



Energy Security: Past, Present, and Future

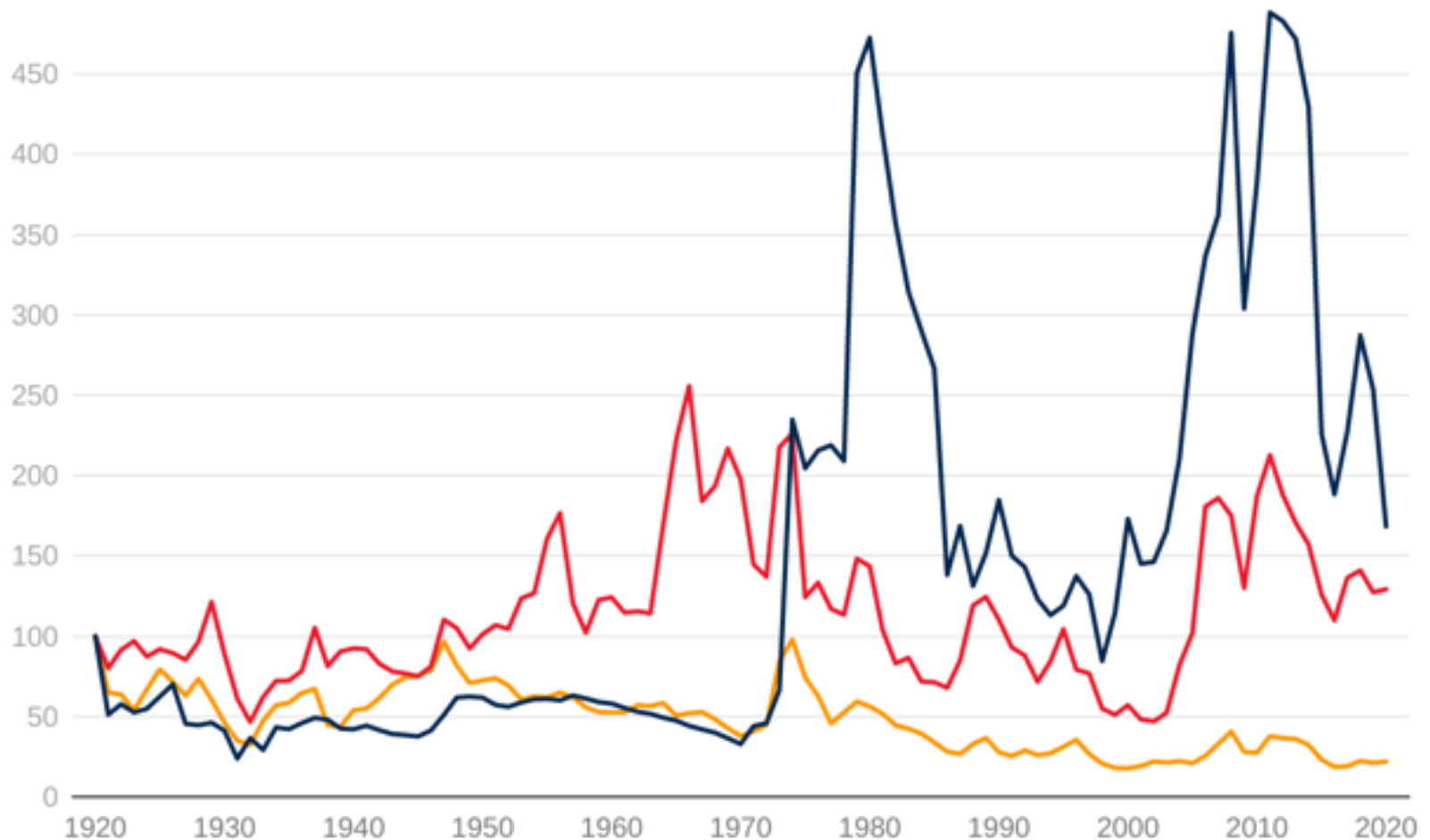
Carmine DiFiglio
Network Faculty Member
Faculty of Engineering and Natural Sciences
Sabancı University

EPRINC
18 July 2023

Real commodity prices since 1920

Index, 100 = 1920

— Petroleum — Copper — Wheat



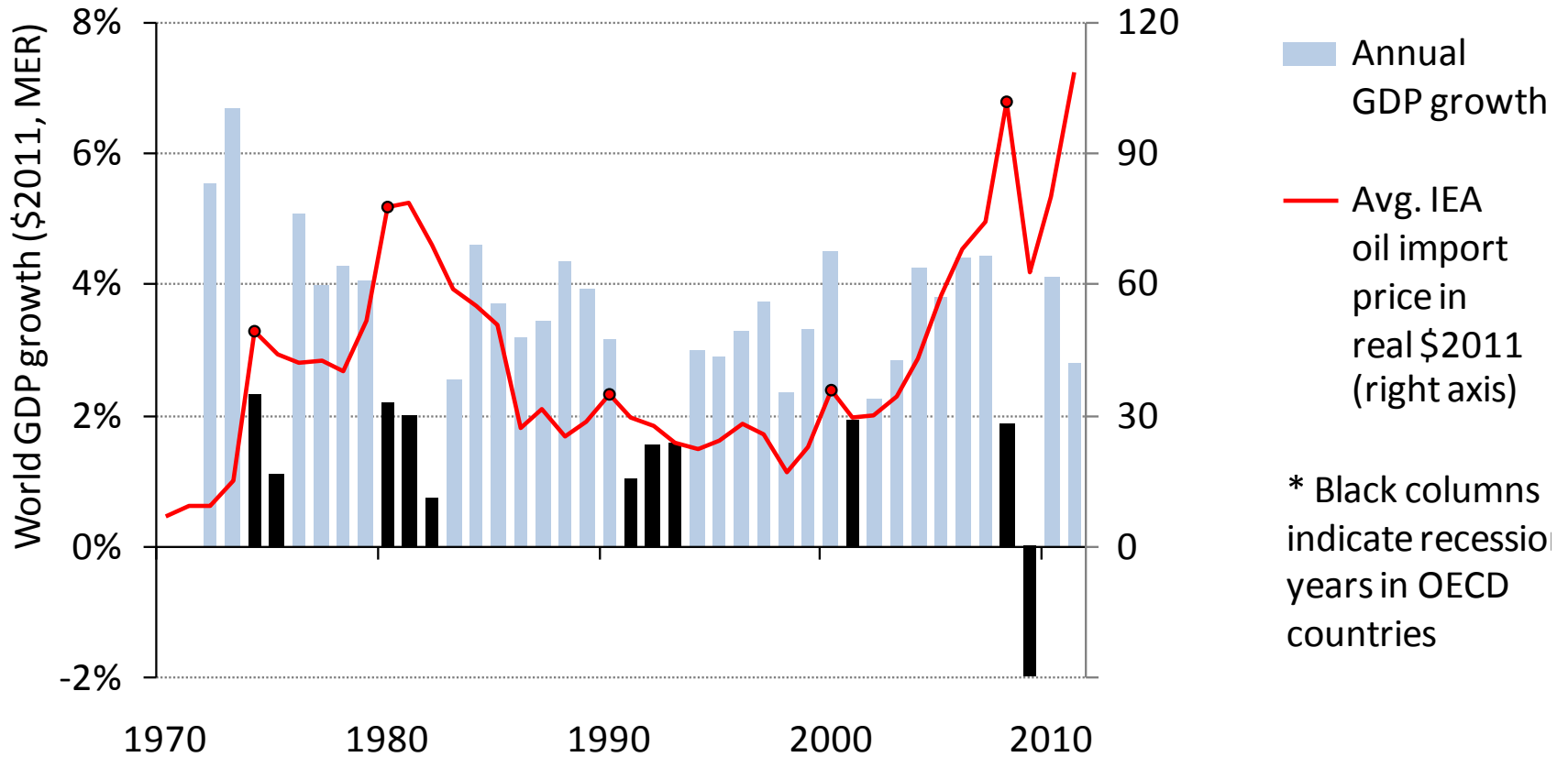
Note: Prices have been deflated by U.S. CPI base year 1990.

Source: World Bank.

Market Managers & Oil Price Volatility

- Since Drake's 1859 oil well, oil prices became volatile due to surges in supply that depressed world prices.
- Price volatility was reduced during the Standard Oil Trust (1870-1911) and resumed after it was found to violate the Sherman Act.
- Spindletop (1901) introduced a vast increase in supply from Texas driving prices down from 1911 through the 1930s.
- In 1935, price volatility was again controlled, this time, by the Texas Railroad Commission issuing weekly oil production orders.
- The TRC's ability to manage prices ended when U.S. spare production capacity ceased to exist by 1970.
- After 1970, price volatility exploded when OPEC took the reins as the world oil market manager.

International crude oil prices and global GDP growth



Source: IEA, *World Energy Outlook 2011*

Oil Price Spikes and the Economy

- **1970 through 2000:** World GDP growth dropped sharply after every oil price spike from & sharp reductions in GDP were rare unless preceded by an oil price spike.
- **2000-2008:** Sharply rising oil prices did not produce a recession, at least not the same way they had affected the economy before 2000.
- **2008:** Quadrupled fuel prices contributed to underwater suburban mortgages & the housing market collapse.
- **2011-2014:** The Libyan price spike sharply grew emerging oil shale production.
- **2014:** The rapid growth of U.S. oil crashed oil prices.
- **2016-2019:** OPEC+'s ability to raise oil prices was constrained by the short time between shale oil investment and production.
- **2020:** oil prices crashed due to the COVID-19 pandemic.

Inflection Point

- **Since the pandemic, the world oil market outlook has changed.**
- **Prior to 2020, the IEA, Chevron, & others expected U.S. shale oil to double by 2030 to keep the world oil market in balance.**
- **After the pandemic, net-zero policies, BEV growth, ESG pressures and greener oil company boards created a wide divergence in the oil demand outlook.**
- **IEA's net-zero scenario is often used as a projection, or as a blueprint, instead of a scenario.**
- **Sometimes, it's assumed that government policies will achieve net-zero, without assessing whether they will.**

Oil Supply & Demand Questions

OIL SUPPLY

- Will IOCs reduce E&P investments based on net-zero, because of ESG, or new corporate management?
- Will U.S. restrictions limit shale oil growth?
- What about the increasing government control of the energy sector?
- Due to these pressures, will E&P investments collapse faster than the need for new production to meet demand growth and offset mature well decline rates?

OIL DEMAND

- Is net-zero BEV & HFCV growth achievable?
- Will the high-growth non-OECD continue to rely on ICE vehicles?

Energy Security Questions

POWER SECTOR

- Can the OECD power sectors rapidly increase intermittent renewables, eliminate natural gas, add enough storage, and accommodate a large load increase from BEVs?

GEOPOLITICAL CONCERNS

- Are we trading one supply chain problem (oil from the Mideast) to another (minerals from China & Chinese client states)?
- Will we see a new alignment of oil producers and consumers that affects U.S. national security?

GOVERNANCE OF THE ENERGY SECTOR

- Are governments replacing markets with industrial planning?