Do Speculators Drive Commodity Prices Away From Supply and Demand Fundamentals?

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Protecting America's Agricultural Markets: An Agricultural Commodity Futures Conference

Do Speculators Drive Prices Away From Fundamentals?

- No

This is an old question ....

"Within the present month efforts have been made in the New York Hop Exchange to introduce the practice of dealing in **so-called** "futures," a method of business which, **as is well known**, inevitably leads to hazardous speculation upon the delusive basis of **fictitious prices**."

Submission to Committee on Ways and Means

United States Brewer's Association, 1890

Data

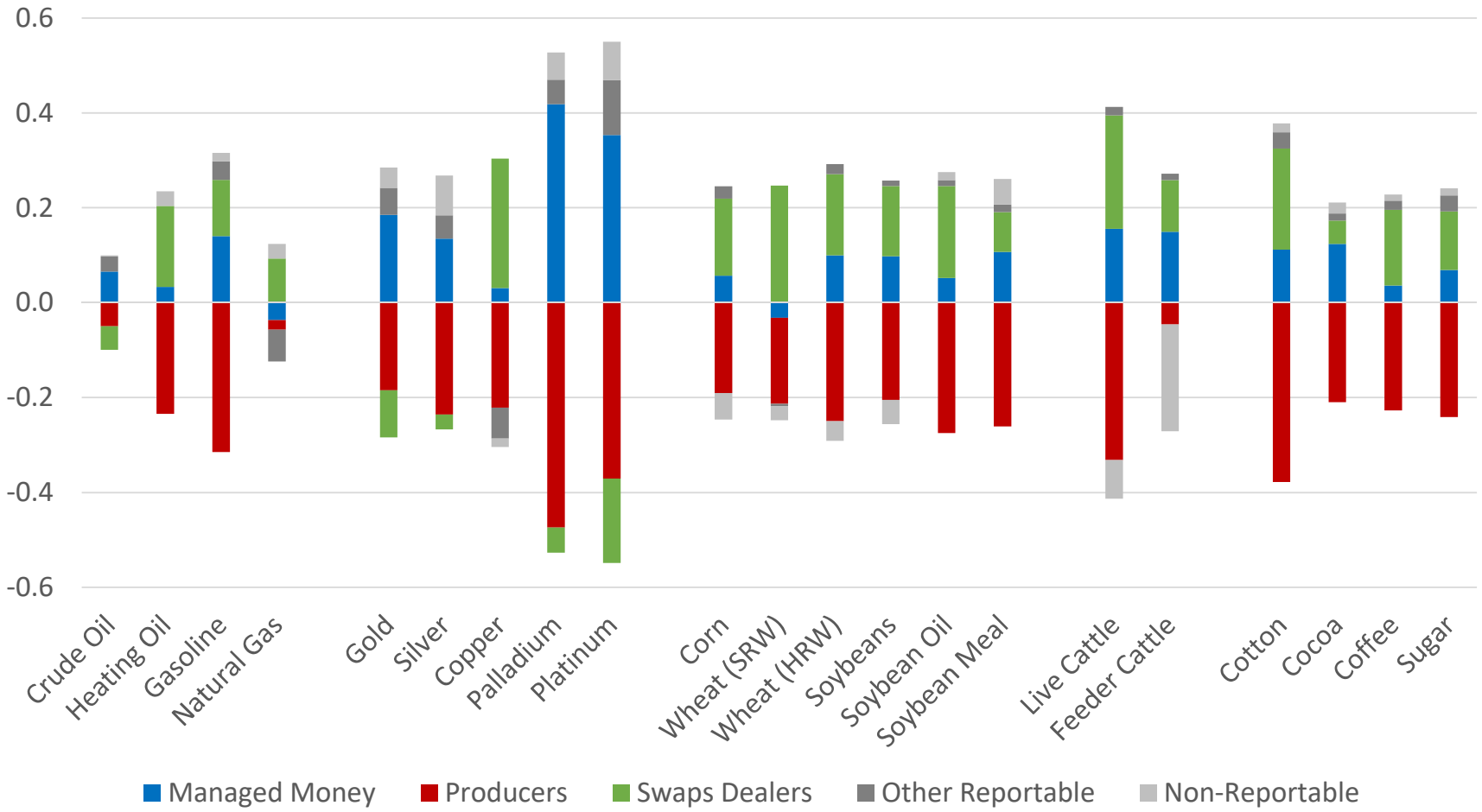
- Weekly futures and options positions held by trader groups:
  - **Managed Money:** a registered commodity trading advisor, a registered commodity pool operator, a hedge fund, or another unregistered fund
  - **Producer:** firm involved primarily in the production, processing, packing or handling of a physical commodity
  - **Swaps Dealer:** engaged mainly in commodity swaps deals with counterparties including speculative traders, index funds, hedge funds, or traders of the physical commodity
  - **Other Reportable:** financial firms that aren't managed money
  - **Non Reportable:** too small to reach reporting threshold

- Nearby futures prices on 21 commodities
  - **Energy:** crude oil, heating oil, gasoline, natural gas
  - **Metals:** gold, silver, copper, palladium, platinum
  - **Grains:** corn, soft red winter wheat, hard red winter wheat, soybeans, soybean oil, soybean meal
  - **Livestock:** live cattle, feeder cattle
  - **Softs:** cotton, cocoa, coffee, sugar

What the Data Look Like

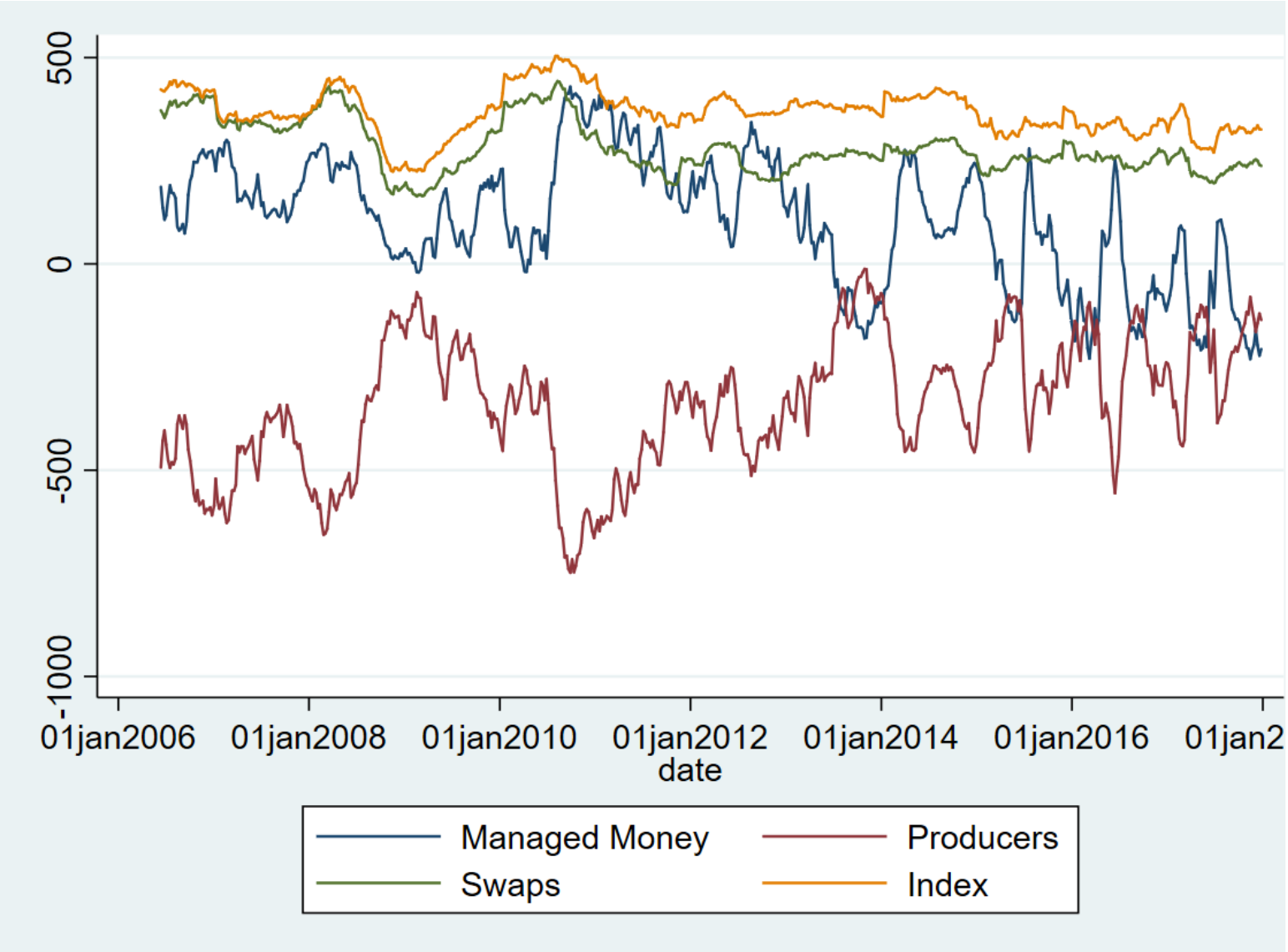
	A	B	C	D	E	F	
1	Market_and_Exchange_Names	Report_Date	Open_Interest	Prod_Long	Prod_Short	Swap_Long	Sw
2	WHEAT-SRW - CHICAGO BOARD OF TRADE	12/26/2017	622514	123807	111001	104449	
3	WHEAT-SRW - CHICAGO BOARD OF TRADE	12/19/2017	652326	128468	110670	104606	
4	WHEAT-SRW - CHICAGO BOARD OF TRADE	12/12/2017	644349	126075	109832	104692	
5	WHEAT-SRW - CHICAGO BOARD OF TRADE	12/5/2017	581401	100207	112404	103759	
6	WHEAT-SRW - CHICAGO BOARD OF TRADE	11/28/2017	598396	113747	119662	102199	
7	WHEAT-SRW - CHICAGO BOARD OF TRADE	11/21/2017	697047	123322	139771	100602	
8	WHEAT-SRW - CHICAGO BOARD OF TRADE	11/14/2017	704038	127041	143314	101708	
9	WHEAT-SRW - CHICAGO BOARD OF TRADE	11/7/2017	708502	145534	141550	97491	
10	WHEAT-SRW - CHICAGO BOARD OF TRADE	10/31/2017	702662	129187	131133	89542	
11	WHEAT-SRW - CHICAGO BOARD OF TRADE	10/24/2017	647209	106809	130812	88789	
12	WHEAT-SRW - CHICAGO BOARD OF TRADE	10/17/2017	608080	95549	119298	87384	
13	WHEAT-SRW - CHICAGO BOARD OF TRADE	10/10/2017	583852	92646	123827	87838	
14	WHEAT-SRW - CHICAGO BOARD OF TRADE	10/3/2017	552053	87597	125692	91378	
15	WHEAT-SRW - CHICAGO BOARD OF TRADE	9/26/2017	533550	77831	114451	91002	
16	WHEAT-SRW - CHICAGO BOARD OF TRADE	9/19/2017	548266	75469	111300	91512	
17	WHEAT-SRW - CHICAGO BOARD OF TRADE	9/12/2017	548631	79362	113757	91288	
18	WHEAT-SRW - CHICAGO BOARD OF TRADE	9/5/2017	548879	81879	111751	92089	
19	WHEAT-SRW - CHICAGO BOARD OF TRADE	8/29/2017	547694	85366	125840	93078	
20	WHEAT-SRW - CHICAGO BOARD OF TRADE	8/22/2017	650366	101463	149411	97240	
21	WHEAT-SRW - CHICAGO BOARD OF TRADE	8/15/2017	596902	82073	151497	98061	
22	WHEAT-SRW - CHICAGO BOARD OF TRADE	8/8/2017	572828	68958	149740	96225	
23	WHEAT-SRW - CHICAGO BOARD OF TRADE	8/1/2017	563534	61656	155901	88975	

Normalized Average Net Positions by Trader Type



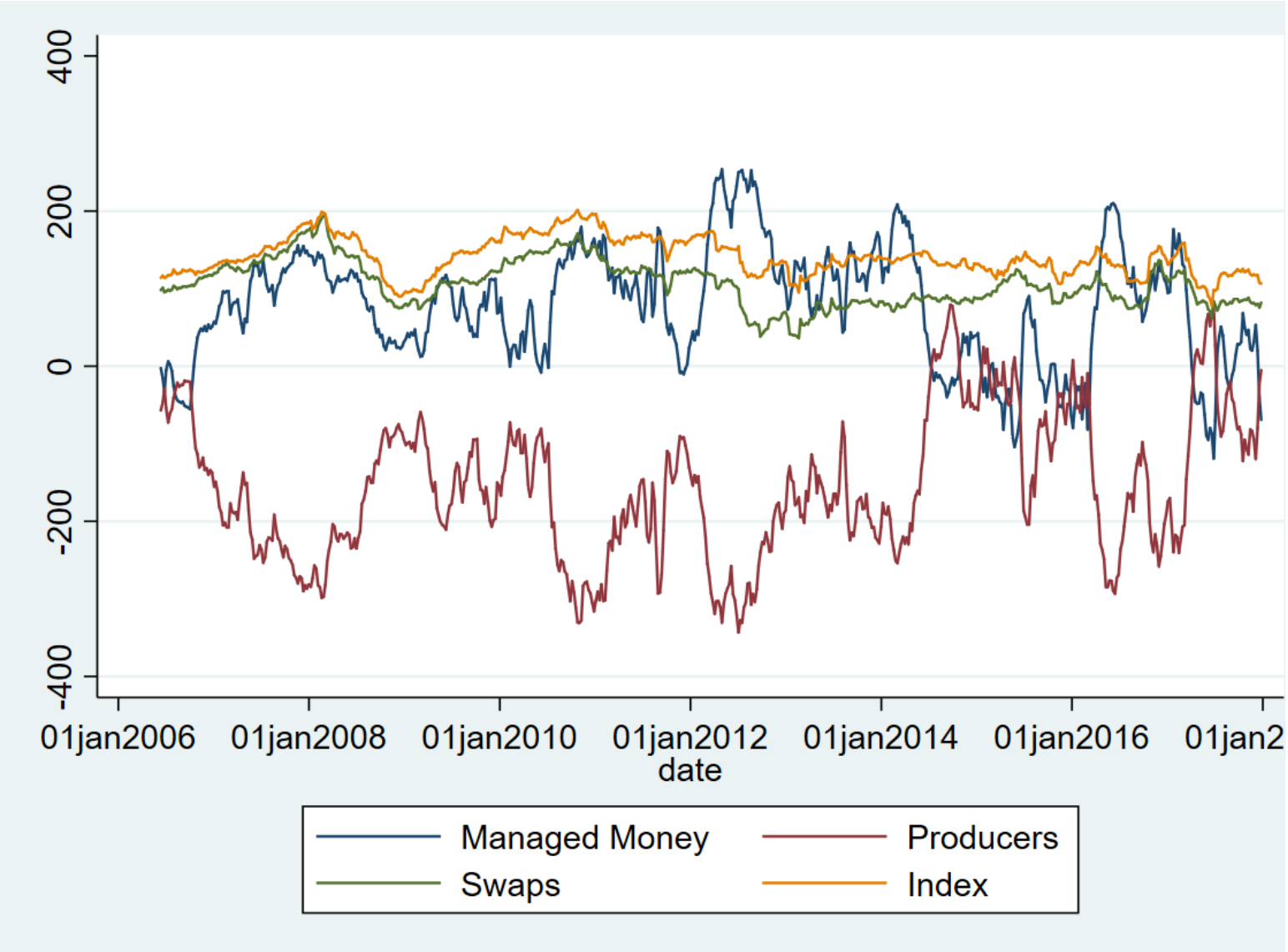
- Normalized net position $= (long - short)/OI$
- Weekly average, 6/13/06 to 12/26/17
- Negative = short; positive = long
- Source: Disaggregated Commitments of Traders report (CFTC)

Weekly Net Positions by Trader Type: Corn



- Net position = *long* − *short*
- Source: Disaggregated COT and Supplemental COT

Weekly Net Positions by Trader Type: Soybeans



- Net position = *long* − *short*
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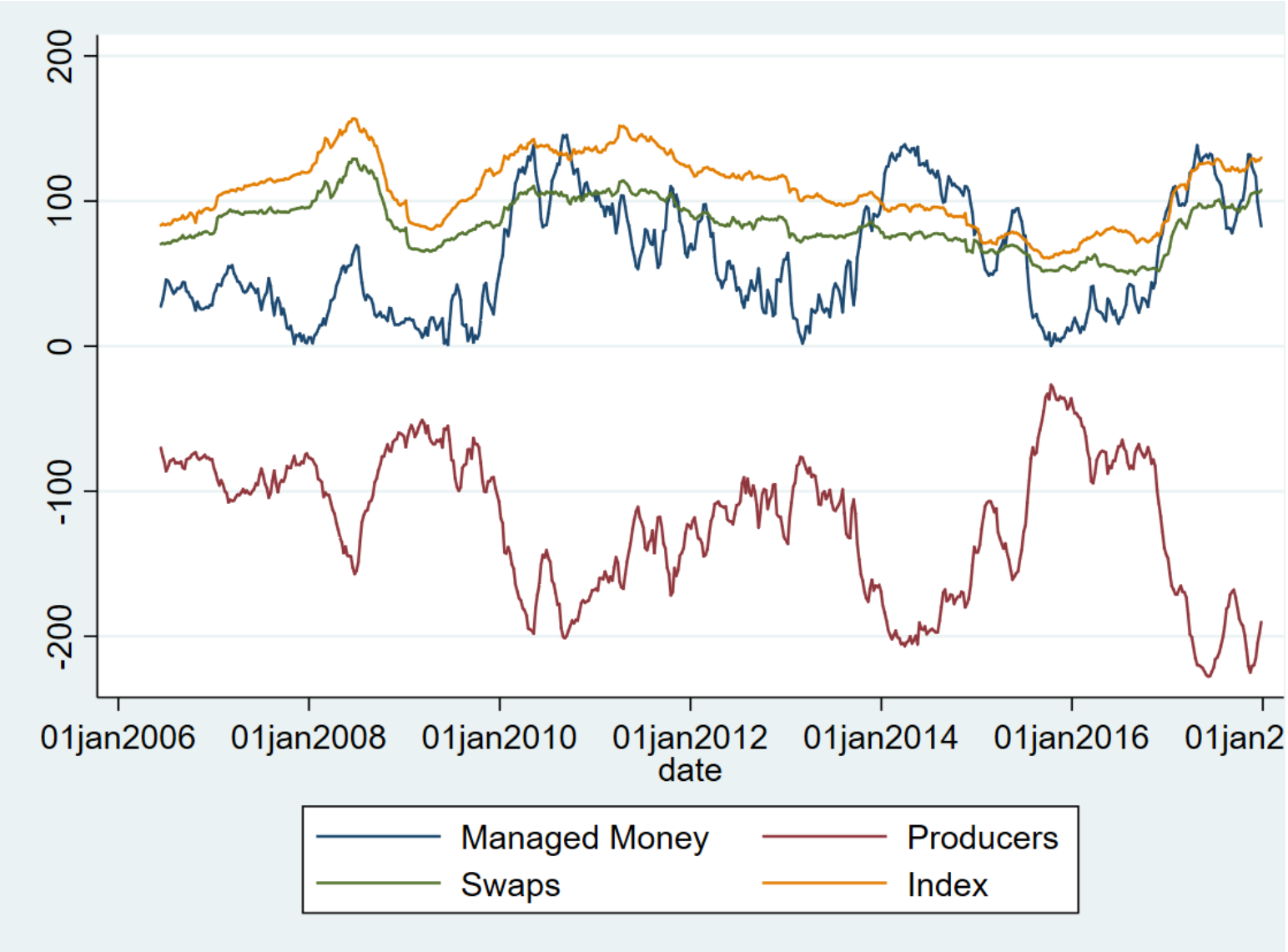
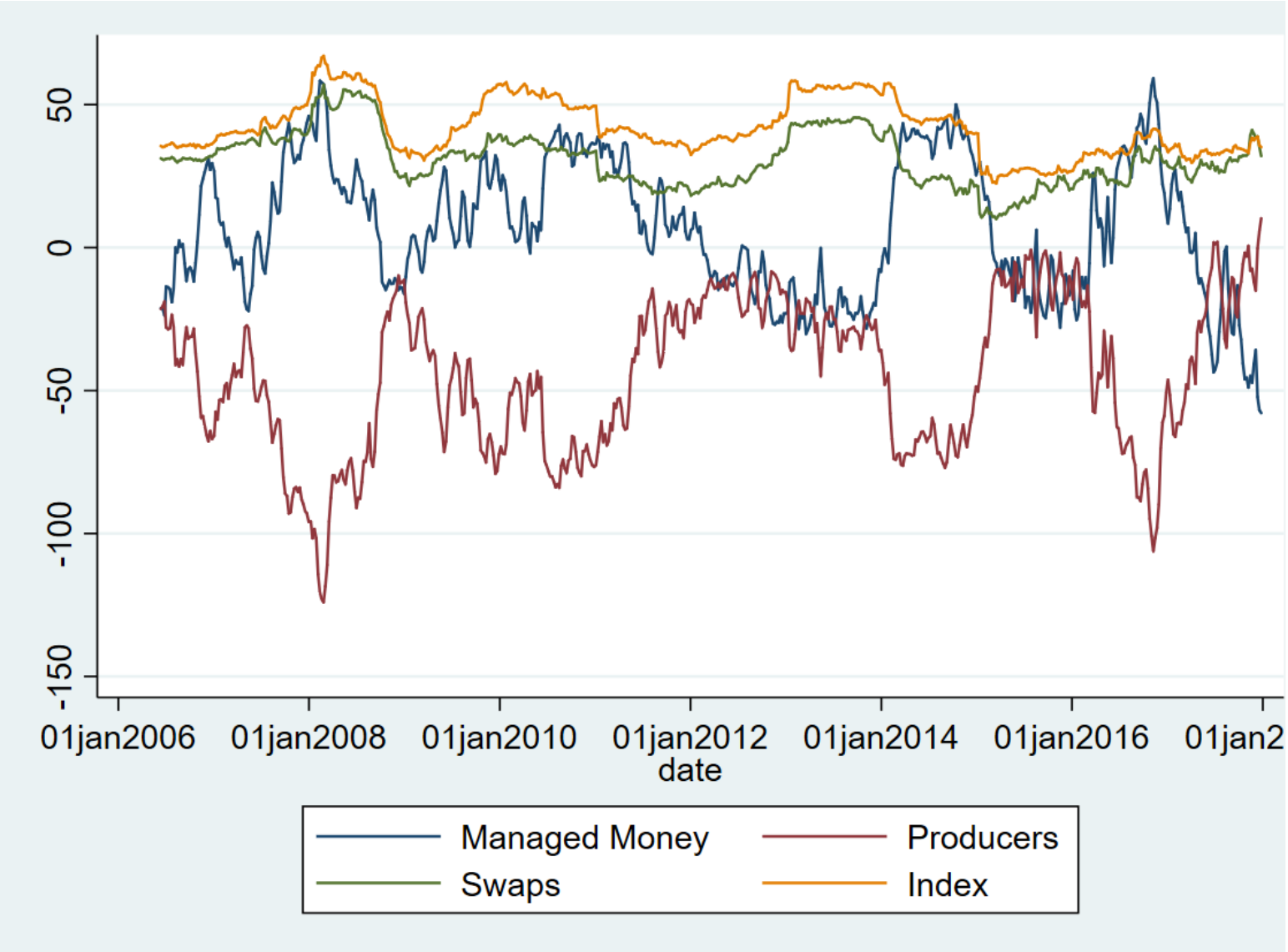
Weekly Net Positions by Trader Type: Live Cattle



- Net position = *long* − *short*
- Source: Disaggregated COT and Supplemental COT

Weekly Net Positions by Trader Type: Coffee



- Net position = *long* − *short*
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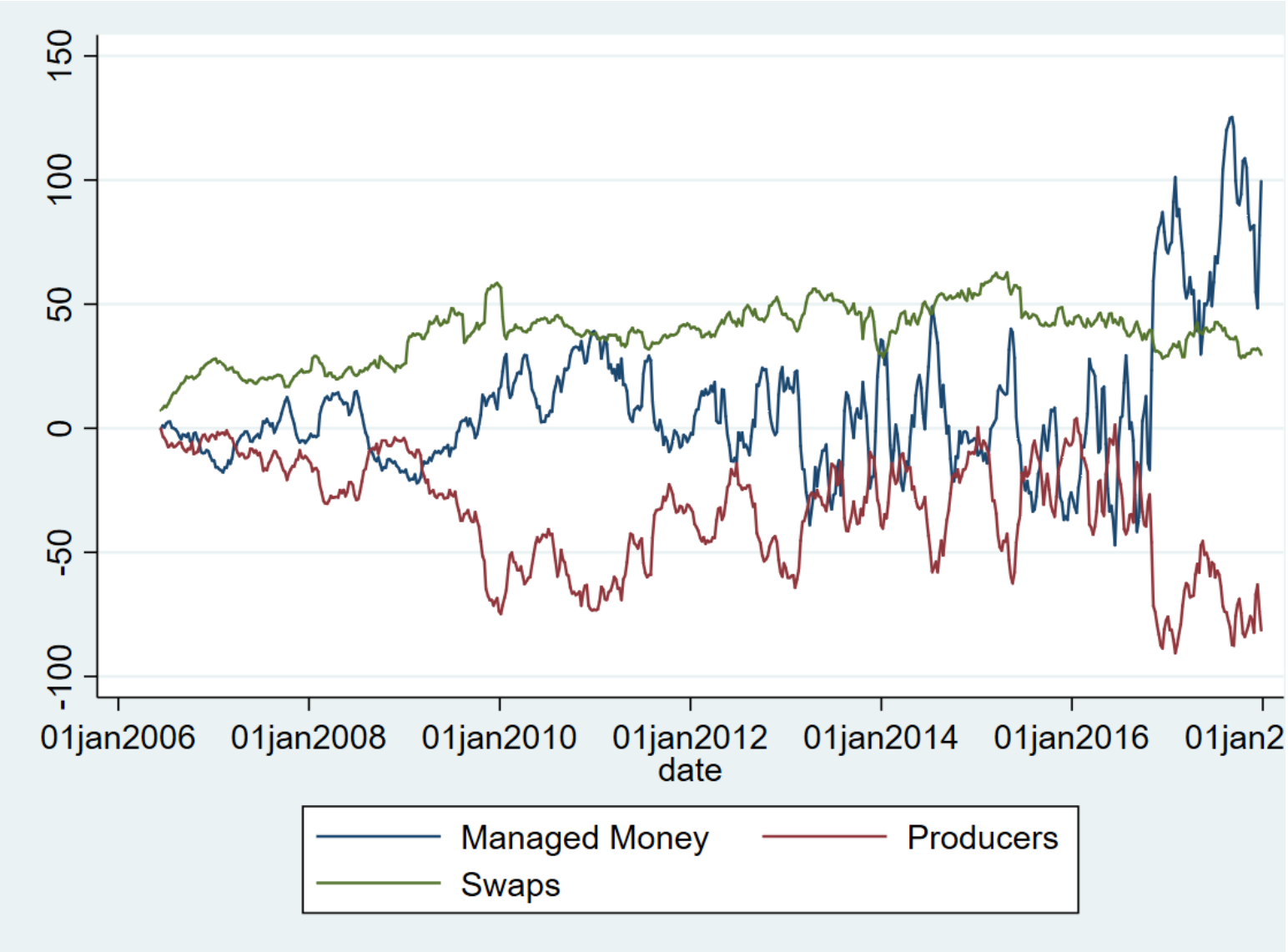
Weekly Net Positions by Trader Type: Copper



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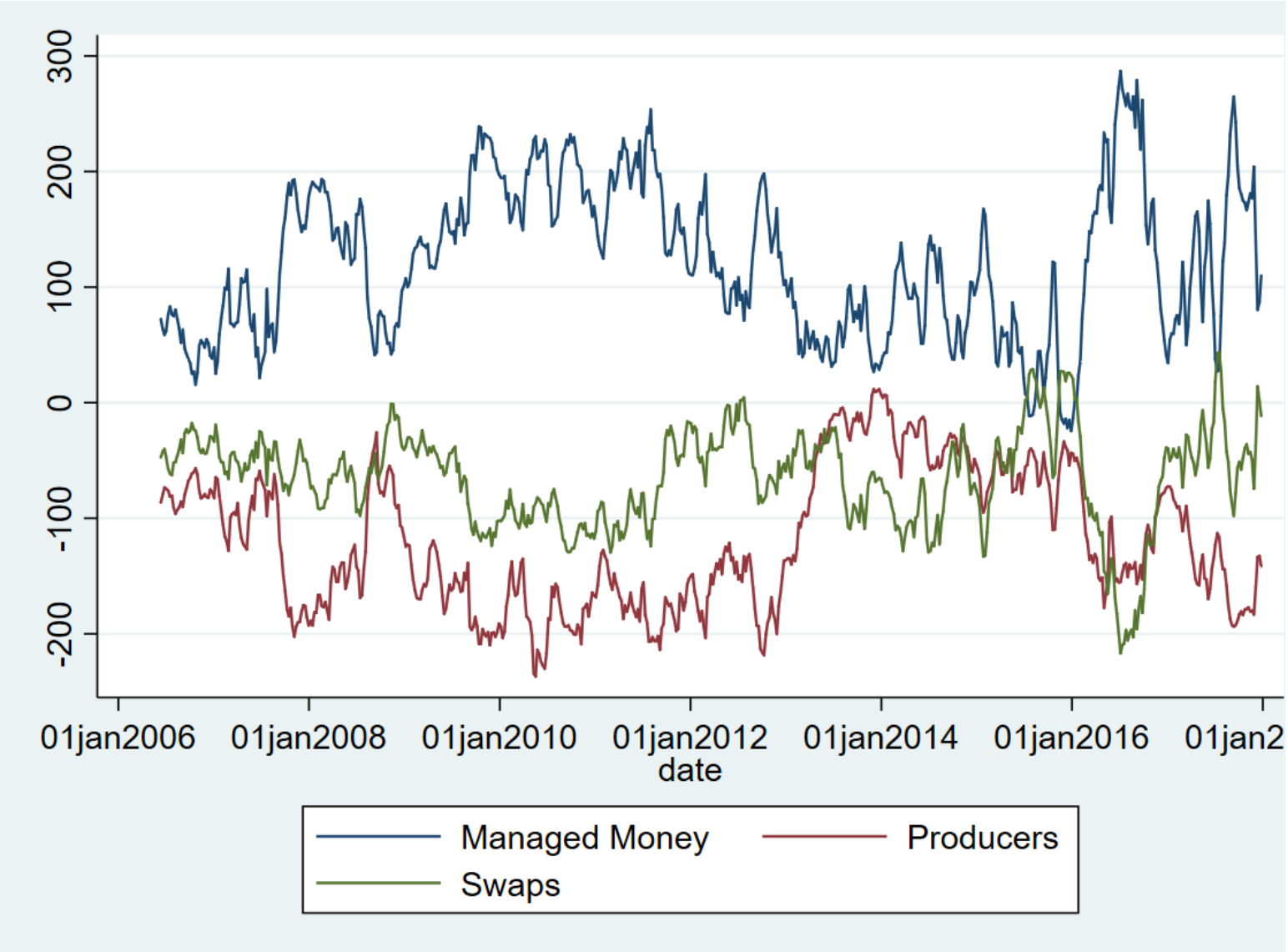
- Source: Disaggregated COT and Supplemental COT

Weekly Net Positions by Trader Type: Gold



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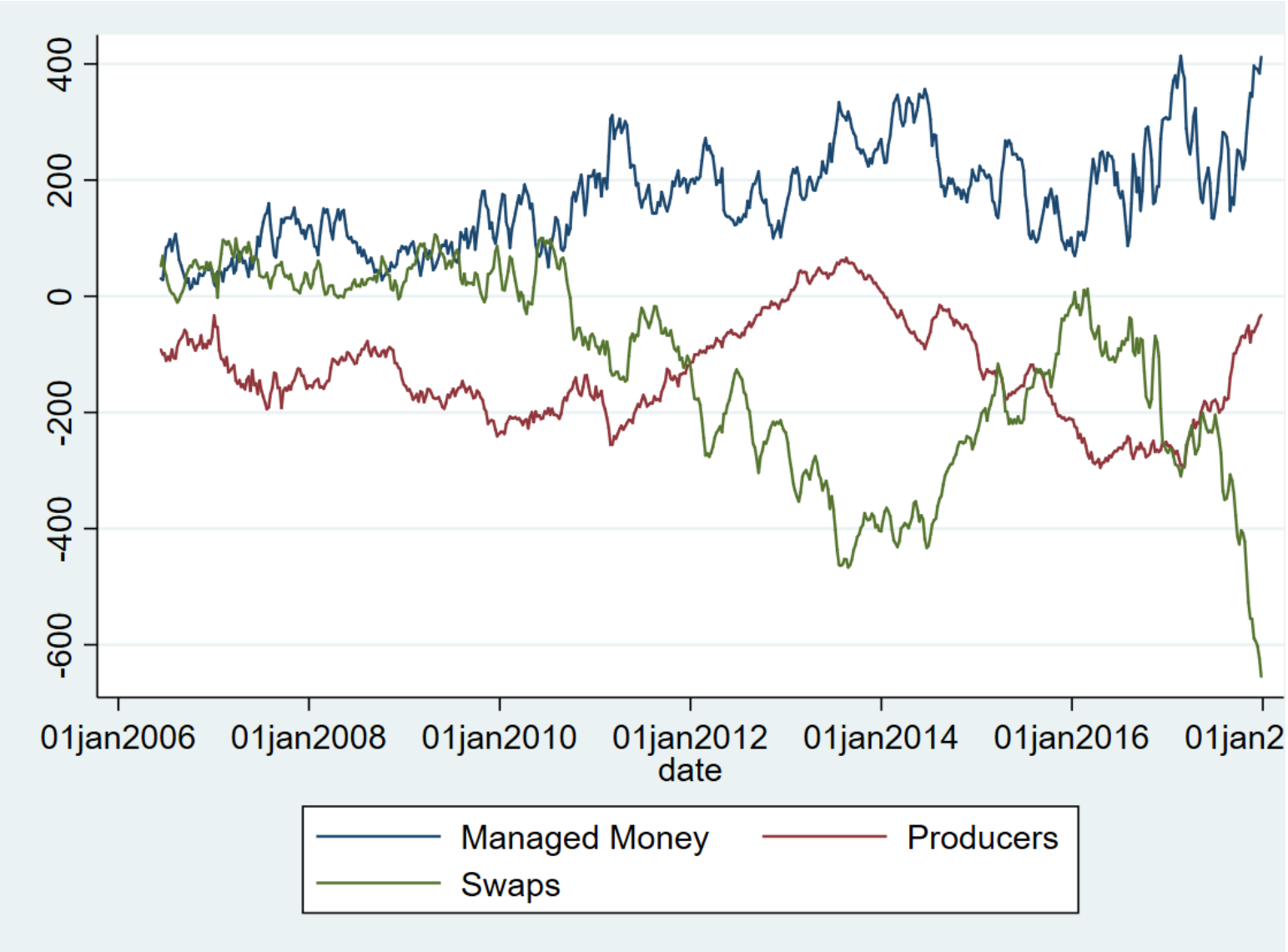
Weekly Net Positions by Trader Type: WTI Crude Oil



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Results so far ....

- Most group-level trade is between **managed money** and **producers**
- Index fund positions don't change much
- **Crude oil and precious metals** are exceptions — lots of swaps dealers hedging OTC trades

How do Position Changes Relate to Price Changes?

- Define **change in net positions**

$$\Delta POS_{ijt} = \frac{(L_{ijt} - S_{ijt}) - (L_{ij,t-1} - S_{ij,t-1})}{OI_{i,t-1}}$$

  for commodity i, trader group j, week t

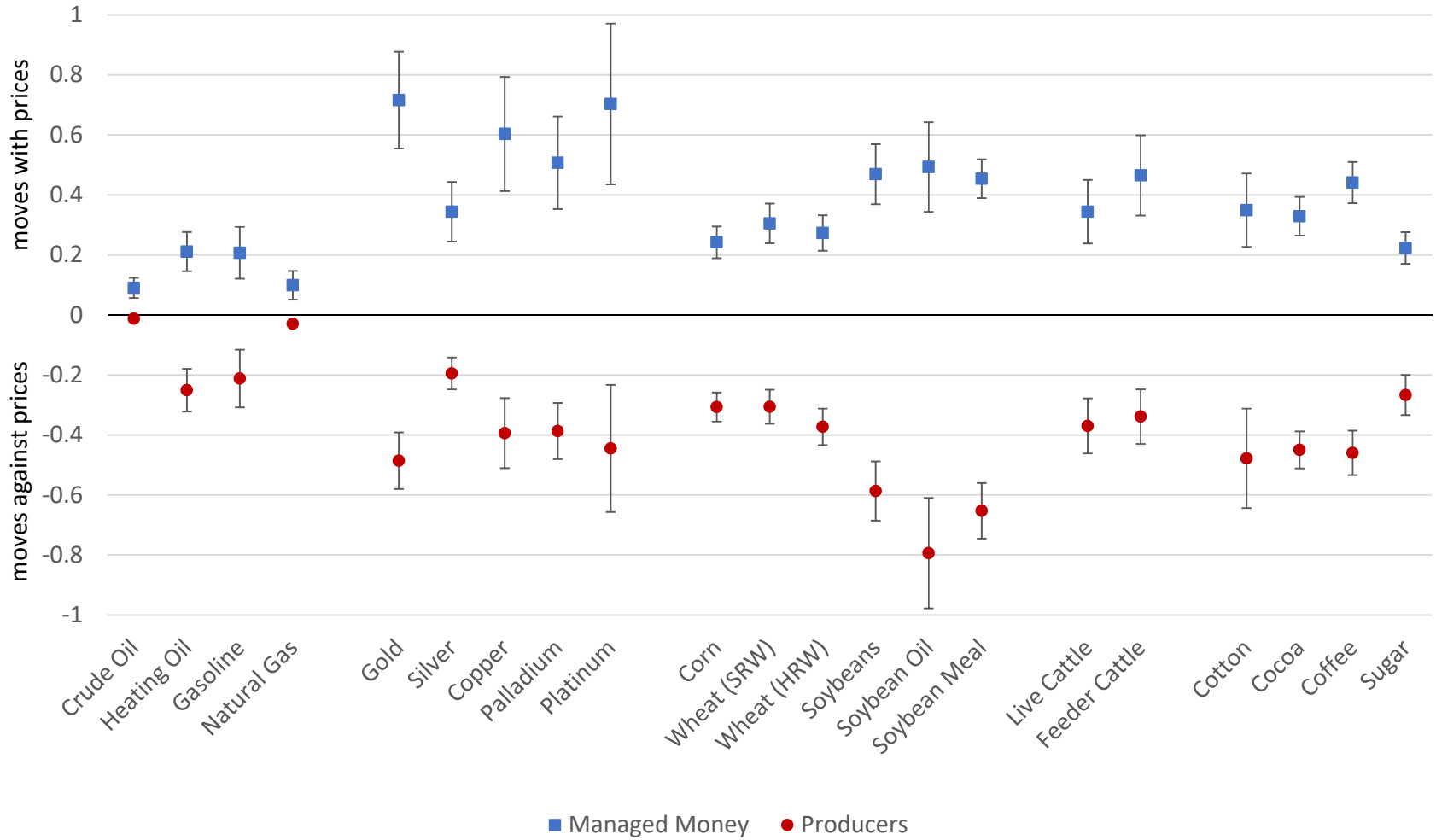
- **Regression** to estimate how price changes relate to position changes

$$\Delta POS_{ijt} = \alpha + \beta \Delta lnF_{it} + \varepsilon_{ijt}$$

  where lnF_{it} is the natural log of the nearby futures price for commodity i in week t

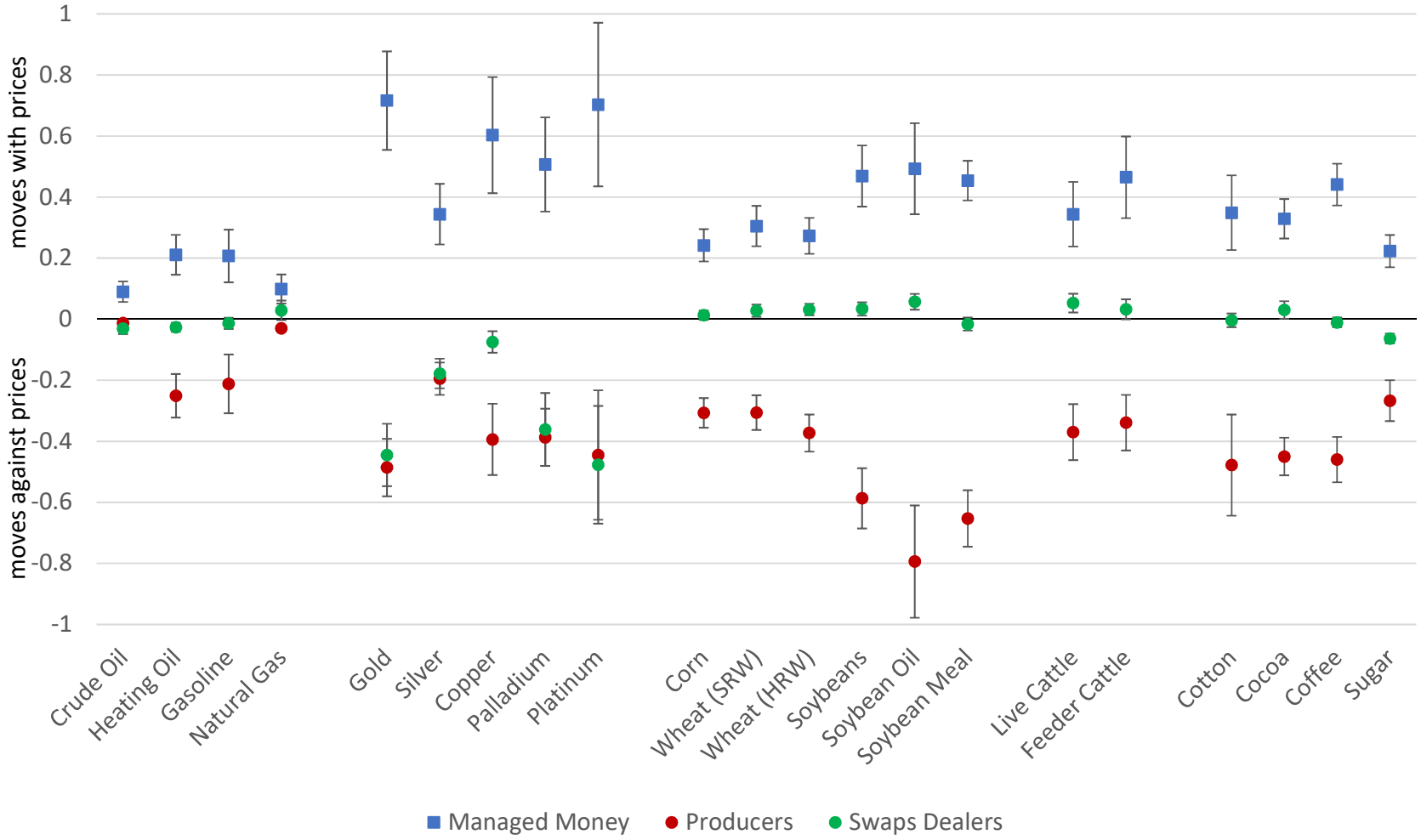
- **Interpretation**
  - $\beta > 0$ means group moves with prices
  - $\beta < 0$ means group moves against prices

$\beta > 0$ for Managed Money; $\beta < 0$ for Producers



- Vertical bars are 95% confidence intervals
- Source: Author's calculations

$\beta \approx 0$ for Swaps Dealers (except precious metals)



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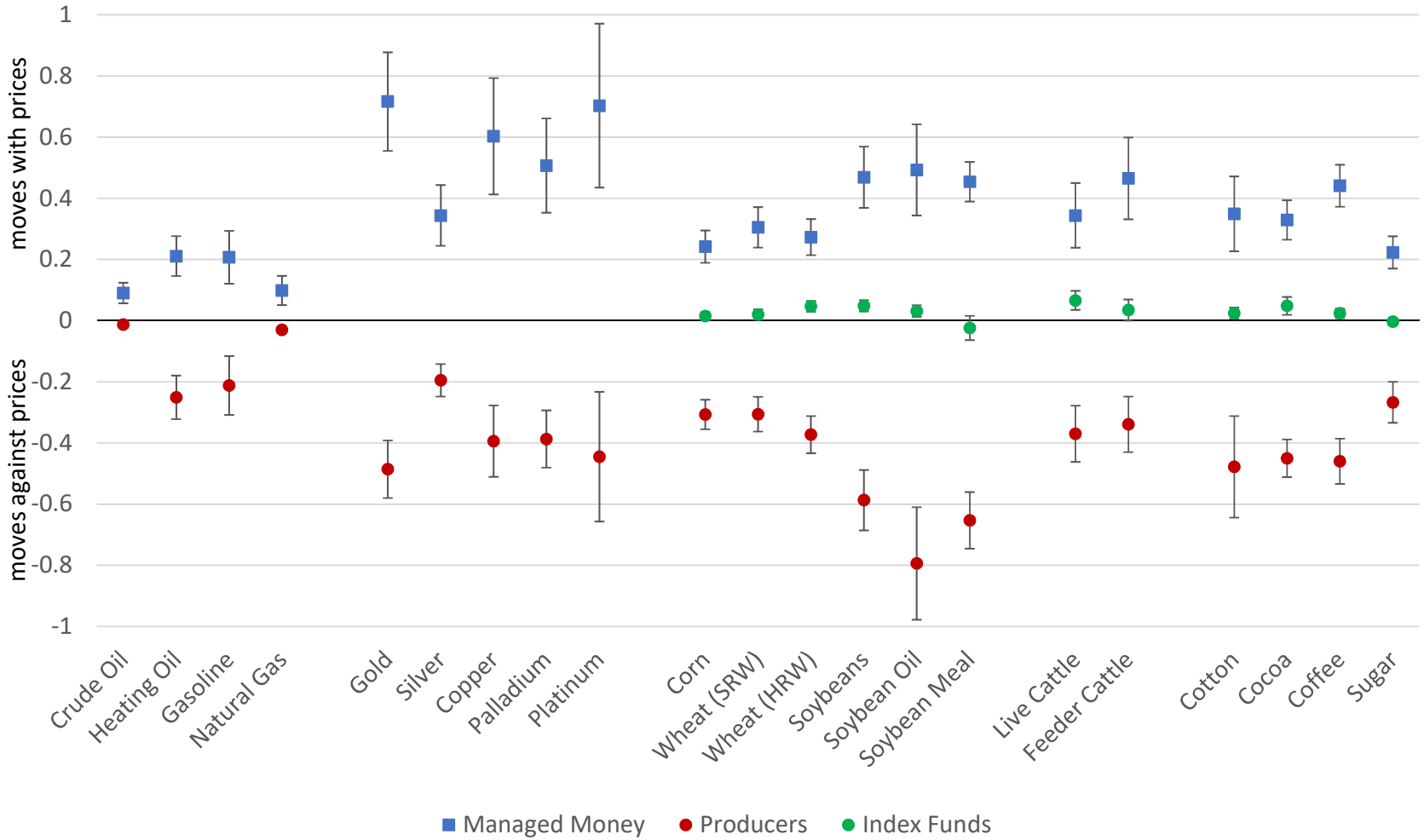
$\beta \approx 0$ for Index Traders



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What Does This Mean?

- **Why do traders trade?**
  - Hedge price risk (e.g., grain marketer)
  - Profit from information
  - Earn a risk premium
  - Earn a premium for liquidity services
  - Speculate on the future
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  - Earn a premium for liquidity services
  - Speculate on the future
  - **TO MAKE MONEY!**
- **Difference of opinion** models imply
  - traders disagree on the price and trade accordingly (Fishe et al., 2014)
  - disagreements are not resolved by trade
  - prices **move in the direction** of trader with strongest opinions
  - opinion strength determined by **confidence**, **amount of capital**, and **risk aversion**

Results so far ....

- Most group-level trade is between **managed money** and **producers**
  - Index fund positions don't change much
  - **Crude oil and precious metals** are exceptions — lots of swaps dealers hedging OTC trades
- Position changes driven by **differences of opinion** between managed money and producers
- **Managed money** has strongest opinions, so prices move with them
- **But does managed money move prices "too far"**?

What would it mean for prices to move too far?

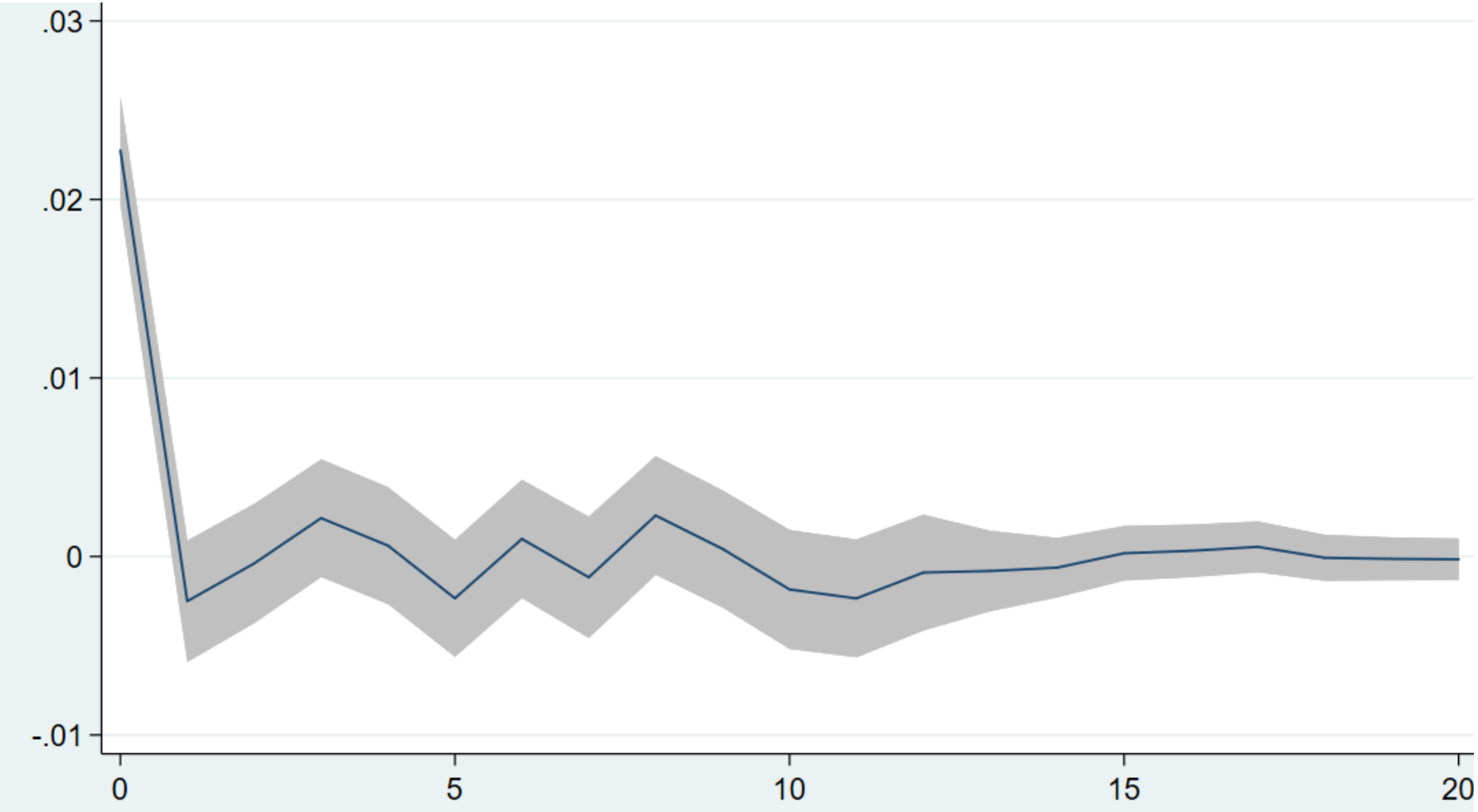
- Unlike many financial markets, commodity futures have a tight link to real economic decisions
  - If price is too high, consumers **buy less** and producers **produce more**
  - Inventories build up until the market self corrects

- How long would market take to self correct?
  - For U.S. corn, Hendricks et al. (2014) estimate supply elasticity is 0.3 and Adjemian and Smith (2012) estimate demand elasticity is -0.7.
  - Thus, net supply elasticity is $0.3+0.7=1$.
  - Consider a 20% non-fundamental price increase: inventories would increase by 20% of the crop
  - Average corn inventory is 15%, so annual inventories would more than double

- **Self correction seems likely to occur well within a year**

- Next, I test for price corrections or reversals

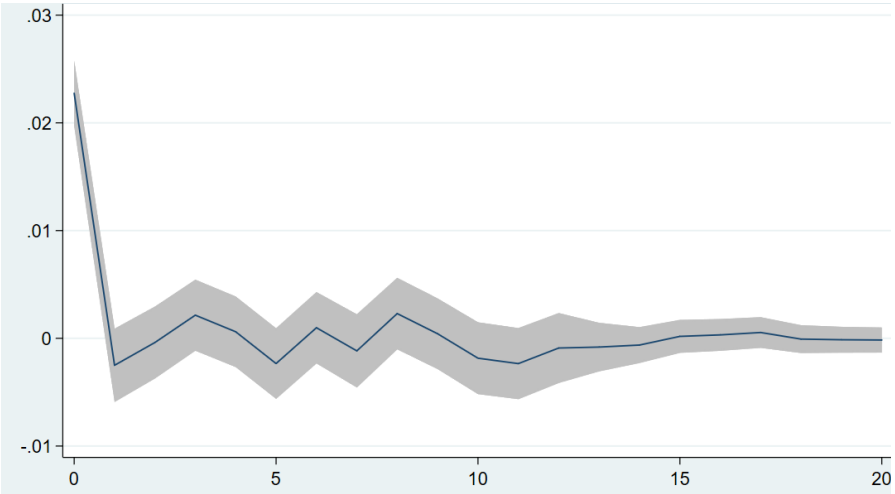
Do prices reverse direction after MM-induced changes?



(a) Corn

- Average change in log futures price $0 - 20$ weeks after MM net position changes
- Shaded regions are 95% confidence intervals for the impulse responses
- Source: Author's calculations

No evidence of price corrections



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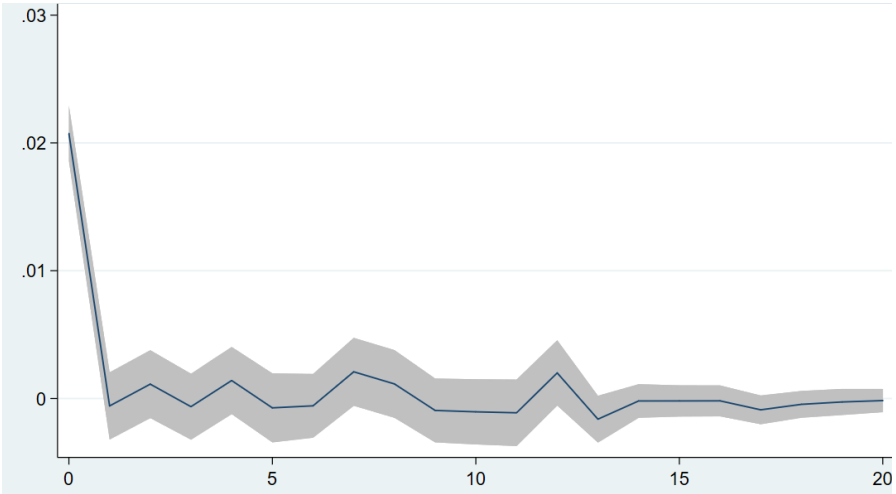

(b) Soybeans

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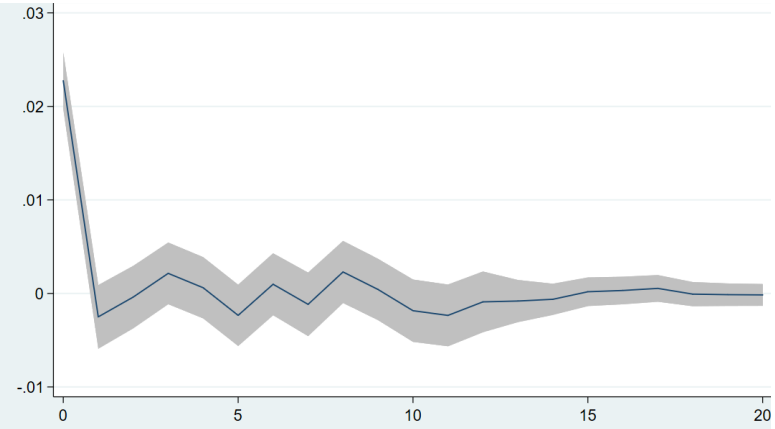

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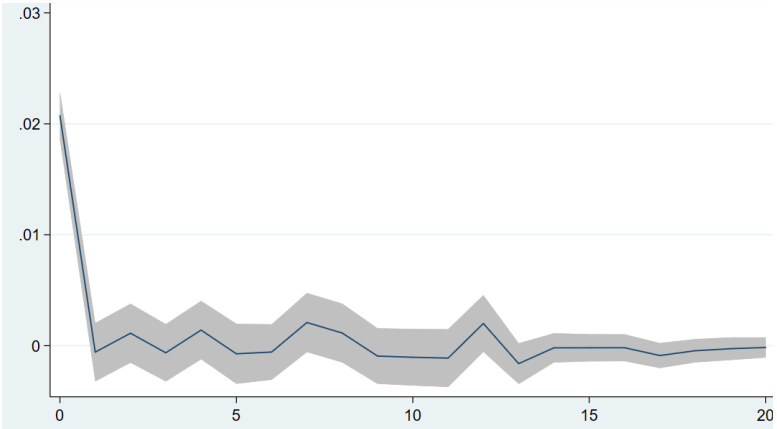

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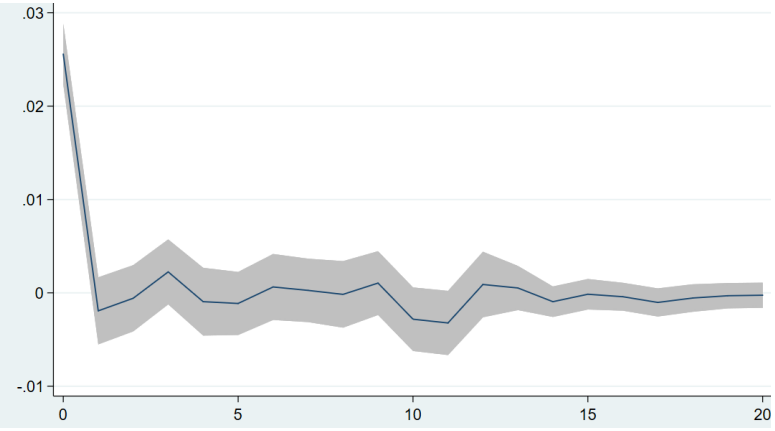
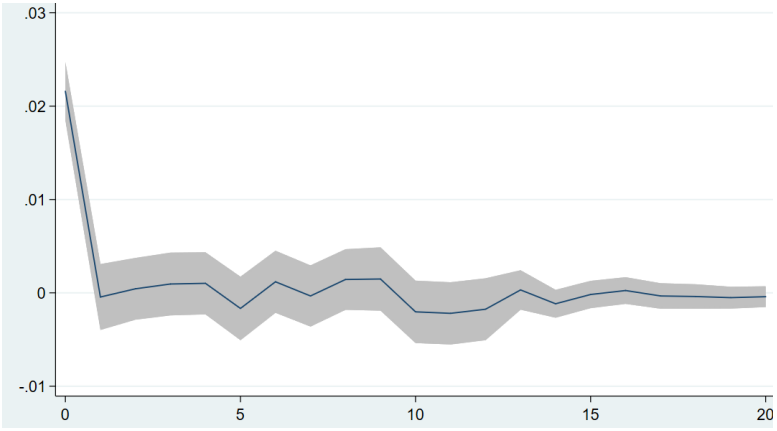


(c) Wheat (SRW)



(d) Wheat (HRW)

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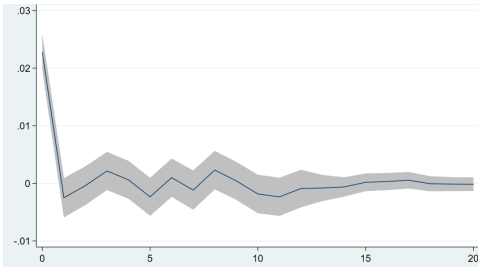

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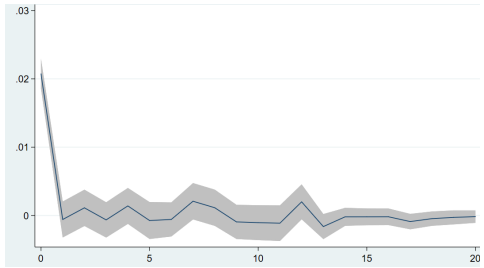

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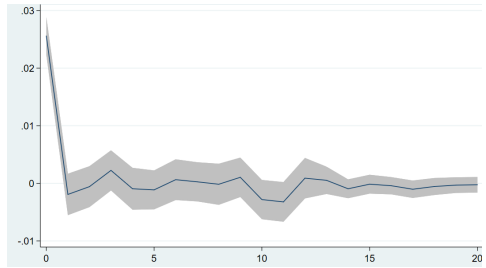

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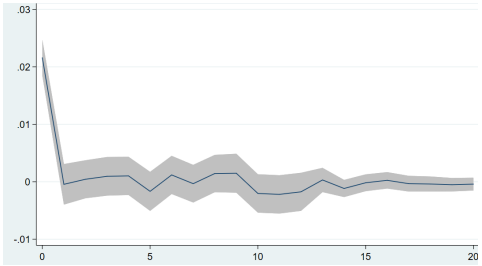

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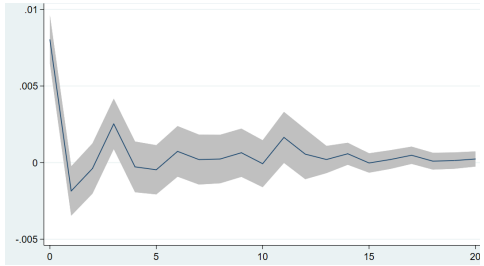
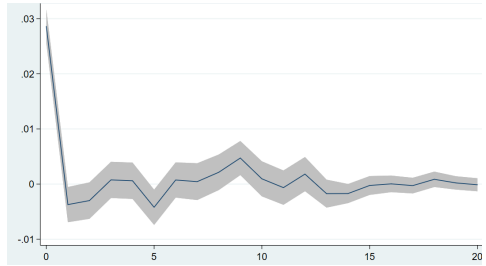
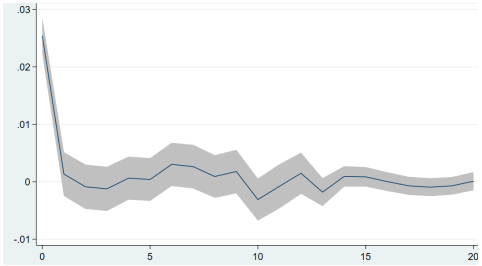


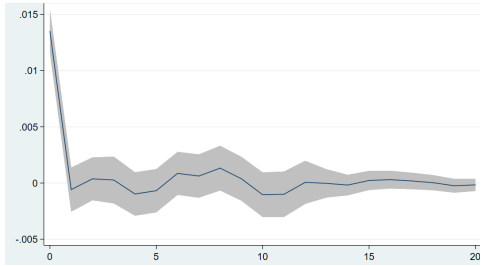
(e) Live Cattle



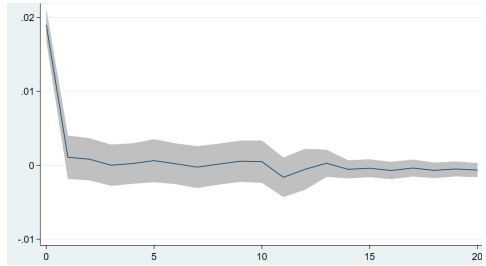
(f) Coffee



(g) Crude Oil



(h) Gold



(i) Copper

- Average change in log futures price $0 - 20$ weeks after MM net position changes
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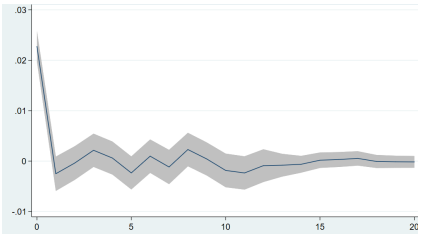
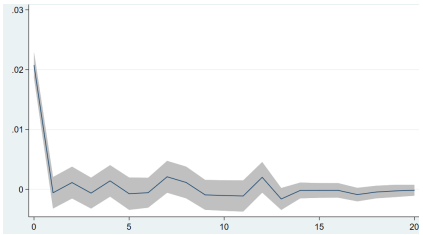
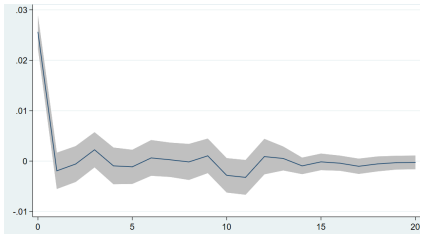
No evidence of price corrections



(a) Corn



(b) Soybeans



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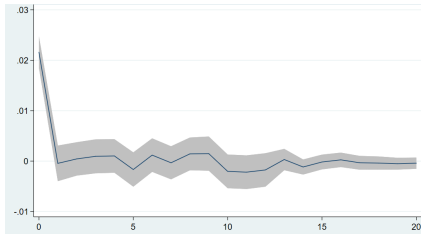
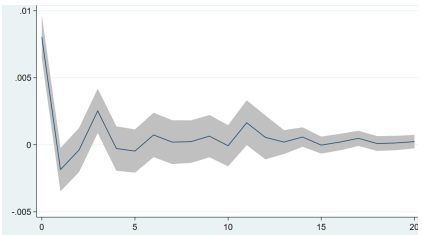
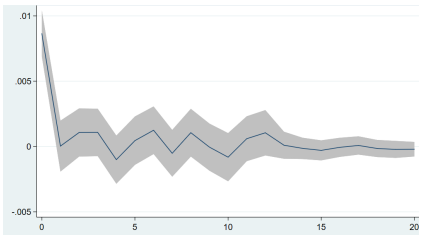


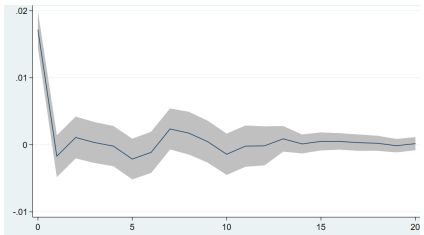
(d) Wheat (HRW)



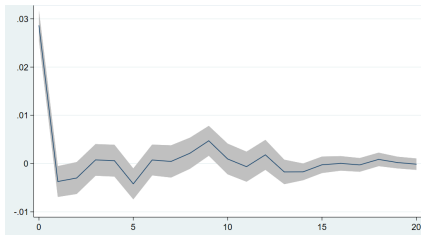
(e) Live Cattle



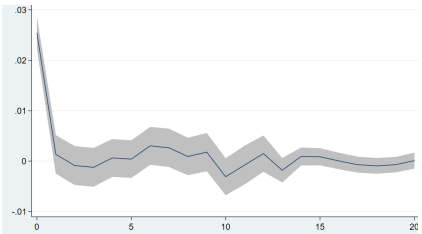
(f) Feeder Cattle



(g) Cotton



(h) Coffee



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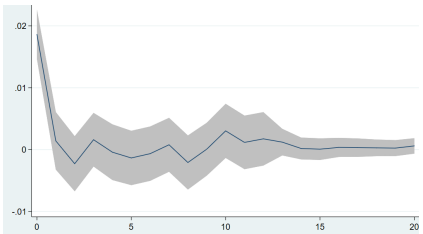
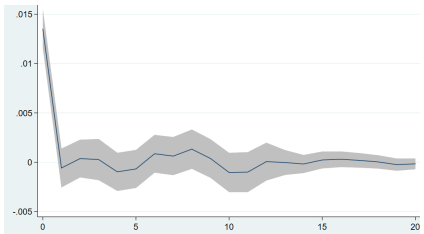
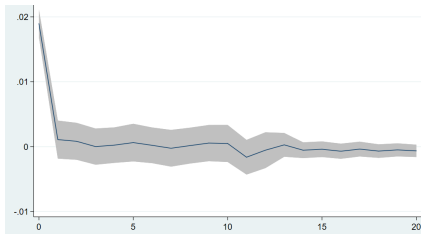


(j) Natural Gas



(k) Gold

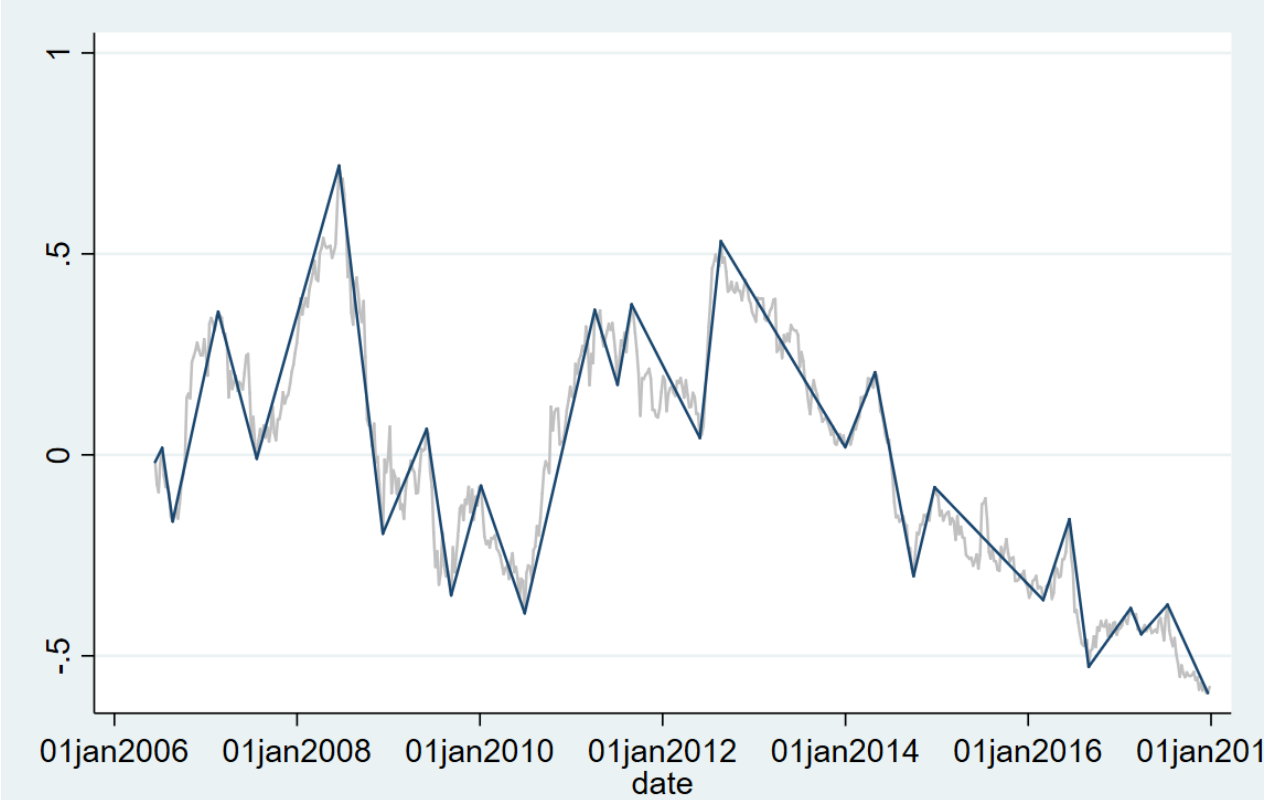


(l) Copper

- Average change in log futures price $0 - 20$ weeks after MM net position changes
- Shaded regions are 95% confidence intervals for the impulse responses

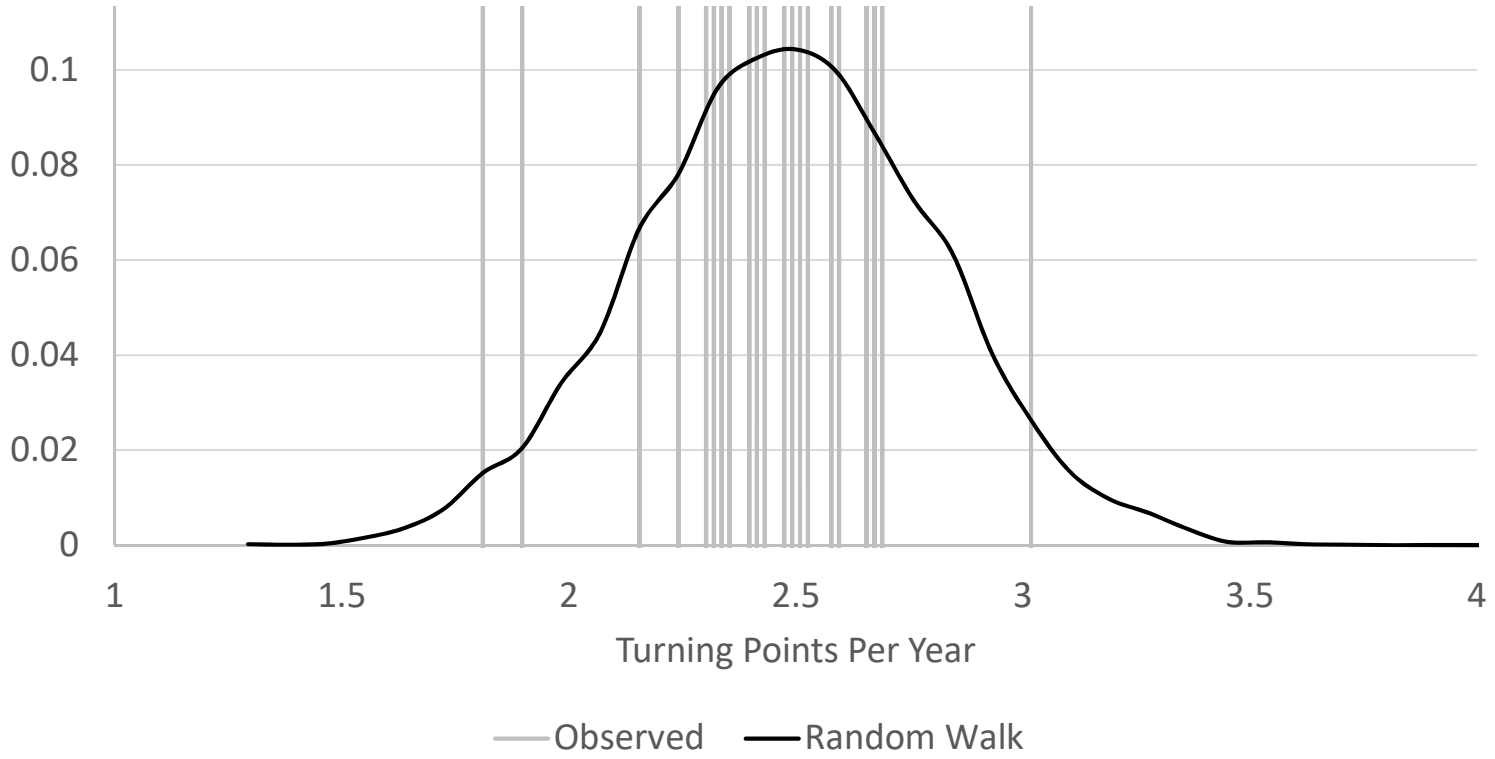
Price Paths

Corn Price Paths



- A **price peak** is higher than any price in the prior or next 3 months
- A **price valley** is lower than any price in the prior or next 3 months
- **Price paths** connect peaks and valleys
- **Are reversals more frequent than in a random walk market?**

Reversals No More Frequent than in a Random Walk



- Average number of reversals is 2.5 per year
- Other findings from path analysis:
  - MM net positions have about as many turning points as do prices
  - Prices and MM positions either **both rising** or **both falling** in 70% of weeks
  - Position turning points often occur around price turning points—sometimes a little before, sometimes a little after

Conclusions

- Most group-level trade is between **managed money** and **producers**—this is where we should focus our research attention
- Prices tend to move **with managed money** and **against producers**
- No sign of price corrections after MM-induced price changes
- No sign that path reversals are too frequent

- **Managed money may drive price changes, but no evidence that it drives prices away from fundamentals**

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