

CRUDE OILPRICE'S IMPACT ON PRICES FOR PETROL AND HEATING OIL

Prices for both petrol and domestic heating oil have risen strongly since the beginning of 1999. In August this year petrol prices were about 10 per cent higher than a year earlier, while the price of heating oil had gone up 24 per cent (Fig. B5).

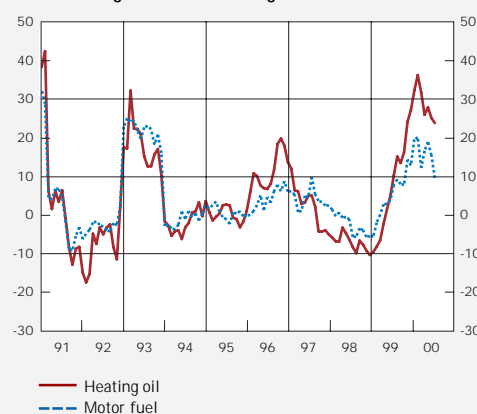
So what lies behind the rapid price increases for these petroleum products? Of the total price of petrol and heating oil, approximately two-thirds consists of taxes and charges.⁸ These taxes were increased markedly in the early 1990s but in recent years there have been only a number of minor rate adjustments. The recent price trend is therefore not a consequence of altered tax rates (Fig. B6).

Apart from taxes, it is the world market price for crude oil and the U.S. dollar's exchange rate that are major determinants of prices for petrol and heating oil. A higher price for crude, as well as a weakening of the Swedish krona against the dollar, can be expected to result in higher prices for petrol and heating oil. Similarly, a lower crude oil price and a stronger SEK/USD rate can be expected to have a downward effect on these prices. During the past twelve months the dollar price of crude has risen strongly, accompanied by a weakening of the krona against the dollar. Measured in kronor, in August the price of crude was about 70 per cent higher than a year earlier. This is the primary explanation for the rapid increase in consumer prices for the refined products.

The consumer price trend has, however, been considerably more subdued than both the SEK price for crude and the producer price for petroleum products. This is usually the case, because the price of crude is only one item in total processing costs (Fig. B7). As processing is undertaken to a large extent in Sweden, prices for the refined petroleum products are also conditioned by, for example, the domestic development of wages.

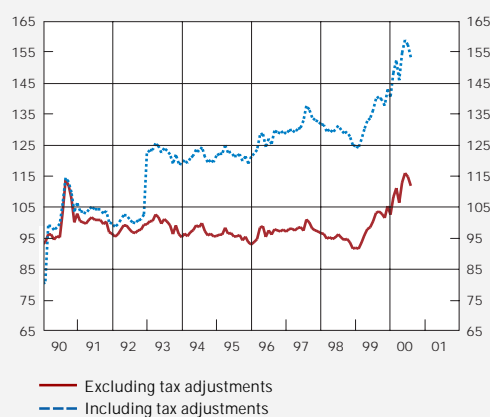
The recent price increases for petroleum products have been accompanied by questions about the pricing principles of petrol companies, for example. Are there differences in these principles for a rising compared

Figure B5. Motor fuel and heating oil prices including tax changes.
Percentage 12-month change



Source: Statistics Sweden.

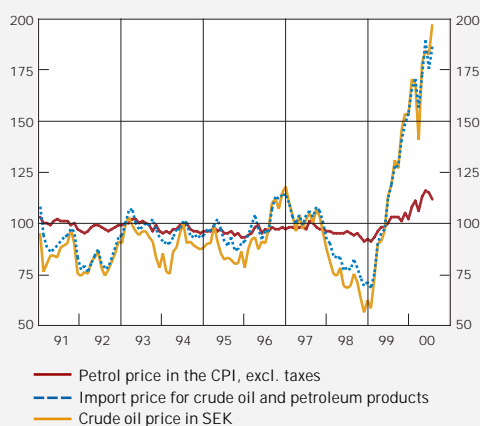
Figure B6. Motor fuel price, including and excluding tax adjustments.
Index: 1990=100



Sources: Statistics Sweden and the Riksbank.

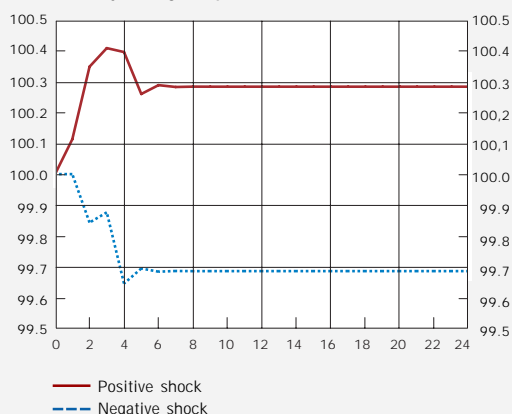
8 As the taxes consist of a fixed levy in SEK in addition to VAT, the tax share decreases when the price of petrol rises.

Figure B7. Crude oil price in SEK and producer and consumer prices for petroleum products. Index: 1990=100



Sources: Statistics Sweden and the Riksbank.

Figure B8. Simulated price effect for heating oil of a 1 per cent change, up or down, in the SEK price for crude oil. Monthly change in price index



Sources: The Riksbank.

with a falling world market price for crude? That is, are petrol price adjustments larger and more prompt when the price of crude rises than when it falls?

In order to study how changes in the price of crude affect prices for petrol and domestic heating oil, a regression equation is estimated where monthly movements in prices for petrol and heating oil, respectively, are explained in terms of movements in, for example, the SEK price of crude. The hypothesis of differences in pricing behaviour when the crude oil price rises and falls, respectively, can then be tested by dividing the time series for the price of crude into periods with rising and falling prices, respectively. This is followed by calculations of the extent to which petrol and heating oil prices are affected when the crude oil price moves 1 per cent up or down.

The results for the price of heating oil indicate that in statistical terms, the hypothesis of an asymmetric price adjustment can be rejected. A crude oil price movement of 1 per cent measured in SEK leads on average to a total price change for heating oil of about 0.3 per cent, regardless of whether the price of crude rises or falls (Figs. B8 and B9).⁹ The time profile of the price effect does differ, however, depending on whether the price of crude rises or falls. An increase in the price of crude elicits an upward effect in the same month as well as a positive effect in each of the next two months, followed by some downward tendency after that (Fig. B9). When the price of crude falls, on the other hand, the adjustment of the price of heating oil begins a month later and is smaller than when prices are rising; the major downward adjustment does not occur until three months after the fall in the price of crude.¹⁰

The results for the price of petrol are more dependent on the empirical model's specification. Some specifications indicate the same total price effect when the price of crude rises as when it falls, while others suggest that the impact is somewhat larger when the price of crude rises. But compared with the price effect for heating oil, a change in the price of crude has an impact on the price of petrol that is generally smaller. Most of the models suggest that when the price of crude rises 1 per cent, the price of petrol moves up by an

9 As the CPI weight for domestic heating oil is 0.006 of the total index, a 10 per cent increase in the price of crude can be calculated to have a short-run partial impact on inflation of about 0.02 percentage points.

10 Based on data for the period January 1990 to July 2000; the result for a shorter period is qualitatively the same.

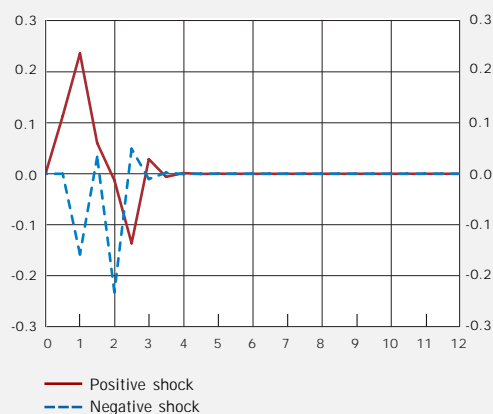
average of 0.1 to 0.2 per cent.¹¹

The dynamics of the adjustment also vary with the model's specification. Some estimates indicate that the price of petrol is adjusted both rapidly and immediately, while others suggest that when the price of crude falls, the adjustment tends to be lagged.

To sum up, there is a clear — but quantitatively limited — relationship between the SEK price for crude oil and the path of consumer prices for petroleum products. The relationship is limited because crude oil is only one item in the total market value; it may also be the case that, for various reasons, firms have limited possibilities of passing on their costs. It is conceivable, moreover, that if allowance is made for consumer aversion to marked price fluctuations, the price of petrol and heating oil is affected to only a minor extent by transient variations in the price of crude. Furthermore, it seems that the consumer price adjustments which are made for petroleum-related products tend to occur sooner when the SEK price of crude has risen than when it has fallen.

Figure B9. Simulated price effect for petrol of a 1 per cent change, up or down, in the SEK price for crude oil.

Monthly change figures



Sources: The Riksbank.

11 As the CPI weight for petrol is 0.0424 of the total index, a 10 per cent increase in the price of crude can be calculated, given a pass-through of 0.2 per cent, to have a short-run partial impact on inflation of about 0.1 percentage points. Summing the price effects of both petrol and domestic heating oil, a 10 per cent price increase for crude has an aggregate CPI effect of just over 0.1 percentage point.