The Relationship between Commodity Investment Flows and Crude Oil Futures Prices: Real or Spurious?

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Impact of Index Investment

Question

- Do position measures constructed from mapping algorithms bias tests on the impact of index investment?

Impact of Index Investment

- Evaluate the impact of index investment using SNG’s framework and examine the sensitivity of the results to model specification, sample period, and alternative index position measures.

Consider SNG’s forecasting regression model, 
\[ ER_{t+1} = \alpha + \beta IIP_{t+3} + \gamma X_t + \epsilon_t \] 
(1)

where
- \( ER_{t+1} \): 1-week excess return of WTI crude oil on nearby futures contract;
- \( X_t \): the set of control variables used by SNG;
- \( IIP_{t+3} \): 13-week change in index positions from the Masters algorithm.

Using the same data and sample period, we obtain virtually the same finding as SNG, i.e., index positions have a statistically and economically significant impact on futures prices for WTI crude oil.

By changing the time lag, SNG’s finding is somewhat sensitive to the length of interval in which index position changes are calculated.

By introducing a dummy variable for 2008, the predictability of crude oil returns using index positions from the Masters algorithm is limited to the onset of the Great Recession in 2008.

By extending the analysis to a post-sample period, the coefficient estimate on \( IIP_{t+3} \) is negative and statistically significant, which contradicts the alleged impact of index investment.

By using the Gilbert’s algorithm, we find a significant impact of index positions with the original model, but again, the results are different as the model or sample period changes.

By considering two alternative index position measures, we find no significant impact in any case.

The relationship between index investment flows and crude oil futures prices found in some previous studies is probably spurious.

Inaccuracy of Mapping Algorithms

The Master algorithm imputes crude oil index positions from agricultural commodities (e.g., Kansas wheat and feeder cattle) that are unique to an index such as the S&P GSCI (Masters, 2008).

The Gilbert algorithm uses the aggregate index positions in agricultural commodities as a measure of index flows in all commodities including crude oil (Gilbert, 2010).

Both algorithms assume annually fixed ratios in index positions, which is rejected by formal tests (Figure 2).

Where Does the Impact Come From?

- Decomposition shows that the imputed index positions from mapping algorithms are mainly driven by positions in feeder cattle for the Masters algorithm (Figure 3);
- a few agricultural commodities for the Gilbert algorithm.

The 2008 “hump” in index positions in a few agricultural commodities, with the simultaneous spike of oil prices, creates a spurious impact of index positions on crude oil futures prices.

Implications

- Results from previous research relying on mapping algorithms to measure index positions are highly questionable.
- New regulations on speculation should only be considered if there is solid evidence.

References


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