



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

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

Lei Yan

University of Illinois at Urbana-Champaign

leiyan2@illinois.edu

Scott H. Irwin

University of Illinois at Urbana-Champaign

sirwin@uiuc.edu

Dwight R. Sanders

Southern Illinois University

DwightS@siu.edu

***Selected Poster prepared for presentation at the 2016 Agricultural & Applied Economics
Association Annual Meeting, Boston, MA, July 31- Aug. 2***

*Copyright 2016 by Lei Yan, Scott H. Irwin, and Dwight R. Sanders. All rights reserved. Readers
may make verbatim copies of this document for non-commercial purposes by any means,
provided that this copyright notice appears on all such copies.*

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

Lei Yan¹, Scott H. Irwin¹, and Dwight R. Sanders²

¹University of Illinois at Urbana-Champaign ²Southern Illinois University

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)

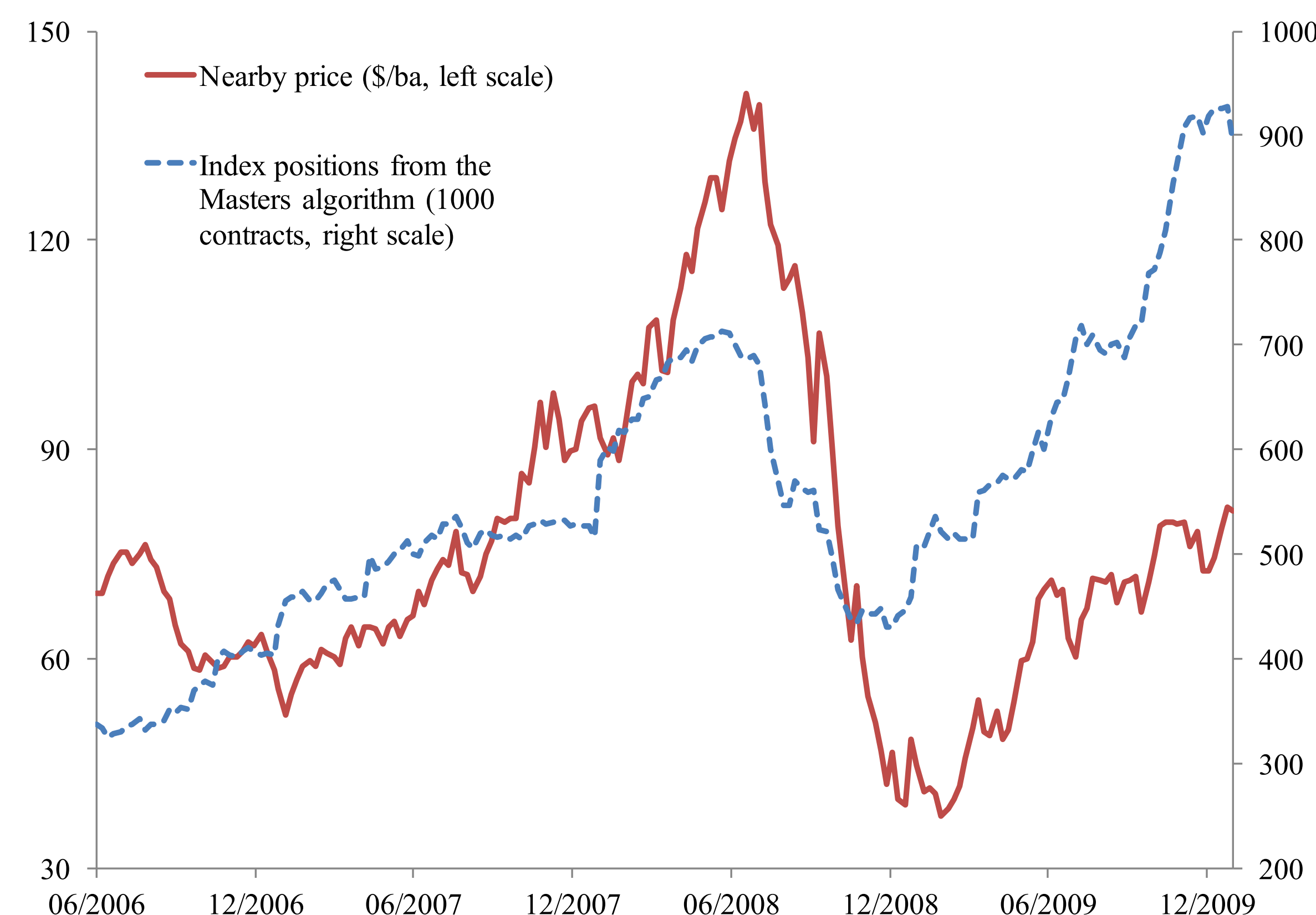


Figure 1: Nearby futures prices of WTI crude oil and index positions

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.

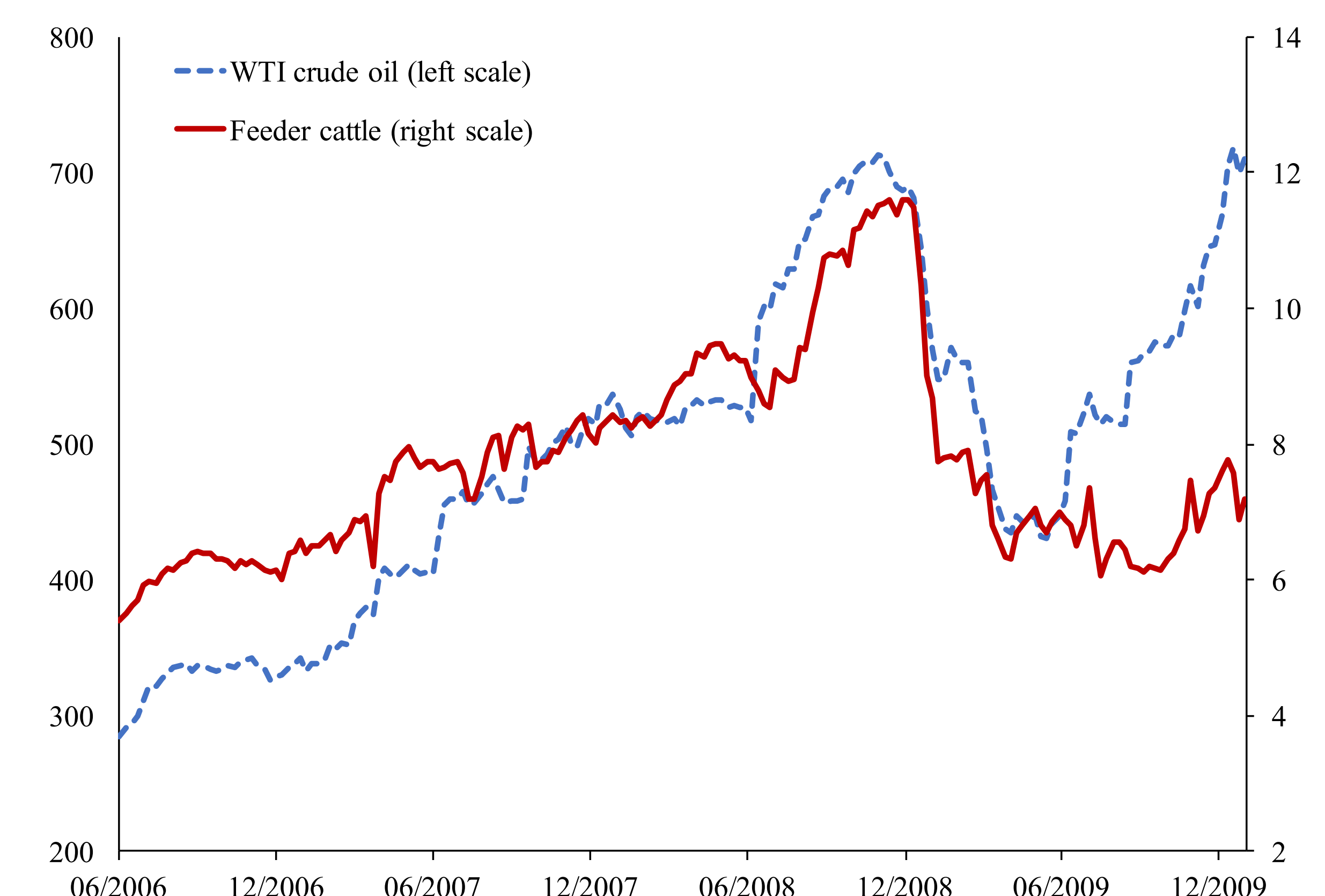


Figure 3: Index positions of WTI crude oil from the Masters algorithm and index positions of feeder cattle from SCOT report, 1000 contracts

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.

References

- Cheng, I., A. Kirilenko, and W. Xiong (2015). Convective risk flows in commodity futures markets. *Review of Finance*, 19, 1733-1781.
- Gilbert, C. L. (2010). Speculative influences on commodity futures prices 2006-2008. UNCTAD Discussion Paper.
- Masters, M. W. (2008). Testimony before Committee on Homeland Security and Governmental Affairs.
- Singleton, K. J. (2014). Investor flows and the 2008 boom/bust in oil prices. *Management Science*, 60(2), 300-318.