

Box C: Gas prices and price controls

By Paul Mortimer-Lee and Urvish N Patel¹

Background

Inflation in the UK has surged to levels not seen since the 1980s and there is a danger of inflation expectations becoming unanchored. Higher interest rates are the conventional response to an upward shock to the price level if this is expected to have second-round effects. However, interest rates take twelve to eighteen months to influence inflation. So, are there other means to influence the outcome sooner? There have been suggestions of price controls in the US (Weber, 2021) and there is pressure in the UK to temper the effects of rises in the price of household gas, including perhaps staggering price increases (Morales and Morrison, 2022). We used our econometric model, NiGEM, to address the issue in the context of Ofgem's recent decision whether to raise the gas price cap by up to 50 per cent for households in April or to stagger it over the future.

Our main findings are:

- If gas prices increase by 50 per cent in one go under rational expectations², inflation is expected to peak in the third period following the shock at just over 0.7 percentage points over the base.
- Staggering the price rise under rational expectations reduces this addition to inflation to just over 0.4 percentage point over the base. However, inflation and interest rates stay higher for longer than in the one-shot case.
- If economic agents have adaptive expectations³ and think the gas price hike has been cancelled, staggering provides the lowest inflation peak at just below 0.3 percentage points over the base, compared with just below 0.6 under a one-shot.
- In the rational expectations case, the peak addition to interest rates, at just below 0.6 percentage points, is slightly higher and later under the two-year staggering than in the other two cases. With adaptive expectations, the peak addition to rates is 0.6 percentage points; in both staggered cases the addition to rates is 0.3 percentage points but is maintained for longer.
- Adaptive expectations result in a cycling of interest rates and inflation, which could be interpreted as a policy mistake, whereas under rational expectations interest rates and inflation move more smoothly.

We have looked at an increase in the gas price cap by Ofgem only from the perspective of inflation. As Chapter 2 details, there are important effects on the income distribution that policy makers must take into account when deciding on the optimum price strategy. Moreover, our simulations consider a permanent price increase. If the price of gas were to fall back at some future date, that is if the increase in the world price of gas were only temporary, the arguments for damping the contemplated price increases near term would be strengthened because it would avoid a cycling in inflation. Note that UK natural gas future prices are higher for delivery in the fourth quarter of 2022 than for April 2022 delivery, though the market prices in significantly lower levels by summer 2023.

Gas and the CPI

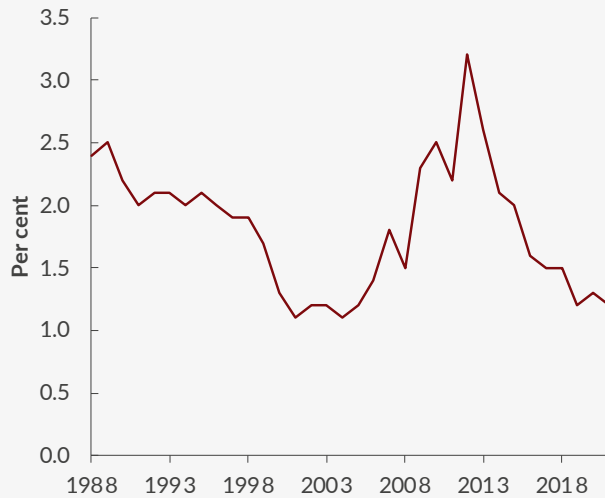
Gas currently has a weight of 1.2 per cent in the consumer price index. This is very near the bottom of the range we have seen for gas prices over the last three or four decades, with the highest weight being 3.2 per cent in 2012, and the lowest 1.1 per cent in 2001 and 2004 (see Figure C1).

The wide range for the weights of gas in the CPI reflects it having a very volatile price (Figure C2). In late 2006, prices were about 40 per cent higher than a year earlier, with a 50 per cent annual rise recorded in 2008 Q4.

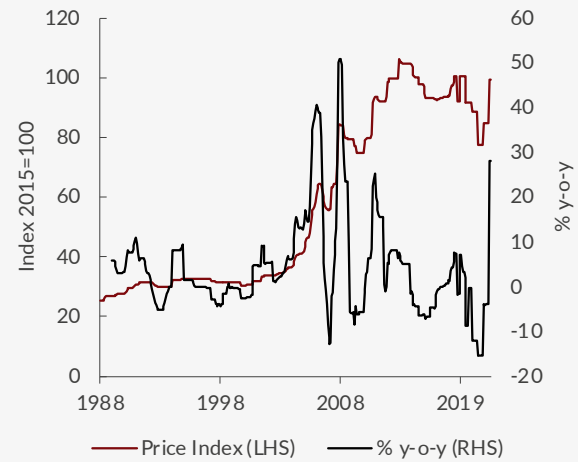
1 The authors would like to thank Jagjit Chadha and Rory Macqueen for valuable comments and Amber Rivett for research assistance.

2 When economic agents use the best available information in a way that is consistent with our model.

3 When economic agents use past data to predict future outcomes.

Figure C1 Weight of Gas Prices in CPI (per cent)

Source: ONS

Figure C2 Gas Price (Index, 2015 =100) and Price Change (per cent y-o-y)

Source: ONS

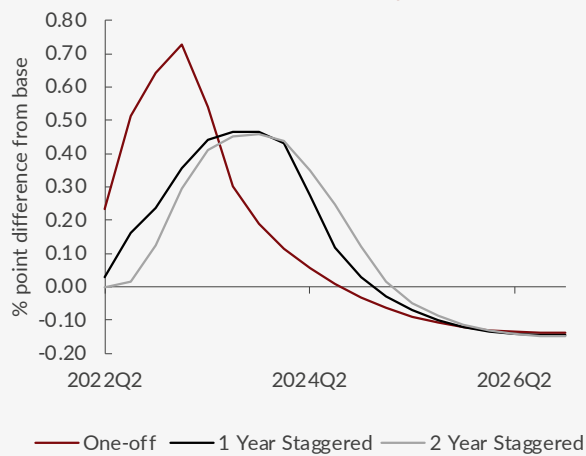
Based on 2015=100, the gas price was 99.4 in December 2021, close to the top of the range, but only 4.6 per cent above the average price of the last ten years. The price in December was marginally below the level in September 2019, prior to the pandemic. With the global demand for energy dropping as Covid-19 hit global GDP, the gas price fell in 2020. As recovery set in, the price of gas to UK households rose by 9.4 per cent in April 2021, though remaining below the level a year earlier. A 17.1 per cent rise in October 2021 took the price back to where it had been before the pandemic. In December, the price of gas in real terms – that is, deflated by all items in the CPI – was 14 per cent below the 2015 base year and about 20 per cent below the peak of the real gas price in 2014. Thus, a 50 per cent rise in gas prices would take them into uncharted territory in real as well as nominal terms.

Analysis

In NIESR's macroeconomic model, the price of gas is permanently increased by 50 per cent under three different scenarios, with each one simulated using rational and then adaptive expectations. In each case, monetary policy is endogenous. The first scenario is of a one-off 50 per cent increase in the price of gas in 2022 Q2. The second and third simulations represent staggering the rise in the price of gas. The former involves two 25 per cent price hikes twelve months apart, and the latter includes four price increases of 12.5 per cent every six months, cumulating to a 50 per cent rise in both cases.

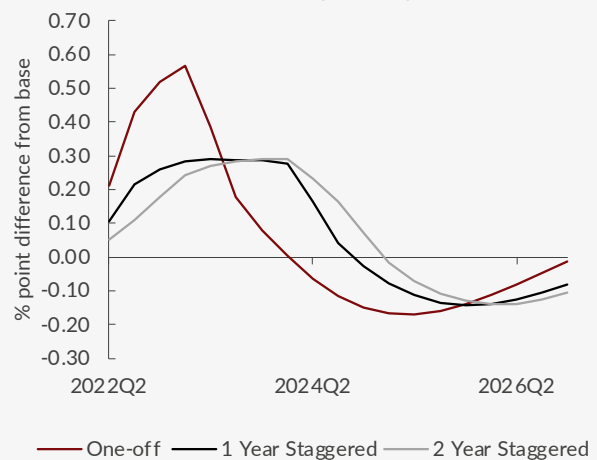
There are three main channels through which higher gas prices may impact the UK economy. First, the direct impact on consumer prices, which reduces real personal disposable incomes. Second, higher consumer prices encourage firms and workers to agree to higher nominal wages, further increasing pressure on firms' production costs and raising inflation as a second-round effect. Third, tighter monetary policy to contain higher domestic inflation reduces domestic demand and leads to an appreciation in the exchange rate, making UK goods less internationally competitive, reducing export demand, and worsening the trade balance while also reducing import prices.

A one-off increase in the price of gas leads to an immediate rise in inflation and triggers a monetary policy tightening; the monetary response is initially stronger under rational expectations than adaptive expectations and returns to base nine periods after the shock. Inflation peaks in the third period following the shock in both cases but under rational expectations the inflation peak is higher at just over 0.7 percentage points above base, compared with under 0.6 percentage points under adaptive expectations (see Figures C3 and C4). This higher addition to inflation under rational expectations is because forward-looking economic agents realise the implications of the shock for future inflation and so start reacting straight away, including in wages. Under adaptive expectations, the inflation response is relatively slower.

Figure C3 The Impact on Inflation* from Higher Gas Prices Under Rational Expectations

Source: NiGEM simulations

*Note: Based on the growth in the consumer expenditure deflator.

Figure C4 The Impact on Inflation* from Higher Gas Prices Under Adaptive Expectations

Source: NiGEM simulations

*Note: Based on the growth in the consumer expenditure deflator.

While staggering the gas price rise may sound as though it could significantly reduce the inflationary impact of the gas price rise, it lowers the addition to inflation slightly but prolongs the inflationary cycle (see Figures C3 and C4). Inflation returns to base later than in the one-shot price rise: after 10-11 periods. If people know the price increases are delayed and not cancelled, they still behave in an inflationary way – their inflation expectations alter behaviour, including price and wage setting, prior to the delayed price rises. Moreover, interest rates must stay higher for longer to fight the prolonged inflationary cycle, particularly in the case of adaptive expectations, reflecting the more extended inflation cycle. The gains in staggering the price rise accrue only when people are not aware of them coming, which seems unlikely since Ofgem's decision was high-profile.

Conclusion

Price controls in the 1970s were not an effective solution to inflation. Only when monetary policy changed, for example, with Paul Volcker in the US in the 1980s, did inflation come down and stay down. Our simulations suggest another reason – people knew the price increases were delayed, not cancelled, and so behaved in a still inflationary way. In terms of UK household gas prices today, it does make a difference to peak inflation in our simulations whether the price hikes happen straight away or are staggered by Ofgem. The inflation benefits of staggering are greatest if expectations are adaptive, though it is difficult to see that people would fail to see the further price increases coming if Ofgem were to make that announcement. Two other sets of considerations affect the policy decision: the impact on the income distribution and on the environment.

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