



Commodity Price Co-movements: what do they tell us?

by

Valeria Rolli

Servizio Studi e Relazioni Internazionali Banca d'Italia

“Food Price Volatility and the Role of Speculation”

FAO Headquarters, 6 July 2012

Outline

- ***Commodity prices and speculation: a link hard to capture***
- ***What has been achieved by the G20 process***
- ***Commodity market financialization: no comprehensive statistics***
- ***Co-movements between commodities: what do they tell us?***

Commodity prices and speculation: a link hard to capture

In theory, financial investments could have both positive (adding depth and liquidity) and negative (destabilizing) effects on commodity markets (due to market imperfections such as asymmetric information, herding behaviour and multiple believes)

In practice, however, the influence of “speculation” is very hard to detect from the empirical point of view (no wonder academic research is quite inconclusive)

Report of the G20 Study Group on Commodities (under the chairmanship of Mr. Nakaso)
[Executive Summary, p. 6]:

“Assessments of the impact of financial investors on commodity prices remain inconclusive. Large changes in physical supply and demand provide plausible explanations for commodity price trends over the past several years and existing literature finds limited signs of investors causing sustained deviations from —fundamentals. At the same time there are views that greater investor participation has at times affected commodity price volatility and correlations between commodity and stock markets.”

Commodity prices and speculation: a link hard to capture

Why the empirical link is so difficult to analyze?

- No complete coverage of speculative positions; when available, data are typically of too low frequency or not detailed enough (do not allow to distinguish investors' motives)
- Data on commodity market fundamentals also incomplete (the unexplained residual, not due to fundamentals, results very high). Problems with poor data on current fundamentals (supply and inventories) and also with data capturing expected future market developments (“news”)
- Impossibility to detect precisely the (causal) direction of the relation between speculative investments and commodity prices (do speculators move prices or do they react to price movements?)
- Even when commodity price drivers are correctly identified, the channels of transmission are hard to distinguish. Example: A change in financial conditions (due to an exogenous monetary policy move) tends to affect commodity prices through multiple channels (changes in expected aggregate demand and inflation, in addition to higher speculative hoarding demand).

What has been achieved by the G20 co-operative process?

G20 Agricultural Ministers "Action Plan on Food Price Volatility and Agriculture" (June 2011)

Launch of the Agricultural Market Information System (AMIS), aiming to provide global monthly data on production and stocks for wheat, corn, rice and soybeans.

G20 Finance Ministers and Central Bank Governors Meeting (Washington, April 2011)

Call for enhanced transparency in both cash and derivatives markets (including Over-The-Counter derivatives), as recommended by IOSCO

Call for stronger regulation and supervision on derivatives markets to address market abuses and manipulation (including through position management powers)

What has been achieved by the G20 co-operative process?

Open issues:

- Counterproductive national policy intervention on agricultural markets (import trade barriers, temporary export restraints, bio-fuel mandatory requirements) recognized but not yet adequately addressed
- Large consensus on improving market transparency (soft regulation) in derivatives markets (especially over-the-counter) but direct intervention by regulators is more controversial
- Regulation pertains to the micro domain, it may not prevent cyclical aggregate financial inflows into commodity markets
- Changes in global liquidity and risk premia affect commodity markets via multiple channels (expected aggregate inflation and demand, possibly financial inflows). A wider approach is needed, encompassing better macroeconomic management (governance of global liquidity, international coordination of monetary and exchange rate policies).

Financialization in commodity markets: no comprehensive statistics

Measures based on weight of financial investments

BIS quarterly data on:

- a) number of commodity derivatives contracts on organized exchanges: substantial increase since early 2000
- b) notional amounts outstanding on over-the-counter (OTC) markets (reflecting both price and volume changes): collapse during 2008 crisis and quite subdued afterwards

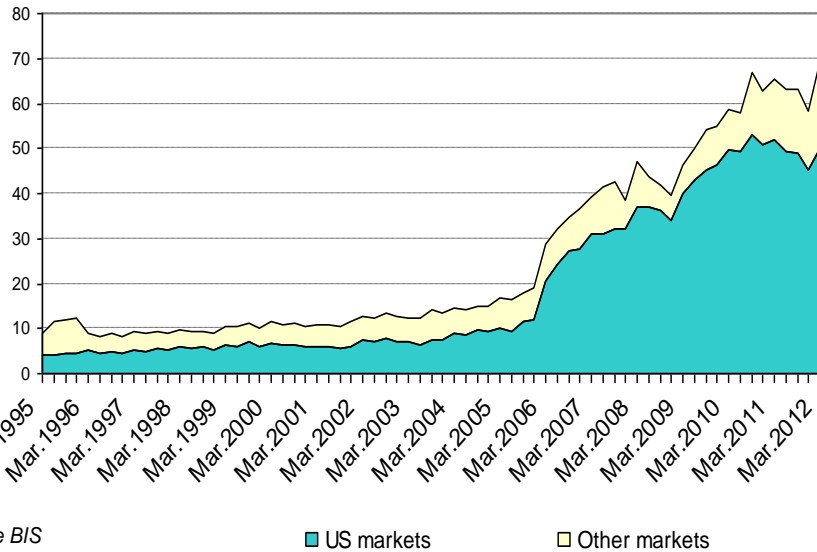
US CFTC (Commodity Futures Trading Commission) weekly positions in regulated derivatives markets by type of investors: peak of pure financial activity (relatively high for oil) in the second half of 2008, collapse during the crisis (especially for oil), subsequent gradual recovery (assessment by the “T index”)

Assets under management by financial institutions provided monthly by Barclays Capital: rapid recovery since mid-2010 (figures are however inflated by ETP in precious metals) reflecting strong development of new instruments (exchange-traded products and medium term notes) while investments in commodity indices have slowed down

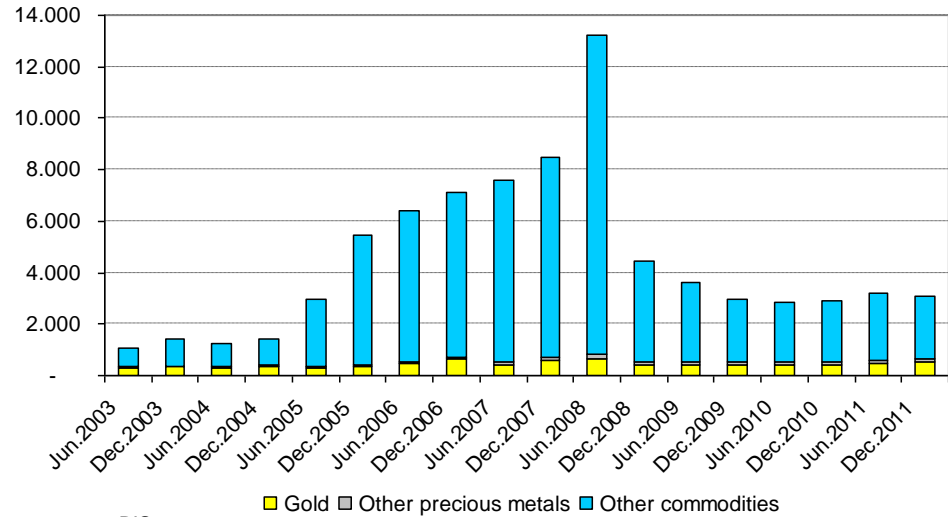
Taken together, these sources confirm the increasing relevance of financial investments since early 2000, due to the combined effects of deregulation and financial innovation; new operators and instruments have emerged.

BIS quarterly data on global commodity derivatives markets

Futures and options contracts outstanding on commodity exchanges
(number of contracts in millions)



OTC- notional amounts outstanding
(billions of US dollars)

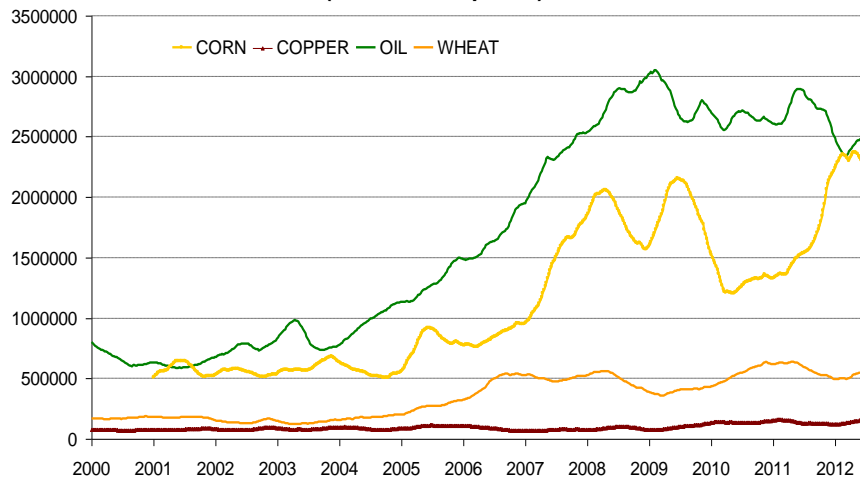


source: BIS

■ Gold ■ Other precious metals ■ Other commodities

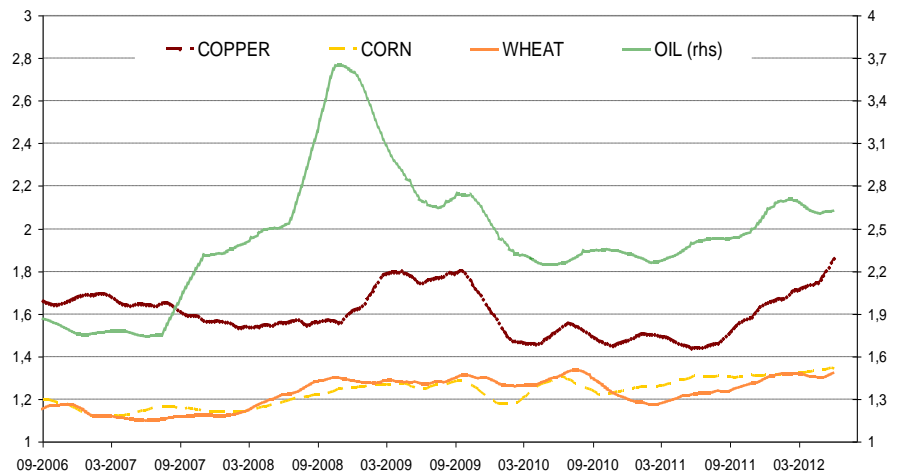
US CFTC weekly positions in regulated derivatives markets, Total and by Investors

Open Interest Positions in Commodity Derivatives (futures and options) ⁽¹⁾



Source: CFTC, Commitment of Traders.
 (1) Total number of outstanding contracts.

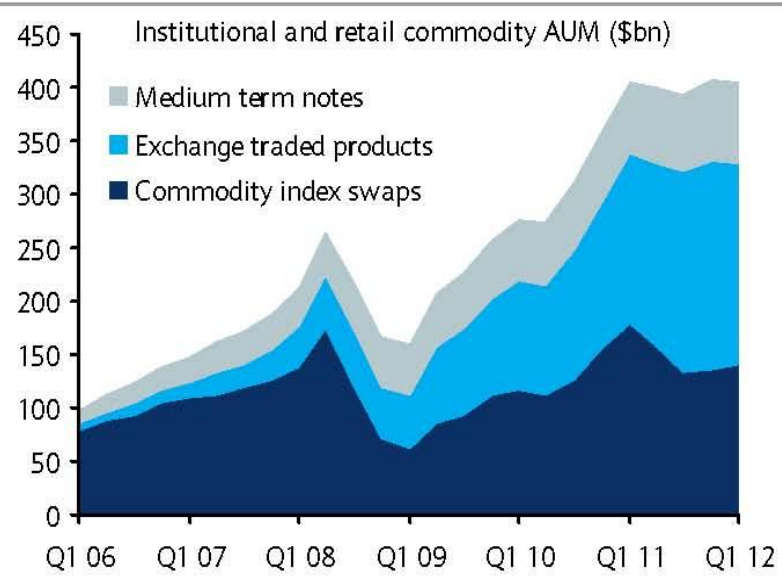
**"T-Index" of the degree of financialization (1)
 (weekly data, 1 month moving average)**



Source :CFTC, Commitment of Traders.
 (1)Number of contracts in which both counterparts are non commercials operators over the total number of contracts held by commercials.

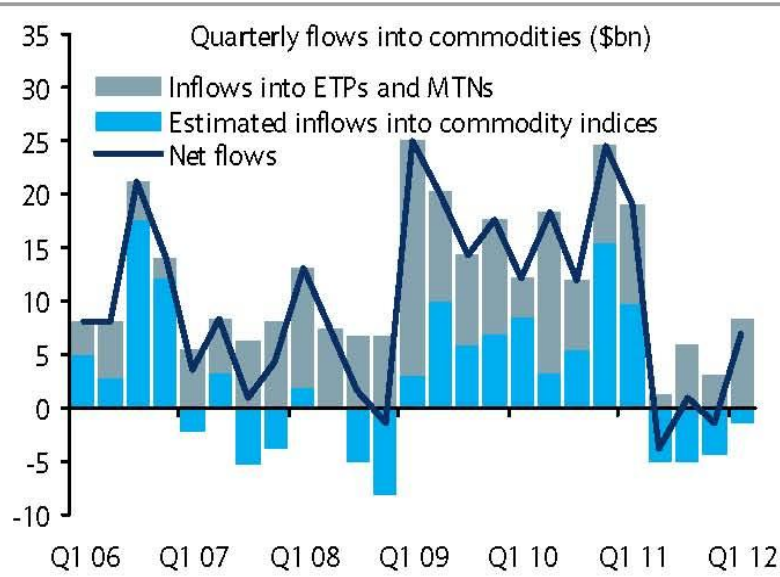
Barclays Capital estimates of assets under management by financial institutions

Total commodity assets under management



Source: Bloomberg, MTN-i, ETP issuer data, Barclays Research

Total commodity investment inflows



Source: Bloomberg, MTN-i, ETP issuer data, Barclays Research

Financialization in commodity markets: no comprehensive statistics

Measures based on price correlations across different commodities, and between commodities and other financial assets

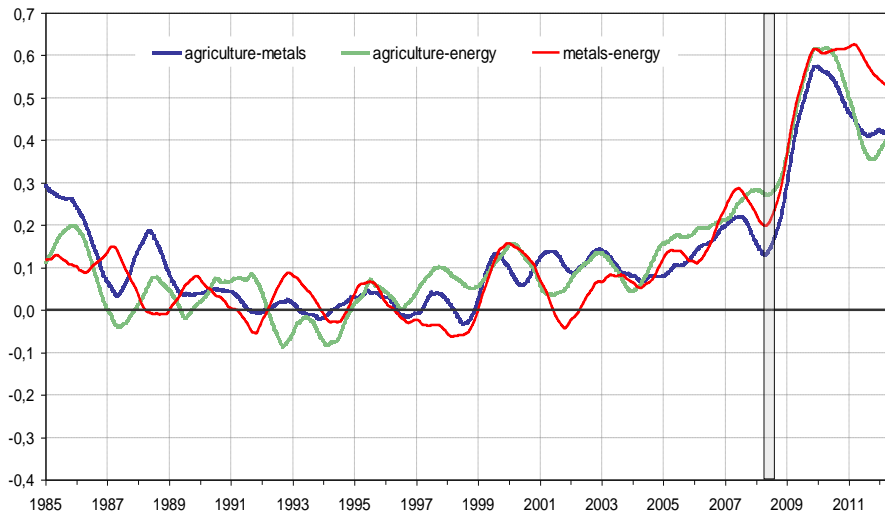
- Correlations (co-movements) between different commodities and commodity indexes have increased in importance, with a structural jump since March 2008
- Commodity and US equity indexes have also become positively correlated (2008 break however not significant, due to a volatile relation across the whole period).

These trends have been taken as evidence of the influence of financial investments (and the diffusion of commodity indices which bundle together single products).

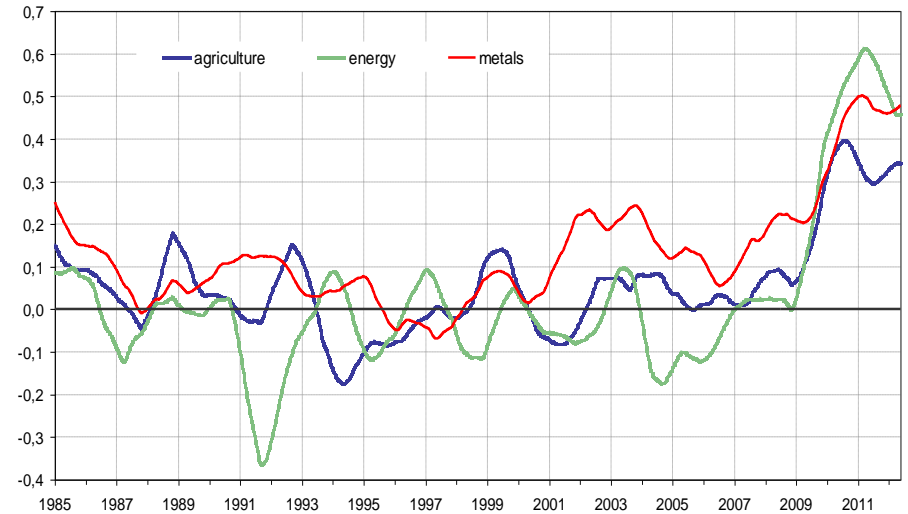
Instead, we look at a different explanation, based on the influence of an underlying common factor (a common shock) affecting both equity prices and commodity demand

Correlations between different commodity indexes and between commodities and other financial assets

Pairwise correlations between main IMF commodity indices



Pairwise correlations between main commodity indices and the SP500



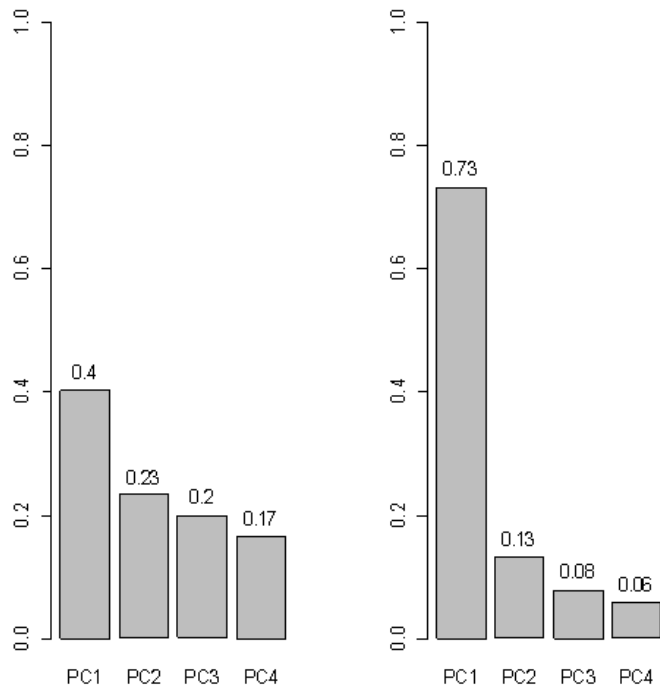
Source: Di Nino and Natoli, Bank of Italy.

Co-movements between commodity prices: what do they tell us?

- Colleagues at the Bank of Italy (joint work by Virginia Di Nino and Filippo Natoli) have taken the monthly yields of the main IMF Commodity Price Indices over Jan 00 – Feb 12 period and applied a principal component analysis. They have found that **the first component (so called “common factor”) explains about 40% of the total variance in the Jan 00 – Mar 08 period, and up to 70% of the total variance in the Apr 08 – Feb 12 period. This indicates that the common factor has become dominant in explaining developments since the 2008 crisis.**
- They have then investigated the reason behind the increased explanatory power by the common factor. Possibility n.1: the elasticity between the common factor and the original commodity indexes (technically speaking, the factor loading coefficients) has changed. Possibility n.2: the variability of the common factor has increased. **The latter possibility has been confirmed by the data. This indicates that a bigger common shock has occurred.**

Principal component analysis applied to the monthly yields of the main IMF commodity price indexes

Share of Total Variance explained by Principal Components



First Principal Component Loading Factor

	Jan 2000 - Mar 2008	Apr 2008 - Feb 2012
Food and beverages	0.43	0.49
Industrial agricultural	0.50	0.47
Metals	0.51	0.52
Oil	0.55	0.52

Source: Di Nino and Natoli, Bank of Italy.

Co-movements between commodity prices: what do they tell us?

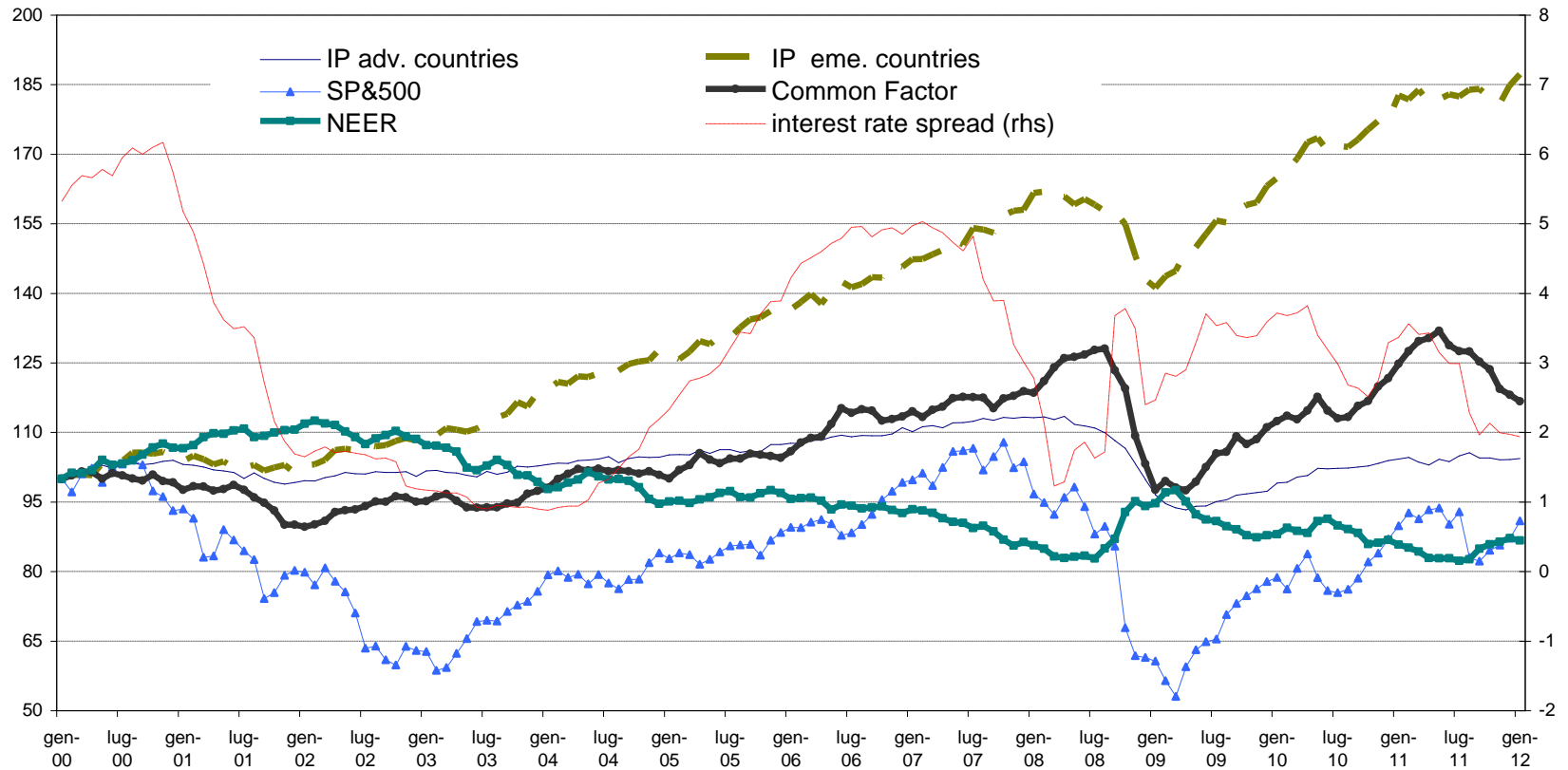
- Finally, they have tried to give some economic interpretation to the Common Factor, examining linkages with real and financial variables: world industrial production (proxy for global demand); nominal effective exchange rate of the US dollar; developments in the US equity index (S&P 500); 10 year—3 month spreads in US interest rates (proxy for monetary policy).
- **They have found that developments in EMEs' industrial production and the \$ nominal effective exchange rate are significant in explaining the movements in the Common Factor (while the other determinants are not significant)**

This indicates that:

- Global demand dynamics is significantly linked to commodity yields, with developments in EMEs' economic activity increasingly important.
- The (negative) influence of the dollar captures multiple (monetary, financial and real) channels: a weakening \$ may depend on looser US monetary policy; may increase commodity demand in countries with appreciating currencies (due to lower costs); may increase speculative demand for commodity assets by financial investors (hedging against financial and inflation risks associated with dollar depreciation).

Possible economic interpretation of the “Common Factor”

IMF Monthly Commodity Indexes Common Factor
and selected Real and Financial Variables
(2000 = 100)



Source: Di Nino and Natoli, Bank of Italy.

Thank you for your
attention