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Commodity Markets: Evolution, Challenges and Policies
(John Baffes and Peter Nagle)

Presentation of the publication By

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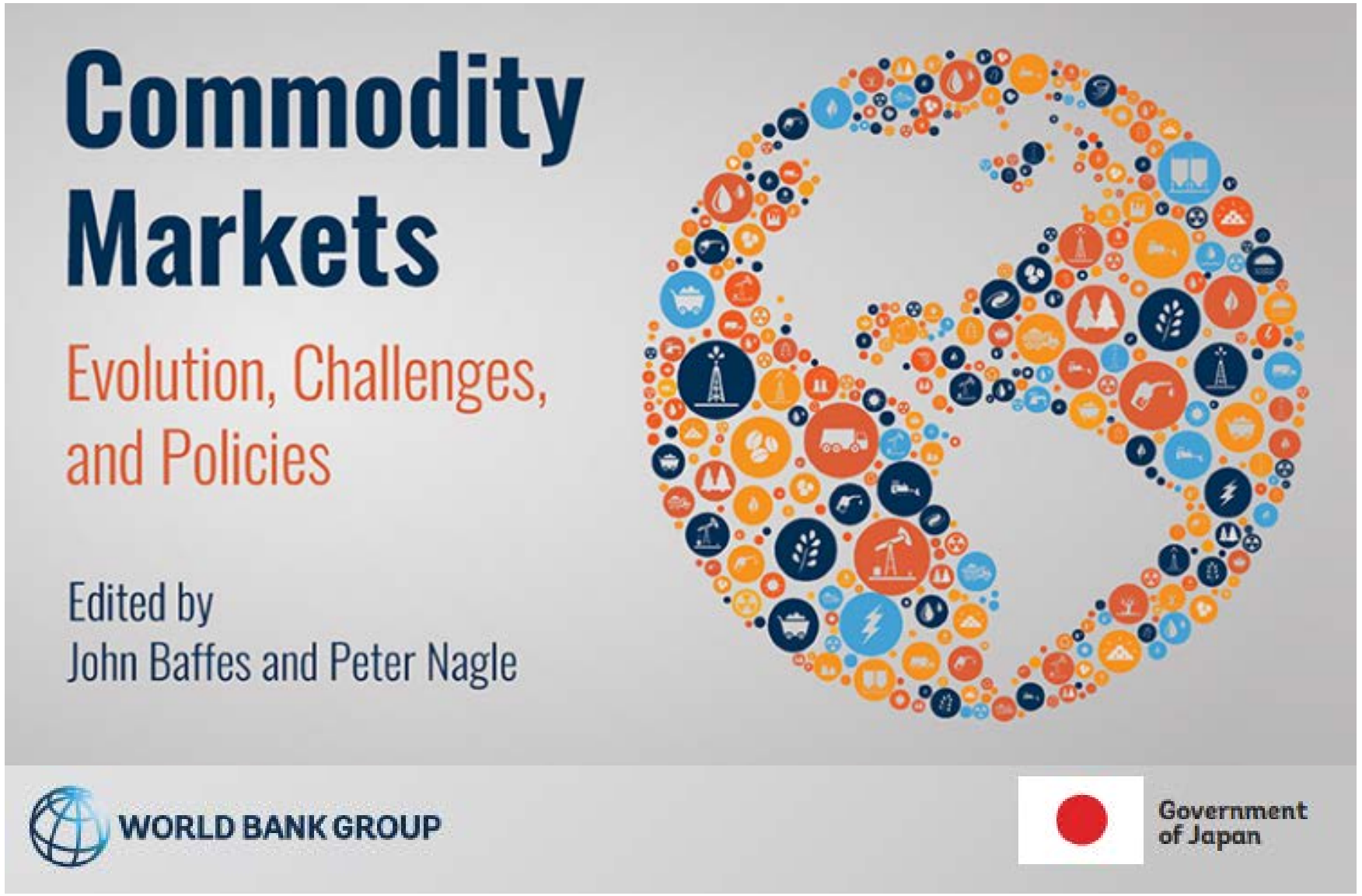

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Outline of the volume and contributors

Foreword
David Malpass, World Bank President

Overview
John Baffes and Peter Nagle

Chapter 1: The Evolution of Commodity Markets Over the Past Century
John Baffes, Wee Chian Koh, and Peter Nagle

Chapter 2: Commodity Demand: Drivers, Outlook, and Implications
John Baffes and Peter Nagle

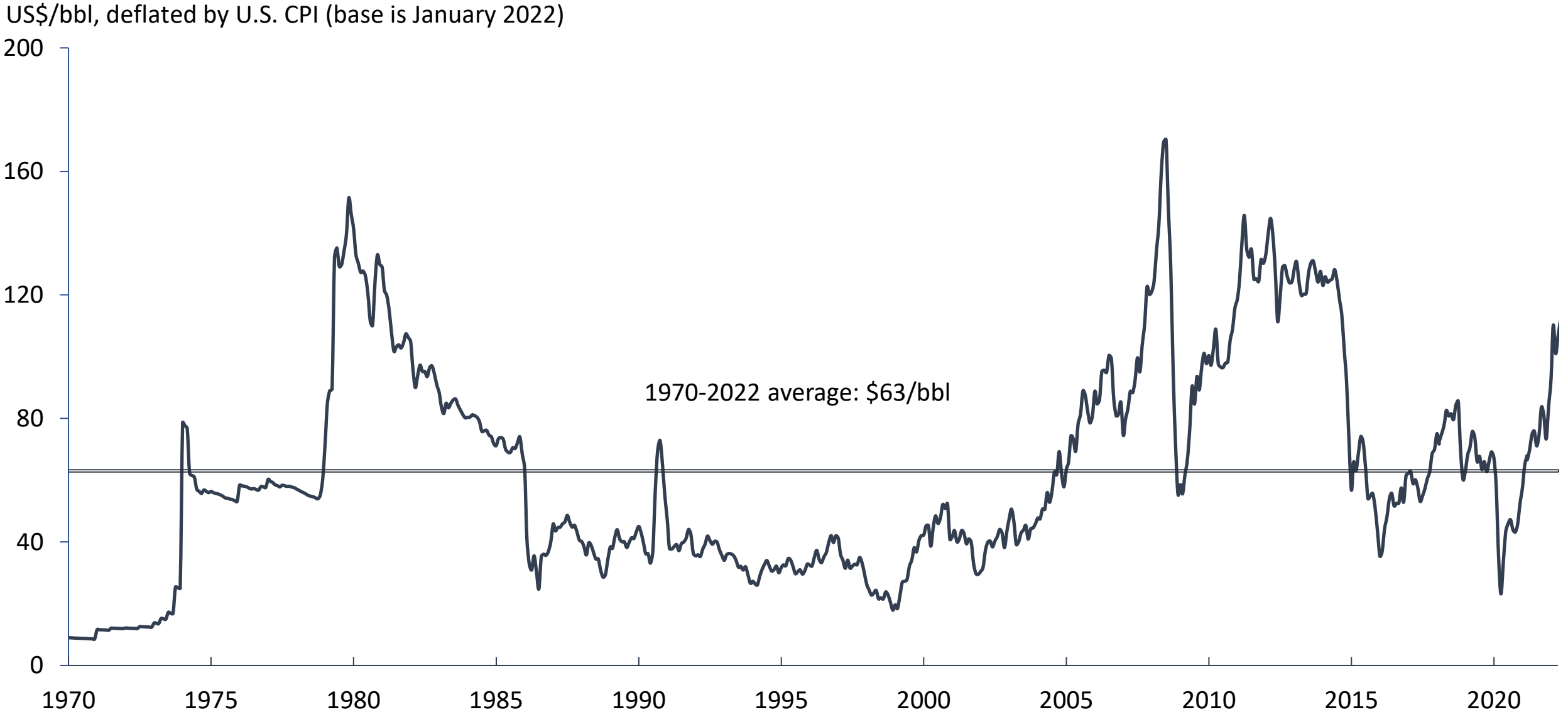
Chapter 3: The Nature and Drivers of Commodity Price Cycles
Alain Kabundi, Garima Vasishtha, and Hamza Zahid

Chapter 4: Causes and Consequences of Industrial Commodity Price Shocks
Alain Kabundi, Peter Nagle, Franziska Ohnsorge, and Takefumi Yamazaki

Key findings

- Commodity markets are repeatedly buffeted by major shocks
- Price shocks can be very destabilizing for commodity-dependent countries
- Policy tools can be highly effective, but need to be carefully targeted
- Commodities are very heterogenous, should not be treated as one group
- Technology, innovation, and substitution are key long-term drivers
- Understanding these is critical to achieving the energy transition

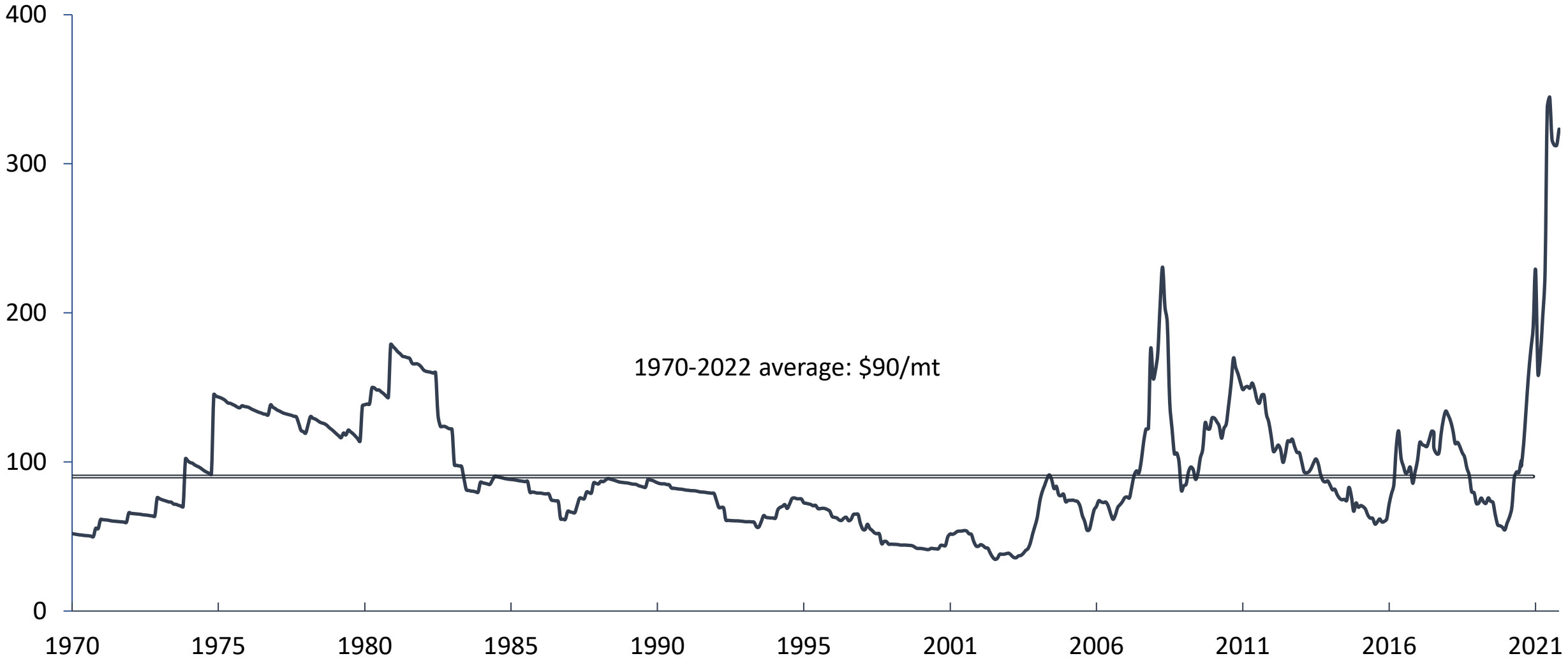
Real oil prices: Elevated but lower than 1970s and 2000s



Source: World Bank.
Note: Price represents the average Brent, Dubai, and WTI. Last observation is August 2022.

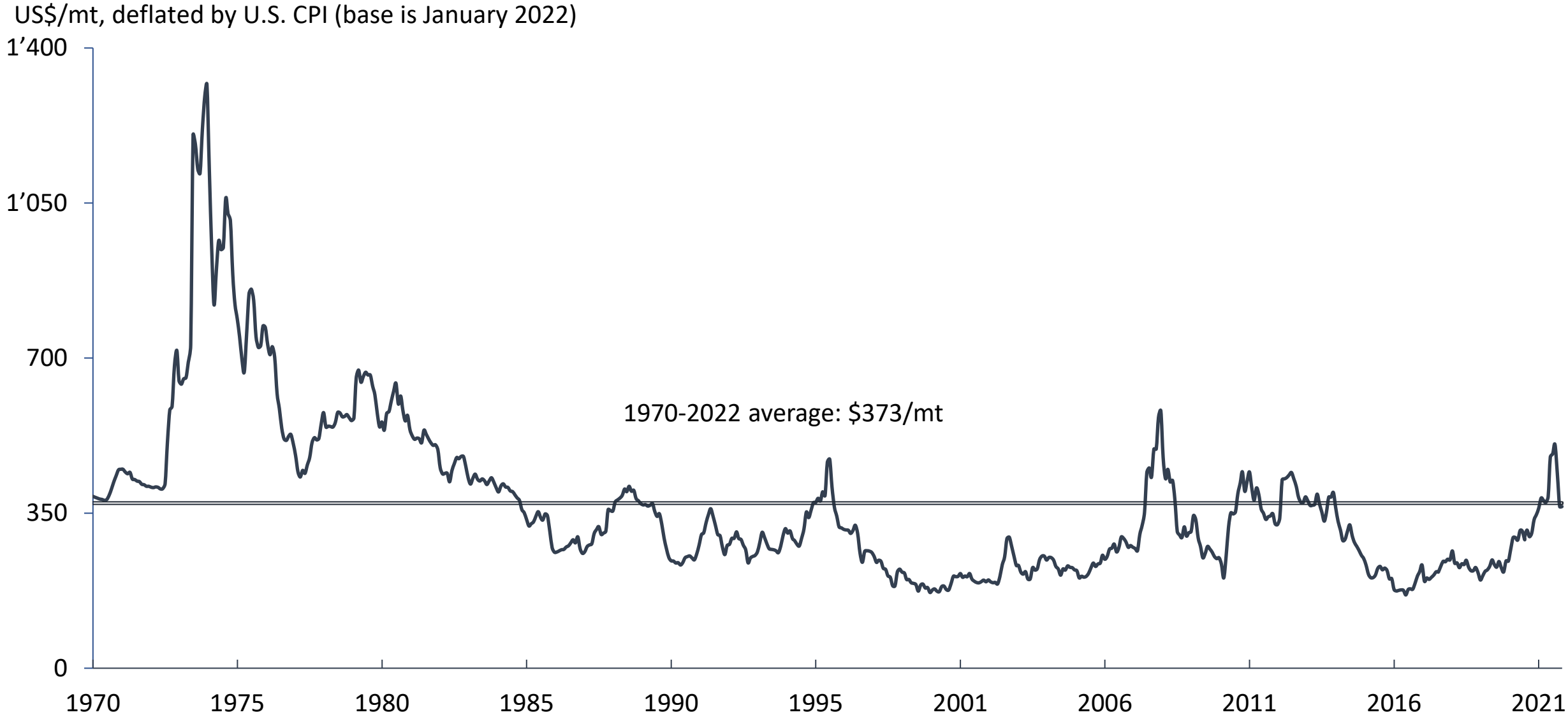
Real coal prices at record high

US$/mt, deflated by U.S. CPI (base is January 2022)



Source: World Bank.
Note: Price refers to the Australia benchmark. Last observation is August 2022.

Real wheat prices: Currently at 1970-2022 average

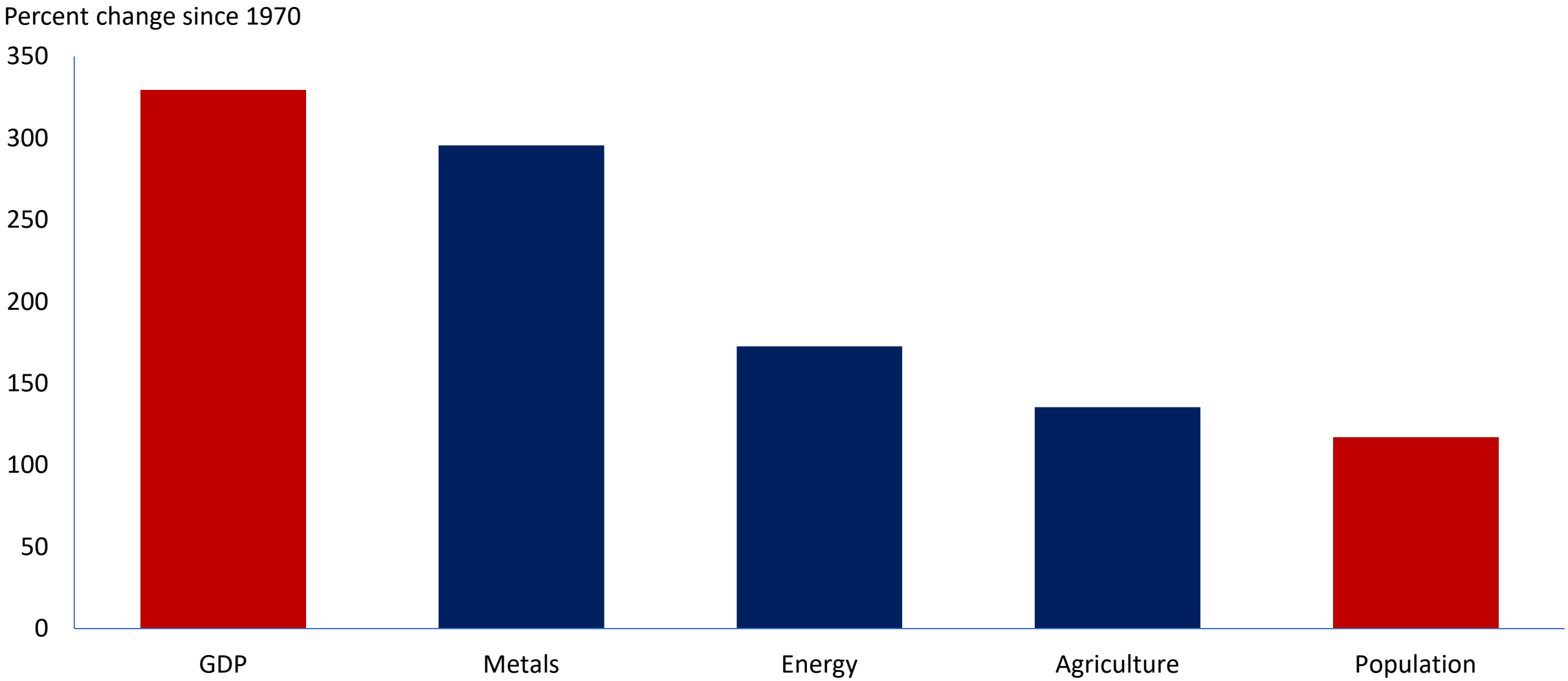


Source: World Bank.
Note: Price represents the US benchmark. Last observation is August 2022.

Evolution

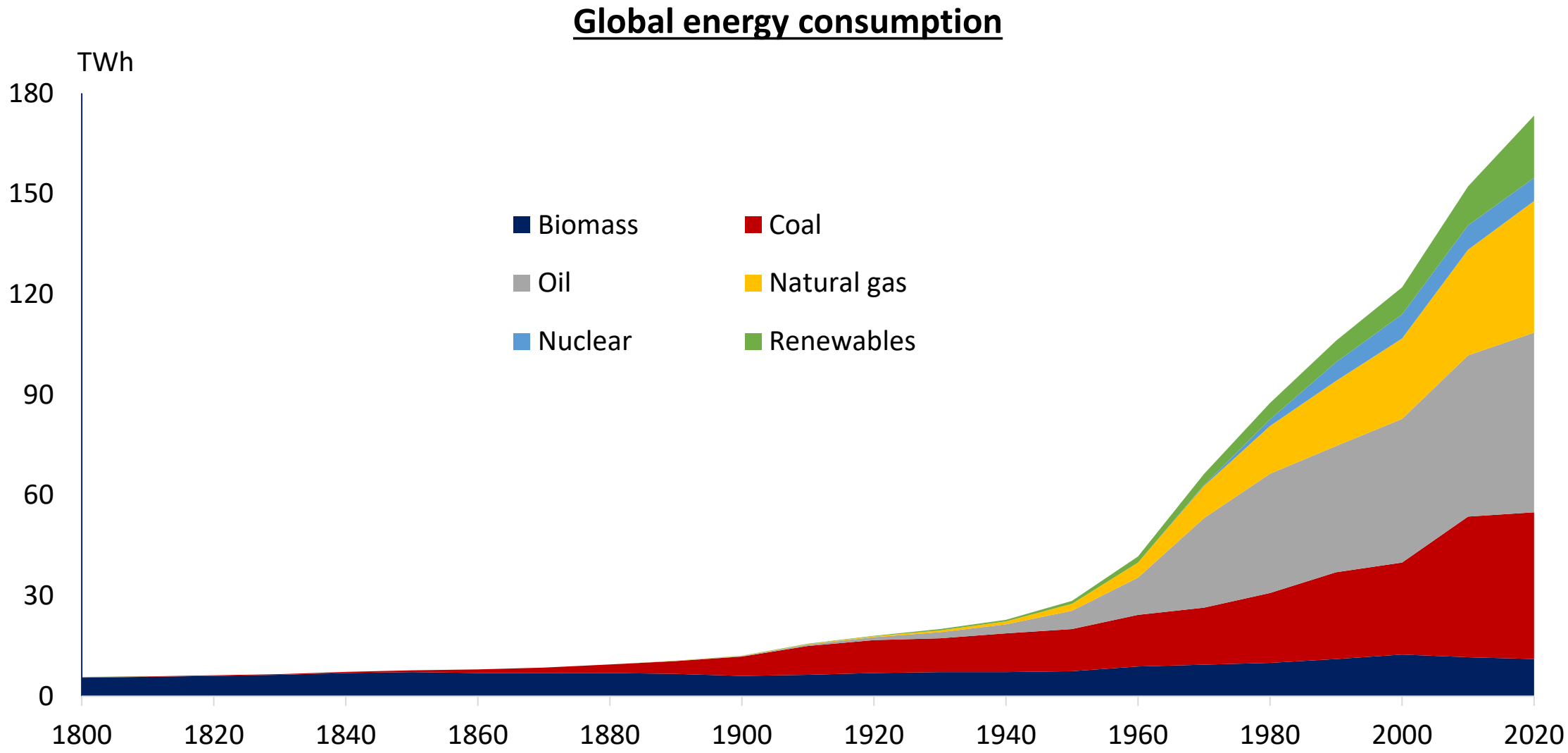
Commodity demand has soared over the past 50 years

Commodity demand, population, and GDP growth, 1970-2020



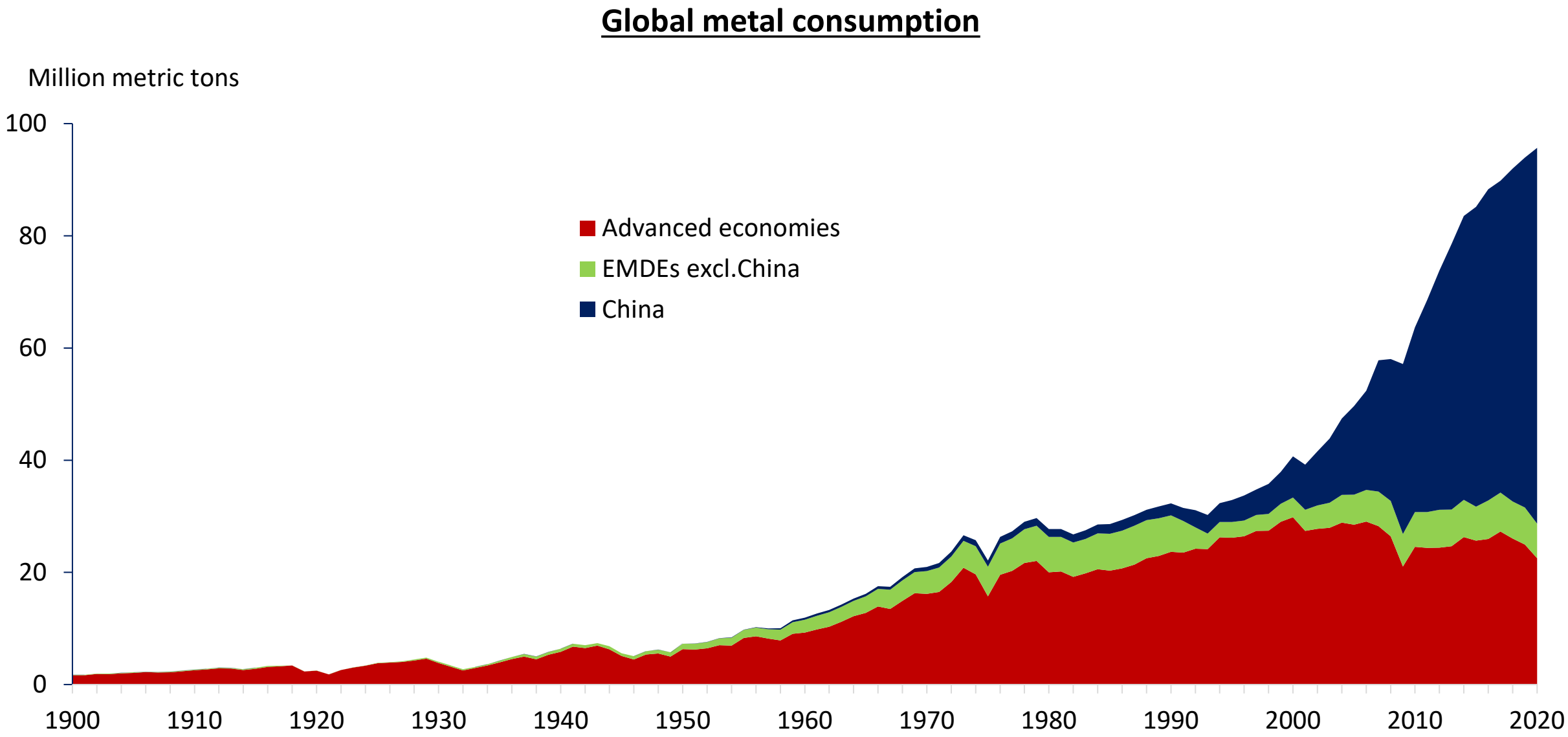
Sources: BP Statistical Review; USDA; World Bureau of Metals Statistics; World Bank

Energy consumption has continually risen as new fuels emerged



Source: BP Statistical Review; Energy Information Administration; World Bank
Note: Renewables includes hydro-electric, solar, wind, geothermal, biomass, wave and tidal.

Metal consumption has also soared, driven by China



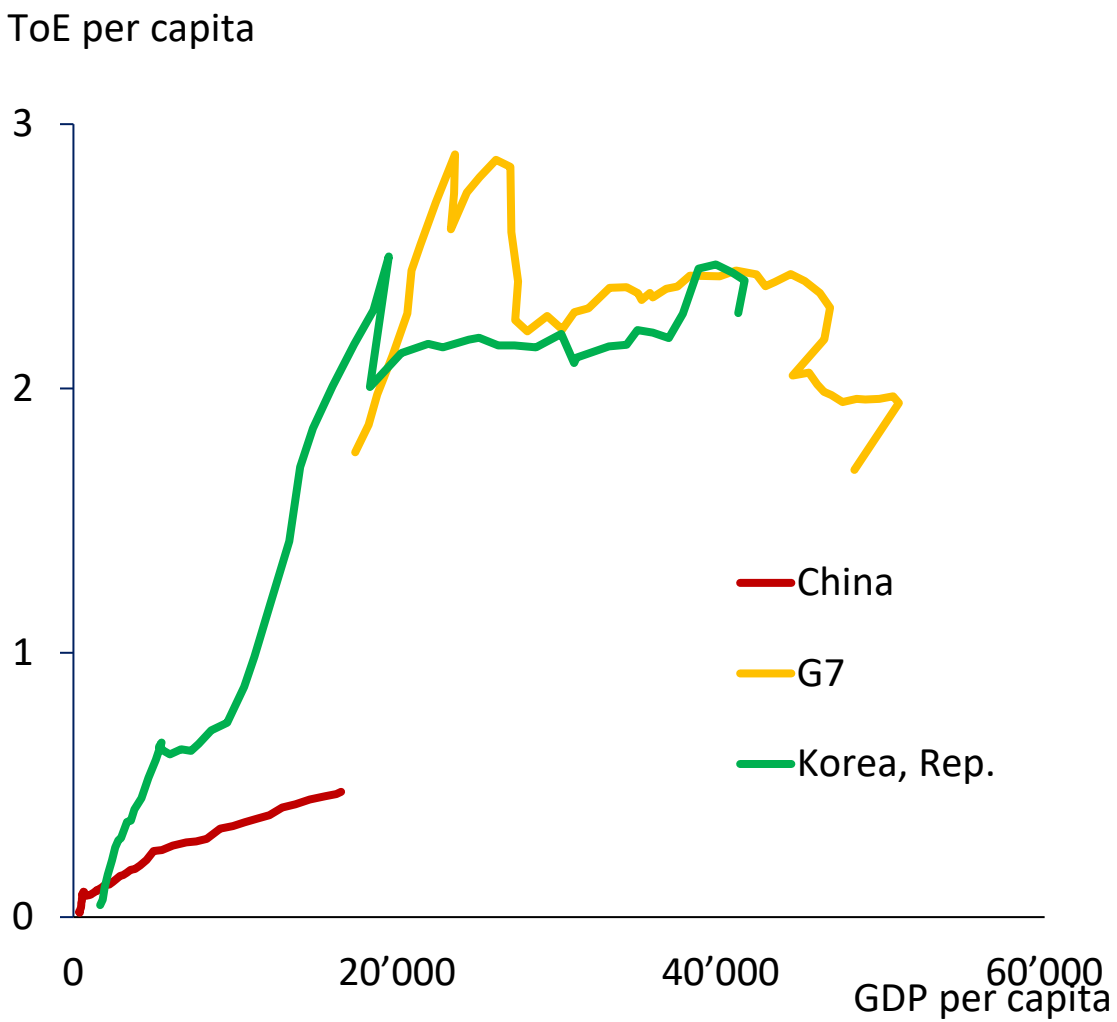
Source: World Bureau of Metal Statistics; World Bank
Note: Refers to consumption of base metals only. EMDE = Emerging Markets and Developing Economies.

Commodity demand has several drivers…

- Population growth
- Income growth
- Industrialization
- Technology/innovation
- Substitution
- Policies
- Preferences

Oil demand growth changes as income rises…

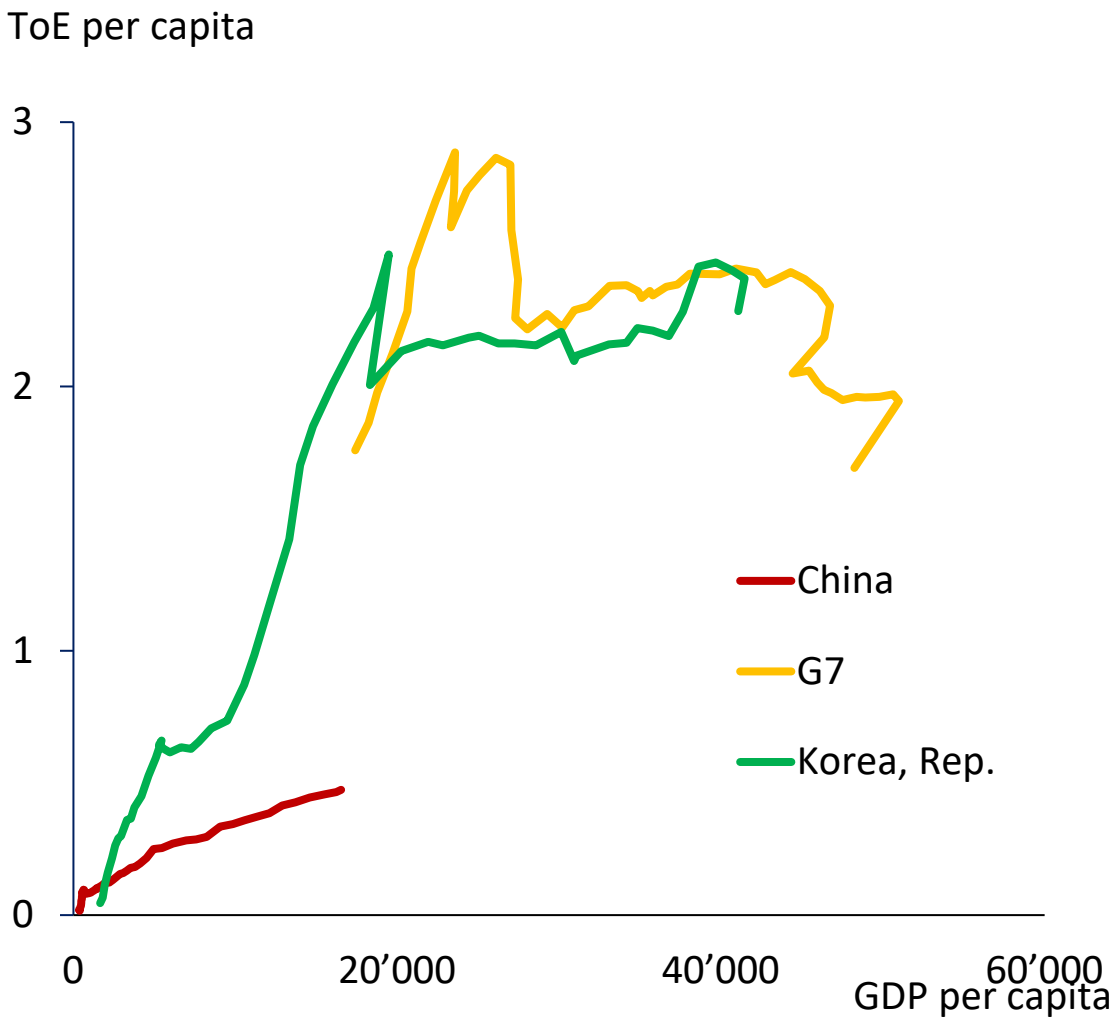
Oil consumption and income per capita



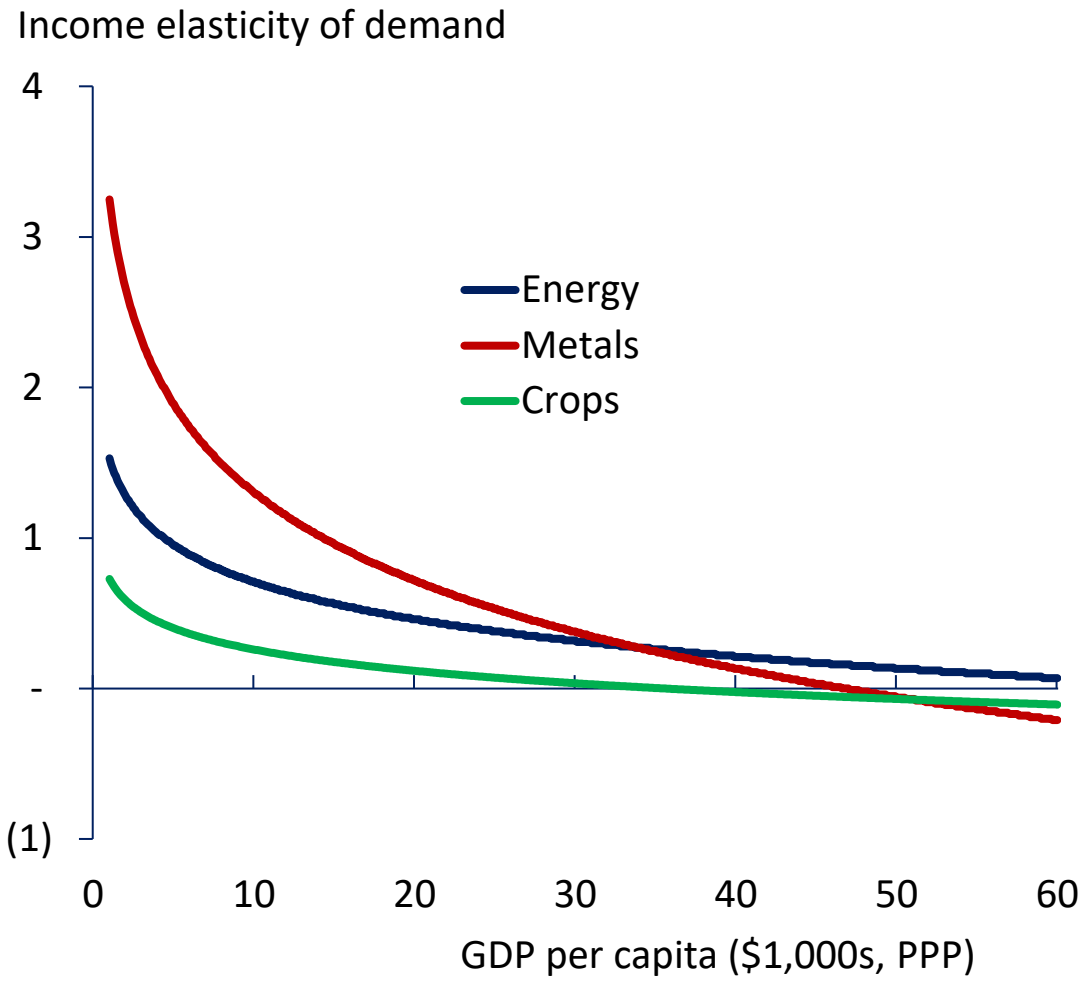
Source: Source: Authors’ calculations; BP Statistical Review of World Energy; World Bank.
Note: LHS refers to oil demand per capita and GDP per capita (MER) from 1965 to 2019.

…reflecting income-varying income elasticities of demand

Oil consumption and income per capita



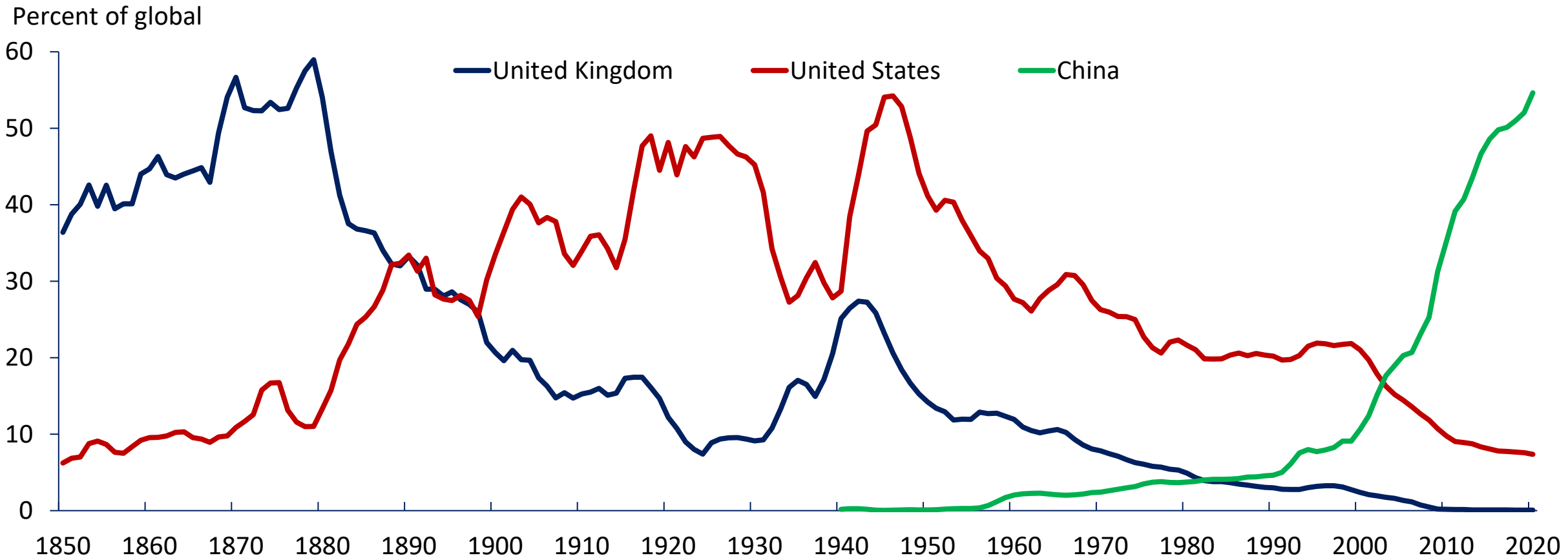
Aggregate income elasticity estimates



Source: Source: Authors' calculations; BP Statistical Review of World Energy; World Bank.
Note: LHS refers to oil demand per capita and GDP per capita (MER) from 1965 to 2019. RHS shows estimates of income elasticity of demand.

In the race to industrialization, the speed of China's rise is unique

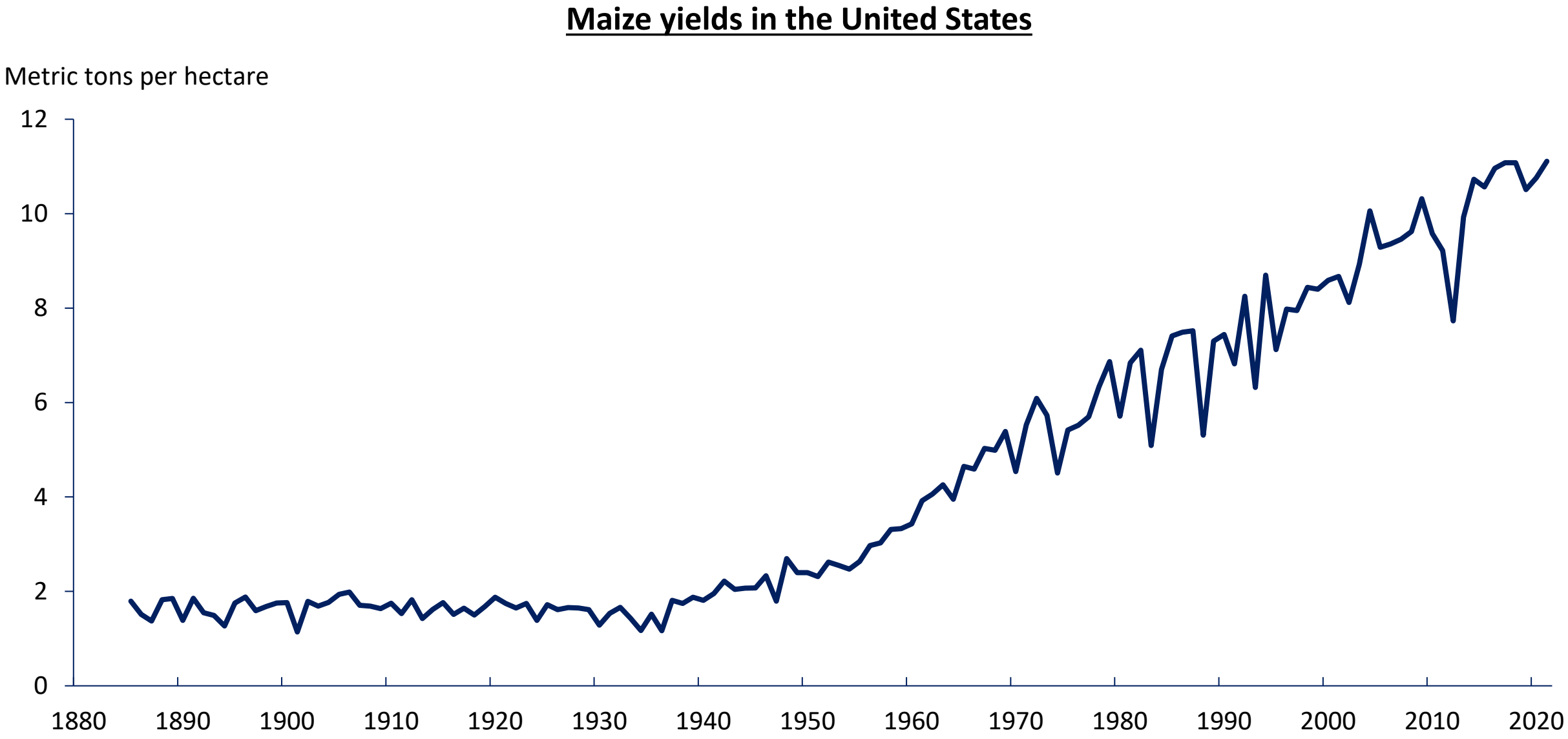
Share of global copper demand



Source: Abstract of British Historical Statistics; BP Statistical Review of World Energy; British Geological Survey; Bureau of Mines Minerals Yearbook; Historical Statistics of the United States; International Historical Statistics; Lemon (1838); Mineral Statistics of the British Empire and Foreign Countries; Statistical Summary of the Minerals Industry; Schmitz (1979); Smil (2017); Stuermer (2017); The Copper Handbook; U.K. Department for Business, Energy & Industrial Strategy; U.S. Energy Information Administration; U.S. Geological Survey; World Bank; World Bureau of Metal Statistics; World Steel Association.

Notes: Share of country or country group in world total. Share of global consumption plotted as 3-year moving average to improve readability. Where consumption is not available, apparent consumption (production + imports - exports) is used. Where there is missing data, especially in the earlier years, linear interpolation is applied. Data from 1850 to 2020.

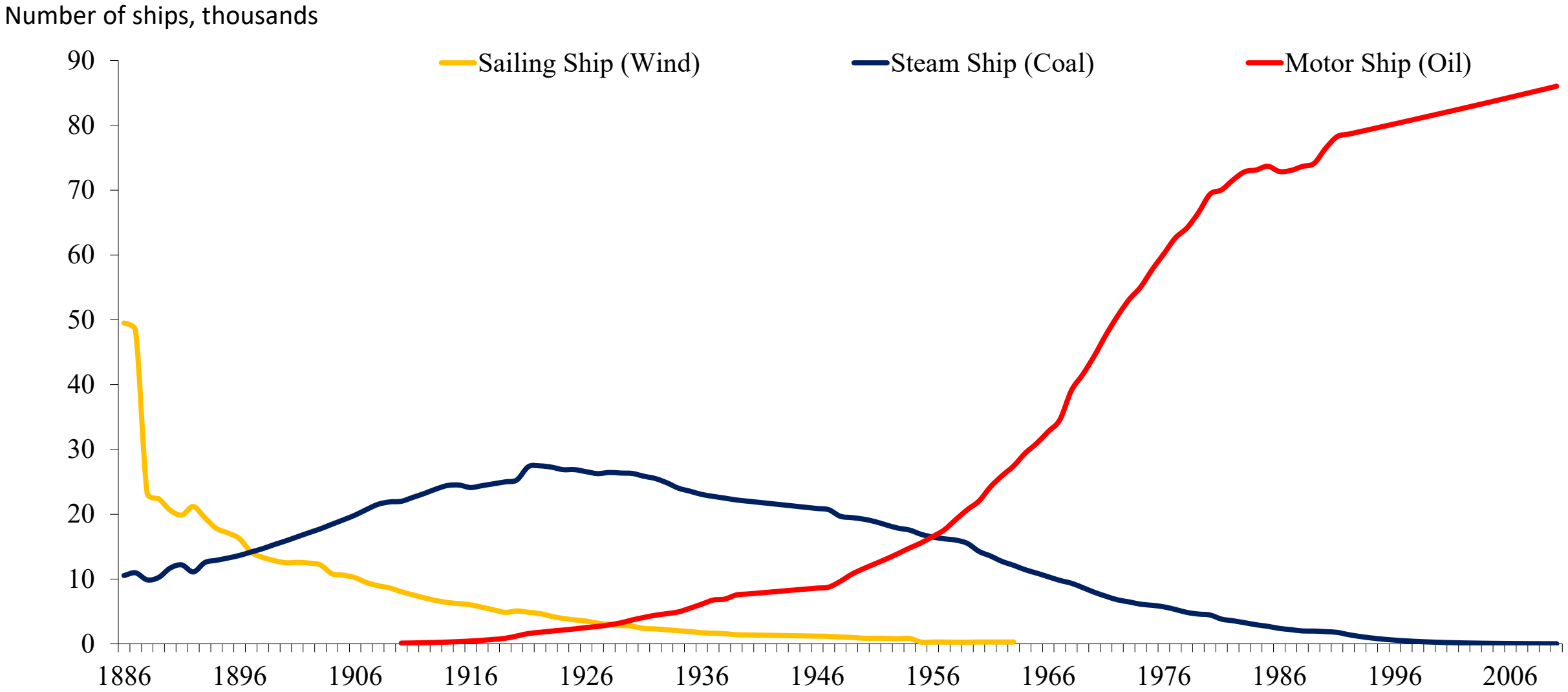
Technology and innovation led to huge increases in productivity



Source: U.S. Department of Agriculture

Technology has also triggered major commodity transitions…

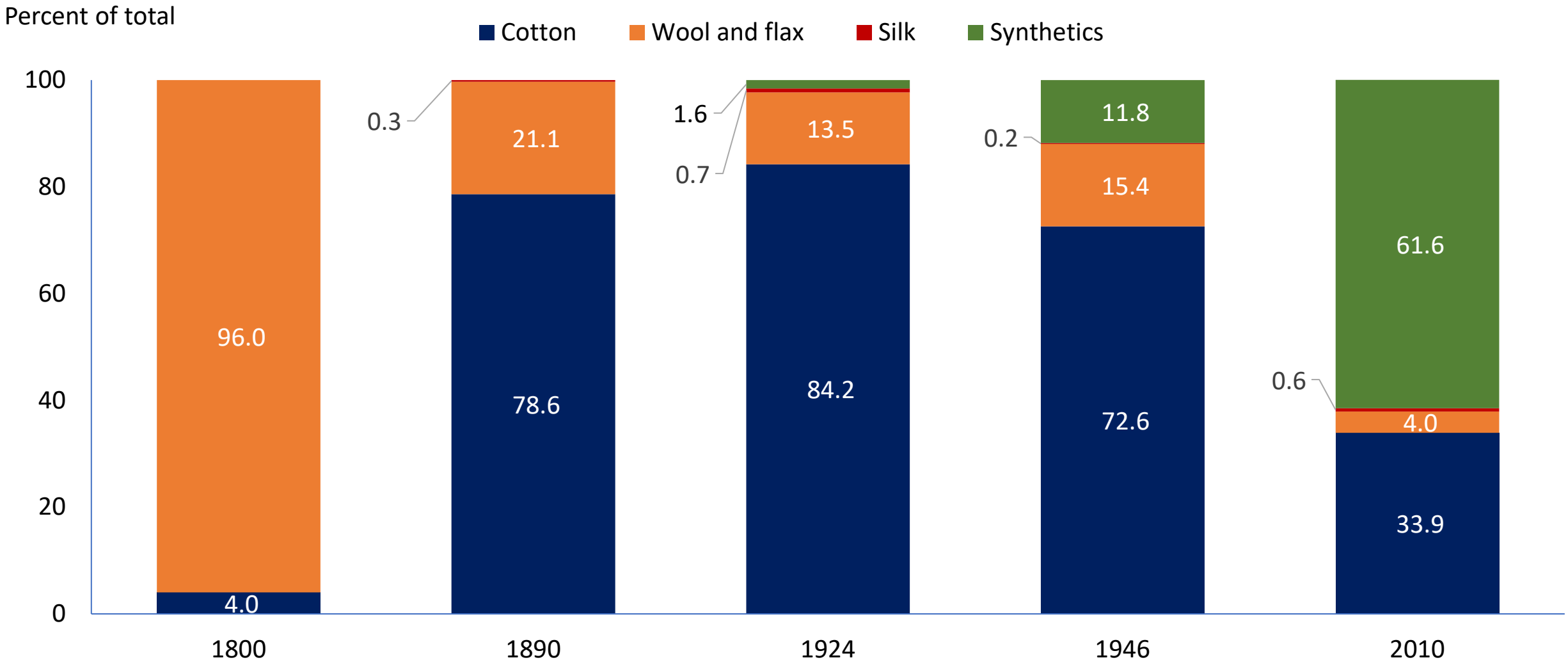
Global shipping fleet, by type of fuel



Source: Lloyds register; World Bank.
Note: Figure shows the number of commercial vessels by type of fuel.

…across a range of different industries

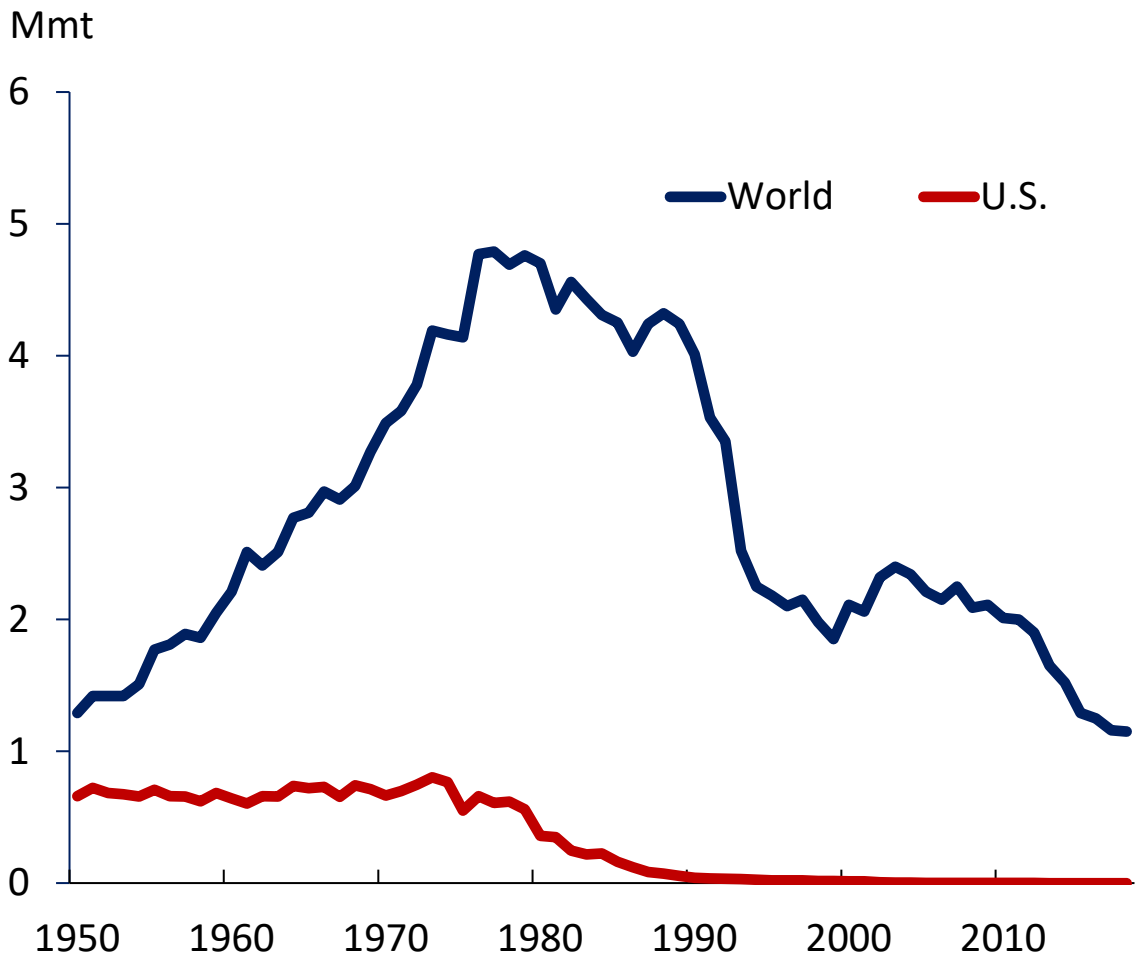
World fiber consumption shares



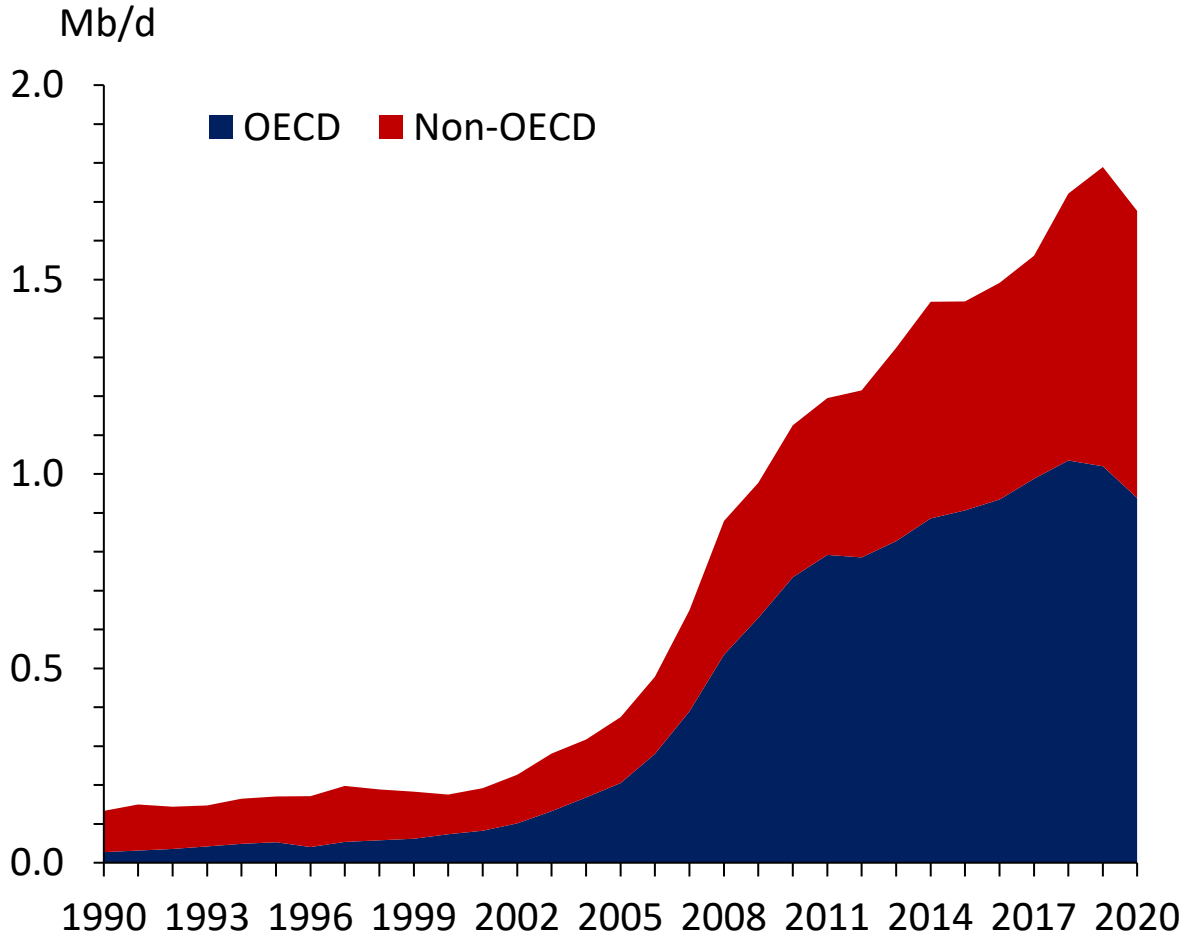
Sources: Authors calculations

Policies can trigger major shifts in patterns of supply/demand

Asbestos use



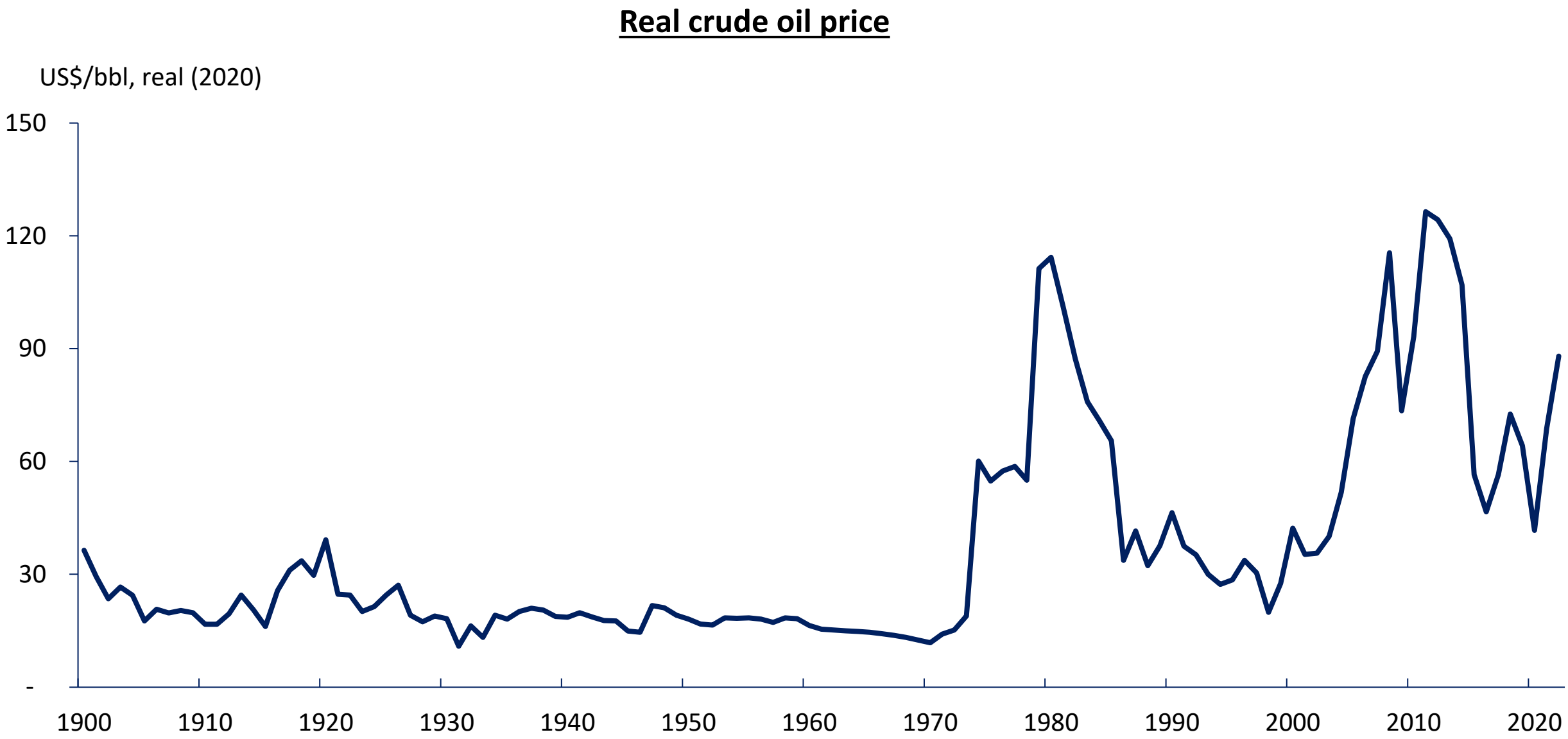
Biofuel production



Sources: BP Statistical Review of World Energy; U.S. Department of Commerce; U.S. Geological Survey; World Bank.

Challenges

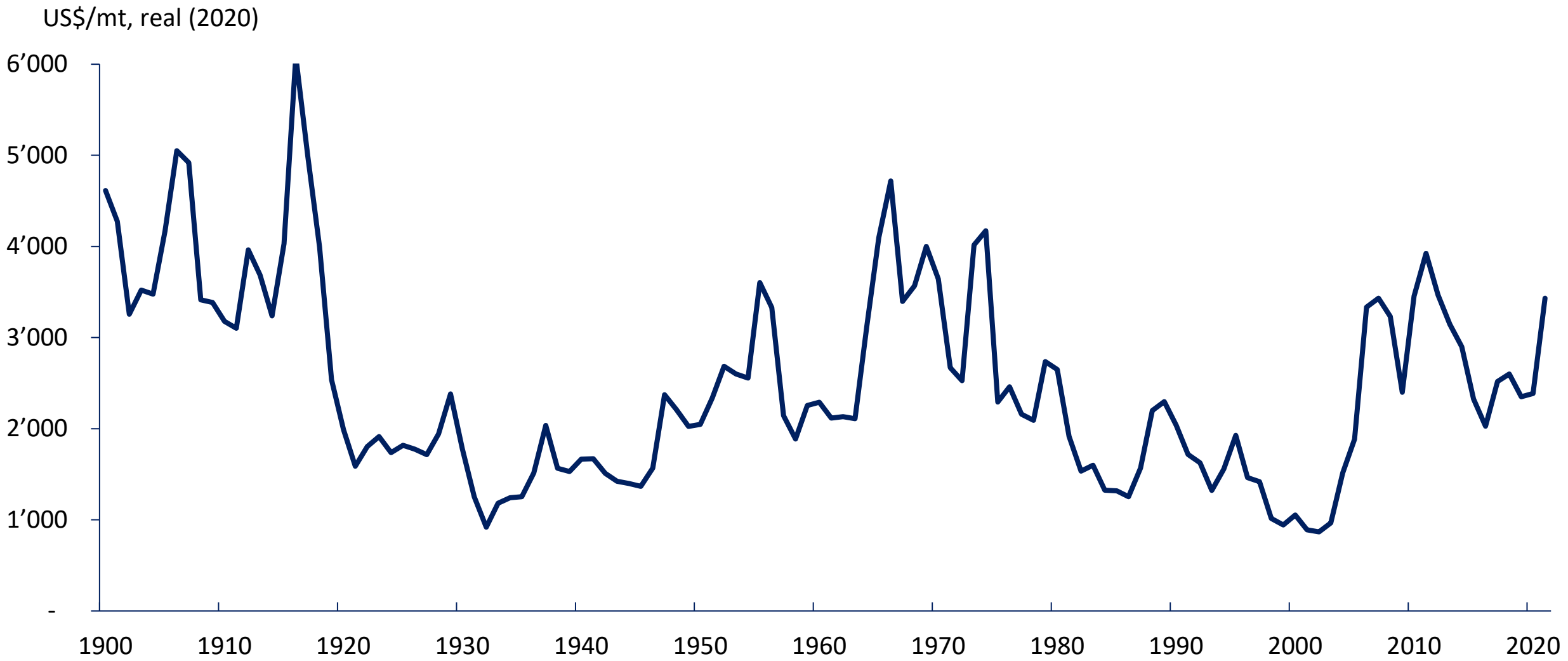
Crude oil prices show repeated boom-and-bust cycles



Source: BP Statistical Review; World Bank.
Notes: Oil prices refers to U.S. average (1900-1944), Arabian Light (1945-1983), and Brent (1984-2022, August). Price series was deflated with the U.S. consumer price index, 2020 base.

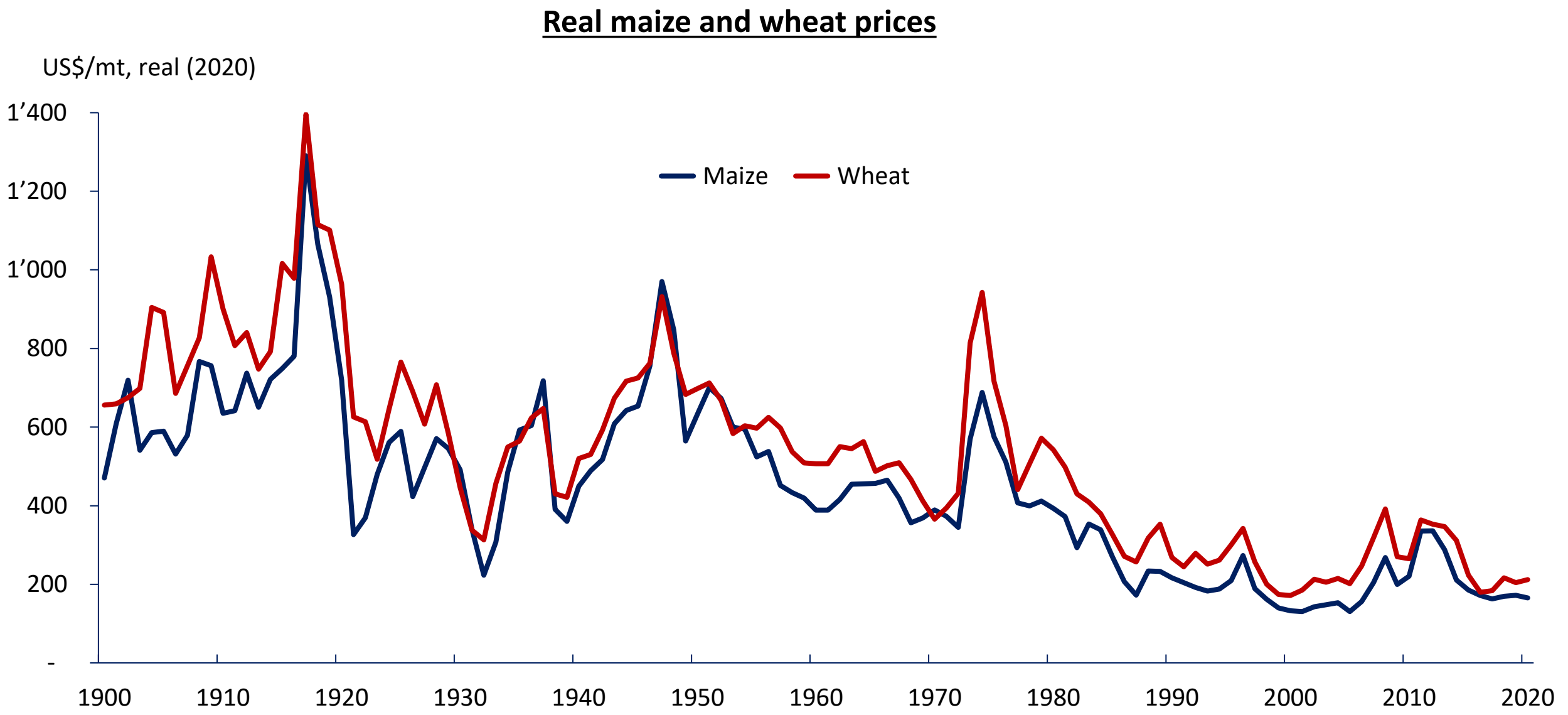
Copper prices volatile and cyclical

Real copper prices



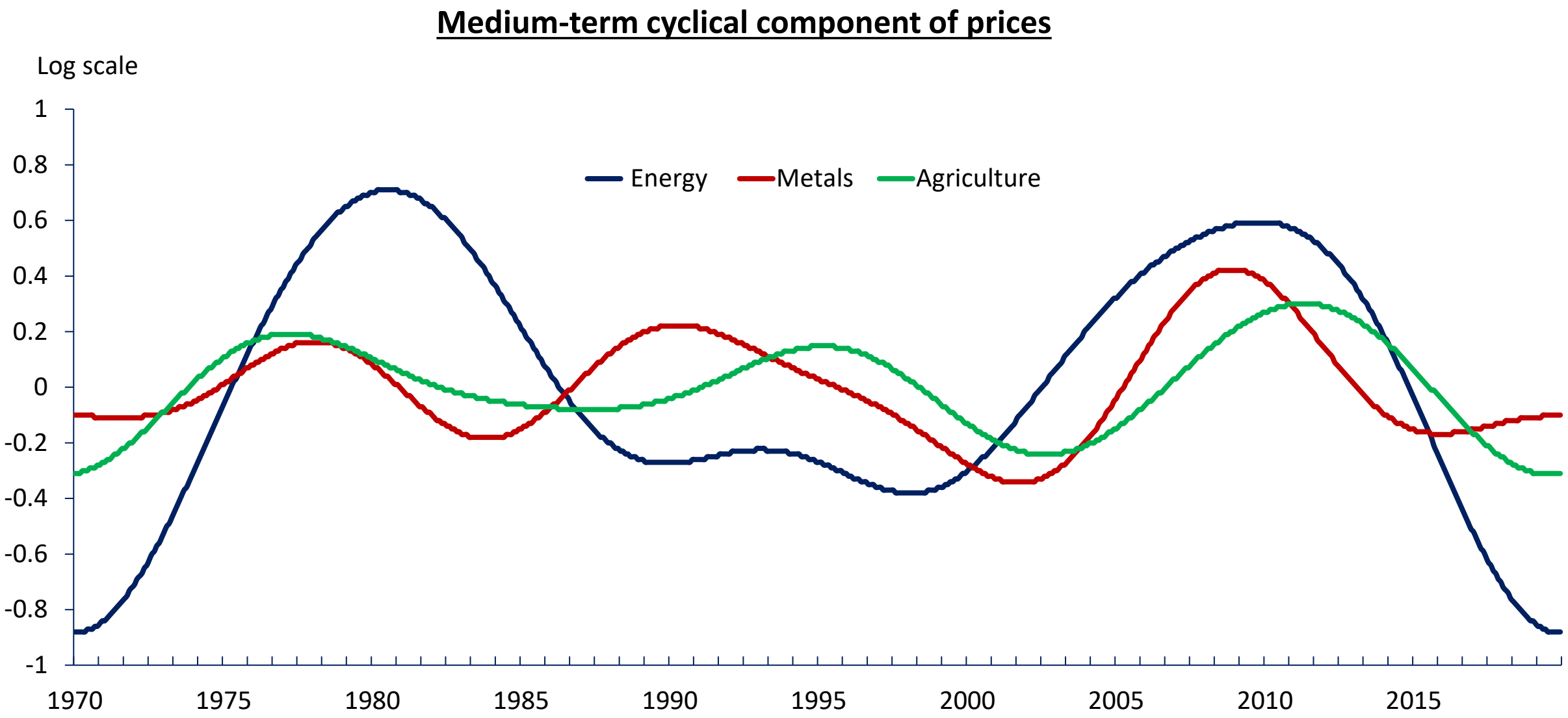
Source: World Bank.
Notes: Price series was deflated with the U.S. consumer price index, 2020 base.

Food prices have seen a long-term downward trend



Source: World Bank.
Notes: Price series was deflated with the U.S. consumer price index, 2020 base.

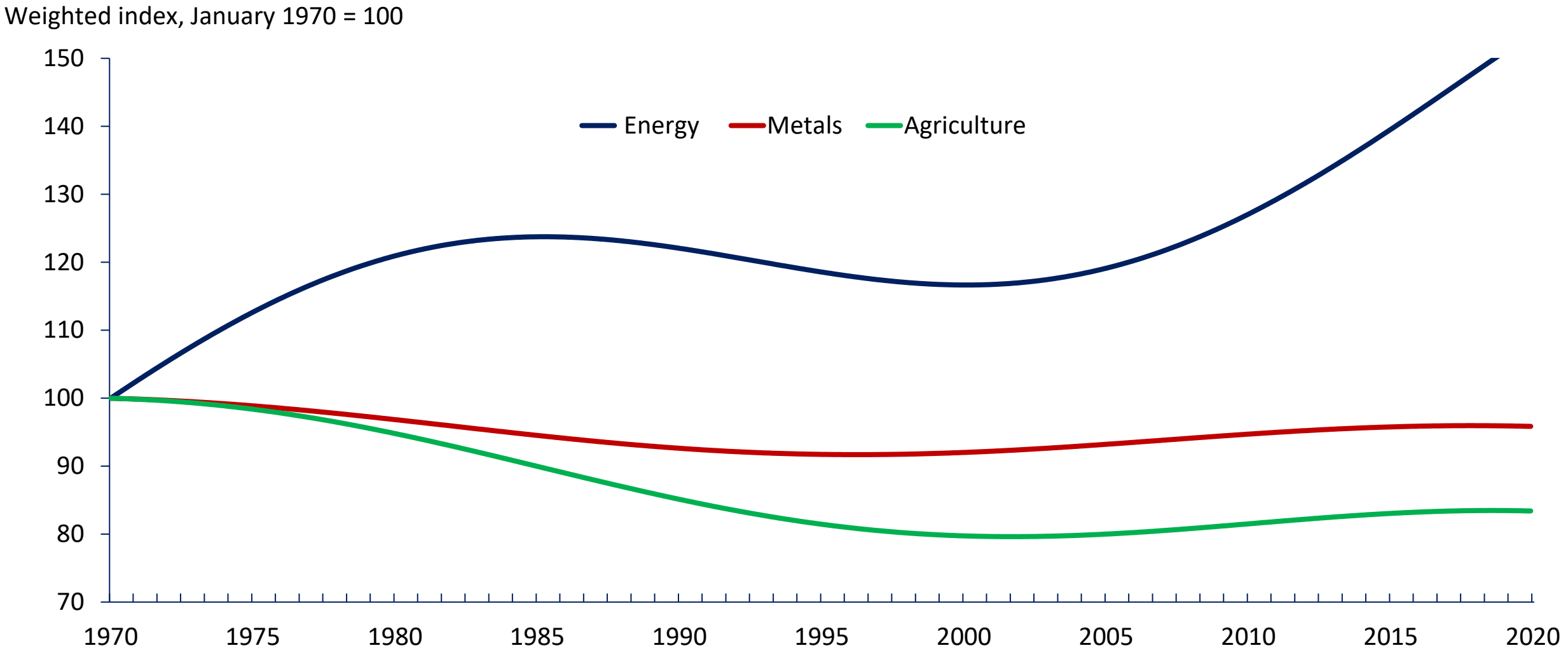
Commodity prices have seen common cycles…



Source: Baffes and Kabundi (2021); World Bank.
Note: Charts show the medium-term component of the commodity price indexes, decomposed using a frequency domain approach (frequency of 8-20 years.)

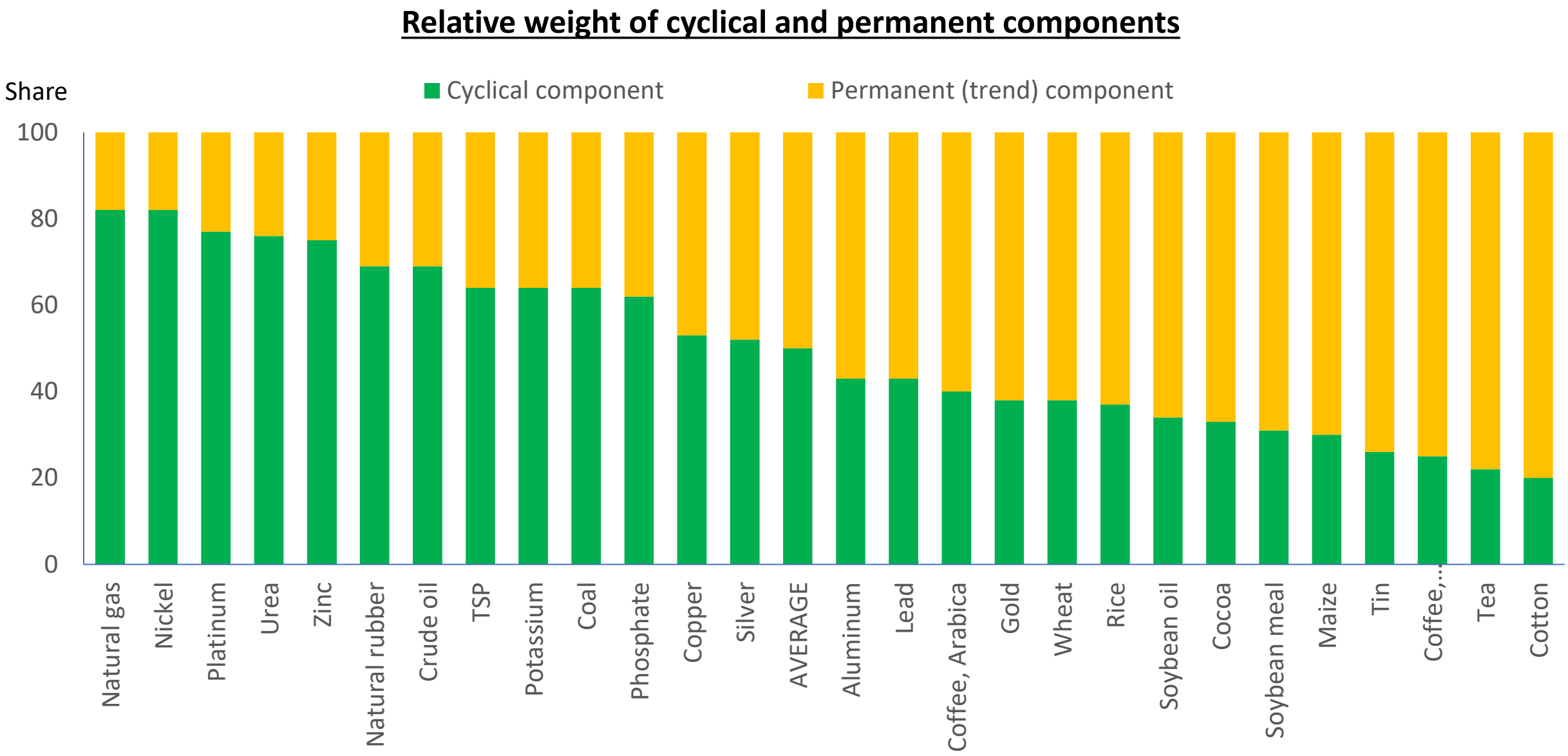
…while long-term trends are markedly different

Long-term (trend) component of prices



Source: Baffes and Kabundi (2021); World Bank.
Note: Chart show the permanent component of the commodity price indexes, decomposed using a frequency domain approach (frequency of greater than 20 years.)

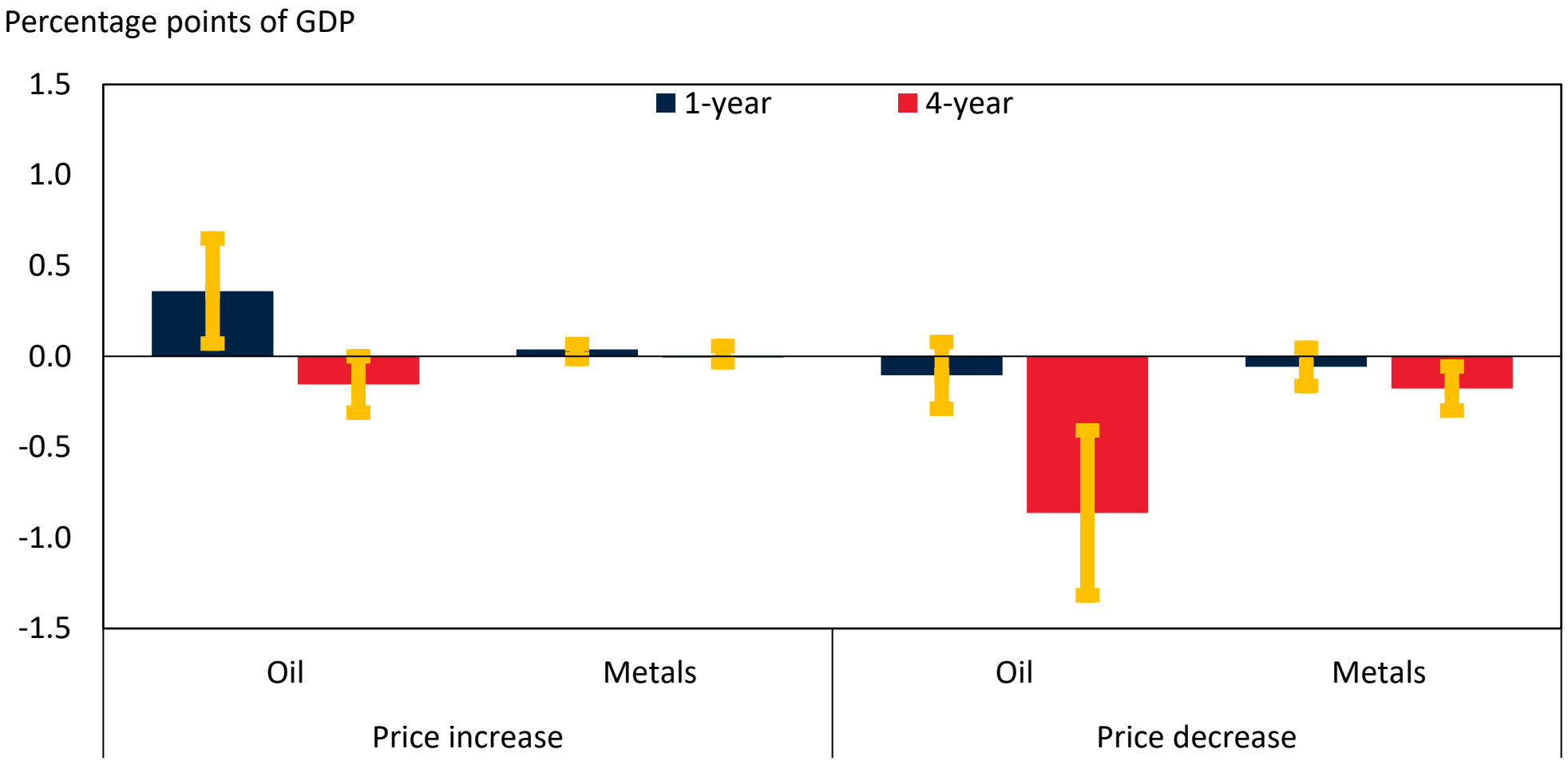
Importance of different shocks is highly heterogenous



Sources: Authors calculations

Price shocks exert heterogenous impact on commodity exporters

Changes in output growth following commodity price increases and decreases



Sources: Authors calculations

Note: Cumulative impulse responses of output growth from a local projection estimation. Dependent variable is output growth after 10 percentage point change in oil/metals price growth. Yellow lines are coefficient estimates and dotted lines are 95 percent confidence bands. Estimated accounting for asymmetric effects of price increases and price declines.

Policy options

Need a wide policy toolkit to respond to heterogenous challenges

- **Energy, metals, and agricultural prices behave very differently and need tailored policies**
- **Shocks affect prices differently at different time horizons**
  - For short-term volatility, generally look through shocks, some fiscal/monetary policy response
  - For medium-term shocks, may need structural adjustments
  - For long-term price declines, asset diversification (sovereign wealth funds), economic diversification, invest in new sources of growth
- **Commodity exporters will face different challenges in the future due to the energy transition and climate change**

Sector-specific challenges: energy

- **Demand**: Fossil fuel demand likely to decline due transition to zero-carbon economy.
- **Energy access:** Providing access to energy a challenge given continued increase in population, and economic growth in low income (high elasticity) countries.
- **Geopolitics**: Could delay the transition in the short term, but accelerate it in the longer term.
- **Investment**: Large-scale investments & new technology will be needed for the energy transition.
- **Governments**: Important role to play to set the right incentives to manage the transition (tax vs. subsidy).

Sector-specific challenges: metals and food

Metals

- **Consumption**: Rising demand as renewable energy sources are metals-intensive.
- **Windfalls**: Metal exporters will need to manage potential windfalls.
- **Concentration**: Metal production concentration is higher in metals compared to energy

Food

- **Food insecurity**: Major problem, especially in low-income countries.
- **Food waste**: At the production stage (low-income countries) and consumption (high income levels).
- **Biofuels**: Account for 3-4% of arable land but contribute only 0.7% to energy consumption.