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

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

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Introduction

- Substantial price surge of crude oil over 2003-08, along with growing investment flows, raised concerns about the role of index investment
- While most empirical research finds limited evidence, studies that measure index positions based on mapping algorithms find a large and significant impact of index investment on crude oil prices (e.g., Singleton, 2014 ("SNG"); Gilbert, 2010; Cheng et al., 2015)

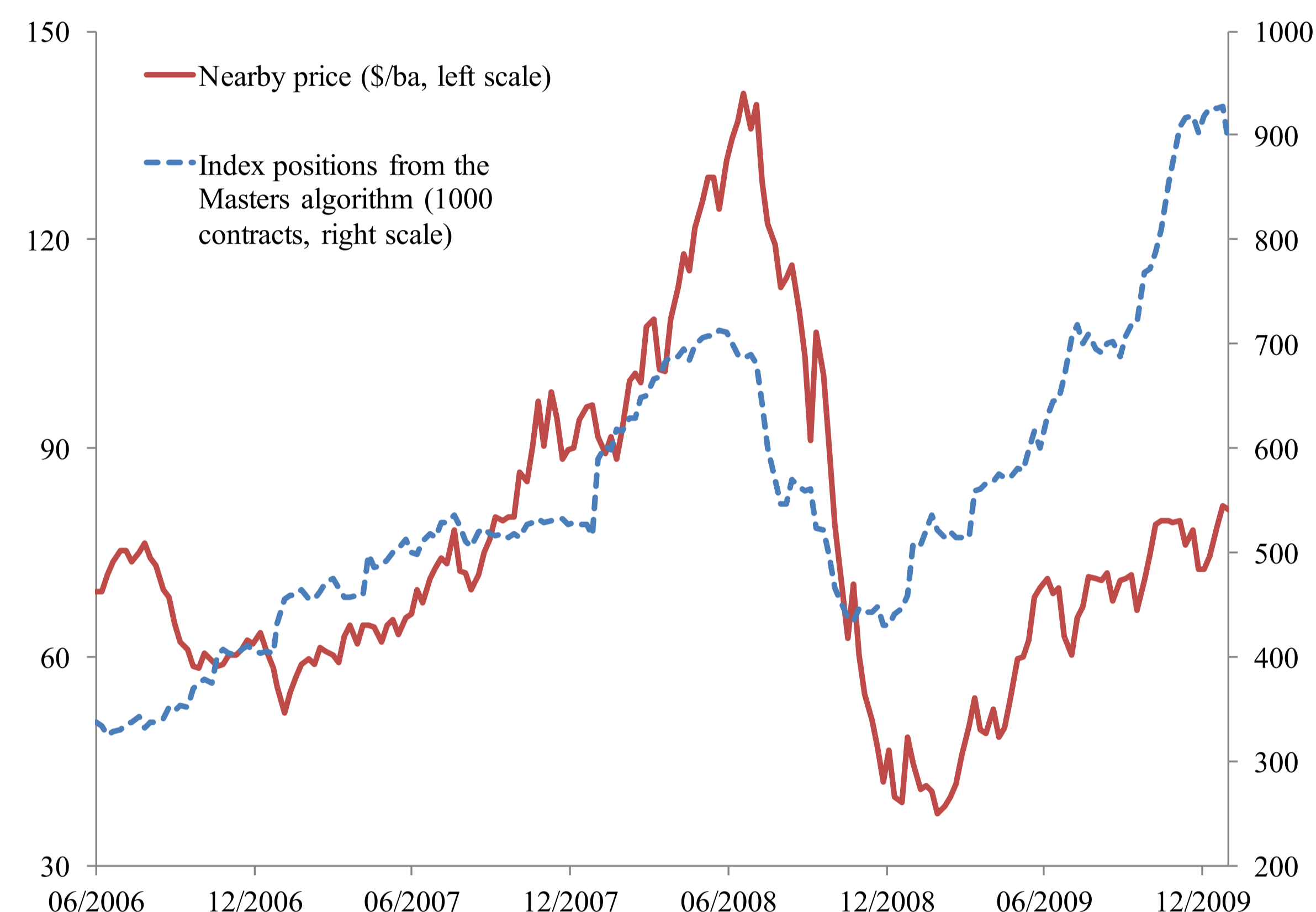


Figure 1: Nearby futures prices of WTI crude oil and index positions

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,

$$ER_{t+1} = \alpha + \beta IIP13_t + \gamma X_t + \epsilon_t \quad (1)$$

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;
- $IIP13_t$: 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 $IIP13$ 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).

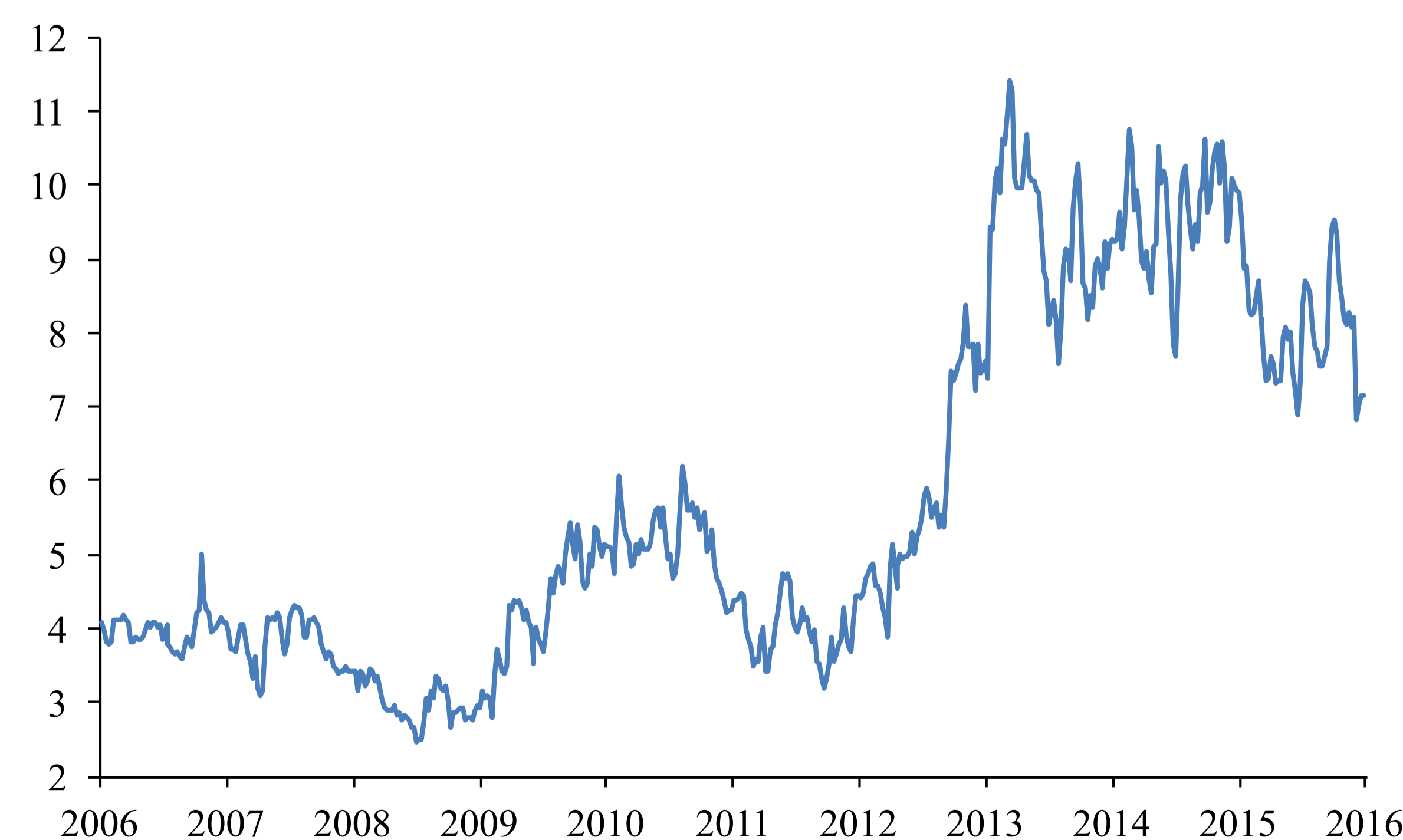


Figure 2: Index position ratios between Kansas wheat and feeder cattle

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.

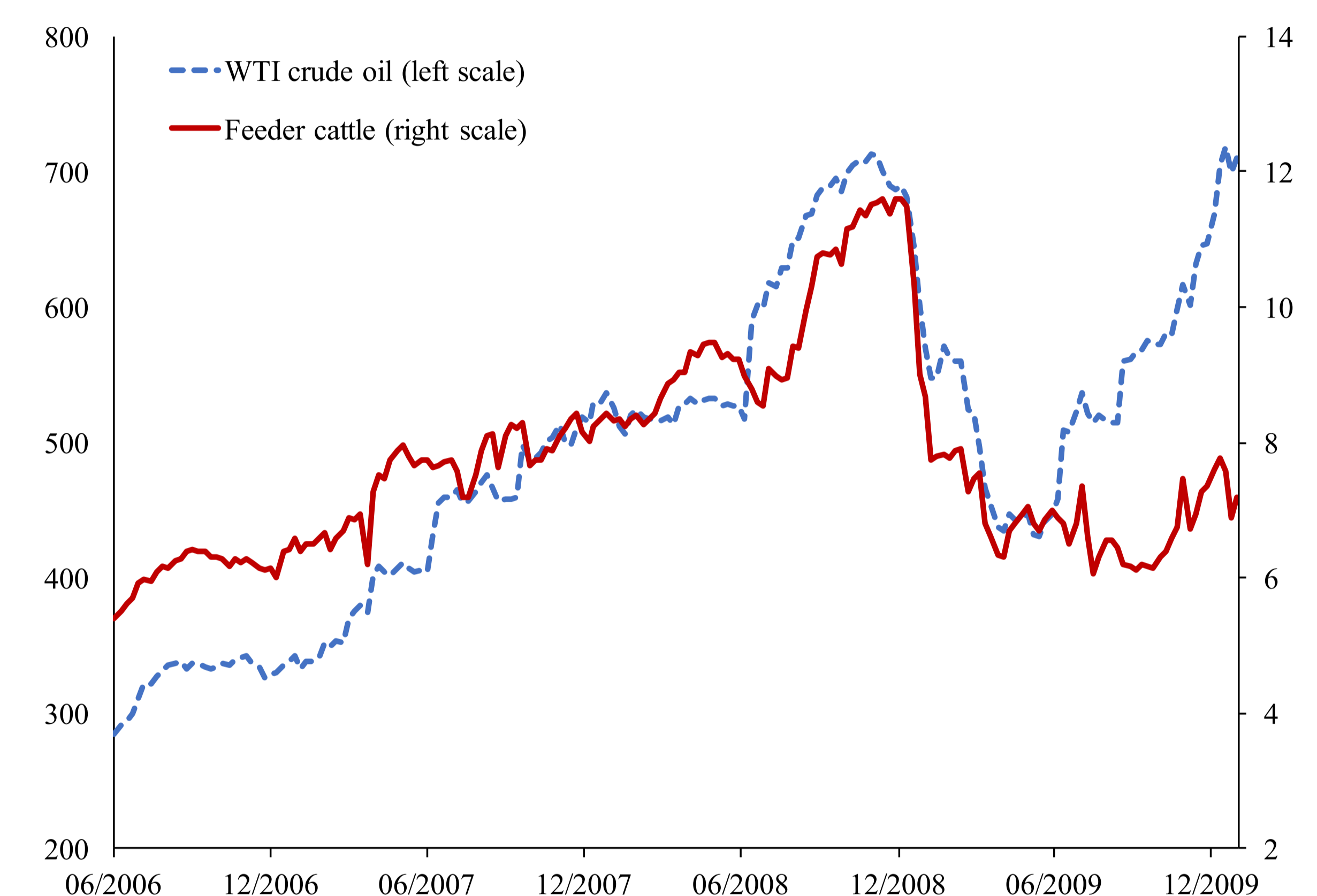


Figure 3: Index positions of WTI crude oil from the Masters algorithm and index positions of feeder cattle from SCOT report, 1000 contracts

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.

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