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PERFECT COMPETITION, SPATIAL COMPETITION, AND TAX INCIDENCE IN THE RETAIL GASOLINE MARKET

Do interstate differences in gasoline prices reflect interstate differences in gas taxes? A simple comparison of interstate gasoline prices and taxes suggests that the difference in price does not equal the difference in gasoline taxes. But the price of gasoline can differ for other reasons, for example differences in the wholesale price of gasoline. Thus, it is necessary to control for the other factors that affect the price of gasoline.

We examine this issue, which is really a question regarding the incidence of state gasoline excise taxes, i.e., to what extent are differences or changes in tax rates reflected in retail prices. Although the issue of sales and excise tax incidence has received considerable attention over the years, most research has focused on tax incidence theory. The standard conclusion of much of this theoretical analysis is that consumers bear the full burden of any sales and excise taxes. Based primarily on this theoretical foundation, most applied incidence studies assume that sales and excise taxes are fully reflected in consumer prices. In other words, it is assumed that prices respond one-for-one to changes in sales and excise taxes, and therefore that interstate differences in gas taxes are reflected one-for-one in gasoline prices. However, actual empirical testing of this assumption of full forward shifting has been surprisingly sparse.

To study this issue, we use monthly price gasoline data for all 50 states in the United States over the period 1984 to 1999. These data allow us to use variation across the states in the timing of tax changes to investigate how taxes affect average prices in states where the changes occurred. We estimate a within-group model that exploits the panel nature of our data and controls for fixed state and time effects. We also include a full array of control variables, including the state gasoline excise tax, demand-side variables, and supply-side factors. Details of the empirical methodology can be found in the report on which this Policy Brief is based.

Gasoline taxes have changed considerably over time. Figure 1 presents the distribution of taxes in nominal cents per gallon by state in 1984 and 1999, a period that spans our empirical analysis. In 1984 the average state tax in nominal terms was 11.9 cents per gallon; by 1999 the average state tax had increased to 20.1 cents per gallon. In real terms the tax increase has obviously not been as large as indicated in Figure 1, but presenting the data in nominal terms demonstrates that there are many policy-driven tax changes over the period of analysis from which we can generate estimates of tax incidence. It is noteworthy that, of the 202 policy driven tax changes during the

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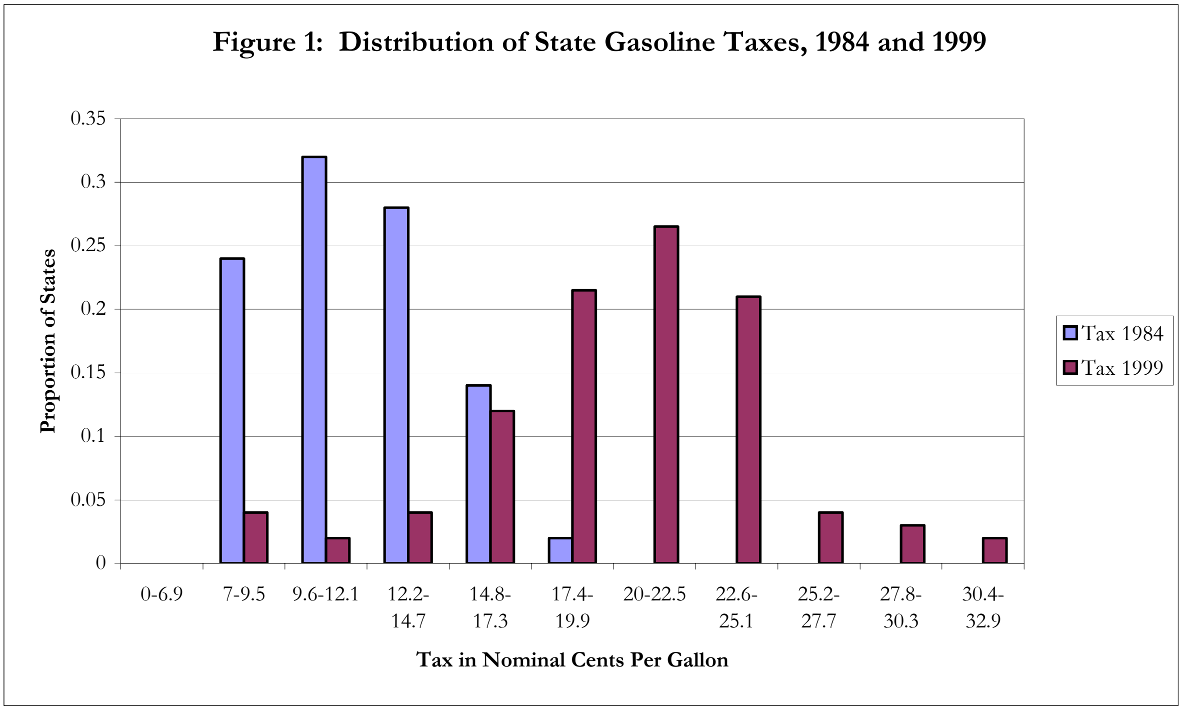
Figure 1: Distribution of State Gasoline Taxes, 1984 and 1999
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
Proportion of States
0-6.9
7-9.5
9.6-12.1
12.2-14.7
14.8-17.3
17.4-19.9
20-22.5
22.6-25.1
25.2-27.7
27.8-30.3
30.4-32.9
Tax in Nominal Cents Per Gallon
Tax 1984
Tax 1999

period of analysis, 24 were tax reductions, which provides an opportunity to examine whether prices respond asymmetrically to tax increases versus tax decreases. The tax changes were distributed fairly uniformly over this period. We observe 45 tax changes during the 1984-1987 period, 82 changes between 1988 and 1991, 50 changes from 1992-1995, and 45 changes during the 1996-1999 period.

Our estimation results generally indicate full shifting of gasoline taxes to the final consumer. In one specification, for example, we find that a 10 cent increase in the inflation-adjusted gasoline tax leads to a 9.86 cent increase in the inflation-adjusted retail price of unleaded gasoline, a magnitude that is not statistically significantly different from one (e.g., full shifting). We also find that changes in gasoline taxes are fully reflected in the tax-inclusive gasoline price almost instantly.

We also find that the incidence of excise taxes depends upon the competitiveness of retail gasoline markets (e.g., urban versus rural markets). Gasoline markets in urban states typically exhibit full shifting, but those in rural states demonstrate somewhat less than full shifting.

Our result suggests that there is a one-for-one increase in the tax-inclusive gasoline price from an increase in the gasoline tax. This means that interstate differences in gasoline prices, once one controls for other factors such as wholesale price of gasoline, equal interstate differences in gas taxes.

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