

Are biofuels and speculation major drivers in current food price volatility?

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Major causes of food price volatility

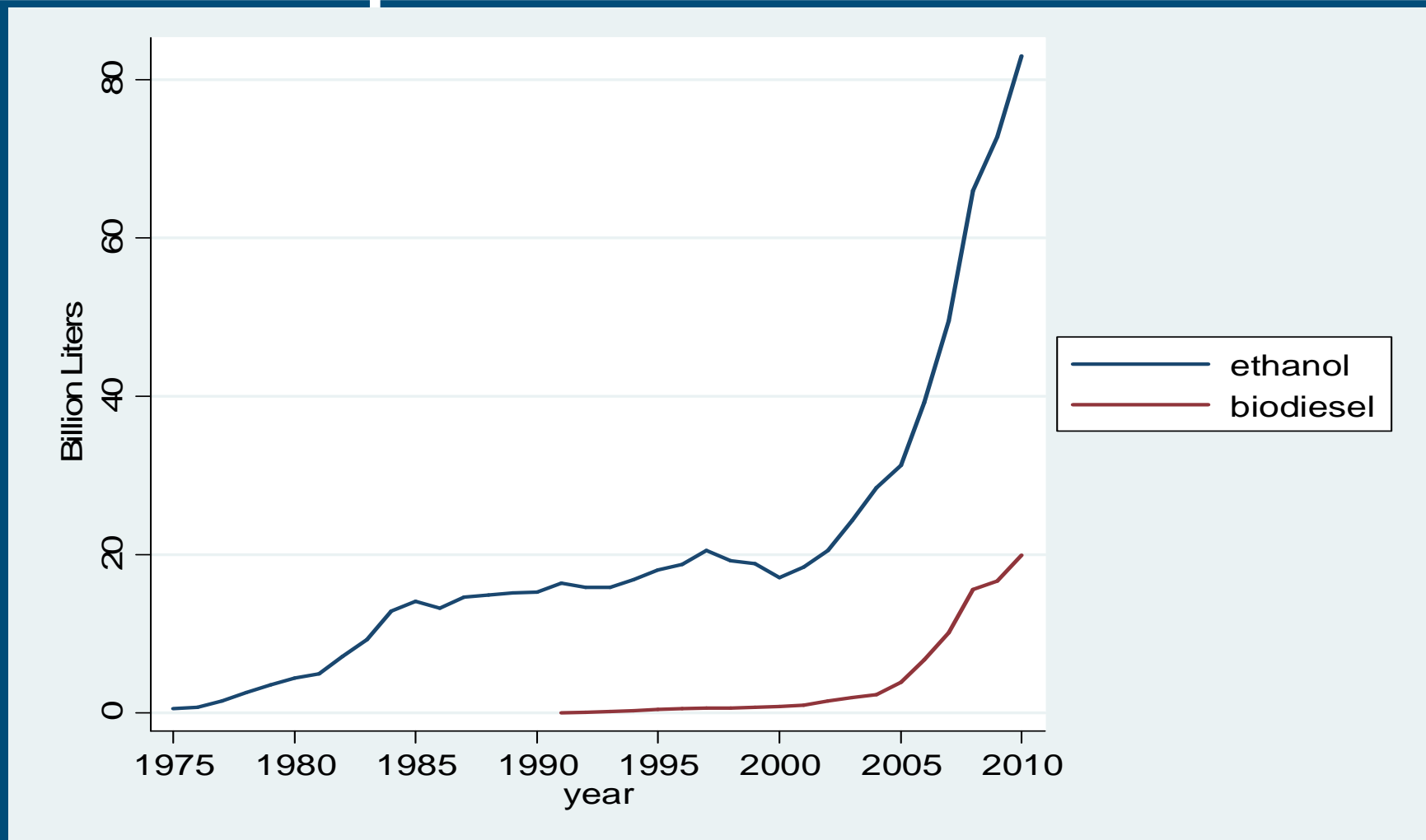
- Weather/climatic shocks
- Demand growing faster than supply
- Government policies
- Low stockpiles
- **Biofuels?**
- **Speculation?**



Do biofuels raise food prices?



Worldwide production biofuels



Source: Earth Policy Institute, Data Center, www.earth-policy.org



Production in 2010 (billion liters)

Country	Ethanol	Biodiesel
United States	45.4	2.8
EU-27	6.5	9.9
France	1.1	2.4
Germany	0.9	2.5
Brazil	27.5	1.9
Argentina	0.4	2.6
China	2.1	-
World Total	83	19.9

Source: F.O. Licht, World Ethanol and Biofuels Report, 8(13): 265, 267 and OECD-FAO Agricultural Outlook

Growth in Biofuels mainly policy driven

■ European Union

- Binding target: 10% biofuels in transport by 2020
- Sustainability requirements (e.g. 35% lower emissions)
- National governments make own plan
- Instruments: VAT benefits, blending (E85 or B100)

■ USA

- *Clean Air Act* (1990) and *Renewable Fuel Standards* (2005 and 2010)
- Current 50 bln. liter should grow to 136 bln. in 2022

■ Brazil

- Since 1975, focused on sugar for ethanol



Motivation for biofuel policies

- Less dependent on mineral oil (USA, Brazil)
- Larger share renewable energy
- Support for agricultural incomes
- Reduction in greenhouse gases (?)

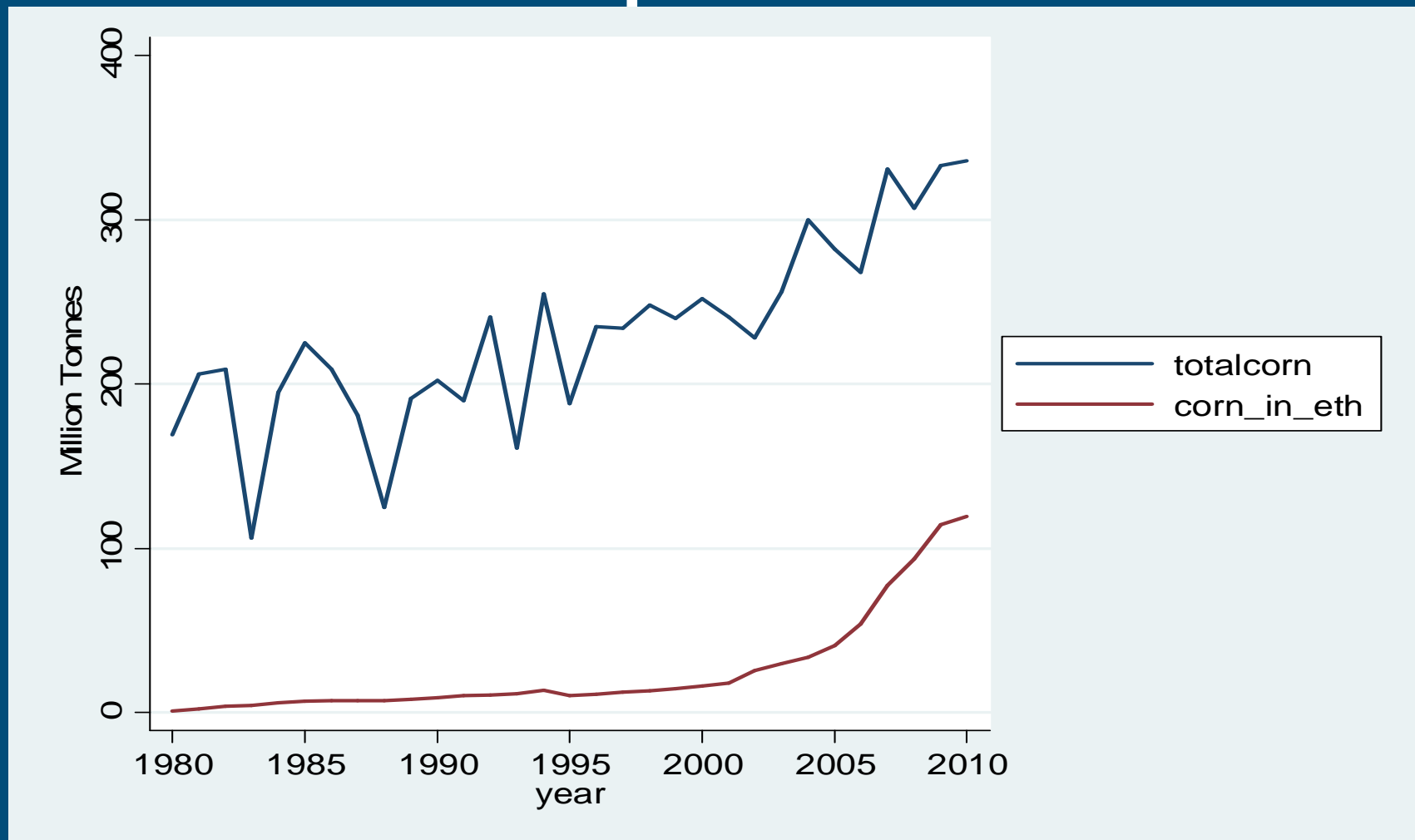


Direct price effect of biofuels

- Additional demand for commodities: corn, sugar, oilseeds → **direct** price effect if demand grows faster than supply.
 - Governments induce demand via biofuel mandates
 - High oil prices → stronger demand for biofuels
 - USA: 30% of corn used in biofuel production
 - USA produces 1/3 of corn worldwide and largest exporter
However, export did not drop substantially since corn production increased.
 - Brazil: sugarcane can be used for sugar or ethanol production



Corn in US ethanol production



Source: Earth Policy Institute, Data Center, www.earth-policy.org



Indirect effects of biofuels

- Change in crop mix. In the USA growth in corn acreage at the cost of soybean acreage → soybean prices increased → higher animal feed costs.
- Growth in total acreage (e.g. Brazil). EU reversed compulsory set-aside policies in 2009.
- Lower stockpiles → increased price fluctuations.



World cereal consumption and US biofuels

World Consumption	2005/ 2006	2007/ 2008	Change	% Change
Corn	705	770	66	9.3%
Wheat	617	612	-5	-0.8%
Milled Rice	413	426	14	3.3%
Other Cereals	286	285	-1	-0.2%
All Cereals	2020	2094	74	3.7%
Corn used in US ethanol production	41	78	37	90.2%
World cereal use except corn for US ethanol	1979	2016	37	1.9%
Corn for US ethanol as share of world ethanol	2.0%	3.7%		

Source: Westhoff, P. (2010). The Economics of Food, page 13 table 1.1

General Equilibrium studies on biofuels

- CGE studies simulate prices using linked markets
- Reviews by Gerber, Eckert en Breuer (2009) en Kretschmer en Peterson (2010).
- Overall: Biofuels influence agricultural prices
 - Oilseeds: world market price rises >30% in 2011-2016
 - Wheat, corn and soy: 3% - 15% price rise
 - Biofuel policies have strong impact on prices



Econometric time-series analyses

- Correct for trends and cycles
- Conclusions vary from no to small positive impact on prices of sugar, corn and oilseeds in 2004 - 2008.
- Biofuels do not affect price volatility



Summary of results

- Biofuels do have a positive impact on prices of corn, sugar and oil seeds, but not on prices of other commodities.
- Biofuels only explain a modest share of the rise in agricultural prices. Other factors also important.
- Biofuel policies affect markets



The future of biofuels

- Many countries have raised their biofuel mandates
- Huge expectations from 2nd generation biofuels
 - Reduces demand for commodities (corn, sugar, oil seeds)
 - But how does this affect soil quality?
- Increasing sustainability requirements and growing doubts on GHG reductions.
- Abolish subsidies, mandates and import restrictions!
 - Distort agricultural markets
 - Huge costs (VAT benefits cost Germany 2 billion Euro; in USA 11 billion dollar)



Agricultural future markets & speculation

- Gilbert (2010): “Speculators and index investors are often considered as cause of high and volatile food prices. One reason for this is that fundamentals of supply and demand are unclear”
- More clarity needed on
 - Role of inventories
 - Production and consumption in emerging markets (China)
 - *Government policies (CG)*
 - *Functioning of future markets (CG)*



Positive functions of futures markets

- Future markets already exist since 1848 (CBOT)
- Future markets have three important roles
 1. **Price discovery** → futures prices incorporate relevant information and indicate what future price of delivery is.
 2. **Risk shifting** → farmers can forward sell their crops at fixed prices reducing their price uncertainty (=hedging)...
 3. ...which **facilitates financing** → loans easier due to reduced uncertainty.
- If working properly, future markets have a positive impact on agricultural production!



Speculators are necessary!

- Hedging by farmers and processors only possible if there are speculators who want to take risks.
- Speculators are necessary to provide liquidity → insufficient speculators leads to malfunctioning of future markets (e.g. as future market for rice).

But who are these speculators?

Can they influence the market?

Should they be regulated?



Informed vs. Uninformed Speculators

- Informed speculators incorporate real info (on droughts, policies, stockpiles etc.) in price formation
- Uninformed speculators use technical analysis (trend following, herd behavior) → may lead prices in wrong direction.
- Efficient Market Hypothesis: Informed speculators gain from 'wrong' price effects by uninformed speculators.

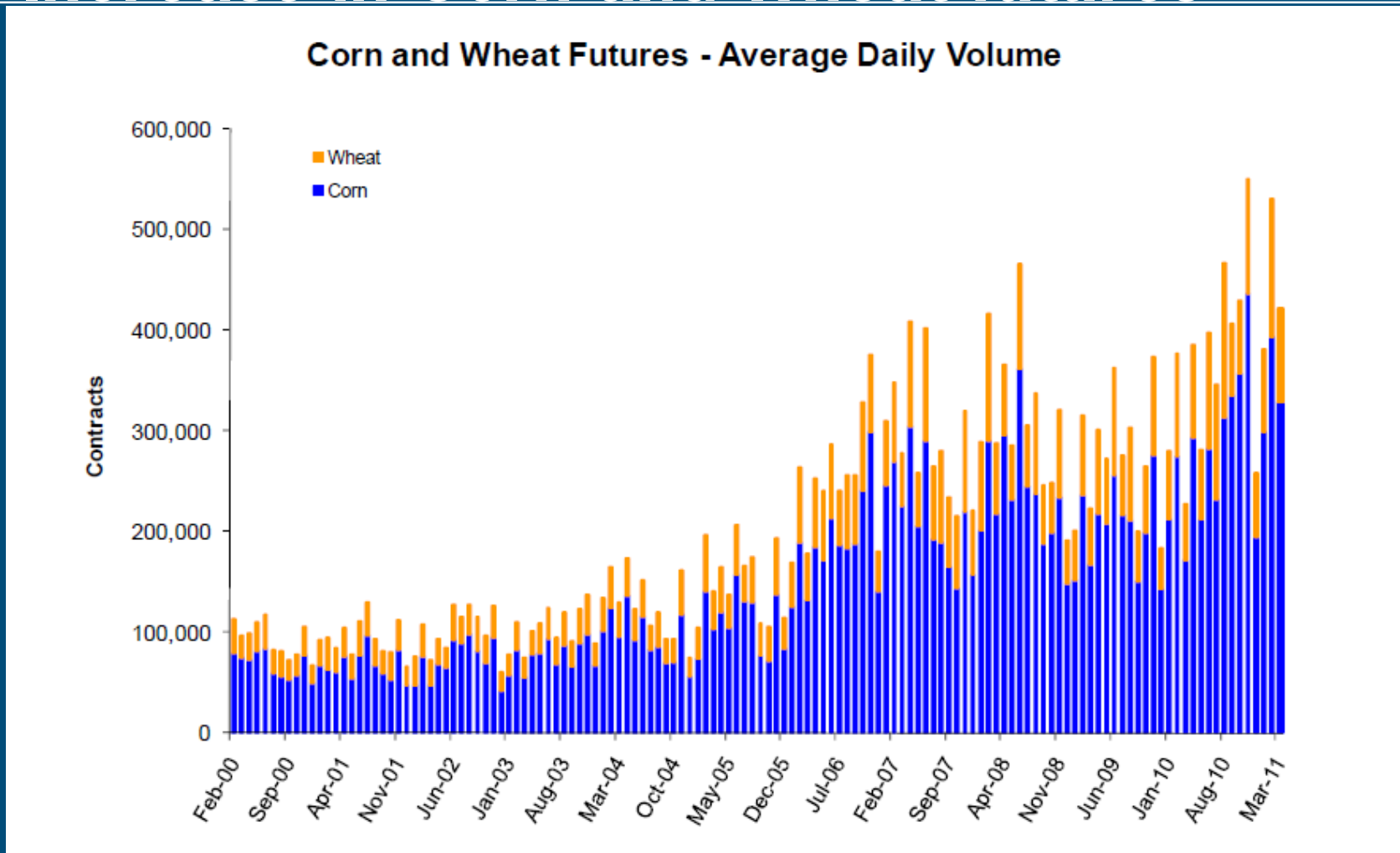


Index funds speculators

- Testimonies for US congress by Michael Masters and George Soros (both speculators) → index funds raise food (and oil) prices:
 - Huge additional demand for future contracts
 - Long-only contracts (buy at current price for future delivery) → imbalance in trade



Increase in Corn and Wheat futures



Source: CME Group, *Monthly Agricultural Grains Update* March 2011, www.cmegroup.com



Did more speculation cause high prices?

- Empirical evidence is mixed
- Often based on time-series econometrics using concept of Granger causality (x leads y)
- Significant role: Masters (2008), Cooke and Robles (2009), Von Braun et al. (2009)
- No or insignificant role: Sanders and Irwin (2009; 2011), Irwin et al. (2010), Gilbert (2010).



Theoretical arguments against effect

- For every 'long' position there needs to be a 'short' position.
- Futures prices should converge to spot price at time of delivery (did not happen in Kansas in 2008).
- Future markets as institution have interest in proper market functioning → requirements on traders.
- Twice a year ultimate new info on the market: new harvests! **Fundamentals drive real markets.**



Some final remarks on speculation

- Speculation can have adverse effect on prices in the short-run if speculators are not well informed.
- This may add to short-run volatility.
- Weak empirical evidence on speculation effects.
- In the long-run speculation cannot raise prices.
- Future markets organize their own regulation; governments should be reserved in this matter.
- Ongoing debate: better understanding and more empirical evidence needed.



Thank you!



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