Does the volatility of commodity prices reflect macroeconomic uncertainty?

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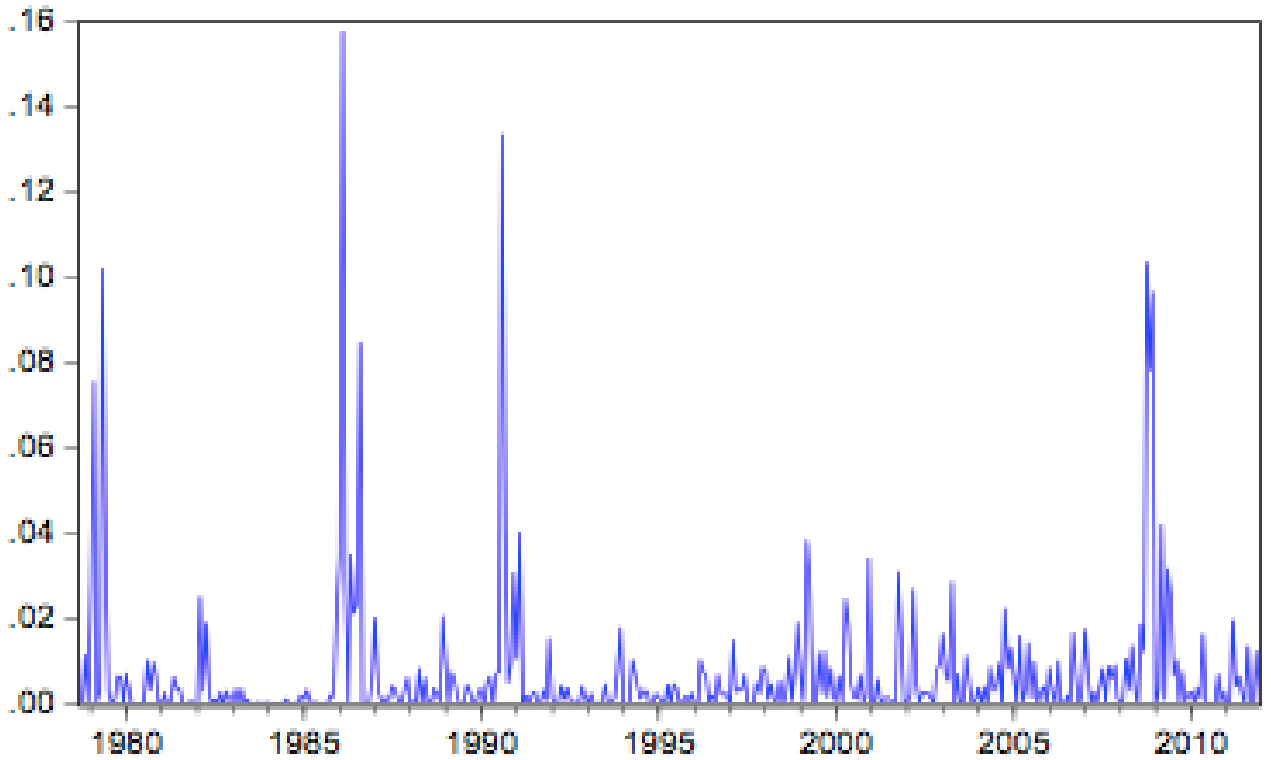

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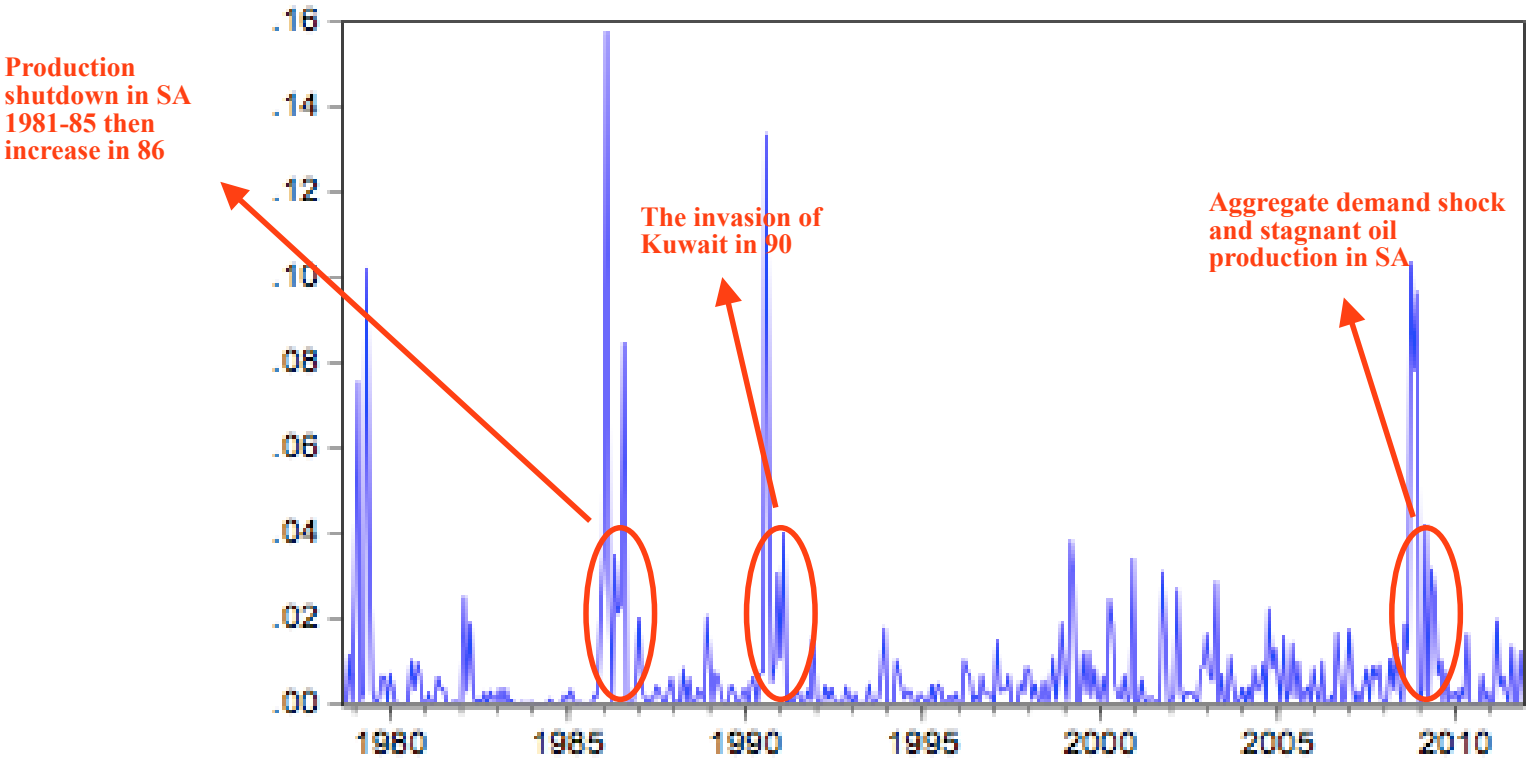

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  - Welfare consequence? (Fattouh and Mahadeva 2014; Joëts and Razafindrabe 2015).

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- What could be the effect on commodity prices?

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  - What shocks make price more uncertain? (supply, demand, or speculation)

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  - Oil price uncertainty in 1980s is mainly supply-driven (1985-86 Saudi Arabia).
  - On the whole speculative shocks do not lead to oil price uncertainty (very limited contribution during the 2007-08 episode).

Outline of the presentation

- Related literature
- The model: empirical strategy
- Impact of macroeconomic uncertainty across states (nonlinear IRF)
- Does maturity matter?
- Does macroeconomic uncertainty generate commodity uncertainty?
- Distinguishing between different types of shocks in oil price uncertainty: uncertainty; supply; demand; and speculative shocks.
- Discussion: The crude oil price decrease paradox in June-Dec 2014 (Arezki-Blanchard 2014 *vs*. Baumeister-Kilian 2015).

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  - empirical paper: Van Robays 2013 $\longrightarrow$ volatility as a proxy for macro uncertainty.

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- Adequate proxy of macro uncertainty?
- Effect of macro uncertainty on various commodity markets / on distinct maturities?
- Does macro uncertainty lead to price uncertainty?
- How much macro uncertainty in price uncertainty?
- How much fundamental and speculative shocks in price uncertainty?

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where $i = 1, ..., N_y$, $E(.|J_t)$ is the conditional expectation of y_{jt}, J_t the available information at time t, $U_{jt}^{y}(h)$ is the conditional volatility of the purely unforectastable component of y_{jt}.

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  3. Construct macro uncertainty from the individual uncertainty.

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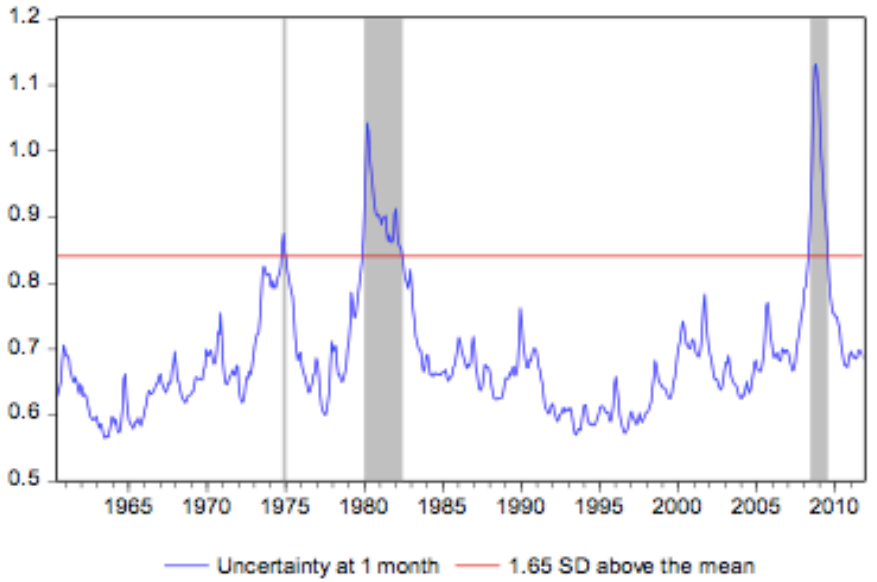

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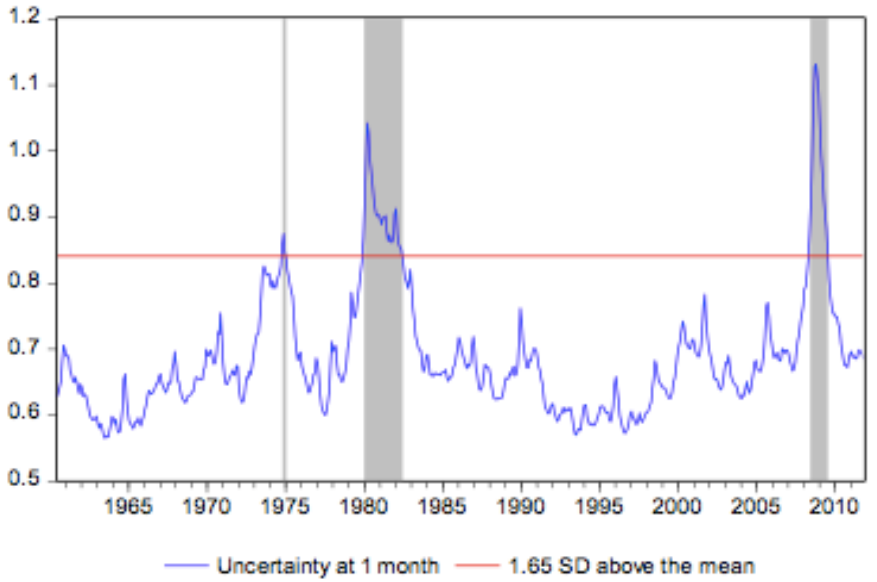

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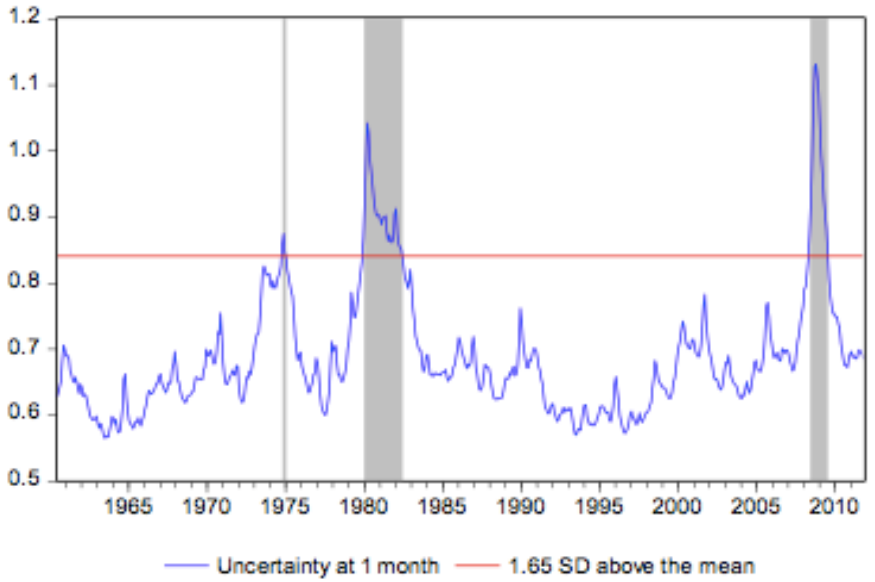

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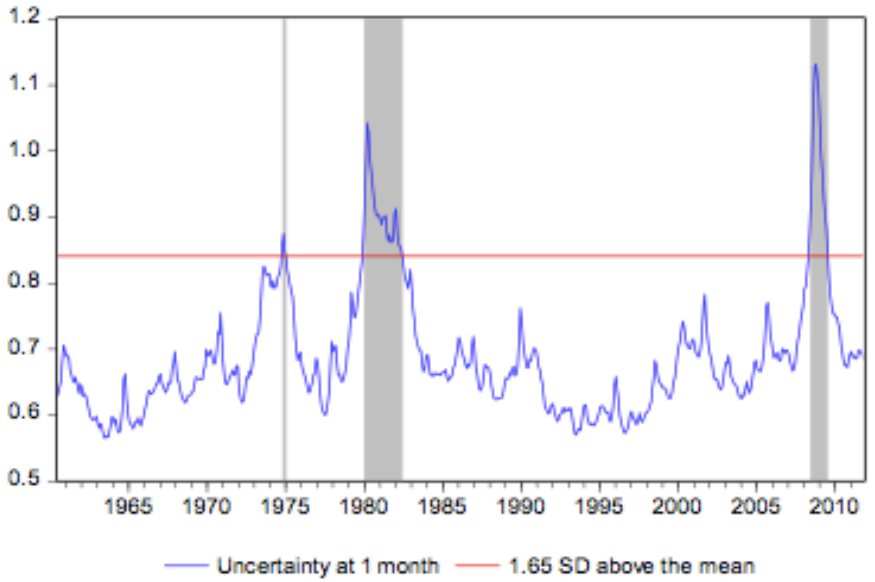

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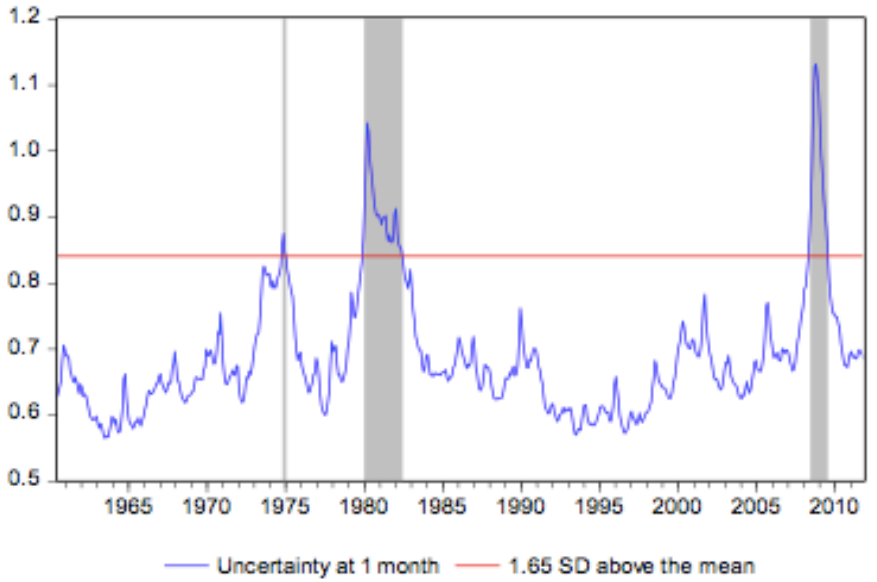

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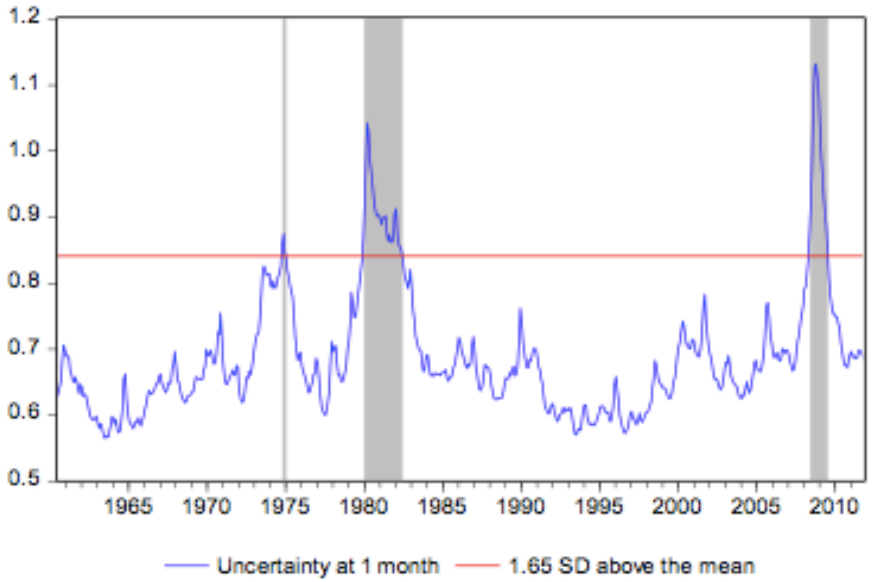

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- endogeneity problem of the threshold: three-period moving average (persistence) of our one-period-lagged threshold variable (switch across states with a delay).

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  3. Commodity prices uncertainty as the time-varying conditional volatility of the forecast errors (stochastic vol. model of Chan and Hsiao 2013): $U_{t+h}^c = E\left[\left(V_{t+h}^y\right)^2 |\Omega_t, u_t^u\right]$.

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  3. Commodity prices uncertainty as the time-varying conditional volatility of the forecast errors (stochastic vol. model of Chan and Hsiao 2013):
  $$U_{t+h}^c = E\left[\left(V_{t+h}^y\right)^2 |\Omega_t, u_t^u\right].$$

$\Rightarrow$ when commodity price uncertainty coincides with periods of macro uncertainty: transfert of uncertainty.

Results (Ia)

Impact of macro uncertainty across states (nonlinear IRF)

- Data of commodity spot prices: energy (1978M10-2011M12), precious metals (1976M2-2011M12), industrial (1980M2-2011M12), agricultural (1980M2-2011M12).

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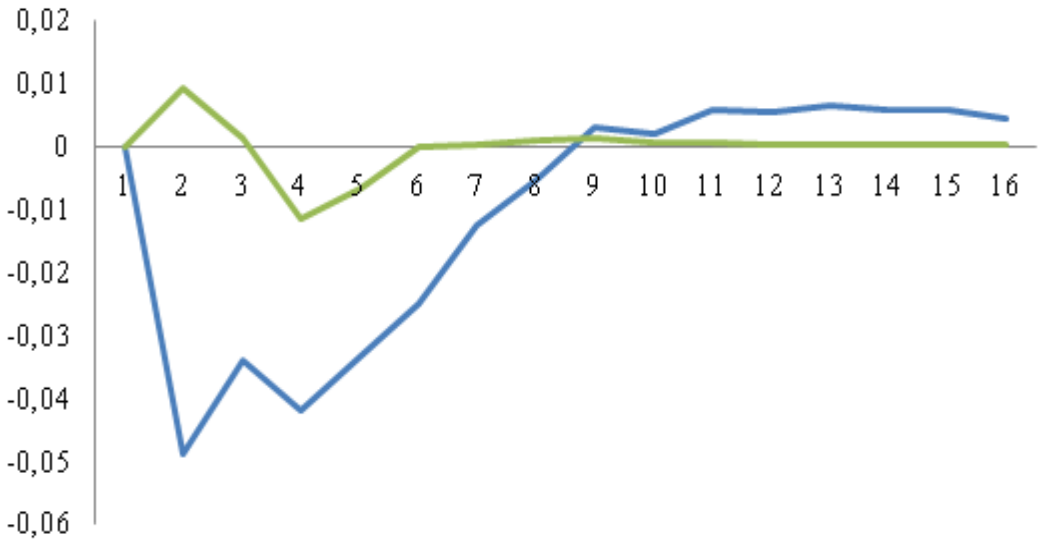
Figure: Impact of macro uncertainty on crude oil price (positive two-standard-deviation shocks)



Results (Ib)

Does maturity matter?

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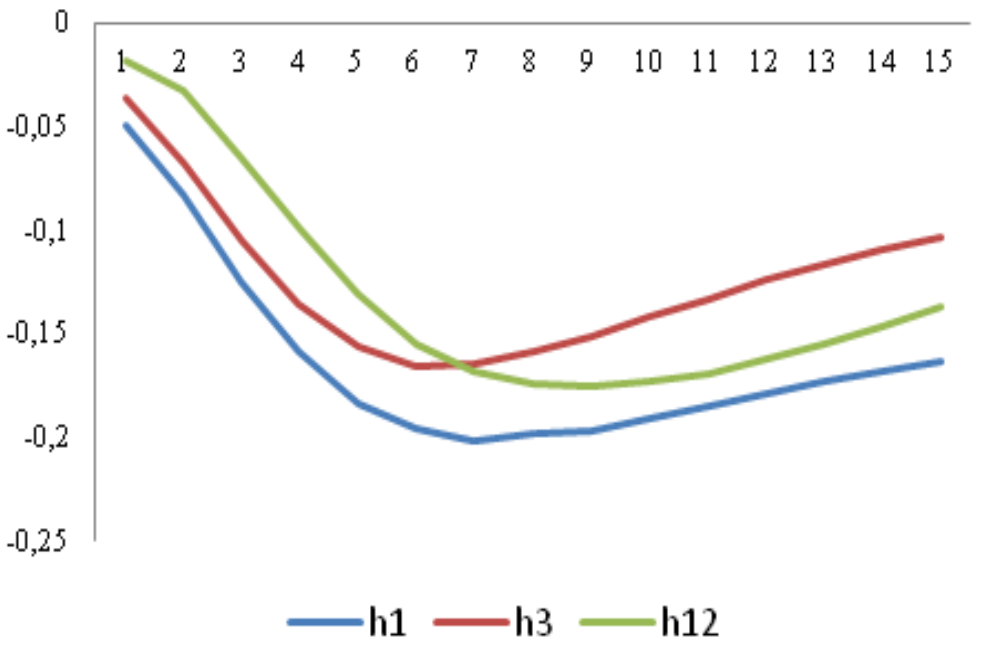
Figure: Uncertainty effect in oil price across maturity (cumulative positive shocks across maturity)



Results (IIa)

Does macroeconomic uncertainty generate oil price uncertainty?

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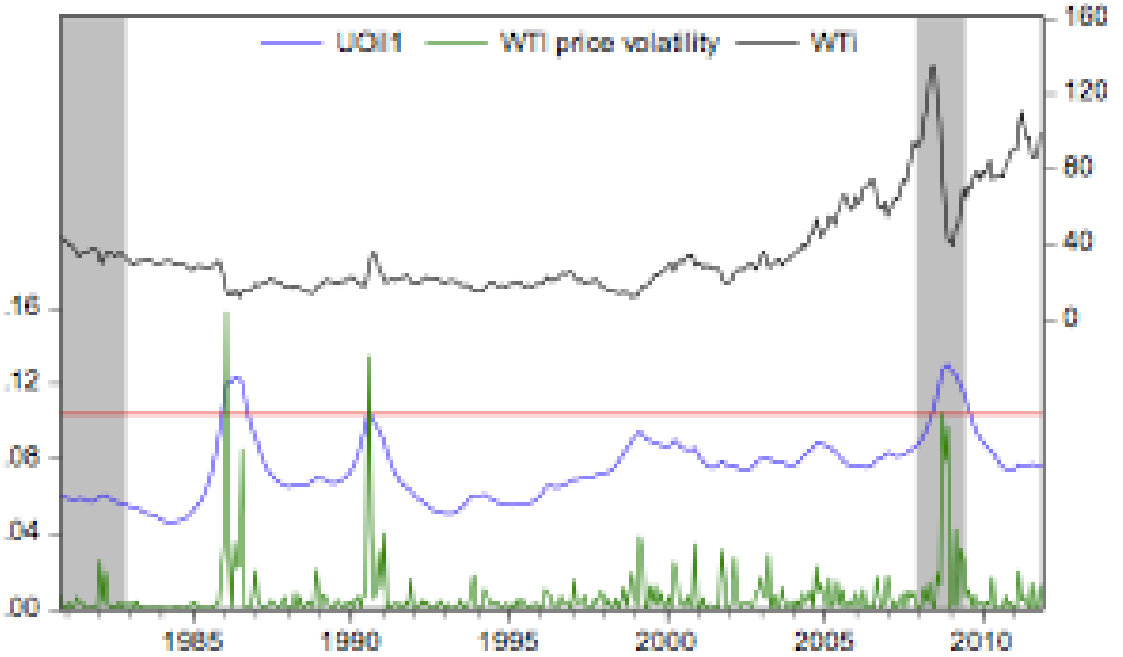
Figure: Oil price uncertainty



Note: Graph depicts oil price uncertainty at 1 month. Horizontal line corresponds to the 1.65 standard deviation above the mean of the serie. Gray bands represent macroeconomic uncertainty periods as described by Jurado et al. (2014). Volatility (green line) is proxied by the daily squared returns of prices.

Results (IIa)

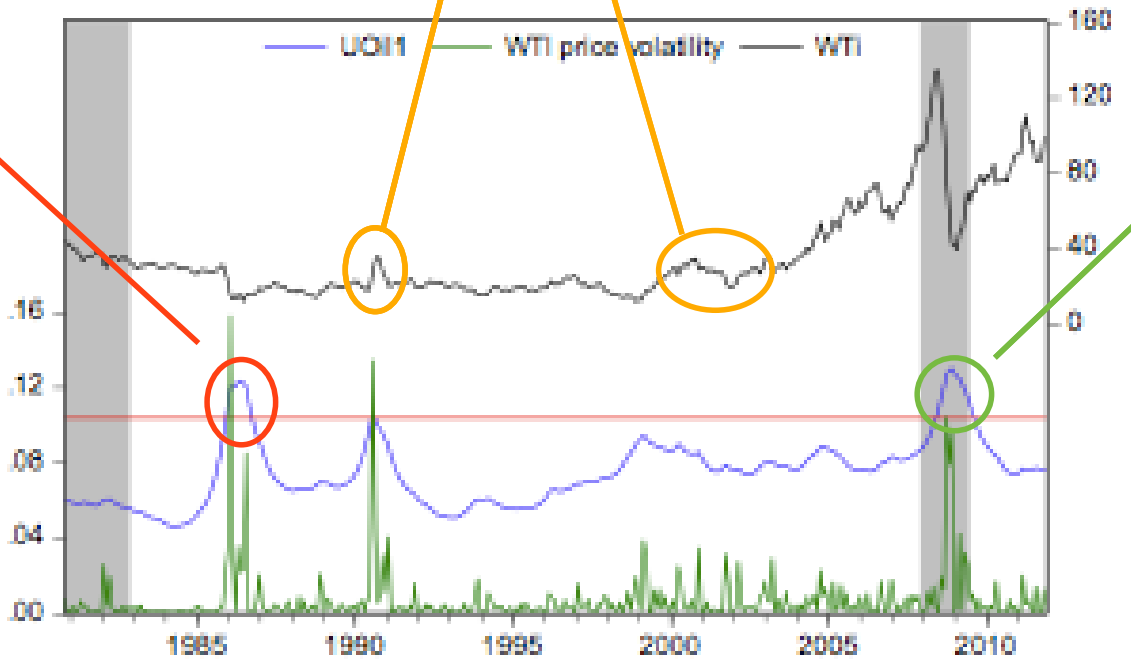
Does macroeconomic uncertainty generate oil price uncertainty?

Kuwait invasion 90, Afghan War 01, Iraq War 02-03: no uncertainty

SA shutdown production: oil price uncertainty

Macro uncertainty: eco growth starting in 2003 with stagnant oil production

Figure: Oil price uncertainty



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Results (IIb)

How much macroeconomic uncertainty in oil price uncertainty?

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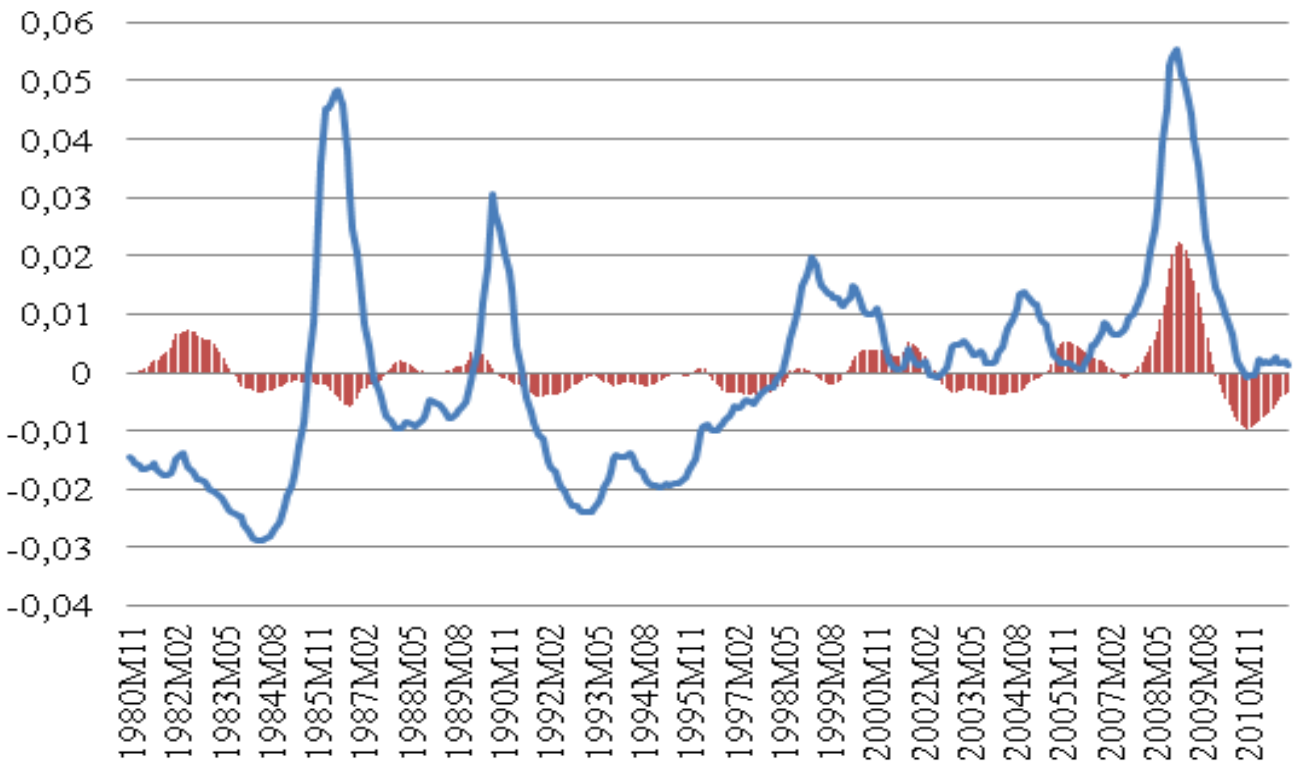
Figure: Historical decomposition analysis



Results (IIb)

What types of shocks make oil price more uncertain: Demand, supply, and speculation?

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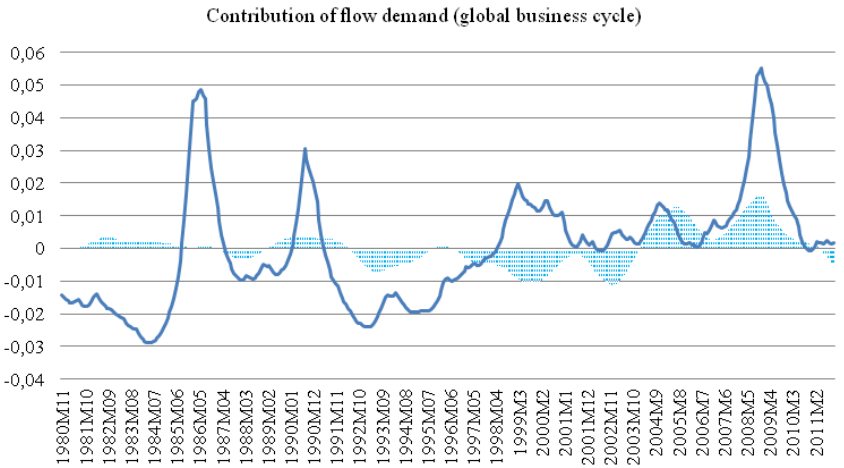

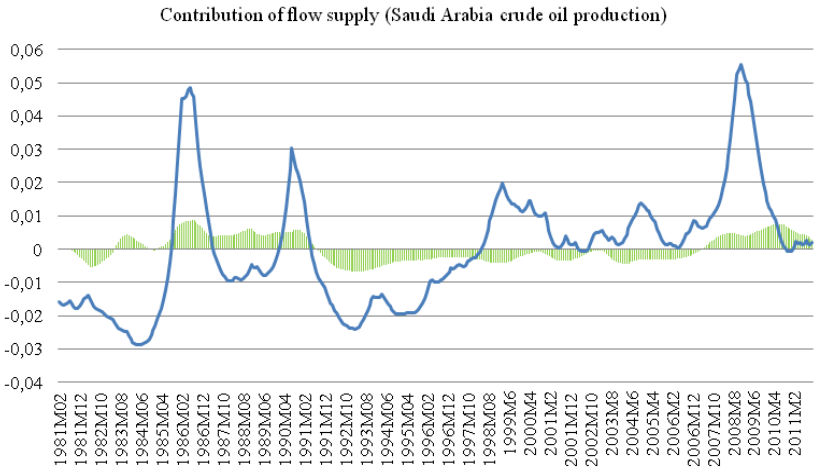

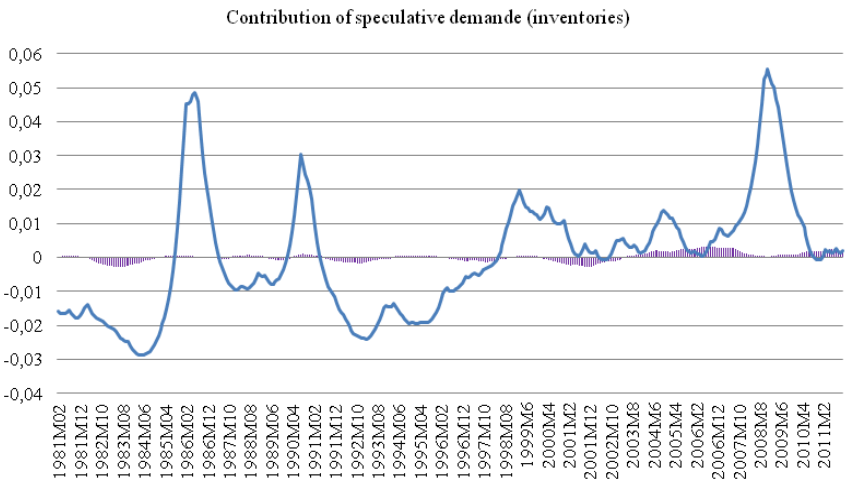

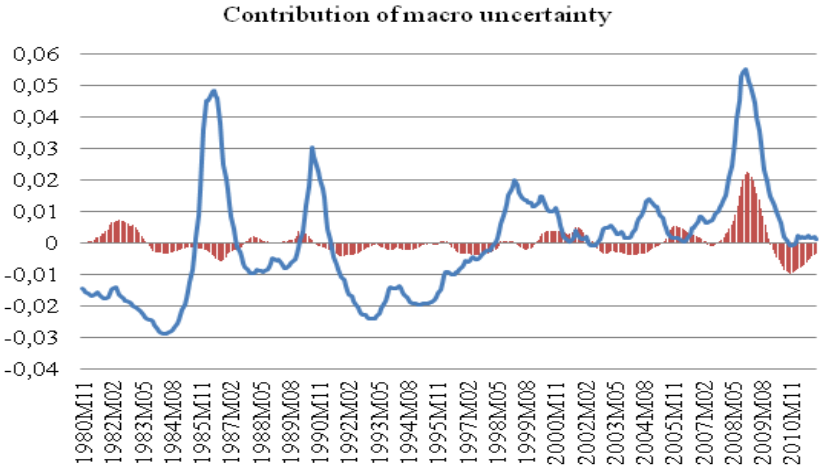

Discussion

The crude oil price decrease paradox (June-Dec 2014)

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- Facts: June-Dec 2014 the price of crude oil fell by nearly 44% leading to severe economic stress on oil producers

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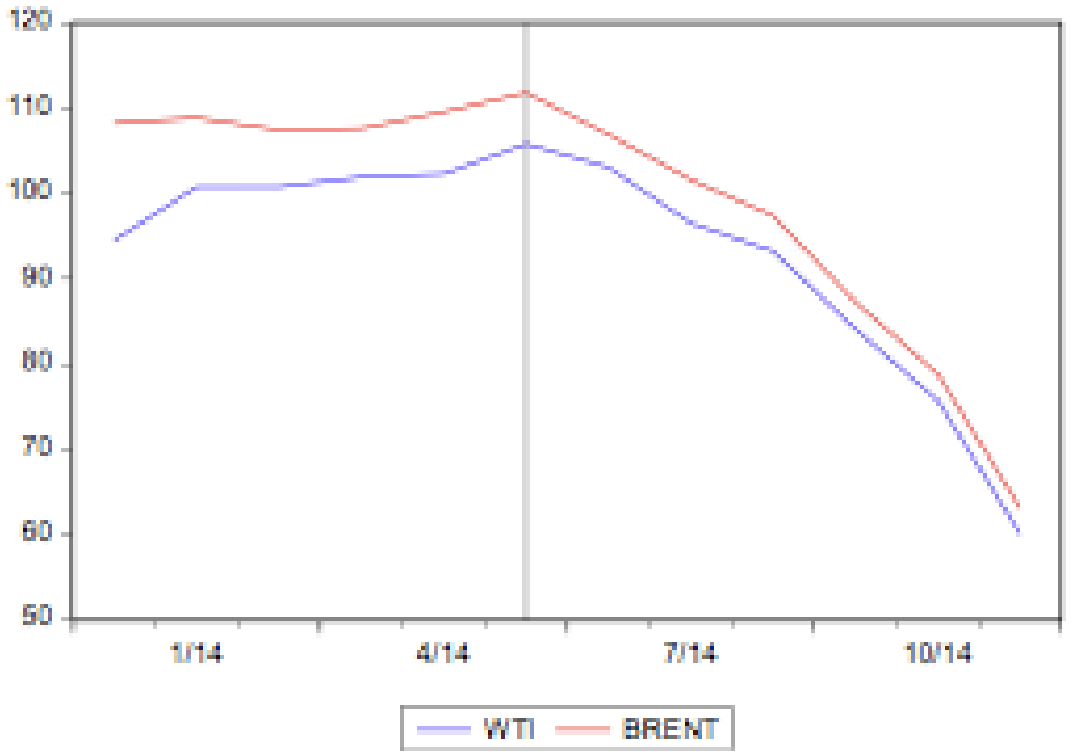
Figure: Crude oil price decrease



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  - Baumeister and Kilian (2015): few large oil market shocks after June 2014 (more than half of the decline was predictable) & a demand shock in Dec (weakening economy).

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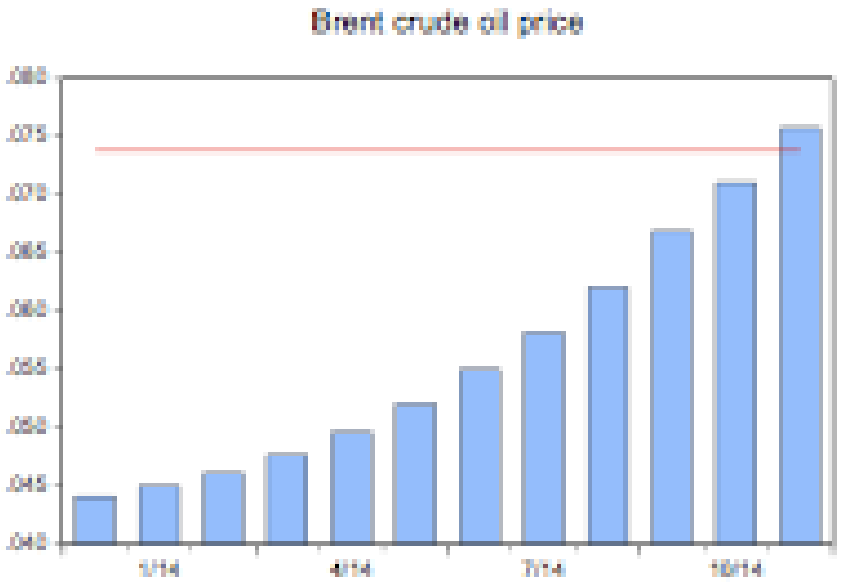

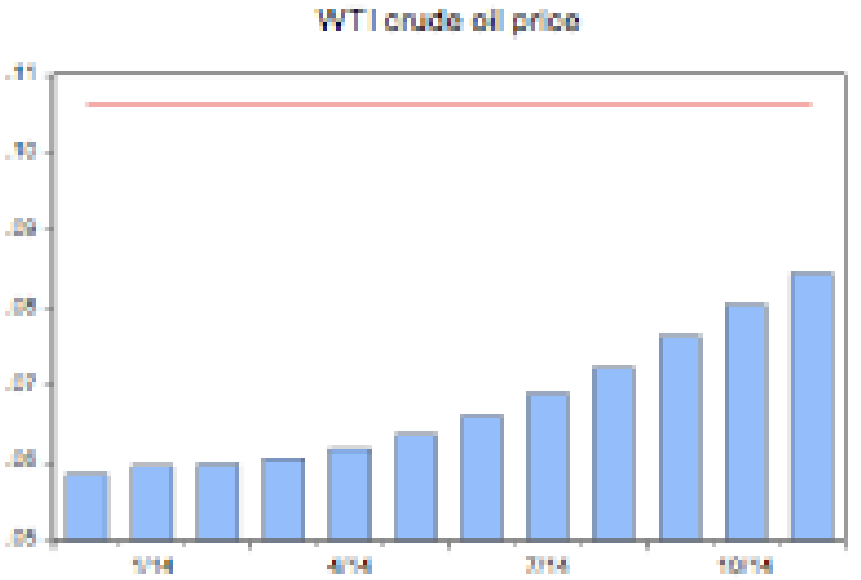

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- The decline of oil price between June and Dec 2014 was predictable (BK are right!).

Thank you!