

THE BEHAVIOUR OF CONSUMER GAS PRICES IN AN ENVIRONMENT OF HIGH AND VOLATILE OIL PRICES

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OVERVIEW

In this paper we examine the pass through of oil prices into consumer gas prices in the euro area. The main features of the paper are: (1) the combination of low frequency (semi-annual) consumer gas price data on price levels from Eurostat with higher frequency (monthly) index HICP data; (2) the mapping of the different stages in the supply chain - from oil prices, to wholesale (border and spot market prices) to consumer prices; (3) analysis at the aggregated euro area and individual country level; and (4) a sample period covering from 1995 to 2009, allowing us to cover a period with relatively low and stable oil prices, but also one with higher and more volatile oil prices. The questions we address are: (a) what is the behaviour of gas prices and in particular the pass through of upstream oil and gas prices into consumer prices (i.e. how much is passed through and how quickly), (b) are there differences across countries and (c) is there any evidence of asymmetry. Although there has been a large literature on the existence or otherwise of an asymmetric response of consumer transport fuel prices to oil price movements (often referred to as the ‘rockets and feathers’ literature), as far as we are aware there has been little investigation of the existence of asymmetries of consumer natural gas prices to upstream oil and gas prices.

METHODS

Given the non-stationary nature of our underlying data the pass through results and test of asymmetry are carried out using cointegration techniques with an error correction mechanism (ECM) term in our econometric framework. However, to allow for the possibility of structural breaks in oil and gas price regimes, we follow the approach of Hatemi-J (2008) who develops a test “for long-run equilibrium relationships (cointegration) between time series variables of interest when this potential relationship may shift twice during the period of study with unknown timing that is determined by the underlying data”. Our results indicate that, once the underlying relationships are correctly modelled, the underlying cointegration vectors are relatively stable.

A key feature of this paper is the pass-through estimation in absolute levels rather than logarithmic terms (see Meyler (2009) in this regard). The reason for this is that the distribution and retail costs and margins appear to be broadly constant in absolute terms rather than being a constant percentage mark-up over input (wholesale) gas costs. A side-effect of this modelling decision is that in order to estimate the pass through at a higher (i.e. monthly) frequency, we must interpolate the semi-annual price level data from Eurostat with the monthly gas component of the Harmonised Index of Consumer Prices. We use the Chow-Lin (1971) interpolation procedure.

RESULTS AND CONCLUSIONS

Our main result is that, despite the substantial increase in upstream prices, for (pre-tax) consumer gas prices the distribution and retail costs and mark-up of over wholesale (i.e. border) gas prices has remained broadly constant at around 5€GJ (see Fig. 1). Although as

there is some lag, mark-ups do buffer upstream price movements to some extent. An important implication of this finding is that, contrary to most studies, the relationship between upstream and downstream prices should be modelled in absolute level rather than logarithmic terms and that the elasticity of consumer gas prices with respect to oil prices is a function of the oil price level (see Table 1).

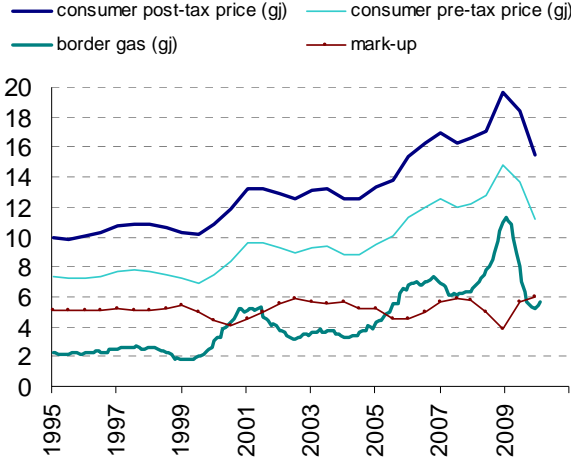


Fig. 1. Decomposing euro area consumer gas prices (border prices, taxes and the ‘mark-up’)

Table 1. Summary of gas price elasticity with respect to oil

crude oil (€ per barrel)	Natural gas (1.8%)**
20	24%
50	44%
100	61%
* Based on taxes (VAT, excise and other) as at end-2009	
** denotes weight in overall HICP	

A number of issues remain to be teased out in more detail. In particular, whether most recent developments, specifically the growing evolution of European spot markets and their partial decoupling from oil prices, has impacted on consumer price developments, or has the impact been confined to electricity generators and industrial customers.

KEY REFERENCES

- Hatemi-J, A. (2008). Tests for cointegration with two unknown regime shifts with an application to financial market integration. *Empirical Economics*, Vol. 35 No. 3, November, 497–505.
- Meyler, A. (2009). The pass through of oil prices into euro area consumer liquid fuel prices in an environment of high and volatile oil prices, *Energy Economics* Volume 31, Issue 6 - Energy Sector Pricing and Macroeconomic Dynamics, November 2009, Pages 867-881