Discussion of "Commodity Connectedness"

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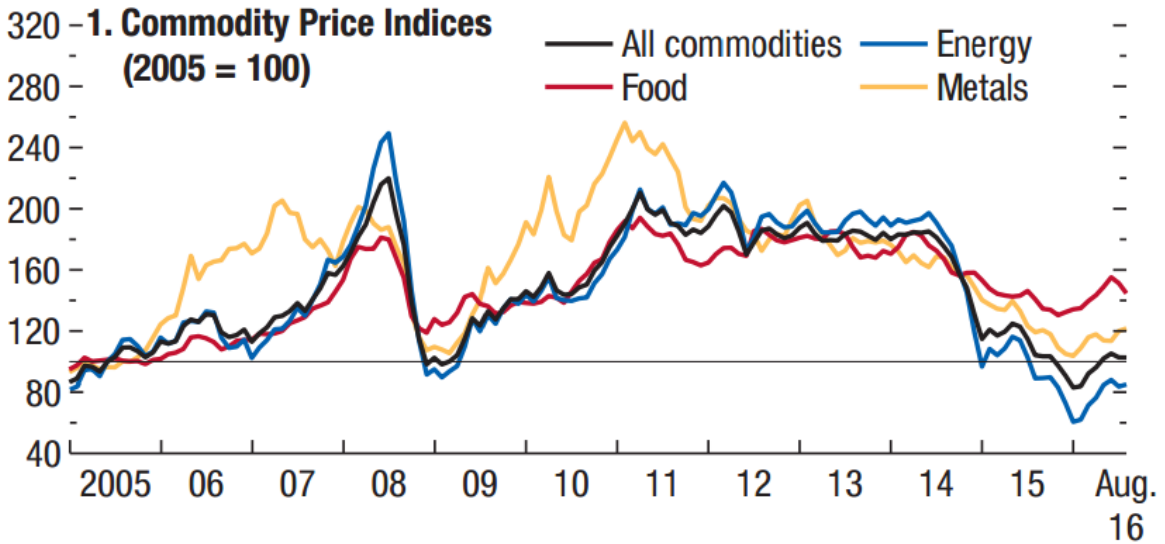
Commodity price dynamics

- Commodity price fluctuations play a key role in global business cycles dynamics, especially in emerging markets
- Diminishing growth prospects for emerging market economies, especially China, combined with abundant supply are putting downward pressure on the prices of most commodities *(WEO, October 2016)*

Figure 1.SF.1. Commodity Market Developments



Contribution: commodities interactions

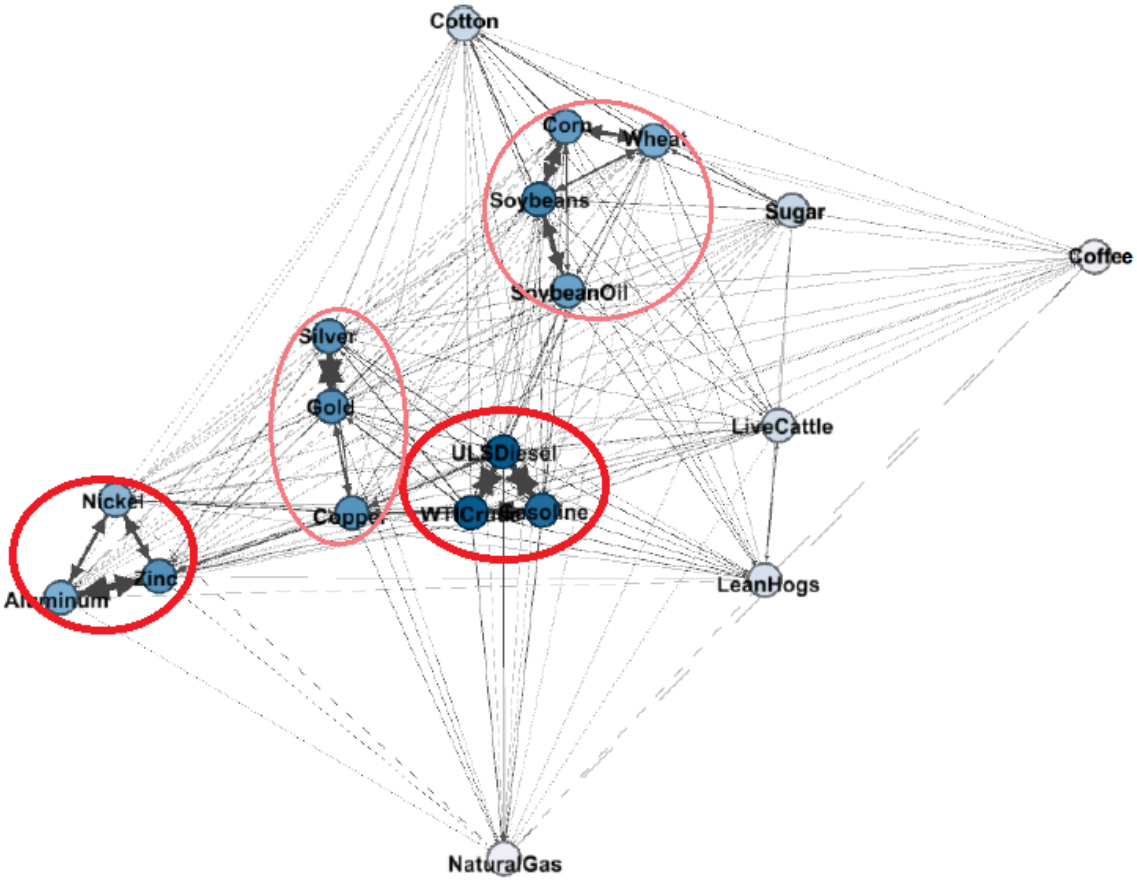
- Commodity indexes summarize prices of a set of commodities into a single number
  - However, they **do not provide information about the complex interactions** between those commodities
  - Very important issue to assess shocks propagation!
- This paper proposes indexes to characterize such complex interactions between commodities over time, named as *Commodity Connectedness* measures.
  - Intuitive econometric methodology
  - Forecast error variance decomposition of large VAR models

Results

- **Static Connectedness**:
  - Half of a commodity's future volatility uncertainty is due to "non-own" shocks
  - Few commodities send large amount of future uncertainty to others (Energy)
  - Commodity shocks are mostly transmitted to its corresponding group, rather than to other groups
- **Dynamic Connectedness**:
  - Connectedness index is a useful tool (for policy makers and investors) to monitor in real-time spillovers in commodities
  - Directional connectedness characterizes main "senders" and "receivers" of shocks in the commodity market
- Commodity connectedness measures represent a great contribution to the understanding of the complex commodity linkages.

Remark I: Structure of the network

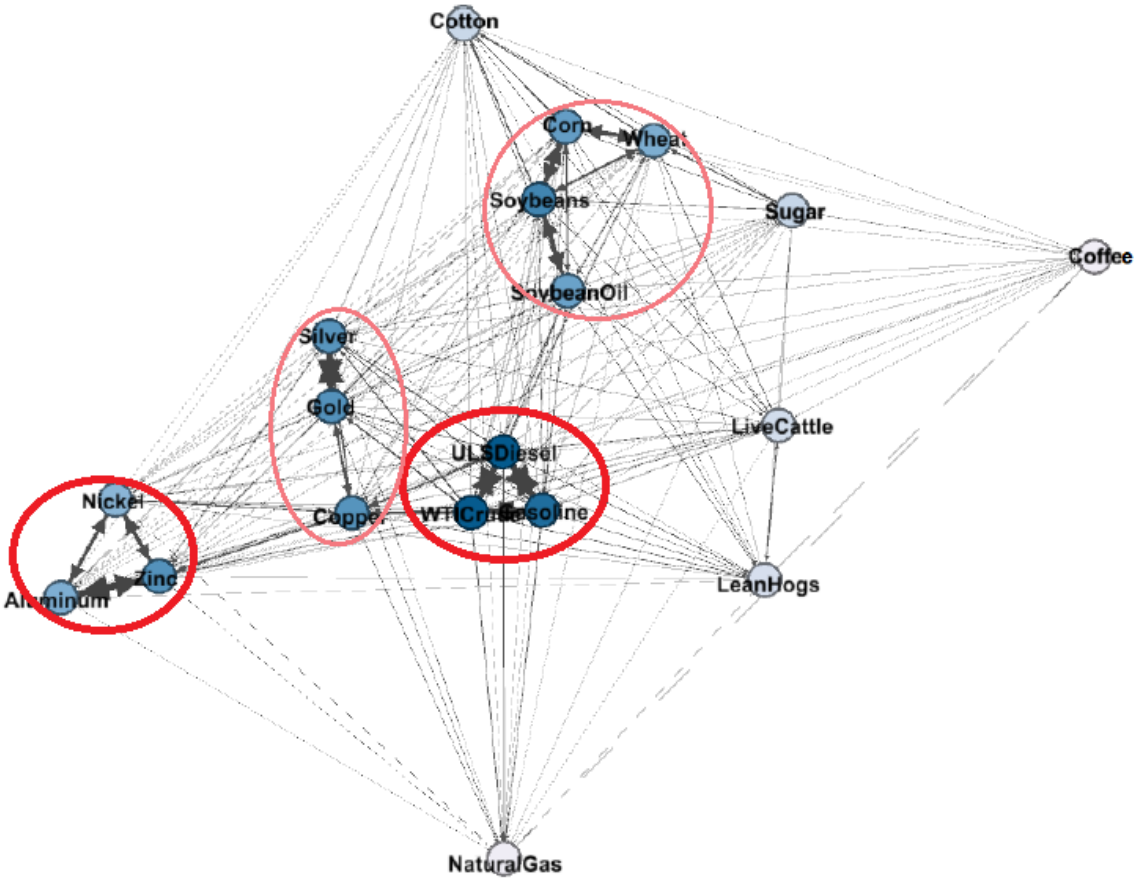
- There is a clear clustering pattern. Particularly, in energy and industrial metals sectors.



- Homophily: tendency of individuals to associate/bond with similar others.

Remark I: Structure of the network

- What are the implications of this network structure for the presence of extreme events?



- This is important to study spillovers/contagion of events such as global recessions, large uncertainty shocks, etc.

Remark II: Degree of Commodity Market Uncertainty

- Commodity markets, like any other financial market, is subject to uncertainty shocks
- Uncertainty shocks in commodity markets $\Rightarrow$ Changes in the underlying (common) volatility of commodities
- Does the level of common volatility matter for commodity connectedness?

Remark II: Degree of Commodity Market Uncertainty

- If so, analyzing two aspects is relevant to assess propagation mechanism of volatility shocks in commodity markets:
  1. Levels of the underlying (common) volatility of commodity market
  2. Exposure of each commodity to such underlying volatility

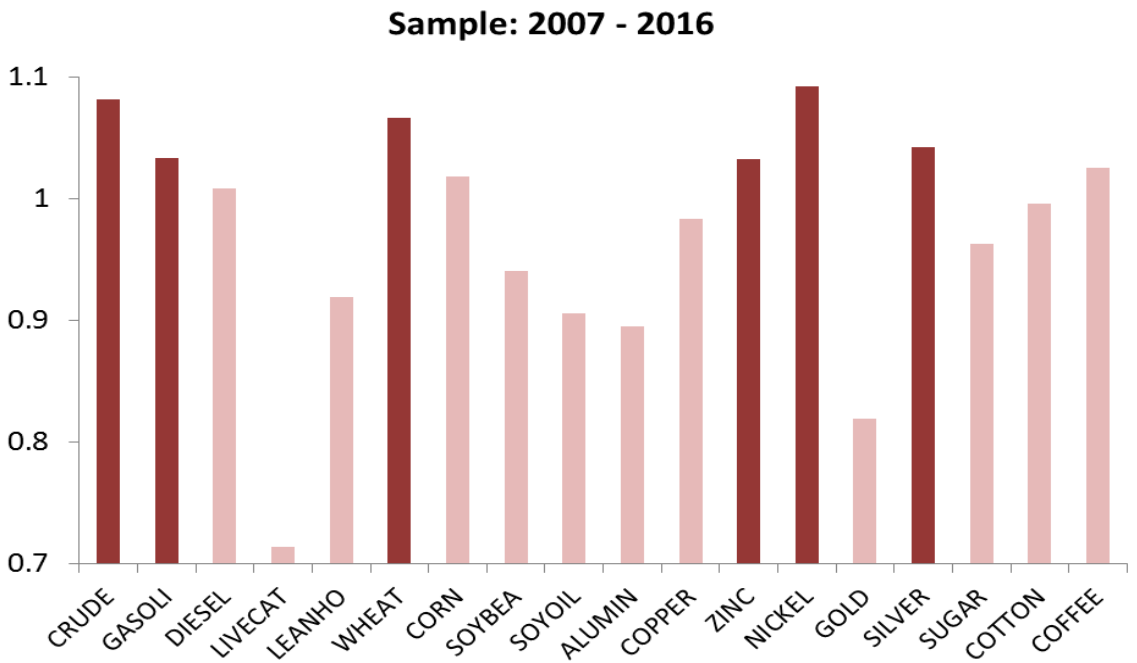
- Stochastic Volatility Factor model (Leiva-Leon (2016))

$$\begin{aligned} y_{i,t} &= e^{\frac{1}{2}\lambda_i h_t}\varepsilon_{i,t} \\ h_t &= \mu_h + \phi_h(h_{t-1} - \mu_h) + \zeta_t \end{aligned}$$

with $\zeta_t \sim N(0, \sigma_h^2)$ and $\varepsilon_{i,t} \sim N(0,1)$, for $i = 1, 2, ..., n$.

Remark II: Degree of Commodity Market Uncertainty

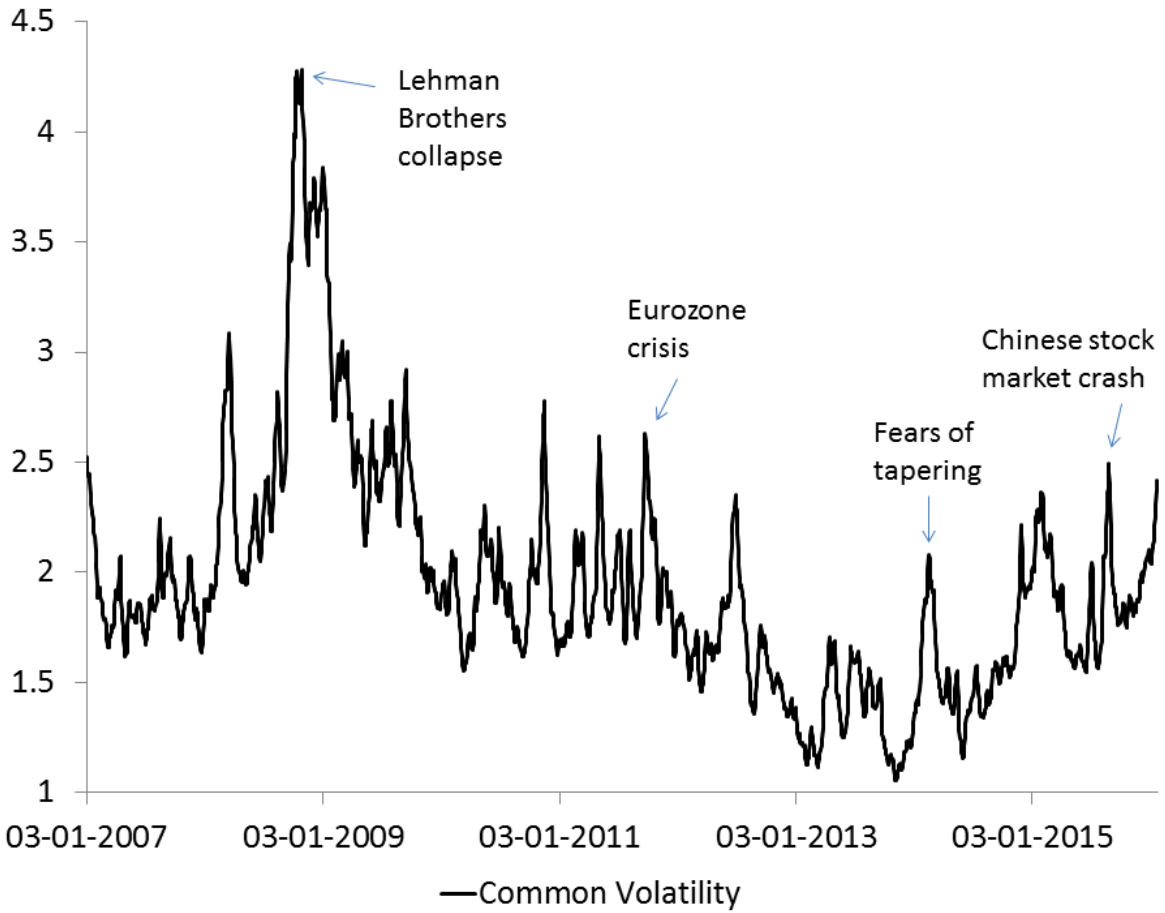
- **Exposure** of commodities to the underlying (common) volatility



- Specific commodities in the energy, metal and food category are the most sensitive to the common volatility

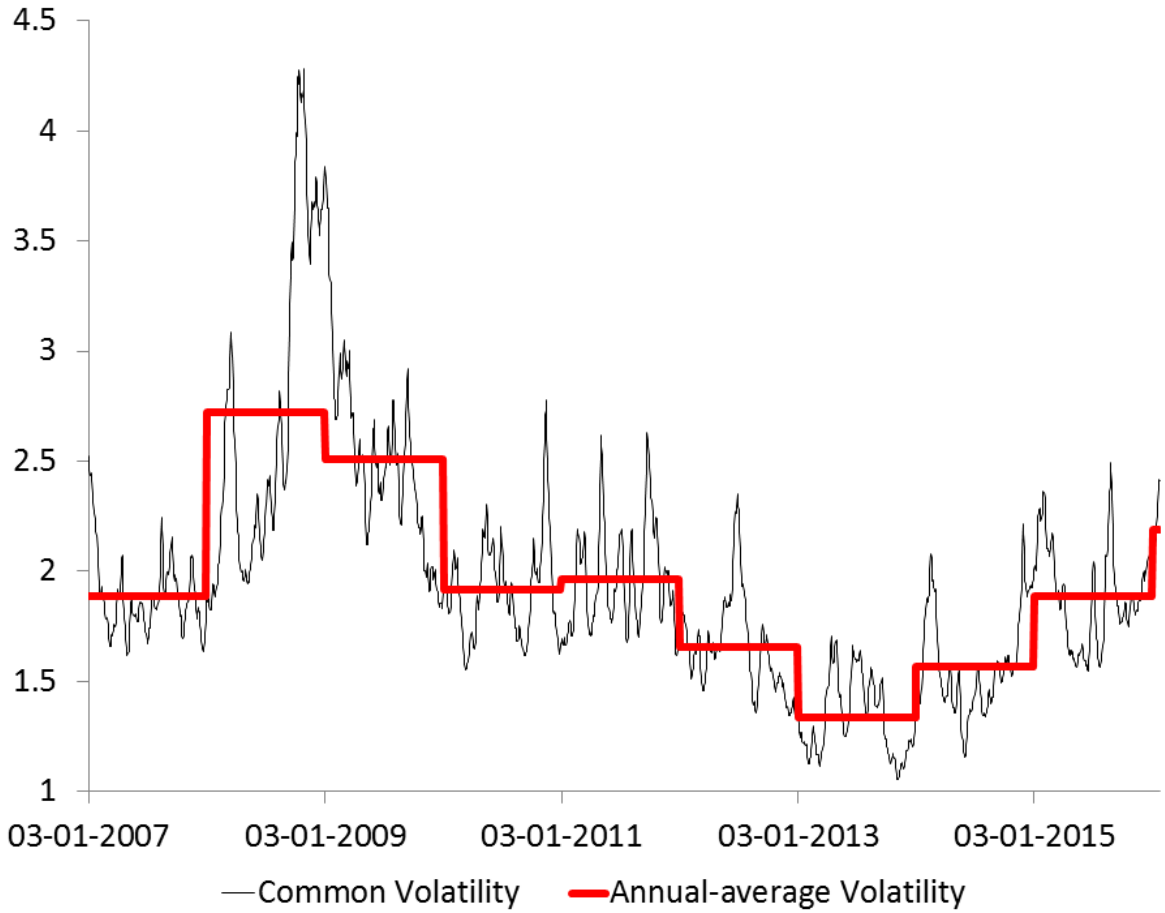
Remark II: Degree of Commodity Market Uncertainty

- **Level** of common volatility in commodities experiences significant changes over time (uncertainty shocks)



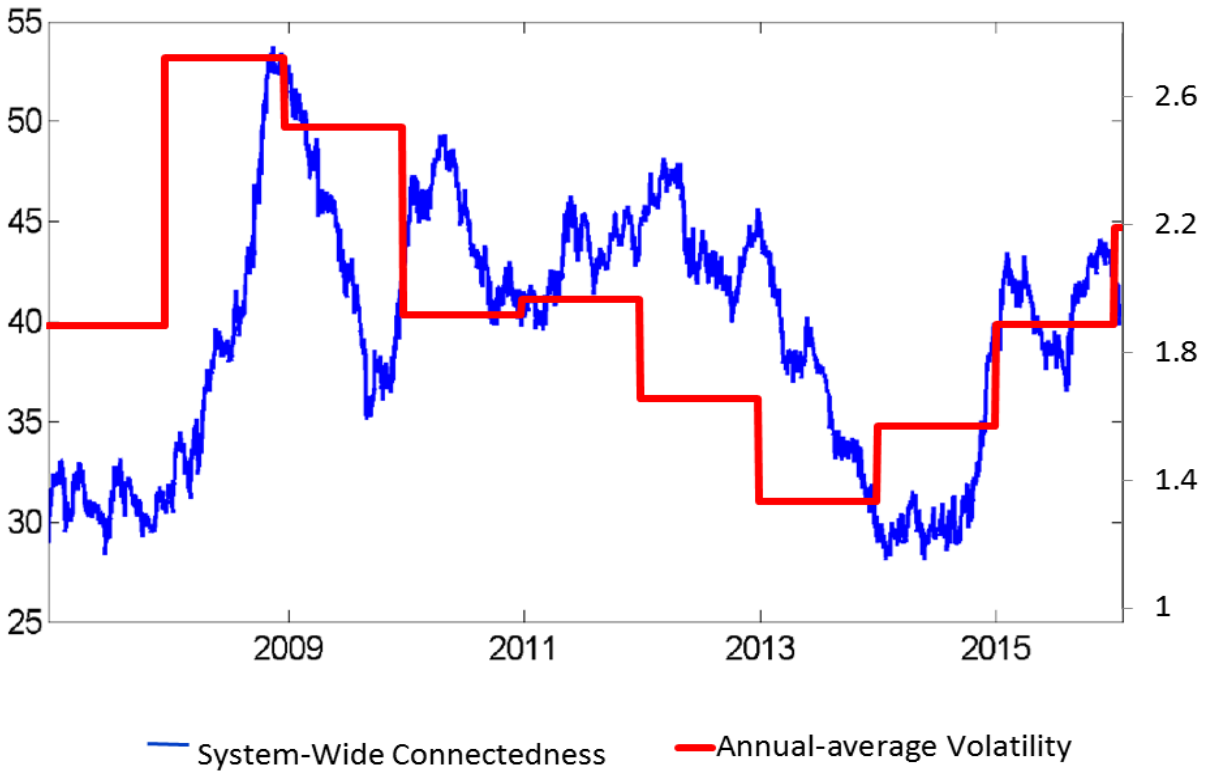
Remark II: Degree of Commodity Market Uncertainty

- Underlying (common) has experienced a persistent declining pattern since the Great Recession



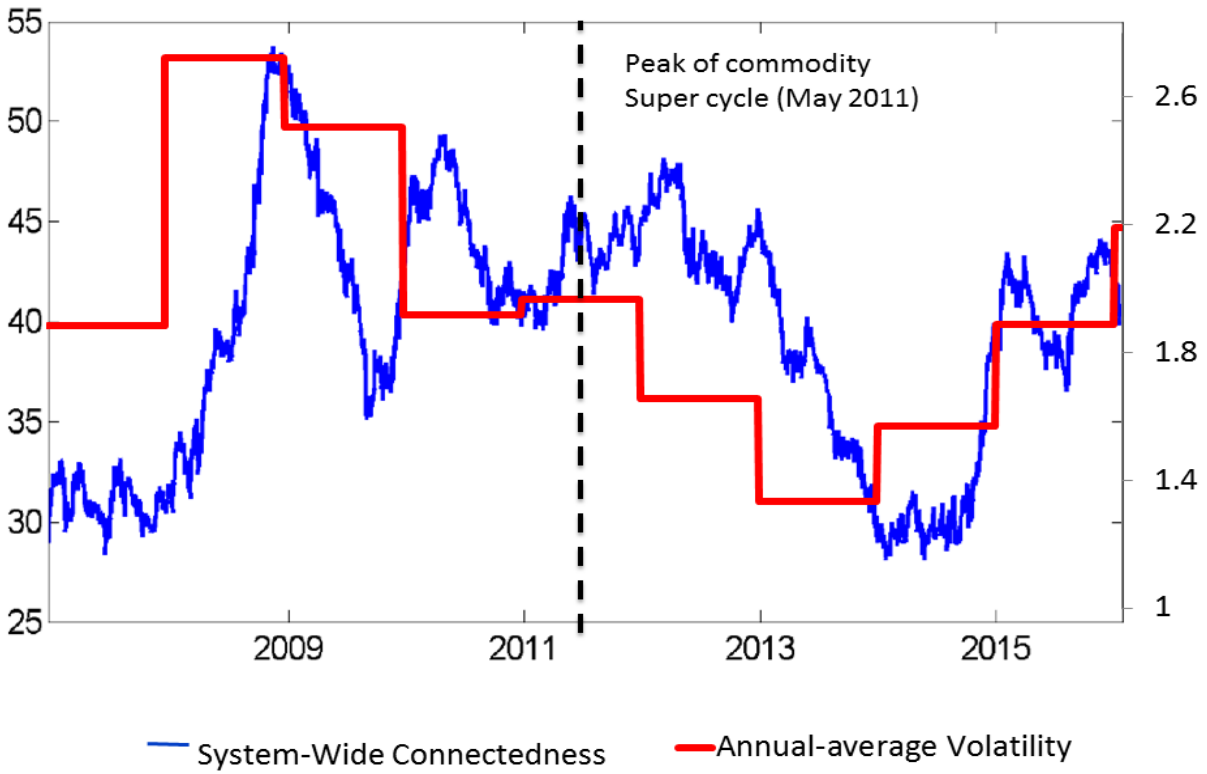
Remark II: Degree of Commodity Market Uncertainty

- The level of common volatility seems to lead the level of connectedness



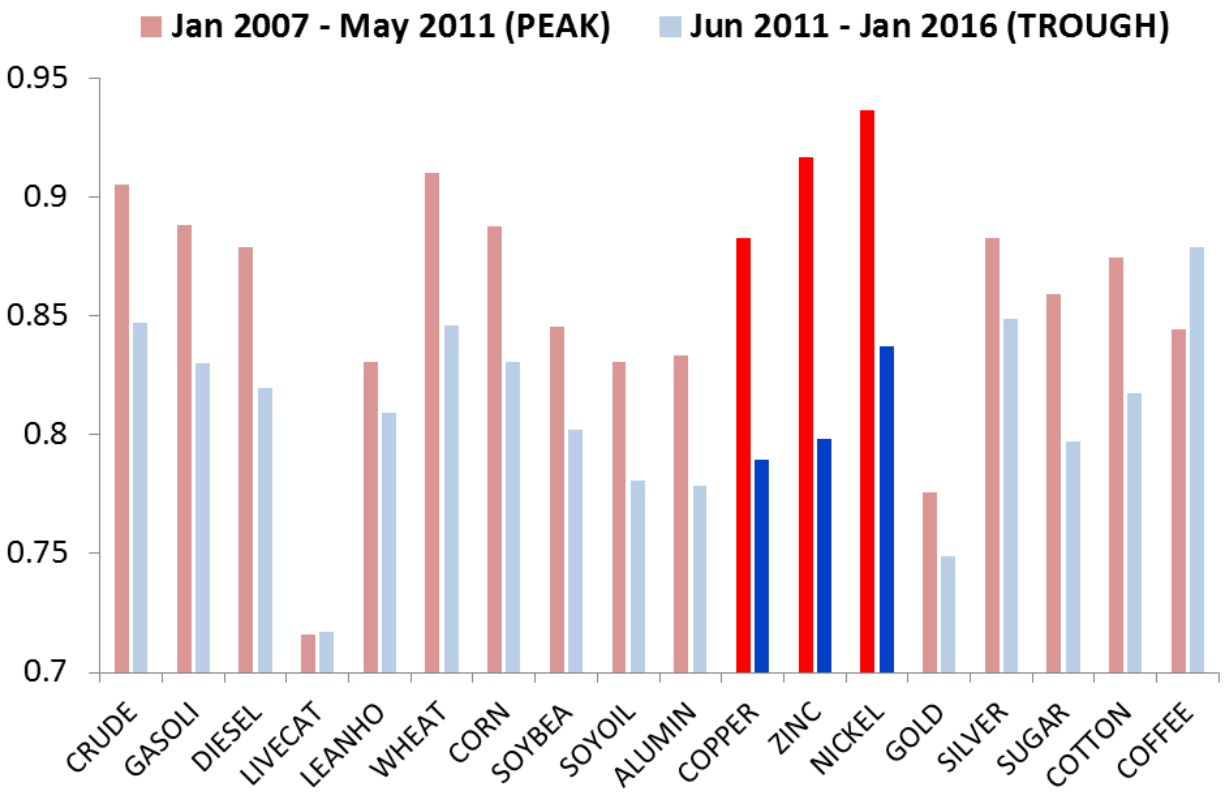
Remark III: Commodity Super-Cycle

- What is the mechanism behind the change of phase in the commodity super-cycle?



Remark III: Commodity Super-Cycle

- Copper, Zinc and Nickel seem to be the main source of the decrease in volatility



Remark III: Commodity Super-Cycle

Table 2: Full-Sample Connectedness Table, Six-Group Aggregation

	Energy	Grains	Ind. Metals	Prec. Metals	Softs	Livestock	From
Energy	0.00	17.11	21.59	16.49	6.01	5.43	66.63
Grains	23.05	0.00	7.23	10.57	18.06	7.02	65.93
Ind. Metals	30.67	8.35	0.00	22.88	2.94	3.05	67.88
Prec. Metals	20.78	9.38	20.28	0.00	3.26	1.11	54.80
Softs	8.33	22.88	4.75	5.67	0.00	3.63	45.25
Livestock	13.48	10.39	6.09	3.09	4.22	0.00	37.26
To	96.30	68.10	59.94	58.70	34.48	20.23	56.29

1. Decrease in underlying (common) volatility
2. Mainly due to industrial metals
3. Energy sector mainly influence industrial metals

- Possible mechanism?
  - Shocks in Energy $\Rightarrow$ volatility in industrial metals $\Rightarrow$ underlying (common) volatility $\Rightarrow$ system-wide connectedness.

Overall

- Very interesting paper!
- Significant contribution to the understanding of the interaction of commodities
- Very relevant topic for policy makers, especially, in emerging markets
- It deals with a highly complex issue in a general, straightforward and intuitive way