

TRENDS AND CONTAGION IN WTI AND BRENT CRUDE OIL SPOT AND FUTURES MARKETS - A SPREAD AND CORRELATION ANALYSIS

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Overview

Co-movements of crude oil prices and markets have long been focused on in energy related research and literature. In the last decade, crude oil prices were subject to strong upward trends and crash-like downward spirals with periods of high and low volatility, driven by global demand and supply shocks, the global financial crises and its aftermath, and military and political conflicts. Seeking to explain some properties of this suspenseful behavior and these movements, we focus on price data of the WTI, Brent, and OPEC basket from January 2007 to August 2016.

Methods

Different long-term and short-term approaches are implemented in order to test trend and contagion hypotheses which are laid out in the article. Firstly, an adjustable long-term filter is applied on spot and futures prices. Secondly, a simple short-term trend measure is defined and applied on daily crude oil prices and returns. Lastly, a BEKK framework paired with asymmetric variance models is applied to returns seeking to explain transmission effects.

Results

With the long-term filter on spot and futures prices, we find that WTI and Brent as well as the OPEC basket are driven by very similar long-term trend processes. It is shown that this homogeneity is increasing in futures markets for WTI and Brent. Despite the widening spread between WTI and Brent crude prices from 2011 to mid-2014, these results are in favor of the globalized market hypothesis. It is demonstrated that some of the trend changes—so-called kink points—are event-triggered. OPEC meetings, however, have only little impact on long-term price trends.

From the short-term perspective, we find an asymmetric trend contagion between WTI and Brent as well as a differing transmission between spot and futures markets. The results indicate that negative trends in Brent prices last longer than in WTI prices, whereas Brent trends lag several days on average relative to its North-American counterpart. Hence, we present additional evidence that WTI is still in a price-leader role, especially in bearish market environments. Additionally, the WTI storage levels and official publications are identified as trigger for short-term trends across markets.

Lastly, we show that these short-term trends have a remarkably asymmetric impact on the daily conditional variance of crude prices. This can lead to a temporal decoupling of markets which becomes visible from the results of the conditional correlation analysis carried out with a multivariate BEKK model. These effects are less pronounced in futures markets of varying maturity. By the long-term analysis, these divergent movements are proven to be short-lived, however.

Conclusions

This paper contributes to existing literature on crude oil markets by applying new approaches for identifying long and short-term trends as well as their interplay and triggers of changes. The results add to the understanding of contagion and transmission mechanisms between locally separated markets. This is of particular interest to policy makers as we provide evidence that OPEC meetings cause short-term market reactions but have little effect on long-term price developments. In addition, the long-term trend analysis offers additional insight on hedging strategies of portfolios consisting of long or short positions in WTI and Brent.