Commodity prices: Recent developments

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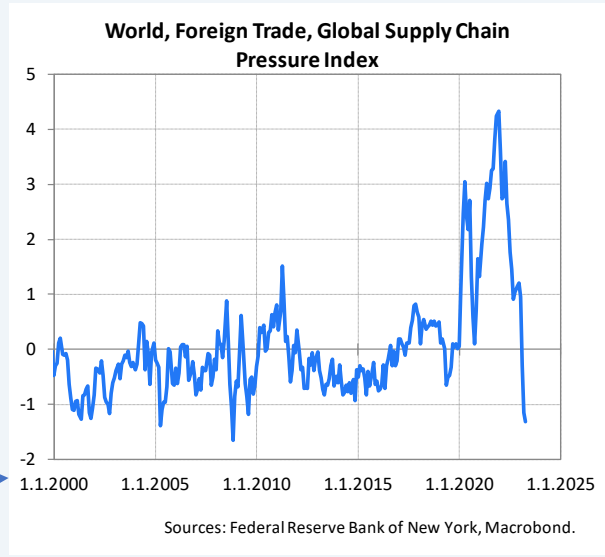
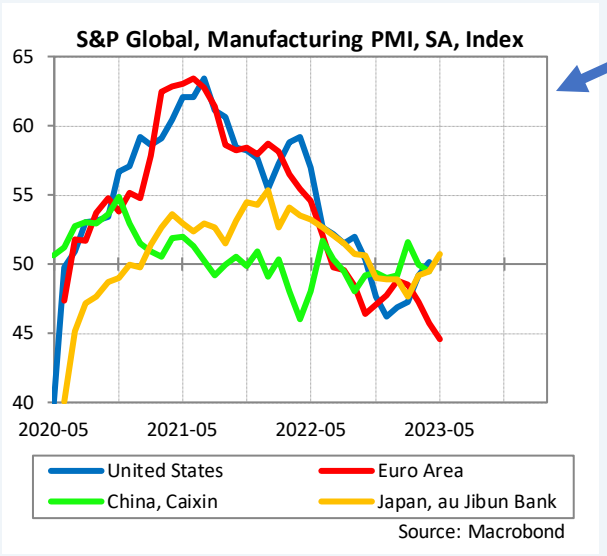
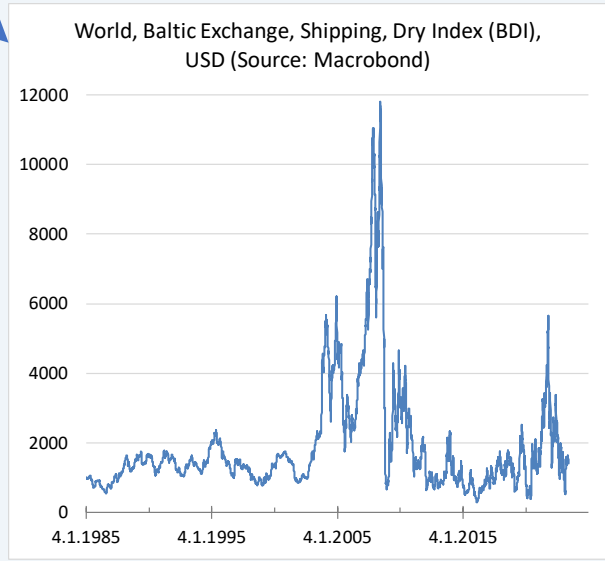
General

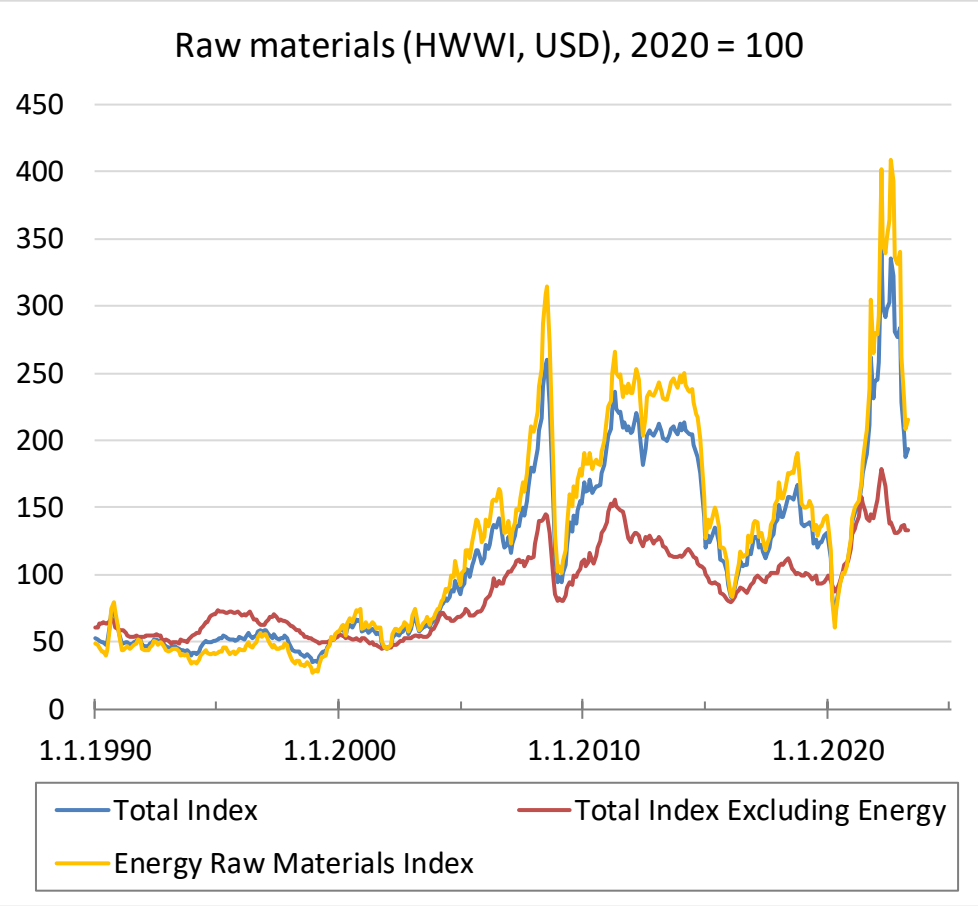
- I will discuss recent developments in metals and minerals, energy, and agricultural commodities.
- In recent years, commodity prices have been affected by the demand shocks and the bottlenecks the pandemic created, and the post-covid19 opening.
- Surge in many commodity prices following Russia's invasion of Ukraine last year.
- However, many prices have recently declined following:
  - an easing of supply chain problems,
  - weaker economic development and outlook (e.g., US diesel demand is down),
  - favourable winter weather, and
  - a global reallocation of commodity trade flows (e.g., European gas imports).
- China's post-Covid opening seems to have had a smaller-than-anticipated impact on the demand for commodities.
- Agricultural prices have also been helped by the Black Sea grain initiative, better harvests, and lower energy prices. Also, lower gas prices => lower fertiliser prices.

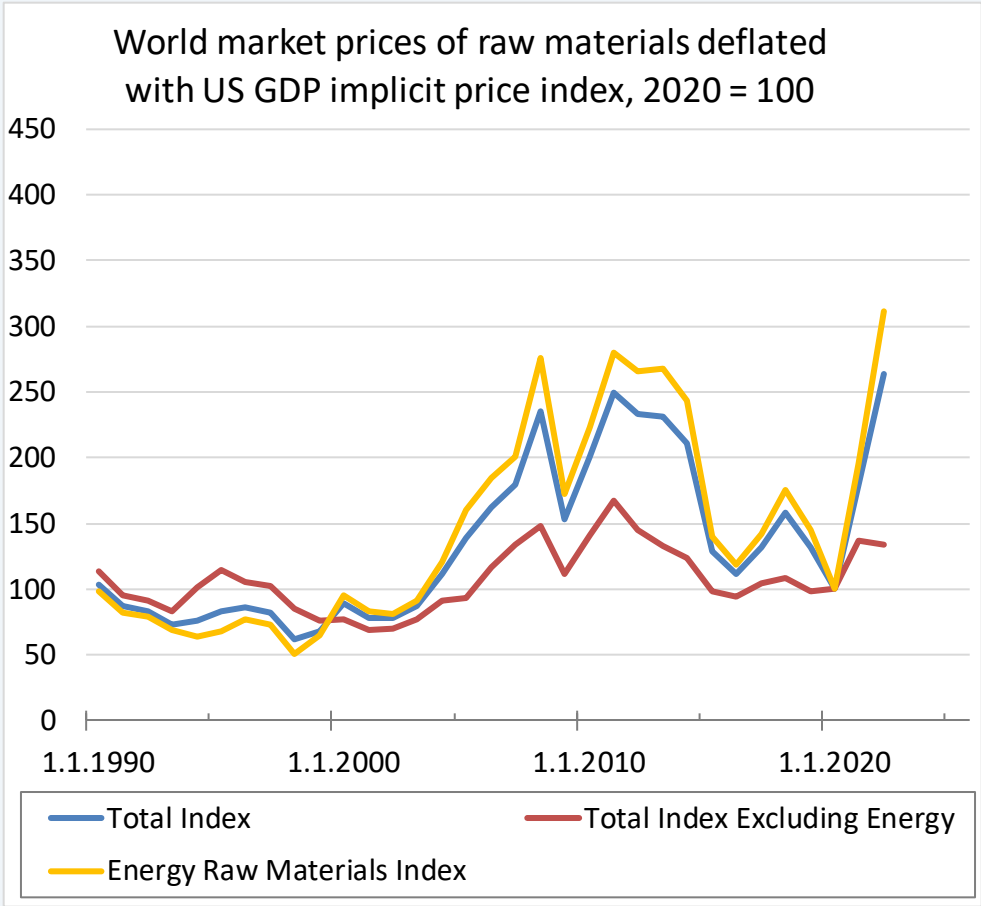




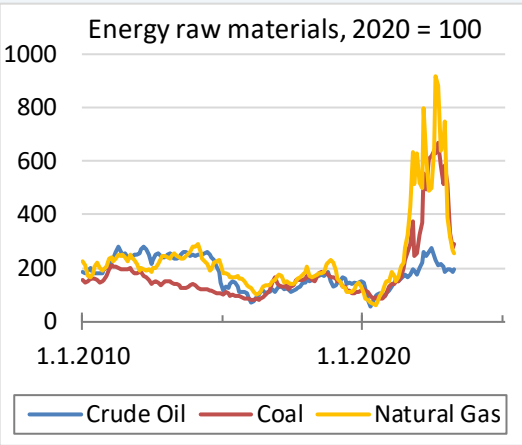


Nominal (monthly) and real (annual) raw material prices, USD



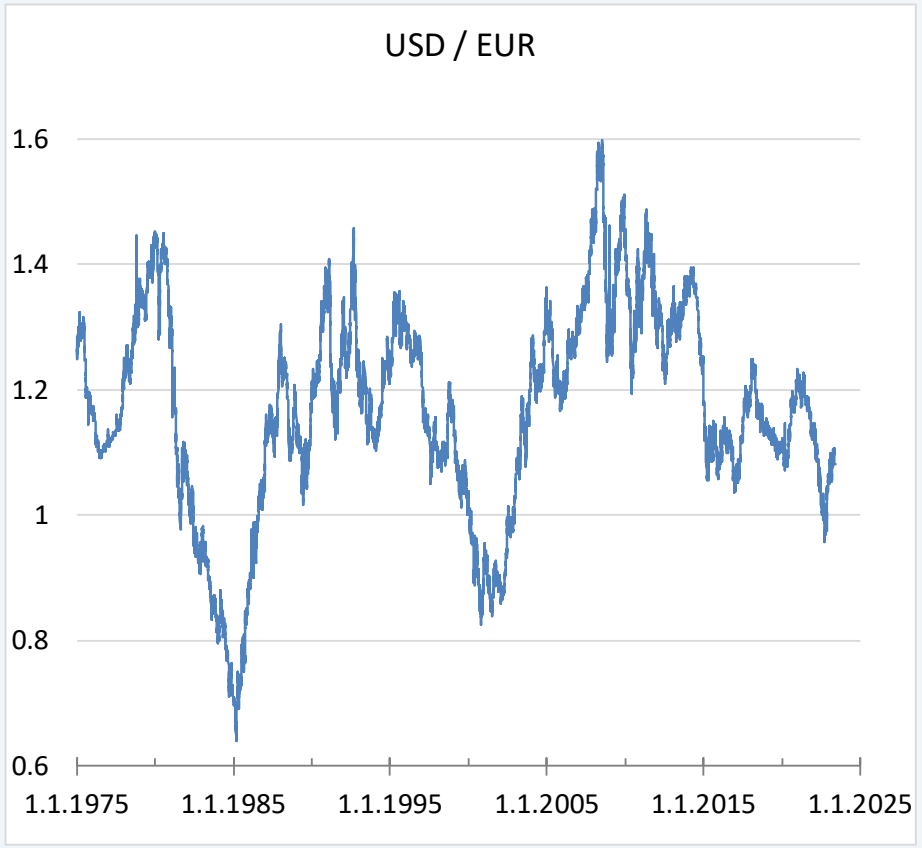


- Nominal prices reached record highs last year but have since then declined.
- Real prices were not that exceptional.
- Energy vs. the rest.



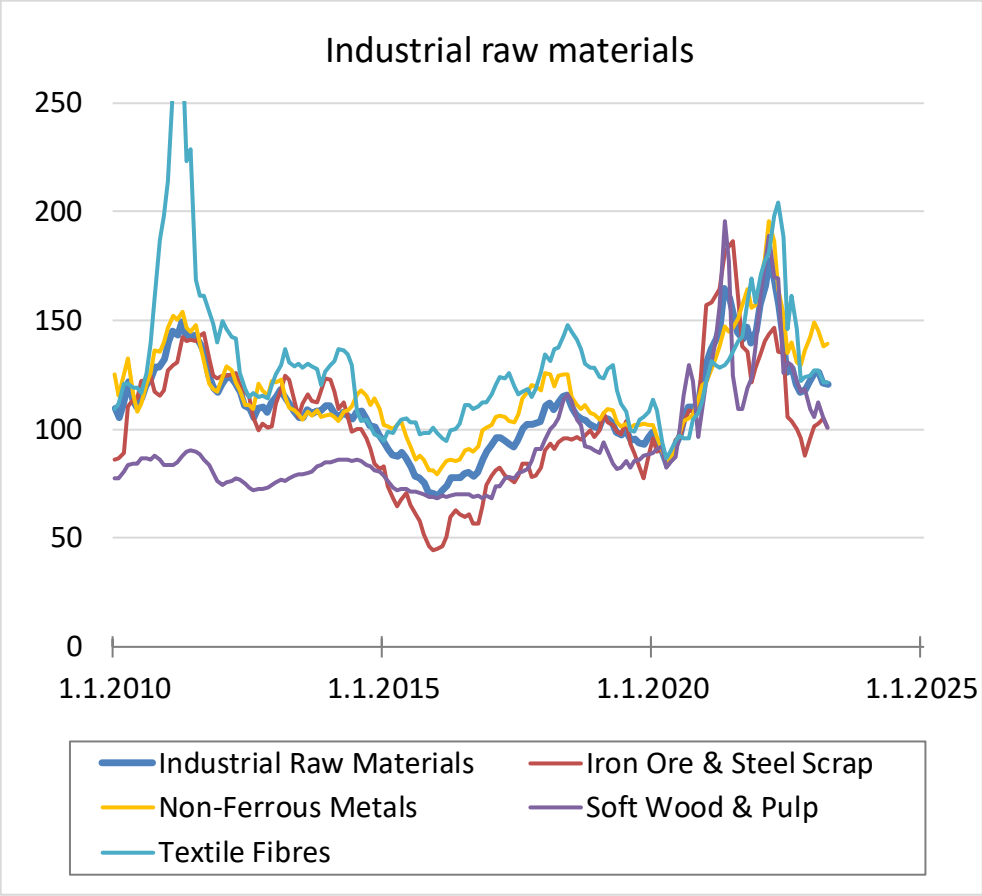
Sources: HWWI, BEA, Macrobond.

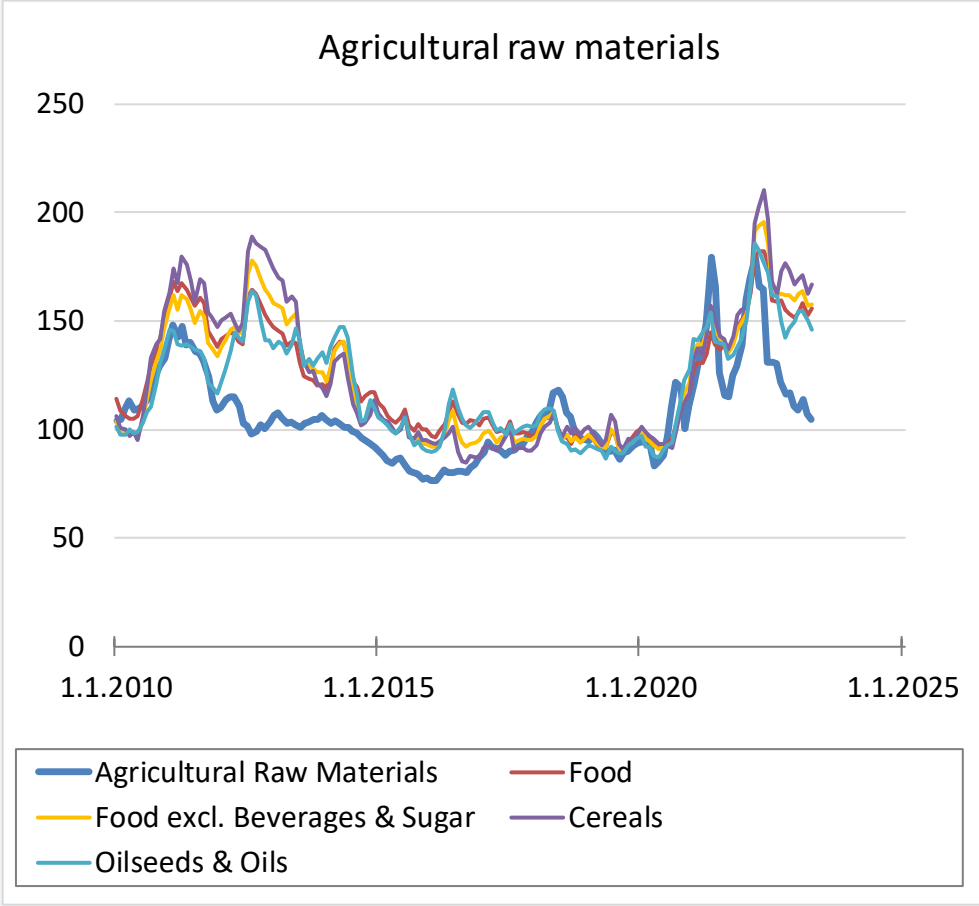
USD / EUR in the long and the short term



- USD strengthened up until late September.
- Average after 1.1.2000 is 1.20.

Industrial and agricultural raw materials (HWWI, USD), 2020 = 100

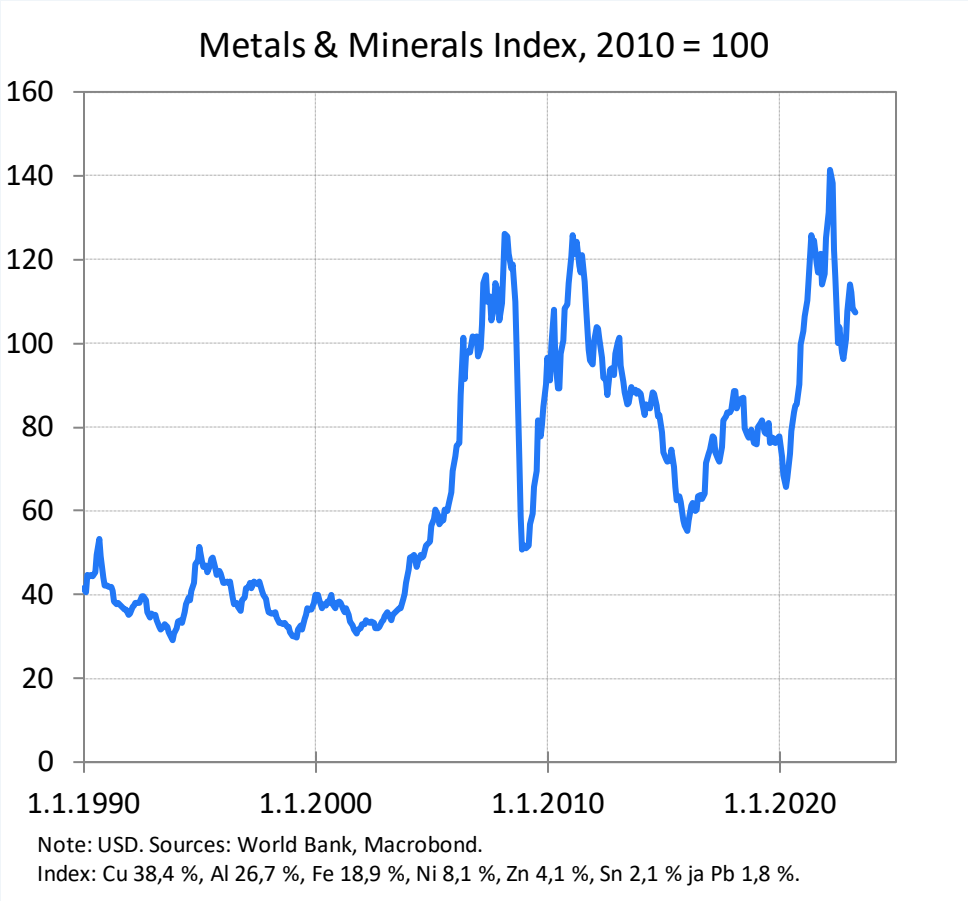




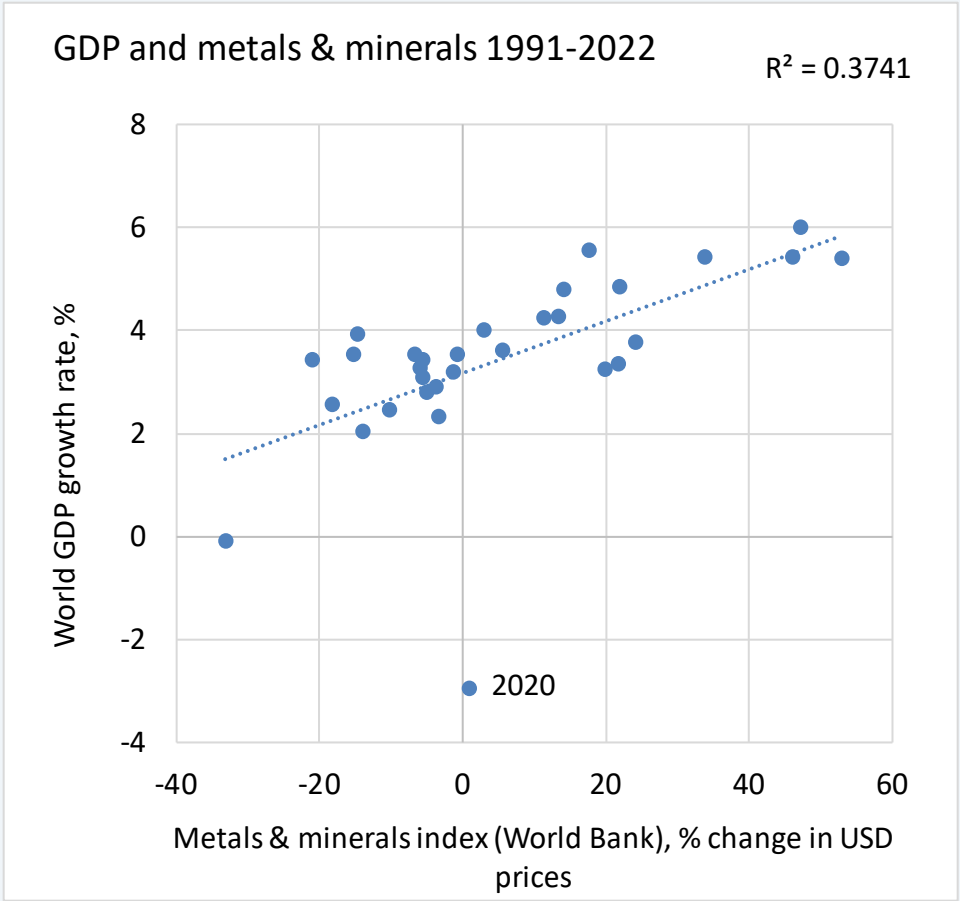
- Raw materials have come down from last year's peaks, but not quite to where they were before Russia's invasion of Ukraine.
- Agricultural raw materials (cotton, wool, hides, natural rubber, wood, wood pulp) have come down
- Food prices remain elevated.

Metals & minerals

Metal prices will recover with the global economy

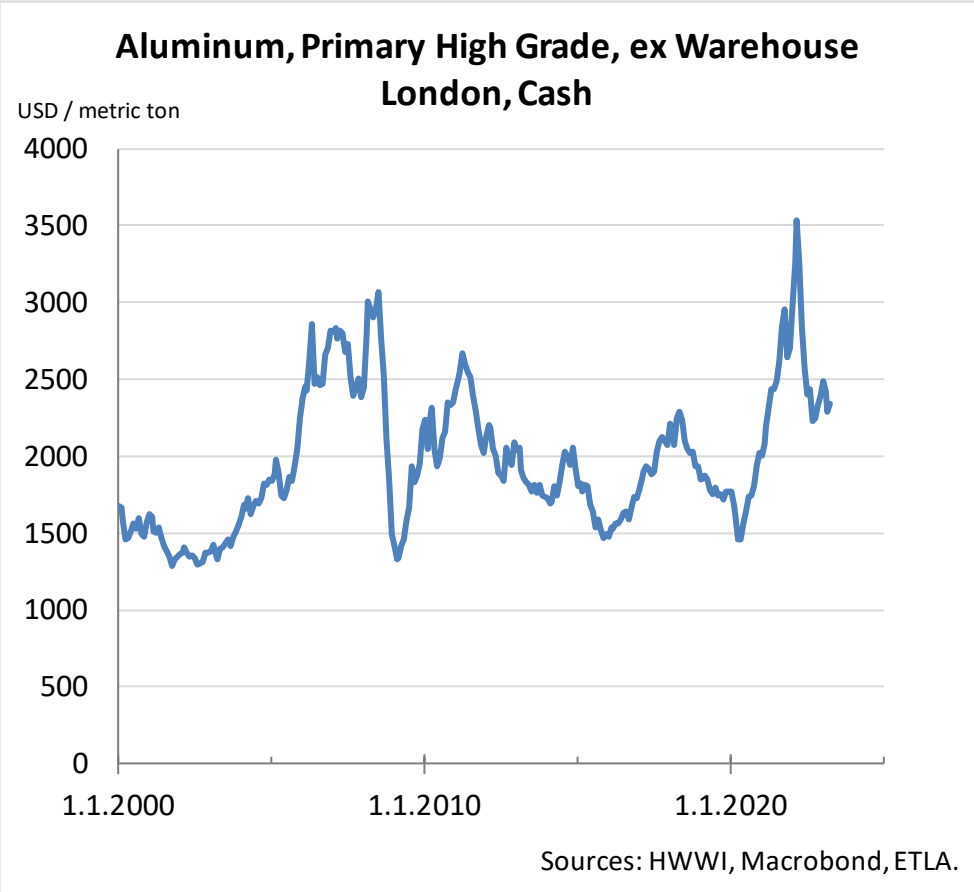


Note: USD. Sources: World Bank, Macrobond.
Index: Cu 38,4 %, Al 26,7 %, Fe 18,9 %, Ni 8,1 %, Zn 4,1 %, Sn 2,1 % ja Pb 1,8 %.

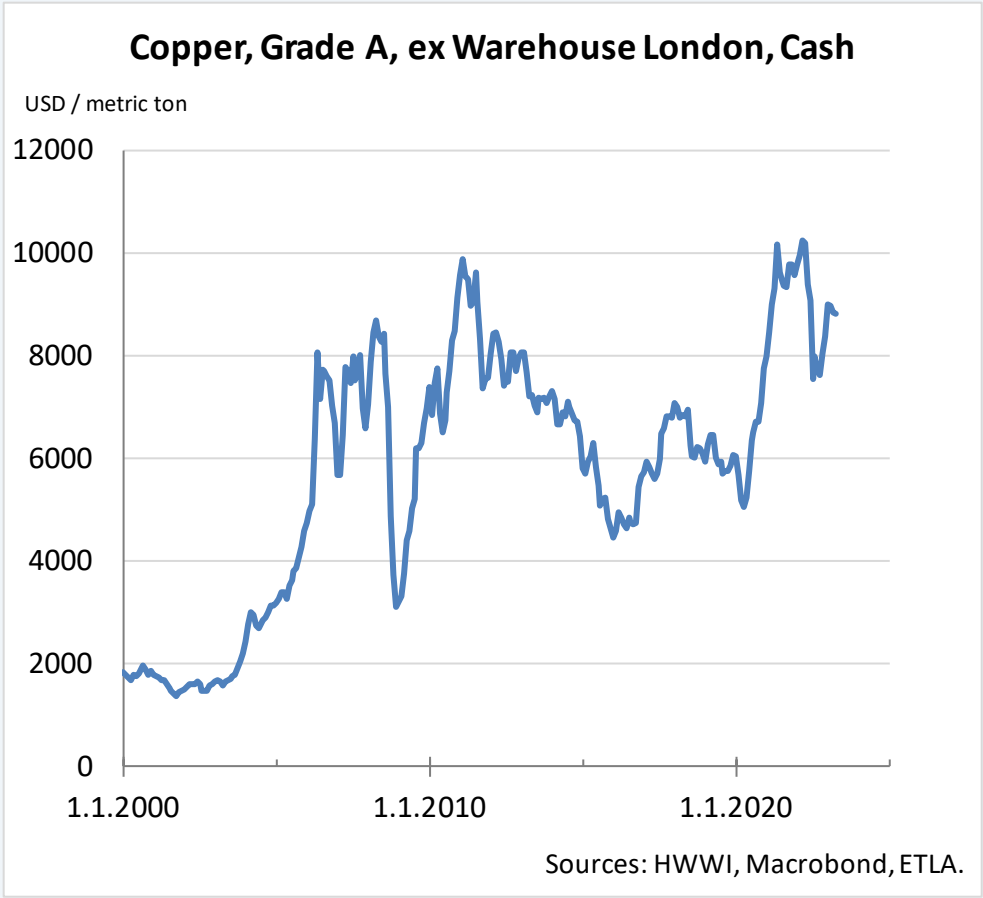


- World GDP growth explains metals & minerals development (w/o 2020 R2 is 0.66).
- R2 is lower if we use a longer historical period.
- How will (China's) construction investments and industry develop?
- China accounts for ~half of the demand for base metals.
- Supply growth: recovery from production outages and new copper, nickel, and zinc mines (World Bank).

Aluminium and copper



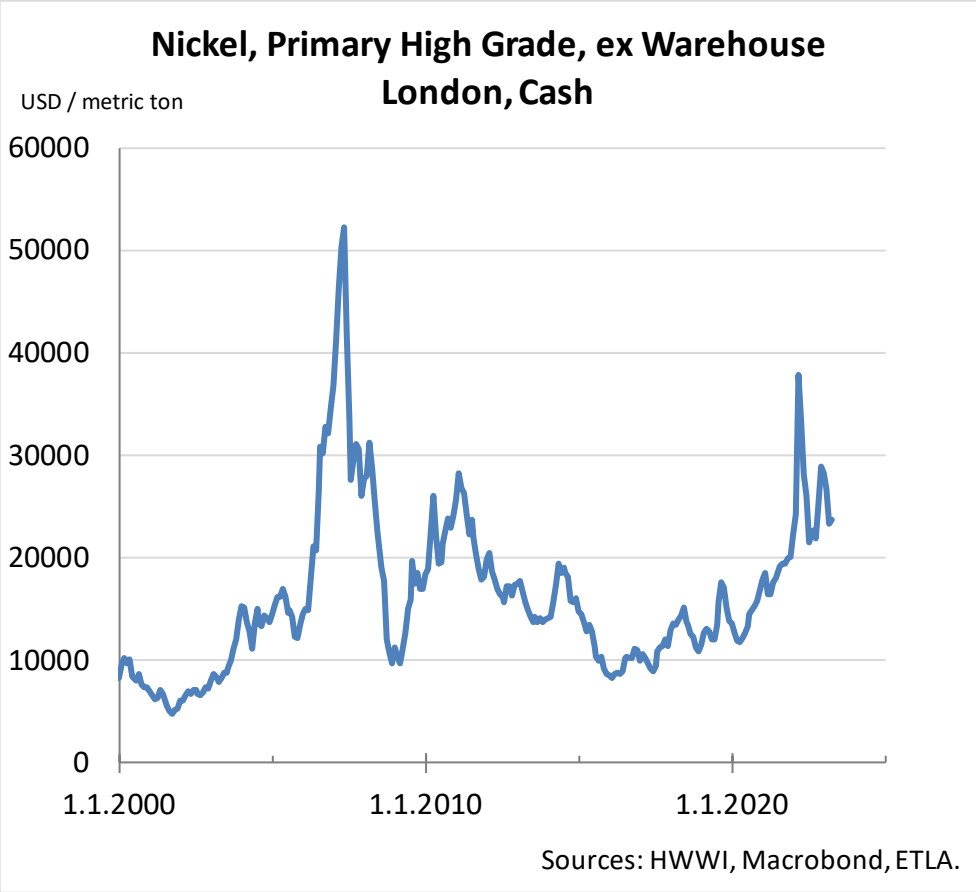
- From bauxite ore: Australia (28%), China (22%), Guinea (22%)
- Smelter production: China (58%), India, Russia, Canada, UAE.
- Users: China (57%)
- Used in transportation equipment, construction, packaging, electrical transmission lines, machinery, and consumer goods.



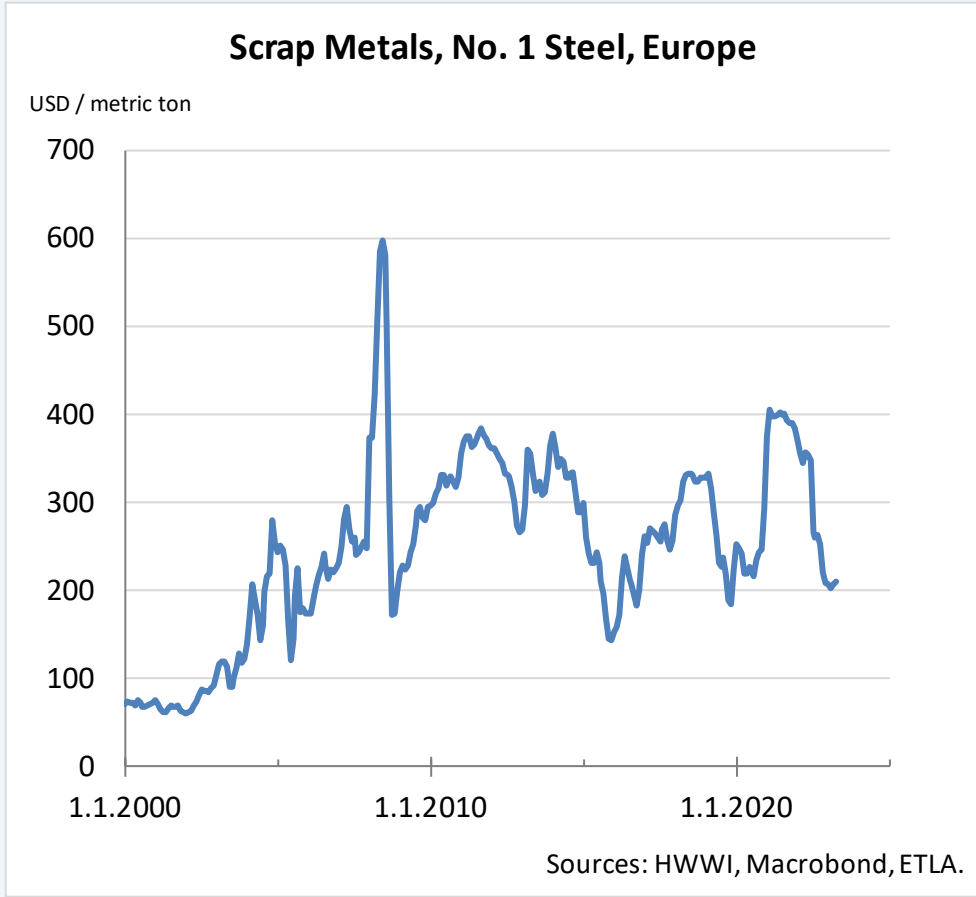
- Mined: Chile (24%), D.R. of Congo, Peru, China, USA.
- Refined: China (42%), Chile, D.R. of Congo, Japan, USA
- Users: China (57%)
- Used in construction, power grids, heavy engineering, transportation equipment, and home appliances.

- Metal prices have recovered somewhat since China dismantled its strict covid19 restrictions.
- But it now seems that China's industrial and construction recovery is weaker than anticipated.
- Also, a worry about the US economy.
- Many metals benefit from green transition (aluminium, copper, nickel, and tin).
- Political unrest in Peru early 2023, impact on copper prices.

Nickel, and iron and steel

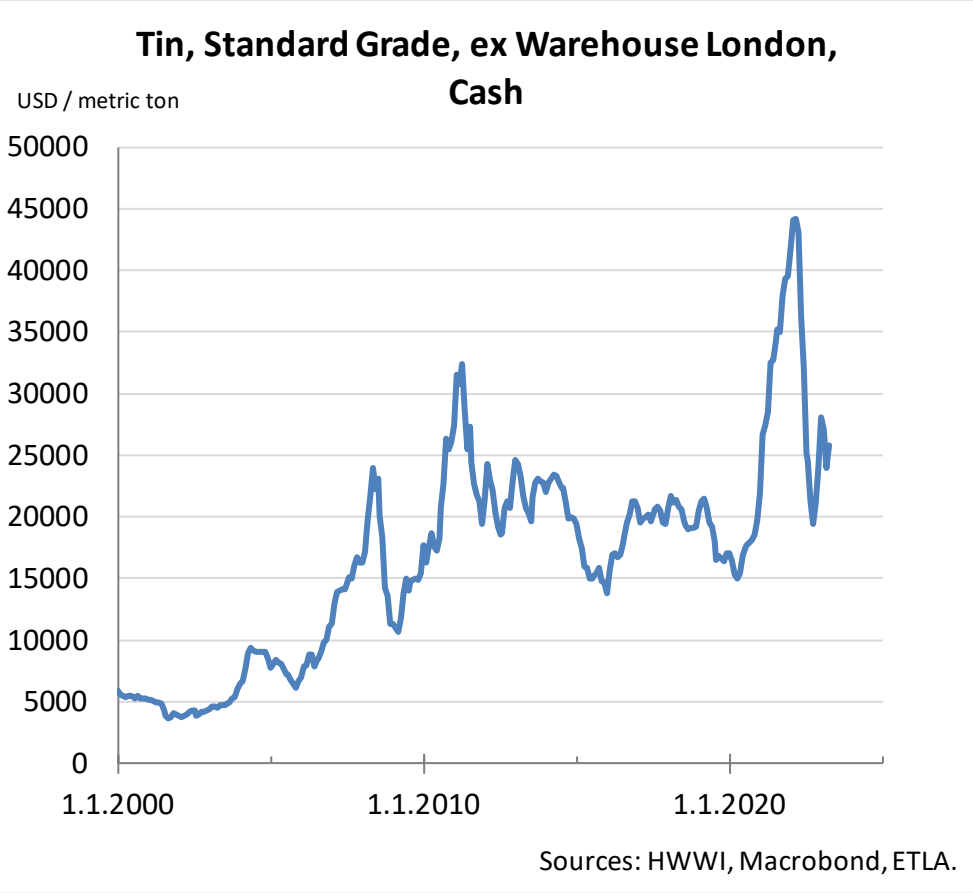


- Mined: Indonesia (48%), Philippines, Russia, New Caledonia
- Users: China (60%)
- Used in stainless steel (68%), superalloys & non-ferrous alloys (aerospace industry, wind turbines), rechargeable batteries.

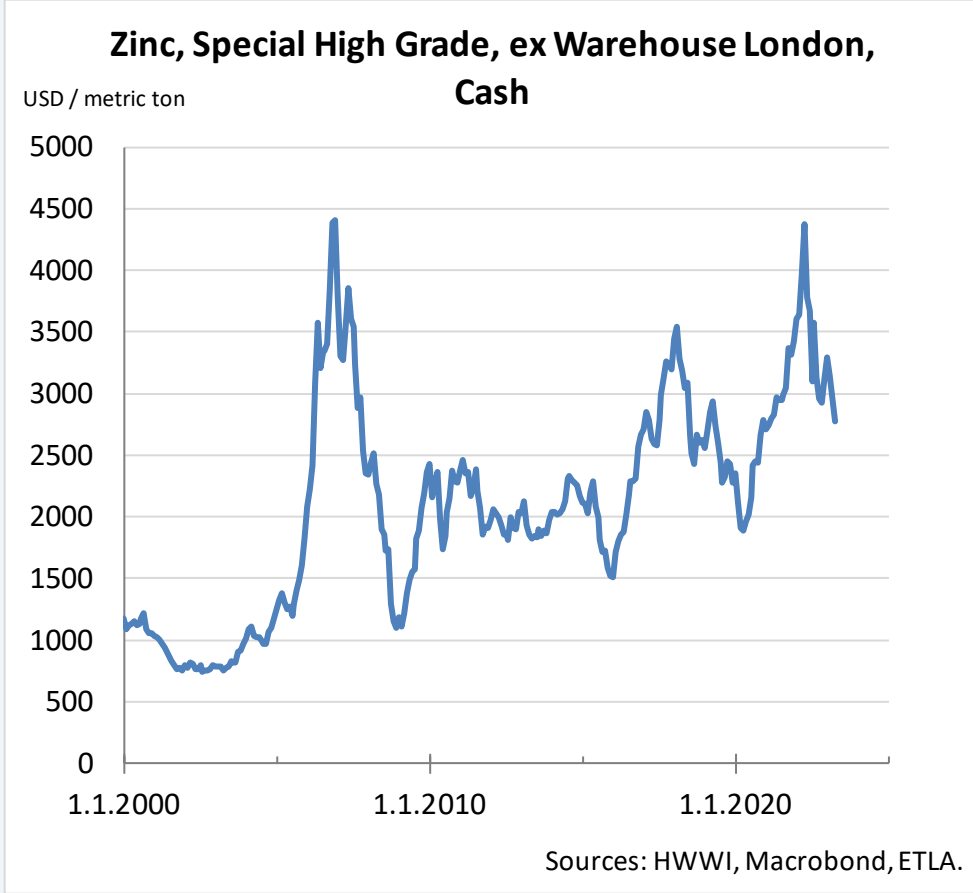


- Iron ore mined: Australia (34%), Brazil, China, India.
- Pig iron (crude iron) production: China (64%), Japan.
- Steel production: China (52%), India, Japan, USA.
- Users: China (52%)
- Used in housing, transportation, industrial, automobile, infrastructure and utilities.

Tin and zinc



- Mined: China (31%), Indonesia (24%), Burma, Peru, Bolivia.
- Users: China (47%)
- Used as a protective coating or an alloy with other metals; semiconductors, electronics, e.g., electric vehicles, solar panels, batteries



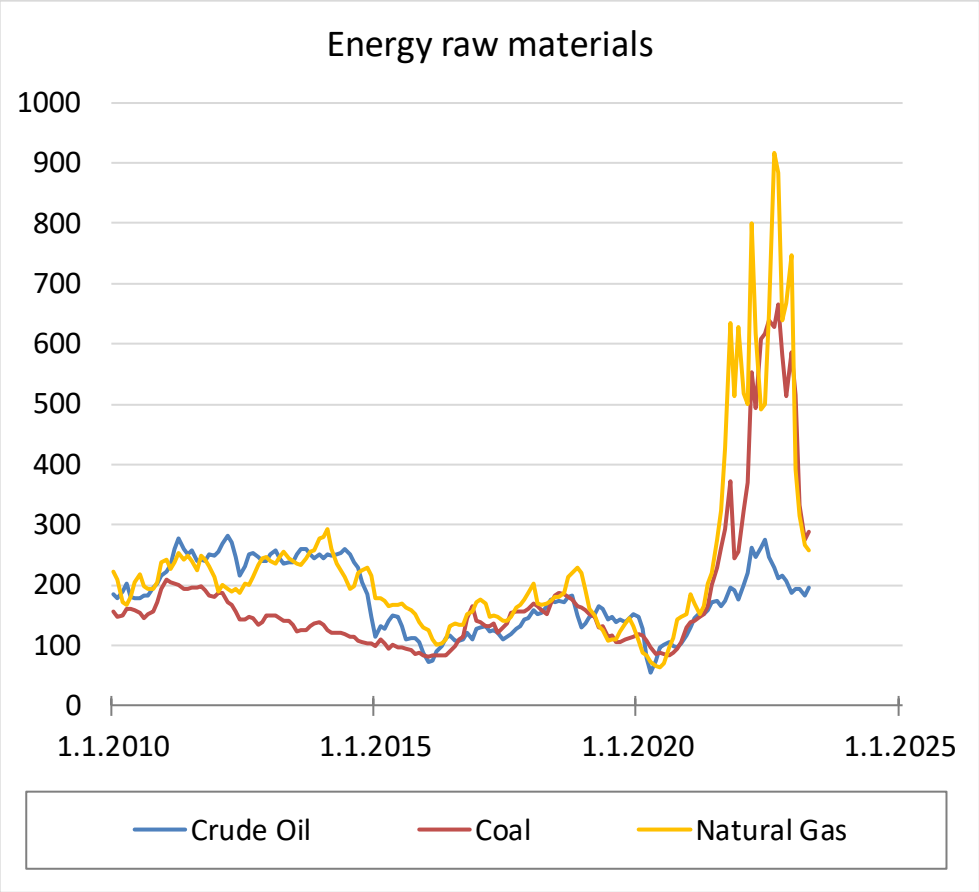
- Mined: China (32%), Peru, Australia, India, Mexico
- Used for galvanizing iron and steel (60%), die-casting alloys (15%), brass and casting (14%)

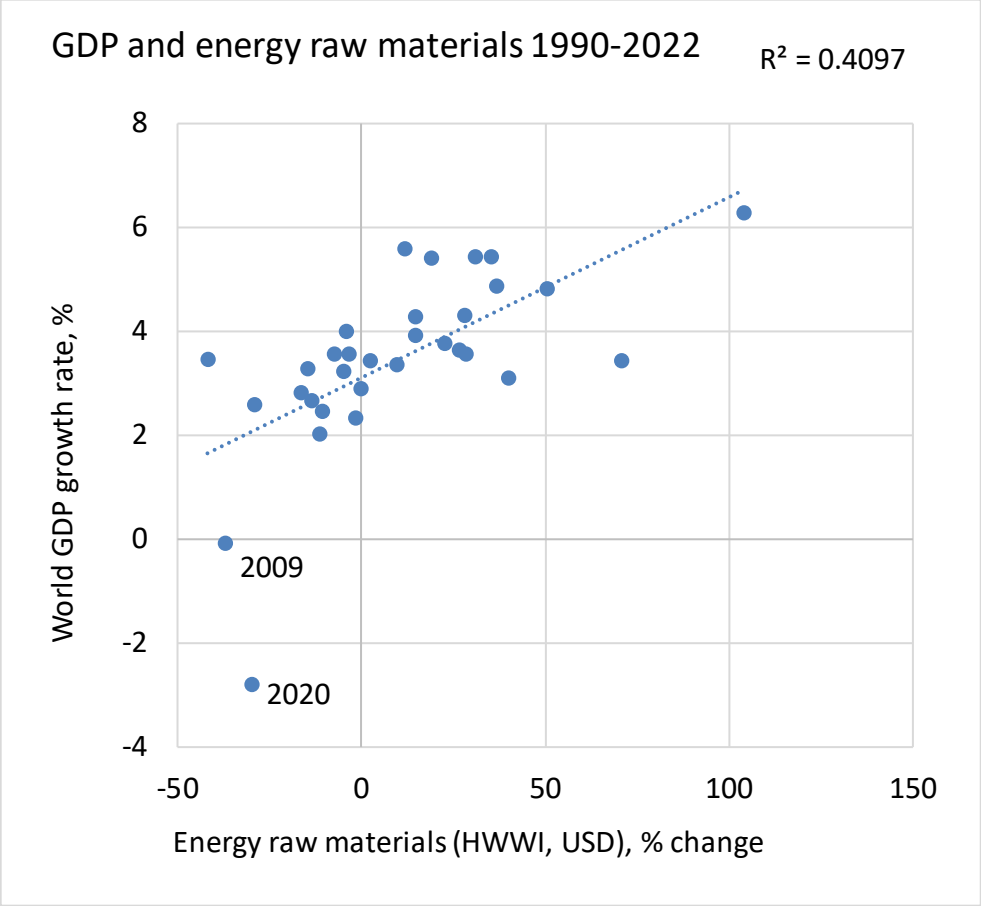
- Tin: Strong demand prospects, but small-scale, bad-for-environment alluvial mines with depleted near-surface high-grade tin deposits, according to Tincorp.
- World Bank CMO expects supply to increase.

- Zinc smelter activity was negatively affected by high energy (gas) prices last year.
- Less important in green transition.

Energy

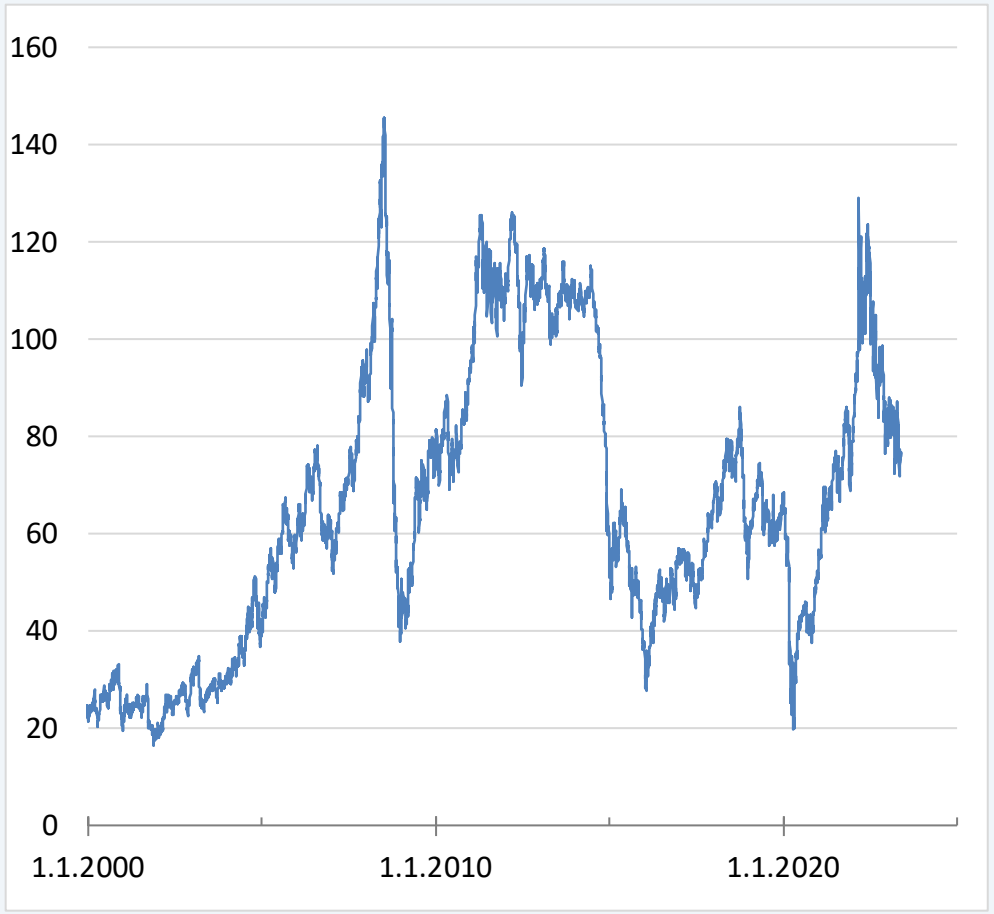
Energy raw materials (HWWI, USD), 2020 = 100

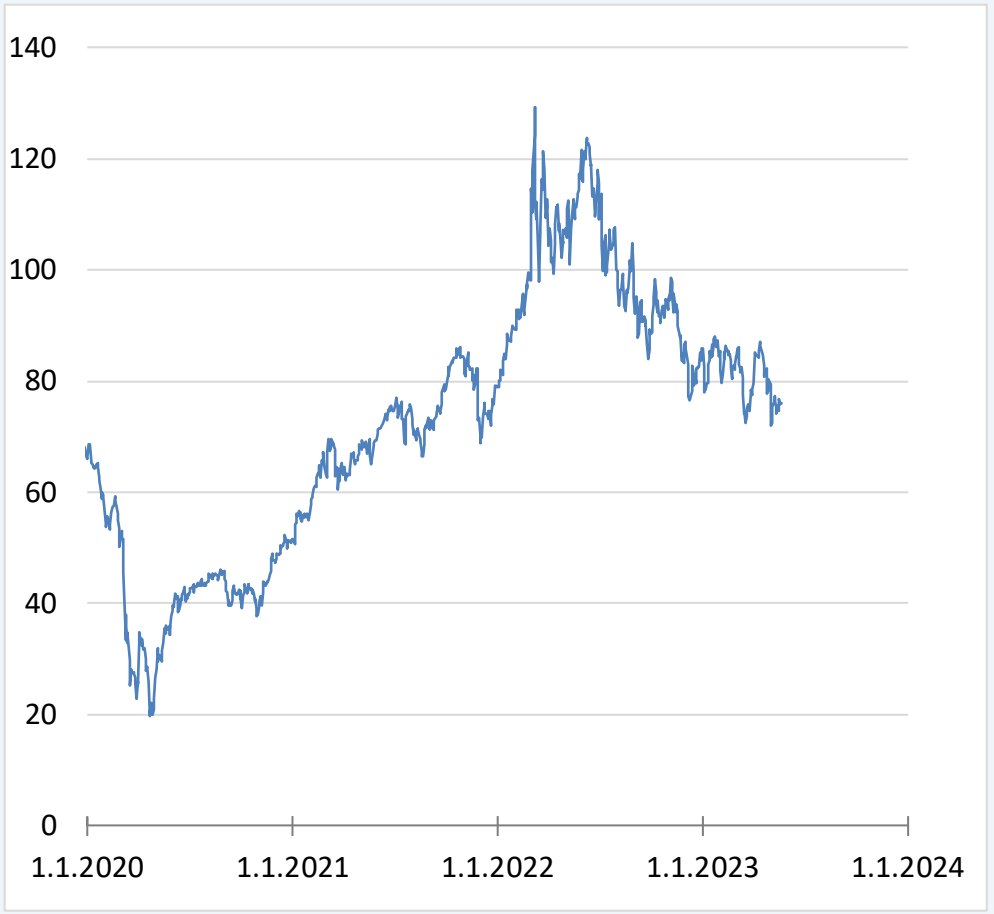




- Coal and gas prices reached record highs in 2022. Exceptional divergence from crude oil prices.
- LNG imports to Europe, decrease in demand, mild winter.
- Now high inventories and increasing LNG import capacity, but next winter may be colder. Demand trend in gas is declining.

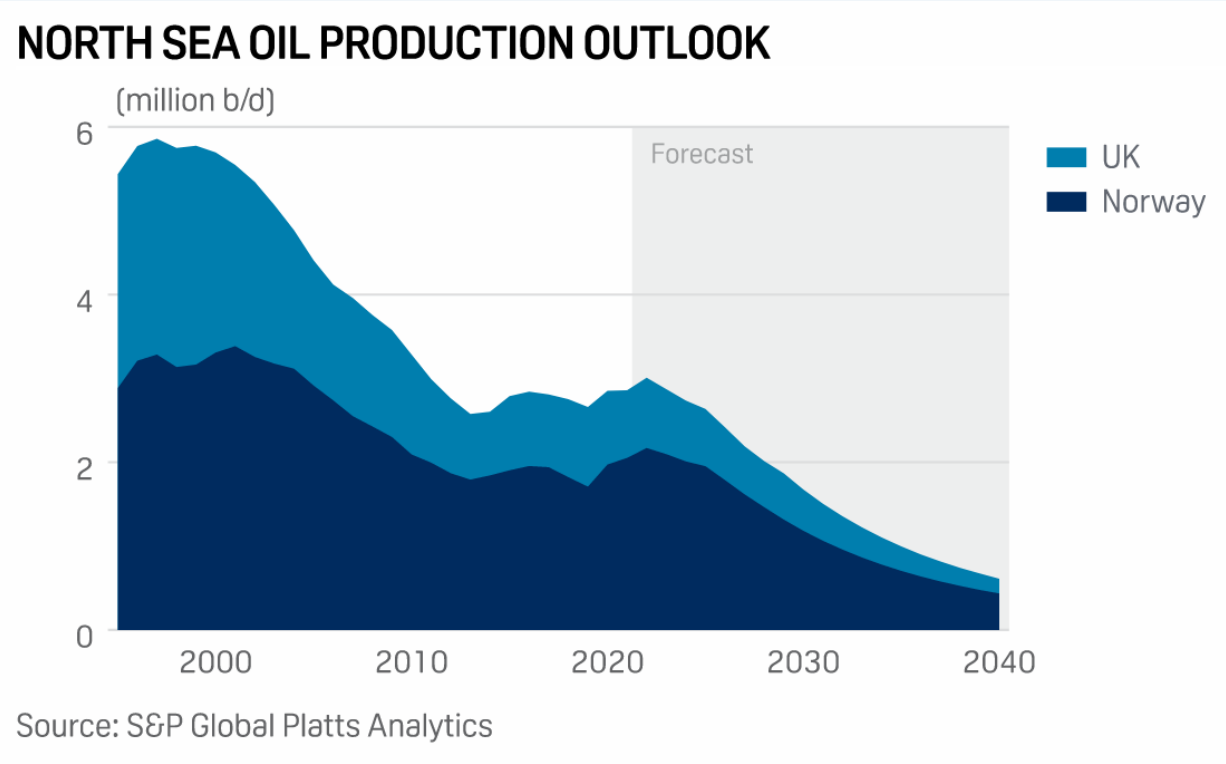
Brent, USD/barrel, in the long and the short term





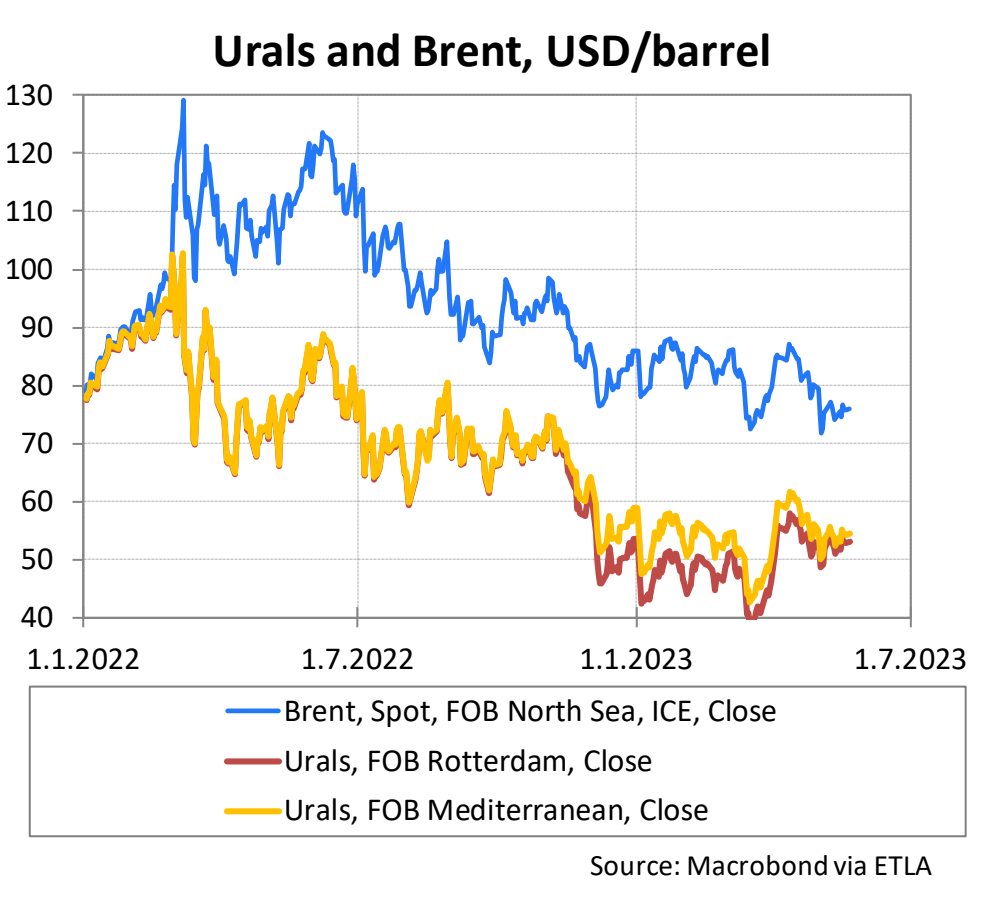
- OPEC+ cuts did not help crude for long. Recession fears loom stronger.

Brent: No more just from the North Sea

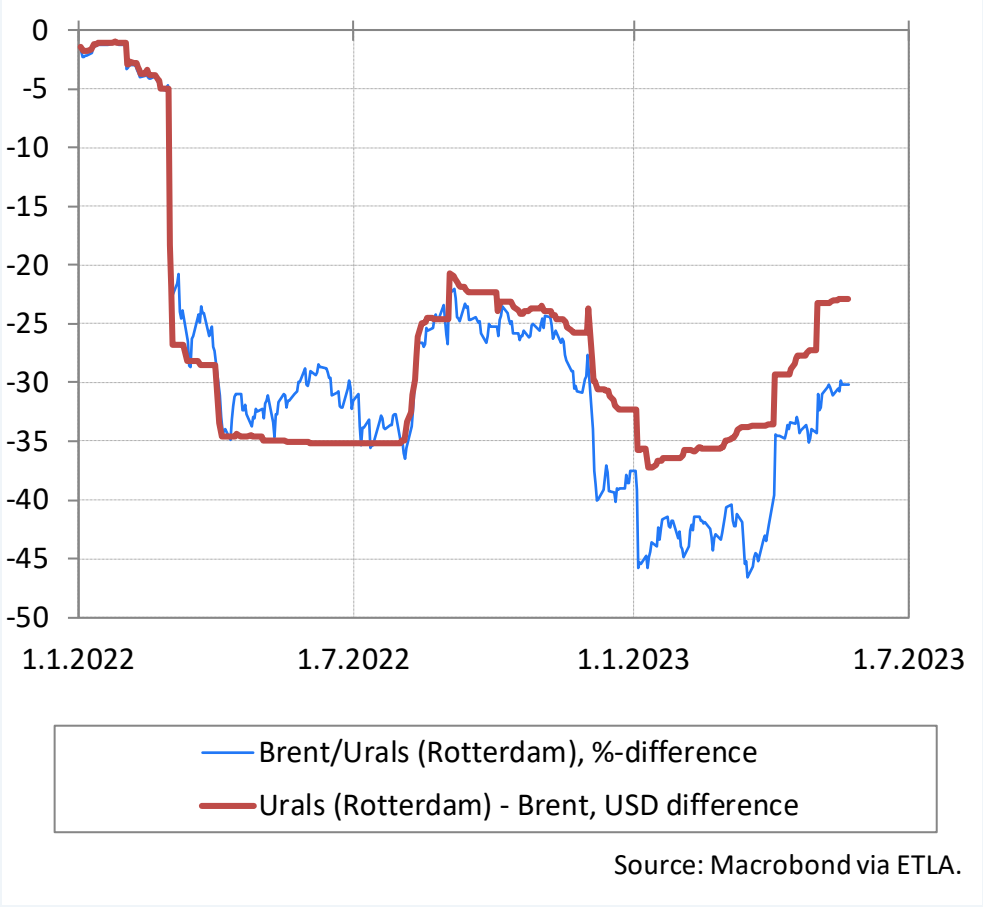


- WTI Midland is added to the Brent basket in June because there has been more US crude oil going into Europe, and output and trade of the grades making up the Brent basket has been falling. => Brent will be much more influenced by US fundamentals such as Strategic Petroleum Reserve releases and Permian production.

Urals at a discount



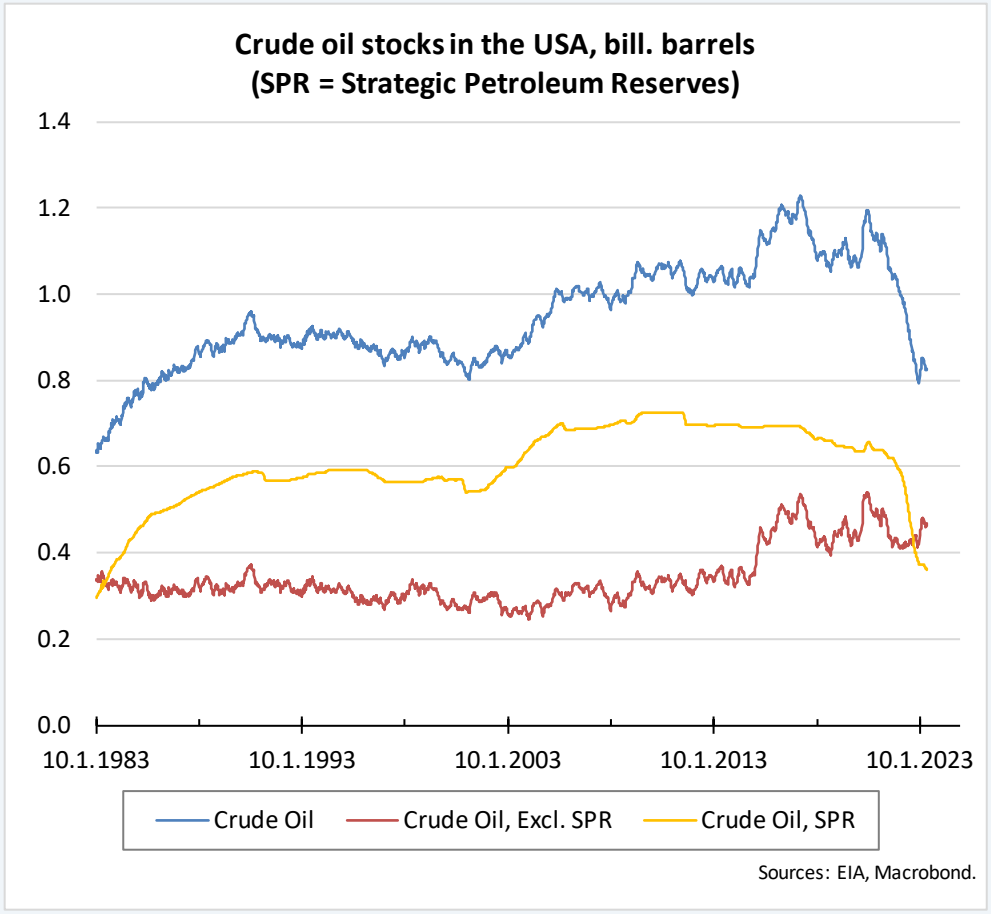
Source: Macrobond via ETLA



Source: Macrobond via ETLA.

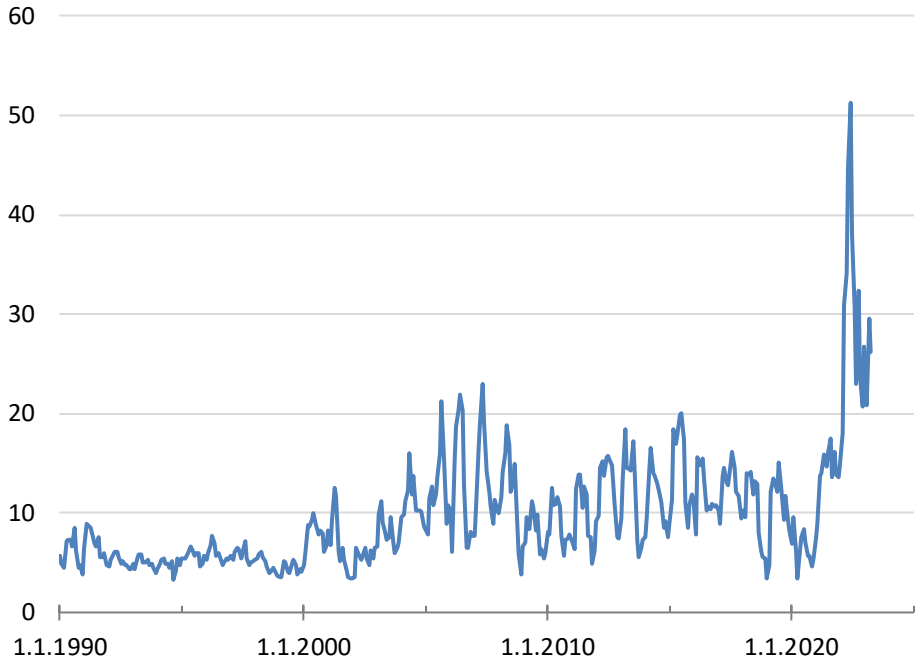
- EU and G7 restrictions on exports of Russian crude and petroleum products have lowered Russia's export revenues. Also, shipping costs for these have skyrocketed.
- However, there is evidence that the Urals discount is not as large as shown in the graphs.
- Also, crude through ESPO pipeline is priced higher.

US strategic petroleum reserves down



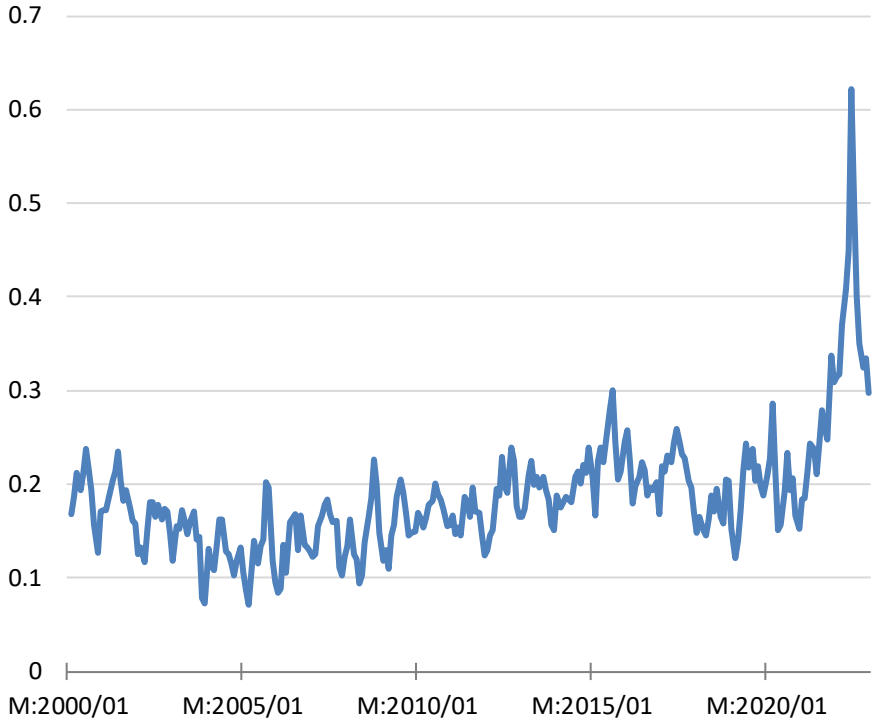
Disruptions in the petroleum market

3:2:1 Brent Crack Spread, USD (Proxy for refining margin: difference between the purchase price of crude oil and the selling price of finished products)

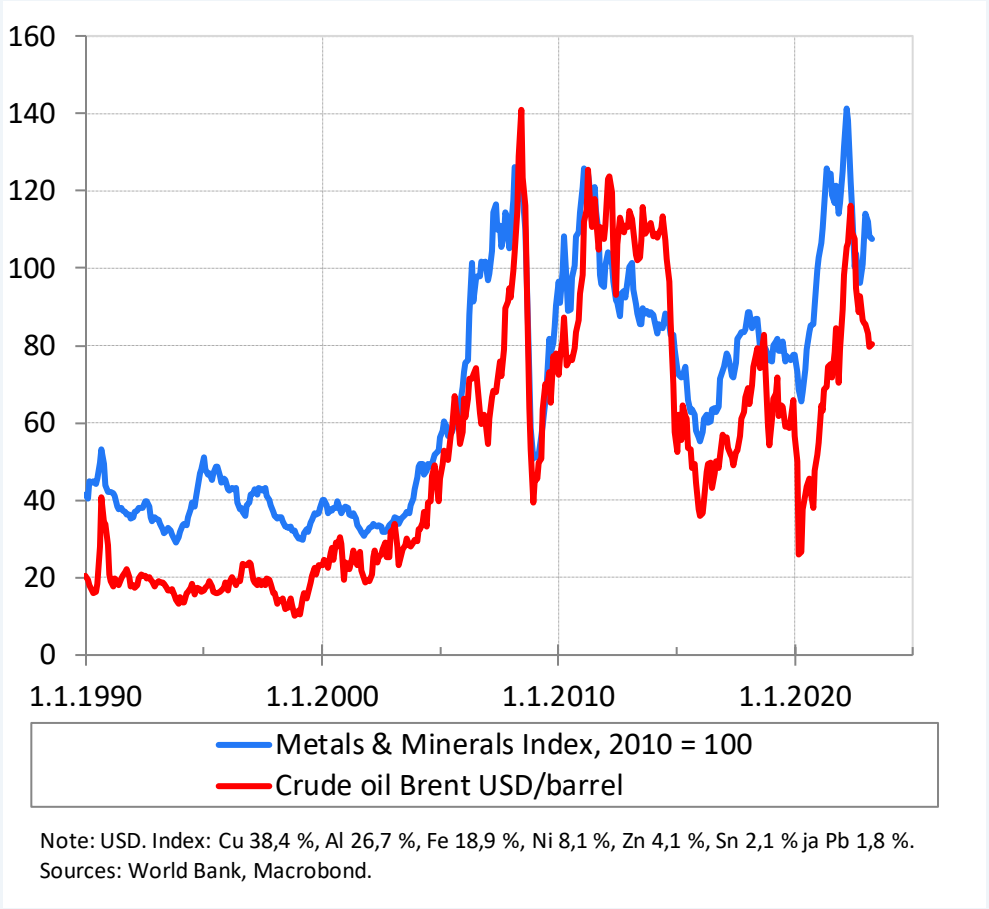


Source: Macrobond.

Total margins for petrol (E95 consumer price) in Finland, €/l (i.e. excl. crude oil, €/$, and taxes)
(Sources: Statistics Finland and ETLA's calculations)



Metals and crude move in tandem



Note: USD. Index: Cu 38,4 %, Al 26,7 %, Fe 18,9 %, Ni 8,1 %, Zn 4,1 %, Sn 2,1 % ja Pb 1,8 %.
Sources: World Bank, Macrobond.

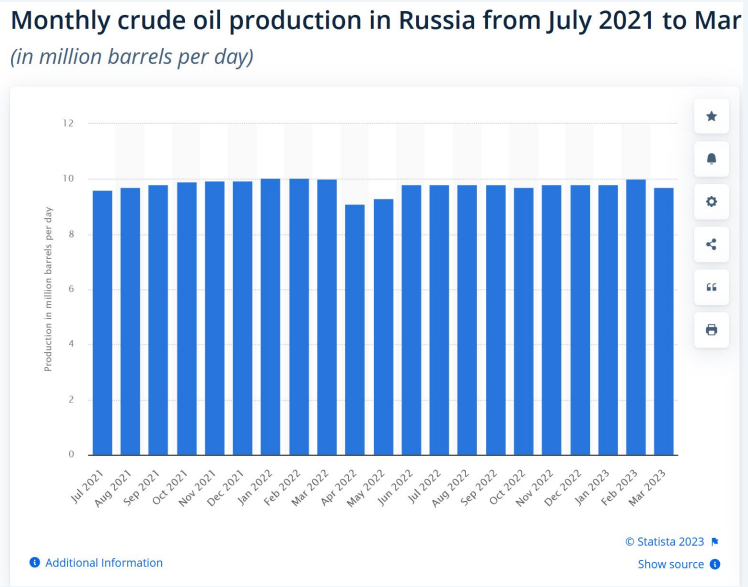
- Divergence so far this year.

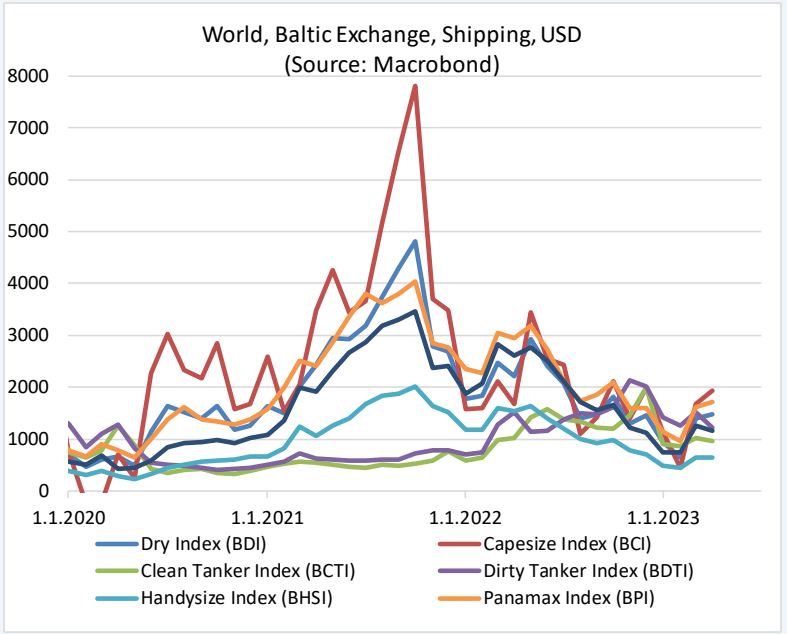
Miscellaneous

- Ukrainian academic institute: 3/4 of the drop in sales of Russian oil and oil products between January and March can be linked to western restrictions: lower sales volume and larger price discounts. The remaining 25 per cent of the fall was linked to lower global prices. (Source: FT)

- New logistical routes for Russian oil and oil products => increased demand for oil tankers globally. Older 'shadow fleet' of (maybe 400) tankers is used for Russian oil. Longer routes, higher prices. Increased risk of oil spills, also in European waters.

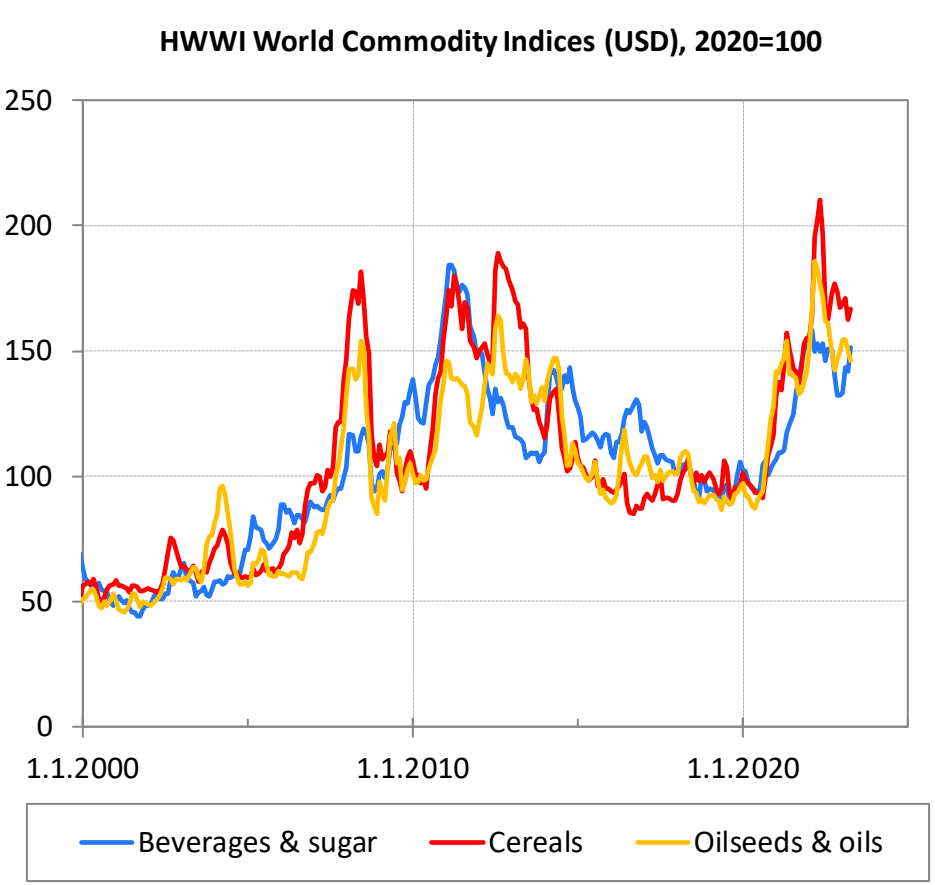
- From La Niña to El Niño in the Pacific. Impact on weather and harvests.

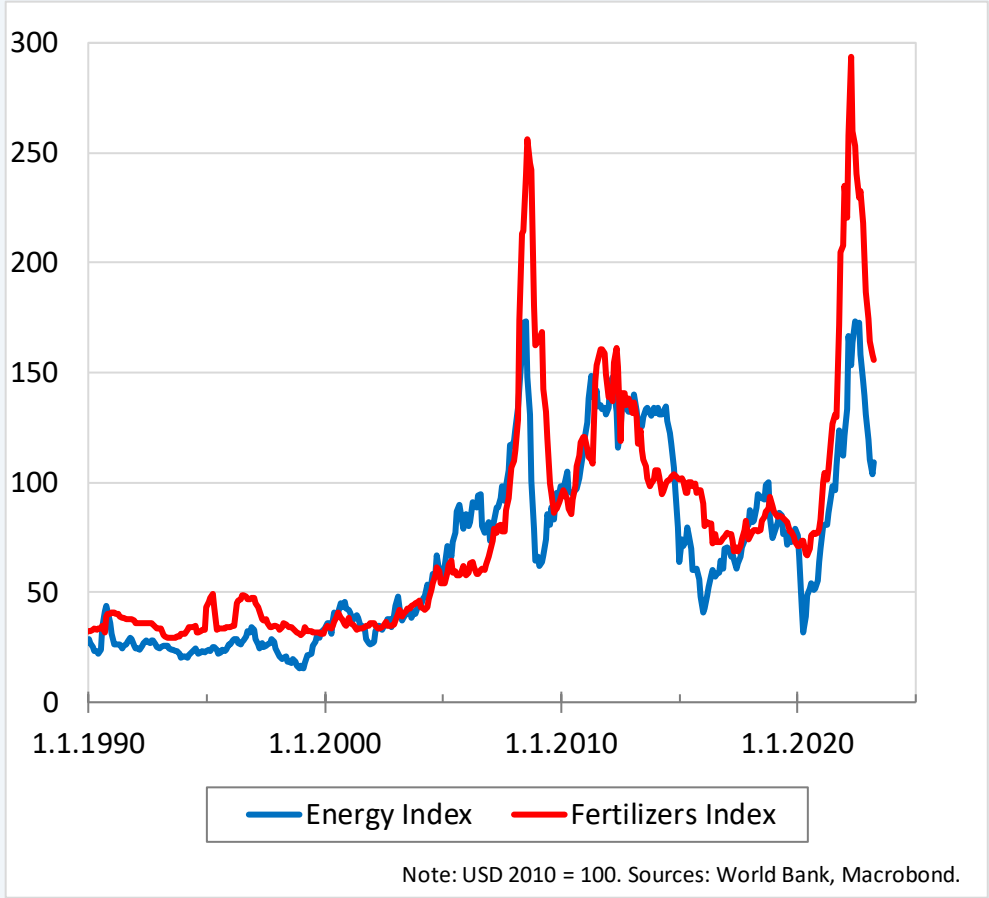




Food

Back towards normal





Note: USD. Natural phosphate rock (16.9%), phosphate (21.7%), potassium (20.1%), and nitrogenous (41.3%). Sources: World Bank, Macrobond.

- Disruptions last year with Russia's invasion of Ukraine.
- Impact on Ukraine's exports of wheat, sunflower oil, fertilisers, etc.
- Higher energy costs and, e.g., urea prices
- High gas prices => high fertilizer prices => high wheat etc. prices
- 'New normal' may be above 'pre-war normal'.
- Challenge to EMDCs

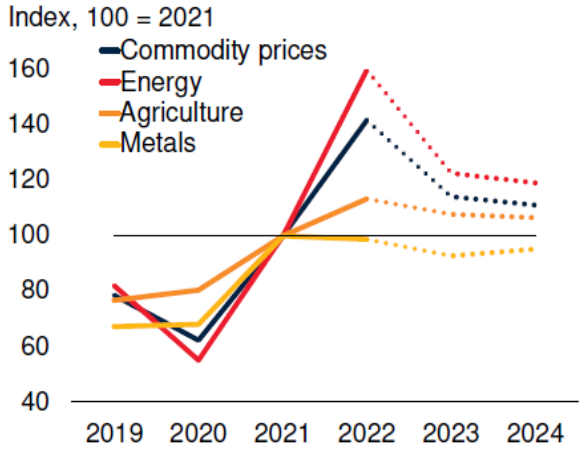
Some forecasts

World Bank Forecasts

TABLE 1 World Bank Commodity Price Forecasts

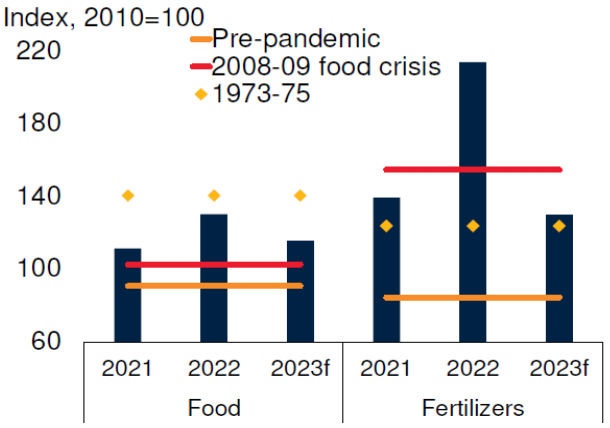
Commodity	Unit	2020	2021	2022	2023f	2024f
Price indexes in nominal U.S. dollars (2010 = 100)						
World Bank Commodity Price Index [1]		63.1	101.0	143.3	112.9	112.1
Energy [2]		52.7	95.4	152.6	113.2	113.3
Non-Energy		84.1	112.5	124.4	112.5	109.5
Agriculture		87.1	108.3	122.7	113.9	111.6
Beverages		80.4	93.5	106.3	101.0	97.6 ↓
Food		93.1	121.8	143.7	132.4	128.7
Oils and Meals		89.8	127.1	145.2	124.7	122.4 ↓
Grains		95.3	123.8	150.4	135.8	125.3 ↓
Other food		95.5	113.1	135.6	139.3	140.1
Raw Materials		75.8	82.9	80.3	75.7	77.3
Timber		86.4	90.4	80.1	80.7	82.0
Other raw materials		64.2	74.8	80.5	70.2	72.3
Fertilizers [3]		74.6	152.3	235.7	148.7	138.2 ↓
Metals and Minerals [4]		79.1	116.4	115.0	105.3	101.8 ↓
Base Metals [5]		80.2	117.7	122.4	111.5	107.9 ↓
Precious Metals [6]		133.5	140.2	136.8	144.3	134.0 ↓

E. Commodity price forecasts



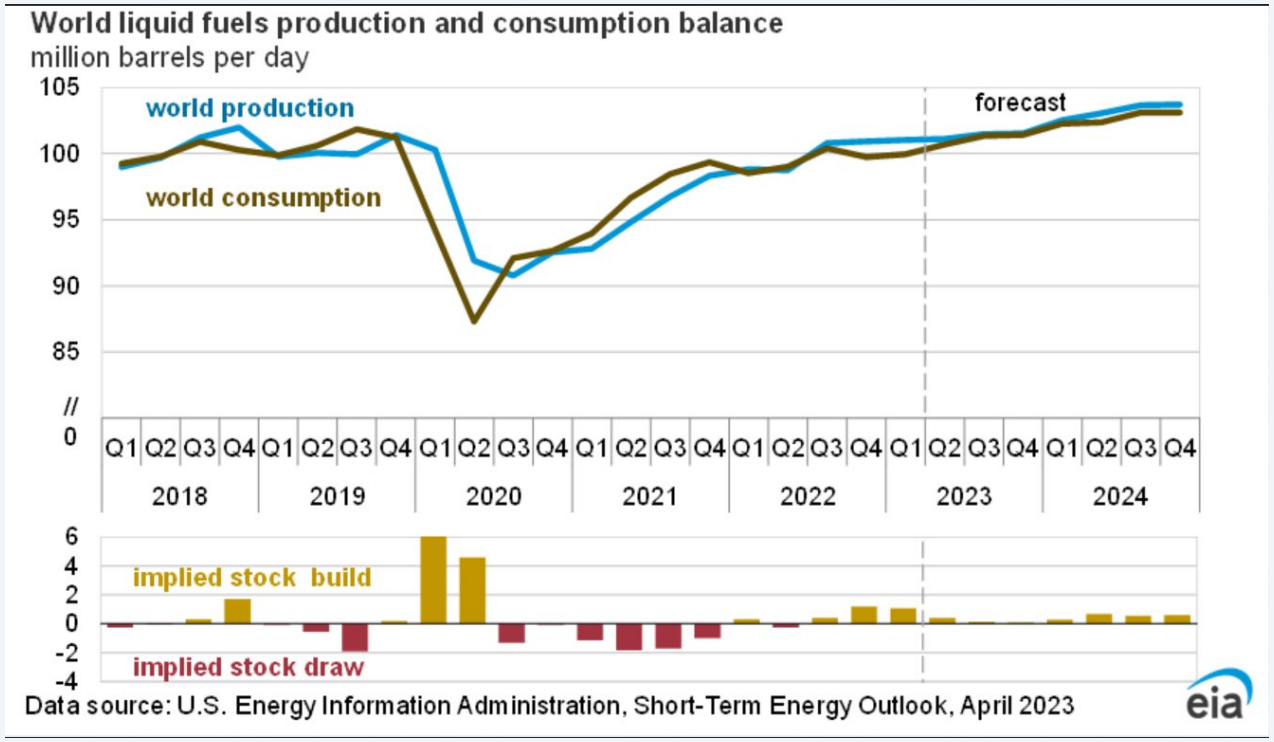
World Bank CMO April 2023.

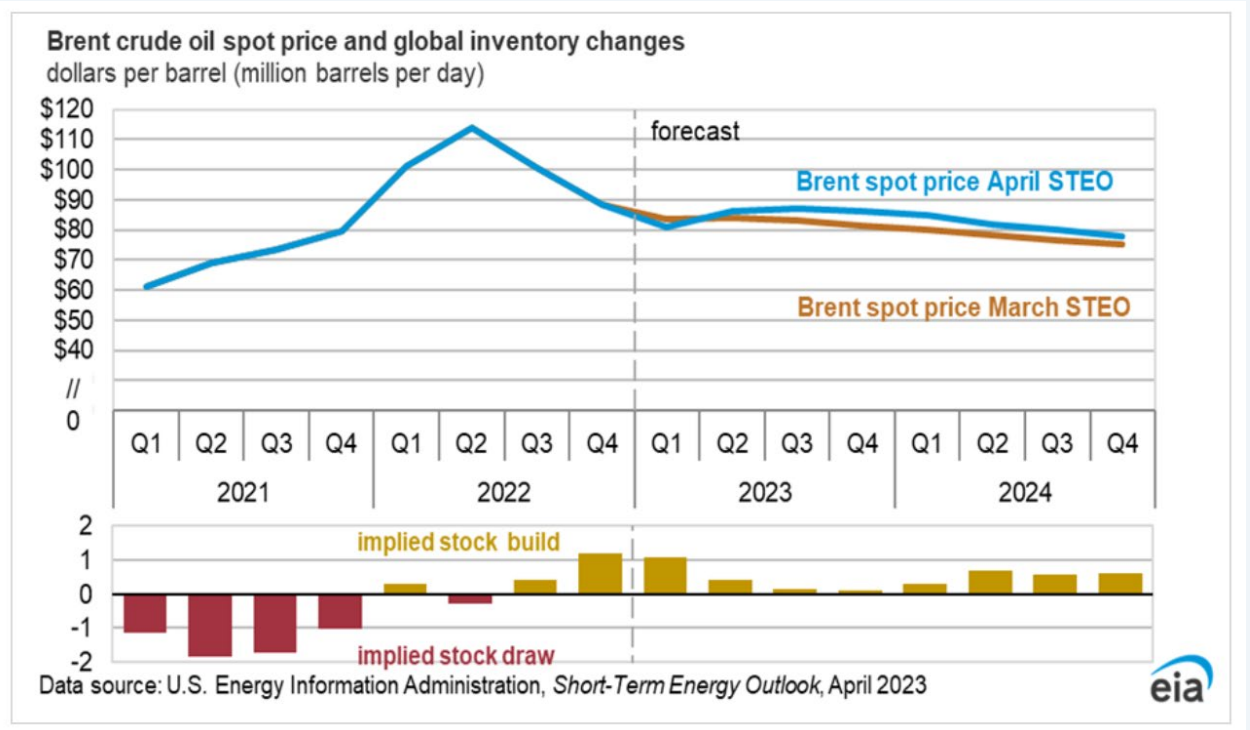
D. Real food and fertilizer prices against record-high price episodes



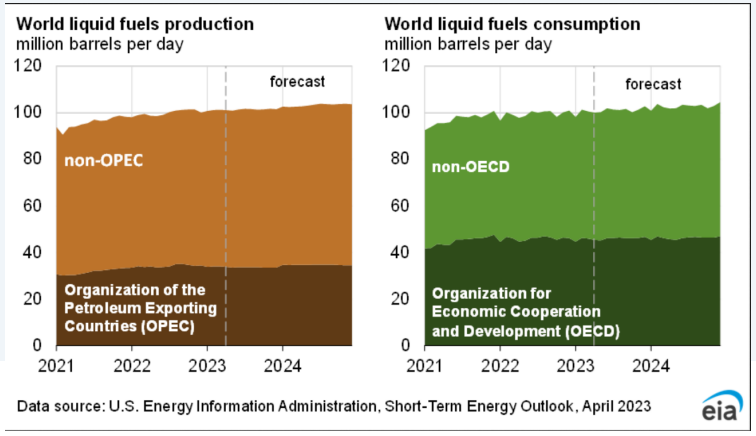
World Bank CMO April 2023.

Liquid fuels (EIA)



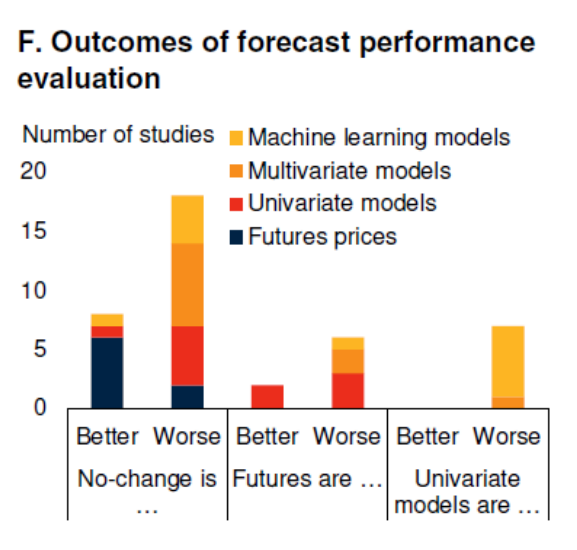


- According to the EIA, production growth will exceed demand growth and put downward pressure on prices.
- Production growth more outside OPEC in 2023, next year 50/50.
- Demand growth mostly outside the OECD.



Multivariate models beat futures prices

- World Bank Commodity Markets Outlook (April 2023) also has a literature survey on the forecasting of industrial commodity (crude oil and metals) prices.
- Their conclusions:
  - Forecasts based on futures contracts are inferior to several model-based approaches.
  - Multivariate time series models (typically VAR) have generally outperformed other methods.
  - Machine learning techniques (artificial neural network and support vector regressions) have tended to yield better forecasts than traditional benchmarks (e.g., no-change forecasts) and univariate (usually ARIMA) methods.
- Results differ somewhat depending on commodities and forecast horizons.



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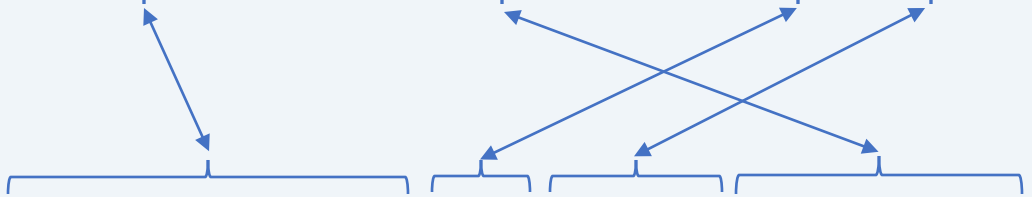

Thank you for your interest!

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