
Article

Analysis of Price Changes in Washington Following the 2012 Liquor Privatization

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Abstract

Aims: In June, 2012 the state of Washington ended a wholesale and retail monopoly on liquor sales resulting in about five times as many stores selling liquor. Three-tier restrictions were also removed on liquor, while beer and wine availability did not increase. Substantial taxes at both the wholesale and retail levels were implemented and it was expected that prices would rise.

Methods: To evaluate price changes after privatization we developed an index of about 68 brands that were popular in Washington during early 2012. Data on final liquor prices (including all taxes) in Washington were obtained through store visits and on-line sources between November 2013 and March of 2014. Primary analyses were conducted on five or six brand indexes to allow the inclusion of most stores.

Results: Washington liquor prices rose by an average of 15.5% for the 750 ml size and by 4.7% for the 1.75 l size, while only small changes were seen in the bordering states of Oregon and Idaho. Prices were found to vary greatly by store type. Liquor Superstores had generally the lowest prices while drugstore, grocery and especially smaller Liquor Store prices were found to be substantially higher.

Conclusion: Our findings indicate that liquor prices in Washington increased substantially after privatization and as compared to price changes in bordering states, with a much larger increase seen for the 750 ml size and with wide variation across store types. However, persistent drinkers looking for low prices will be able to find them in certain stores.

INTRODUCTION

At the repeal of alcohol prohibition, US states took a number of different paths regarding markets for alcoholic beverages. In many states, including Washington, the government created a monopoly on the distribution and retailing of spirits. In the other states, and for beer in all states, laws regulating the ownership of the production, distribution and retailing of alcoholic beverages were put in place to keep the production, wholesale, and retail market sectors separate: the ‘three-tier system’. This was done in recognition of the tied-house saloons (owned or controlled by producers) that were viewed as especially problematic before prohibition and designed to prevent aggressive pricing policies believed to be facilitated by vertical integration (Cook, 2007). Because alcohol, like tobacco, is a habit forming, addictive and potentially harmful product, temporary low prices could be used to increase future demand. Alcoholic beverages can also be used as loss leaders to drive customers to supermarkets or other stores,

as has become common in the UK and Australia (Jones *et al.*, 2012). The three-tier system, or having government control, may prevent these kinds of activities.

In November, 2011, voters in the state of Washington approved Initiative 1183, which ended the state monopoly on spirits sales as of 1 June 2012 and removed a number of state regulations related to distribution and pricing. Producers are now allowed to sell directly to retailers, bypassing the wholesale tier and potentially allowing some large retailers to heavily discount certain brands, particularly private label brands that are specific to store chains. Washington is the first state to fully privatize both the distribution and retailing of spirits (other states such as Iowa have privatized the retail tier only) and the first state to completely remove the three-tier system for spirits (National Alcohol Beverage Control Association (NABCA), 2011). After an earlier unsuccessful initiative attempt, the privatization initiative which passed included new spirits taxes that mirrored the mark-up

procedures under the state system to insure that revenues were maintained. It has been observed that increased alcohol taxes for revenue purposes may be more palatable than those introduced for public health or perceived social benefit reasons (Giesbrecht *et al.*, 2004). Both prices and availability of spirits increased significantly after privatization and tax data indicate increased spirits sales in Washington and at stores in Oregon and Idaho near the Washington border (Cull, 2014; González, 2014).

The new spirits taxes are primarily collected by retailers and Washington tax rates on spirits are now, by far, the highest in the USA (Kerr *et al.*, 2014). These taxes include a number of different elements but can be summarized as 10% of the wholesale price (paid by the distributor) plus 17% of the retail price (paid by the retailer), with both of these included in the retail price. Additionally there are further taxes on top of the retail price of 20.5% plus a spirits volume tax equivalent to \$2.83 per 750 ml bottle. These taxes on top of the retail price are listed on each price label (as required by Initiative 1183) so consumers are shown this part of the tax. The degree to which tax changes are passed on to the consumer is called the tax pass through rate, which can be greater than one or as low as zero. Studies of specific tax increases in the USA have found evidence of pass through rates much greater than one (Kenkel, 2005) suggesting that producers take advantage of such changes to implement additional price increases. However, a recent analyses of cross-sectional differences (Siegel *et al.*, 2013) found a pass through rate of 0.93, suggesting that over time sellers are only able to pass on the tax itself or slightly less. There is also evidence from the UK that taxes are differentially passed through across price/quality levels with under-shifting for lower priced brands and over-shifting for higher priced brands (Ally *et al.*, 2014). Given these diverse findings, a detailed study of the effects of this privatization on prices is needed.

Since the changes occurring in the Washington privatization went beyond the tax implementation it was not at all clear what the results would be. New distributors and retail sellers of spirits were licensed with a restriction that retail stores have at least 10,000 square feet of space, limiting licensees to large beer, wine and spirits superstores, supermarkets, drug stores and department stores such as Costco and Walmart. Additionally, many of the state-owned and contract stores that sold spirits for the state in less populated areas were allowed to continue under the privatized system with a license purchased at auction. About 1600 stores now sell spirits in Washington as compared to less than 500 before privatization (193 state stores plus about 300 contract stores). Not only has outlet density increased but spirits are now sold in the same stores as beer and wine and in stores that consumers commonly visit for other commodities, particularly supermarkets. Some of these stores also have later trading hours than the state stores, which closed at 9:00 pm during the week, 10:00 pm on Friday and Saturday and 5:00 pm on Sunday. Late night spirits availability may have a disproportionate effect on alcohol-related problems and harms (Hahn *et al.*, 2010). Both the effects of price increases on reducing alcohol consumption (Wagenaar *et al.*, 2009) and the effects of increased outlet density on increasing alcohol consumption (Campbell *et al.*, 2009) are well established, so these major aspects of the privatization will affect alcohol sales in opposite directions. Studies of combining alcohol policy interventions have considered policies with common directions of impact (Giesbrecht and Greenfield, 2003). Key research questions are whether the effects of taxation or availability will predominate in this situation in regards to price changes, alcohol use patterns and alcohol-related harms.

The objectives of this paper are to evaluate the impacts of this privatization on brand and container size-specific alcohol prices across

store types to estimate the size of the overall price change and to compare price changes across these key dimensions. As part of a larger study examining the impacts of the Washington Liquor privatization we conducted a survey of brand and container size prices in a random sample of licensed liquor outlets in selected counties in Western Washington. Because the privatization included such a large increase in licenses, several types of new taxes and a relaxation of the wholesale tier requirements and other pricing regulations, it was unclear how prices would be affected. However, based on the size of the taxes, a general increase in prices was hypothesized. We also hypothesized that larger multi-outlet store chains such as Costco, who sponsored the initiative implementing privatization, would be in a better position to take advantage of quantity discounts, buying directly from producers, and selling with lower margins.

METHODS

Selection of spirit products

To evaluate price changes after privatization an index was developed consisting of 68 brands that were popular in Washington during early 2012. The popularity of the spirits products was determined using the Statistics for Alcohol Management Database (SAM) provided by the National Alcohol Beverage Control (NABCA). Initially, 86 brands were identified if they had sold 5000 or more 9-l cases during the period of June 2011 through May 2012. The index was reduced to 68 brands based on a preliminary search of on-line stores in Washington. The final index includes both 750 ml and 1.75 l sizes of the most popular liquor brands as well as a few smaller but popular local brands, paying specific attention to different liquor categories and price levels. Pre-privatization prices in Washington are from the SAM database, which includes all liquor sales in each of the control states. After privatization Washington liquor price and sales data were no longer reported to SAM. Because the bordering states of Idaho and Oregon are control states, we tracked index brand prices in those states across the same period using the SAM database.

Store sampling

The location of liquor retail stores was determined from the off-premise licensees list available at the Washington State Liquor Control Board website (Washington State Liquor Control Board, 2014). Only businesses with an active issued license were considered for sampling. Using Arc Map (ESRI, 2011) the addresses of the retail stores were geocoded and mapped at the county level as shown in Fig. 1. Stores in the following counties were randomly selected for sampling: Clark County, King County, Kitsap County, Pierce County, Thurston County, and Whatcom County. Counties were selected based on population size and geographic accessibility to our research team. In total 45 stores were sampled of the 916 active licenses; five stores in each county with the exception of King County (Seattle) where ten stores were sampled. An additional five stores were sampled with available spirit prices online. The stores sampled consisted of various store types including both former state liquor and contract stores. The sampled area represents the most populated regions of Western Washington but does not include Eastern Washington or less populous counties.

Data collection

Data on liquor prices was collected through store visits and on-line sources between November 2013 and March 2014, with the majority of store visits occurring in February 2014. As determined by the Public

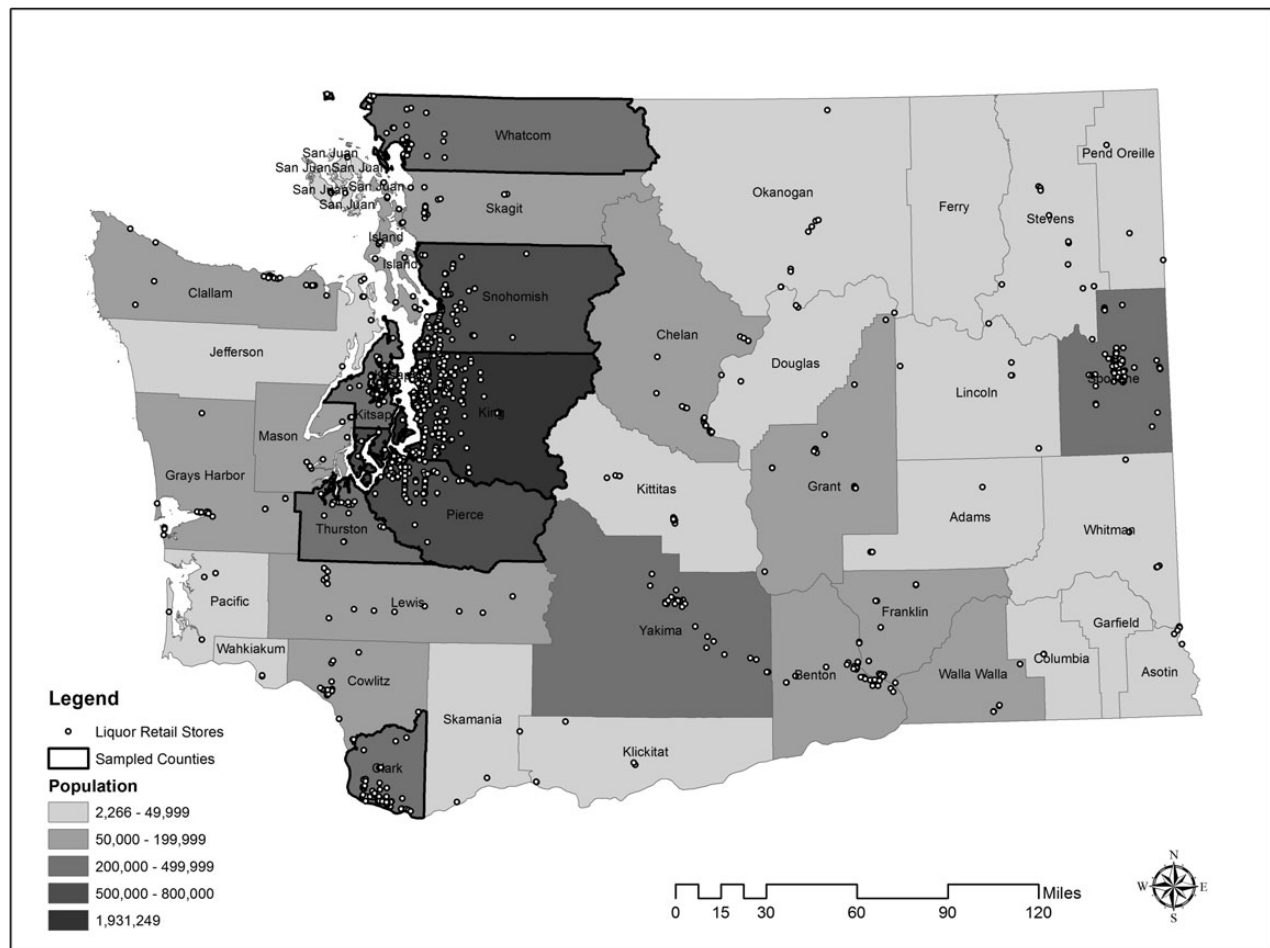


Fig. 1. Locations of Washington liquor retail licenses and total population by county. Bold borders indicate counties where store visits occurred.

Health Institute IRB, informed consent of store owners or employees was not required since the subject of research was liquor prices. In order to accurately capture the listed price, photographs of the brands and price labels were taken. When photography was not feasible, prices were manually recorded. During the visit it was also noted if the listed price included the state taxes and both the spirits sales tax and spirits liter tax were added to the listed price when necessary to calculate final prices.

Data analysis

The average 'shelf price' (an average over the period of final prices that includes both regular and promotional prices weighted by the volume of sales at each price) between January 2012 and May 2012 from the SAM database was used as a pre-privatization baseline to compare the changes in price after privatization. Stores were categorized into six types: Liquor Superstore (ex. Total Wine & More), Liquor Store (ex. University Liquor), Grocery Store (ex. Safeway), Drug Store (ex. Walgreens), Department Store (ex. Target) and Wholesale Store (ex. Costco). Products were categorized into seven types of spirits: gin, rum, tequila, vodka, whiskey, brandy and liqueurs. A selection index was developed indicating the number of brands out of the 68 brands of interest that were available at each store. To account for the brands that were missing in various stores, several indexes were developed to make valid comparisons across stores. The names of the brands in each index are listed in Tables 2 and 3. The first index

consisted of six 750 ml brands that were available in 33 of the stores sampled. A second index of two 750 ml brands that were available in 41 of the stores sampled. The third index consisted of five 1.75 l brands that were available in 31 stores. For each index and store type comparison the average price change from baseline was determined. To capture store average prices using a larger number of brands we also calculated store average prices including all available brands in each store. Since varying price/quality levels across stores would bias any comparison of average prices we instead focused on the percentage change in each brands price from the pre-privatization baseline and compare the average of these percentage changes. Tests for significant changes in prices, price indices and percentage changes were t-tests (Stata Corp., 2013).

RESULTS

Before examining price variation we consider the availability of popular brands across the different store categories post-privatization. Compared to the availability of all 68 brands in state liquor stores before privatization, Table 1 illustrates the average and variability in selection across store types. Liquor Superstores, as the name implies, have the largest selection with 59 of the 68 brands for both sizes. Smaller liquor stores have the next most complete selection for both sizes with Grocery, Drug, and Department Stores all at a similar selection level with about two-thirds of the 750 ml brands and less than half to

one third of the 1.75 l brands. The wholesale stores have nearly none of the 750 ml brands but 31 of the 1.75 l brands, consistent with their general strategy of offering only larger sized products for which they can deliver a low price.

Analyses of price changes after privatization focus on equal-weighted indices of brands available in a large number of the stores. The difficulty of finding brands available in most stores is illustrated by our use of only six brands and two brands for 750 ml and five brands for 1.75 l containers. Excepting Jack Daniel's Whiskey, different brands are included in the 1.75 l index in part because the popularity of brands differs by container size. Table 2 presents results for

Table 1. Selection index of spirits brands by store type out of 68 brands

	Number of stores	750 ml selection			1.75 l selection		
		Avg.	Min	Max	Avg.	Min	Max
Liquor Superstore	4	59	55	63	59	55	64
Liquor Stores	9	50	28	66	37	10	58
Grocery Stores	18	45	18	60	23	0	42
Drug Stores	7	41	30	56	20	13	36
Department Stores	4	43	30	57	30	18	43
Wholesale Stores	3	2	1	3	31	31	31

the 750 ml indices. Only small and non-significant increases in price are seen in Oregon and Idaho, suggesting that increases found are related to privatization rather than producer price increases. The 6 brand index shows an overall 15.5% increase in prices for the 33 included stores with variation across brands from a low of 4.8% for Bacardi Rum, the top selling brand in the USA, and a high of 21.1% for Absolut Vodka. Comparisons across store types show considerable variation. Liquor Superstores had a non-significant 3.9% increase in prices while the largest increase is found among smaller Liquor Stores at 27.2%. This indicates a substantial price advantage for the Liquor Superstores. Significant increases were also found for the Grocery, Department, and Drug Store types. Results for the 2 brand index covering 41 stores are very similar to those for the 6 brand index and confirm those results.

Analyses of a 5 brand index for the 1.75 l container size are presented in Table 3. Results show a significant increase in prices of 4.7%, a much smaller increase than seen for the 750 ml size. Less variation is seen across brands than in the 750 ml index. This price increase is similar to the increase in Oregon control system stores suggesting little impact of privatization. However, comparison across store types illustrate that the Wholesale and Liquor Superstores actually had non-significantly lower prices while smaller Liquor Stores and Department Stores had significantly higher prices by 12.3 and 8.8% respectively. Grocery and Department Stores also had non-significantly higher prices.

In part because the index comparisons had to rely on such a small number of the most popular brands and only two-thirds of the stores

Table 2. Spirits 750 ml container price index comparison of 2013–2014 prices with 2102 pre-privatization prices in WA State Liquor Stores

	Avg. price		Min.		Max.	
	\$ amount	% change	\$ amount	% change	\$ amount	% change
6 brand index						
Bombay Sapphire Gin	\$31.21	15.8%	\$26.29	2.4%	\$39.15	45.3%
Bacardi Superior Rum	\$16.71	4.8%	\$13.66	-14.4%	\$21.85	37.0%
Absolut Vodka	\$27.30	21.1%	\$22.10	-2.0%	\$38.25	69.7%
Crown Royal	\$34.19	18.1%	\$20.87	-27.9%	\$42.10	45.4%
Jack Daniel's Whiskey	\$27.82	11.5%	\$24.51	-1.8%	\$34.70	39.1%
Jameson Irish Whiskey	\$35.15	17.4%	\$30.53	1.9%	\$43.25	44.4%
Total	\$28.73	15.5%**	\$25.78	3.3%	\$30.72	23.1%
Store Type Mean Index Price						
Liquor Superstore	\$25.86	3.9%	\$25.10	0.6%	\$26.92	7.9%
Liquor Store	\$31.64	27.2%**	\$28.92	15.9%	\$36.55	46.5%
Grocery Store	\$28.67	15.2%**	\$23.59	-5.5%	\$31.94	28.0%
Drug Store	\$28.22	13.4%*	\$26.72	7.1%	\$29.70	19.0%
Department Store	\$27.06	8.8%	\$24.59	-1.4%	\$28.48	14.1%
ID State Liquor Store	\$22.05	1.0%	\$20.70	-5.2%	\$22.94	5.0%
OR State Liquor Store	\$23.41	1.9%	\$21.62	-4.5%	\$24.80	7.9%
2 brand index						
Bacardi Superior Rum	\$16.82	5.5%	\$13.66	-14.4%	\$21.85	37.0%
Absolut Vodka	\$27.58	22.4%	\$22.10	-2.0%	\$38.25	69.7%
Total**	\$22.20	15.3%**	\$19.97	2.8%	\$24.53	26.2%
Store Type Mean Index Price						
Liquor Superstore	\$19.83	3.0%	\$19.08	-1.8%	\$20.89	7.5%
Liquor Store	\$24.84	29.0%*	\$22.66	16.6%	\$30.05	54.6%
Grocery Store	\$21.86	13.6%*	\$19.07	-1.9%	\$25.71	32.3%
Drug Store	\$21.62	12.3%	\$20.59	5.9%	\$22.70	16.8%
Department Store	\$21.08	9.5%	\$18.47	-5.0%	\$23.30	19.9%
ID State Liquor Store	\$16.35	0.0%	\$15.45	-5.5%	\$16.95	3.7%
OR State Liquor Store	\$18.25	1.1%	\$16.95	-0.1%	\$19.95	10.5%

Test results indicate significant changes from 2012 prices. The 6 brand index results include 33 stores and the 2 brand index results include 41 stores.

**P < 0.001 *P < 0.05.

Table 3. Spirits 1.75 l container price index comparison of 2013–14 prices with 2102 pre-privatization prices in WA State Liquor Stores

	Avg. price		Min.		Max.	
	\$ amount	% change	\$ amount	% change	\$ amount	% change
5 brand index						
Captain Morgan's Spiced Rum	\$42.78	7.10%	\$31.89	-20.20%	\$52.38	31.10%
Smirnoff Vodka	\$31.59	5.50%	\$25.26	-15.70%	\$39.12	30.60%
Jack Daniel's Whiskey	\$53.21	4.40%	\$40.33	-20.80%	\$66.84	31.20%
Rich & Rare Canadian Whisky	\$24.60	-1.40%	\$19.24	-22.90%	\$28.28	13.30%
Seagram's 7 Crown	\$30.69	6.00%	\$23.46	19.00%	\$35.51	22.70%
Total	\$36.58	4.70%*	\$33.23	-4.92%	\$39.81	13.91%
Store Type Mean Index Price						
Liquor Superstore	\$30.98	-11.40%	\$28.52	-18.40%	\$33.08	-5.35%
Liquor Store	\$39.27	12.30%*	\$37.26	6.62%	\$41.96	20.07%
Grocery Store	\$36.77	5.21%	\$34.06	-2.55%	\$41.72	19.36%
Drug Store	\$38.01	8.80%*	\$36.11	3.32%	\$40.69	16.42%
Department Store	\$37.42	7.10%	\$34.23	-2.05%	\$44.42	27.11%
Wholesale Store	\$32.08	-8.20%	\$29.22	-16.40%	\$34.41	-1.54%
ID State Liquor Store	\$28.44	1.80%	\$27.20	-2.61%	\$29.60	5.98%
OR State Liquor Store	\$31.36	5.50%	\$29.95	0.47%	\$32.57	9.26%

Test results indicate significant changes from 2012 prices. The 5 brand index results include 31 stores.

* $P < 0.05$.

Table 4. Mean price and change for all available brands in each store by store type

	Average	Avg. change (%)
750 ml container		
WA State Liquor Store	\$20.30	
Liquor Superstore	\$23.02*	7.4%
Liquor Store	\$27.22*	26.1%
Grocery Store	\$24.90*	20.0%
Drug Store	\$25.05*	18.2%
Department Store	\$25.92*	19.8%
1.75 l container		
WA State Liquor Store	\$40.28	
Liquor Superstore	\$40.46	-0.9%
Liquor Store	\$48.46*	19.5%
Grocery Store	\$38.65	14.6%
Drug Store	\$36.29	14.1%
Department Store	\$39.34	7.8%
Wholesale Store	\$41.75	-8.7%

Test results indicate significant changes from 2012 prices in WA state liquor stores before privatization.

* $P < 0.05$.

In some cases we also considered a comparison of price changes including all available brands at each store. To make these somewhat comparable across stores we first calculated the percentage change in price for each brand and then averaged these percentage changes for each store. This procedure minimizes the bias from selections with relatively more or less expensive brands across the price spectrum. Results suggest a similar pattern to those from the index with some differences including higher, though still relatively low, prices in the Liquor Superstores and somewhat higher prices for other store types in most cases (Table 4).

DISCUSSION

Our analysis of liquor price changes in the US state of Washington following the privatization of the government controlled system in June

of 2012 has illustrated the variability of effects on liquor prices across store types, container sizes and brands. While prices were found to increase as hypothesized given the large (for the USA) taxes that were imposed to make up for revenues lost from ending the control system the variability of such increases, particularly across store types was surprising in that two store types, Liquor Superstores and Wholesale Stores, had non-significantly lower prices for the 1.75 l size. This suggests that these stores were able to obtain lower prices from wholesalers or producers, or to bypass wholesalers in some cases, and were able mark-up these products with lower margins, perhaps partly reflecting lower business costs, than other types of stores. The Liquor Superstores also showed the lowest price increases on 750 ml brands indicating that some pricing factors applied across all products while others were specific to the 1.75 l size.

We also found the smaller Liquor Stores had the highest prices for both container sizes. These stores are generally independently owned and were acquired through an auction of licenses to operate at or near former State Liquor Stores or Contract Store locations. Some of these had previously been contract stores for the state. These stores do not seem to be able to generally match the prices of any of the other store types, although they do have larger selections than all store types except for the Liquor Superstores. News reports (González, 2014) suggest that they are doing poorly given the convenience of Grocery, Drug, and Department Stores, where many customers already shopped, along with lower prices in these and in the Wholesale and Liquor Superstores. A number of these smaller stores have already gone out of business with more likely to follow. This development was obviously not expected when the owners bid on licenses and offers a caution regarding the value of licenses for other states considering privatization.

In addition to the increase in price and availability of liquor products, other developments have been observed. In reaction to the general increase in liquor prices in Washington there has been an increase in cross-border shopping to Oregon and Idaho, where prices changes have been small. Another unexpected change has been an increase in the theft of spirits amongst retailers (Hoang, 2014). The extent of this is unknown, but the availability of liquor in Grocery and Drug Stores, which have less control over theft and allow unaccompanied minors

on premise, compared to control system stores, are possible explanations. Furthermore, it has also been suggested that organized criminals engaging in these thefts are re-selling to some bars and restaurants, which were also impacted by higher liquor prices post-privatization (Hoang, 2014).

Previous studies of actual privatizations in individual U.S. states have shown a significant increase in the sales of the particular beverage that has been privatized, usually wine, but also small increases in alcohol sales overall (Wagenaar and Holder, 1991, 1995). In 1969 Washington allowed the sale of wine produced outside the state in grocery stores, where beer and Washington wines were already sold; expanding availability from the State Liquor Stores. A significant increase in wine consumption, but no change in beer or spirits, was associated with this privatization (Macdonald, 1986). One of the few case studies of spirits privatization (Iowa) occurred at the retail level with the state retaining control over the wholesale tier. This change increased spirits consumption by 10% and overall alcohol consumption by 5% (Holder and Wagenaar, 1990; Mulford *et al.*, 1992).

Most relevant to the Washington case are experiences of privatization at the retail level in two Canadian provinces. An analysis of privatization in Alberta, Canada, found higher prices due to increased costs and excess capacity in private stores. However, there were also more stores and greater availability, which resulted in more consumption despite the higher prices. The province was also estimated to have collected \$500 million less in tax revenue between 1994 and 2003 than they would have under government control (Flanagan, 2003; Trolldal, 2005). In British Columbia (BC), Canada, a partial privatization resulted in an increase in the number of stores, but the government kept control of the wholesale tier and kept most of its retail outlets, so prices did not decline in general. An analysis of prices paid for alcoholic beverages found a decline for beer especially due to a decline in the average quality purchased (Treno *et al.*, 2013). Both alcohol consumption and alcohol-related deaths were found to increase with the density of private stores in an area (Stockwell *et al.*, 2009, 2011). Both of these cases suggest that increased availability has a larger effect than increased prices.

There are several limitations relevant to inference from this study. Data collection on price was at a single time so that some products were on sale and others not, unlike SAM 'shelf prices' that average over these. The SAM prices provide a more stable baseline for comparisons and averaging results over brands and stores is important for inferences on price changes. We did not collect beer or wine prices for comparison. Stores in certain counties were sampled and Eastern Washington was not included because of the added time and cost, although we expect results would be substantially similar if these areas were included. The number of brands sold in all stores was more limited than expected, but we were able to make comparisons with a small number of exact brands as well as to include a comparison of mean price changes for all brands sold in each store, with similar results. Only the two most common container sizes were included, with differing results, suggesting other less common sizes might also differ in results.

Our analyses confirm that the privatization of spirits wholesale and retail operations designed to maintain revenues to the state will result in higher prices to consumers indicating that taxes are largely passed on them. While the increase in prices we have detailed in Washington should, to some extent, reduce the harmful impact of increased spirits availability it also appears that persistent drinkers looking for low prices will be able to find them in certain stores. Findings of lower price increases for 1.75 l containers suggest that these larger packages may be targeted to more price sensitive drinkers through reduced

margins relative to the 750 ml size at the producer, wholesale and/or retail levels. These results also add to the literature on alcohol pricing, illustrating the complexity of tracking price changes in a marketplace where brand, container size and store type all show large variations in prices and on the price impact of the same set of taxes and policies.

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CONFLICT OF INTEREST STATEMENT

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