

CIO Vantage Point



Commodity Investing

Spotlight on Commodities

Commodities have been brought into focus by climate change narratives, a need for infrastructure renewal, and threats of global fragmentation.

Industrial Metals to Drive Energy Transition

Oil and gas continue to account for a significant share of global energy needs; Industrial metals will play a key role in the long-term energy transition.

A Looming “Global Food Crisis”

Agriculture commodities remain more relevant than ever as extreme weather and geopolitical tensions spell the threat of a “global food crisis”.

Benefits of Commodity Investing

Exposure to commodities, including gold, allows investors to benefit from rising prices and provides valuable portfolio diversification.

INTRODUCTION

Investing in Commodities

Dear valued clients,

The past two years have taken us from a global pandemic of unprecedented scale to inflation hitting its highest level in 40 years.

We have witnessed prices of commodities go through the roof, with Russia's invasion of Ukraine further fuelling discussions of a commodities super-cycle.

Slowly but surely, several long-term forces lay in the undercurrent, driving transformation across commodity markets. Billions of dollars in capital have been poured into improving renewable energy capabilities, setting the wheels of the energy transition in motion.

Given the colossal amounts of metals needed to construct low-carbon infrastructure, the supply and demand in commodity markets in the long run will inevitably face great change.

In this CIO Vantage Point, we discuss why fossil fuels will continue to meet the bulk of the world's energy needs in the medium term, and why gold remains a strategic commodity to own. Amid heightened threats to global food stability, agricultural commodities have also been brought to the fore.

We highlight the benefits and risks of commodities as an asset class, and how it plays an important role as a diversifier in an overall portfolio of bonds and equities.

I hope you enjoy the read.



Hou Wey Fook, CFA
Chief Investment Officer

Energy transition in motion

Commodities

Snapshot

Introduction

As the world forges a path of progress, commodities - the physical building blocks of the global economy - will see ever-growing demand, providing tailwinds for those in the value chain of commodity production. Yet from a supply standpoint, climate change narratives and rising needs for infrastructure renewal, coupled with geopolitical risks, set the stage for persistent undersupply in coming years. These forces point to the inclusion of commodity exposure for portfolio resilience – more so now than ever before as we stand at the edge of a new inflationary era.

Spotlight on Commodities

Geopolitical tension, supply shortages, and disruption of distribution networks exacerbate fluctuations in commodity markets.

Fossil fuels to bridge the renewables gap

Before renewables are ready to take over the reins, traditional energy sources remain indispensable in meeting the bulk of the world's energy needs.

The energy transition is metals-intensive

Given the vast amounts of metals crucial for the construction of low-carbon infrastructure, the demand and supply in commodity markets will be reshaped

The emerging test of food security

Global supply of agricultural commodities has been impacted by climate change, high energy costs, and rising protectionism. Investments to build out required infrastructure can help to alleviate shortages.

Commodities for **inflation protection**

As a key component of inflation, commodities are a solid hedge against rising prices. Recent volatility in equity and bond markets accentuates its diversification benefits.

Risks of commodity investing

Aside from greater volatility, investors should be mindful that commodities are traded via futures contracts - returns vary from the underlying due to roll yields.

Value in Scarcity

DBS Chief
Investment Office

All throughout history, commodities have supported the development of humankind, providing the building blocks for food, shelter, and energy. From the dawn of civilisation to industrialisation, and even on to the modern amenities of today, commodity markets have kept the world well stocked and supported advancements in technology and improvements in standards of living of a global population that has quadrupled over the past century.

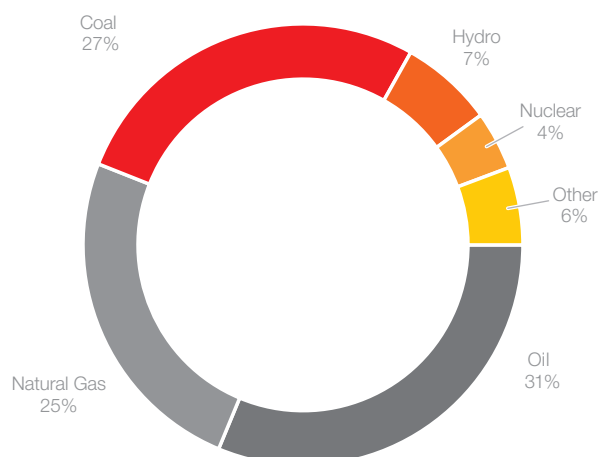
The dual crises of the past two years have shone the spotlight on commodity markets.

Since the turn of the decade, wild swings across commodity markets have made headlines. As the pandemic brought the world to an abrupt halt, most commodities experienced a sharp drop in demand. Notably, crude oil plunged to its sharpest monthly decline in April 2020. Amid economic recovery amplified by supply constraints, prices soon bounced back as quickly as they fell. Still reeling in the aftermath of the pandemic, Russia's invasion of Ukraine and the resulting sanctions imposed on Russia have taken discussions of a commodities super-cycle up a notch, given the world's reliance on Russia for metals, grains, and energy.

While today's price volatility may be alarming, it comes not without precedent. The inelastic nature of demand and supply implies that short-term price fluctuations in individual commodities are common. However, overlaying the immediate ebb and flow of commodity prices are longer-term forces driving transformation across commodity markets, reflecting the dynamism of one of the oldest asset classes in history. These include:

- Fossil fuels' continued relevance in the medium term: Despite the environmental, social, and corporate governance (ESG) narrative aspiring to phase out fossil fuels in favour of renewables, oil and gas are expected to continue fuelling a significant share of global energy needs in the medium term while the transition remains under way. Even as the transition progresses, fossil fuels could retain its relevance as an integral component of the world's energy mix for decades to come. After all, the world would be hard pressed to find an energy source to substitute both the energy density and transportability of fuels, especially for applications such as aviation or maritime transport, where vehicles must carry heavy loads over extended distances without refuelling. Although investments and innovations are pouring into renewables infrastructure, before renewables are prepared to take over the reins, fossil fuels will continue to power the world.

The world continues to be reliant on fossil fuels – breakdown of global energy demand by energy source

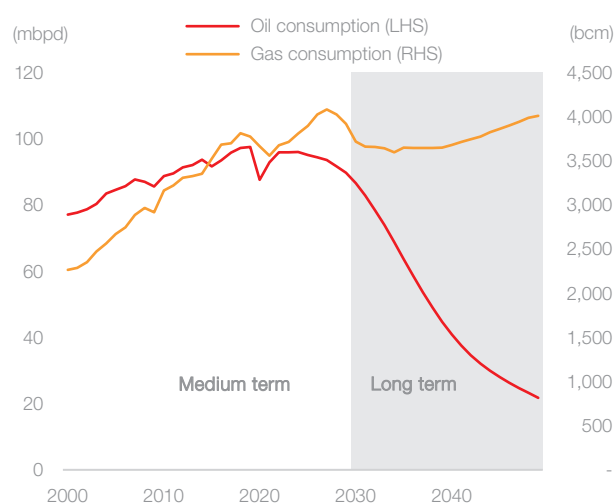


Source: bp Statistical Review of World Energy July 2021, DBS

Furthermore, as the world stands on the cusp of this transition, a mismatch between the persistence of fossil fuel demand in the medium term and political pressures calling for an immediate halt of investments into this sector may support elevated prices as the sector struggles to juggle decarbonisation targets while meeting energy demand. Already, we are seeing the results of underinvestment in fossil fuels, with crude oil soaring to its 13-year high at the start of 2022. Since energy is used in the production of most other commodities, sustained increases in energy prices would push up commodity prices across the board.

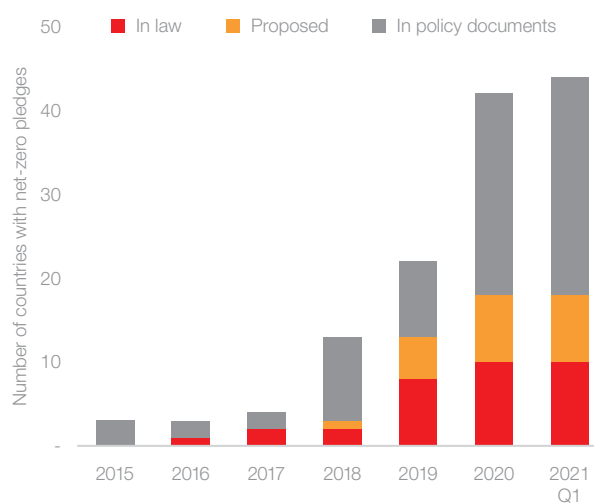
- A long-term transition to lower carbon intensity: The continued significance of fuels in the coming years does not detract from a longer-term movement towards energy substitution by less carbon-intensive sources. Heavy emphasis of sustainability in national agendas and billions of dollars in capital pouring into improving renewable energy capabilities have set the wheels of the energy transition in motion. This transition is on track to reshape supply and demand in commodity markets in the long run, given the vast amounts of metals that are crucial for the construction of low-carbon infrastructure such as iron ore for wind farms, copper for solar panels, and lithium for battery storage.

Oil expected to retain significance in the medium term before longer term substitution by renewables



Source: Bloomberg NEF, DBS

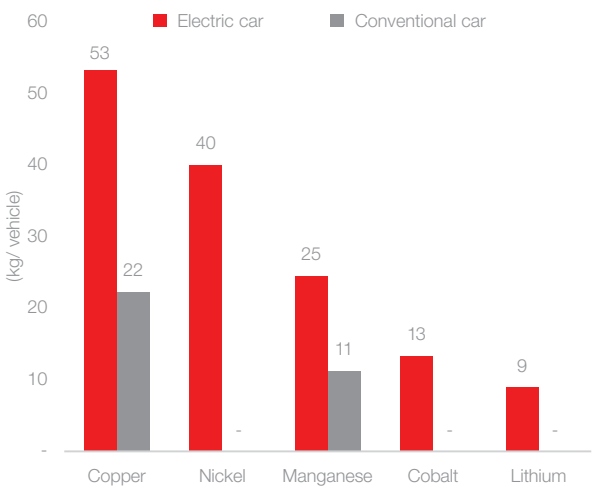
Governments and corporates have committed to shift the world's energy mix from brown to green



Source: International Energy Agency (2021), Net Zero by 2050, IEA, Paris, DBS

The energy transition is metals-intensive

Minerals used in electric cars compared to conventional cars



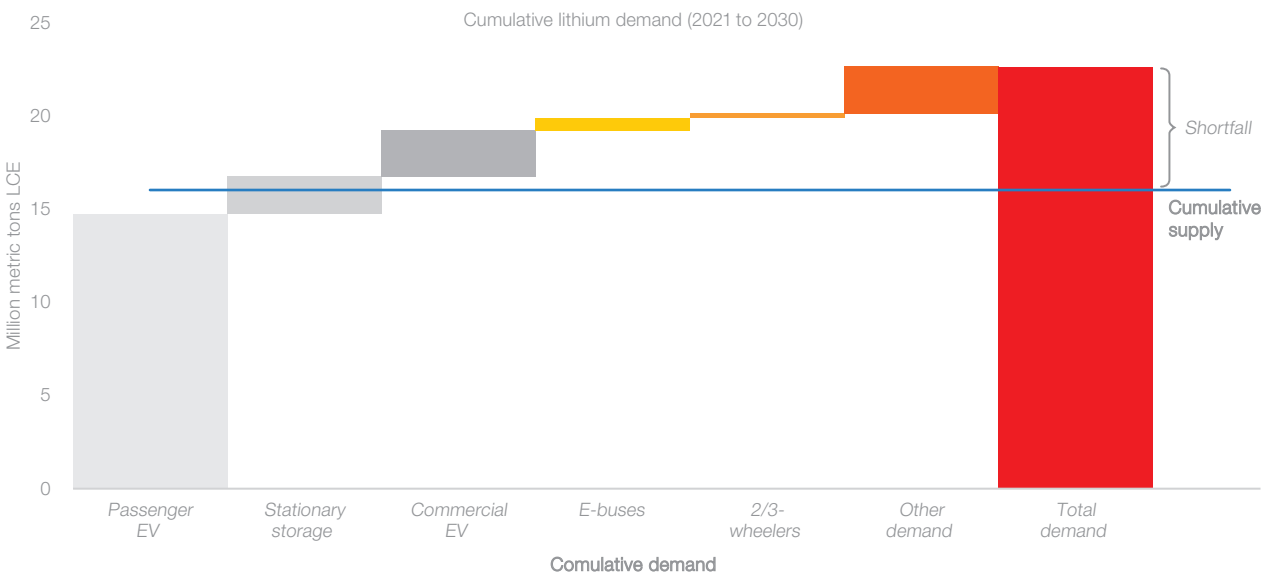
Source: International Energy Agency, DBS
 Note: The values are for the entire vehicle including batteries, motors and glider.

Despite expectations that demand would ramp up over the coming decades, mining and resource companies continue to underinvest in the discovery and production of metals. The irony is that, in a bid to appear environmentally faultless, the widespread imposition of regulations presents formidable challenges to resource producers looking to invest in mining capacity to meet energy-transition demand. For example, extensive environmental studies required as a prerequisite to implementing mining projects has rendered many such projects unfeasible. Such underinvestment in capacity layers a cost-push element to “greenflation” – or rising costs of materials used in the green transition.

- Global fragmentation driving up price risks: Geopolitical tensions, supply shortages, and disruption of distribution networks have

Greenflationary pressures: Lithium supplies may be insufficient to meet energy transition demand by 2030

Cumulative lithium supply and demand under net zero projection scenario (2021 to 2030)



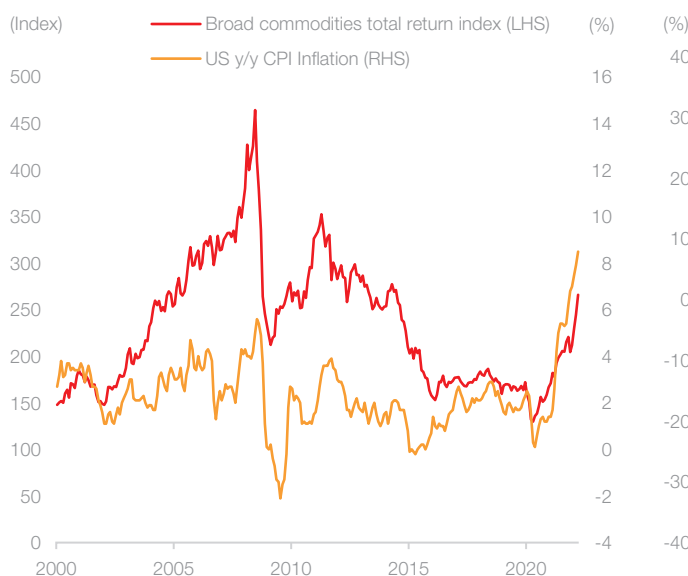
Source: Bloomberg NEF, DBS

all added momentum to a deceleration in globalisation. Pandemic-induced supply chains shocks have fuelled protectionist inclinations, as policymakers focus on safeguarding supplies of essential provisions, especially food and energy, as a matter of national security. To add to this, tensions in Eastern Europe and the resulting sanctions on Russia may have longer-term implications on commodity markets beyond the present restrictions on Russian exports. Firstly, starving Russian hydrocarbon and mineral extraction resources from foreign capital flows would limit supply from Russia in the longer term. Secondly, the current strife may amplify risks of global fragmentation between democracies and autocracies, with extended ramifications on global trade uncertainty. This would exacerbate commodity price risks given Russia's significance in global commodity trade.

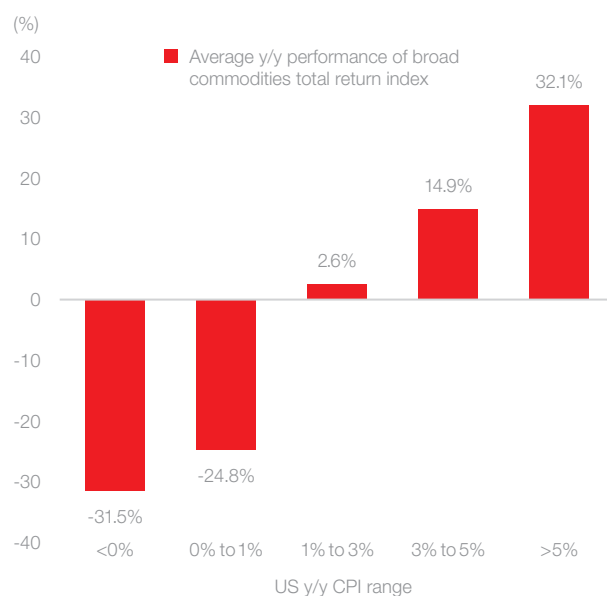
Benefits of commodity exposure. The above trends reiterate that while demand for specific materials could be dramatically altered, the world will always need commodities. The world's dependence on commodities and the interaction between commodity supply, demand, and overall development of technologies and the way we live, make commodities a unique asset class that provides the following benefits to investors:

- Inflation protection: Amid deglobalisation pressures and geopolitical uncertainties that have driven up cost-push inflation, other changes in the structural backdrop such as rising labour power suggest that we may be standing at the start of a new inflationary era. Given that high inflation is often accompanied by soaring commodity prices, investors would do well to consider exposure to commodities

When inflation goes high, commodities go higher



Source: Bloomberg, DBS

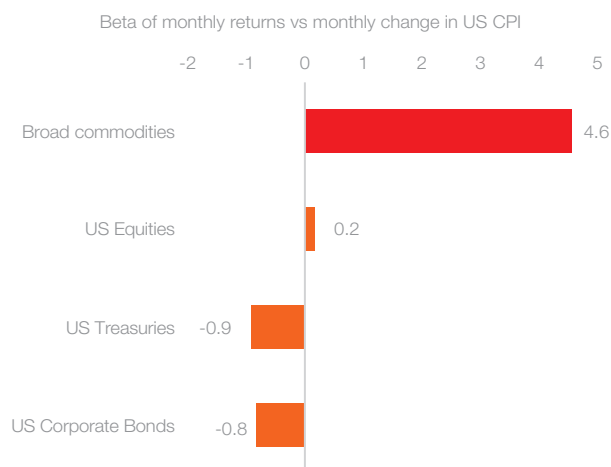


Source: Bloomberg, DBS

as an inflation hedge. As a key component of inflation, commodities help defend a portfolio against the impact of rising prices. In contrast to equities and bonds which have historically shown low or negative beta against inflation, returns of broad commodities display significant beta against inflation over the past 50 years, demonstrating commodities' effectiveness as an inflation-hedging tool.

- **Diversification:** Recent volatility in both equity and bond markets amid rallying commodities illustrates the diversification benefits of commodities. Low correlations against stocks and bonds allow commodities to reduce the volatility of a typical 60/40 portfolio. Indeed, compared against long-term historical data over the past 50 years, commodity returns displayed low correlations of 0.12 against equities and -0.05 against bonds. These low correlations stem from the sensitivity of commodities to non-

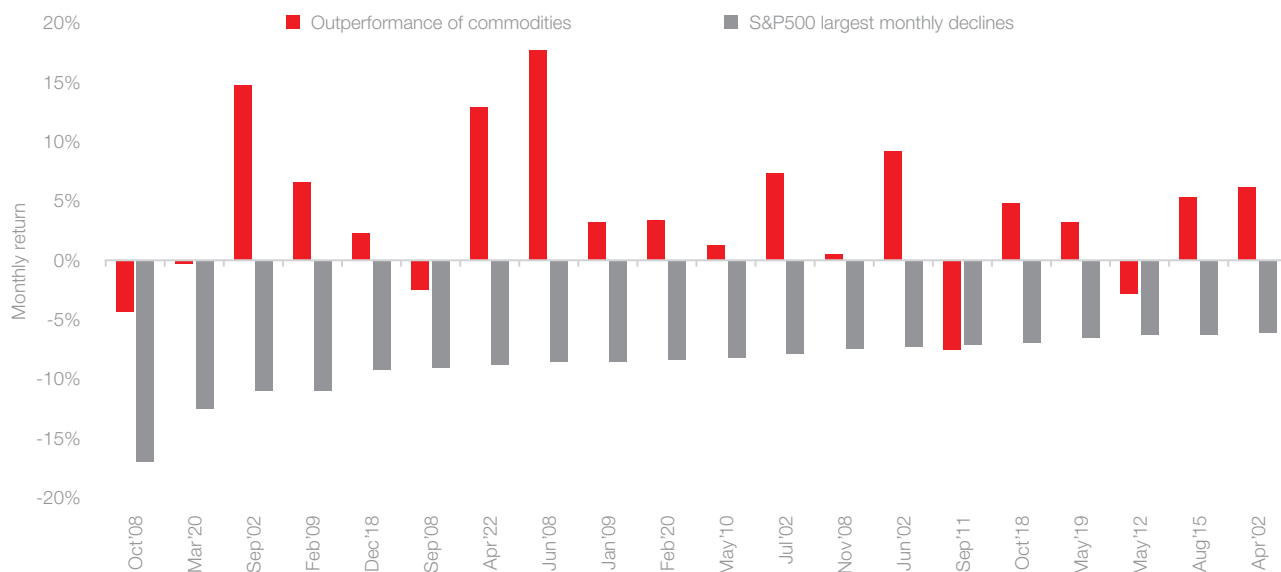
Commodities are inflationary assets to hold



Source: Bloomberg, DBS
Note: Based on returns since 1973

financial drivers such as weather, pestilence, and political unrest in producing countries, which are unlikely to influence global equities and bonds to

Commodities outperformed during most of the S&P500's worst months in the last two decades



Source: Bloomberg, DBS

the same extent. Although correlations between asset pairs have since risen in recent decades, commodities continue to cushion against equity volatility. To illustrate, over the past two decades, commodities broadly outperformed equities during all but four of the S&P500's worst 20 months, demonstrating the value of this asset class in insulating against equity downturns.

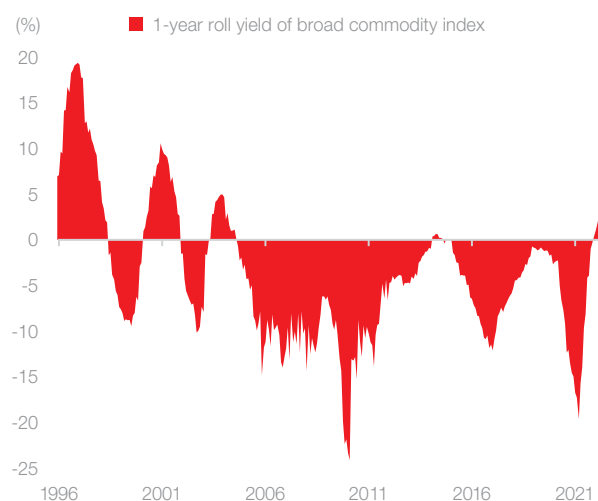
Risks of commodity investing. Since few investors would be interested in receiving physical barrels of oil or bales of cotton, most commodity funds do not invest in the actual commodities. Instead, commodities are typically traded via futures contracts. Although futures prices usually closely track the underlying assets, it is important to note that returns from futures could vary from that implied by underlying commodity prices because of risks embedded in the use of these financial derivatives.

- Negative roll yields in contango markets: Since futures contracts come with a fixed maturity date, to maintain exposure to the underlying commodity, investment managers must

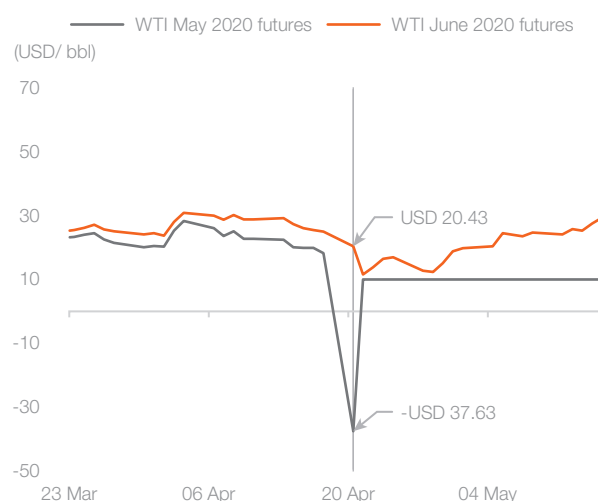
exit futures as they approach maturity, and simultaneously long a contract with a more distant maturity date as a replacement. The difference in the price of futures closer to maturity and their longer-dated counterparts, compared with the change in the spot price over the same period, drives roll yields. Since roll yields could move in either direction depending on the outlook for the commodity, they could cause a commodity investment's returns to either exceed or fall short of spot price changes. When futures markets are in backwardation, futures trade at a higher price as they approach maturity and investors will benefit from positive roll yields. The converse also applies, and commodity portfolios would expect to incur negative roll yields when markets are in contango, and further-dated futures are more expensive than the spot price.

- Potentially negative futures prices: A much more remote, but high impact consideration is the possibility of exposure to negative futures prices. While few had previously such a scenario much consideration, on 20 April 2020, the price of US

Roll yields in futures investing



The day oil prices went negative



West Texas Intermediate (WTI) crude oil futures contract expiring the next month crashed below zero for the first time in history. This black swan event brought attention to the possibility that investing in futures could have more downside in prices than expected.

In this case, the negative pricing of the May 2020 WTI contract occurred amid an unprecedented collapse in crude oil demand given a shutdown in global economic activity as the Covid-19 pandemic ravaged the world. Factory activity came to a halt, highways were eerily empty, and planes were grounded. However, oil producers could not cut back on production quickly enough, and storage facilities were already brimming with surplus oil. The negative prices theoretically meant that buyers were compensated to remove barrels of oil in a market that was severely oversupplied.

Other than commodity futures, shares of commodity-producing companies offer convenient, albeit indirect exposure to commodities. If a commodity rises in price, upstream companies producing that commodity are likely to experience increased earnings and margins. While returns of commodity-sector equities are indeed highly correlated against the broad commodity index, one means of reducing volatility is to invest in commodity conglomerates that have operations in both upstream and downstream portions of the value chain. That said, investors should note that commodity-sector equities are also susceptible to non-commodity factors such as operating risks, the company's capital structure, and performance of any non-commodity businesses under the same company.

Few risk assets can rise above inflation when commodities edge towards a new cyclical boom. As the saying goes – If you can't beat them, join them.



Industrial Metals

From space shuttles to drink cans. Metals have been used since prehistoric times to cast tools, weapons, and other objects. Their importance to humankind has grown over time, and today, industrial metals are key inputs in a myriad of industries: copper is used in wiring due to its conductivity, aluminium has uses ranging from drink can production to aerospace engineering because of its light weight and corrosion resistance. Steel is equally ubiquitous with applications ranging from cutlery production to automobile construction.

In sync with global growth. Both consumption and production of most industrial metals are dominated by the world's largest economies (i.e. China, US, and the EU), which provides a stable and long-term demand base for this sub-asset class. Additionally, the sector exposure for industrial metals is highly favourable; both transport and construction are multi trillion-dollar industries with wide-ranging end uses and healthy forecasted growth rates.

Mind the gap. The global outlook for industrial metals is one that can be summarised by growing demand and a limited, finite supply.

	Top three consuming countries/regions	Top three producing countries/regions	Major global end uses (sector)
Aluminium	China – 60% EU – 10% US – 8%	China – 60% Russia – 5% Canada – 5%	Transport Construction Foil and packaging
Copper	China – 55% EU – 12% US – 7%	China – 43% EU – 10% Chile – 9%	Construction Electronics Transport
Nickel	China – 54% EU – 9% US – 3%	China – 20% Japan – 6% Canada – 4%	Stainless steel Batteries Electroplating
Zinc	China – 50% EU – 14% US – 7%	China – 46% EU – 14% South Korea – 6%	Construction Transport Consumer goods
Crude steel	China – 52% Other Asia – 19% EU – 8%	China – 51% Other Asia – 20% EU – 8%	Construction Transport Machinery

Source: EIU, OECD, UC RUSAL, United States Geological Survey, Lucintel, Statista, Investing News Network

- Greenwashing and underinvestment to limit supply: A main theme in the supply of base metals is that of chronic underinvestment in the past decade. The reasons for this are twofold: i) global focus on climate change mitigation strategies has warped the relationship between increased prices and supply response; and ii) long investment horizons and high hurdle rates make procuring financing for these projects challenging. As a result, industrial metals will find a lower supply baseline and higher price levels moving forward.

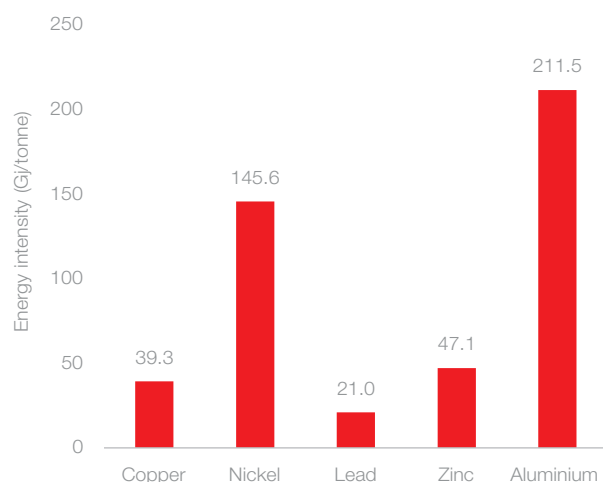
The reduction in supply will be further exacerbated by policy-led decisions such as energy rationing and emissions control in China. This is significant as China is the largest global producer for majority of the industrial metals complex, including aluminium, copper, nickel, and steel. Metals that have an energy intensive

production process like aluminium and nickel will be particularly affected by these measures; expect the supply of these metals to be curtailed more sharply than others should there be a tightening of emissions policies or another energy crunch.

- Accelerating demand driven by climate change: The most significant underlying catalysts for base metal demand are the energy transition and climate change mitigation. The IMF estimates that the demand boom triggered by the energy transition could lead to more than a fourfold increase in the value of metals production - totalling USD13t over the next two decades for the copper, nickel, lithium and cobalt. In particular, cobalt and lithium will experience the greatest consumption growth, increasing by four-fold and seven-fold respectively by 2050.

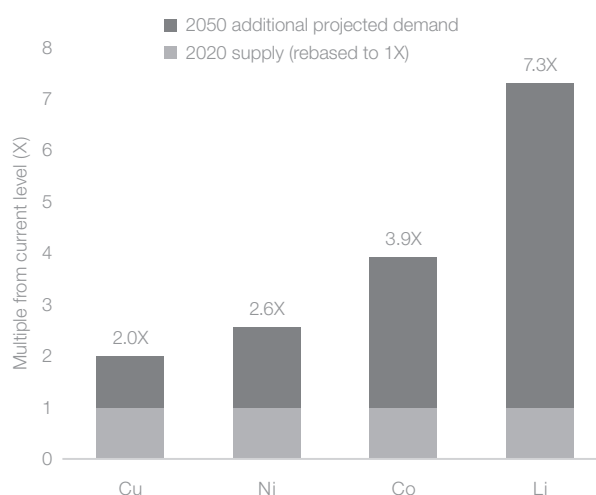
Aluminium and Nickel production are energy intensive

Base metals production energy intensity



Source: SocGen Cross Asset Research/Commodities, John Rankin, CSIRO, Process Science and Engineering

Energy transition base metal requirements (incremental)



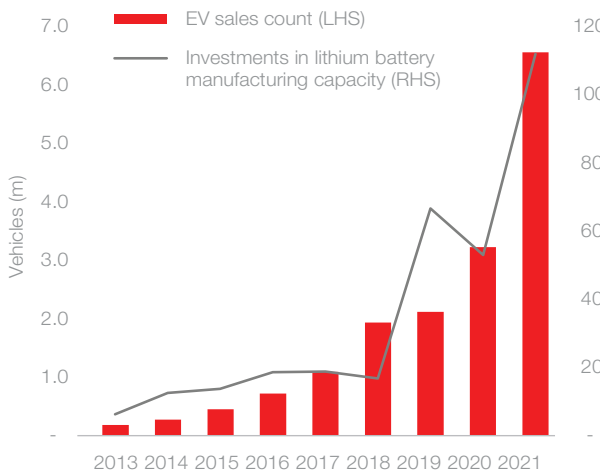
Source: IMF

Emerging industries, particularly renewables and Electric Vehicles (EVs) will contribute significantly to the growing demand and price of base metals moving forward. EV sales count grew more than eightfold since 2016 and investment in EVs has followed suit. In addition to lithium, nickel and copper are also important EV production inputs and

will play an important role in the electrification of the global automotive fleet. A key datapoint to highlight here is that Nickel demand for use in EV production is forecasted by Bloomberg to increase close to 10 times in the next decade, from c.52,000mt in 2021 to c.500,000mt in 2029.

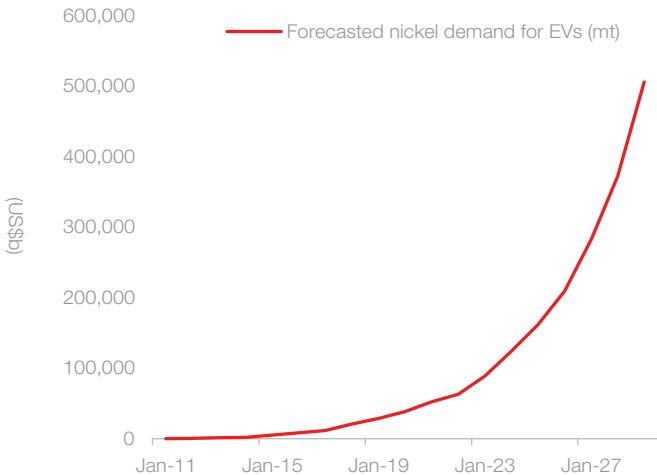
EV sector growth to fuel investment in Lithium and Nickel

Global EV sales count and investments in battery manufacturing capacity



Source: Bloomberg NEF, Bloomberg Intelligence, DBS

Forecasted nickel demand for EVs



Source: Bloomberg, DBS

Soft Commodities

The bread and butter of human civilisation.

Ever since the agricultural revolution, humans have depended on crops for sustenance. With production and transportation advancements in the past centuries, these commodities have boomed in terms of production volume and proliferation on a global scale. Fast-forward to 2022, agricultural commodities remain more relevant than ever as the threat of a “global food crisis” looms on the horizon.

More than just food. Over time, agricultural commodities have evolved from being just direct food sources and livestock feed to having key industrial uses as well. This is especially true for grains (wheat, corn/maize, soybeans, barley etc.), which have been increasingly channelled into ethanol/biofuel production and other industrial

chemicals in the past decade. Due to the diverse nature of agricultural commodities and the specific climate and conditions needed to grow different crops, supply is relatively diversified with no one country dominating production or consumption across the complex. A general rule of thumb is that grain production requires temperate (cooler, further from equator) climates, while soft commodities such as coffee and sugar cane can be grown in tropical (warmer, closer to equator) climates.

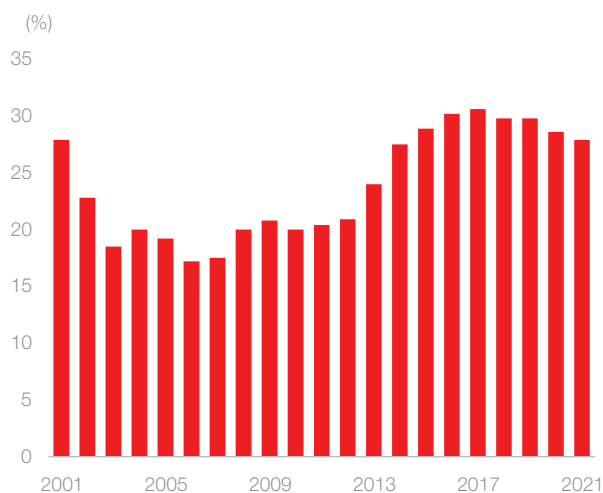
Multi-barrelled supply shocks raise risk of “global food crisis”. The global supply of agricultural commodities has been impacted by climate change, high energy costs, geopolitical tensions, and logistical hiccups at ports. This backdrop has adversely affected entire value chains for numerous commodities, ranging from wheat, barley, and corn to sunflower oil, leading to rising risks of a “global food crisis”.

	Top three consuming countries/regions	Top three producing countries/regions	Major global end uses (sector)
Wheat	EU – 14% China – 18% Other East Asia – 7%	EU – 18% China – 17% India – 14%	Food Livestock feed Seed
Corn/Maize	US – 27% China – 25% Japan – 1%	US – 32% China – 23% Other East Asia – 7%	Livestock feed Biofuel/ethanol Food
Soybean	China – 31% US – 18% Brazil – 13%	China – 32% Brazil – 37% Argentina – 13%	Livestock feed Food Industry
Palm Oil	Indonesia – 22% India – 11% EU – 9%	Indonesia – 60% Malaysia – 23% Thailand – 4%	Food Industry Biofuel
Sugar	India – 16% China – 9% Other Asia – 15%	Brazil – 20% Other Latin America – 9% India – 19%	Food
Coffee	EU – 25% US – 16% Brazil – 13%	Brazil – 35% Vietnam – 17% Mexico & Central America – 12%	Food

Source: EIU, USDA, International Grains Council, World Economic Forum, UN Food and Agriculture Organization, Our world in Data

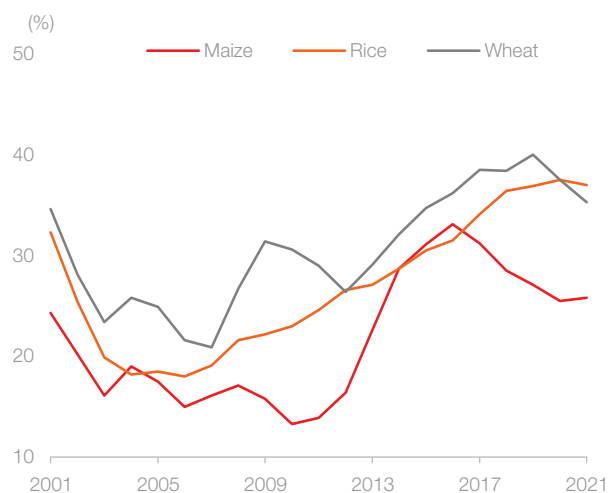
Falling agricultural stocks on back of rising global consumption

Aggregate stocks-to-use



Source: U.S. Department of Agriculture, World Bank

Stocks-to-use ratio for maize, wheat, and rice



Source: U.S. Department of Agriculture, World Bank

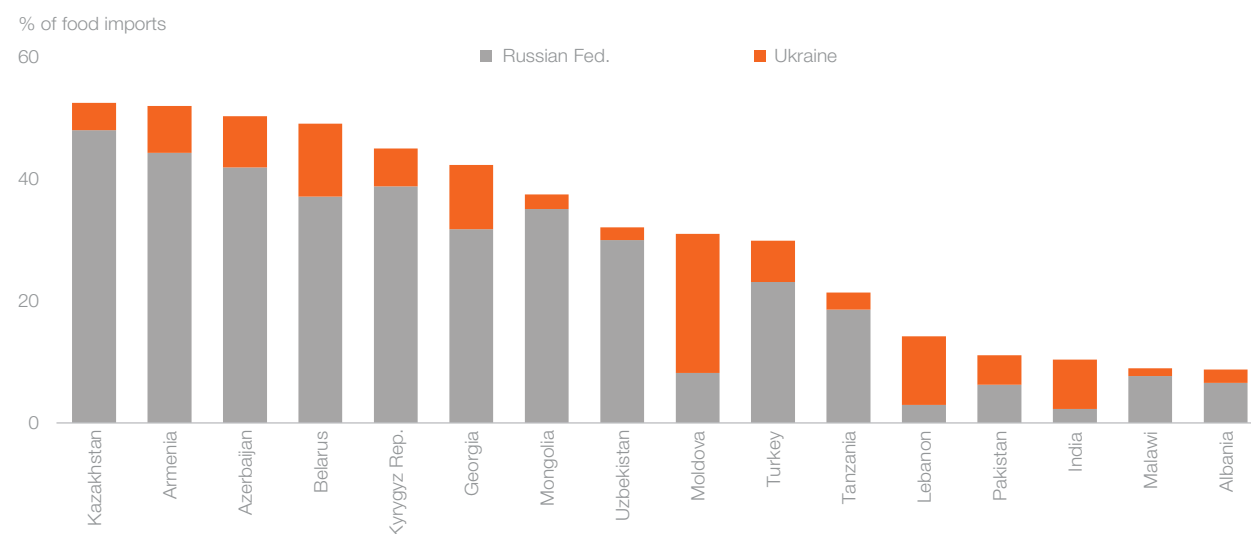
- Renewed focus on “self-sufficiency” in a post pandemic world: The Covid-19 lockdowns in the past two years have triggered a paradigm shift for many around the world. Businesses and governments are now increasingly aware of the importance of supply chain resilience (in addition to efficiency and costs), and strategies are switching from “just in time” to “just in case”. Businesses are softening their lean-inventory strategies and carrying more inventory as safety stock while governments are doing the same for food, energy, staples, and other goods that are deemed to be important to “national security”. While stock-to-use ratio (a rough measure of supply relative to projected demand) for food commodities have fallen over the past five years, it is due solely to rising consumption. More than ever, countries are now ready to halt exports in the name of self-sufficiency, and this can be seen from recent events such as India, Indonesia, and Malaysia banning the export of wheat, palm oil,

and fresh chicken respectively. Although some of these policies may ultimately prove temporal, the entrenchment of “nation-first ideology” and increasingly “protectionist” policies will result in higher food prices and unpredictable supply moving forward.

Ostensibly, this sentiment has been further reinforced by the Russia-Ukraine crisis as many neighbouring countries who are dependent on the warring nations for food are now struggling to fill supply gaps left by the conflict. To put into perspective the scale of disruption caused, Russia and Ukraine collectively contribute nearly 30% of the world’s wheat and barley, 15% of its maize, and 75% of its sunflower oil. In the wake of this massive shortage, we believe that these countries will attempt to diversify their food supplies and reduce their dependence on the imports to the extent possible.

Europe scrambles to fill supply void in wake of Russia-Ukraine crisis

Dependence on Russia and Ukraine food imports



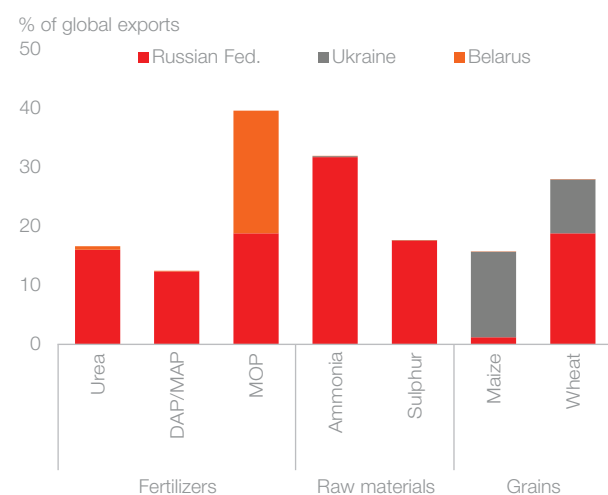
Source: BP Statistical Review, UN Comtrade, U.S. Department of Agriculture, World Bank

In addition to direct food reliance, the world is also dependent on Russia for fertilisers and fertiliser inputs. On average, approximately 16% of the world's Urea, diammonium phosphate, and potassium chloride fertiliser exports come from Russia. Any

disruption to fertiliser supply, as this conflict has shown, will invariably impact crop yields in countries such as China, India, and the US, which account for a major share of the global fertiliser consumption.

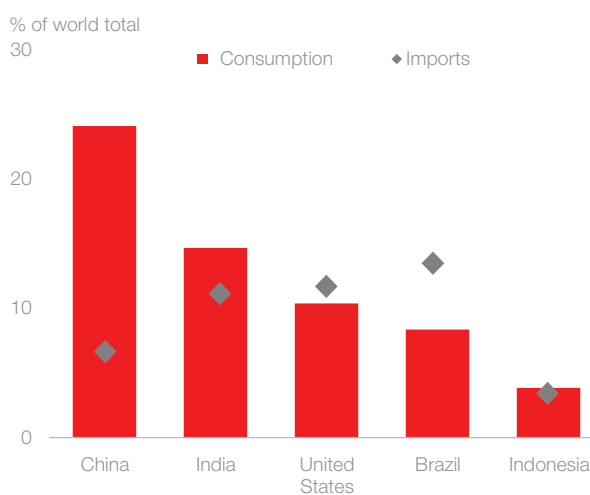
Dependence on Russian fertiliser will impact next season's harvests

Belarus, Ukraine, and Russia agricultural exports



Source: International Fertilizer Association, U.S. Department of Agriculture, World Bank

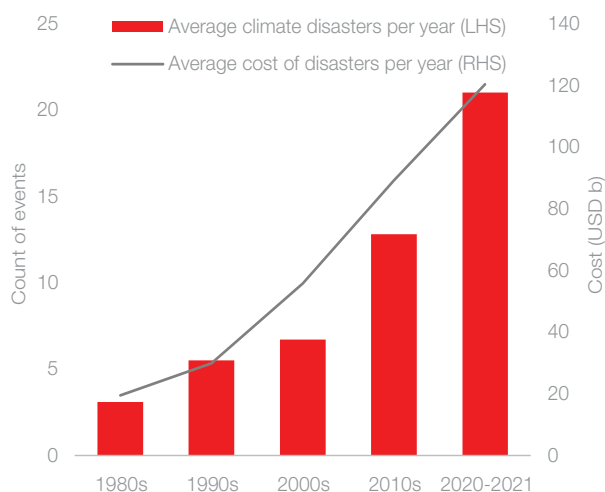
Top fertiliser consumers



Source: Bloomberg, World Bank

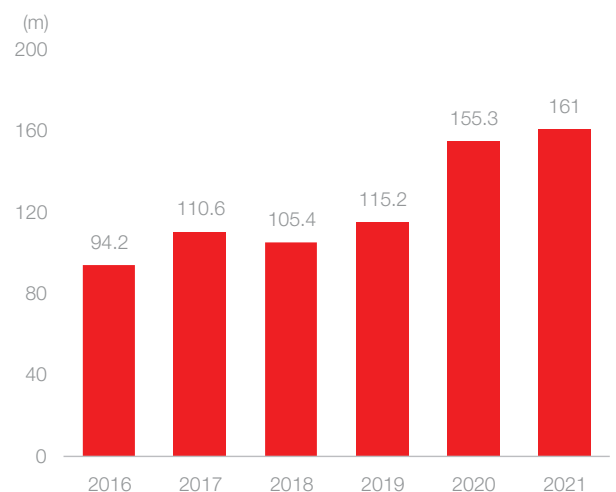
- Unstable weather patterns loom over crop yields: Climate change has fundamentally altered weather patterns and increased both the frequency and severity of extreme weather events dramatically over the past 40 years. In 2020-2021, the average cost of a weather disaster was approximately USD120b, up nearly four times compared to USD30b in the 1990s. The incidence rate has also increased from roughly six events per year in the 1990s to over 20 in 2020-21. We believe swings in climate conditions will cast a shadow over global food supply chains for the foreseeable future and trigger not just price shocks but also spontaneous export bans on disaster-hit commodities.
- The very real risk of a “global food crisis”: Beyond a mismatch in supply and demand, as well as skyrocketing prices, this food crisis has impacted the lives and livelihoods of millions especially in third world countries where little refuge can be sought from the double barrel-ed impact of extreme weather and conflict. The worst hit countries include the Democratic republic of Congo, Afghanistan, Nigeria, Ethiopia, Yemen, and Syria each of which have more than 10m people facing starvation and death. In absolute numbers, the world bank estimates that there is a total of 161m people worldwide facing acute food insecurity in 2021, up substantially from 115m in the pre-pandemic year of 2019. While the extent of human suffering in a food crisis is lamentable, investments into agricultural commodities might liberate the capital required to build out the required infrastructure to alleviate shortages, and yet demand ensures that returns are commensurate with the risks involved. Investors can do well by doing good.

Extreme weather events are increasing in frequency and severity



Source: NOAA National Centers for Environmental Information (NCEI)
U.S. Billion-Dollar Weather and Climate Disasters (2022)

The number of people facing acute food insecurity in the world is rising



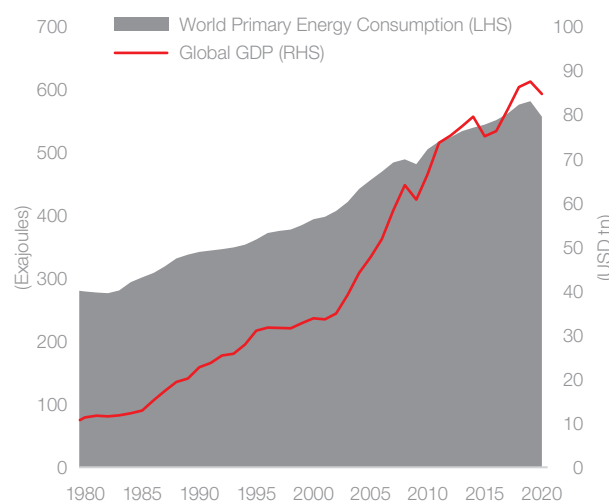
Source: Food and Agriculture Organization of the United Nations, World Bank, World Food Program

Energy

Fuelling the world's economic engine. There is little need to belabour the world's need for energy. So much of our lives depend on having an uninterrupted and steady energy supply – we will always need to keep our lights on, factories humming, and ports bustling. Given energy's central role in every aspect of economic activity, it factors into the cost of almost everything that the world consumes and produces, allowing energy prices to even serve as an indicator of economic health.

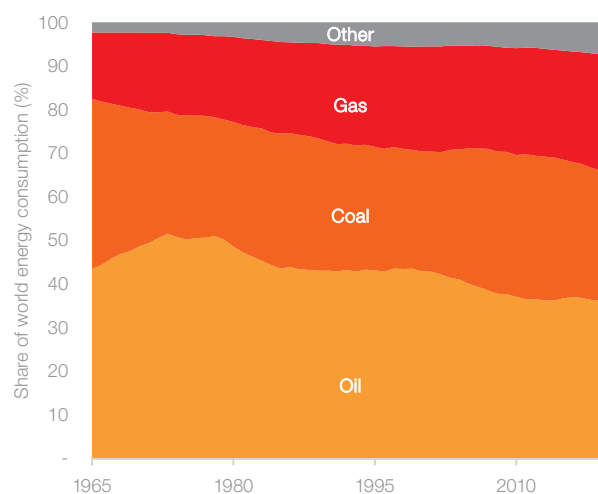
It is unsurprising that over the past three decades, global energy consumption has more than doubled, driven by economic development and population growth. Of the energy consumed worldwide, fossil fuels account for more than three quarters while the remainder is powered by renewable energy sources. Given environmental concerns, technological advancements, and an urgent need to diversify energy sources, renewables are likely to play an increasingly important role in the world's energy mix in the foreseeable future. However, before renewables are ready to take over the reins, oil, gas, and coal are expected to continue meeting the bulk of the world's energy needs.

The world's growing demand for energy



Source: World bank, bp Statistical Review of Energy 2021, DBS

Fossil fuels continue to meet the bulk of the world's energy needs

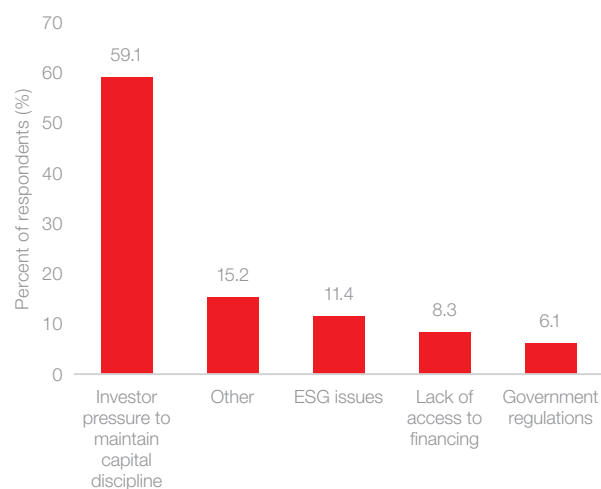


Source: Our World in Data, bp Statistical Review of World Energy 2021, DBS

The global outlook for energy commodities is expected to be most heavily driven by the following themes:

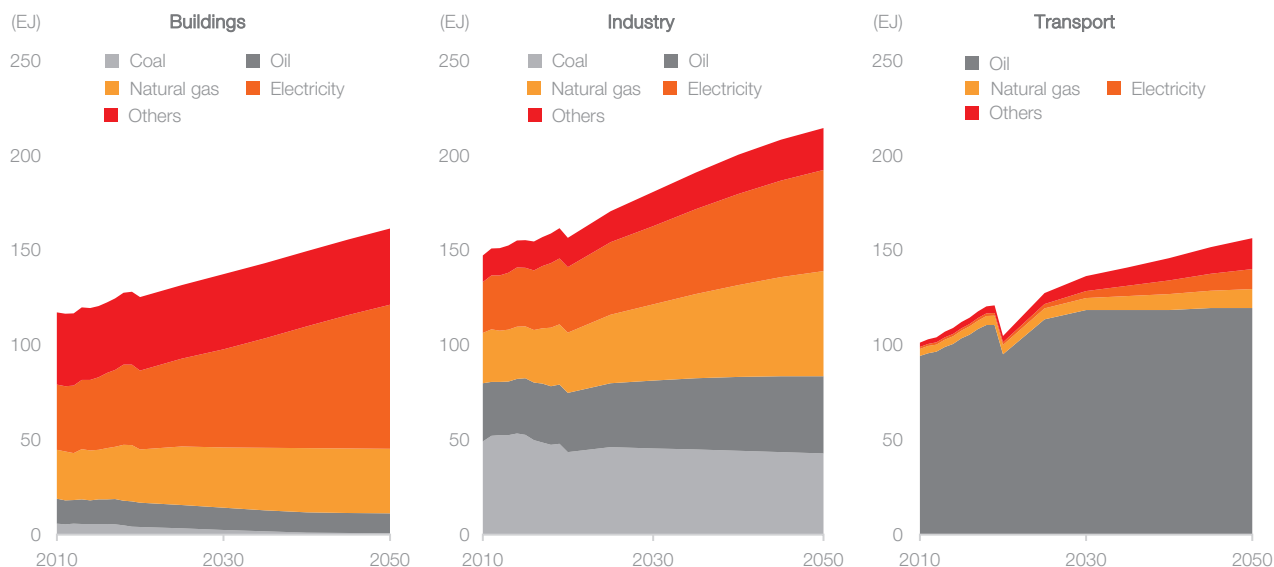
- Under-investment and under-supply of fossil fuels: Expanding supply requires exploration and investing in upstream projects. Given the long term and capital-intensive nature of such investments, shareholders of fossil fuel producing companies may not be supportive of reinvestment of earnings into such projects. Furthermore, ESG-related scorn for fossil fuel investments compounds challenges to securing external funding for new projects, on top of regulatory hurdles to obtaining permits for exploration, construction, and drilling. This confluence of factors are formidable obstacles to dialling up upstream production capacity, leading to a chronic undersupply that is expected

Chronic undersupply: Primary reasons for publicly traded oil producers to restrain growth



Source: Bloomberg NEF, Federal Reserve Bank of Dallas, DBS

Total projected energy consumption by sector – Transport continues to drive oil consumption, while natural gas and electricity are used for buildings and industry



Source: International Energy Agency (2021), Net Zero by 2050, IEA, Paris, DBS

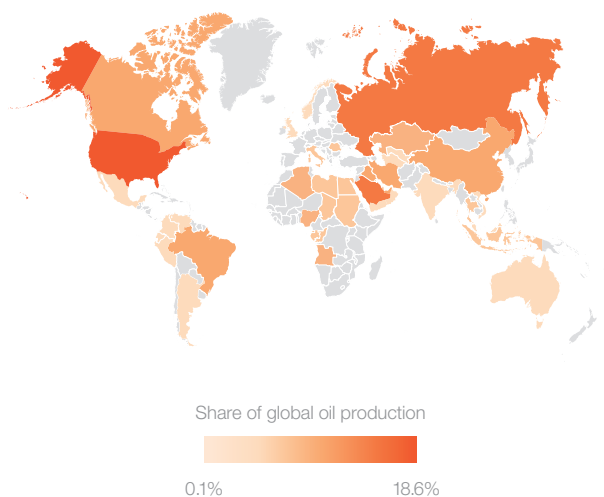
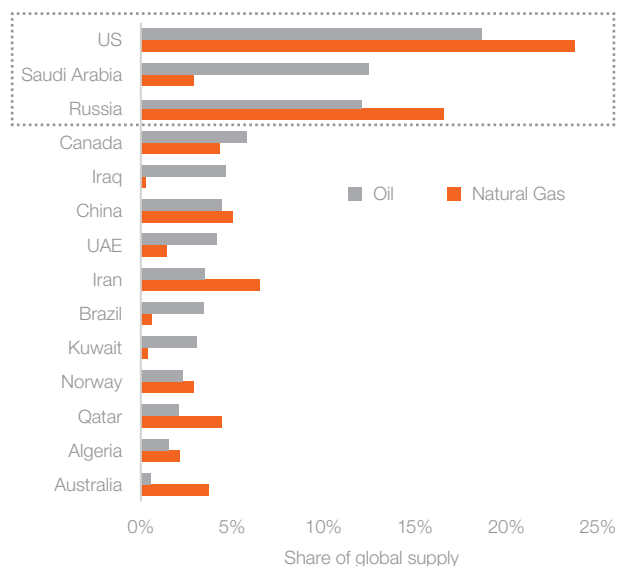
to persist in the near to medium term given the aforementioned stickiness of demand growth.

- Geographical concentration of energy resources: Few in the world are as richly endowed with a supply of hydrocarbons as the US, Saudi Arabia, and Russia, which collectively control more than 40% of oil and gas supply. This uneven distribution of oil and gas fields across the globe leaves the have-nots at the mercy of oil and gas-exporting nations, making energy exports a key source of revenue and political leverage in a world powered by fossil

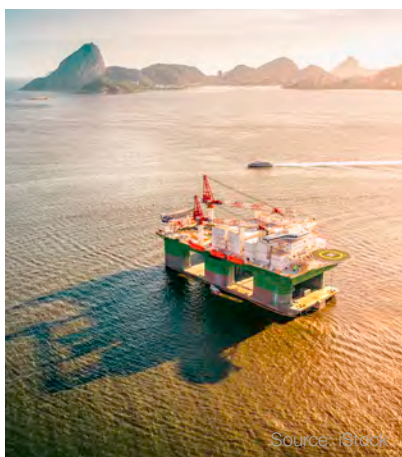
fuels. Although the politicisation of energy is compelling energy importers to safeguard their sovereignty by pursuing alternative energy sources, before there are feasible substitutes, the world will have to grapple with this uneasy imbalance that places energy commodities in centre stage.

Positive energy. Burgeoning energy demands, unincentivised upstream producers, and tightly controlled oil and gas fields set the stage for energy commodities to prevail over the next decade.

Power is held in the hands of few – nearly half of the world’s oil and gas production comes from the top three producing countries



Crude Oil



Crude oil, or petroleum, is a flammable liquid that contains hydrocarbons and other organic compounds. Oil has been the world's main energy source in recent decades. Today, most of oil is used as transport fuel but a significant portion of demand comes from non-energy uses as a raw material for petroleum derivatives (e.g. cosmetics, plastic, rubber).

Natural gas



Natural gas refers to a mix of methane, ethane, and other hydrocarbons. It is considered the least polluting of the fossil fuels given its high energy density and relatively low carbon emissions. Today, it is a major source of electricity generation and a key source of heating in buildings.

Coal



Coal is a critical energy source, fuelling nearly a third of energy production. However, is the most polluting fuel both in terms of carbon emissions and other pollutants being a threat to human health. Its reputation as the dirtiest fuel has caused global capital to flee the coal sector, leaving it omitted from major commodity indices.

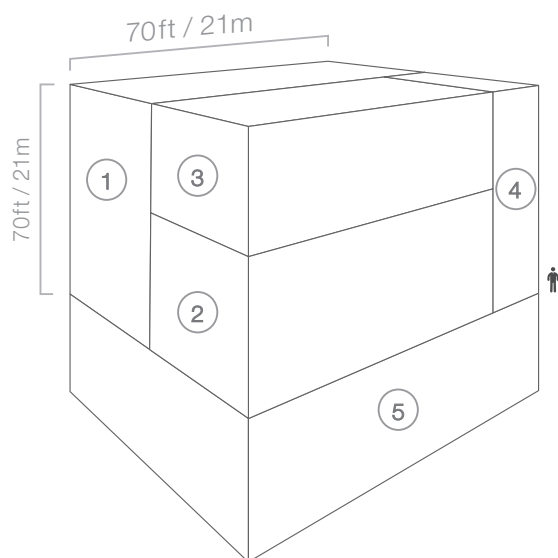
Gold

Shining, shimmering, splendid. Since time immemorial, humankind has been enamoured with this shiny yellow metal. Much of its appeal comes not just from its seductive lustre, but also its finite supply. The world's supply of gold is estimated to fit into just three Olympic pools. With remaining known reserves at about 54,000 tonnes (equivalent to less than one Olympic-sized pool's worth), the whole three pools could be insufficient to satiate the world's thirst for this precious metal.

Gold is unique as it displays dual characteristics as both a safe haven and a luxury good. The diversity in gold's functions, combined with its internationally recognised value, make it a strategic commodity to own. Some of gold's diverse identities are as follows:

- **Crisis commodity:** Since the demise of Bretton Woods in the early 1970s, gold has become a popular investment. Gold is often added to a portfolio as protection from tail risk events. Due to its allure as a safe haven, gold is a useful store of value and has historically often appreciated in emergencies against the threat of demonetisation, political unrest, and economic uncertainty.

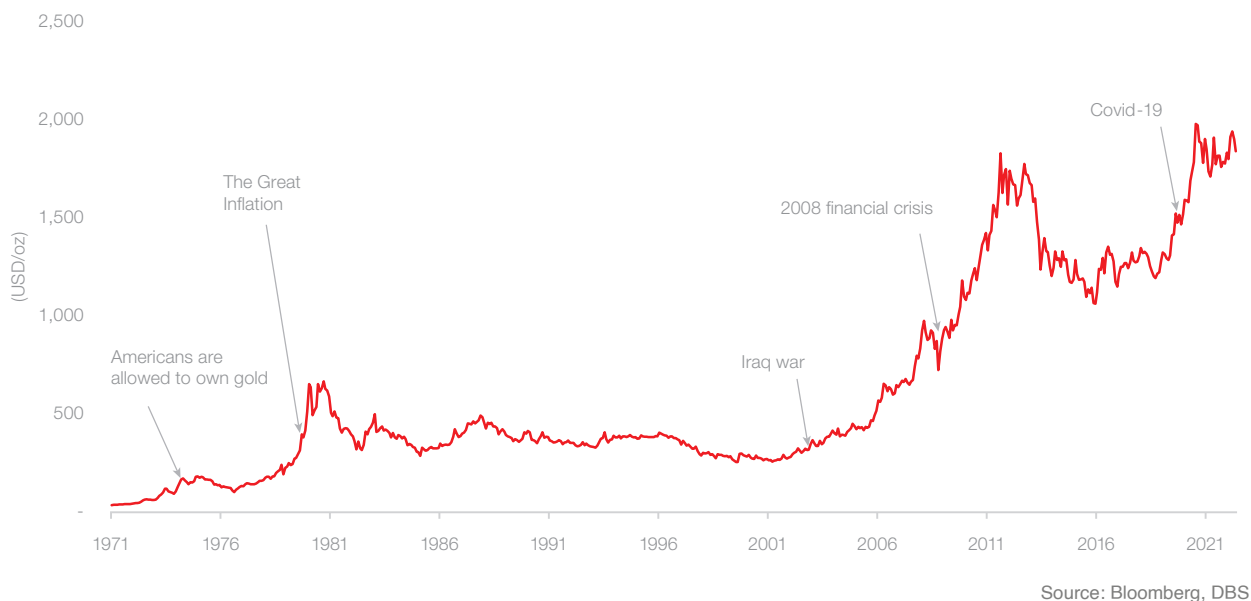
Total gold supply can fit in just under three Olympic pools



- 1. Jewellery**
c.93,253t, 46%
- 2. Bars and coins
(including gold backed ETFs)**
c.44,384t, 22%
- 3. Central banks**
c.34,211t, 17%
- 4. Others**
c.29,448t, 15%
- 5. Proven reserves**
c.54,000t

Source: World Gold Council

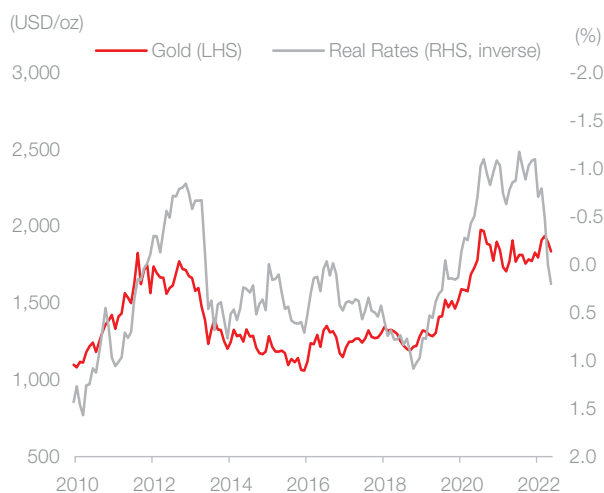
Gold shines as a safe haven investment



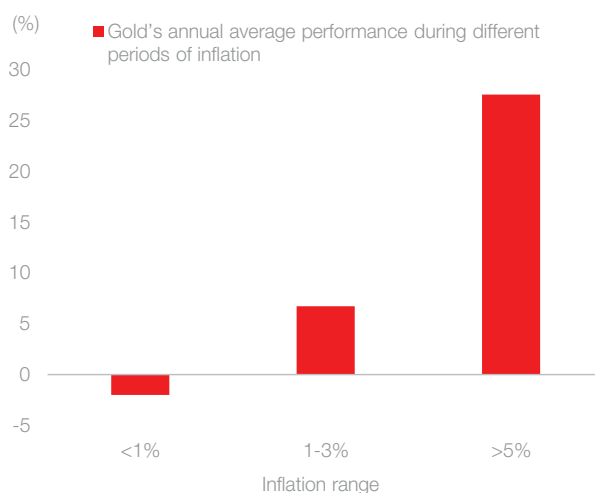
- **Inflation hedge:** Gold has long been hailed as a hedge against inflation, with historical data confirming its ability to protect purchasing power, especially during periods of hyperinflation.

Furthermore, historical gold prices also display a strong inverse correlation against real interest rates given investors' propensity to buy gold when negative rates threaten to erode the value of cash holdings.

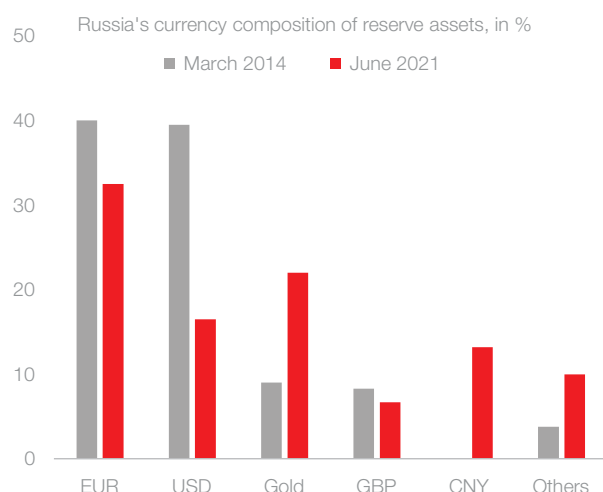
Gold prices are inversely correlated to real rates



Gold performs extremely well in a hyperinflated environment

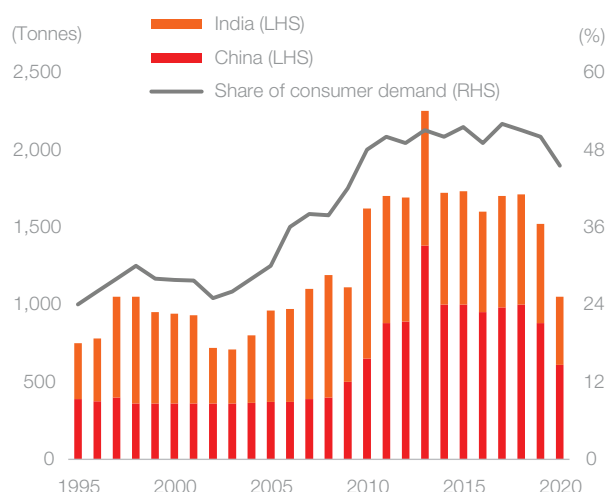


Russia's reserve holdings – More gold, less USD



Source: Bloomberg, DBS

Half of consumer demand comes from China and India



Source: World Gold Council

- **Central bank reserves:** Being an internationally trusted store of value makes gold one of the most crucial assets in national reserves worldwide, with central banks around the world collectively holding nearly a fifth of the world's supply. While the value of a country's domestic currency may fluctuate, gold holdings protect reserves against devaluation of fiat and diversify currency concentration risks. This would be particularly significant should the world become increasingly fragmented. In such a scenario, the reincarnation of interest in geopolitically neutral gold reserves could mitigate against economic isolation and weaponisation of major reserve currencies, driving central banks to accumulate more gold.
- **Consumer demand:** The earliest accounts of humans interacting with gold date back to 3,000 BC, where ancient Egyptians regarded it as a

symbol of wealth, mythology, and daily life. A few millennia later, gold continues to be entrenched as a status symbol in many cultures, with about half of gold demand coming from discretionary goods such as jewellery and ornaments. Of this, the bulk of global spend on gold jewellery comes from China and India given its association with good fortune and wealth. The value of gold in Indian society has even birthed a highly liquid gold loan market that allows locals to trade gold for loans, reinforcing the notion that gold can act as savings for rainy days.

Golden opportunities. Gold truly shines in both good times and bad. While it is widely celebrated for its cultural value and pleasing aesthetic, its enduring appeal positions it as an excellent store of value through inflationary environments and times of uncertainty, making this metal truly precious.



Commodities have low correlation with other major asset classes

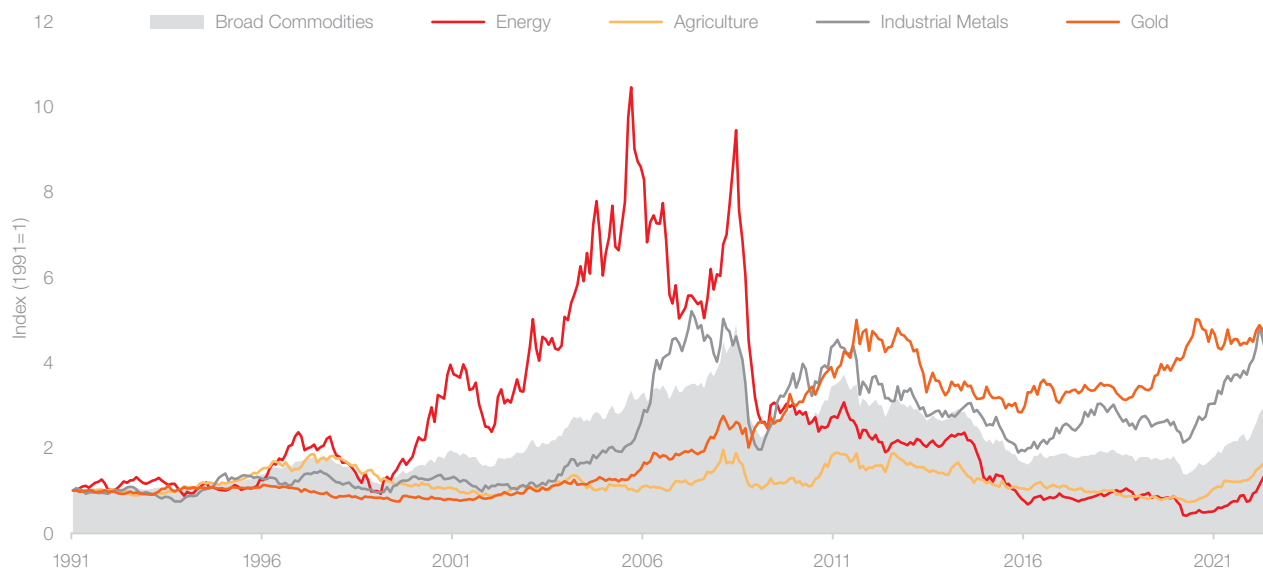
Security	Global Equities	Global IG Bonds	US High Yield Bonds	EM Bonds	Sovereign IG Bonds	Broad commodities	Crude Oil	Industrial Metals	Soft Commodities	Food Commodities	Gold
Global Equities	1.00	0.31	0.64	0.57	0.47	0.44	0.23	0.58	0.39	0.21	0.09
Global IG Bonds	0.31	1.00	0.28	0.37	0.88	0.20	0.09	0.26	0.32	0.10	0.40
US High Yield Bonds	0.64	0.28	1.00	0.60	0.53	0.40	0.22	0.45	0.41	0.23	0.06
EM Bonds	0.57	0.37	0.60	1.00	0.82	0.28	0.22	0.36	0.40	0.13	0.28
Sovereign IG Bonds	0.47	0.88	0.53	0.82	1.00	0.29	0.22	0.30	0.40	0.21	0.43
Broad Commodities	0.44	0.20	0.40	0.28	0.29	1.00	0.84	0.62	0.70	0.43	0.29
Crude Oil	0.23	0.09	0.22	0.22	0.22	0.84	1.00	0.44	0.45	0.22	0.18
Industrial Metals	0.58	0.26	0.45	0.36	0.30	0.62	0.44	1.00	0.57	0.41	0.31
Soft Commodities	0.39	0.32	0.41	0.40	0.40	0.70	0.45	0.57	1.00	0.53	0.35
Food Commodities	0.21	0.10	0.23	0.13	0.21	0.43	0.22	0.41	0.53	1.00	0.19
Gold	0.09	0.40	0.06	0.28	0.43	0.29	0.18	0.31	0.35	0.19	1.00

Source: Bloomberg, DBS

Conclusion. Commodities are the physical building blocks of our economic fabric, keeping the world moving, fed, and sheltered. From a demand standpoint, as long as humankind continues to forge a path of progress, commodities will see ever-growing needs, providing tailwinds for those controlling the sources of commodity production. Yet, from a supply perspective, climate change narratives, rising needs for infrastructure renewal, layered with the increasing threat of geopolitical fragmentation, set the stage for persistent undersupply for the coming decade.

As such, the world's dependence on commodities and the interaction between supply, demand, and the structural shifts in commodity markets support the inclusion of commodity exposure to a resilient portfolio. Given the unique, non-financial drivers of demand and supply driving each commodity, the addition of commodity exposure provides a valuable portfolio diversification – noting the low correlations of the broad commodity sub-indices with traditional asset classes such as equities and bonds. In addition, while consumers around the world face the prospect of rising inflation, commodity exposure allows investors to benefit from such rising prices.

Performance of commodity sub-indices over the past 30 years



Source: Bloomberg, DBS

Finally, even as most financial assets have benefitted from the provision of extraordinary liquidity by global central banks in the decade of the 2010s, the 2020s have shown the start of a paradigm shift towards hard assets that have value defined by scarcity – which the commodity complex embodies in many respects.

Investors with exposure to commodity futures contracts/managed funds will gain direct albeit volatile exposure to price fluctuations, which works well as a source of alpha in a broadly diversified portfolio of various asset classes. For others who prefer to avoid outsized volatility, long exposure to equities/ETFs of commodity-related sectors across the value chain (upstream, trading, equipment providers, services) will allow investors to mitigate earnings volatility while participating in the favourable trends discussed above. Such developments may appear momentous, but investors who have grown used to a world of abundance may be best positioned by preparing for a future that looks nothing like the past.

CIO Collection



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April 2022



Alternatives
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The Metaverse
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ESG Investing
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