

# **\$25 Minneapolis Wheat Had to be a Bubble, Right?**

**Xiaoli L. Etienne, Scott H. Irwin, and Philip Garcia**

**West Virginia University and University of Illinois at Urbana-Champaign**

June 24, 2014

The 3<sup>rd</sup> International Agricultural Risk, Finance, and Insurance Conference







# Speculation?

theguardian

[News](#) | [US](#) | [World](#) | [Sports](#) | [Comment](#) | [Culture](#) | [Business](#) | [Money](#)

Comment is free

## What Goldman Sachs should admit: it drives up the cost of food

As Goldman shareholders meet today, they should be hearing about the financial titan's exploitative business practices



**UN News Centre**

with breaking news from the UN News Service

[News](#)

[Radio](#)

[Television](#)

[Photo](#)

[Webcast](#)

[Meetings Coverage](#)

[Media Accredita](#)

[Africa](#)

[Americas](#)

[Asia Pacific](#)

[Europe](#)

[Middle East](#)

UN food and agriculture agency warns about negative impact of food speculation

## Big Banks Made £2.2bn From Food Price Speculation

The Huffington Post UK | By Asa Bennett [Twitter](#) [Facebook](#)

Posted: 05/11/2013 11:17 GMT



**OXFAM**  
America

WORKING TOGETHER TO END POVERTY AND INJUSTICE

[Who We Are](#)

[What We Do](#)

[What You Can Do](#)

[Stories & Videos](#)

[Publica](#)

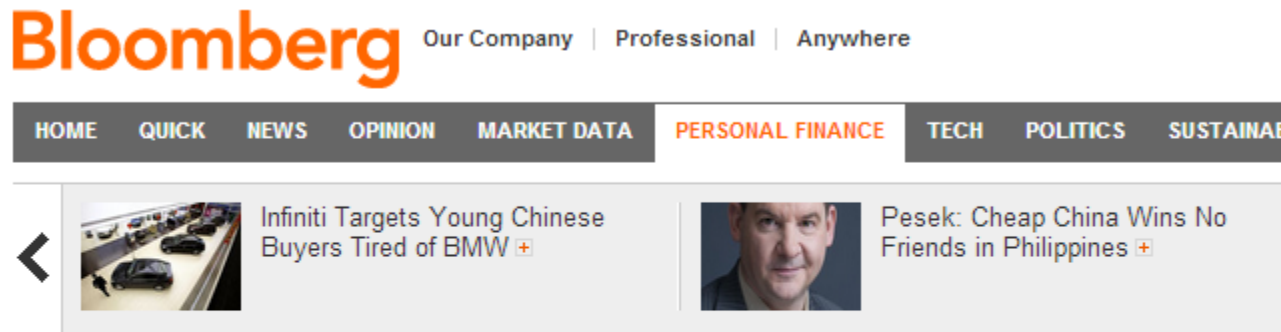
[Home](#) > [Press room](#) > [Press releases](#) > 461 Economists call for urgent action against excessive speculation on food com

FOR IMMEDIATE RELEASE

## 461 Economists call for urgent action against excessive speculation on food commodities

# Policy Responses

- [Dodd-Frank ACT](#) → Authorizes CFTC to set position limits
- [European Parliament](#) → adopt amendments imposing position limits on commodity derivatives



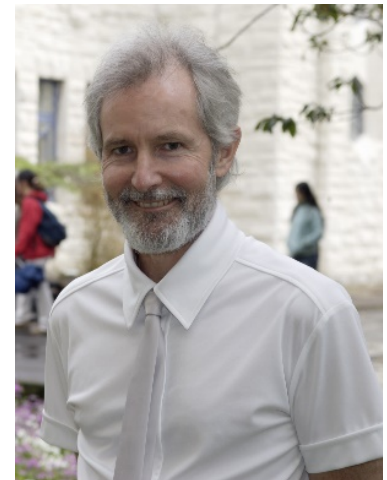
## Top U.S. Regulator Approves New Limit on Commodity Speculation in 3-2 Vote

# Present Study

- Testing for bubbles in Minneapolis wheat futures markets
- Bubble testing procedures and modifications
- Data
- Testing results
- Conclusions and policy implications

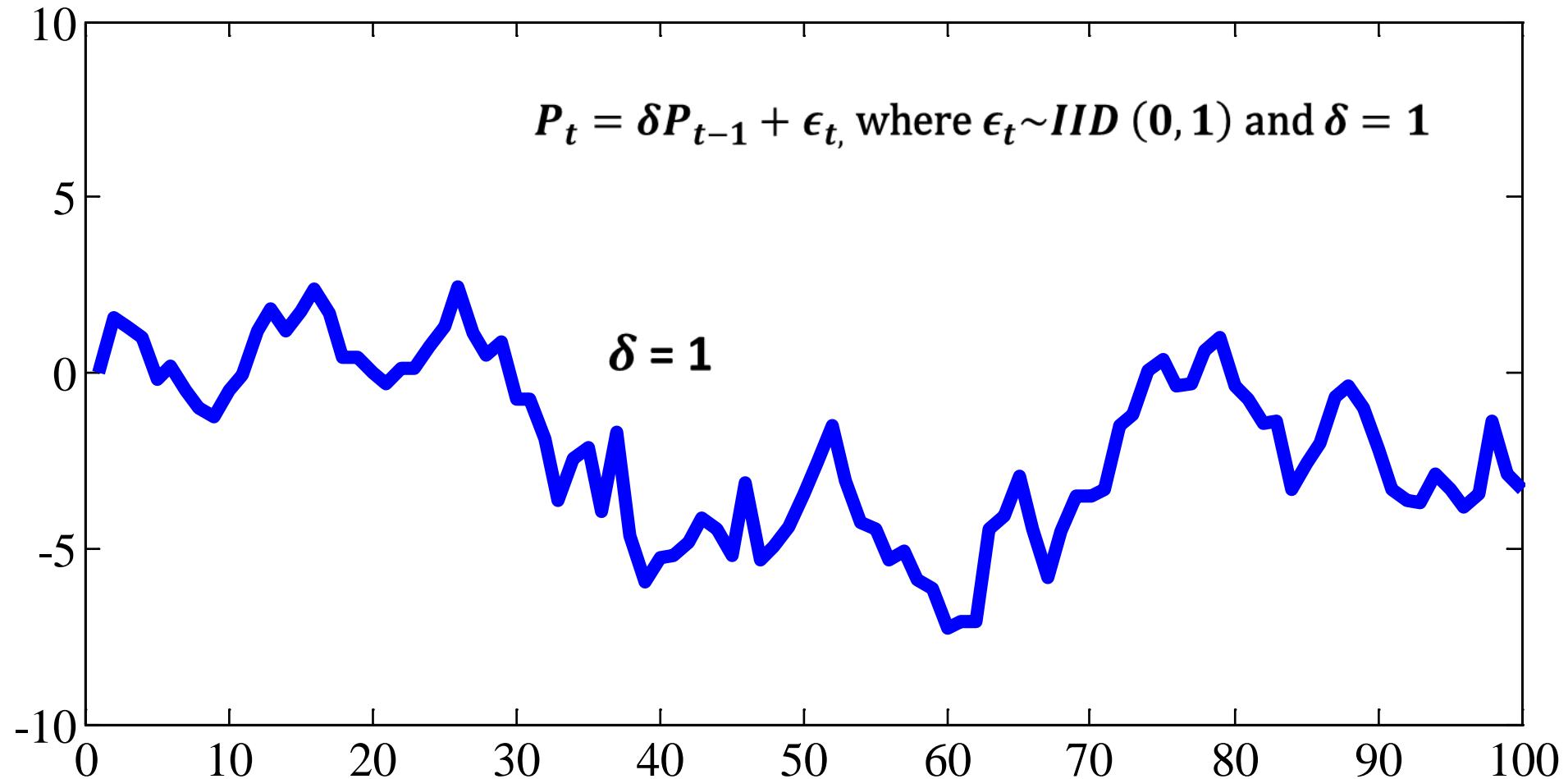
# Testing for Bubbles

- Structural model approach: model imperfection vs. bubbles?
- Time series procedure: not consistent when multiple bubbles
- Recent development: Peter Phillips



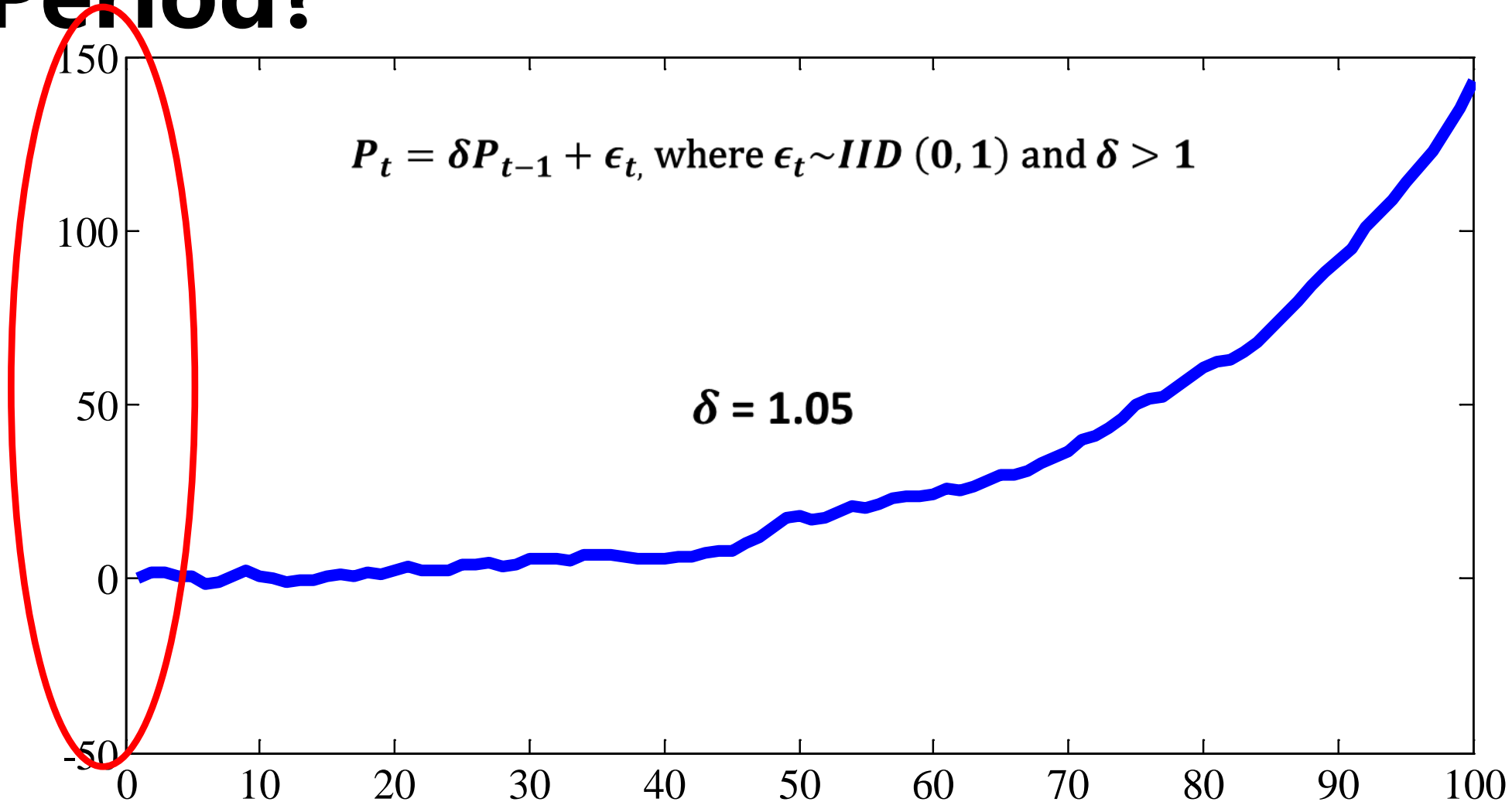
Peter C.B. Phillips  
Yale University

# No Bubbles: Random Walk

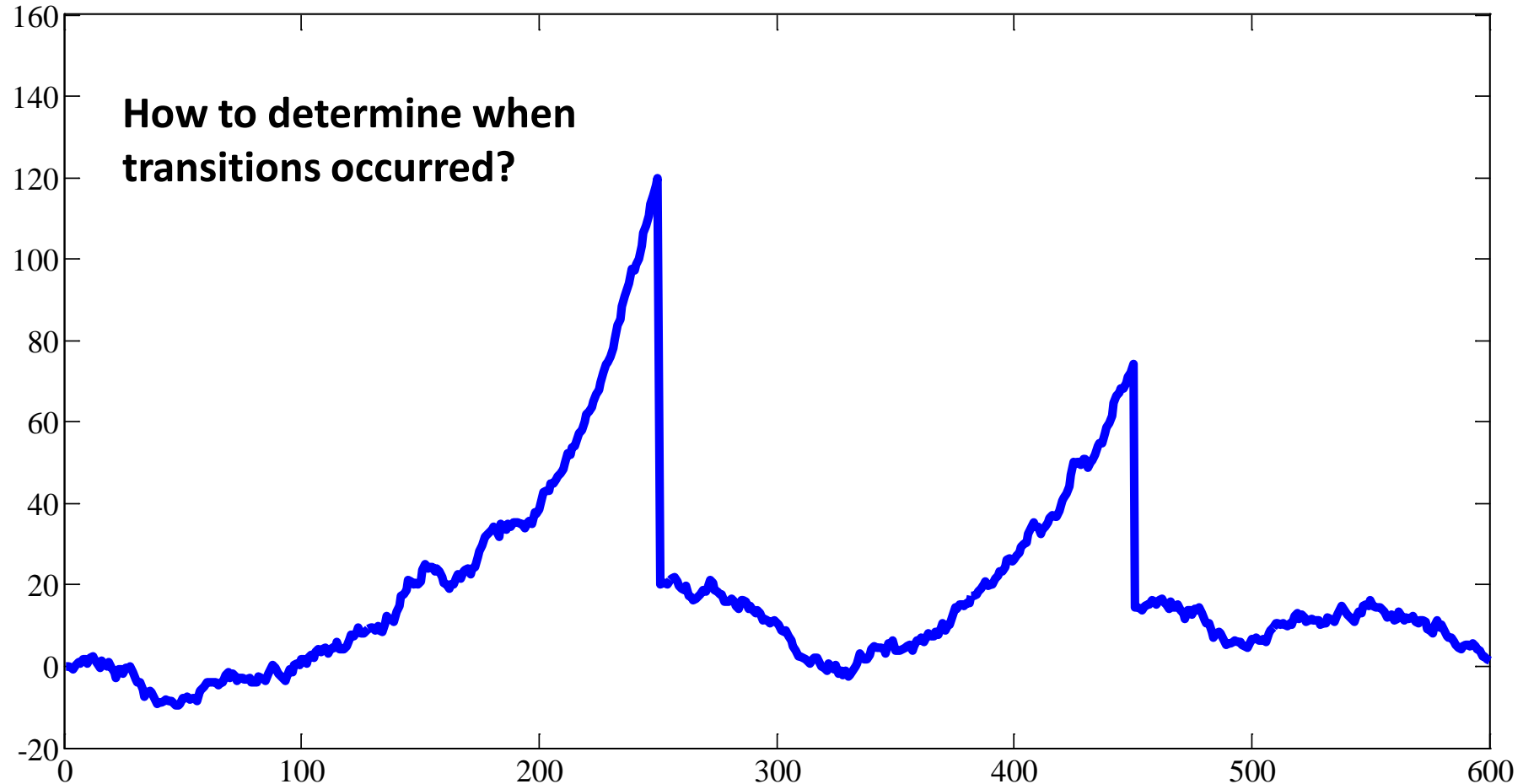




# What Constitutes an Explosive Period?



# Mixed Random Walk & Explosive Processes



# Phillips, Shi, and Yu (2012, PSY)

Right-tailed Augmented Dickey-Fuller (ADF) Test

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

$$H_0: \beta = 0$$

vs.

$$H_1: \beta > 0$$

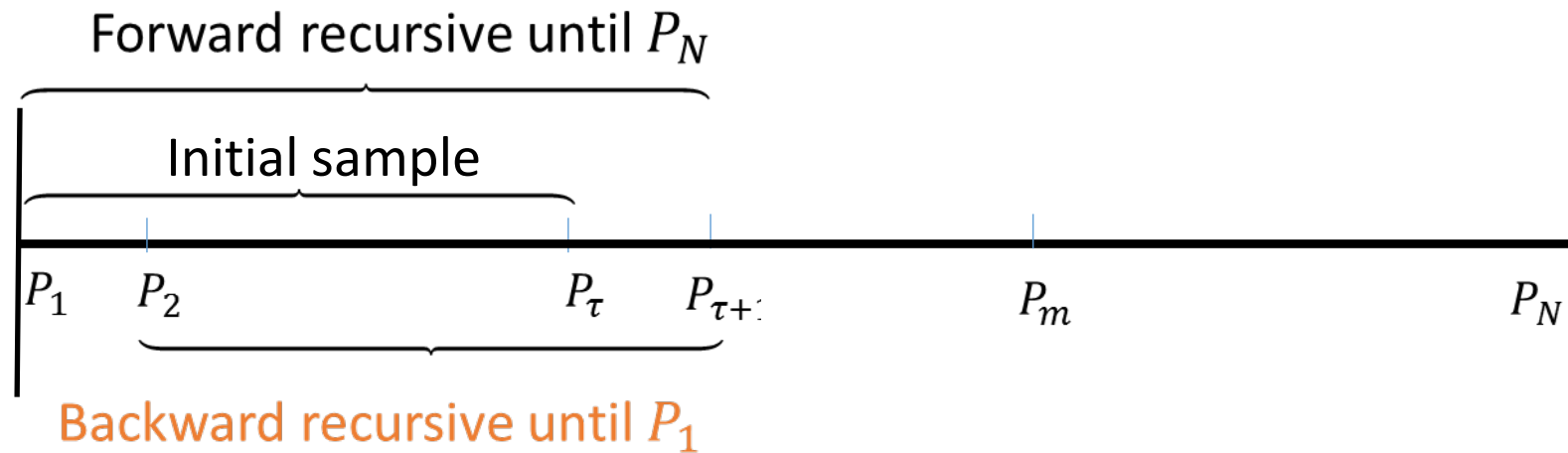
=

$$H_0: \delta = 1$$

vs.

$$H_1: \delta > 1$$

# Phillips, Shi, and Yu (2012, PSY)



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

# Phillips, Shi, and Yu (2012, PSY)

- Date-stamping explosive periods: *Sup ADF test*

$$SADF_m = \sup(ADF_1, ADF_2, \dots, ADF_{m-\tau+1})$$

$$\tilde{r}_{1s} = \inf_m \{m: SADF_m > CV_m\} \quad \leftarrow \text{Start}$$

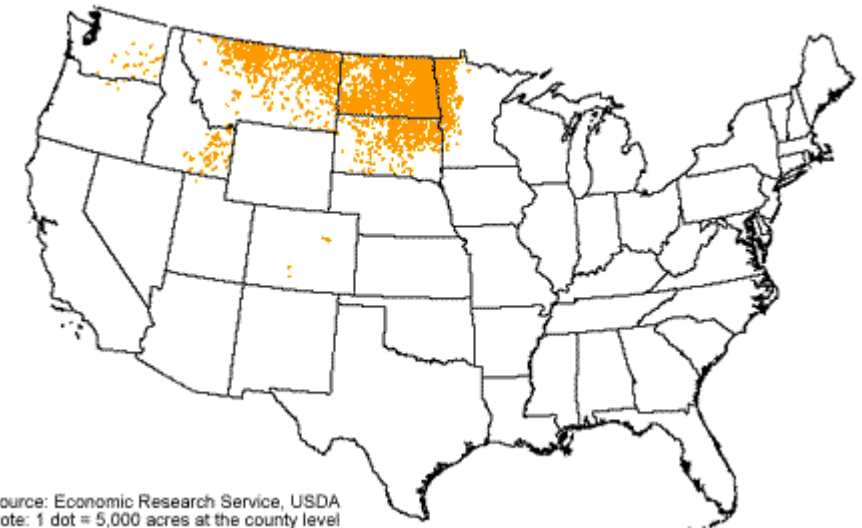
$$\tilde{r}_{1e} = \inf_m \{m: SADF_m < CV_m\} \quad \leftarrow \text{End}$$

- Need to last  $h$  days to consider a bubble
- Critical values obtained from recursive wild bootstrap

# Hard Red Spring Wheat in the US

- High protein: bread flour and high-gluten flours
- Primarily in the Northern Plains
- Accounts for 25% of US wheat production, exports to over 70 countries
- Mostly traded at Minneapolis Grain Exchange
- Price signals important to farmers, millers, elevators, consumers, policy-makers

Hard Red Spring Wheat, Area Planted 1998



Source: Economic Research Service, USDA  
Note: 1 dot = 5,000 acres at the county level  
(counties with less than 5,000 planted acres do not appear)

# MN Wheat Nearby Futures Prices, 2000-2014



**Kendell Keith**  
President of the National Grain and Feed Association

**There's no question there's been speculation**

# Data

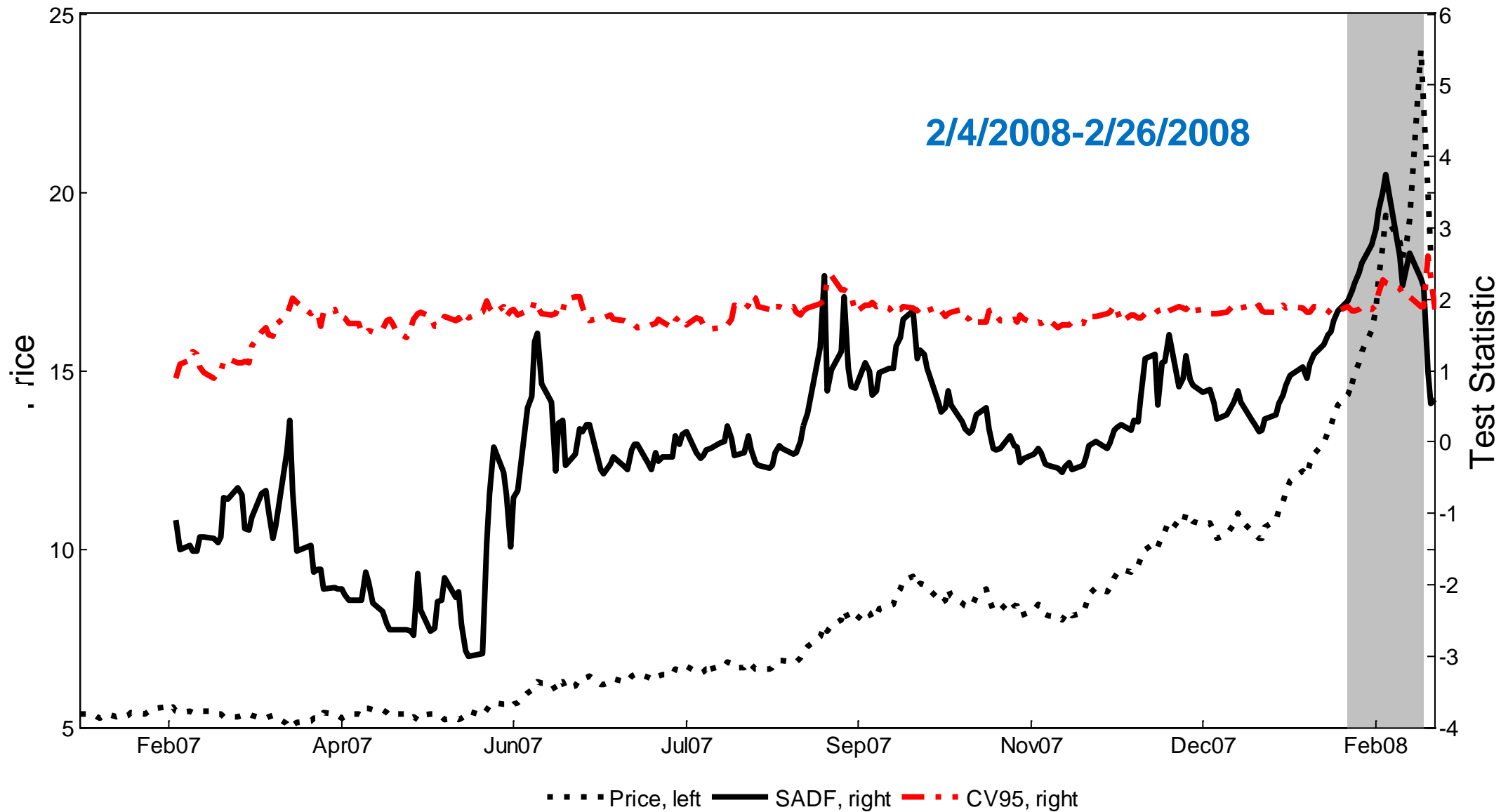
- Daily individual futures contract prices at close ( $F_{t1}^T, F_{t2}^T, \dots$  . . . .)

$$F_t^T = E_t(P_T | I_t)$$

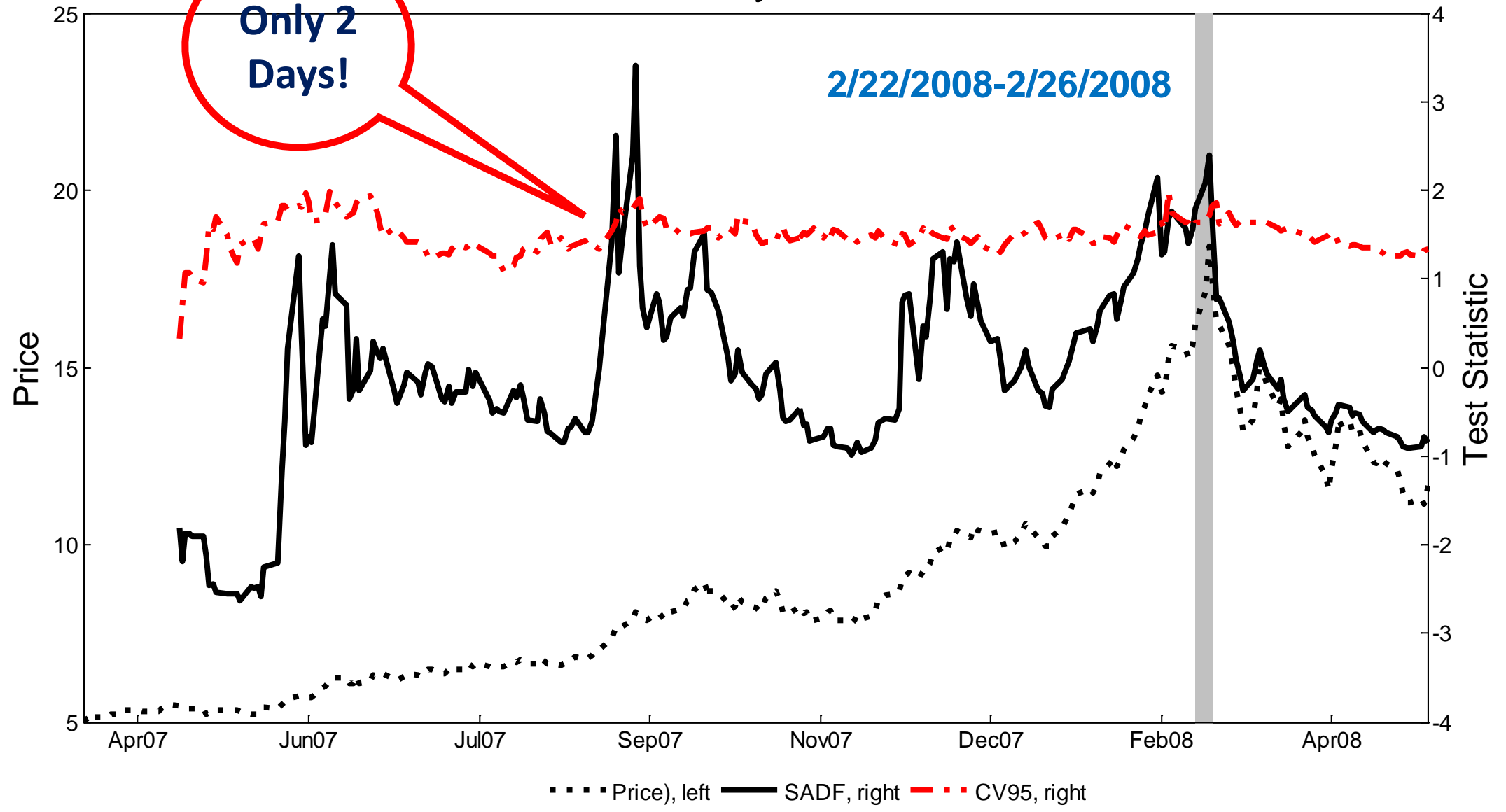
- March, May, July, September, December 2008 MGEX wheat futures contract
- 13 moth before contract expires



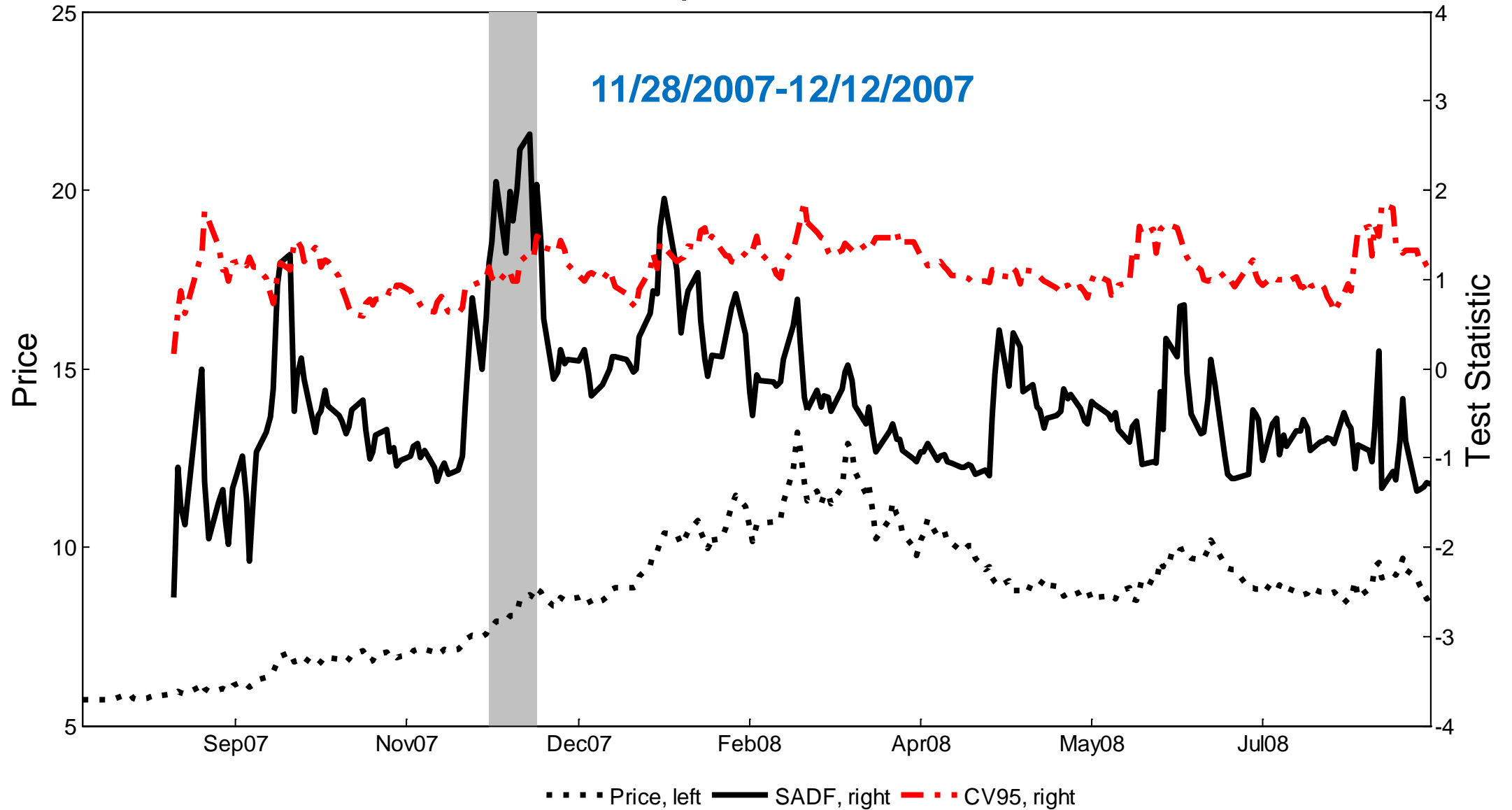
# MN Wheat March 2008 Contract



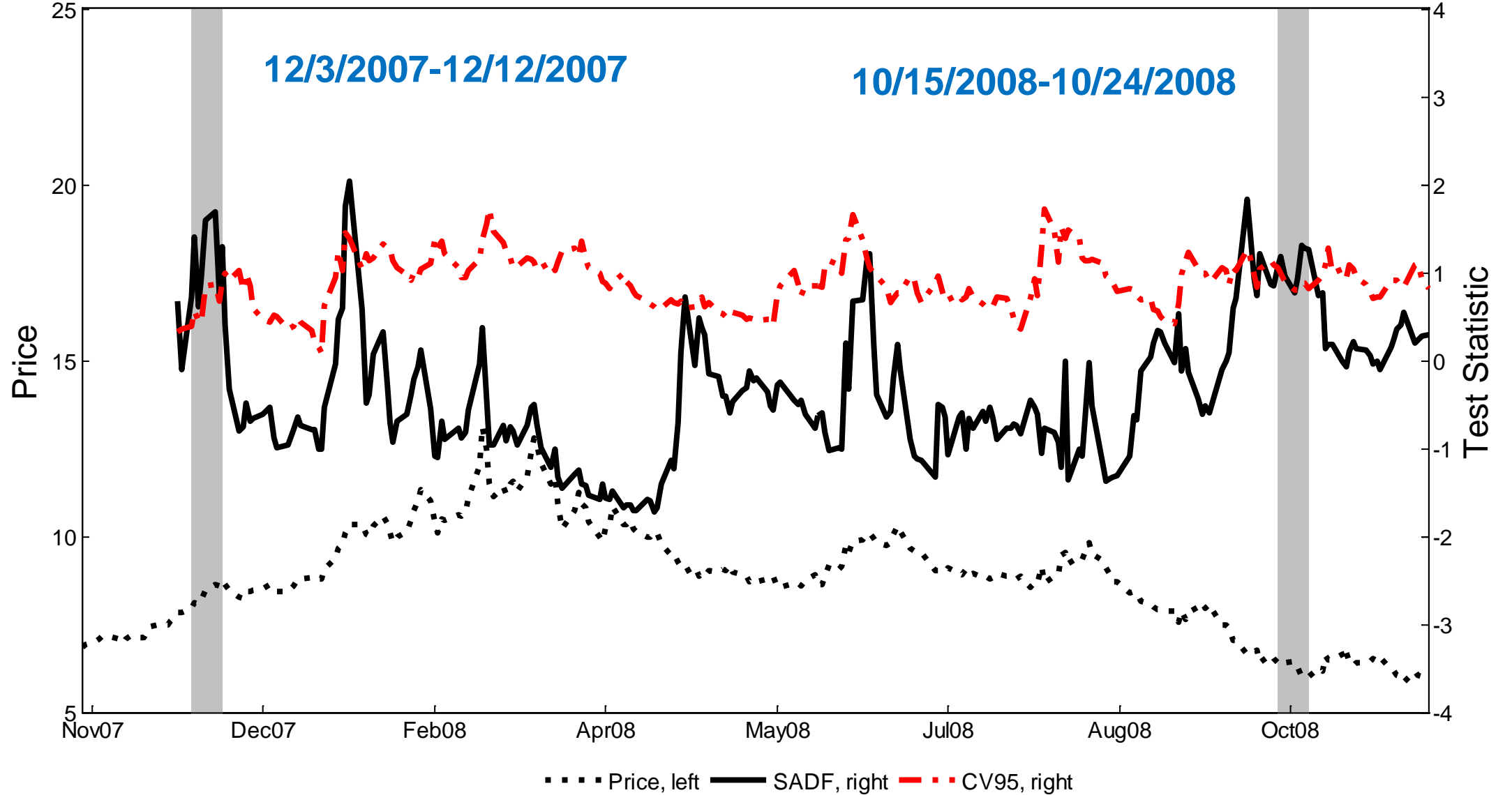
# MN Wheat May 2008 Contract



# MN Wheat September 2008 Contract



# MN Wheat December 2008 Contract



# Summary and Conclusions

- Bubbles do exist in MN wheat futures prices in 2007-2008
- Only occurred for a very short time periods in 2007-2008:  
11/28/2007-12/12/2007; 2/4/2008-2/26/2008; 10/15/2008-10/24/2008
- Prices are still mostly driven by fundamentals
- Even during bubble periods, fundamentals may play a role

# Possible Causes of Huge Volatility?

- Rising global demand for grain → consumption > production
- 2006 Drought in Australia → cut production in half
- US wheat inventories before the 2008 harvest lowest levels in 50 yrs
- World wheat inventories fallen to their lowest levels since 1982
- Traders hold rather different views during volatile periods → leading to bubbles (Singleton 2013, Scheinkman 2013)



**Thanks!**

