

HEALTH AND HUMAN SCIENCES

How Temperature Affects Retail Gasoline Prices: An Empirical Study

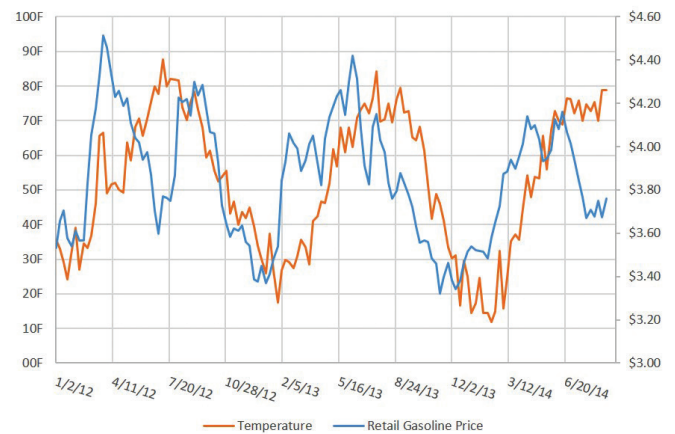
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Local observations in West Lafayette, Indiana, have revealed that retail gasoline prices correlate with temperature variations. This means that significant temperature shocks might signal sharp retail gasoline price changes. Since local consumers' sentiment strongly corresponds with the variation in retail gasoline prices, it is important to determine how temperature variations affect local retail gasoline prices. It is also important to determine whether this relationship exists throughout the United States, not just in West Lafayette.

The hypothesis of this study is there is positive correlation between temperature and retail gasoline prices. This is because generally, increases in temperature equal an increase people's demand for gasoline and their elasticity in demand, which could lead to price increases. A data set with weekly average retail gasoline prices and corresponding temperatures from 10 cities in the United States was obtained from the U.S. Energy Information Administration and local weather stations, along with crude oil prices and natural gas prices, which are other factors that would affect retail gasoline prices. After removing the influence on crude oil price, natural gas price, seasonal influence, and the distance to refinery facilities (regional influence), the result shows that on average throughout the United States, temperature and retail gasoline prices are positively correlated. The faster the temperature increases, the sharper the retail gasoline prices increase.

However, when the United States was divided into different geographic regions, such as the East Coast, the West Coast, the Great Lakes Area, the West and the South, the same estimation showed different results among different regions. Results from the Great Lakes Area, the West, and the South are consistent with the average result, but results from the West Coast and the East Coast differ. This might be the result of special circumstances in these regions, such as policies, economics, or nature. Therefore, research on specific geographic regions is needed, as well as research on the demand changes with temperatures.

Research advisor Kevin Mumford writes, "This paper is interesting because it estimates the relationship between gasoline price and the temperature in 10 major U.S. cities using a fixed-effects estimation strategy. If the temperature is above average for the week in the specific city, the results show that the gasoline price is statistically higher than usual."



Chicago retail gasoline price and temperature (1/2/12–9/1/14).

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