# Liquor consumption changes from Covid-19

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**Abstract**

This paper analyzes liquor consumption changes from COVID-19. Our data set contains bar/restaurant, and retail liquor sales by month in the state of Idaho. We estimate aggregate changes in wholesale and retail sales for both rural and urban areas. We find, controlling for persistent seasonal fluctuations in liquor consumption, that retail liquor sales surged during height of the COVID-19 shutdown (March, April and May of 2020) at the same time that bar and restaurant sales declined. As bars and restaurants started opening back up in June, July, and August of 2020, bar and restaurant sales recovered to pre-pandemic levels while the increased retail sales persisted statewide. However, some substantial differences were seen the response between urban and rural areas.

Keywords: Liquor, COVID-19
Running Head: Liquor consumption changes

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# Introduction

One of the many effects of the COVID-19 pandemic was that liquor consumption increased. We use a data set of all liquor sales in the state of Idaho to identify how much liquor consumption increased, what types of liquor increased, and how persistent that change was for both rural and urban areas. For example, since COVID-19 caused a dramatic downward shift in consumption from wholesale (restaurants and bars) due to availability, this mitigates the effects of the increase in retail sales. We compare the magnitude of these changes in demand. Furthermore, there may be differences in the ethanol levels, or other characteristics, once the shifts in consumption occurred. We also analyze how persistent these changes were once wholesale consumption rebounded.

While liquor stores remained open throughout 2020, many restaurants were closed or faced restrictions. According to Chetty et al. (2020), the first case of COVID-19 in the United States was reported on January 20th, 2020. The state of Idaho issued a stay-at-home order on March 25th that closed all non-essential businesses, including restaurants for in-person dining and all bars. This changed consumer spending dramatically. Figure 1 shows the changes in spending for both grocery stores and restaurants/hotels. The figure shows that there was first a large increase in consumer spending quickly followed by sharp decrease in restaurant/hotel spending. While these two shifts were mitigated, there was a persistent effect on both types of spending. Idaho then began reopening select businesses on May 1st. On June 24th, the Idaho governor re-closed select businesses (e.g. bars) on a regional basis (the city of Boise, Idaho's largest city was affected). Chetty et al. (2020) find that retail food sales in Idaho spiked over 60% in late March 2020 and remain over 20% higher through October 2020. Conversely, restaurant and hotel sales dropped over 60% in Idaho by the beginning of April 2020 and remained

almost 20% lower through October 2020 (figure 1). Using a highly detailed data set of liquor sales in the state of Idaho, we intend to provide some more insights into retail and bar/restaurant sales of one component of the broader food consumption impacts of COVID-19.

Idaho is one of seven states that restrict liquor sales to state run liquor stores (Watson et al. 2020). Furthermore, Idaho requires that all liquor sales, both retail and wholesale to bars and restaurants, go through a state licensed liquor store. Because of this, all liquor sales, whether they are for at-home or away-from-home consumption, are recorded by the state and available in the data set.

With this data set, we are able to test few a few hypotheses. First, we can see what the overall effect of COVID-19 and the lock-downs was on liquor demand while controlling for year and seasonal effects. Second, we can see how persistent the changes in demand were over time. Third, we can estimate how much of the changes in demand are due to anxiety from nearby COVID cases, income/employment, or other shifts in demand. Fourth, we see if there are differences in the effects of COVID between retail and wholesale demand. Fifth, we analyze any differences between urban and rural ares in these outcomes.

# Literature Review

There is a sizeable literature on the demand for liquor across many countries (Selvanathan 2017), and much of it focuses on the price elasticity and substitution between beer and wine (Baltagi and Griffin 1995; Gallet 2007; Fogarty 2010). Other studies investigate the relationship between the economy and demand for alcohol. Some studies find a positive relationship between the economy and alcohol demand (Cotti et al. 2015) while others find a negative relationship for individuals if they suffer large economic losses (Mulia et al. 2014).

Research suggests that actual sales transactions are ideal for liquor demand studies since using tax revenues can be an unreliable source for quantity and prices (Young and Bielinska-Kwapisz 2003; Ruhm et al. 2012). This paper utilizes actual sales from the state of Idaho so that any changes in prices and quantities can be detected. This data set also allows us to control for variables such as the type of liquor and any regional effects, as well as find differences in effects from the economy or beer/wine substitutes.

COVID-19 and the associated regulations have certainly influenced the consumption of many types of food. Many commodities, such as potatoes, dairy, eggs, and meat, have seen dramatic swings in demand. COVID-19 has influence prices for fruits and vegetables (Richards and Rickard 2020), the meat sector (McEwan et al. 2020), and hogs (Zhang et al. 2020). While perhaps not always the case, some of these changes in prices were influenced by changes in the supply chain (Lusk et al. 2020; Reardon et al. 2020; Gray 2020), and some of the supply chain changes may be long term (Hobbs 2020). Furthermore, there seemed to be a shift towards "comfort foods" (Chaudhuri 2020), which seems to apply to liquor.

The effects of COVID and the responses to COVID have shown to be different in rural and urban areas (Peters 2020; Summers-Gabr 2020; Souch and Cossman 2020). Using our data set we are able to research differences between changes in demand in rural vs urban areas. Although COVID cases arrived into different areas at different times, we are able to control for this using COVID cases in the county as a control variable.

We intersect these areas of the literature by estimating changes in demand for liquor. We also estimate the substitution between liquor and beer/wine as well as the relationship between the economy and the demand for liquor. However, we focus on the shifts in demand from COVID-19 and find the differences between rural and urban consumers. We also discuss how these changes may be due to the

availability restaurants, similarly to a change in the supply chain.

# Data

The data for this analysis was obtained from the Idaho State Liquor Division (ISLD) for all monthly sales of a given unique bottle of liquor at all 186 liquor stores in Idaho from January 2007 through August 2020. The data include the month, store, liters sold, price, liquor type, and proof (alcohol content) of the liquor. The data set is novel in the sense that it includes monthly sales of every unique bottle of liquor in the state of Idaho with both retail and wholesale sales tracked separately. Idaho is a state where all liquor sales, both retail sales to consumers and wholesale sales to bars and restaurants must go through a state licensed liquor store. Therefore our data set represents the entire market for liquor in the state of Idaho. We aggregate the unique bottles of liquor into 58 types of liquor using type codes provided to us by the ISLD. These type codes include fairly detailed categories such as single malt Scotch whisky, blended Scotch whisky, domestic gin, imported gin, bonded bourbon, blended bourbon, etc.

One complicating issue is that no data is reported if a bottle of that type is not sold at a specific store in a given month. We also removed any sale that is less than .2 liters from the data set to get rid of very small bottles which we considered to be a different market than standard bottles. Therefore, our data are truncated at 0.2 liters and OLS regression is not appropriate. To overcome this limitation we employ a truncated regression which we will detail in the model section.

Other variables of interest include a count of new COVID-19 cases in each county obtained from the U.S. Centers for Disease Control (CDC) to test the effect of rising COVID-19 cases on the quantity of liquor demanded, the county unemployment rate obtained from the U.S. Bureau of Labor Statistics (BLS) to control for income

effects, and consumer price indexes for both beer and wine obtained from the U.S. Bureau of Economic Analysis (BEA) to control for the price of substitute goods.

Simply disaggregating the data by month and type of sale (retail/wholesale) gives us some insight. Figure 2 shows that, as expected, in March of 2020 retail sales increased dramatically while restaurant sales started to decrease. While January and February levels were similar to 2018 and 2019, it is clear that changes happened in March. Retail sales remained high throughout the summer. In April, restaurant sales were almost non-existent and started to rebound in May. Figure 3 shows this graphically over a longer trend. While sales are heavily dependent upon month and show a general upward trend, sales clearly spiked in March of 2020. Figure 4 shows this effect is even more pronounced for retail sales. Figure 5 shows that restaurant sales plummeted over this same time period, but did rebound later in the year.

In aggregate, we can say that overall liquor consumption increased increased 14.7% in the months of March through August 2020 as compared to the same months in 2019. However, liquor sales have increased by an average of 5.3% annually from 2007 through 2019, therefore we would have otherwise expected sales to have increased by that amount from 2019 to 2020. After accounting for the expected increase in sales, liquor sales in 2020 still increased by 8.9%. This overall increase hides the fact that while retail sales of liquor skyrocketed, wholesale sales of liquor plummeted. Retail sales from the months of March through August 2020 were 26.8% higher than those same months in 2019. However, wholesale sales (which comprise restaurant and bar sales) decreased by 41%. Again, retail and wholesale sales showed an average annual increase from 2007 to 2019 of 6.4% and 2.2% respectively. Therefore, the actual increase in retail sales was 19.2% and the decrease in wholesale sales was 42.3% (table 1).

These results are affected by a multitude of dimensions such as differences in liquor type (e.g. bourbon versus vodka), other idiosyncratic yearly differences be-

yond COVID-19, county differences, and most germane to this analysis, differences between urban and rural places. To explore these effects, we will next present a formal model.

# Analysis

Most basically, we are exploring the effects of COVID-19 on the quantity of liquor demanded. This, however is complicated by the fact that fear, perceptions, and future expectations may play as large a role as the actual number of cases in a given place. Furthermore, the economic shutdowns associated with COVID-19 themselves create a shift in demand apart from the shift in demand from COVID-19. Therefore, in addition to including COVID-19 cases by county, we also include county unemployment, and specific month-year dummy variables for February through August 20202 to capture fear and expectations associated with the pandemic that are not captured by actual COVID-19 cases or the ensuing unemployment effects.

Furthermore, we are not simply interested in the total liquor changes, the unique richness of our data set enables us to break down liquor sales into retail versus wholesale sales. Since all liquor sold in the state of Idaho must be mediated by a state-run liquor store and because surrounding states tend to have more expensive liquor (Watson et al. 2020), our data set represents nearly all of the liquor sold and consumed in the state of Idaho. We, therefore, estimate separate models for retail, wholesale, and total liquor sales.

Lastly, we are interested in differences in COVID-19 impacts between urban and rural areas. To capture these differences, we create separate statewide, urban, and rural models. We define urban as the three most populous counties in the state of Idaho: Ada, Canyon, and Kootenai counties. These three counties represent roughly half of the population and account for roughly half of the total liquor sales

in Idaho.

All transactions are for a specific type of liquor, at a specific store, in a specific month from January 2007 through August 2020.

Our model can be expressed as:

$$Q_{rjt} = f(P_{jt}, A, B_t, W_t, U_t, C_t, K_t, L, M_t, Y_t, S) \tag{1}$$

were $Q_{rjt}$ represents the liters sold of in region $r$ ($r \in urban, rural, statewide$), transaction $j$ ($j \in retail, wholesale, total$) in time $t$. $P$ represents the own price of the liquor, $A$ is the percent alcohol of the specific liquor, $B$ is the consumer price index for beer, $W$ is the consumer price index for wine, $U$ is the unemployment rate for the county for that month, $C$ are the number of new COVID-19 cases in the county, $K$ represent dummy variables specifically for months in 2020 (February 2020,...,August 2020), $L$ are dummy variables for the type of liquor, $M$ are dummy variables for month of the year, $Y$ is are dummies for the year, and $S$ are dummies for specific store where the transaction took place.

As stated earlier, our data set do not record sales where there are no transactions in a given month for that specific type of liquor. Our data also omit any transaction is not at least 0.2 liters. Therefore we are dealing with a truncated data set at 0.2. The model is then estimated with the truncated maximum likelihood function presented in Greene (2018) and is estimated in STATA with the "truncreg" function and incorporating robust standard errors.

In order to express the results in elasticity for, we take the natural log of all non-dummy variables except for $C$. Because $C$ is zero for the majority of the months in the analysis, logging is not possible. We therefore transform this variable using an inverse hyperbolic sine function. This transformation enables us to still interpret the coefficient as an elasticity, but it allows for zeros in the data (Burbidge et al.

1988; Layton 2001).

# Results

Some results are consistent for all nine regressions. The effect of price on sales is significant for each analysis, although the magnitude is much smaller for wholesale sales. For retail sales, the price elasticity for aggregated sales is estimated at -.91 while for wholesale it is estimated at -.19. There is consistently a statistically significant effect on the demand for liquor with higher ethanol, however, the direction of the effect is not always the same. Ethanol are demand are positively correlated except in the case of rural and aggregate wholesale demand. Ethanol seems to be in higher demand for urban consumers buying retail. Wine is a statistically significant substitute for liquor, although the results for beer are mixed and less robust.

As the unemployment rate increases, demand for liquor decreases, implying that liquor is a normal good. This effect was strongest for wholesale urban demand. This implies that if the lockdowns caused an increase in unemployment, this would have a negative effect on liquor sales. Therefore, any increases in liquor are from other factors than the employment effects.

The number of new COVID-19 cases in the county had very different effects for retail and wholesale cases. New cases in the county caused an increase in liquor demand for retail sales. At the same time, wholesale sales decreased as cases increased, presumably due to the fact that restaurants closed down as cases increased. However, this effect was smaller and not significantly significant in rural areas, meaning that COVID-19 cases mainly drove down wholesale demand for liquor in urban areas. The interpretation of this result can be difficult since the number of cases is associated with both regulation and anxiety that consumers may face. However, it seems logical that new cases would decrease wholesale and increase retail sales.

Given the size of the estimates and the size of retail vs. wholesale sales, the net effect is that an increase in the number of local COVID-19 cases increases overall alcohol consumption. Since, this is apart from statewide dummy variables controlling for the month, this may suggest that some of these sales were due to anxiety from an increase in the number of cases nearby.

The month effects also vary between retail and wholesale, as well as urban vs. rural. First, the Feb2020 variable is not significant in any of the regressions. Clearly consumer behavior had not been dramatically changed by February of 2020, but this non-significance is noteworthy in that there does not seem to be any omitted factors influencing liquor demand at that time. Aggregate statewide liquor demand increased starting March and peaked in April and May at a 43.9%.[1] By August, the month indicator variables for overall sales was not significant. However, in Urban areas, the increase in demand for liquor was shorter lived, as only the April and May indicator variables were significant. This might be offset by the fact that there were higher levels of COVID-19 cases in urban areas. In the estimations of the retail sales, the statistical significance of the month indicator variables is similar, however the increase in demand peaked in April at 69.4%.

For wholesale demand, effects varied widely by urban and rural areas. This may be due to differences in restrictions. Rural areas saw a drop in March, but both areas had large negative coefficients in April. In May, rural areas again had lower demand while urban areas were positive, although not statistically significant. In June, both areas saw positive increases in demand, although the coefficient was much larger in urban areas. In July and August, aggregate and rural wholesale demand saw no statistically significant changes, but urban areas continued to see large and significant increases in demand. These results could be due to many reasons. Again, urban areas saw more new COVID-19 cases, which decreases demand. Also,

[1] $e^{.364} - 1 = .439$

both COVID-19 cases and urban/rural are undoubtedly correlated with restaurant restrictions and social pressure to be socially distant. Whatever the reason, it seems clear that wholesale demand differed in urban and rural areas.

# Conclusion

Retail liquor sales increased significantly in the pandemic months of March 2020 through August 2020. However, the increase in retail sales was partially offset by a large decrease in wholesale (restaurant and bar) sales. Taken together, total liquor consumption was still up by almost 10%. While this number is somewhat smaller than some other reports, probably due to the fact that our analysis include alcohol consumption both inside and outside the home, it still represents a substantial increase in overall liquor consumption during the pandemic. Also, the initial increase in liquor purchases was higher in March, but the increase has dissipated over time.

We also found that COVID-19 cases and corresponding increased unemployment, while a significant determinant of liquor consumption, did not explain all the change in overall liquor sales during the pandemic months. There were still large month fixed effects. Furthermore, we find some evidence that rural counties were less impacted by number of COVID-19 cases, which could imply they were more impacted by the lockdowns and regulation. To this point, after controlling for COVID-19 cases, wholesale sales in urban counties were actually expected to be higher than they actually were, indicating that while the actual number of cases were responsible for driving down wholesale liquor demand in urban areas, it was state-wide restrictions that were more responsible for reduced wholesale demand in rural areas.

It was also found that the retail liquor sales seems to be more persistent in rural areas than in urban areas. While retail sales in urban areas largely returned to their

pre-pandemic level by June, retail sales in rural areas are still significantly above their pre-pandemic levels.

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Table 1: Changes in Liquor Sales in Idaho

| | Total Liquor | Retail Liquor | Resturant Liquor |
|---|---|---|---|
| Liters Sold Mar-Aug 2020 | 6,527,005 | 5,920,816 | 571,513 |
| Liters Sold Mar-Aug 2019 | 5,689,822 | 4,668,127 | 969,126 |
| Percent Change 2019 to 2020 | 14.71% | 26.83% | -41.03% |
| Expected Percent Change Based on Trend | 5.31% | 6.37% | 2.17% |
| Expected Mar-Aug 2020 Sales | 5,991,952 | 4,965,486 | 990,156 |
| Percent Diviation from Trend | 8.93% | 19.24% | -42.28% |

Table 2: Monthly Changes in Liquor Sales in Idaho

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug |
|---|---|---|---|---|---|---|---|---|
| Total liters sold in 2019 | 802,982 | 780,485 | 884,502 | 837,001 | 953,689 | 935,316 | 1,041,428 | 1,037,888 |
| Total liters sold in 2020 | 849,967 | 854,772 | 1,122,311 | 947,945 | 1,089,483 | 1,085,436 | 1,179,391 | 1,102,439 |
| % change 2019 to 2020 | 5.85% | 9.52% | 26.89% | 13.25% | 14.24% | 16.05% | 13.25% | 6.22% |
| Average monthly change 2017 to 2019 | 5.54% | 5.32% | 5.31% | 5.70% | 5.54% | 4.56% | 5.62% | 5.21% |

Table 3: Summary Statistics

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| total liters sold | 808,604 | 145.98 | 408.17 | 0.20 | 18,483.60 |
| real price per liter | 795,834 | 28.00 | 16.86 | 1.02 | 4,960.00 |
| percent ethanol | 795,834 | 0.38 | 0.06 | 0.10 | 0.95 |
| cpi for beer | 808,768 | 211.77 | 14.32 | 179.71 | 240.50 |
| cpi for wine | 808,768 | 169.04 | 2.38 | 160.59 | 173.78 |
| unemployment rate in county | 794,608 | 0.06 | 0.03 | 0.01 | 0.23 |
| new covid cases per 100k people | 794,490 | 10.04 | 84.91 | 0.00 | 2,696 |
| Fixed Effects | | | | | |
| Month | 12 months | | | | |
| Year | 14 years | | | | |
| Store | 186 stores | | | | |
| Liquor type | 58 types | | | | |

Table 4: Demand for Liquor in Idaho

| | STATEWIDE | | | URBAN | | | RURAL | | |
|---|---|---|---|---|---|---|---|---|---|
| ln(total liters) | Coef. | Std. Err. | P>z | Coef. | Std. Err. | P>z | Coef. | Std. Err. | P>z |
| ln(real price per liter) | -0.8055 | 0.0064 | <.0001 | -0.7903 | 0.0123 | <.0001 | -0.7667 | 0.0074 | <.0001 |
| ln(percent ethanol) | 0.3375 | 0.0222 | <.0001 | 1.2035 | 0.0510 | <.0001 | 0.2435 | 0.0248 | <.0001 |
| ln(cpi for beer) | 0.0088 | 0.2299 | 0.9690 | 0.8968 | 0.3879 | 0.0210 | -0.2559 | 0.2762 | 0.3540 |
| ln(cpi for wine) | 1.1298 | 0.1635 | <.0001 | 1.4940 | 0.2850 | <.0001 | 0.8473 | 0.1957 | <.0001 |
| ln(unemployment rate) | -0.2790 | 0.0057 | <.0001 | -0.3390 | 0.0142 | <.0001 | -0.2218 | 0.0063 | <.0001 |
| ihs(new covid cases per 100k) | 0.0249 | 0.0031 | <.0001 | 0.0509 | 0.0180 | 0.0050 | 0.0077 | 0.0034 | 0.0230 |
| Feb-20 | -0.0063 | 0.0169 | 0.7080 | 0.0018 | 0.0283 | 0.9500 | -0.0101 | 0.0205 | 0.6220 |
| Mar-20 | 0.0665 | 0.0190 | <.0001 | -0.0518 | 0.0781 | 0.5070 | 0.1032 | 0.0218 | <.0001 |
| Apr-20 | 0.3644 | 0.0234 | <.0001 | 0.4019 | 0.0971 | <.0001 | 0.3144 | 0.0264 | <.0001 |
| May-20 | 0.3645 | 0.0212 | <.0001 | 0.3217 | 0.0706 | <.0001 | 0.3643 | 0.0240 | <.0001 |
| Jun-20 | 0.2054 | 0.0234 | <.0001 | 0.1032 | 0.1121 | 0.3570 | 0.2441 | 0.0262 | <.0001 |
| Jul-20 | 0.0966 | 0.0273 | <.0001 | -0.0790 | 0.1410 | 0.5750 | 0.1873 | 0.0302 | <.0001 |
| Aug-20 | -0.0048 | 0.0274 | 0.8610 | -0.1480 | 0.1307 | 0.2580 | 0.0882 | 0.0311 | 0.0050 |

| | STATEWIDE | | | URBAN | | | RURAL | | |
|---|---|---|---|---|---|---|---|---|---|
| ln(retail liters) | Coef. | Std. Err. | P>z | Coef. | Std. Err. | P>z | Coef. | Std. Err. | P>z |
| ln(real price per liter) | -0.9144 | 0.0063 | <.0001 | -0.8642 | 0.0119 | <.0001 | -0.8903 | 0.0075 | <.0001 |
| ln(percent ethanol) | 0.3189 | 0.0228 | <.0001 | 1.1027 | 0.0500 | <.0001 | 0.2473 | 0.0262 | <.0001 |
| ln(cpi for beer) | 0.2557 | 0.2291 | 0.2640 | 0.8637 | 0.3799 | 0.0230 | 0.0540 | 0.2783 | 0.8460 |
| ln(cpi for wine) | 1.3041 | 0.1628 | <.0001 | 1.3218 | 0.2792 | <.0001 | 1.1112 | 0.1969 | <.0001 |
| ln(unemployment rate) | -0.2584 | 0.0057 | <.0001 | -0.2766 | 0.0139 | <.0001 | -0.2131 | 0.0064 | <.0001 |
| ihs(new covid cases per 100k) | 0.0225 | 0.0031 | <.0001 | 0.0594 | 0.0181 | 0.0010 | 0.0071 | 0.0034 | 0.0360 |
| Feb-20 | -0.0051 | 0.0167 | 0.7610 | -0.0018 | 0.0279 | 0.9500 | -0.0047 | 0.0204 | 0.8170 |
| Mar-20 | 0.1695 | 0.0188 | <.0001 | 0.0187 | 0.0784 | 0.8110 | 0.1994 | 0.0216 | <.0001 |
| Apr-20 | 0.5271 | 0.0229 | <.0001 | 0.4339 | 0.0974 | <.0001 | 0.4948 | 0.0259 | <.0001 |
| May-20 | 0.4703 | 0.0210 | <.0001 | 0.3327 | 0.0713 | <.0001 | 0.4817 | 0.0238 | <.0001 |
| Jun-20 | 0.2441 | 0.0232 | <.0001 | 0.0611 | 0.1127 | 0.5880 | 0.2740 | 0.0260 | <.0001 |
| Jul-20 | 0.1409 | 0.0270 | <.0001 | -0.1197 | 0.1417 | 0.3980 | 0.2135 | 0.0300 | <.0001 |
| Aug-20 | 0.0474 | 0.0271 | 0.0800 | -0.1762 | 0.1314 | 0.1800 | 0.1242 | 0.0309 | <.0001 |

Table 5: Wholesale Demand for Liquor in Idaho

| | STATEWIDE | | | URBAN | | | RURAL | | |
|---|---|---|---|---|---|---|---|---|---|
| ln(wholesale liters) | Coef. | Std. Err. | P>z | Coef. | Std. Err. | P>z | Coef. | Std. Err. | P>z |
| ln(real price per liter) | -0.1945 | 0.0095 | <.0001 | -0.1325 | 0.0178 | <.0001 | -0.1646 | 0.0113 | <.0001 |
| ln(percent ethanol) | -0.3340 | 0.0334 | <.0001 | 0.4923 | 0.0715 | <.0001 | -0.4050 | 0.0392 | <.0001 |
| ln(cpi for beer) | -0.6382 | 0.3253 | 0.0500 | 0.5100 | 0.5354 | 0.3410 | -0.9649 | 0.3988 | 0.0160 |
| ln(cpi for wine) | 1.2312 | 0.2334 | <.0001 | 1.7790 | 0.3916 | <.0001 | 0.9262 | 0.2863 | 0.0010 |
| ln(unemployment rate) | -0.2938 | 0.0083 | <.0001 | -0.4501 | 0.0196 | <.0001 | -0.1957 | 0.0096 | <.0001 |
| ihs(new covid cases per 100k) | -0.0112 | 0.0058 | 0.0530 | -0.1540 | 0.0273 | <.0001 | -0.0112 | 0.0068 | 0.0990 |
| Feb-20 | -0.0427 | 0.0248 | 0.0840 | -0.0491 | 0.0375 | 0.1900 | -0.0411 | 0.0319 | 0.1990 |
| Mar-20 | -0.4816 | 0.0301 | <.0001 | -0.0045 | 0.1177 | 0.9690 | -0.4301 | 0.0351 | <.0001 |
| Apr-20 | -1.7084 | 0.0622 | <.0001 | -0.9314 | 0.1448 | <.0001 | -1.7800 | 0.0826 | <.0001 |
| May-20 | -0.4712 | 0.0360 | <.0001 | 0.1095 | 0.1007 | 0.2770 | -0.5329 | 0.0437 | <.0001 |
| Jun-20 | 0.1456 | 0.0391 | <.0001 | 1.1142 | 0.1692 | <.0001 | 0.0957 | 0.0447 | 0.0320 |
| Jul-20 | 0.0459 | 0.0471 | 0.3300 | 1.1198 | 0.2133 | <.0001 | 0.0672 | 0.0538 | 0.2110 |
| Aug-20 | -0.0057 | 0.0476 | 0.9040 | 1.0242 | 0.1971 | <.0001 | -0.0016 | 0.0564 | 0.9780 |

Figure 1: Changes in Grocery and Restaurant/Hotel spending in Idaho

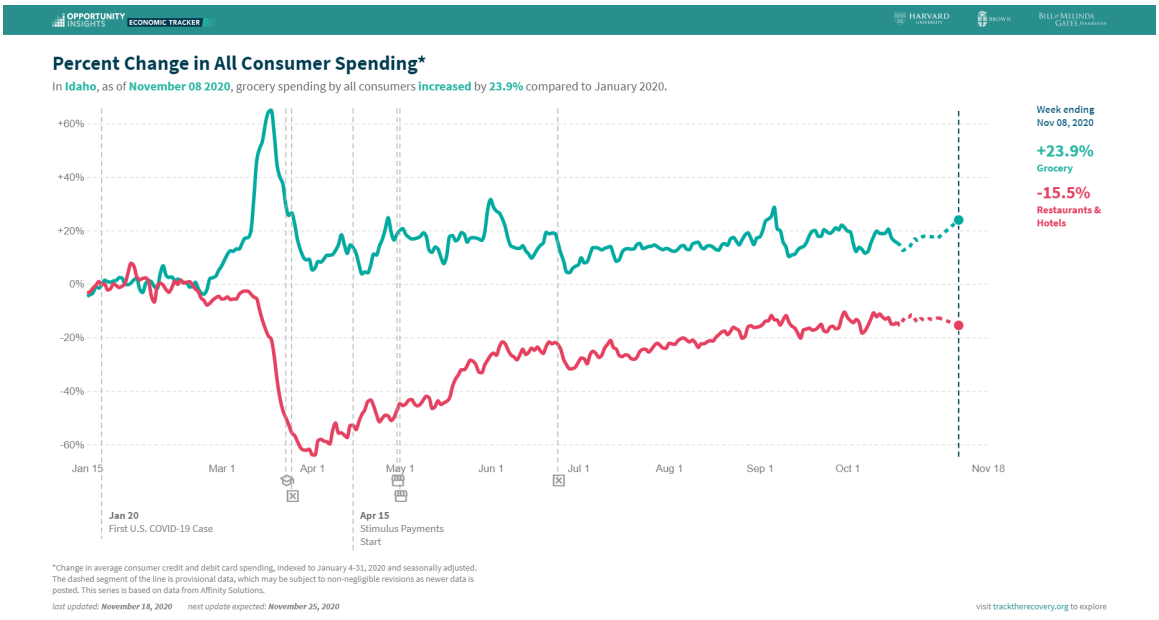

Figure 2: Retail and Wholesale liquor sales in Idaho by month

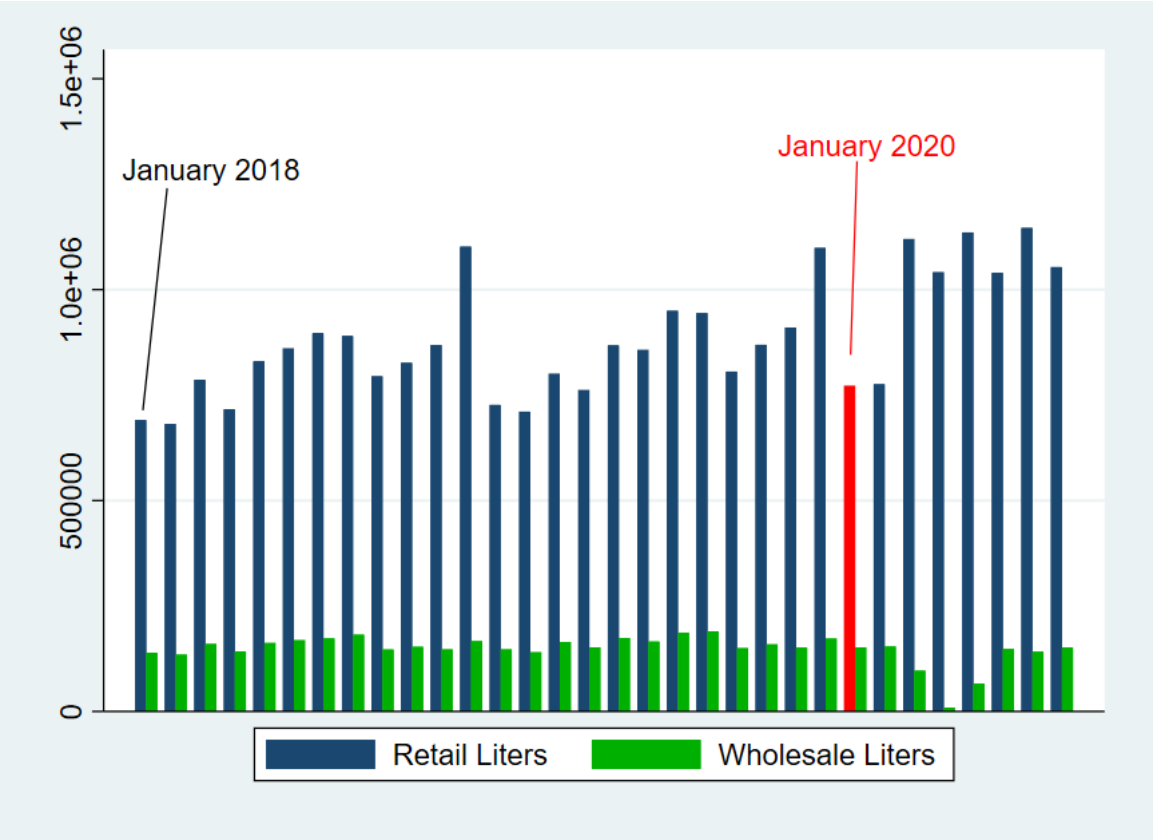

Figure 3: Total Liters Sold

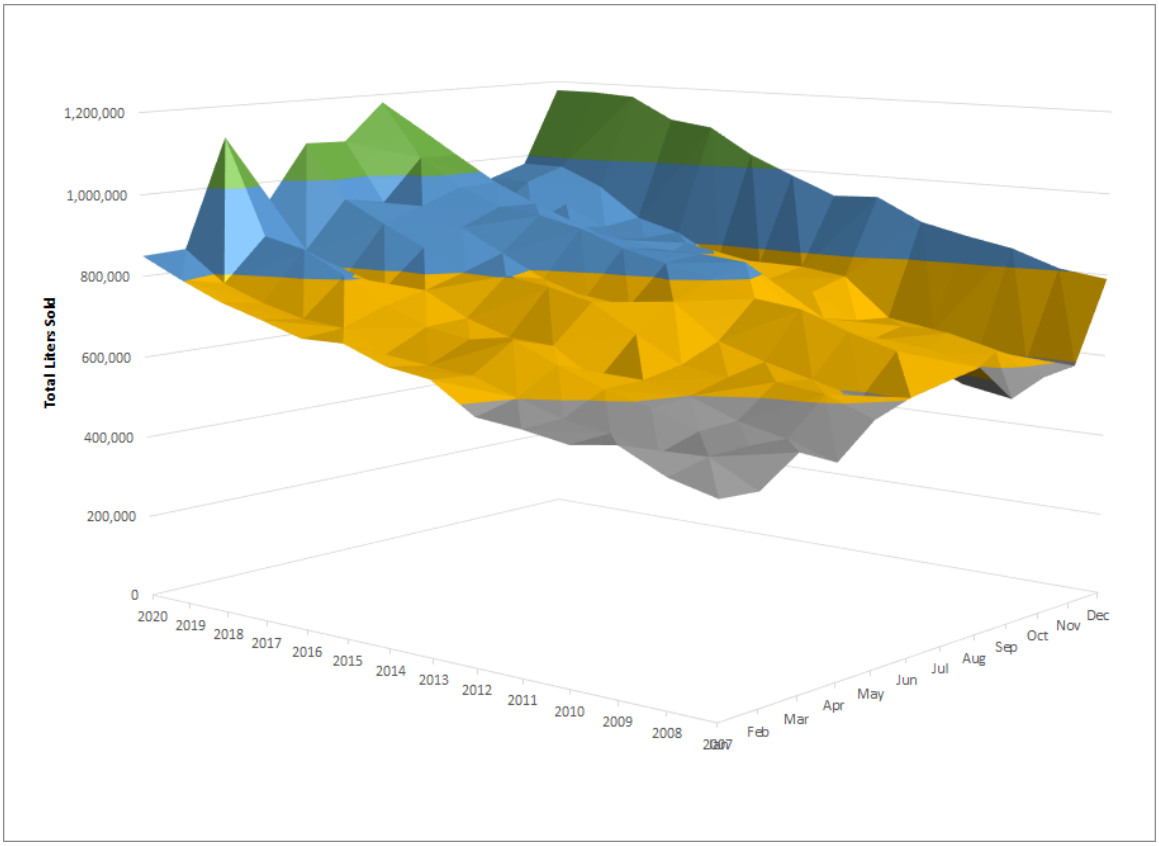

Figure 4: Retail Liters Sold

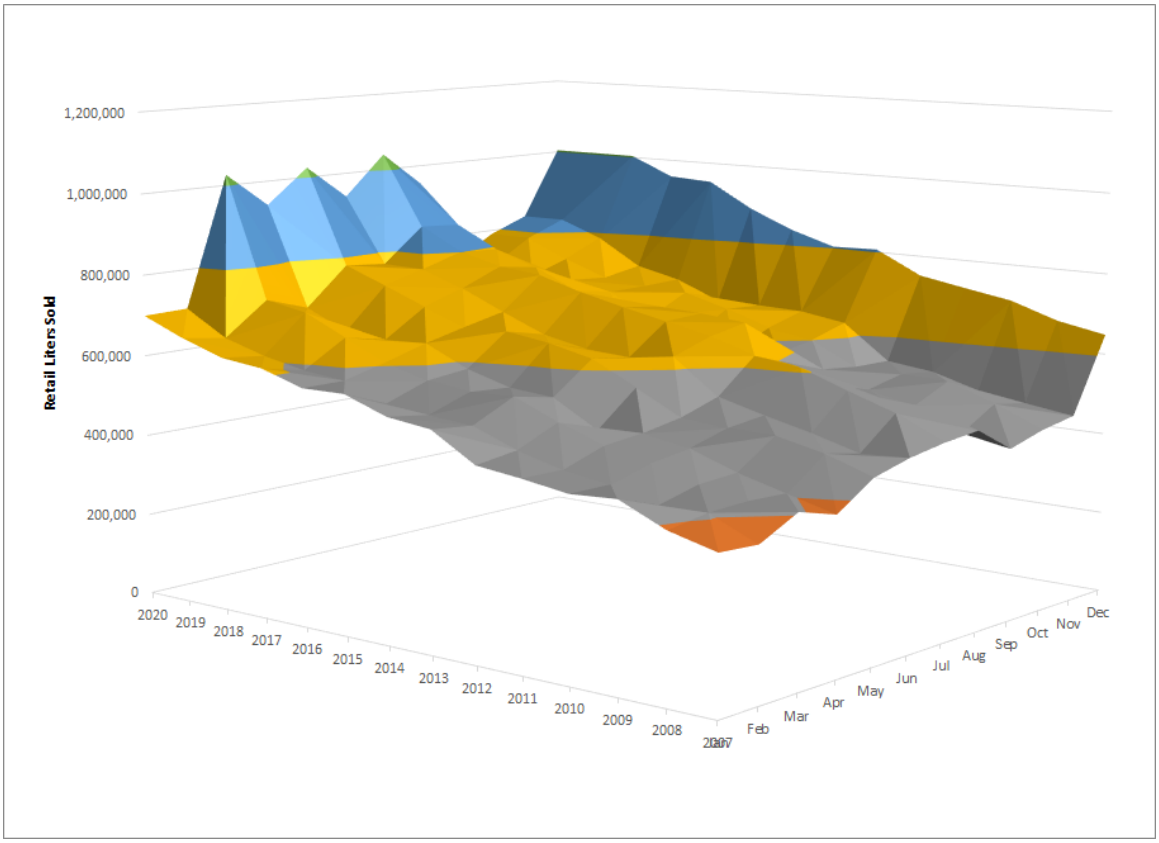

Figure 5: Wholesale Liters Sold