the existence of discriminatory effects. Indeed, the sensitivity of alcohol markets to relatively small variations in regulations has been examined by a wide range of scholars who have studied topics such as the regulation of franchise terminations (e.g., FTC 2005, Whitman 2003) , exclusive territories (e.g., Culbertson 1989, Culbertson and Bradford 1991, Jordan and Jaffee 1987, Sass and Surman 1993, 1996), "post and hold" laws that require alcohol distributors to publicly post their prices and leave them unchanged for a specified period of time (e.g., Cooper and Wright 2012), bans on advertising (e.g., Hoeadley et. al 1984, Milyo and Waldfogel 1999, Nelson 1990a, 1990b, 2003, Ornstein and Hanssens 1985, Schweitzer et. al 1983), and prohibitions on grocery store wine sales (e.g., Ellig 2009, Holder and Wagenaar 1990, MacDonald 1986, Rickard 2009, Wagenaar and Holder 1995).

Putting aside these contributions to the literature on alcohol regulation, our work builds most directly on a series of papers by Wiseman and Ellig (2004, 2007) that analyzed the impacts of bans on (and subsequent legalization of) direct wine shipment. More specifically, Wiseman and Ellig (2004) found that when interstate direct shipment was illegal in Virginia, online prices of premium wines were lower than prices in Northern Virginia bricks-and-mortar stores, and online variety was greater. A followup study found that repeal of Virginia's ban on interstate direct wine shipment corresponded to the reduction in the average online-offline price differential by 40 percent (Wiseman and Ellig 2007).

The current study builds directly on these works to assess the impacts of the types of laws that have been passed in the wake of *Granholm v. Heald* by revisiting the analysis in Wiseman and Ellig (2004, 2007) to analyze how (if at all) their results, in regards to price effects, would change if the state of Virgnia had adopted some of the laws that are currently found in other states today: laws that might permit some direct interstate wine shipment but limit the entities that can ship. Perhaps it is the case that only allowing direct shipment by wineries, or wines produced by smaller wineries, provides most of the potential consumer benefits, and the remaining restrictions are primarily nuisances. Or perhaps, as plaintiffs in the post-*Granholm* cases suggest, these restrictions harm consumers by blunting most of direct shipment's competitive impact on in-state sellers. Engaging in this type of analysis will allow us to assess the empirical merits of these claims, which will help to lay the foundation for empirically assessing broader arguments regarding the discriminatory effects of interstate trade restrictions in commerce clause cases.

3. Data and Study Design

This study employs price data on two comparable samples of highly popular wines that have been used in several previous studies of direct shipment. 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 (*Bolick v. Danielson*, 330 F.3d 274 (4th Cir. 2003).[9] 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. Wiseman and Ellig (2004), which drew on data that was collected one year before the state changed its law (i.e., 2002), found that Virginia's ban on direct wine shipment from out-of-state deprived Northern Virginia consumers of access to some highly popular wines and prevented them from enjoying significant price savings on more expensive wines.

Subsequent studies, which drew on data that was collected one year after Virginia changed its law (i.e., 2004), 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 shipment appears to have induced 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).

To assess the effects of different production caps and retailer prohibitions in local markets, we draw on the data sets that were used in these previous studies and make two

[9] Virginia had initially (until 2003) banned interstate direct shipment of wine, while allowing intrastate direct shipment of wine.

additions. First, we employ a complete set of online prices charged by wineries to see if laws that restrict direct shipment to wineries (i.e., laws banning interstate shipment by retailers) 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.[10]

The sample of wines is derived from two editions of *Wine and Spirits* magazine's annual restaurant surveys -- the magazine's 13th and 15th annual polls, published in April 2002 and 2004 -- which identify top-selling wines. During these years, *Wine and Spirits* surveyed approximately 2,000 restaurants to find their ten top selling wines in the last quarter of the year. For each of the ten wines listed in the restaurant's response, *Wine and Spirits* assigned a point value ranging from ten for the best-selling wine to one for the tenth best-selling wine, and identified the "Top 50" wines as those that receive the most mentions per 100 responses, with the point values used to break ties.[11]

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.[12] After eliminating bottles that were no longer available for sale or misnamed, there were 79 bottles available online for 2002 and 72 bottles for 2004. Of these, 67

[10] 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.
[11] More details on each sample can be found in Wiseman and Ellig (2004, 2007).
[12] 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.

bottles were available both online and in Northern Virginia stores in 2002, and 63 bottles were available both online and offline in 2004.[13]

Research teams collected price data during the summers of 2002 and 2004. Bricks-and-mortar prices were gathered by 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.[14] 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—offered consumers the same price savings compared to bricks-and-mortar stores, with and without production caps. Taxes and transportation costs, however, could affect the online-offline price differential, and the comparisons account for these differences. More specifically, 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, however, 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.

Estimates for transportation and shipping costs for both online and offline purchases were calculated in the following way. For each bottle available online, data were collected from

[13] The complete list of bottles that were identified as being in the "Top 50" by *Wine and Spirits* for 2002 and 2004 can be found in Appendix 2.

[14] 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. In 2002 and 2004, research teams also engaged in price checks in several grocery stores and warehouse clubs in Northern Virginia (including Giant Gourmet, BJ's, Costco, Safeway, and Trader Joe's) to see whether there were obvious price differences between these retailers and those in our sample. No obvious price differences were observed.

United Parcel Service in 2002 and 2004 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.[15] 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, where mileage was measured from the bricks-and-mortar retailer to the generic residence located in McLean that was used for the UPS shipping calculations. Calculating local travel costs in such a way, of course, might have overstated travel costs to the extent that consumers combine multiple errands in one car trip, or it might have significantly understated costs because it ignores the opportunity cost of the consumer's travel time.

Table 1 provides descriptive statistics for each year's data. As mentioned above, for 2002, out of a total of 83 bottles identified in the *Wine and Spirits* survey, 79 were available online and 68 were available offline; and for 2004, out of a total of 78 bottles identified in the *Wine and Spirits* survey, 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 two outcomes of interest to consumers. First, is it the case that the least expensive bottles can be found online? And second, how might the prices at bricks-and-mortar wine sellers respond to the threat of out-of-state competition following various types of legalized direct shipment?[16]

[Insert Table 1 about here.]

4. Retailer vs. Winery Direct Shipment

[15] The data were collected from UPS's website:www.ups.com.

[16] One potential consequence of legalized direct shipment is, of course, that incumbent bricks-and-mortar retailers might ultimately be pushed out of business in response to enhanced competition online. A follow-up investigation reveals that as of November 2012, only one of the original thirteen bricks-and-mortar stores that was used for data collection no longer exists (although some of the original stores have changed names and/or ownership).

While prior studies demonstrated that consumers could save money by purchasing wine online (i.e., Wiseman and Ellig 2004; Ellig and Wiseman 2007), these studies compared the lowest available online price with prices available in bricks-and-mortar stores, and for every bottle, the lowest online price was offered by a retailer, not a winery. Hence, one wonders whether wineries also offer online substantial price savings to consumers, or are such savings only available when a state allows retailers, as well as wineries, to engage in direct shipment?

In answering this question, Table 2 presents the respective costs savings (or extra expenses) that come with purchasing a bottle at a winery or the lowest price online retailer, in comparison to the lowest price at a bricks-and-mortar store (Table 2a) or the average price at bricks-and-mortar stores that carry the bottle (Table 2b). The left panel of Table 2a presents the difference between the winery price for bottle *i* and the lowest bricks-and-mortar store price for that bottle in 2002; the second column presents the difference between the lowest online price for bottle *i* and the lowest bricks-and-mortar store price for that bottle in 2002. (The right columns of Table 2a present analogous results for 2004). Consideration of these findings shows that, on average, wineries and the lowest-priced bricks-and-mortar stores charged about the same prices in both 2002 and 2004.[17] Once transportation costs are included, however, wineries face a significant price disadvantage in both years under almost all shipping methods. The only exception occurs for consumers who wished to purchase a half case (6 bottles) or a full case (12 bottles) in 2002 and have it shipped via ground, where the mean winery price is statistically indistinguishable from the mean price at the lowest-priced wine store (as determined by a two-tailed t-test). The results in Table 2b demonstrate that while the average bricks-and-mortar price

[17] For each column, the variable of interest 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. The statistical tests reported are t-tests for assessing the significance of a difference in means (i.e., testing the null hypothesis that the average price difference is equal to zero).

was actually higher in 2002 than the winery price for bottle *i*, the cost savings from the winery were quickly swamped by the relevant shipping costs that would be incurred to bring the bottle into Northern Virginia. (Moreover, the results for 2004 in Table 2b are substantively similar to those identified in Table 2a.)

[Insert Table 2 about here.]

This finding contrasts with the comparison of the lowest online price against those found in Northern Virginia wine stores. Consistent with earlier studies, we see that on average, a consumer could save money by buying 6 or 12 bottles from the lowest online retailer 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 scope of online savings available, if only wineries could engage in direct shipment.[18]

To explore such scenarios, Table 3 identifies how many bottles in the sample would be less expensive to purchase online (either from a retailer or winery) in comparison to purchasing from a bricks-and-mortar retailer, if a consumer were purchasing a case and shipping it either by UPS ground or via next-day air.[19] Given that sending a case via UPS ground is the least

[18] Moreover, as noted in Wiseman and Ellig (2007), the scope of potential savings from buying online is greater for more expensive bottles, so especially price-sensitive consumers could potentially experience substantial savings if they were allowed to purchase any bottlings from any source online. These points will be explored further below.
[19] For the purposes of our analysis, we identify a bottle as being less expensive online if any (i.e., greater than zero) price savings could be accrued to a consumer, rather than apply a de minimis standard for what constitutes meaningful savings.

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.[20]

[Insert Table 3 about here.]

Regardless of the year, or the offline price used for comparison, allowing only wineries to direct ship eliminates the potential savings on most bottles that might come from buying online. For example, if a consumer wanted to ship a case via ground in 2002, 46 of the 67 bottles (67% of the sample) would be less expensive to acquire online in comparison to the lowest priced bricks-and-mortar retailer (accounting for average shipping costs). In comparison, if only wineries were allowed to ship into Virginia, only 15 of the 67 bottles (22% of the sample) would be less expensive to acquire online, rather than in the lowest-priced bricks-and-mortar retailer. More generally, if a consumer were to ship via ground, wineries offer price savings on only about one-quarter of the sample when compared to the lowest bricks-and-mortar wine shop price, and one-third of the sample when compared to the average store price. If 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.[21]

[20] Customers who are very concerned about preserving their wine's quality, however, would likely opt to ship via next-day air, and shipping by the case is the most economical way to do this.

[21] 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. Focusing on posted prices in 2002, we see that 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

In demonstrating how prohibiting retailers from direct shipment would significantly decrease the scope of online price savings, it is also worthwhile to consider how Virginia bricks-and-mortar retailers might respond to the out-of-state competition that was still allowed. 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. Given that Wiseman and Ellig (2007) demonstrated that bricks-and-mortar merchants appeared to cut prices in response to online competition, however, one can reasonably argue that bricks-and-mortar stores would cut prices on the wines for which the wineries offer online price savings.

Building on this point, Table 3 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. Alternatively, they offer savings on 6–14 percent of the bottles if purchased by the case and shipped via second-day air. Hence, if Virginia had passed a law that allowed only wineries to direct ship, it is reasonable to argue that such a law 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. Production Caps

Turning to the likely impacts of production-cap-based shipping permits, it is worthwhile noting (as demonstrated above) that not all wines are less expensive online. Hence, it is plausible that the wines that would be excluded by different production caps are the wines for which there were no significant price savings to consumers. In that case, dictating that direct shipment can

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$3.80 per bottle on the nine bottles that were only available online. Both differences are statistically significant at conventional levels ($p<.01$).

only occur for wines below certain production caps would have relatively little impact on the scope of consumers' potential savings and the local bricks-and-mortar market(s).

In considering the likely impact of production caps, it is important to note that very low production caps ban direct shipment for virtually all of the wines in the sample that was identified by the *Wine and Spirits* restaurant poll. A 50,000 gallon cap would permit direct shipment of only 20 of the wines in our sample. A 30,000 gallon cap would permit direct shipment of just nine, and a 20,000 gallon cap would permit shipment of just six. Moreover, of this limited subsample, we were able to obtain pricing data for an even smaller number of bottlings. More specifically, price data could be acquired for only five bottles that were produced by wineries producing below the 50,000 gallon cap, whereas price data could only be acquired for only two bottles that were produced below the 30,000 and/or 20,000 gallon cap. Thus, very low production caps mostly allow shipment of low-volume production wines that may not even be available at bricks-and-mortar retailers. These wines pose a much less direct competitive threat to the bricks-and-mortar retailers.

Therefore, we focus on the likely market impacts of a 250,000- and 150,000-gallon cap, which allow direct shipment of more of our sample. Further details about the size and characteristics of the different subsamples can be found in Appendix Table 1, which presents a summary statistics on bottle prices (from wineries, online, and bricks-and-mortar retailers) for bottles that are produced by wineries that would be subject to various caps.

In considering these data, Table 4 calculates the potential online price savings for wines produced by wineries above and below the 250,000-gallon cap.[22] Similar to Table 2, the variable of interest is the difference between the winery price for bottle *i* and the lowest bricks-and-mortar store price for that bottle (Table 4a), or the difference between the winery price for bottle

[22] This is the cap currently in place in Ohio, New Jersey, and frequently considered, but never enacted, in Florida.

i and the average bricks-and-mortar store price for that bottle (Table 4b). The table identifies the scope of potential savings depending on whether the winery produced more, or less than or equal to, 250,000 gallons in the year that the bottle was sold. When shipping costs are included, the average online 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 a half-case or a full case and shipping via ground. On the other hand, 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 many of the wines in our sample, the 250,000-gallon cap preserves consumers' access to most of the wines that offer online price savings.

[Insert Table 4 about here.]

Table 5 presents results that are analogous to Table 4, and 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.

[Insert Table 5 about here.]

Comparing the results in Tables 4 and 5, it is clear that 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 once one accounts for shipping costs.

Regardless of the *potential* savings online, it is plausible that banning shipment of wines from wineries that produce above certain caps could influence bricks-and-mortar stores' prices in various ways. On this point, Wiseman and Ellig (2007) reported that the percentage price spread between bricks-and-mortar store prices and the lowest online price fell in 2004, one year after direct shipment became legal. While it is possible that this contraction in the price spread was due to other factors in the local market (e.g., perhaps Virginia retailers were responding to more aggressive competition in the DC market), Wiseman and Ellig also demonstrated that after direct shipment became legal, the price spread was positively correlated with online sellers' shipping costs (whereas it had been uncorrelated with potential shipping costs when direct shipment was illegal). Given that enhanced competition in (or other features of) the local market would not obviously induce this positive correlation between price spread and online shippers' shipping costs, their findings suggest that legalization of direct shipment prompted Northern Virginia wine stores to respond to online competition.

While it is not possible to assess, precisely, how the imposition of production-cap-based bans might have influenced bricks-and-mortar retailer behavior, one can glean some insight(s) by employing the same econometric specifications as Wiseman and Ellig (2007) but segment the sample based on whether the wines sold would have been affected by either a 250,000- or 150,000-gallon cap. As such, we can identify whether bricks-and-mortar retailers were responsive to the prices of all bottlings in the sample, or only those produced by relatively small,

or large, wineries. Such findings can give us some guidance regarding the likely effects of imposing similar production-based shipment bans on retail prices in local markets.

As a first pass at investigating these questions, Figures 1a and 1b present histograms of the percentage price differences between buying a bottle online in comparison to the lowest offline bricks-and-mortar retailer in 2002 and 2004, respectively. A consideration of these figures reveals that the average percentage difference between online and offline prices for bottles did, indeed, appear to decrease following the legalization of direct shipment. The mean percentage difference in 2002 was approximately .158 in 2002, whereas it was approximately 0.089 in 2004. The median percentage difference was 0.1838 in 2002, whereas it was 0.1124 in 2004. Hence, a cursory analysis of the data suggests that the gap between online and offline prices converged following the legalization of direct shipment into Virginia, but further analysis is clearly needed in order to assess how these results might have changed if only some bottles were eligible for shipment.

As a point of comparison, the first two columns of Table 6 replicate the analysis in Wiseman and Ellig (2007) to establish a baseline, and we incorporate the exact same variables that Wiseman and Ellig used in their earlier analysis. More specifically, we estimate an Ordinary Least Squares model where the dependent variable of analysis is (*Lowest bricks-and-mortar price for bottle i – Lowest online price for bottle i*)/(*Lowest bricks-and-mortar price for bottle i*). Hence, positive values indicate that percentage by which the lowest bricks-and-mortar price is higher than the lowest online price for bottle *i*. *2004 Data* is a dummy variable that indicates whether the price data were collected in 2004. *Average bottle price (offline)* is the average price that bottle *i* was sold for in a bricks-and-mortar store in Northern Virginia (when it was found on the shelves). *Per-Bottle Shipping Costs* identify how much it would cost to ship a bottle into

Northern Virginia from the lowest-priced online retailer, and are calculated based on the assumption that a consumer purchased a case of bottle *i* and had it shipped to his/her residence in McLean from an online retailer via UPS 2nd-Day air service. Finally, Bottle Popularity is bottle *i*'s rank in the Wine and Spirits "Top 50" list for the 2002 and 2004 restaurant polls. The crucial variable of interest is *2004 Data*, which indicates whether the pricing data was collected one year after interstate direct shipment became legal.

The analysis in Model 1 demonstrates that the legalization of direct shipment led to approximately a 40% decrease in the percentage price spread between the lowest online and lowest offline price (Model 1). This decrease in price spread is statistically significant, and a similar result is obtained even when one controls for estimated shipping costs and several other control variables such as average bottle price, bottle popularity, and the like (Model 2). Furthermore, consistent with the discussion above, the positive and statistically significant interaction variable *Per-Bottle Shipping Costs X 2004 Data* indicates that the online-bricks-and-mortar price spread was responsive to online sellers' shipping costs following the legalization of direct shipment (in a manner that had not occurred when direct shipment was illegal).[23] It is also interesting to note that the *Average Bottle Price* is positively related to the percentage price spread. In other words, while bricks-and-mortar retailers lowered their prices to meet online competition following the legalization of direct shipment, they lowered their prices less for their more expensive offerings.

Columns 3-4 and 5-6 demonstrate how these results would change if we focused only on those wines that could have been legally shipped if a 250,000, or a 150,000 gallon cap were in place in Virginia in 2004. For both sets of models, several results are immediately apparent. First, if one focuses only on those bottles that would have been permitted under a 250,000 and/or

[23] p-value = 0.12 (two-tailed).

150,000 gallon cap, we see that the sample size decreases substantially from 130 (the entire sample), to 51 (those bottles coming from wineries producing less than 250,000 gallons) to 24 (those bottles coming from wineries producing less than 150,000 gallons). Second, the legalization of direct shipment would seem to have different impacts on the average percentage spread between the lowest online price and lowest bricks-and-mortar retailer.

More specifically, from Model 3 we see that if direct shipment were allowed only for those bottles sold by wineries that produced less than 250,000 gallons, the average percentage spread between online and offline retailers would drop by 5 percentage points (approximately 24%). While smaller in magnitude than the average decrease for the entire sample, this contraction in the price spread is still marginally statistically significant (p-value = .159) and substantively meaningful; and this result is robust to the inclusion of the relevant control variables (as demonstrated in Model 4), much in the manner that we observe for the baseline analysis on the entire sample.

For those bottles that could have been shipped if a 150,000-gallon cap were in place, however, a different story emerges. For these 24 wines, the effect of legalized direct shipment on the price spread is very small—approximately 2 percentage points-- and the effect is not statistically different from zero. Interestingly, we see that legalized direct shipment does have a statistically significant effect on the percentage spread once we include the additional control variables in Model 6. Using the mean 2004 values of the interaction variables to calculate the net effect, we see that the impact of direct shipment on the price spread was no greater than approximately 5 percentage points. More expensive bottles have higher price spreads only in 2004, and shipping costs affect the price spread only in 2004. (Of course, given the relatively

small sample that is analyzed in this specification, those findings that fail to obtain statistical significance should be viewed with a grain of salt.)[24]

Additional insight can be gleaned if we estimate the impact of legalized direct shipment for those bottles that come from wineries producing more than 150,000 gallons. This analysis is presented in Models 7 and 8 and demonstrates that for those 106 bottles, legalized direct shipment in 2004 reduced the price spread by approximately 8 percentage points (approximately 53%, given the constant of .149) and this result is substantively robust to the inclusion of the relevant controls in Model 8. It seems, then, that imposing a 150,000-gallon cap as a criterion for legalized direct shipment effectively excludes those wines that saw the biggest reduction in the price spread under direct shipment.

As we noted above, banning direct shipment of wines from wineries producing more than 150,000–250,000 gallons still allows the shipment of the wines that offer the largest average online price savings. That said, the regression analyses in Table 6 suggest that production caps within the 150,000-250,000 gallon range would exclude those wines that create the most significant impetus for price reductions in bricks-and-mortar stores. While these results might seem contradictory at first glance, it is worth noting that wines that are produced by the smaller wineries in our dataset are generally more expensive than the wines from the larger wineries.[25] Hence, production caps effectively exclude the less-expensive wines from being shipped, while still allowing the more expensive wines to enter the direct shipment retail channel. The potential online price savings are larger for these (presumably higher-quality) wines from the smaller

[24]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 *2004 Data* 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.

[25] This is evident from the tables in Appendix 1 that illustrate how the average bottle sold by wineries that produce less than 250,000 gallons are more expensive than those bottles sold by larger wineries.

wineries, yet (ironically) bricks-and-mortar stores 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. Hence, our results suggest that the cap would have deprived Northern Virginia consumers of most of the savings they enjoyed in bricks-and-mortar stores in 2004 due to the presence of online competition, thus undermining the most obvious price benefits that followed from liberalization of interstate trade barriers.

6. Exclusion of Retailers Combined with Production Caps

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. In auxiliary analysis (not provided here due to space considerations) we calculated the average online price savings from wineries above and below the 250,000-gallon cap, as well as those above and below a hypothetical 150,000-gallon cap, similar to the analysis presented in Tables 4 and 5. We find that if we divide wineries based on whether they produce at least 250,000 gallons, then 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 had much higher prices than the offline retailers, regardless of shipping method.

The results for the 150,000-gallon cap 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, if 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. Building on this point, Table 7 presents analysis that is analogous to Table 3. Each column identifies the number of bottles (and their respective percentage, in comparison to the sample) that would be less expensive to purchase online in 2002 and 2004 in comparison to the lowest bricks-and-mortar store price, as well as the average bricks-and-mortar store price (accounting for relevant shipping and transportation costs), if they were allowed to be shipped according to various production caps.

The results reveal 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 of 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 allowed only wineries producing 150,000 gallons or less to direct ship would be doubly restrictive of competition. It would exclude the most aggressive competitors—online retailers—while also excluding most of the wineries that would underprice the bricks-and-mortar stores.[26]

[26] 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.

7. Conclusions

While the public would be expected to gain from frictionless commerce among the states, the economic benefits that might accrue to local sellers from establishing trade barriers has often tempted lawmakers in different states and localities to establish policies that seem to contradict the spirit, if not the explicit meaning of, the Dormant Commerce Clause. Indeed, in the context of the "Wine Wars," scholars have been quick to note how the creation of various restrictions on interstate alcohol trade has often been marked by substantial lobbying activity by those who stood to benefit from such laws (which often led to substantial litigation).[27] While one particular type of trade barrier was struck down by the Supreme Court in *Granholm v. Heald*, the legal ambiguity surrounding what constitutes the "unquestionably legitimate" aspects of the three-tier distribution system has paved the way for the current legal landscape in which several states have enacted statutes that clearly treat one set of economic entities (i.e., retailers, wineries of different sizes, etc.) different than another, in regards to direct shipment rights.

Our goal in this paper has been two-fold. First, we have sought to provide clear data-based evidence regarding the likely impacts of many of these laws on local markets. Simply stated, our results suggest that 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. While 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, online retailers do appear to be the more significant source of price competition for bricks-and-mortar stores. Hence, excluding retailers from direct shipment will likely reduce the competitive pressure on bricks-and-mortar stores to cut their own prices.

[27] Mendelson (2009) provides an outstanding overview of the lobbying and litigation dynamics that ensued in the years immediately following prohibition that paved the way to the legal landscape in the United States on the eve of *Granholm v. Heald*.

To the extent that some states have combined production caps with exclusion of retailers, our results suggest that such laws are the most restrictive of all, and that they ultimately deprive consumers of access to lower prices online. Moreover, such laws effectively give 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.

Of course, as is the case with any empirical study, ours comes with certain caveats. The most obvious potential concern with our approach is that we are analyzing data that are nearly 10 years old for certain bottlings. Hence, it is possible that the market tendencies that we describe are not representative of the way that the current bricks-and-mortar marketplace might respond if various legal regimes were altered, and incumbent firms were exposed to greater, or less, competition from out-of-state interests. Further research is warranted to address precisely this issue. This potential concern aside, our analysis is still helpful in that it allows us to clearly illustrate how earlier findings, which clearly pointed to the market consequences of the legalization of direct shipment, might have been changed (in some cases, quite dramatically), if certain policies were in place that are similar to those that have been promulgated in the wake of *Granholm*. Taken together, our findings would seem to be consistent with the type of data that courts have asked for in order to establish a discriminatory effect in recent commerce clause challenges to different state laws.

Building on this point, our second objective in this paper (beyond analyzing the empirical impacts of different laws that have been passed in the wake of *Granholm v. Heald*) has been to

illustrate how researchers could plausibly use price data to assess whether partial state restrictions on out-of-state firms' ability to serve local markets have discriminatory effects on interstate commerce. If a restriction excludes the most effective out-of-state competitors, it could have a discriminatory effect even if it is ostensibly neutral. Our method could readily be applied in industries other than alcohol where the relevant price data are available. To the extent that the court would seek evidence of discriminatory harm to justify striking down a law, analysis of price effects may prove useful when quantity data are unavailable or insufficient to demonstrate whether a state restriction discriminates against out-of-state interests.

Table 1: Descriptive Statistics[♣]

Variable	N	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 in *Wine & Spirits* Poll	83	24.35	14.86	1	48
Winery production (1000s of cases)	83	910.239	1638.518	25	8000
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 in *Wine & Spirits* Poll	78	24.42	14.80	1.00	46.00
Winery production (1000s of cases)	78	554.348	885.738	8000	4000
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

[♣]Each entry refers to an attribute belonging to each bottle *i* in our sample. For example, "Lowest price in offline winestore" refers to the lowest price for bottle *i* that could be obtained in an offline wine store. Likewise, "Winery production" refers to how many cases the winery that produced bottle *i* produced in a given year.

Table 2: Mean Cost Savings (– Extra Expenses) per Bottle When Shopping Online for Entire Sample♣

Table 2a: Comparisons against Lowest Store Price

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**

Table 2b: Comparisons against Average Store Price

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

***p< .01, **p < .05, *p< 0.1 (two-tailed)

♣ For each column, the variable of interest 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. The statistical tests reported are t-tests for assessing the significance of a difference in means (i.e., testing the null hypothesis that the average price difference is equal to zero).

Table 3: Conditions Under Which Online Retailers or Wineries Offer Savings Over Bricks-and-Mortar Retailers♣

	Number of Bottles for which Online Retailer Offers Lower Price		Number of Bottles for which 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%

♣ The table identifies the number of bottlings in each sample (and their respective percentages) that would be less expensive to purchase online, either from a retailer (left columns) or a winery (right columns) if purchasing an entire case of that bottle and shipping it either by UPS ground or 2nd-day Air. For each year we identify how the online price compares to the lowest bricks-and-mortar store price (top row) as well as the average bricks-and-mortar store price (bottom row), accounting for relevant shipping and transportation costs.

Table 4: Effect of 250,000-Gallon Cap on Availability of Online Price Savings♣

Table 4a: 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***

Table 4b: 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***

***p< .01, **p < .05, *p< 0.1 (two-tailed)

♣ For each column, the variable of interest 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. The statistical tests reported are t-tests for assessing the significance of a difference in means (i.e., testing the null hypothesis that the average price difference is equal to zero).

Table 5: Effect of 150,000-Gallon Cap on Availability of Online Price Savings♣

Table 5a: 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***

Table 5b: 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

***p< .01, **p < .05, *p< 0.1 (two-tailed)

♣ For each column, the variable of interest 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. The statistical tests reported are t-tests for assessing the significance of a difference in means (i.e., testing the null hypothesis that the average price difference is equal to zero).

Table 6: Effects of Gallon Caps on Price Competition♣

	Dependent Variable: Percentage Difference in Lowest Offline and Lowest Online Price							
	Baseline Analysis		<= 250,000 Gallons		<= 150,000 Gallons		>150,000 Gallons	
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2004 Data	-0.069**	-0.211***	-0.046	-0.249***	-0.022	-0.356***	-0.080**	-0.198**
	(0.027)	(0.079)	(0.032)	(0.088)	(0.044)	(0.086)	(0.031)	(0.099)
Avg. Bottle Price (offline)		0.002***		0.002***		< -0.001		0.002***
		(< 0.001)		(< 0.001)		(0.002)		(< 0.001)
Avg. bottle price X 2004 Data		0.002		0.001		0.005		< 0.000
		(0.001)		(0.001)		(0.003)		(0.001)
Per-Bottle Shipping Costs		< -0.001		-0.003		< 0.001		0.002
		(0.009)		(0.007)		(0.010)		(0.010)
Per-Bottle Shipping Costs X 2004 Data		0.021		0.029**		0.038*		0.021
		(0.013)		(0.014)		(0.020)		(0.017)
Bottle Popularity		< 0.001		0.002*		-0.001		< -0.000
		(0.001)		(0.001)		(0.001)		(0.001)
Constant	0.158***	0.081	0.211***	0.107**	0.201***	0.243***	0.149***	0.084
	(0.016)	(0.053)	(0.021)	(0.047)	(0.017)	(0.050)	(0.019)	(0.061)
N	130	130	51	51	24	24	106	106
Adjusted R^2	.04	.18	.02	.28	.03	.26	.05	.17

***p< .01, **p < .05, *p< 0.1 (two-tailed)

♣Ordinary Least Squares Coefficients with Huber-White standard errors in parentheses. The dependent variable is: (*Lowest bricks-and-mortar price for bottle i – Lowest online price for bottle i*)/(*Lowest bricks-and-mortar price for bottle i*). Hence, positive values indicate that percentage by which the lowest bricks-and-mortar price is higher than the lowest online price for bottle *i*.

Table 7: Effects of Production 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%

[♣] The table identifies the number of bottlings in each sample (and their respective percentages) that would be less expensive to purchase online in 2002 and 2004 in comparison to the lowest bricks-and-mortar store price (top row) as well as the average bricks-and-mortar store price (bottom row), accounting for relevant shipping and transportation costs, depending on whether the bottle could be shipped given various production caps.

Figure 1a: Percentage Differences between Lowest Online and Lowest Offline Prices in 2002 (N=67)

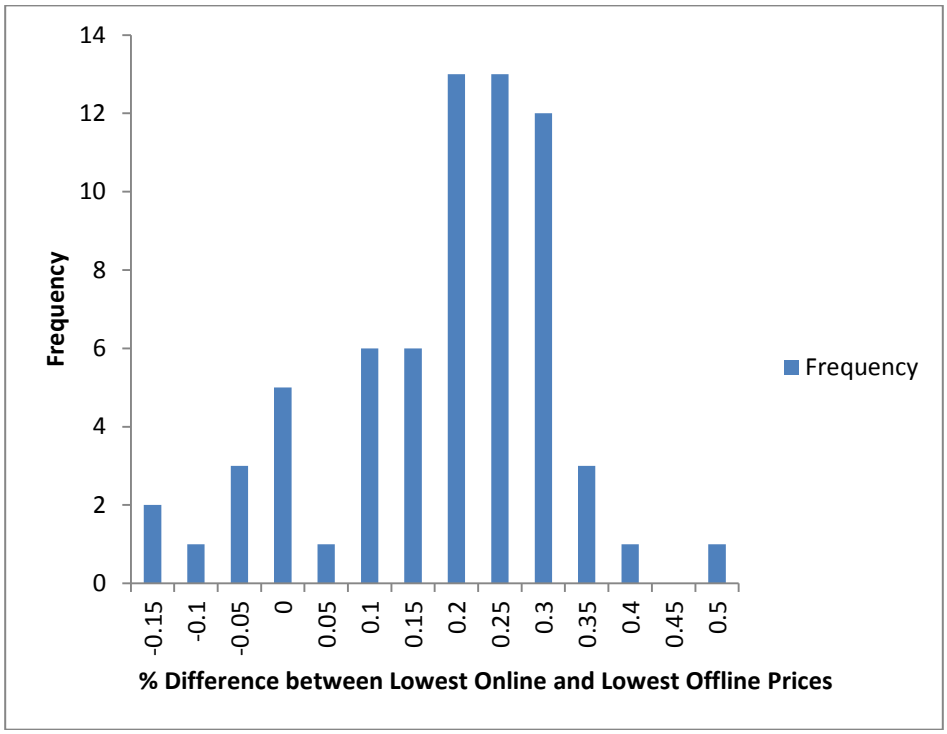
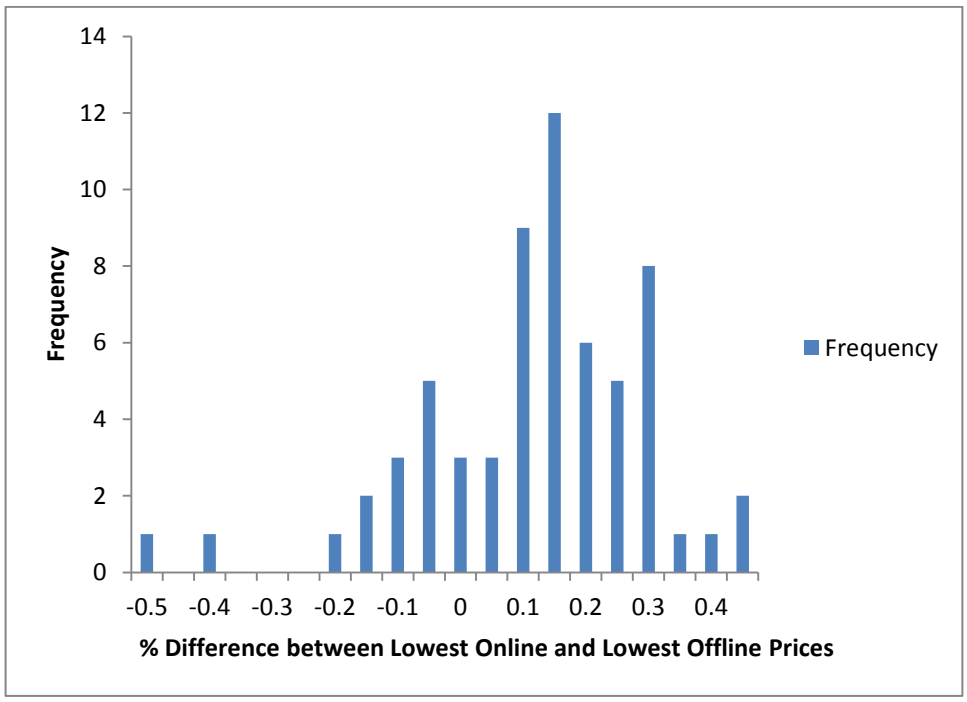


Figure 1b: Percentage Differences between Lowest Online and Lowest Offline Prices in 2004 (N=63)



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Appendix 1: Descriptive Statistics of Bottles by Winery Production Levels♣

A. Wineries that produce greater than 250,000 gallons annually

Variable	N	Mean	Std. Dev.	Min	Max
Lowest Price in offline wine store	82	18.50	11.42	7.99	89.99
Average Price in offline wine stores	82	20.01	12.13	8.79	99.99
Lowest online price	91	16.83	9.88	7.69	82.99
Winery price	91	21.12	11.20	9.95	100.00

B. Wineries that produce less than or equal to 250,000 gallons annually

Variable	N	Mean	Std. Dev.	Min	Max
Lowest Price in offline wine store	54	38.56	24.51	16.99	169.99
Average Price in offline wine stores	54	40.88	24.72	17.32	169.99
Lowest online price	60	35.07	22.67	13.99	129.99
Winery price	60	39.56	23.30	16.00	136.00

C. Wineries that less than or equal to 150,000 gallons annually

Variable	N	Mean	Std. Dev.	Min	Max
Lowest Price in offline wine store	27	33.76	11.93	16.99	69.99
Average Price in offline wine stores	27	35.62	12.18	17.32	74.99
Lowest online price	28	33.74	23.50	14.99	129.99
Winery price	28	39.15	24.19	16.99	136.00

D. Wineries that less than or equal to 50,000 gallons annually

Variable	N	Mean	Std. Dev.	Min	Max
Lowest Price in offline wine store	5	31.19	9.42	21.99	46.99
Average Price in offline wine stores	5	32.07	8.50	26.39	46.99
Lowest online price	4	25.96	7.23	17.99	34.95
Winery price	4	29.25	6.65	24.99	39.00

E. Wineries that produce less than or equal to 30,000 gallons annually

Variable	N	Mean	Std. Dev.	Min	Max
Lowest Price in offline wine store	2	28.49	2.12	26.99	29.99
Average Price in offline wine stores	2	28.49	2.12	26.99	29.99
Lowest online price	1	27.89	-	27.89	27.89
Winery price	1	24.99	-	24.99	24.99

♣ These tables present the summary statistics for bottles in the broader sample that are produced by wineries of various sizes, ranging from greater than 250,000 gallons, to less than 30,000 gallons (annually).

Appendix 2: Wine and Spirits "Top Fifty" Wines

Table 2a: 2002 Restaurant Poll

Winery	Varietal	Wine Label	Vintage
Beaulieu Vineyard	CA	Napa Valley Rutherford	1999
Beaulieu Vineyard	CA	Napa Valley Tapestry	1998
Benziger Family Winery	CH	Carneros	2000
Beringer Vineyards	CA	Knights Valley	1998
Beringer Vineyards	CA	Napa Valley Private Reserve	1997
Beringer Vineyards	CH	Napa Valley	1999
Beringer Vineyards	CH	Napa Vly. Private Reserve	1999
Blackstone Winery	M	California	2000
Blackstone Winery	M	Napa Valley	2000
Cakebread Cellars	CA	Napa Valley	1998
Cakebread Cellars	CH	Napa Valley	2000
Cakebread Cellars	CH	Napa Valley Reserve	1998
Cakebread Cellars	SB	Napa Valley	2001
Cambria Winery & Vineyard	CH	Santa Maria Vly. Katherine's	2000
Caymus Vineyards	CA	Napa Valley	1999
Caymus Vineyards	CA	Napa Vly. Special Selection	1999
Chalk Hill Winery	CH	Chalk Hill	1999
Chateau St. Jean	CH	Belle Terre	1999
Chateau St. Jean	CH	Sonoma	2000
Chateau Ste. Michelle	M	Canoe Ridge	1999
Chateau Ste. Michelle	M	Washington	1999
Clos du Bois	M	Alexander Valley	1999
Clos du Bois	M	Sonoma	1999
Cuvaison Winery	CH	Napa Valley Carneros	2000
De Loach Vineyards	CH	Russian River Valley	2000
De Loach Vineyards	CH	Sonoma OFS	1999
Duckhorn Vineyards	M	Napa Valley	1999
Duckhorn Vineyards	M	Three Palms	1999
Duckhorn Vineyards	SB	Napa Valley	2000
Ferrari-Carano Winery	CH	Alexander Valley	2000
Ferrari-Carano Winery	CH	Alexander Vly. Reserve	1999
Ferrari-Carano Winery	M	Alexander Valley	1999
Ferrari-Carano Winery	SB	Alexander Valley Fume	2001
Franciscan Oakville Estate	M	Napa Oakville Estates	1999
Frog's Leap Winery	SB	Napa Valley	2001
Grgich Hills Cellar	CH	Napa Valley	1999
J. Lohr Winery	CA	Paso Robles 7 Oaks	1999

J. Lohr Winery	CA	Paso Robles Hilltop	1998
Jordan Vineyard & Winery	CA	Alexander Valley Estate	1993
Jordan Vineyard & Winery	CH	Sonoma Cty. Estate	1999
Kendall-Jackson Vineyards	CA	Calif. Proprietors Reserve	
Kendall-Jackson Vineyards	CA	Calif. Vinters Reserve	1998
Kendall-Jackson Vineyards	CH	Calif. Grand Reserve	2000
Kendall-Jackson Vineyards	CH	Calif. Vinters Reserve	2000
Kendall-Jackson Vineyards	M	Calif. Proprietors Reserve	
Kendall-Jackson Vineyards	M	Calif. Vinters Reserve	1999
La Crema (Kendall-Jackson)	P	Russian River Valley	1999
Landmark Vineyards	CH	Sonoma Overlook	2000
Markham Winery	M	Napa Valley	1999
Murphy Goode Estate	SB	Fume	2000
Murphy Goode Estate	SB	Fume Reserve	2000
Ravenswood	Z	Lodi	1999
Ravenswood	Z	Sonoma Vitners Blend	2000
Ridge Vineyards	Z	Geyserville	1999
Ridge Vineyards	Z	Lytton Springs	2000
Robert Mondavi Winery	CA	Napa Valley	1999
Robert Mondavi Winery	CA	North Coast Coastal	1999
Rodney Strong Vineyards	CH	Chalk Hill	2000
Rodney Strong Vineyards	CH	Sonoma	2000
Rodney Strong Vineyards	M	Sonoma	1999
Rombauer Vineyards	CH	Napa Valley	
Rombauer Vineyards	CH	Napa Valley Carneros	2000
Rombauer Vineyards	M	Napa Valley	1999
Rutherford Hill Winery	M	Napa Valley	1999
Shafer Vineyards	M	Napa Valley	1999
Silver Oak Wine Cellars	CA	Alexander Valley	1997
Silver Oak Wine Cellars	CA	Napa Valley	1997
Simi Winery	CH	Alexander Valley	2000
Sonoma-Cutrer Vineyards	CH	Cutrer	1999
Sonoma-Cutrer Vineyards	CH	Les Pierres	1999
Sonoma-Cutrer Vineyards	CH	Russian River Ranches	2000
Stag's Leap Wine Cellars	CA	Napa Valley	1999
Stag's Leap Wine Cellars	CA	SLD Fay	1998
Stag's Leap Winery	CA	Napa Valley	1998
Stag's Leap Winery	M	Napa Valley	1998
Sterling Vineyards	CA	Diamond Mountain Ranch	1999
Sterling Vineyards	CA	Napa Valley	1999

Sterling Vineyards	M	Central Coast - Vintners Collection	1999
Sterling Vineyards	M	Napa Valley	1999
The Hess Collection	CA	Calif. Hess Select	1999
The Hess Collection	CA	Napa Valley (Mt. Veeder)	1998
The Hess Collection	CH	Calif. Hess Select	2000
The Hess Collection	CH	Napa Valley	2000

Table 2b: 2004 Restaurant Poll

Winery	Varietal	Wine Label	Vintage
Adelsheim Vineyard	P	Willamette	2002
Beringer Vineyards	CA	Knight's Vly.	2000
Beringer Vineyards	CA	Napa Founders Estate	2001
Blackstone	M	California	2001
Blackstone	M	Napa Vly.	2000
Byron	P	Santa Maria	2002
Cakebread Cellars	CA	Napa Vly.	2001
Cakebread Cellars	CH	Napa Vly.	2002
Cakebread Cellars	SB	Napa Vly.	2003
Cambria Vineyard	CH	Santa Maria Katherine's	2002
Chalk Hill Winery	CH	Sonoma Chalk Hill	2000
Chateau St. Jean	CH	Sonoma	2002
Chateau Ste. Michelle	CH	Canoe Ridge	2001
Chateau Ste. Michelle	CH	Washington	2002
Chateau Ste. Michelle	M	Washington Canoe Ridge	2001
Chateau Ste. Michelle	M	Washington Cold Creek	2001
Chehalem Winery	P	Willamette Stoller Vineyard	2001
Chehalem Winery	P	Willamette Three Vineyards	2002
Clos du Bois	M	Alexander	2001
Clos du Bois	M	Sonoma	2001
Columbia Crest	CH	Columbia Valley Grand Estate	2002
David Bruce	P	Central Coast	2002
David Bruce	P	Sonoma	2002
Duckhorn Vineyards	M	Napa Vly.	2001
Duckhorn Vineyards	M	Napa Vly. Estate	2001
Duckhorn Vineyards	SB	Napa Vly.	2002
Ferrari-Carano Winery	CH	Alexander Vly.	2001
Ferrari-Carano Winery	CH	Alexander Vly. Reserve	2001
Ferrari-Carano Winery	SB	Alexander Vly. Fume Blanc	2003
Francis Coppola	M	Napa Diamond Series	2002
Franciscan Oakville Estate	CA	Napa Vly.	2001
Franciscan Oakville Estate	M	Napa Oakville Estate	2001

Frog's Leap Winery	M	Napa Vly.	2001
Grgich Hills Cellar	CH	Napa Vly.	2001
J. Lohr Winery	CA	Paso Robles 7 Oaks	2001
J. Lohr Winery	CA	Paso Robles Hilltop	1999
Jordan Vineyards & Winery	CA	Alexander Vly. Estate	2000
Jordan Vineyards & Winery	CH	Alexander Vly. Estate	2001
Kendall-Jackson Vineyards	CH	Calif. Grand Reserve	2001
Kendall-Jackson Vineyards	CH	Calif. Vintners Reserve	2002
La Crema	CH	Sonoma Coast	2002
La Crema	P	Russian River Vly.	2002
La Crema	P	Sonoma Coast	2002
Liberty School	CA	California	2002
Liberty School	CA	California Coastal Oaks	.
Markham Winery	M	Napa Vly.	2001
Patricia Green Cellars	P	Yamhill Cty.	.
Patricia Green Cellars	P	Yamhill Cty. Eason	2002
R.H. Phillips	CH	Dunnigan Hills Toasted Head	2002
Ravenswood	Z	California Vintners Blend	2001
Ravenswood	Z	Sonoma	2001
Robert Mondavi Winery	CA	Napa Vly.	2000
Robert Mondavi Winery	CA	North Coast Coastal	2001
Robert Mondavi Winery	CH	Napa Vly.	2001
Robert Mondavi Winery	CH	North Coast Coastal	2002
Rombauer Vineyards	CH	Carneros	2002
Saintsbury	P	Carneros	2001
Saintsbury	P	Carneros Garnet	2002
Silver Oak Wine Cellars	CA	Alexander Vly.	1999
Silver Oak Wine Cellars	CA	Napa Vly.	1999
Silverado Vineyards	M	Napa Vly.	2000
Simi Winery	CA	Alexander Vly.	2001
Simi Winery	CA	Sonoma	.
Sonoma-Cutrer Vineyards	CH	Cutrer	2001
Sonoma-Cutrer Vineyards	CH	Les Pierres	2001
Sonoma-Cutrer Vineyards	CH	Russian River Ranches	2002
Stag's Leap Wine Cellars	CA	Artemis	2001
Stag's Leap Wine Cellars	CA	Napa Vly.	.
Stag's leap Winery	CA	Napa Vly.	2000
Stag's Leap Winery	M	Napa Vly.	2001
Sterling Vineyards	CA	Central Coast Collection	2001
Sterling Vineyards	CA	Napa SVR	2000

Sterling Vineyards	M	Central Coast	2001
Sterling Vineyards	M	Napa Vly.	2000
The Hess Collection	CA	California Hess Select	2001
The Hess Collection	CA	Napa Vly.	2000
The Hess Collection	CH	Calif. Hess Select	2002
The Hess Collection	CH	Napa Vly.	2002