



Budget Model

Effects of a Federal Gas Tax Holiday

A follow up post estimates the effects of a three-month federal gas tax holiday as proposed by the Biden Administration.

Summary: We estimate that suspending the federal gas tax from March to December 2022 would lower average gasoline spending per capita between \$16 and \$47, depending on geographic location and assumptions, but lower federal tax revenue by about \$20 billion over that period.

Introduction

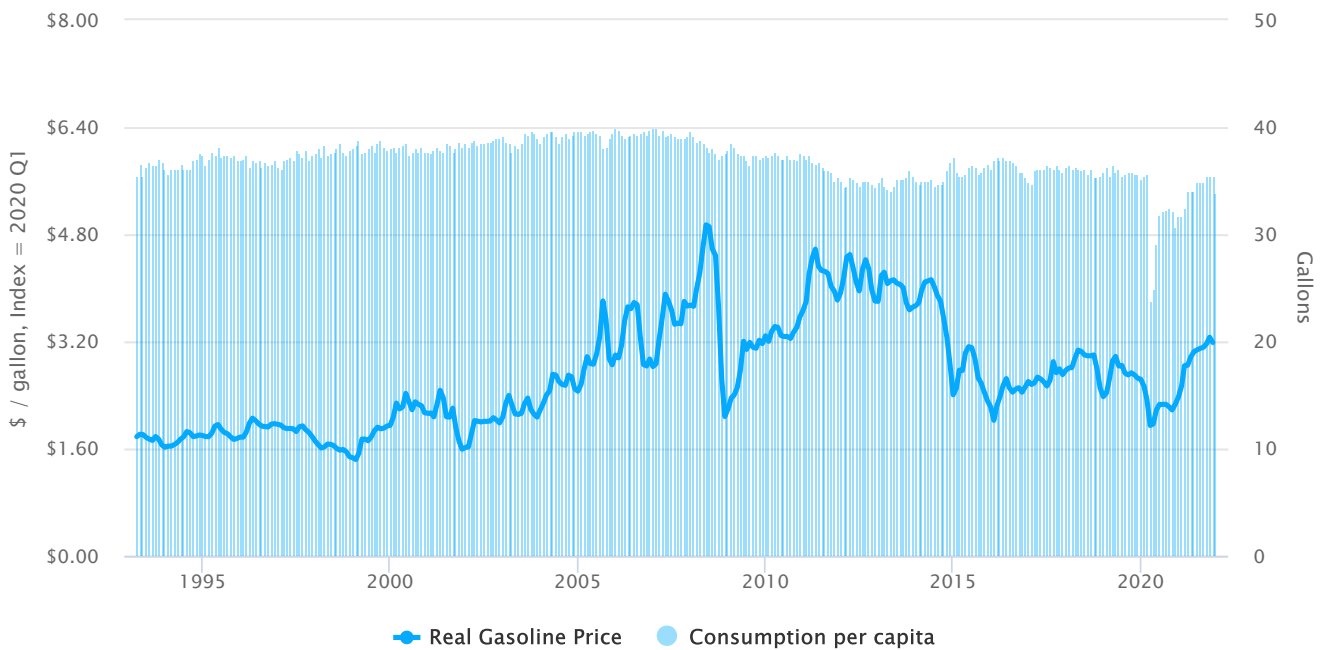
Last month, a group of senators introduced a bill that would suspend the federal excise tax on gasoline through the end of this year. The proposal was unveiled at a time of rising gasoline prices. Based on recent data from the U.S. Energy Information Administration (EIA), the average retail gasoline price reached [\\$3.70 per gallon](#) which was a 32.3 percent increase from a year ago. We examine the effects of a federal gasoline tax holiday on gasoline consumption expenditure and federal and state tax revenue. We report the national averages, as well as by state given the variation in gasoline consumption and taxation across states.

Gasoline prices and consumption expenditure

Gasoline prices have fluctuated over time. Figure 1 shows the real U.S. average price and consumption per capita from 1993 to 2021.¹ Even though the prices rose and fell over the years, consumption stayed relatively flat. It dropped sharply in April 2020 as the pandemic lockdowns went into effect but have rebounded since then.

Figure 1: Retail gasoline price vs Consumption per capita

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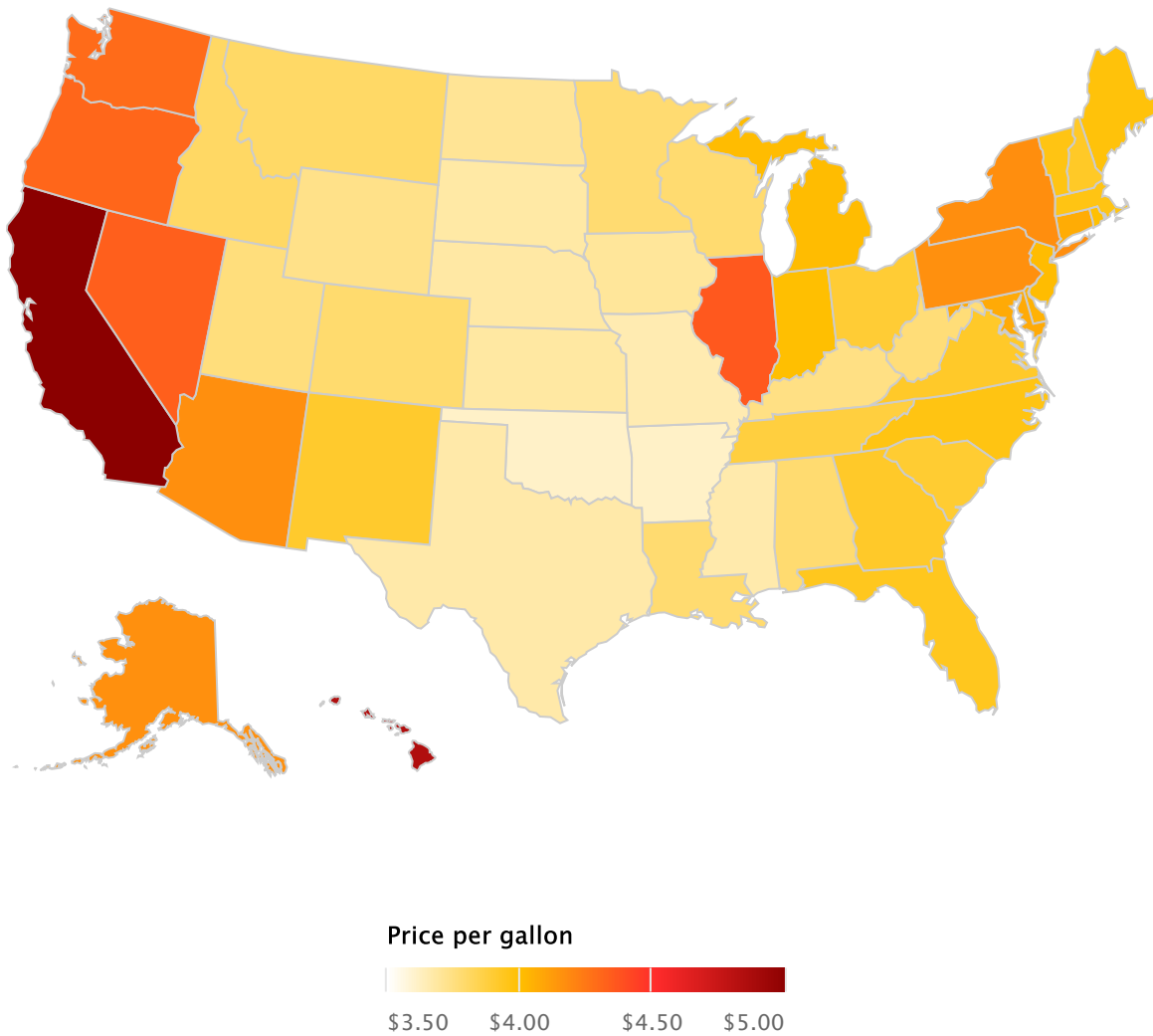


Source: U.S. Energy Information Administration, U.S. Bureau of Economic Analysis

Gasoline prices also vary considerably across states. Figure 2 shows the average gasoline price in each state as of March 3rd, 2022. Gasoline retail prices on the West Coast are generally higher compared to other regions. California has the highest price in the nation with a state average of \$5.09 per gallon. On the other hand, Rocky Mountain and Gulf Coast regions generally see lower prices than average while Oklahoma has the lowest price in the nation at \$3.61 per gallon.

Figure 2: U.S Average Gasoline Retail Prices by State

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Source: AAA Gas Price Website

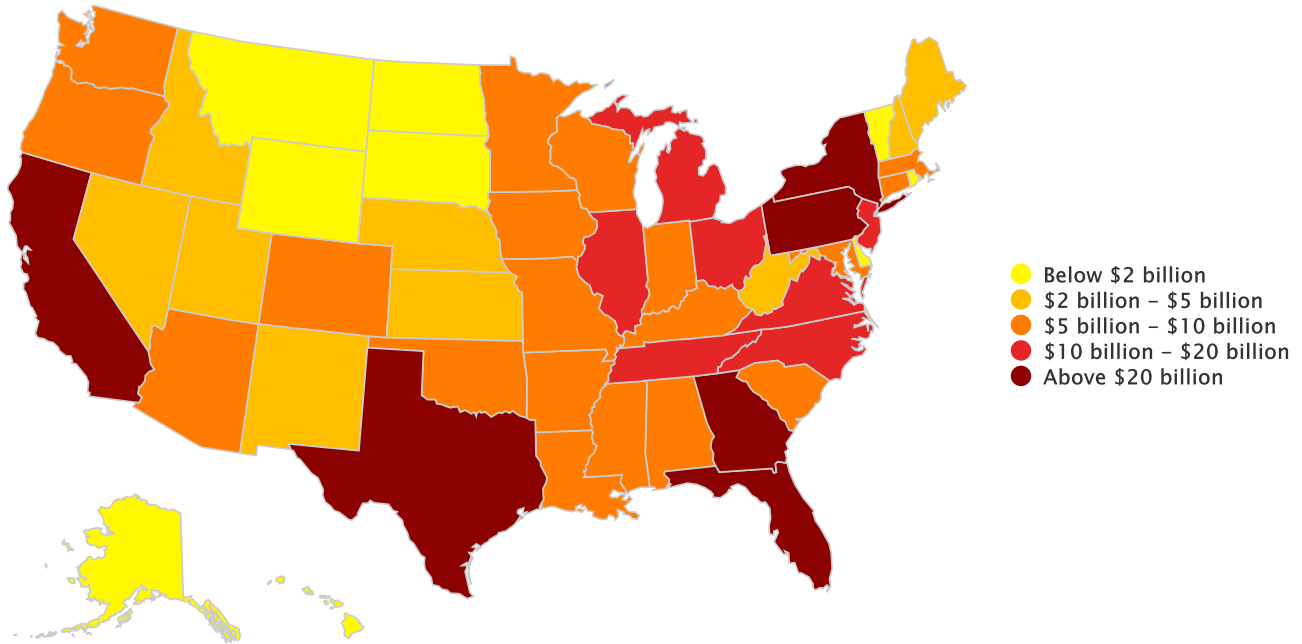
The difference in gasoline prices along with the difference in gasoline consumption leads to a big variation in gasoline expenditure across states.² The state total gasoline expenditure ranges from \$358 million in the District of Columbia to \$54 billion in California. The per capita gasoline expenditure is the highest at \$1,853 in Alabama and the lowest at \$534 in DC. Due to this variation, consumers in different states would experience different levels of change in their gasoline consumption expenditure following the suspension of the federal gasoline excise tax.

Figure 3: Total and Per Capita Gasoline Expenditures by State from March to December 2022

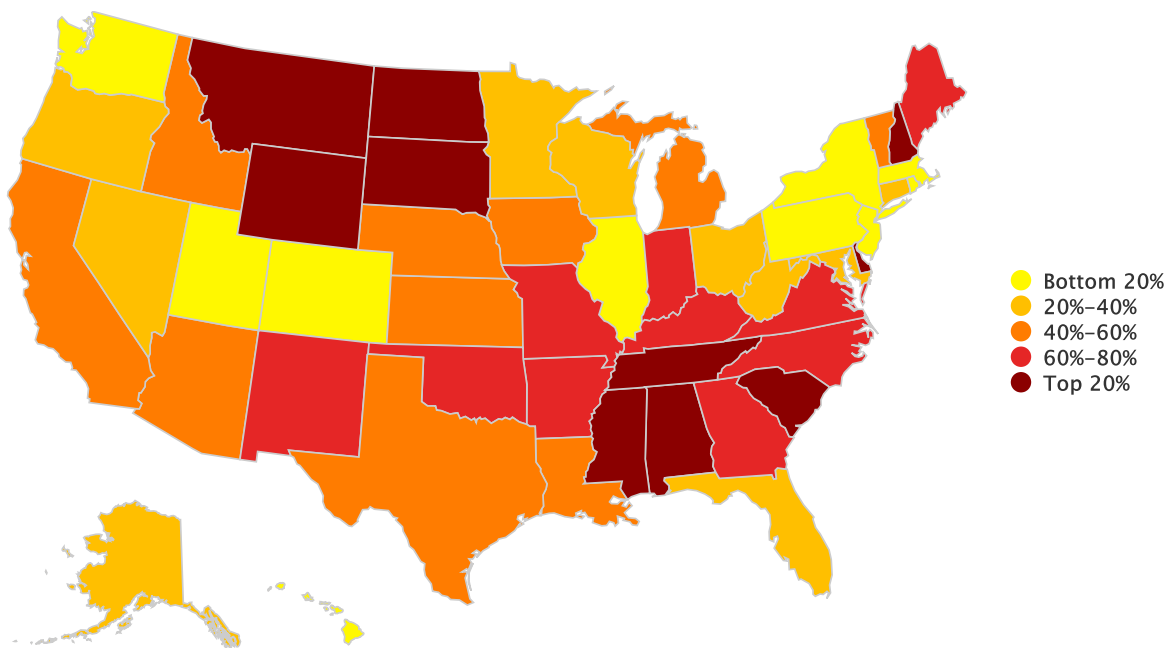
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- Total Expenditures
- Per Capita Expenditures

Total Expenditures



Per Capita Expenditures



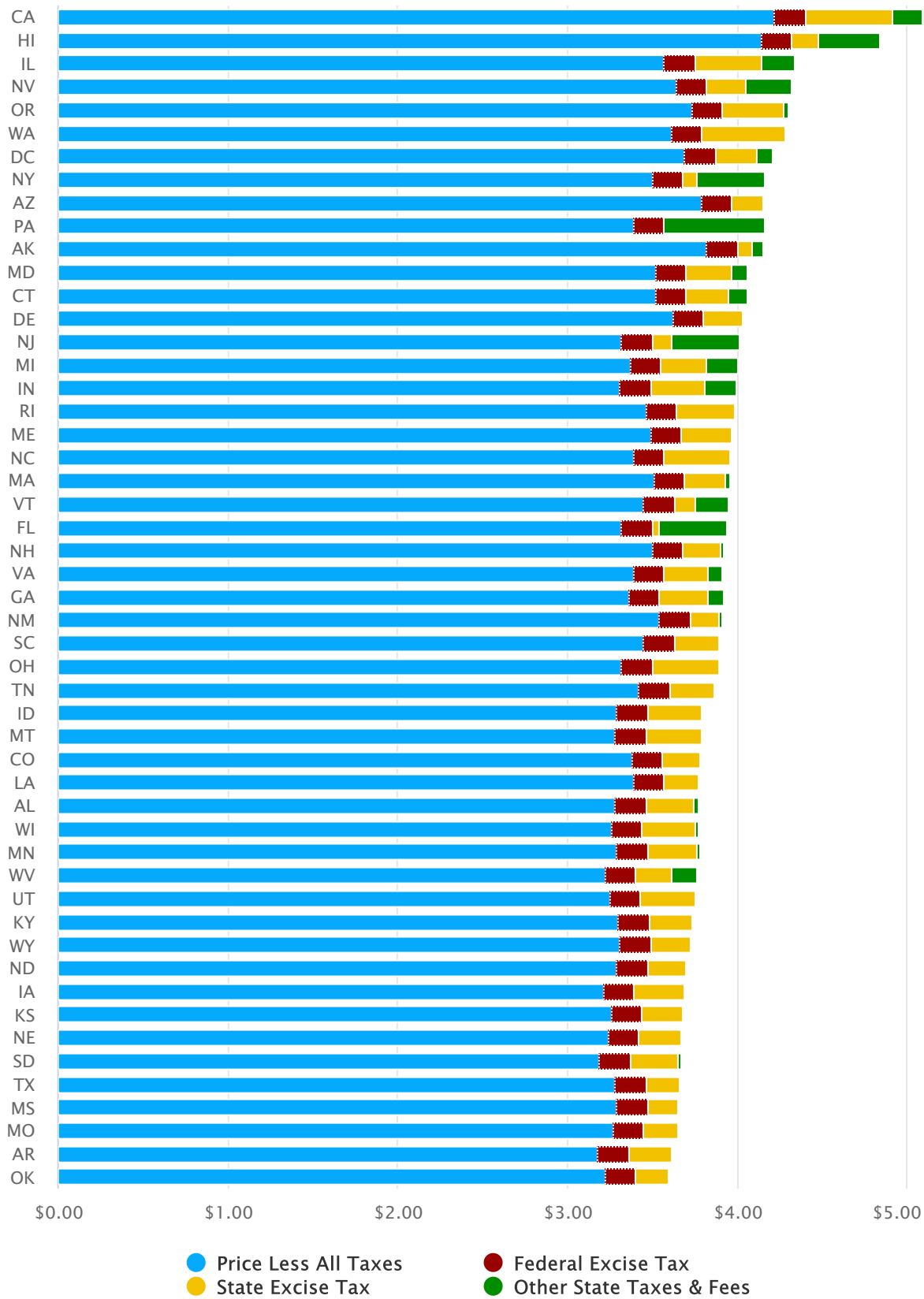
Source: U.S. Energy Information Administration, U.S. Bureau of Economic Analysis, AAA Gas Price

Gasoline taxes in the United States

The federal gasoline tax was first introduced in 1933 and it has stayed at 18.4 cents per gallon since 1993.³ Because it is not adjusted for inflation, the federal gasoline tax has declined in real terms. In addition to the federal gasoline tax, there are also state excise taxes on gasoline and other taxes and fees such as environmental surcharges applied at the state and local level. The average state excise tax on gasoline is 25.45 cents per gallon which ranges from 0 in Pennsylvania to 51.1 cents per gallon in California. Other state taxes and fees applied to gasoline range from 0 in a few states such as Texas and Iowa to 58.7 cents per gallon in Pennsylvania with an average of 12.14 cents per gallon. Ultimately, the combined [state excise tax and other state taxes and fees](#) range from 15.13 cents per gallon in Alaska to 68.15 cents per gallon in California, with an average of 38.07 cents per gallon. Figure 4 shows the federal excise tax on gasoline along with the state excise taxes, other state taxes and fees and the gasoline retail prices for each state. Federal excise tax accounts for a small fraction of the gasoline prices consumers see at the pump, 4.61 percent on average, while the share of state taxes and fees varies by state. For example, on average, consumers from Pennsylvania and Alaska see similar gasoline prices at \$4.16 per gallon but the composition of producer prices and taxes is different. Pennsylvania has relatively low producer prices of \$3.39 per gallon while state taxes on gasoline are high. In contrast, Alaska has relatively low state level taxes, but the producer prices are higher at \$3.82 per gallon.

Figure 4. Federal, State Taxes and Retail Gasoline Prices

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Source: AAA Gas Price Website, American Petroleum Institute

Effects of a federal gas tax holiday

The gasoline tax is an excise tax, and it is imposed on the producers and passed on to consumers through higher prices. The tax creates a wedge between the prices that consumers pay and the prices that producers receive. Consumers and producers share the burden of tax with more of the burden falling on the side of the market that is more inelastic. The U.S. gasoline market is typically characterized by inelastic supply and inelastic demand in the short run.⁴ For example, using excise tax returns from the IRS from 1990 to 2009, [Coyle, et al. \(2012\)](#) find the short-run price elasticity of demand for gasoline to be -0.07 and that of supply to be 0.29 . These elasticities imply that 80% of the tax burden falls on consumers and as a result, 80% of a tax decrease would be passed on to consumers in the form of lower prices.⁵

We estimate the change in gasoline consumption and expenditure per capita in each state as well as the change in federal and state revenue in the case that the federal gas tax is suspended from March to December 2022. We make the following two assumptions: (1) 80% of the tax decrease, that is, 14.72 cents per gallon, translates into lower prices paid by consumers and (2) gasoline demand increases as a result of the lower prices with an elasticity of -0.07 . Using different estimation methods and datasets, the literature finds a short-run gasoline demand elasticity that mostly falls between 0 and -0.4 .⁶ We therefore also show the estimates with a demand elasticity of -0.4 and an implied tax incidence of 41.2% that falls on consumers.

Table 1 reports the change in federal tax revenue along with the average change in state tax revenue and gasoline consumption and expenditure per capita across states. We find that the federal gas tax holiday would reduce federal tax revenue by about \$20 billion and increase state tax revenue by between \$100 and \$300 million on average due to increased consumption from lower consumer prices. Given that the federal tax on gasoline is small compared to prices and the demand for gasoline, at least in the short run, is very inelastic, we do not find a significant change in people's gasoline consumption expenditure. From March to December 2022, the average increase in gasoline consumption per capita across states would be between 0.9 and 2.7 gallons and the average decrease in gasoline expenditure per capita would be between 16 and 47 dollars depending on the demand elasticity. When the demand elasticity is higher, people increase their gasoline consumption by more in response to lower consumer prices which leads to a smaller reduction in their gasoline expenditure.

Table 1: Change in Federal and State Tax Revenue, Gasoline Consumption and Expenditure

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Demand Elasticity	Change In Federal Tax Revenue (billion \$)	Change In State Tax Revenue (billion \$)	Average Consumption Change (gallon)	Average Expenditure Change (\$)
-0.07	-19.86	0.10	0.90	-47.18
-0.40	-19.86	0.30	2.67	-15.83

Figure 5 shows the estimated change in gasoline consumption and expenditure per capita in each state under the two different demand elasticity assumptions. In both cases, the increases in consumption per capita are small. Generally, larger states like Wyoming where driving is the primary mode of transportation would experience a larger increase in consumption.⁷ States like Oklahoma where the retail gasoline prices are lower would also experience a larger increase in consumption as the federal excise tax accounts for a larger share of

the prices.⁸ Consumers would benefit from the drop in gasoline prices, but the effects are small. The decreases in their gasoline consumption expenditure from March to December 2022 vary from \$17 in DC to \$67 in Alabama (\$5.8 and \$22.6, respectively, when demand elasticity is -0.4).

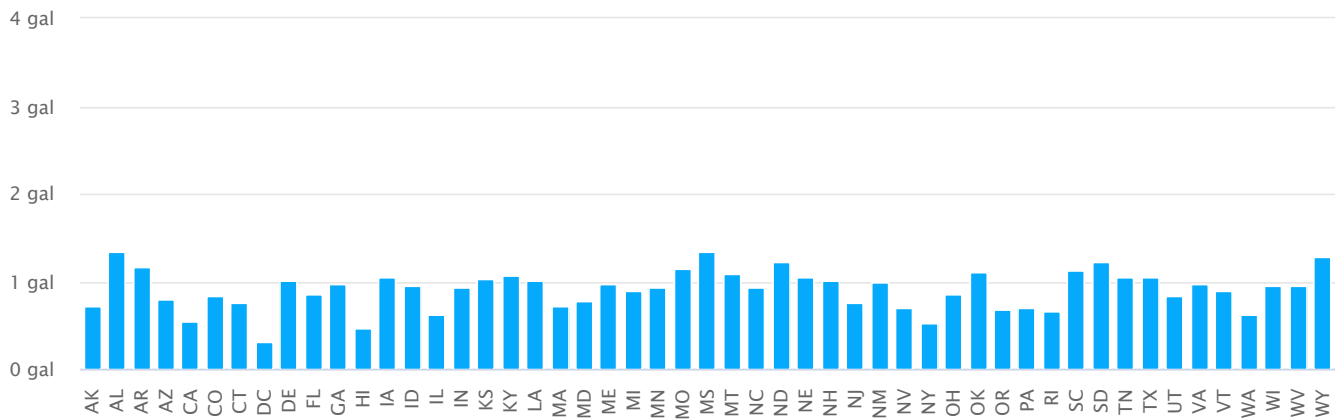
Figure 5: Estimated change in gasoline consumption and expenditure per capita by state

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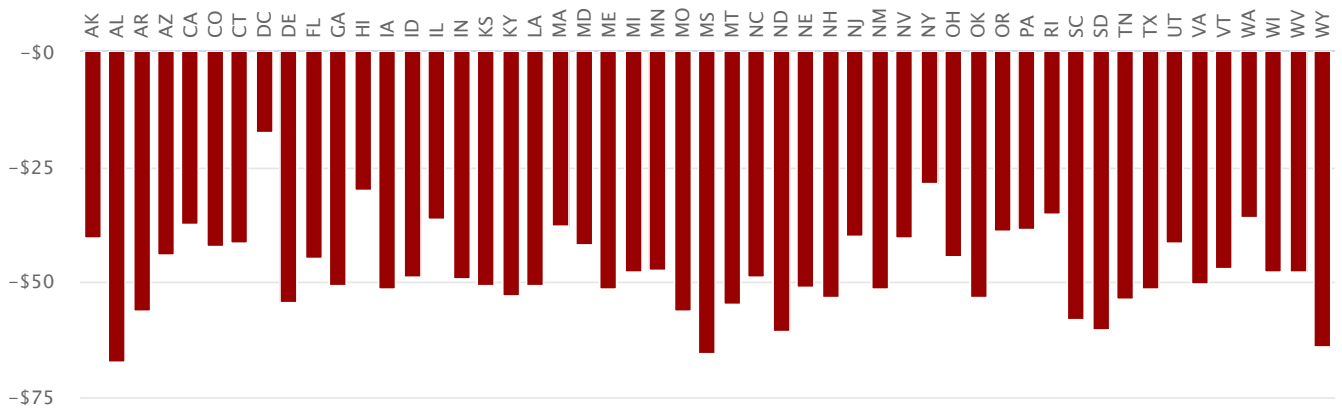
- Elasticity = 0.07
- Elasticity = 0.4

Elasticity = 0.07

Per Capita Consumption Change

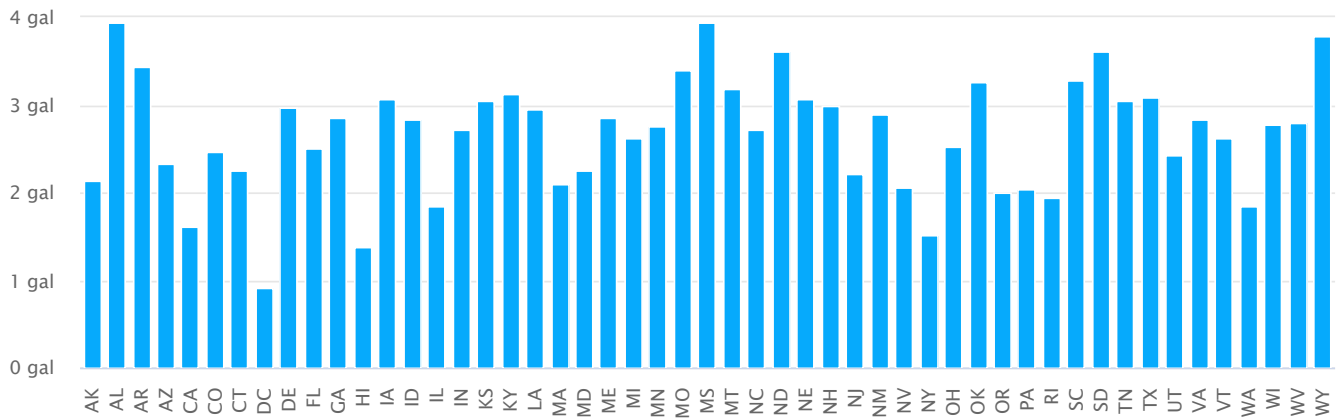


Per Capita Expenditure Change

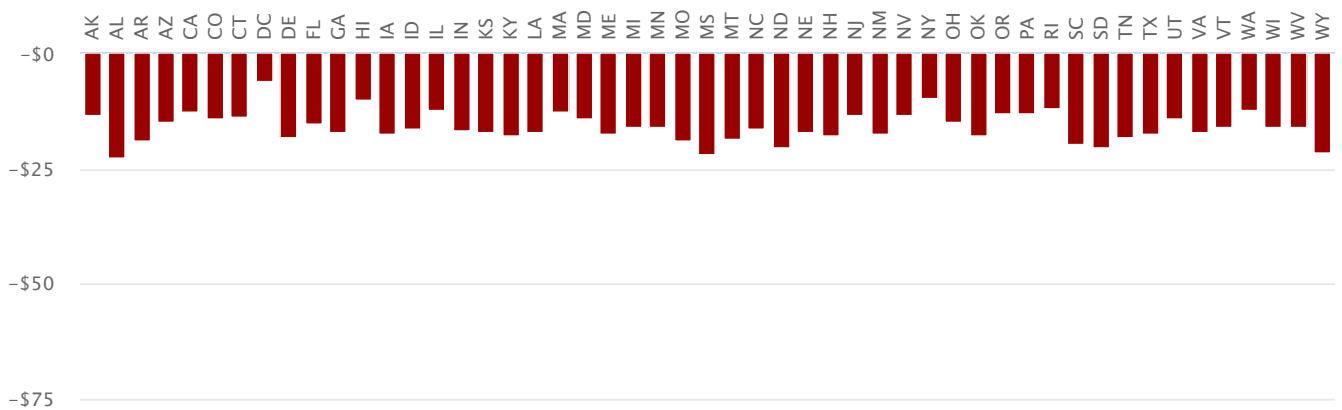


Elasticity = 0.4

Per Capita Consumption Change



Per Capita Expenditure Change



Source: U.S. Energy Information Administration

This analysis was prepared by [Zheli He](#) and [Xiaoyue-Sun](#) under the direction of [Richard Prisinzano](#). Prepared for the website by [Mariko Paulson](#).

1. We use the GDP Implicit Price Deflators from the Bureau of Economic Analysis to convert the nominal gasoline retail prices to constant 2020 Q1 dollars and use their data on population to calculate per capita consumption. We seasonally adjust consumption per capita to make it comparable across time. ↩
2. Data on the state-level gasoline consumption from the EIA are only available through 2020. The EIA provides projections for gasoline consumption at the national level for 2022 based on different oil price scenarios. We calculate the percentage change in total U.S. gasoline consumption from 2020 to 2022 using EIA’s projections and impute each state’s gasoline consumption for 2022 assuming that the percentage change is the same across states between 2020 and 2022. We then adjust the annual consumption by the share of March to December based on monthly gasoline consumption. Finally, we calculate each state’s gasoline expenditure from March to December 2022 under the assumption that state gasoline prices stay at their March 3rd levels. ↩

3. The 18.4 cents per gallon includes \$0.001 per gallon leaking underground storage tank fee. ↩
4. In the long run, consumers may exchange for electric cars, switch to other transportation modes, for example, by taking the bus rather than driving, or move for a shorter commute, in response to higher gasoline prices. As a result, gasoline demand becomes more elastic over time. ↩
5. Studying the suspension and reinstatement of the gasoline sales tax in Illinois and Indiana, [Doyle and Samphantharak \(2008\)](#) find that 70% of the tax suspension translates into lower prices for consumers and 80%-100% of the tax reinstatements fall on consumers. ↩
6. [Hughes, Knittel and Sperling \(2008\)](#) find that the short-run gasoline demand became more inelastic in the past decades from -0.21 to -0.34 between 1975 and 1980 to -0.034 to -0.077 between 2001 and 2006. Using leads and lags of gasoline taxes to separate out the variation in gasoline prices that is not driven by demand, [Coglianese, et al. \(2017\)](#) find a short-run demand elasticity of -0.37 . [Levin, Lewis and Wolak \(2017\)](#) find short-run demand elasticities that range from -0.27 to -0.35 using data on daily credit card purchases of gasoline. ↩
7. Even if the percentage increases in consumption per capita are the same in two states, the state with a higher level of initial consumption per capita would experience a bigger increase in quantity consumed. ↩
8. These states would experience a bigger percentage decrease in gasoline consumer prices as a result of the federal gas tax. ↩