

Study: Reducing carbon emissions: High gas taxes equal low impact

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Increasing the federal gasoline tax would have only minimal effects in reducing vehicle carbon dioxide emissions, says a University of Michigan economist.

For example, a 10-cent increase in gas taxes would lower U.S. carbon emissions from the transportation sector by about 1.5 percent and decrease total U.S. carbon emissions (from all sectors) by about 0.5 percent, says Lutz Kilian, U-M professor of economics.

"Although not negligible, this is small when compared to recent annual increases in carbon emissions," he said. "To put this estimate in context, total U.S. carbon dioxide emissions increased by 1.1 percent annually between 1990 and 2007, so a 10-cent gasoline-tax increase would approximately offset half a year of growth in total U.S. emissions."

Currently, the [federal tax](#) on [gasoline](#) is 18.4 cents per gallon and the average state and local taxes on gas are another 29 cents per gallon. About a third of all carbon dioxide emissions in the United States are derived from the transportation sector.

In a new study forthcoming in the *Journal of Applied Econometrics*, Kilian and colleague Lucas Davis of the University of California-Berkeley analyze national gasoline prices, consumption and taxes from 1989 to 2008, using monthly data from the U.S. departments of Energy and Transportation.

While they base their findings on an after-tax price of \$3.21 per gallon (March 2008), the researchers say that the effect of a 10-cent tax increase is about twice as large if evaluating the effects on a lower after-tax price of \$1.75 per gallon (December 2008).

"Our results indicate that gasoline consumption is more sensitive to gasoline taxes than would be

implied by recent estimates of the gasoline price elasticity," Kilian said. "Even under the largest plausible estimates, however, gasoline-tax increases of the magnitude that have been discussed by policymakers would have only a moderate, short-run impact on total U.S. gasoline consumption and carbon emissions—resulting from reduced discretionary driving and reduced driving speeds, for example."

The long-term response is likely to be considerably larger, however, as drivers move toward buying more fuel-efficient vehicles, the researchers say.

Kilian and Davis say their study is only a first step in computing the effect of higher gas taxes on carbon emissions. Since the United States represents a small and decreasing fraction of total global [carbon dioxide emissions](#)—estimated to be only 16 percent by 2030—widespread international adoption of gasoline tax increases may have considerably larger effects. Likewise, a broad-based carbon tax on all sources of carbon dioxide, as well as larger gasoline tax increases, would reduce [carbon emissions](#) further.

"Although interest in carbon taxes has quieted down recently as a result of the rapidly deteriorating global economic conditions, that situation is likely to be temporary," Kilian said. "As the economy recovers, it will be only a question of time before these issues re-emerge. The current respite provides an opportunity to reflect impassionately on the merits of a gasoline tax increase, as the leading example of how a carbon tax would be implemented in practice."

Provided by University of Michigan

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