



The Role of Federal Gasoline Excise Taxes in Public Policy

Robert Pirog
Specialist in Energy Economics

September 11, 2009

Congressional Research Service

7-5700

www.crs.gov

R40808

Summary

American drivers, compared to those in other industrialized nations in Europe, pay relatively low federal, state, and local gasoline and diesel excise taxes. The Federal taxes are used specifically to fund annual highway construction, maintenance, and mass transit. Over the years, proposals have come forth to raise the federal tax as a way to address long-standing national policy concerns, including U.S. dependence on imported oil and various environmental problems related to large volumes of gasoline consumption.

Policy attention on the role of the gasoline tax has also increased recently due to three major developments. First, the 2008 oil and gasoline price run-up and subsequent economic downturn have led to a decline in gasoline tax revenues available for needed highway construction and maintenance. Second, the possibility of enacting some form of binding climate change legislation in the next several years will eventually mean an increase in the relative price of fossil fuels, including oil and gasoline. Third, the volatility of gasoline prices has affected investment planning (e.g. for alternative fuels) and arguably contributed to the troubles facing domestic automobile manufacturers. In the above context, this report outlines some of the macroeconomic and microeconomic pros and cons of using the federal gasoline excise tax for policy purposes in addition to the funding of highway infrastructure.

Whether an increase in the gasoline tax was fixed or variable, advocates argue that increasing the relative price of gasoline would promote beneficial short- and long-term changes in how we use this form of energy. A higher relative price would encourage consumers and manufacturers to move toward more fuel-efficient vehicles, or to switch to alternative fuels, thus reducing oil consumption and imports, reducing air pollution, and possibly encouraging greater use of mass transit. Advocates further argue that such taxes could be recycled back into the economy through changes in the tax structure and/or increased investment in renewable or alternative fuels, among other options.

Opponents of gasoline tax increases point to the effects on consumer and business spending, which affect the short- and long-term performance of the overall U.S. economy, especially in a time of needed economic recovery. Additionally, opponents point out that the gasoline tax has a regressive impact and affects rural areas disproportionately. Opponents also argue that such tax revenues could be better spent if left in the private sector.

Gasoline price increases due to market forces, or earlier tax increases, of course, have been part of the economic environment for almost four decades. Since the mid-1970s, there have been significant spikes in gasoline prices due to world oil market turmoil attributed to political conflict and war in the Middle East and to financial market speculation. Depending on the specified purpose of a new gasoline tax increase, it could be modest, or more significant. Because the demand for gasoline is quite price insensitive (inelastic), significant revenues could be generated with little change in real consumption, even with a relatively low tax increase. A more substantial tax increase would likely be needed to change consumer preferences and business investment decisions. Any debate on modifying the gasoline excise tax will likely revolve around these tensions.

Contents

| | |
|---|---|
| Introduction | 1 |
| Background | 1 |
| Economic Effects | 3 |
| Changing Demand-Supply Relationships..... | 3 |
| Reducing Gasoline Price Volatility | 5 |
| Revenue Effects | 7 |
| Conclusion..... | 8 |

Tables

| | |
|---|---|
| Table 1. Comparative Gasoline Prices and Taxes, 2008..... | 7 |
|---|---|

Contacts

| | |
|----------------------------------|---|
| Author Contact Information | 8 |
|----------------------------------|---|

Introduction

Gasoline taxes affect both the national economy and the decisions of individual consumers. If set at a sufficiently high level, they can reduce consumption to levels that reflect the adverse effects of gasoline use, including environmental damage and security costs. However, they can also slow the level of macroeconomic activity, despite contributing to lower trade deficits by reducing the need for imported oil. If, as in the United States, federal gasoline tax revenues are directly tied to financing highway construction and maintenance, they can also create jobs and improve the national infrastructure. If the gasoline tax is designed in such a way that the price of gasoline is stabilized, more informed decisions concerning the purchase of fuel-efficient vehicles and the funding of mass transit might also be made.

It is widely believed that the federal gasoline tax is unpopular with consumers and increasing the tax will likely generate opposition. However, the federal tax on gasoline is relatively low, only 7.5% of the average price per gallon in July 2009 and less than 5% of the average price in the summer of 2008, and it raises revenue for highway construction and maintenance, which is directly related to automobile and gasoline use. Many attempts to increase the tax since the early 1970s, especially those tied to energy policy initiatives, have been defeated; however, over the period the tax increased in several steps from 4 cents per gallon to the current rate of 18.4 cents per gallon.

Although the federal gasoline tax is collected at the refinery, it is fully passed on to consumers, and is included in the pump price.¹

This report examines the effects of the federal excise tax on gasoline and analyzes the positive and negative effects of the tax. The report also evaluates the incentive structure that a higher gasoline tax would likely create, and examines a revised version of the tax, a variable gasoline tax.

Background

Excise taxes are, in effect, sales taxes levied on specific goods. The tax may be set either as a percent of the value of the good, an ad valorem tax, or as a set dollar value per unit of the good, a unit tax. Excise taxes have been used to provide general, or dedicated, revenue and deficit reduction, but in some cases, for example liquor and cigarettes, there is a presumption that discouraging consumption in addition to raising revenues is a motivating factor in enacting the tax.

The first excise tax on motor fuels in the United States was enacted by Oregon in 1919. Within 13 years, every state and the District of Columbia had enacted similar taxes ranging from 2 to 7 cents per gallon. The federal government levied its first excise tax on gasoline in 1932 at the rate of 1

¹ Under some cases, economists believe that the price does not rise as much as the tax, but this result depends on supply characteristics, including relative elasticities, that are not likely to apply to petroleum refining.

cent per gallon as a general revenue tax. The federal excise tax became permanent in 1941 under Section 521 (a)(20) of the Revenue Act of 1941.²

Gasoline for use on highways is currently taxed by the federal government at 18.4 cents per gallon. Of this 18.4-cents-per-gallon tax, 18.3 cents per gallon is earmarked for the Highway Trust Fund, and 0.1 cents per gallon is allocated to the Leaking Underground Storage Tank (LUST) Trust Fund. The total excise tax on gasoline, at the retail level, is in the range of approximately 40 cents to over 50 cents per gallon, depending on the specific state and local taxes that are added to the federal tax. Federal, as well as most state and local levies, are unit taxes, and as such, do not vary with the price of gasoline, as a tax based on ad valorem rates would.

While opposition to the federal gasoline tax has existed since its inception, the direct tie to the Highway Trust Fund, the expansion of the interstate highway system, and highway projects to ease road congestion, has led to the view that the tax might be a proxy for a user charge, or price, to consumers who directly benefit from services provided through the tax, easing opposition to some extent.

After the oil embargo of 1973-1974, interest in the use of the gasoline tax as a policy instrument expanded to areas beyond highway financing. The Nixon Administration considered using a gasoline tax increase as a way of reducing inflationary pressures in the economy. During the Ford Administration, Representative Al Ullman introduced legislation to increase gasoline taxes to fund alternative energy sources by allocating revenues to a proposed trust fund. The Carter Administration embraced the idea of escalating gasoline taxes as a part of an energy program in 1977 designed to reduce oil consumption and increase U.S. energy security. After the fall of the Shah of Iran in 1979 and the Iran-Iraq war that began in 1980, gasoline prices increased to then-record levels and interest in gasoline taxes as a way to reduce foreign oil dependence was suggested by independent presidential candidate John Anderson. The Carter Administration proposed an oil import fee in March 1980 that was intended to approximate the effect of a gasoline tax. None of these proposals were successfully passed into law by Congress.³

In 1982, the Reagan Administration proposed an increase in the federal gasoline tax for the purpose of improving and repairing the nation's highways, based on the user-fee nature of the tax. Within the Administration, the fact that the tax was likely to create jobs was also considered as a reason for the tax increase, although President Reagan did not support government-funded jobs programs, or tax increases. The Reagan gasoline tax increase passed in both the House and the Senate and was signed into law on January 5, 1983. It raised the federal tax from 4 cents per gallon to 9 cents per gallon.

A further increase in the gasoline tax was included in the Omnibus Budget Reconciliation Act of 1990, but the rationale for the tax increase was deficit reduction. President George H.W. Bush initially opposed the tax increase, but then reversed himself and supported it, and signed the

² A more detailed history of the federal excise tax on gasoline can be found in CRS Report RL30304, *The Federal Excise Tax on Gasoline and the Highway Trust Fund: A Short History*, by Pamela J. Jackson, March 29, 2000.

³ Martin A. Sullivan, Gas Tax Politics, Part I, Taxanalysts Tax History Project, September 22, 2008, available at <http://www.taxhistory.org/thp/readings.nsf/ArtWeb/5DDB79194769C2BF852574D5003C28D5?OpenDocument>.

Omnibus Budget Reconciliation Act of 1990 into law on November 5, 1990, raising the federal gasoline tax to 14.1 cents per gallon.

President Bill Clinton initially supported a broad-based energy tax rather than a gasoline tax. The Administration decided to propose a tax on the energy content of fuels, a British Thermal Unit (B.T.U.) tax. This tax proposal failed to gain support in Congress, and, as an alternative, an increase in the gasoline tax to 18.4 cents per gallon was passed by Congress and signed by President Clinton, and took effect in December 1993. The revenue from the tax increase, 4.3 cents per gallon, was restricted to be allocated to deficit reduction. The latter part of the 1990s was characterized by declining federal deficits as tax revenues rose, as well as low gasoline prices, taking increases in the gasoline tax off the policy agenda.⁴

President George W. Bush's Administration did not propose any increase in the gasoline tax. However, there were calls for a temporary reduction in the tax to help American drivers who paid record high prices for gasoline in the summer of 2008.⁵

The Obama Administration has opposed an increase in the gasoline tax during the recession. However, it has advocated a number of policy objectives—greenhouse gas reduction, energy security, economic stimulus, more fuel efficiency, and moving toward alternative energy sources—that have been discussed in the past as justifications for gasoline tax increases.

Economic Effects

The purpose of a tax is to fund government through a transfer of resources from the taxpayer to the government. As a result, every tax leaves the taxpayers with less purchasing power than they had before the tax was levied. However, the government may use the resources acquired through the tax revenue to finance the provision of public goods and services for the benefit of the taxpayers.⁶ Because it is unlikely that every taxpayer can agree about the proper mix and level of every public good and service, as well as every choice and level of tax instrument, taxes are unlikely to be voluntary, and the government must use the force of law to levy and collect taxes.

In addition, taxes can have a wide variety of economic effects, from altering consumer decisions concerning mix of goods to purchase, to national macroeconomic issues of economic growth, employment, and inflation.

Changing Demand-Supply Relationships

The legal, or statutory, incidence of an excise tax on gasoline is on the refiner; however, the tax is typically passed on to the consumer, and is paid at the pump along with state and local taxes, leaving the economic incidence of the tax with the consumer. This result is in accord with

⁴ Ibid.

⁵ See CRS Report RL34475, *Transportation Fuel Taxes: Impacts of a Repeal or Moratorium*, by Robert Pirog and John W. Fischer.

⁶ Tax revenue may also be used to pay interest on, or retire, national debt, provide a variety of income transfers, or provide aid to foreign nations.

economic theory that suggests that if the demand for the product is totally inelastic the firm will pass the tax on to consumers who will pay the tax, independent of the nature of supply. Although the demand for gasoline is not totally inelastic in the short run, its elasticity is very low, approximating total inelasticity. Analytic studies suggest that the elasticity of gasoline demand over a wide range of price variation is low, and perhaps near zero in the short run.⁷ In the case of gasoline taxes, the supply side of the market is likely to support the demand side result because of the wide range of essentially constant cost output levels of gasoline from modern refineries.

When a tax alters consumers' or producers' economic decisions, the tax is said to have an excess burden, a burden beyond that of the tax revenue paid to the government. If an excise tax is levied on a good whose marginal social cost is greater than its marginal private cost, the excess burden, which shifts consumer's choices away from the taxed good, may be part of the design of the tax.⁸

In the case of gasoline, if it is hypothesized that gasoline use generates social costs—for example, national security and/or environmental issues—that raise its total cost above the private costs, then in an untaxed environment, it could be said that gasoline is being over-consumed. If one denies the linkage between social costs and gasoline consumption, then a free market-generated consumption level consistent with the price equalized with marginal private cost is appropriate on economic efficiency grounds. In the real-world market for gasoline, it is unclear whether the market result is efficient or not, because a variety of market imperfections related to actual or potential market power exist, making it difficult to determine whether actual consumption is greater, or lower, than the consumption level of the free market. These market power factors include a market dominated by a few large firms, the presence of the Organization of the Petroleum Exporting Countries (OPEC), and national oil companies exerting political influence on the world price of oil.

Even if it is accepted that gasoline consumption is associated with the generation of social costs, the level of the tax on a per-gallon basis must be determined. To encourage the use of alternative fuels, or to reduce petroleum imports and carbon emissions, the tax must be set high enough to cause consumers to decide that it is in their economic interest to substitute other energy sources, or to conserve. If the price elasticity of demand for gasoline is low, this implies that a relatively large tax will be necessary to result in a significant reduction in consumption.

An increase in the federal excise tax on gasoline would be a drain on consumer purchasing power, and could result in a slow-down in macroeconomic activity. However, part, or all, of the tax revenue raised could be returned to consumers through reductions in other taxes. A total return of tax revenue would not be appropriate if the purpose of the tax increase was to fund the Highway Trust Fund. If the purpose is to reduce the consumption of gasoline, then a return of tax revenue through reductions in other taxes is more reasonable.

⁷ Price elasticity of demand measures the sensitivity of the quantity demanded to variations in price. It is calculated as the percent change in quantity demanded divided by the percent change in price. See James D. Hamilton, *Understanding Crude Oil Prices*, *The Energy Journal*, Vol. 30, No. 2, pp. 189-192, for price elasticity of oil and gasoline estimates.

⁸ Economists use the term social cost to refer to the sum of the private cost of the good plus, or minus, any additional costs accruing to society including, for example, those associated with national security or environmental pollution.

Reducing Gasoline Price Volatility

Two key factors in explaining gasoline demand in the United States are price and consumer income. Economists have empirically estimated that in the short run, the sensitivity of the quantity demand of oil, and therefore, gasoline quantities, to price variations is low.⁹ Low price elasticity of demand, a percentage quantity variation less than the percentage price variation, suggests that the good is viewed by consumers as a necessity, one that must be purchased with little quantity variation, even in the face of higher prices. Additionally, commodities with low price elasticity of demand tend to be subject to substantial price volatility when quantities available on the market vary.

Income elasticity measures how responsive consumer demand for a good is to changes in consumer income levels. Income and price elasticity can interact. For example, even if the price of a commodity increases, implying that the quantity demanded should fall in the proportion suggested by the price elasticity measure, the predicted demand reduction might not be observed in consumption data if income increases sufficiently, making any given expenditure on the good a smaller percentage of available income.

These concepts of price and income elasticity are likely to have important effects on the structure and level of an effective gasoline tax. Effective, in relation to a gasoline tax, can be defined in a variety of ways. One possible way to define effective with respect to a tax is its efficacy in providing government revenues, and/or reducing the consumption of gasoline, in a predictable manner that provides consistent incentives to consumers to make appropriate economic choices, in accordance with national economic goals.

U.S. gasoline consumption rose by 9.6% from 2000 to 2007 even as the nominal price of gasoline almost doubled.¹⁰ Income growth, as well as a variety of other factors, contributed to the increasing demand, even as prices rose. Demand for gasoline began to decline in the fourth quarter of 2007, coincident with the onset of the current recession. The rise, and then peaking, of gasoline prices at over \$4 per gallon in 2008 also contributed to the declining demand that resulted in the reduced demand that continues in 2009.¹¹

The behavior of gasoline demand over the period from 2000 to 2009 has implications for the design of a gasoline tax. The current federal tax on gasoline is a fixed 18.4 cents per gallon. In addition, states and localities generally add their own taxes on gasoline. The current tax does not appear to be functioning as an effective tax, by the definition set out above; it is not raising adequate revenues, reducing consumption, or providing consistent incentives. On the revenue side, the federal gasoline tax, along with the corresponding tax on diesel fuel (24.4 cents per gallon) provided over \$30 billion in revenue to the Highway Trust Fund in FY2008; however, the Highway Trust Fund, the financing of which depends on fuel excise taxes for about 90% of its funding, is relatively unstable financially.¹² In addition, because the existing federal tax is

⁹ James D. Hamilton, *Understanding Crude Oil Prices*, The Energy Journal, Vol. 30, No.2, 2009, p.180.

¹⁰ Nominal prices are prices not adjusted for inflation.

¹¹ The U.S. Department of Transportation, Federal Highway Administration estimates that high fuel prices, reduced income growth due to recession, and other factors resulted in a 3.6% decline in road travel in 2008, over 107 billion fewer vehicle miles compared to 2007.

¹² See CRS Report R40053, *Surface Transportation Program Reauthorization Issues for the 111th Congress*, coordinated by John W. Fischer, for more on transit funding issues.

relatively small, compared to the price of gasoline, and is a declining portion of consumer income, as incomes rise, it likely is not having as large an effect in reducing consumption as it might have had when it was instituted. Reducing gasoline consumption is a goal consistent with achieving less dependence on imported crude oil, and reducing greenhouse gas emissions.

Since the federal gasoline tax is a fixed amount per gallon, and small relative to the price of gasoline, it does little to provide incentives to consumers to consider fuel-efficient vehicles. When the price of gasoline rises, and attains high levels, consumer interest in fuel efficiency increases, but when gasoline prices fall, their interest wanes. Volatile gasoline prices cause this cycle to repeat itself. As a result, consumers tend to buy the “wrong type” of vehicle for the next gasoline price cycle.

On the production side, consumers’ shifting automobile preferences have contributed to the instability in the auto industry. The high gasoline prices in 2008 shifted consumer demand away from sport utility vehicles and light trucks, profit centers for the U.S. auto manufacturers, and helped push General Motors and Chrysler to bankruptcy. As these firms emerge from bankruptcy, their plans to introduce fuel-efficient cars that they can sell profitably could be problematic if gasoline were to fall below \$2 per gallon and remain there for a significant time.

One way to overcome these uncertainties, if it is the policy to discourage gasoline consumption in order to lessen dependence on imported oil and to reduce greenhouse gas emissions, is through a variable gasoline tax. A variable gasoline tax would target a specific price of gasoline (including tax) that was thought by policy makers to achieve desirable levels of gasoline consumption and/or revenue production. When the price of oil rises, increasing the cost of gasoline above the target price, the tax would remain constant, and consumption would fall in response to market forces. Alternatively, if gasoline prices fell, the tax would automatically rise to keep the price including tax at the target price level. In this way, the tax would provide a more constant incentive to consumers to purchase fuel-efficient vehicles, drive less, and encourage interest in alternative fuel vehicles.

Economists identify two factors in consumer purchases, the substitution effect and the income effect. A tax raises the relative price of gasoline relative to other goods, causing consumers to respond with a decision to buy less of the good; this is called the substitution effect. Taxes also make the taxed goods more expensive, reducing consumers’ general purchasing power; this is called the income effect. Even if the income effect is reversed through a tax rebate program, the substitution effect will still encourage lower consumption of the taxed commodity. In this way, the tax could have a minimal effect on purchasing power if consumers chose to follow market economic incentives and minimize consumption of the taxed good. If they chose to attempt to continue to consume at pre-tax levels, purchasing power would be reduced, but that would be the free choice of the consumer.

The variable gasoline tax, set at a sufficiently high level to affect consumer decisions, could be expected to stimulate the demand for smaller, more fuel-efficient automobiles, spur the development of cars that use alternative energy sources, reduce U.S. oil imports and dependence on supplies from unstable parts of the world, reduce greenhouse gas emissions, and reduce the costs of maintaining the highway and road system, as well as likely reducing the number of accidents and fatalities.

Table 1. Comparative Gasoline Prices and Taxes, 2008

(dollars per gallon)

| | United States | United Kingdom | Germany | France |
|---------------|---------------|----------------|---------|--------|
| Retail Price | 3.24 | 7.53 | 7.72 | 7.53 |
| Price, Ex Tax | 2.84 | 2.88 | 2.86 | 2.96 |
| Tax | 0.41 | 4.65 | 4.86 | 4.57 |

Source: Energy Information Administration, available at <http://www.eia.doe.gov/emeu/international/gas1.html>.

Notes: In some cases, data is not consistent with respect to fuel grade.

While U.S. consumers have enjoyed low taxes on gasoline for some time, taxes in other industrialized nations are higher. As shown in **Table 1**, in 2008 gasoline prices ex tax were within a 5% spread, but the price of gasoline including taxes was almost 2.5 times higher in the European nations. High gasoline taxes in Europe have provided incentives for consumers to buy smaller cars, drive less, and switch to diesel fuel, which offers better fuel economy than comparable gasoline-fueled automobiles.

As gasoline prices have fallen during the first half of 2009, retail prices have declined in all the countries cited in **Table 1**. However, the European prices range from \$4.88 per gallon in the United Kingdom to \$5.74 per gallon in Germany and \$5.54 per gallon in France, while the U.S. price fell to \$1.91 per gallon.

Although the gasoline taxes in the countries identified in **Table 1** are not variable, as evidenced by falling oil prices that have resulted in lower consumer gasoline prices, the taxes appear to be high enough to avoid the changing incentives that the current U.S. tax provides.

Revenue Effects

With U.S. gasoline consumption generally in the range of nine million barrels per day (378 million gallons per day), the gasoline tax would have a large base. If, for example, the tax were initially set at \$2.00 per gallon, to achieve a tax inclusive price of over \$4 per gallon, revenues could amount to almost \$1 billion per day, minus the effect of conservation.

Revenue on this scale might have a negative effect on the overall purchasing power of the economy, which might be a problem, especially in a recession. This could be ameliorated if tax revenue were recycled back into the economy through increased infrastructure projects, or expenditures on alternative energy projects. If desired, the tax revenue could be returned to households through an income tax rebate program, or a reduction in the income tax rates. If the revenue were returned to taxpayers in this way, the variable gasoline tax could still achieve a portion of its conservation goals through a higher relative price of gasoline, which would discourage consumption.

Revenues generated by the gasoline tax could also assure funding for the Highway Trust Fund, improve the mass transit infrastructure, and fund research and development of alternative energy sources, as well as contributing to deficit reduction.

Conclusion

The Obama Administration has expressed interest in reduced carbon emissions, reduced dependence on imported oil, and the development of alternative, renewable energy sources. The Highway Trust Fund is in need of an increase in funding. These goals might be attained through an increase in the federal excise tax on gasoline. To facilitate consistent economic decision-making the tax could be set with variable rates, or levels, which would also enhance the predictability of the revenue base.

However, a gasoline tax increase is also likely to be unpopular with consumers. It might also drain purchasing power, especially from an economy that is weakened by recession.

Author Contact Information

Robert Pirog
Specialist in Energy Economics
rpirog@crs.loc.gov, 7-6847