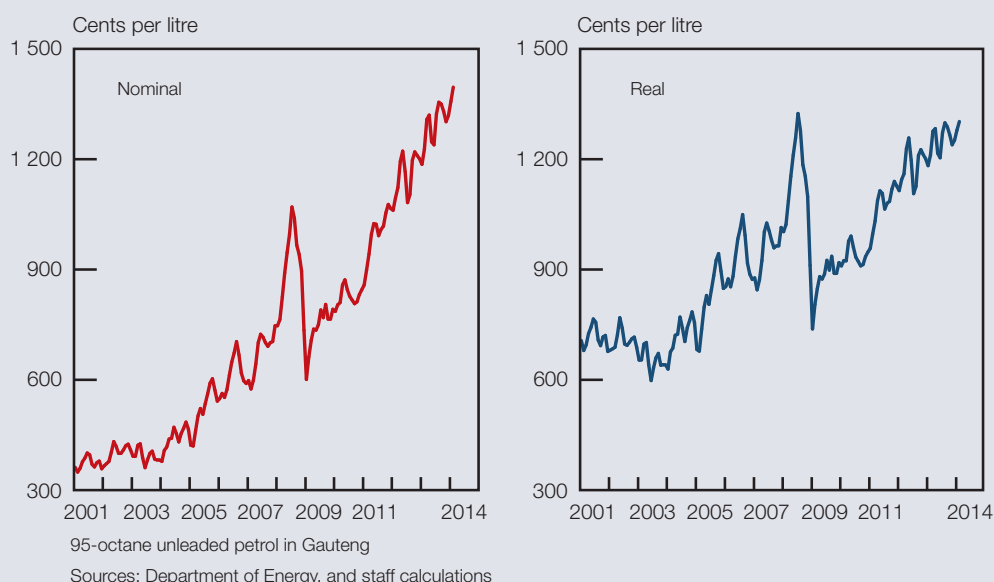


Box 2: South African fuel price movements

On 5 March 2014, the price of 95-octane unleaded petrol in Gauteng reached R14,32 per litre.¹ There has been a significant rise in both the nominal and real price of petrol over the past decade. The decline in international oil prices during the global financial crisis provided some relief, but since the end of 2009, domestic petrol prices have increased by 80 per cent in nominal and by 43 per cent in real terms. This box analyses some of the factors underpinning the movement in petrol prices. Attention is also devoted to the impact of petrol price movements on inflation outcomes in South Africa.

Figure 1: Petrol price movements



The retail price of petrol is regulated by government with prices being set on the first Wednesday of each month. While there are a number of factors that are taken into account when setting the pump price, these can generally be divided into two groups – one reflecting the impact of international developments and the other domestic influences. The impact of international influences is captured by the basic fuel price (BFP) element in the price-setting formula. In essence, the BFP is the imported rand cost of petroleum products. It is directly linked to the price of petrol quoted in US dollars at refineries in the Mediterranean area, the Arab Gulf and Singapore, and also includes other costs related to the transport and storage of petroleum products. Domestic influences include taxes, levies and margins which are added to the BFP to arrive at the final petrol pump price.²

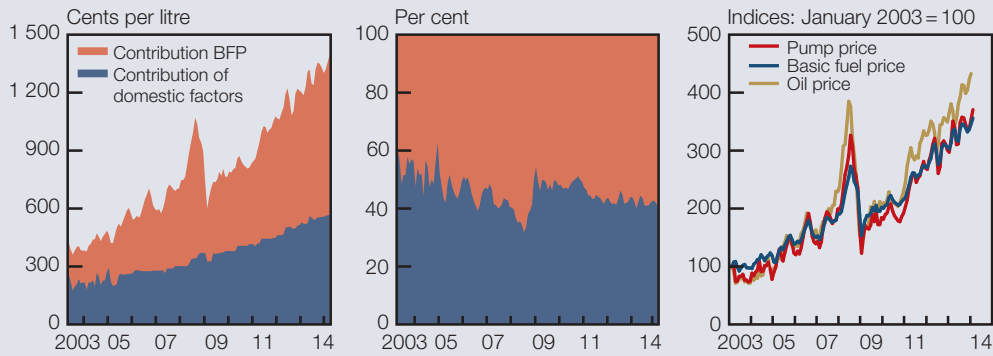
Since the implementation of the current formula in April 2003, the contributions of both domestic and international influences to petrol price movements have steadily increased over time (Figure 2). However, in relative terms, the contribution of the international elements (BFP) to the pump price has increased from approximately 45 per cent in 2003 to 58 per cent in 2013, on average.

Given the importance of oil as an input in the manufacturing of petroleum products, it is not surprising that the BFP is strongly correlated with international oil price developments in domestic currency terms (Figure 2, right-hand panel). Movements in the BFP mainly account for the changes in the petrol price. The BFP is influenced by changes in international product prices and exchange rates. These two elements account for virtually all of the monthly changes in the domestic petrol price (Figure 3).

¹ The price of 93-octane unleaded petrol increased to R14,11 on 5 March. Real prices are obtained by deflating nominal values by the consumer price index (CPI).

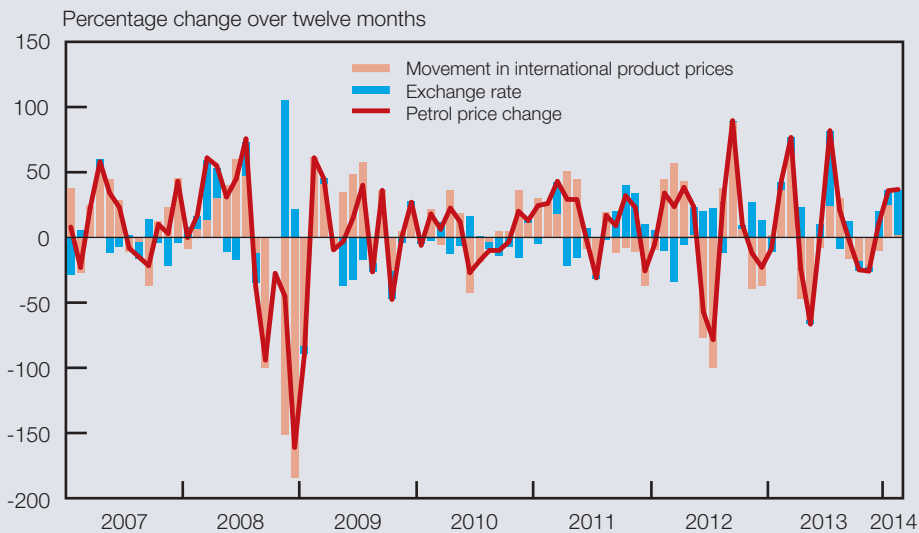
² Components of the BFP include the spot price of international petroleum products, freight costs, insurance costs, ocean loss allowance, cargo dues, coastal storage and stock financing costs. Domestic costs include inland transport costs, wholesale and retail profit margins, an equalisation fund levy, customs and excise, a levy for the road accident fund, a slate levy, a demand side management levy on 95-octane unleaded petrol and a petroleum pipelines levy. For a more detailed description of the elements see http://www.energy.gov.za/files/petroleum_frame.html.

Figure 2: Contribution of domestic and international factors to petrol price movements



Sources: Department of Energy, and staff calculations

Figure 3: Contributions to changes in the petrol price



The impact of petrol price changes on headline consumer price inflation occurs either *directly* through its share in the CPI or *indirectly* through its impact on the prices of other (non-fuel or non-petrol) goods in the CPI. Between January 2004 and December 2013, petrol price increases made a direct contribution of around 13 per cent to the overall increase in the headline consumer price level – significantly above its weight of approximately 5 per cent in the CPI basket. In essence, this was due to petrol price inflation averaging 12,5 per cent per year which was significantly above the average headline inflation rate of 5,6 per cent during this period. *Indirect* or second-round effects of fuel price changes can be gauged by ascertaining the pass-through effects of petrol prices to non-fuel prices in the CPI. Econometric estimates for the period January 2003 to December 2013 using a fairly basic model show evidence of second-round effects from petrol price inflation in South

Africa.³ The results indicate that the impact of these price effects persists over periods of up to twelve months, but becomes statistically insignificant thereafter. Using the core macro-econometric model of the Bank for simulation, a petrol price shock (increase) of 10 per cent directly raises consumer price inflation by 0,6 percentage point, and indirectly by a further 0,3 percentage point after one year.

3 Following Cecchetti and Moessner (2008, *BIS Quarterly Review*, pp55-66), second-round effects are estimated by considering the following gap model:

$$\pi_t^{nf} - \pi_{(t-i)}^{nf} = \alpha + \beta (\pi_{(t-i)}^{headline} - \pi_{(t-i)}^{nf}) + \varepsilon \quad \text{Equation (1)}$$

where i = lags in months; π_t^{nf} = non-fuel inflation in period t ; $\pi_t^{headline}$ = headline inflation in period t . Equation 1 reflects the impact of fuel inflation (i.e., the gap between headline and non-fuel inflation) in period $(t-i)$ on the increase in non-fuel inflation between period t and $(t-i)$. The basic point here is that if β is positive and significant then petrol price changes affect the prices of non-petrol goods (i.e., there is evidence of second-round effects from petrol price changes).

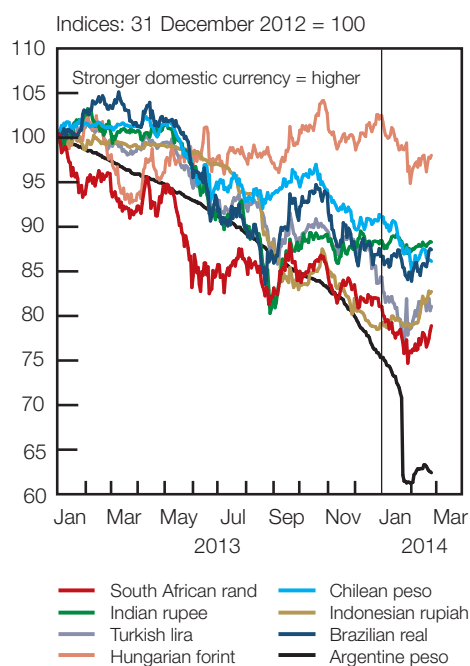
Table: Pass-through price impacts of petrol price inflation into non-fuel (non-petrol) inflation

| Lags in months | \bar{R}^2 | α | β | p value $H_0: \beta = 0$ |
|----------------|-------------|------------------|-------------------|-------------------------------|
| $i = 3$ | 0,17 | -0,39* (0,22) | 0,95*** (0,34) | 0,005 |
| $i = 6$ | 0,17 | -0,63 (0,41) | 1,73*** (0,58) | 0,004 |
| $i = 12$ | 0,07 | -0,70 (0,71) | 1,94* (1,04) | 0,062 |
| $i = 18$ | 0,04 | -0,59 (1,66) | 1,66 (1,36) | 0,224 |
| $i = 24$ | 0,03 | -0,66 (0,83) | 1,76 (1,60) | 0,275 |

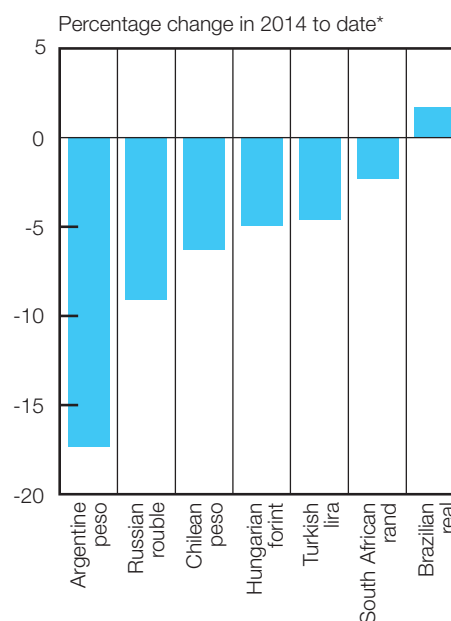
Note: The standard errors, which are reflected in brackets, are corrected for serial correlation.
*** and * depicts significant at the 1 per cent and 10 per cent level respectively.

Some emerging-market central banks attempted to protect their exchange rates by intervening in the foreign-exchange market, but a lack of sufficient foreign-exchange reserves have rendered these interventions unsustainable. The risks attached to intervention in the foreign-exchange market by selling foreign currency to protect the exchange rate was illustrated when intervention by the Argentinian central bank failed due to a depletion of its reserves, thereby rendering the country very vulnerable.

Selected exchange rates: US dollar per domestic currency unit



US dollar per domestic unit



* Date as at 28 February 2014