The volatility of oil and gas prices

by

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(1) Overview

In this paper we consider the volatility of a set of oil and gas products and compare them with a set of other commodities. The oil and gas industry is considered highly volatile and this paper compare the level of volatility with other energy assets (coal and electricity), as well as other commodities (copper, coffee, cotton, sugar, salmon among others). We want to assess the relative volatility within petroleum products, other energy commodities and commodities in general. In addition we consider the volatility level over time, both comparing the relative level of one commodity and between commodities over time.

(2) Methods

The study considers 15 commodities with daily observations over 20 years, providing us with 5 000 observations per product. Volatility is calculated with standard deviation of daily log-returns using a rolling window of 1000 observations. In addition to comparing the level of the entire sample period, we compare a set of sub-samples to control for changing volatility levels over time.

(3) Results

We show that throughout the sample period, the level of volatility is varying. Oil and gas are in general highly volatile compared to other commodities, although there hasve been periods of relatively calm. Most commodities have experienced an increase in volatility since the financial crisis, and are now experiencing the same levels as seen during the 1990s. This is in particular true for oil, gas, copper, cotton, wheat and sugar. Coffee still has a relatively low volatility compared to its level during the 1990s. All commodities experience periods with relatively high volatility, although these spells mostly last only for a short period of time. This may be a result of temporary supply shocks (e.g. agriculture and aquaculture production risk), increased short-term demand (industrial metals) or seasonal imbalance (electricity supply and demand). However, on average for the entire period oil and gas have a higher volatility level compared to other commodities with the exception of high grade copper, indicating that petroleum are among the most volatile commodities, and also more volatile than other energy sources.

(4) Conclusions

Volatility is varying for most commodities in the sample. While oil and gas in general have high volatility levels, it experienced relatively calm in the mid 1990s as well as in the period before the financial crisis. While many commodities are more volatile after the financial crisis, a few commodities experience the opposite, e.g. coffee, once considered a highly volatile commodity, had relatively high volatility levels during the 1990s, and relatively low during the 2000s. The change in

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relative volatility levels between commodities may be a consequence of production risk (supply disruptions due to climate, technological breakthroughs), market risk (introduction of futures markets) and demand-supply imbalances (developing countries, China).

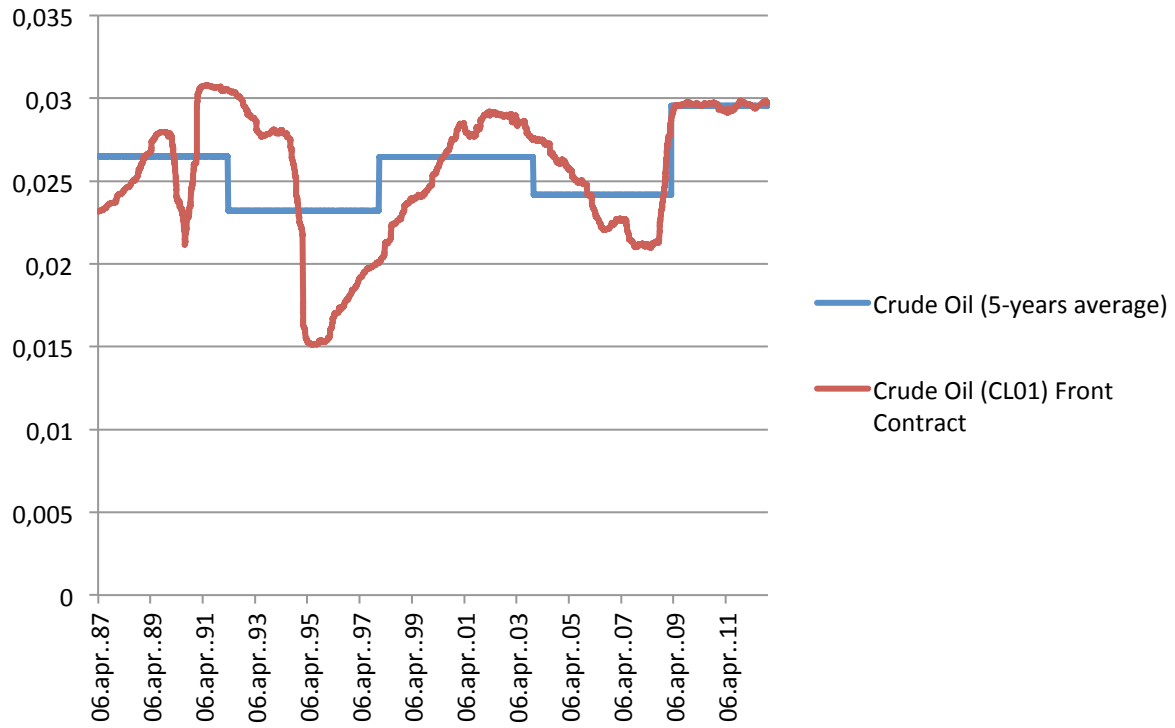

Figure 1 - Standard deviation calculated for Crude Oil from 1987 - 2012, using a rolling window of 1 000 observations, compared to 5-year averages.

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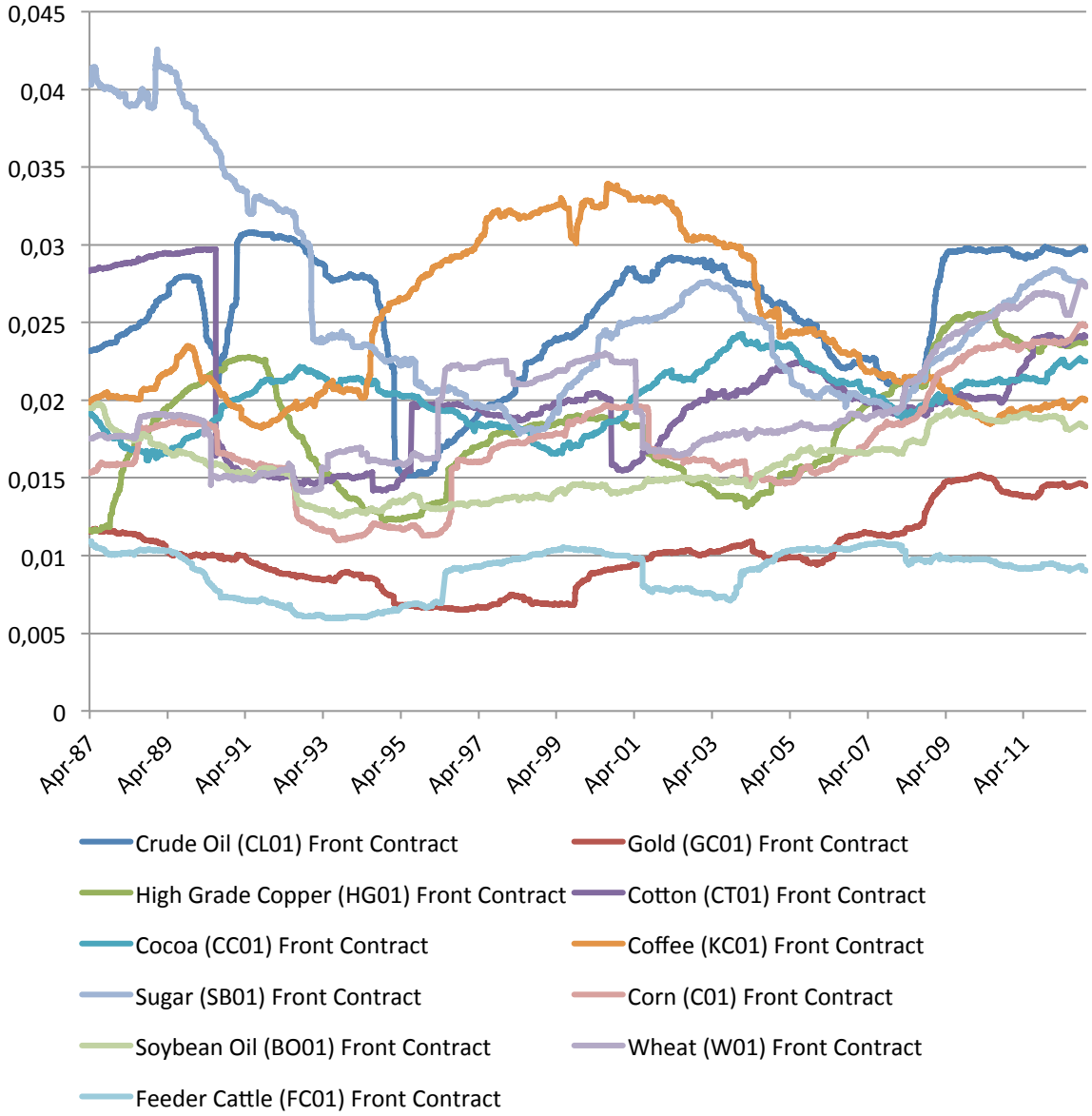
Figur med flere råvarer



Standard deviation of daily log-return data calculated for a set of commodities from 1983 - 2012, using a rolling window of 1 000 observations.