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Petroleum Taxes

Trends in Fuel Taxes (and Subsidies) and the Implications

Recent World Bank analysis shows that taxes on petroleum products are a critical source of government revenue for low-income countries. And if the experience of industrial countries serves as any guide, the rates of these taxes will have to rise sharply as low-income economies develop. But policymakers must be mindful of how taxes (or subsidies) affect the relative prices of fuels, since too large a difference in prices between products can lead to fuel switching and adulteration, adversely affecting the government tax take and pollution levels.

In 2000 the price of crude oil rose to levels not seen for more than 20 years, and as a result so did the price of oil products. The price hikes prompted public debate about the level of taxes determining the final prices paid by consumers. By one estimate, taxes accounted for 68 percent of the final price in the European Union in 2000 (OPEC 2000). But what about developing countries, where petroleum product taxes are often an important source of government revenue? In particular:

- How important are petroleum product taxes for developing countries?
- What principles should govern the level and structure of taxes on oil products?
- Is the general level of oil product taxes in developing countries similar to that in industrial countries?
- What is the pattern of relative tax rates on different products?

How important are fuel taxes?

Calculating total government revenue from all taxes on petroleum products in a country requires extensive data, and even for OECD countries separate figures on such revenue are generally unavailable. But a 1990–91 International Monetary Fund survey of 30 developing and industrial countries does provide data on tax revenues from petroleum products, and thus allows an analysis of their relationship to the government budget and GNP (Gupta and Mahler 1994). Statistical analysis drawing on these data reveals the following relationships:

- The consumption of petroleum products rises almost as fast as GNP (elasticity of 0.8).
- Total government tax revenue from all sources tends to rise faster than GNP (elasticity of 1.2).
- Tax revenue from petroleum products rises more slowly than total tax revenue (elasticity of 0.7).

- Thus tax revenue from petroleum products rises slightly more slowly than GNP (elasticity of 0.9).

Regression analysis indicates that at a GNP per capita of US\$316, predicted total tax revenue per capita was around US\$40, while that from petroleum products was US\$8 (20 percent). At a GNP per capita of US\$10,000, predicted total tax revenue per capita was US\$2,500, and fuel tax revenue per capita was US\$126 (5 percent).

These results illustrate the importance of downstream taxation of petroleum products, especially for low-income countries. The reason is that taxing fuel is one of the easiest ways to get revenue: collecting fuel taxes is relatively straightforward, and the consumption of fuels as a group is relatively price inelastic and income elastic, ensuring buoyant revenue as income rises and tax rates are increased. So while petroleum product taxes are important in developed countries, they may be even more important in developing countries.

What makes good tax policy?

Tax theory suggests that where the government's sole aim is to raise revenue for public expenditure, goods for which demand is least sensitive to price increases should tend to bear the highest tax rates. Goods that are close substitutes should be taxed at similar rates to prevent demand from switching from the higher- to lower-taxed good, reducing government revenue. In addition, where equity is an important

consideration, goods accounting for a larger share of budgets for the rich than for the poor should be taxed more heavily. Goods that produce large negative externalities (such as emissions from automotive fuel use or congestion from excessive road use) should also be taxed at high rates, to discourage their consumption and reduce social harm.

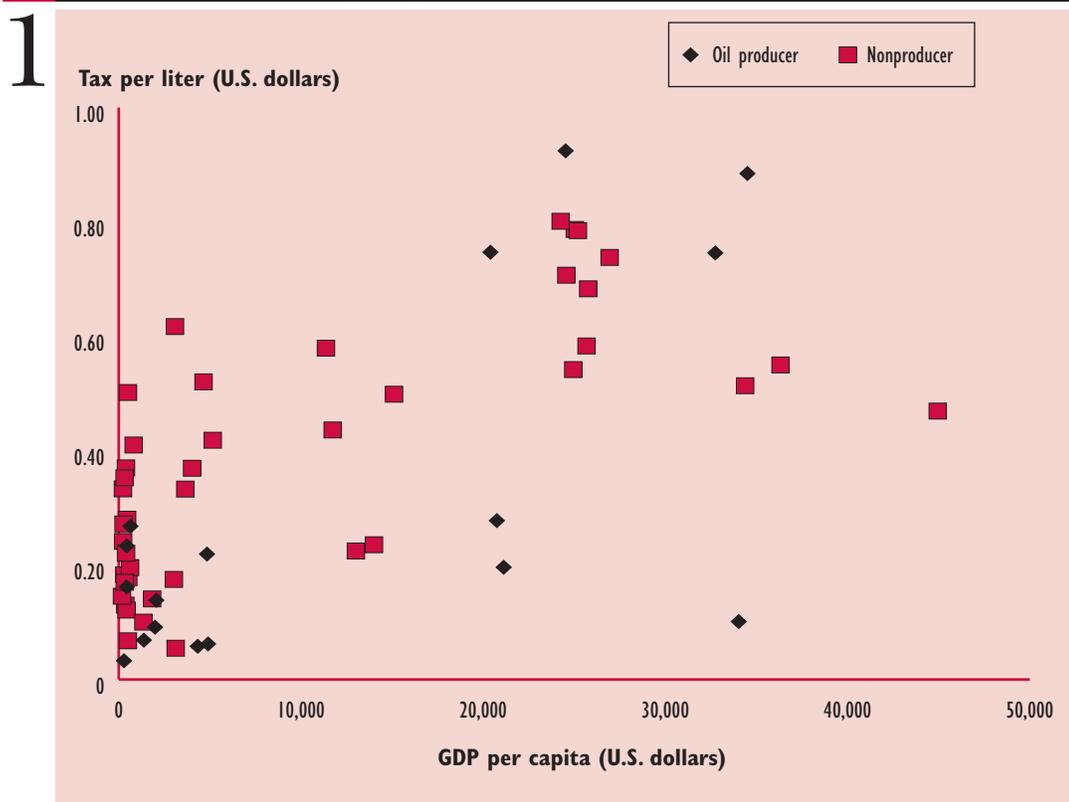
For fuels, these principles do not always work in the same direction, so the relative importance of each principle needs to be evaluated in each case. For example, emissions from diesel fuel are more harmful than those from gasoline, but encouraging the use of diesel-powered mass transit may be desirable as a way of relieving congestion. Kerosene is particularly problematic in developing countries, since it can be used to adulterate both gasoline and diesel. As a result, setting lower taxes on kerosene (to reduce the cost of lighting and cooking fuels for the poor) can erode the total tax collected (necessitating an increase in the general tax level to produce a given revenue). And where kerosene replaces gasoline, lower taxes lead to higher emissions and worse vehicle performance. Higher taxes on kerosene can hurt poor households, however, which tend to spend a larger share of their budgets on this fuel than do better-off households. But this also means that if governments wish to offset the effect of higher kerosene taxes on poor households, they can do so through targeted assistance rather than across-the-board kerosene subsidies.

Table 1 Average petroleum product taxes and prices in OECD and non-OECD countries, 1999

Fuel and country group	Tax as share of final price (percent)	Tax (U.S. cents per liter)	Net price (U.S. cents per liter)	Gross price (U.S. cents per liter)
Gasoline				
OECD countries	67	58.1	25.2	83.3
Non-OECD countries	44	22.9	26.9	49.7
Automotive diesel				
OECD countries	59	42.4	25.0	67.4
Non-OECD countries	40	16.6	22.8	39.4
Kerosene				
Non-OECD countries	23	5.1	12.3	17.4

Note: The table shows data for 22 OECD countries (excluding the Czech Republic, Hungary, Mexico, Poland, and Turkey) and 37 non-OECD (mostly developing) countries. Source: For OECD countries, IEA (2000); for non-OECD countries, World Bank staff estimates.

Figure Gasoline tax rate and GDP per capita in selected OECD and non-OECD countries, 1999



Note: This figure covers the same countries as table 1.
Source: Author's analysis based on World Bank data.

How do tax rates compare?

There are few published data on petroleum product taxes for developing countries, so World Bank estimates for 1999 were collated.¹ Collecting direct data on the full range of petroleum product subsidies, used in many developing countries at some point in the value chain, would have been a substantial task and so was not attempted. But prices net of tax are available, and in the absence of subsidies these could be expected to be fairly similar across countries, since petroleum products are highly tradable. Thus when a country's price net of tax is near the global average, the subsidy element is likely to be small.

For gasoline and automotive diesel, the average net price in developing countries is fairly similar to that in OECD countries (table 1). Since OECD countries do not subsidize petroleum products, this suggests that the average net price in developing countries includes little subsidy.

By contrast, the difference in tax charged per unit is very large, with the average tax per liter in

the higher-income countries two and a half times that in developing countries for both gasoline and diesel. This difference is reflected in the higher gross prices in OECD countries.

The net prices for gasoline and diesel are similar, reflecting the approximately equal production costs for the two fuels. But the average tax per liter is 40 percent higher for gasoline than for diesel in both groups of countries, resulting in substantially higher gross prices for gasoline. The difference in taxes might encourage a switch to diesel in the long run through the use of mass transit, but it will also tend to reduce government revenue and thus require an offsetting increase in general taxation.

Kerosene has a lower net price and much lower tax rate than the other fuels, producing a gross price that is less than half that for diesel and a third that for gasoline. Since kerosene can replace up to 5 percent of the volume of gasoline and 20 percent of the volume of diesel without consumers noticing, this large

price difference can lead to a substantial diversion of kerosene in countries with poor systems for monitoring and enforcing fuel quality standards, with a resulting loss of tax revenue.

Conclusion

The data on petroleum product taxes in 1999 provide strong evidence that rates in developing countries as a group are much lower than those in high-income countries, even though these taxes are a more important source of revenue for low-income countries. Oil producers, which can obtain substantial revenue from upstream royalties, are likely to charge lower commodity taxes than other countries at the same level of GNP and government expenditure. The results of a regression confirm these conclusions.

The regression, which distinguishes oil producers and nonproducers, finds a strong positive correlation between GDP per capita and the tax per liter of gasoline: a US\$1,000 increase in GDP per capita is associated with a 1.5 cent rise in the tax per liter (figure 1). An increment of 1 million barrels a day of crude oil production is associated with a 6 cent decline in the tax. For automotive diesel, a US\$1,000 increase in GDP per capita is associated with a 1 cent rise in the tax per liter, while domestic oil production has no significant effect.

A comparison of net gasoline and diesel prices across countries shows that the prices are similar in virtually all countries, reflecting the near equality of production (plus transport) costs. By contrast, a comparison of gross prices shows that in virtually all countries the gasoline price is much higher than the diesel price. This difference reflects a general tendency to encourage the use of diesel, although increasing diesel emissions in the megacities of developing countries may result in a push toward equality in prices.

The data also suggest that as incomes rise and the ability to finance public expenditure improves, countries will tend to increase automotive fuel taxes rapidly, though not quite proportionately because of their ability to broaden the tax base. Thus developing countries can be characterized as moving to tax rates that are higher but of lower significance

for government revenue. Nevertheless, even for high-income countries, fuel taxes are among the most important commodity taxes.

Notes

1. Metschies (1999) provides data for many countries on prices including taxes. An earlier paper analyzing the share of taxes in final prices is Saito (1975).

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