

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

Bubbles, Froth, and Facts: The Masters Hypothesis and Recent Food Commodity Price Spikes

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Disclosure Statement

- Funding
 - Recent grants from USDA/ERS, USDA/OCE, and OECD
 - Regular support from a university endowment
 - Occasional consulting projects
- Sometimes trade in commodity futures markets
- Principal in a private company that provides U.S. corn and soybean yield forecasts
- Member of Chicago Mercantile Exchange (CME) Agricultural Markets Advisory Council
- Co-manage family grain farm in Iowa

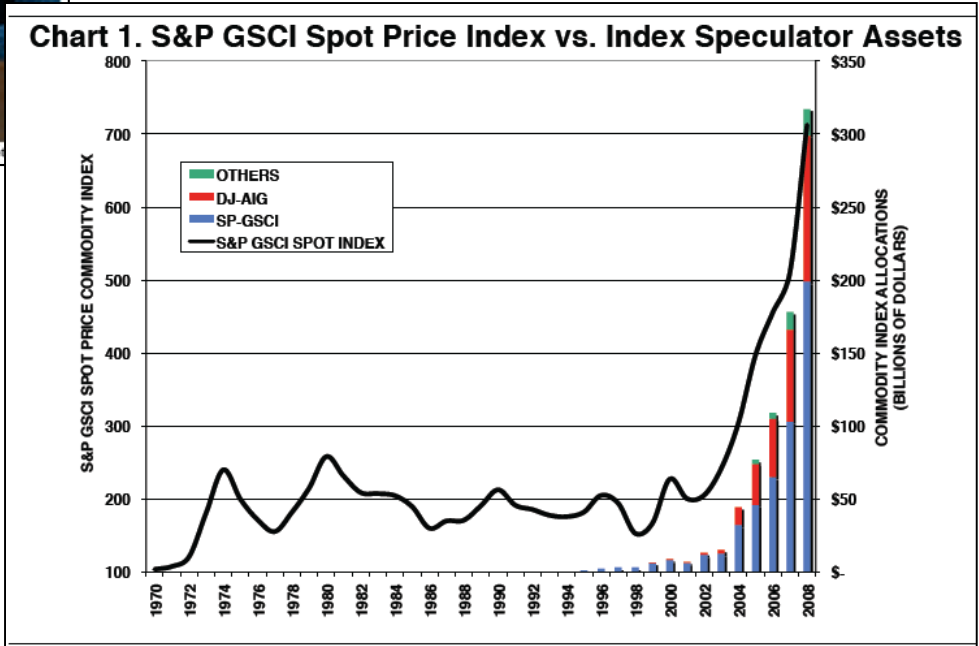




Mark Wilson/Getty

<http://www.nytimes.com/2008/09/11/washington/11speculate.html>

“The Masters Hypothesis”



<http://www.loe.org/images/content/080919/Act1.pdf>





Mark Wilson/Getty

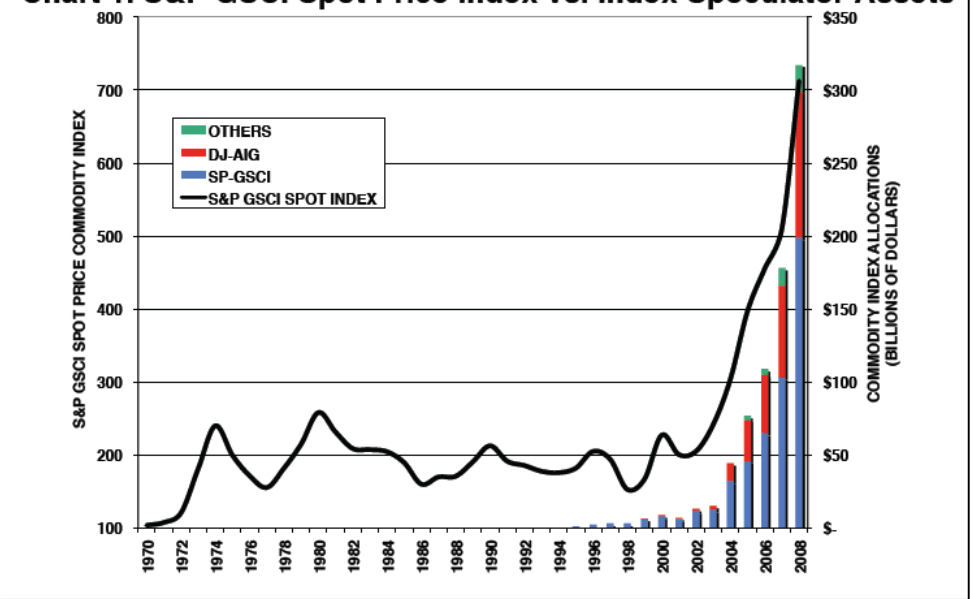
<http://www.nytimes.com/2008/09/11/washington/11speculate.html>

“While individually these Investors are trying to do the right thing for their portfolios (and stakeholders), they are unaware that collectively they are having a **massive impact** on the futures markets that makes the Hunt brothers pale in comparison.”

---Masters and White (2008)

“The Masters Hypothesis”

Chart 1. S&P GSCI Spot Price Index vs. Index Speculator Assets



<http://www.loe.org/images/content/080919/Act1.pdf>



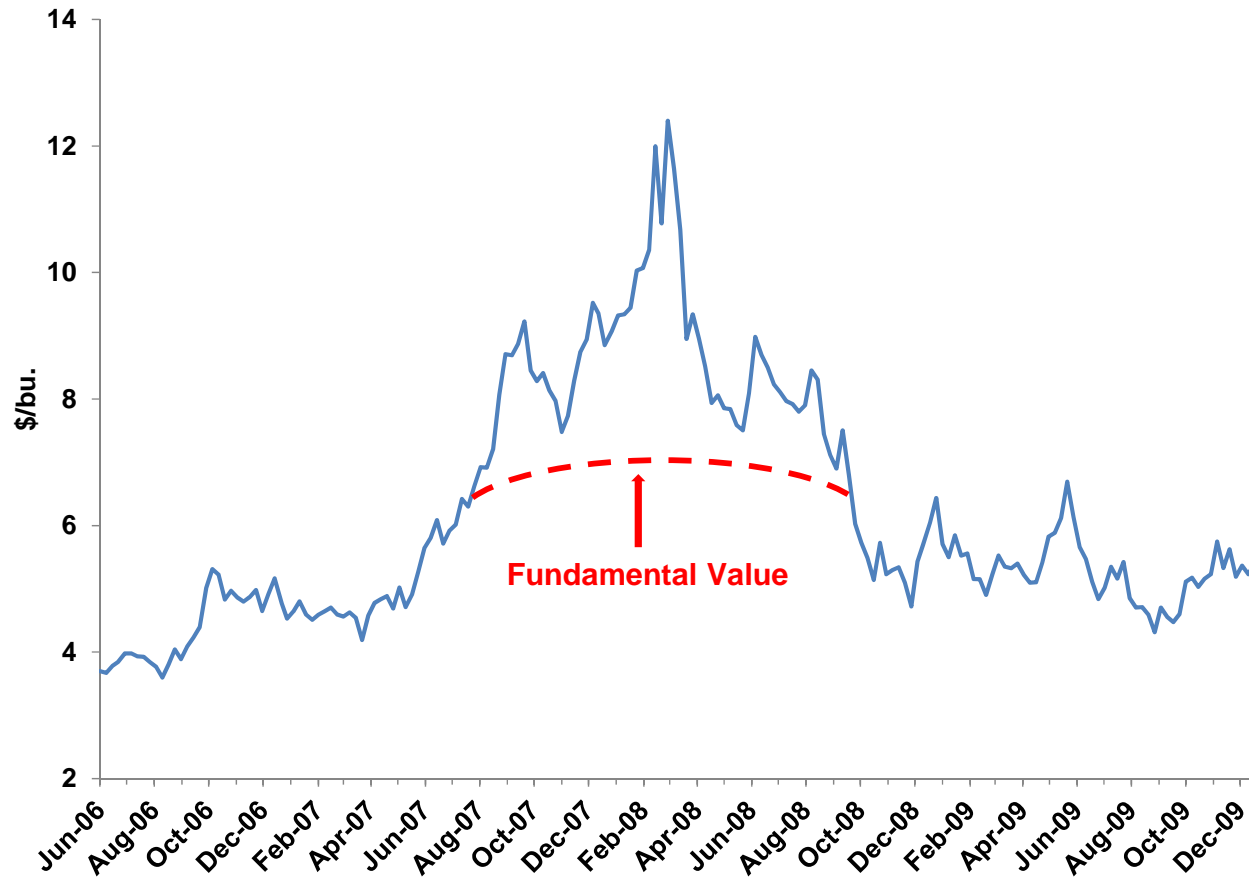
Key Aspects of the Masters Hypothesis

Nearby CBOT Wheat Futures Prices, June 2006 - December 2009



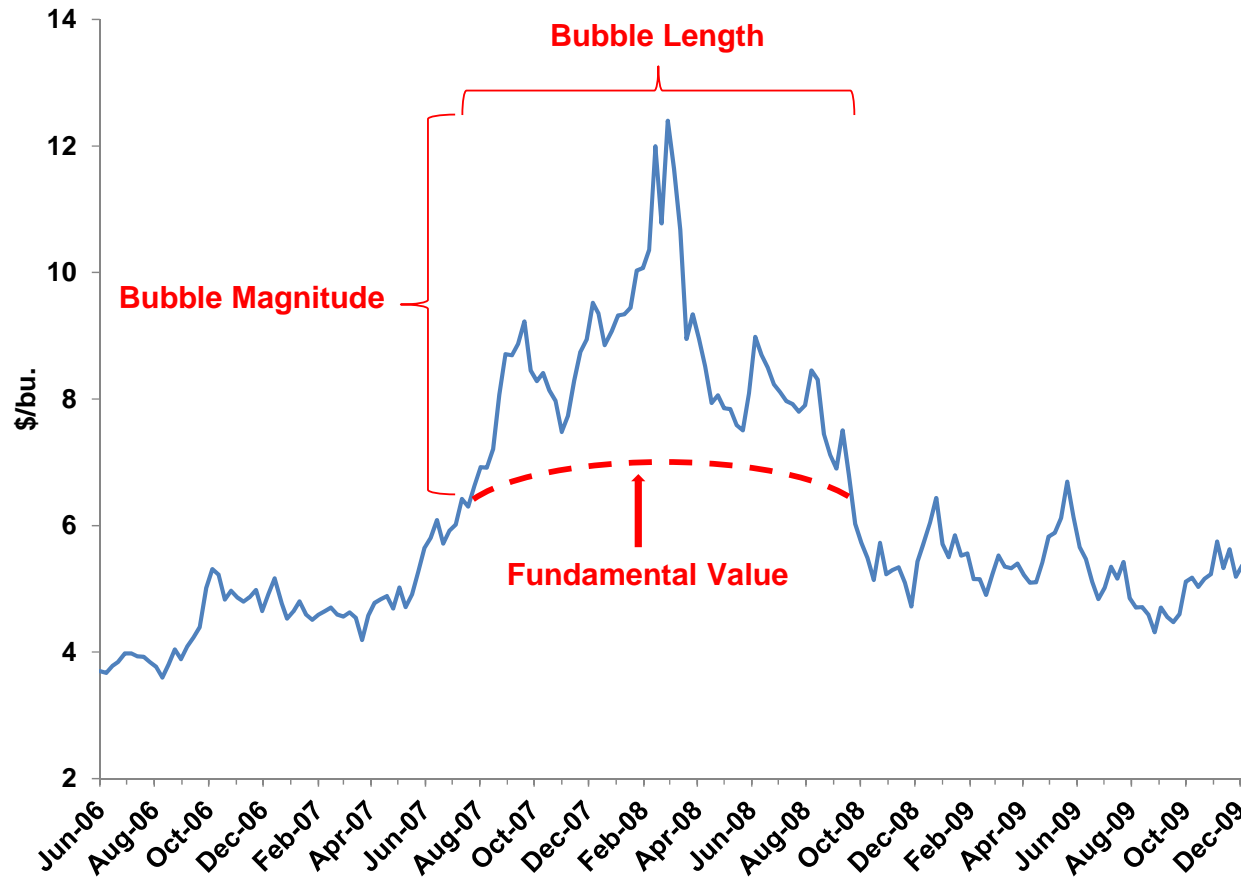
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Explosion of Studies on the Relationship between Index Investment and Food Commodity Prices

Review articles published since 2011:

- Irwin and Sanders (2011)
- Will, Prehn, Pies, and Glauben (2012)
- Fattouh, Kilian, and Mahadeva (2013)
- Irwin (2013)
- Cheng and Xiong (2013)

Leibniz Institute of Agricultural Development in Central and Eastern Europe (IAMO)
www.iamo.de

IAMO
Policy Brief

N° 9

Issue No. 9
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Alarm or rather false alarm? A literature review of empirical research studies into financial speculation with agricultural commodities

Thomas Glauben,
Ingo Pies,
Sören Prehn and
Matthias Georg Will

An evaluation of 35 research papers into the impact of financial speculation on agricultural commodities markets has revealed: The vast majority of studies did not confirm the concerns that prevail in public discourse. The current state of knowledge indicates only a few, and weak, findings that verify the assumption that the rise in financial speculation in recent years has increased (1) the level or (2) the volatility of agricultural commodity prices. Instead, those developments have rather been caused by fundamental factors in the real economy. This is why the majority of academic studies are not in favor but against (3) enacting regulatory barriers to market entry. Transaction taxes or position limits are described as involving high risks. Various studies explicitly warn against overregulation, which would impair rather than improve the functionality of agricultural markets. Seen in this light, the alarmism about financial speculation should be classified as a false alarm: Those who desire to effectively combat hunger in the world have to take real-economy precautions to ensure that food supplies will match the envisaged increasing demands.

New players have entered the futures markets for agricultural commodities over the last ten years. Commodity Index Traders (CITs) are heavily engaged in a business model that consists of permanently covering long positions that are continually rolled forward. Without building their own inventories, CITs contribute to hedge agricultural producers against markdown risks.

This recent development has given rise to the suspicion that CITs could be causally responsible for the dramatic price events in 2007/8, 2010/11 and 2012. In view of global hunger revolts there was a great deal of conjecture among theoreticians and practitioners that CIT-conditioned financial speculation with agricultural commodities prompted rapid food price rises that notably affected people suffering from extreme poverty.

This suspicion has sparked an intense international discussion that has already entailed regulatory actions. The US, for instance, has introduced position limits, while Europe is updating the Markets in Financial Instruments Directive (MiFID). Various renowned civil society organizations (CSOs)

in Germany have mounted a joint public awareness campaign in this context. The CSOs demand the introduction of a transaction tax, the subjection of futures market speculators to severe position limits, and a full ban on financial speculations by CITs.

The CSOs commissioned their own studies (Pies 2012) to increase the efficiency of their demands. These groups assert that a "scientific evaluation" of available data provides "overwhelming evidence" that financial speculation causes and exacerbates hunger in the world.

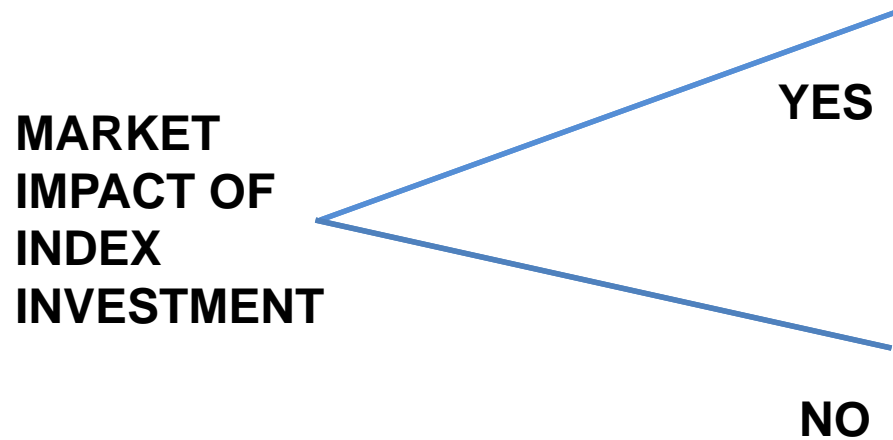
Those statements have prompted strong responses. To give but one example: Thilo Bode, executive manager of foodwatch, asserts that banks with their speculative futures market transactions, are "hungermakers". Within a few months, Bode attended no less than three publicly-documented debates where holders of economics chairs pointed out that his claims contradicted the state of the art in research (PAL 2012, Handelsblatt 2012, Süddeutsche Zeitung 2012). The CSOs, however, maintain their view that scientific evidence is on their side (attac 2012).

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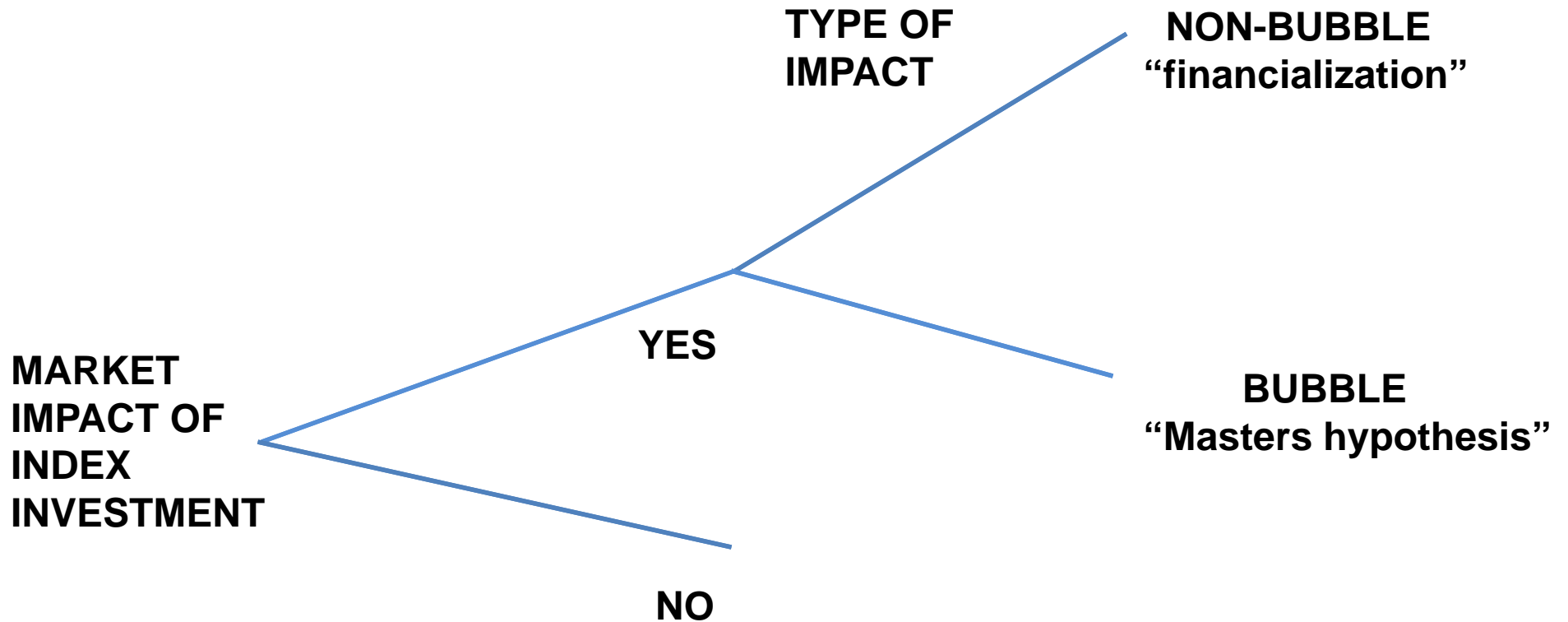
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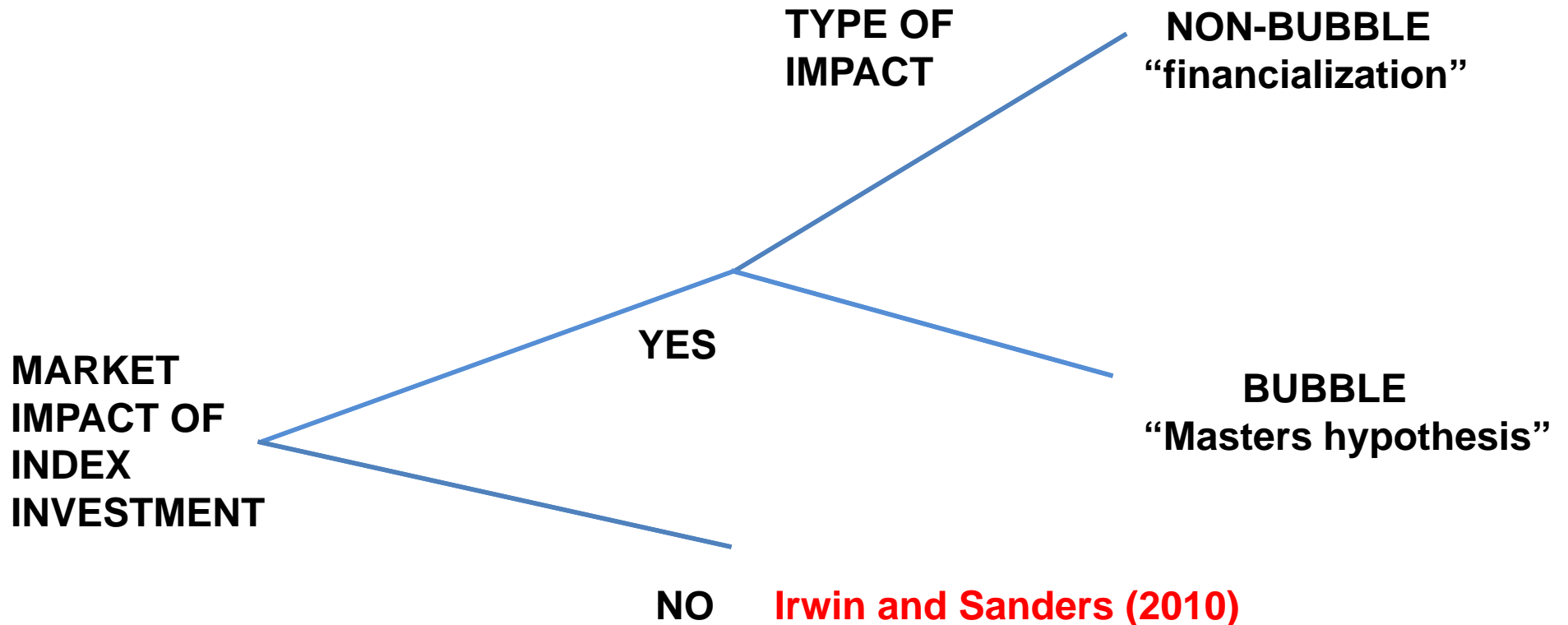
Typology of Empirical Results



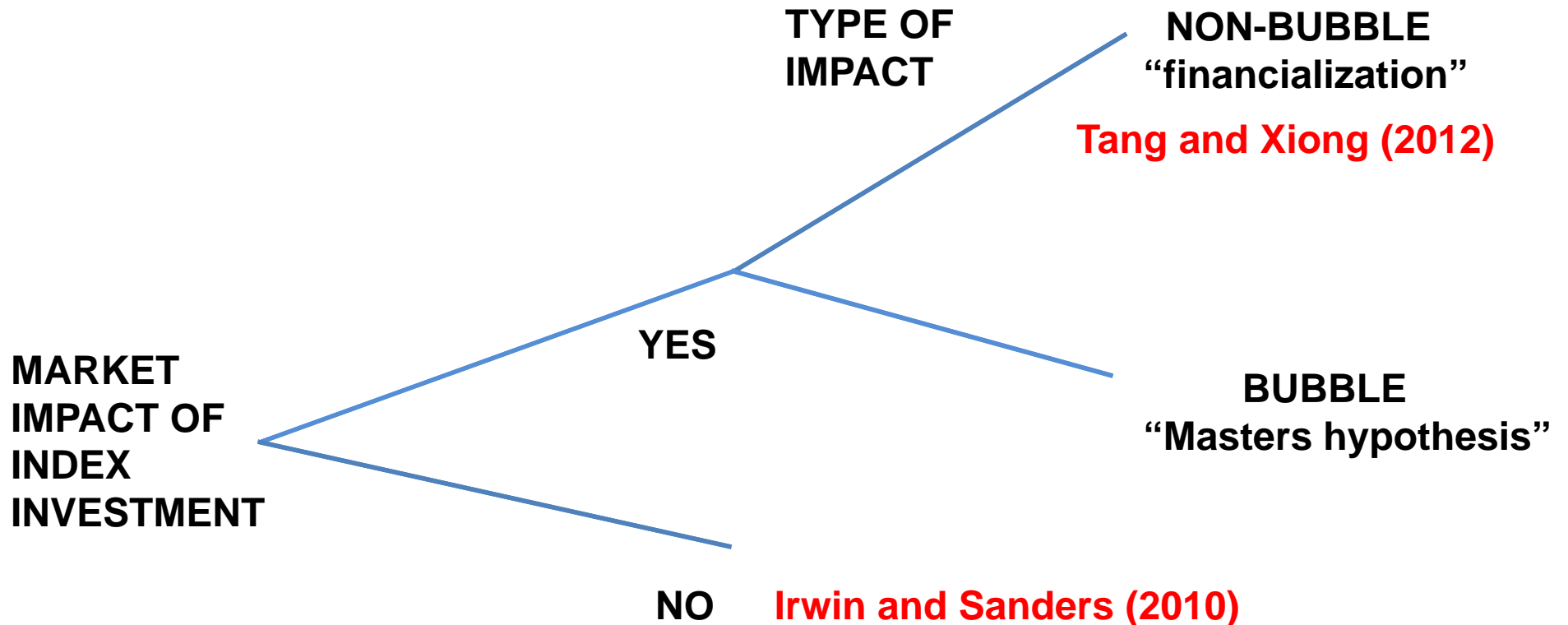
Typology of Empirical Results



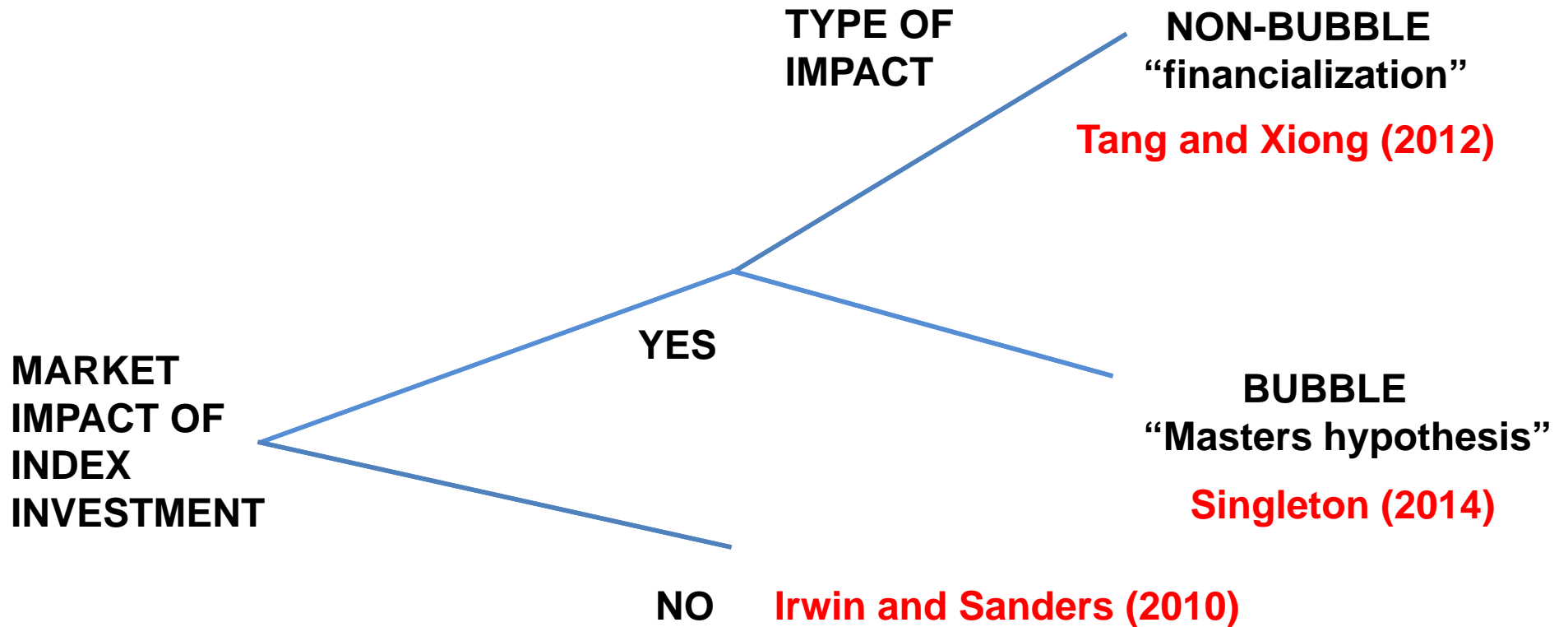
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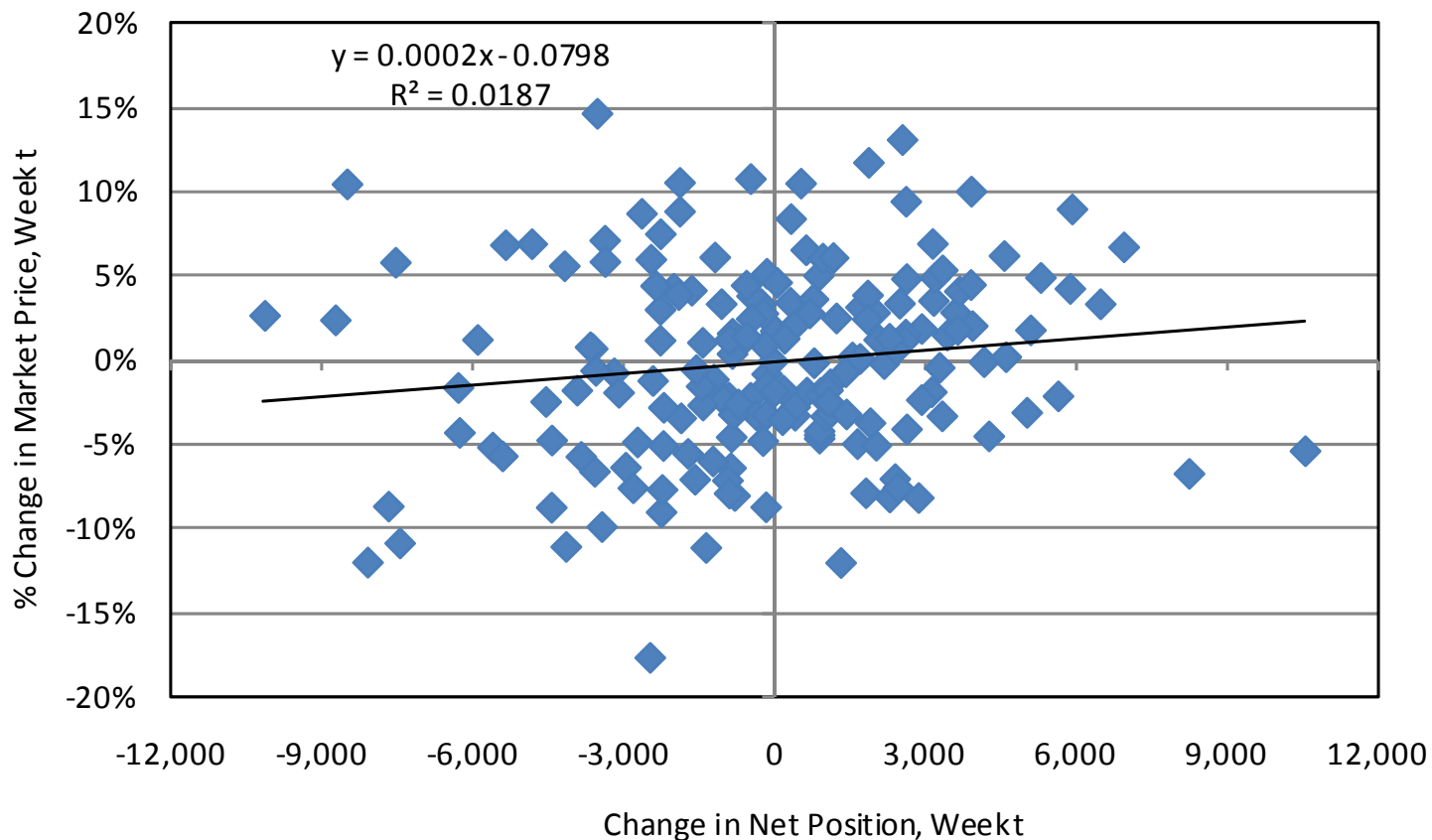
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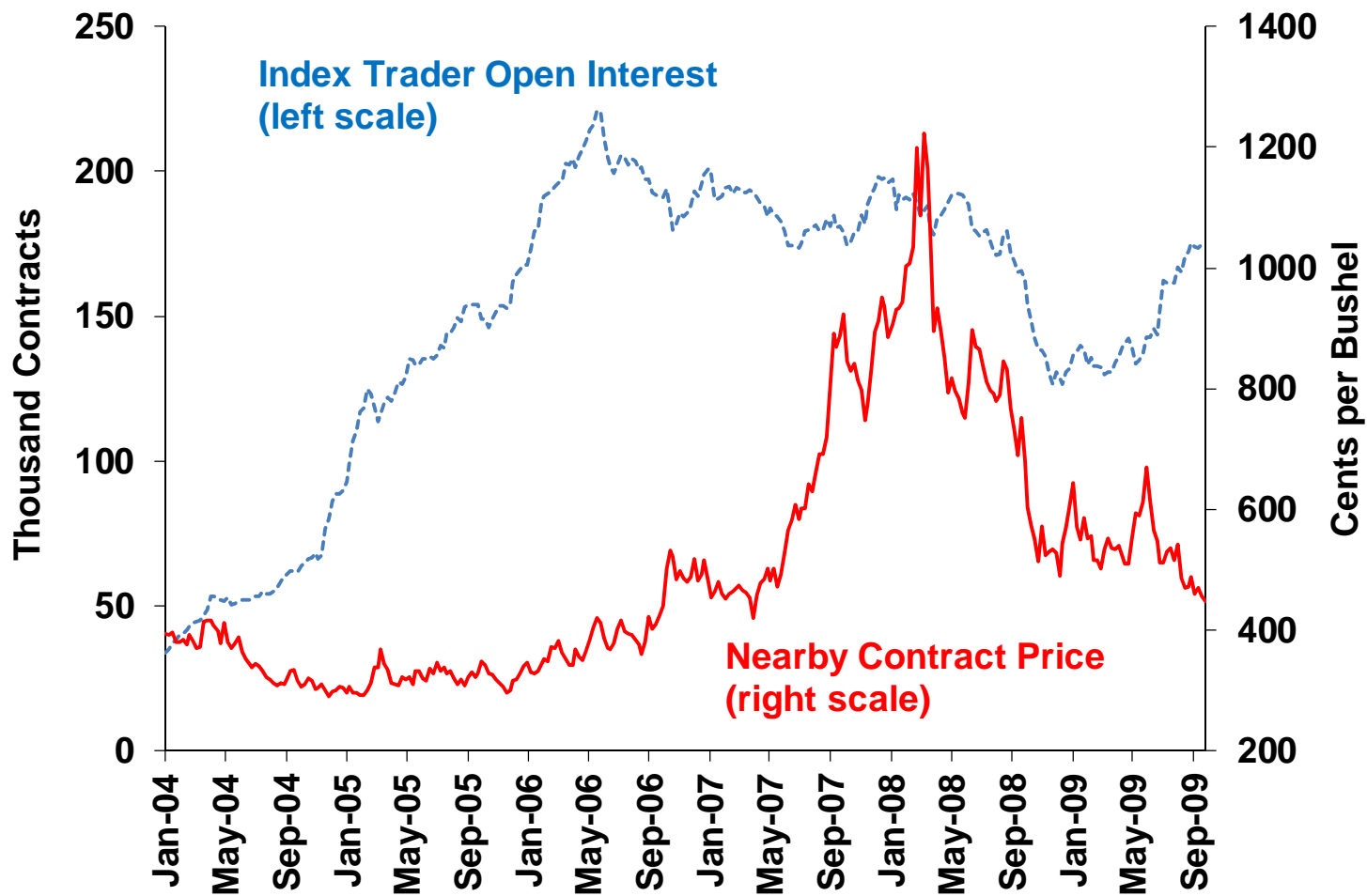
Relationship between CBOT Wheat Returns and Index Trader Net Long Positions, June 2006-December 2009



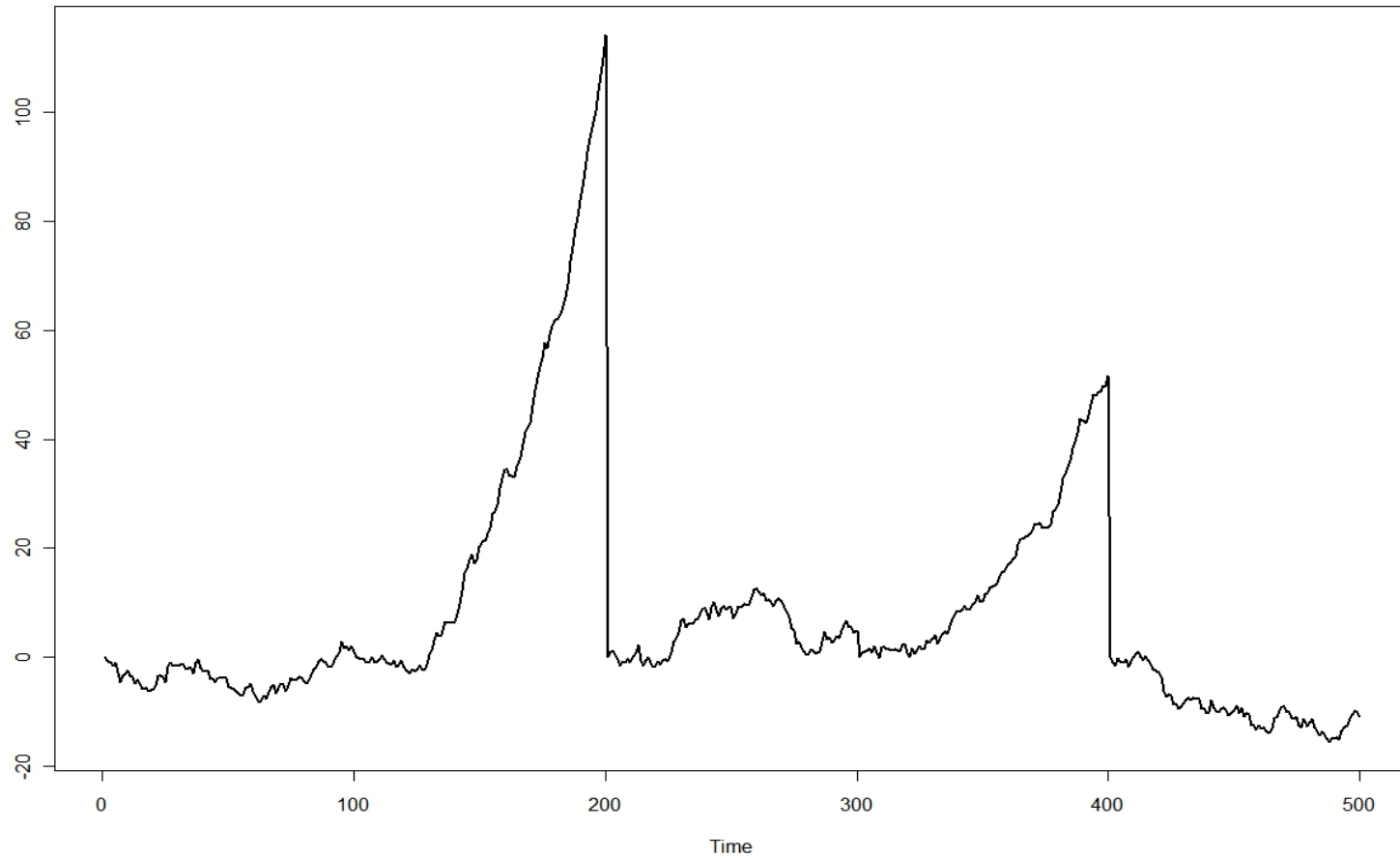
Source: Irwin and Sanders (2010)



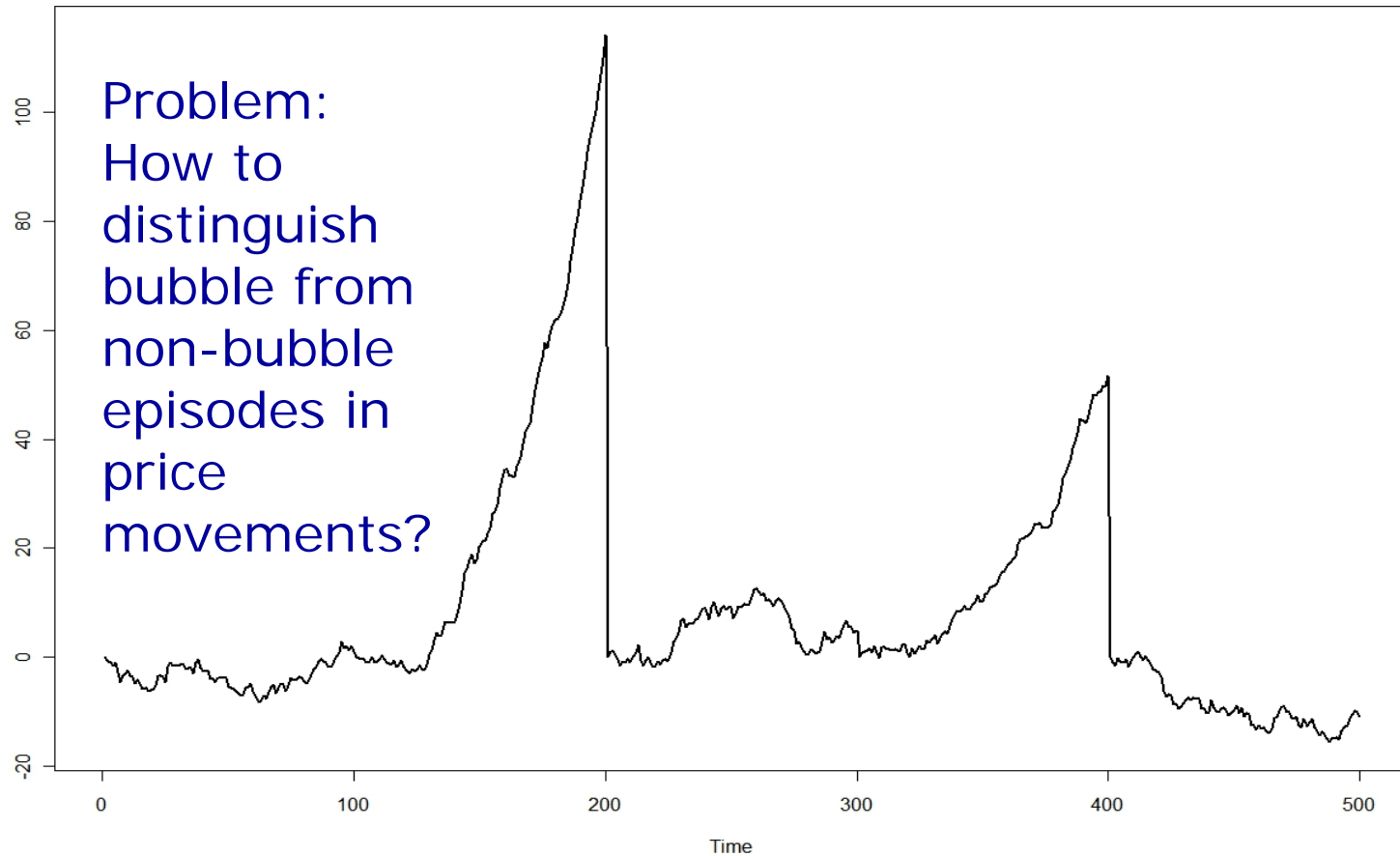
CBOT Wheat Futures Prices and Index Trader Net Long Positions, January 2004-September 2009



Direct Test for Bubbles in Prices



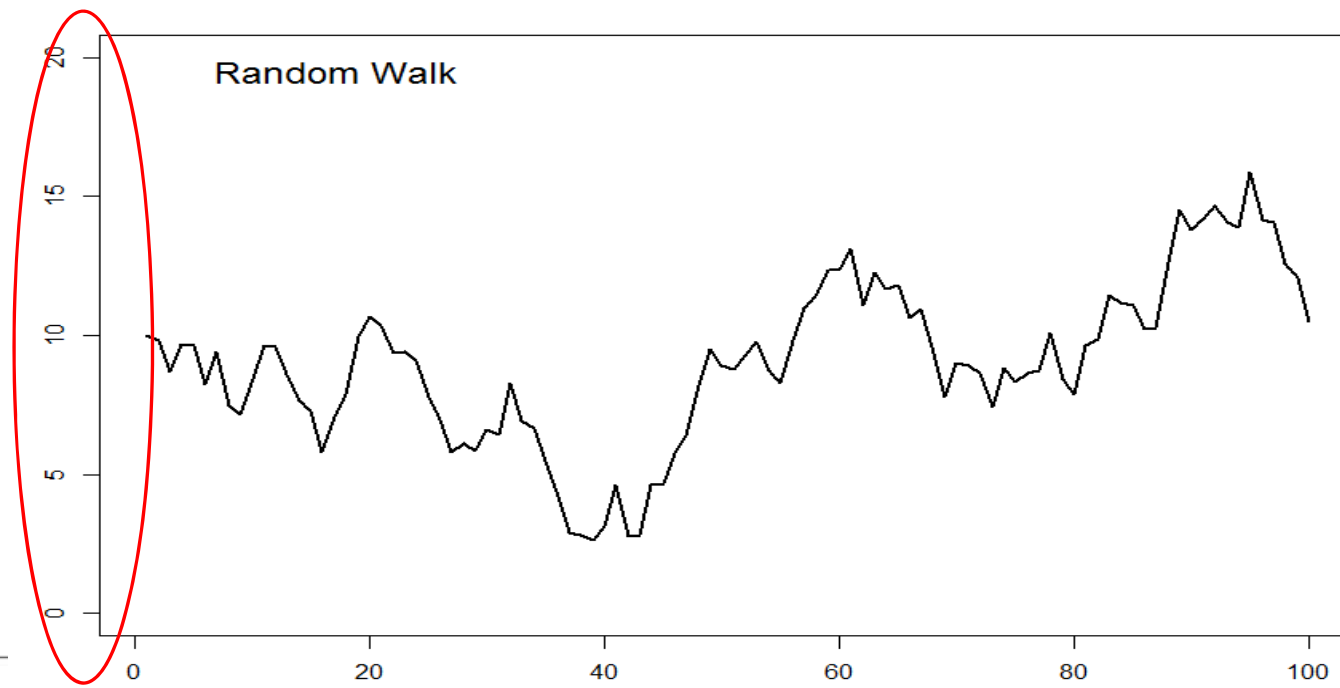
Direct Test for Bubbles in Prices



Price Behavior in Non-Bubble Periods

Absent structural change, price follows a *random walk*:

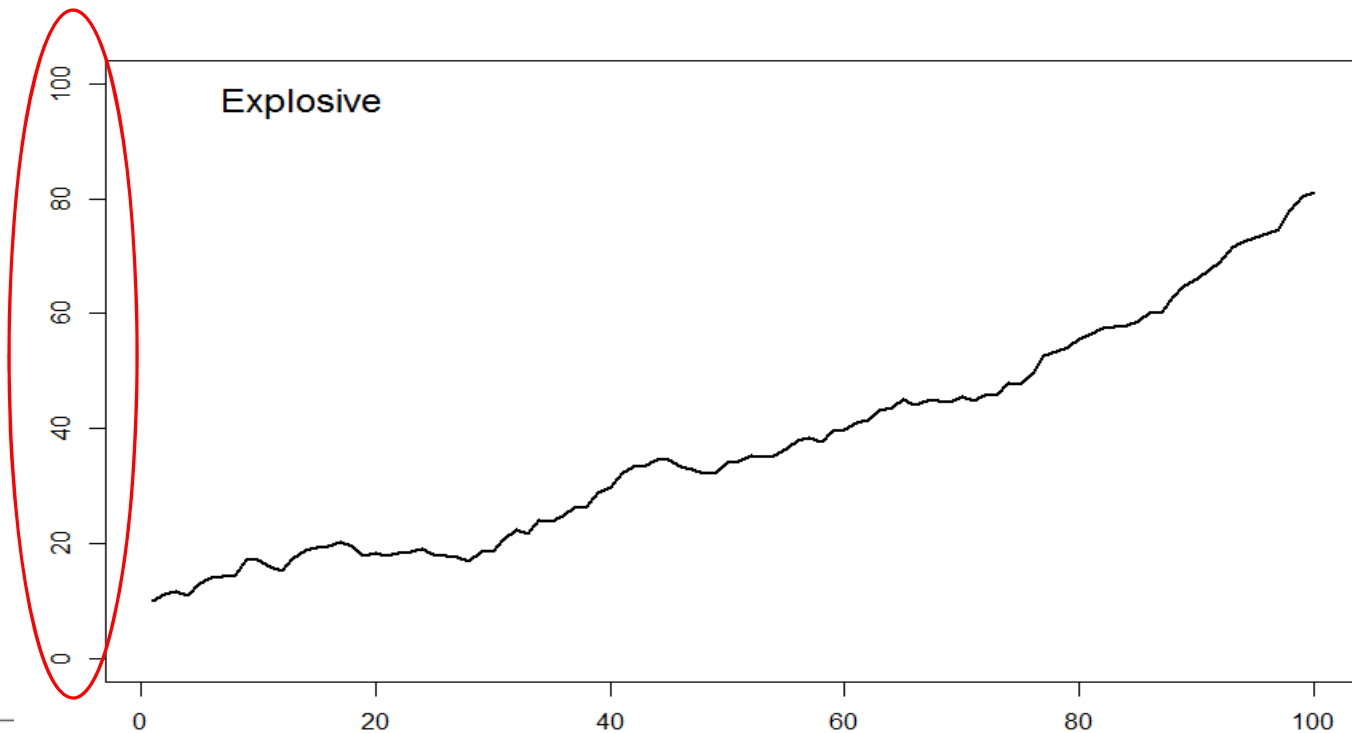
$$P_t = \delta P_{t-1} + \varepsilon_t, \text{ where } \delta = 1 \text{ \& } \varepsilon_t \sim iid N(0,1)$$



Price Behavior in Bubble Periods

Bubble period \rightarrow price become explosive:

$$P_t = \delta P_{t-1} + \varepsilon_t, \text{ where } \delta > 1 \text{ \& } \varepsilon_t \sim iid N(0,1)$$



Phillips, Shi, and Yu (2012)'s Generalized Recursive Procedure for Detecting Multiple Bubbles

Right-tailed Augmented Dickey-Fuller (ADF) Test

$$\Delta P_t = \alpha + \beta P_{t-1} + \sum_{i=1}^k \gamma^i \Delta P_{t-i} + \varepsilon_t$$

$$H_0: \beta = 0$$

vs.

$$H_1: \beta > 0$$



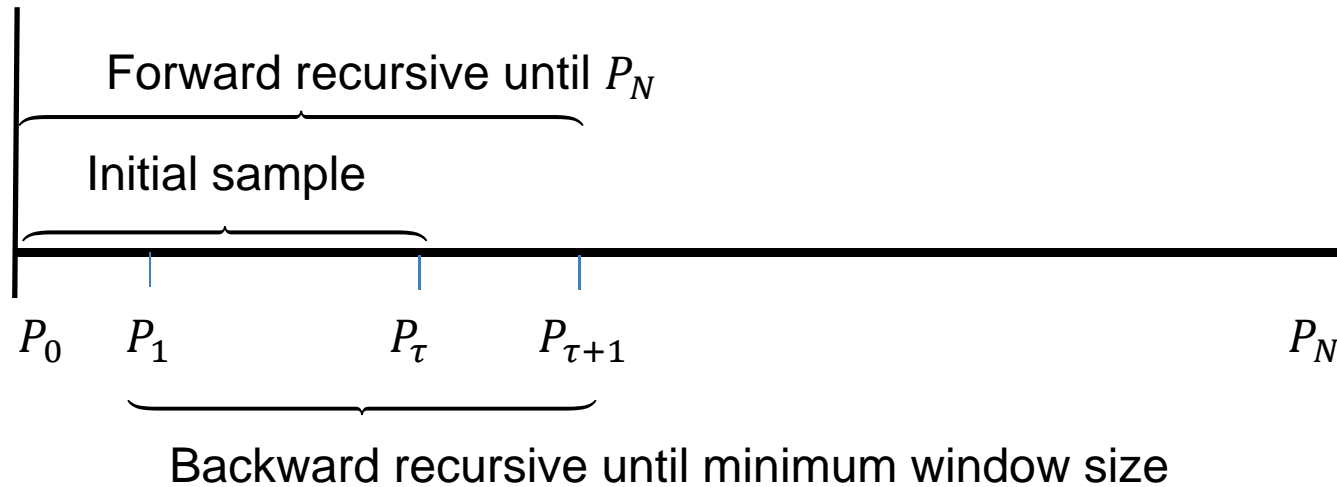
$$H_0: \delta = 1$$

vs.

$$H_1: \delta > 1$$



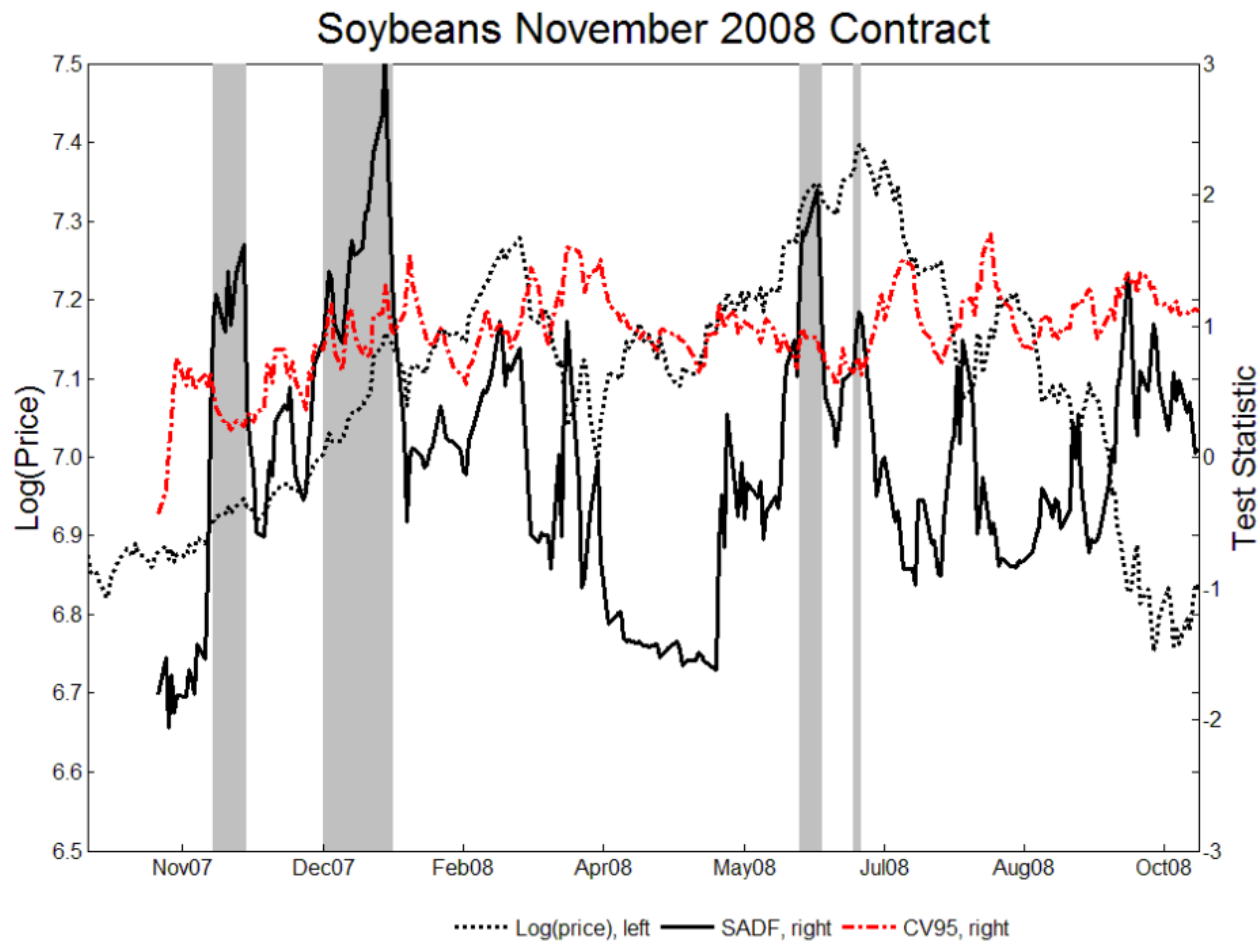
Phillips, Shi, and Yu (2012)'s Generalized Recursive Procedure for Detecting Multiple Bubbles



For every ending point P_h , run ADF test on $h - \tau + 1$ samples

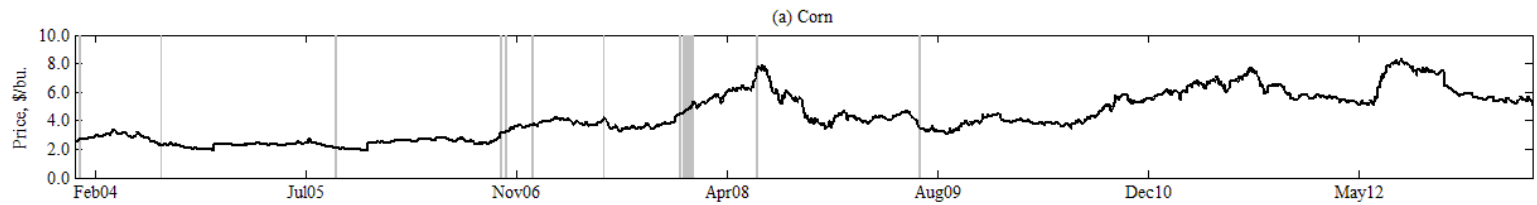


Example of PSY Bubble Test Results

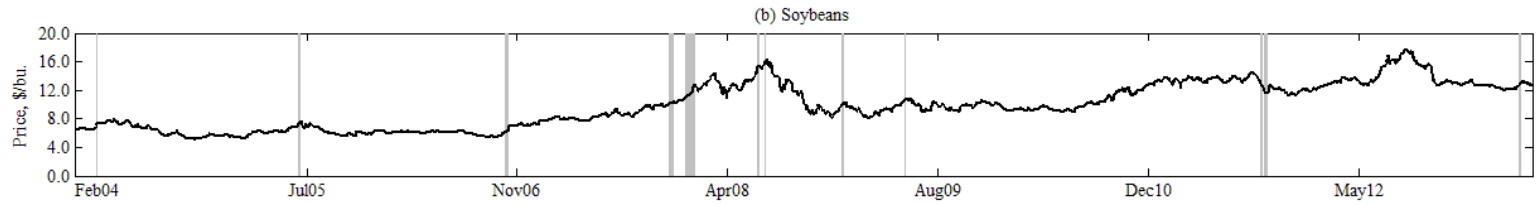


Bubble Periods in Grain Futures Prices, 2004-2013

Corn

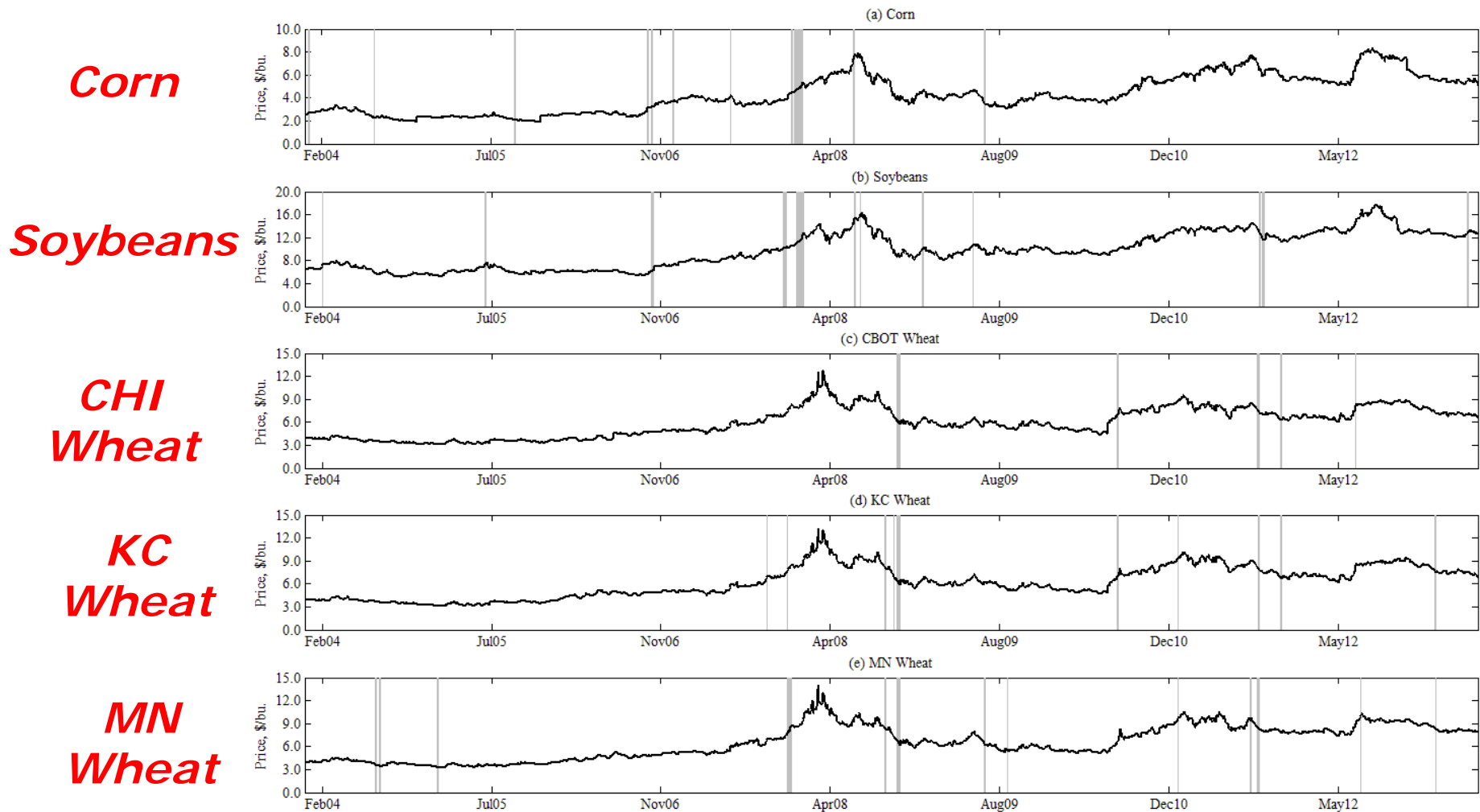


Soybeans



Source: Etienne, Irwin, and Garcia. "Price Explosiveness, Speculation, and Grain Futures Prices," 2014.

Bubble Periods in Grain Futures Prices, 2004-2013



Source: Etienne, Irwin, and Garcia. "Price Explosiveness, Speculation, and Grain Futures Prices," 2014.

Descriptive Statistics for Bubbles in Corn, Soybeans, CHI Wheat, KC Wheat, and MN Wheat over 2004-2013

	# Bubbles	# Positive	# Negative	# Trading Days	Average Length	Average Size
Corn	11	8	3	59 (2.5%)	5.4 days	3.9%
Soybeans	12	10	2	74 (3.1%)	6.2 days	3.9%
CHI Wheat	5	2	3	26 (1.1%)	5.2 days	6.0%
KC Wheat	10	4	6	42 (1.8%)	4.2 days	4.0%
MN Wheat	13	4	9	72 (3.0%)	5.5 days	4.2%

Source: Etienne, Irwin, and Garcia. "Price Explosiveness, Speculation, and Grain Futures Prices," 2014.

What Have We Learned?

- Price bubbles in agricultural futures markets do occur but they are infrequent, small, and short-lived
- Correspondence between price spikes and bubbles is rather low
- Surprisingly high proportion of detected bubbles occur during downward price movements



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“Evidence is inconsistent with the Masters Hypothesis”



Growth of Trading Volume in Commodity Futures Markets (2000-2010)

