

# A NEW SUPERCYCLE BULL MARKET FOR COMMODITIES

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## EXECUTIVE SUMMARY

Structural bull and bear cycles in commodity markets are often sustained for a decade or more. We believe a structural bear phase in commodities ended with the onset of the COVID-19 pandemic and its aftermath and a new structural bull phase has now begun.

The structural commodity bear market that occurred during the 2010s was brutal, but relatively short by historical standards. Research by the Bank of Canada (BoC) documents the existence, nature and causes of commodity supercycles. There have been four distinct supercycles since 1899, lasting 30 years on average, each with a well-defined bull and bear phase. These cycles, which are much longer than economic cycles, are typically sparked by a sustained and unexpected demand shock and prolonged by slow-moving supply responses. The bull phase of these cycles also tends to coincide with rapid industrialization in a significant part of the global economy.

We extended the BoC's quantitative methodology of analyzing and dating supercycles by an additional six years to today and found evidence for the beginning of a new bull phase that began in 2020. We also identified a number of recent fundamental developments that are analogous to events of past supercycles:

1. Massive fiscal and monetary policy stimulus in response to the pandemic drove a significant positive global demand shock.
2. Decarbonization and the global transition to green sources of energy will require massive amounts of new green infrastructure requiring significant raw material inputs, a process akin to a global re-industrialization.
3. Increased geopolitical tension and lessons learned from the pandemic are leading to a reorganization of global supply chains, which will require commodity-intensive capital spending.
4. On the supply side, chronic underinvestment in commodity production during the past decade due to sharply falling prices, environmental policies and the rise of ESG investing, and investor demand for capital discipline have meant that commodity production is likely to satisfy only a portion of expected demand in the coming years.
5. The Russia-Ukraine conflict is an amplifier of the trend toward commodity scarcity (by removing Russian and hampering Ukrainian supply) and increased commodity demand (increased military spending from NATO's European members).

We believe we are in a higher-inflation regime that will be sustained for the balance of the decade and commodity prices have exhibited historical strength during higher-inflation environments. Commodities also become more powerful diversifiers to equities during higher-inflation regimes while bonds become less powerful diversifiers.

Given our view that we are in the early stages of a commodity structural bull phase and a higher-inflation regime, we believe commodities and commodity-related assets will likely exhibit strong relative performance over the next several years. Therefore, we think there is a solid case to include/increase strategic exposure to commodities in investor portfolios in the current environment.

## **COMMODITY SUPERCYCLES: WHAT ARE THEY? WHAT DRIVES THEM?**

Commodity prices tend to go through extended periods of boom and bust, known as supercycles. Bank of Canada (BoC) research shows that there have been four broad-based commodity price supercycles since the early 1900s.<sup>1,2</sup>

These cycles last much longer than business cycles, which in the US have typically lasted approximately six years in the post-war period. While short-term commodity prices tend to fluctuate in tandem with the business cycle, a full commodity cycle has lasted roughly 30 years, on average; hence the name supercycles. The bull phase of the last three supercycles lasted about 16 years, on average, while the corresponding bear phase persisted for approximately 14 years.

Why do these cycles last so much longer than business cycles? One potential driver is the interaction of “large, unexpected demand shocks and slow-moving supply responses,” as described in BoC’s research that also shows commodity prices exhibit high price elasticity to changes in global output growth. That is, an increase in global output growth tends to have a large positive effect on commodity prices and vice versa. Therefore, it is generally accepted that commodity price supercycles are likely triggered by unexpected structural increases in aggregate demand.

Supercycles have tended to coincide with periods of rapid industrialization in significant parts of the global economy. The first cycle, for example, coincided with the industrialization of the US in the late 19th century; the second, with the onset of global rearmament before the Second World War in the 1930s; and the third, with the reindustrialization of Europe and Japan in the late 1950s to early 1960s following the economic destruction and devastation of World War II. The most recent full commodity price supercycle began in the mid-to-late 1990s. This coincided with a series of important reforms in China, including its eventual accession to the World Trade Organization (WTO) in 2001. In this instance, rapid industrialization in China was turbocharged by the country’s acceptance into WTO allowing China to establish itself as the world’s primary manufacturing platform. Resource-intensive economic growth in China led to a rising tide across many emerging market economies and generally ushered in a period of booming global growth. The resultant positive demand shock kicked off the prior cycle bull phase, which picked up speed in the early 2000s. This period of robust global growth was only interrupted by the Global Financial Crisis (GFC) later in the decade and set the stage for the next commodity down cycle.

In addition to industrialization, other forces can push commodity prices above their long-term trend. For example, delays in committing to new investment tend to exacerbate price moves. The high start-up cost of new investment means firms are often cautious when prices initially begin to increase, delaying investment until there is more clarity about the unexpected demand’s sustainability, and the long-term profitability of new projects.

Start-up costs are particularly high for oil and base metal projects.<sup>3</sup> It can take more than five years for a new mine to generate cash flow after the initial investment.<sup>4</sup> Oil projects also have a long lead time before generating cash flow. A typical onshore project requires three to six years between first evaluation and first production. Offshore projects typically take a decade or more.<sup>5</sup> As construction projects are completed, increasingly more commodity supply becomes available to meet demand. However, if investors incorrectly estimate demand to be stronger than it turns out to be, or do not anticipate the cumulative increase in new supply, then prices will begin to moderate. Eventually, when demand growth slows, the cycle will enter its long downswing phase as new supply continues to come online even after demand peaks.

<sup>1</sup> Commodity Price Supercycles: What Are They and What Lies Ahead? Bank of Canada Review, Autumn 2016, Buyuksahin, Mo, Zmitrowicz.

<sup>2</sup> Cycles are based on the Bank of Canada Commodity Price Index (BCPI) which is a commodity spot price index.

<sup>3</sup> This is less true for agricultural products.

<sup>4</sup> BoC.

<sup>5</sup> The End of the World Is Just the Beginning: Mapping the Collapse of Globalization, Peter Zeihan, 2022 Page 248.

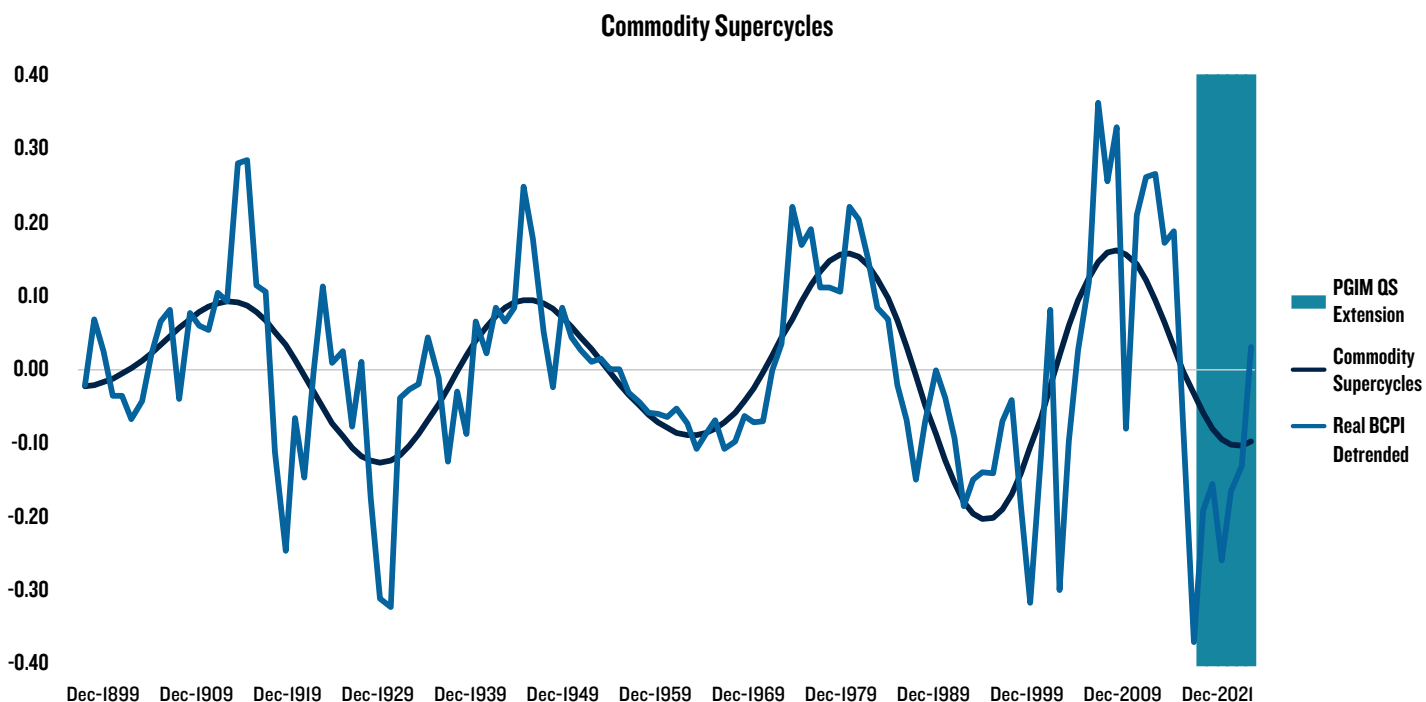
## UPDATING THE BANK OF CANADA'S SUPERCYCLE MEASURE

In their aforementioned paper, the BoC employs an econometric technique to date commodity cycles known as an asymmetric band pass filter, which was originally developed in 1999 by Christiano and Fitzgerald and published as part of the National Bureau of Economic Research's working paper series.<sup>6</sup> Band pass filters are a family of signal processing algorithms that are widely used in wireless transmission and reception. These filters attempt to smooth noisy data by focusing on frequencies only within a certain range. In this particular case, the asymmetric version of the filter was designed to be applied to frequencies of varying lengths, a common characteristic of macroeconomic time series data.

Before running the Bank of Canada Commodity Price Index (BCPI) through the filter, it had to be transformed from a nominal index to a real index, meaning the impact of inflation needed to be removed. Fortunately, The BoC decided to use the commodity component of the US Producer Price Index (PPI), which provides historical data going back to the 19th century and appropriately reflects traded prices of commodities.

After following the BoC's methodology to extend the supercycle analysis, we find confirming evidence that we could be at the beginning of a new cycle that began in the shadow of the COVID pandemic in 2020.

**Figure 1: Extending the BoC's Supercycle Measure**



Source: PGIM Quant as of December 31, 2021.

This uptick on the cycle measure is tentative and should not be considered a definitive conclusion. The model's filtering algorithm is meant to be used in a descriptive sense, rather than a predictive one. However, when considered in the context of the macro-fundamental arguments we present in the next section, the measure's upturn is consistent with the beginning of a potential new cycle.

## OUR FUNDAMENTAL CASE FOR A NEW SUPERCYCLE BULL PHASE

We believe a confluence of structural demand growth and suppressed supply-side forces are likely to result in a long-term rise in commodity prices for the remainder of the decade or longer.

### I. COVID As a Positive Demand Shock:

As discussed, commodity supercycles are typically kicked off by unexpected demand shocks. The policy response to the economic crisis stemming from the pandemic, characterized by unprecedented peacetime fiscal and monetary stimulus, led to a significant positive global demand shock. As pandemic lockdowns kept us all at home, stimulus payments drove a boost in demand for goods, durable goods in particular, as we collectively sought to distract ourselves through purchases. Spending patterns are now in the process of normalizing as goods spending falls back to its long-term trend growth path. Meanwhile, service sector spending is still recovering and moving back toward its long-term trend as the pent-up demand created amid COVID restrictions works its way through the economy.

<sup>6</sup> The Band Pass Filter, Christiano, Fitzgerald, NBER Working Paper Series, July 1999.

Aggregate demand is running well ahead of aggregate supply as evidenced by current rates of consumer price inflation in developed economies, the likes of which have not been seen in decades. However, the jury is still out as to how much of the current situation is driven by excess demand or whether it is mainly a constrained supply story. Once the logistical and labor force challenges stemming from the pandemic fully fade will the COVID stimulus have created too much aggregate demand relative to long-run aggregate supply? We suspect the answer is yes but acknowledge that much uncertainty remains at this early stage.

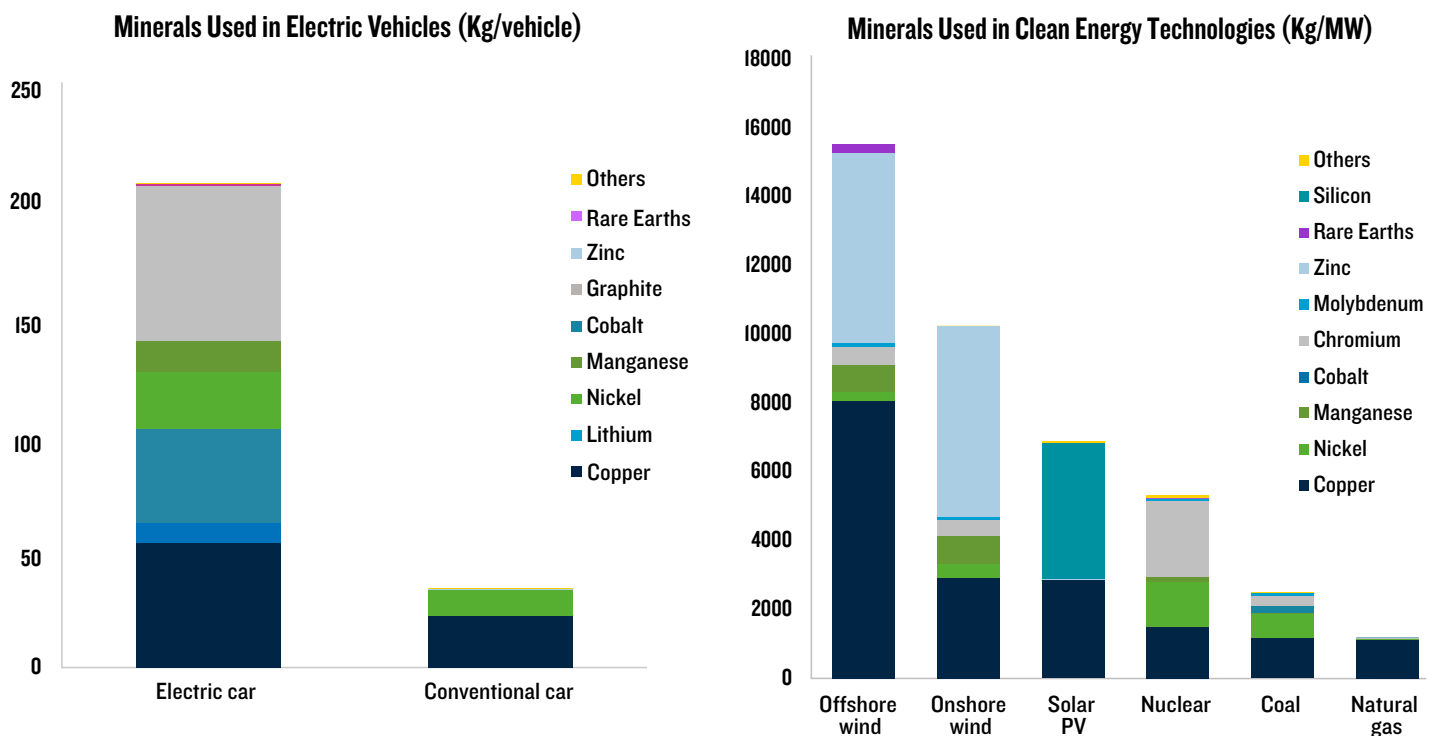
Whether or not excess demand is the principal problem we face now in early 2023, it's likely to be one we face looking forward. The shift from fiscal restraint to profligacy appears to be a defining feature of the post-COVID world that will be sustained and could fuel excess demand well into the future. While the fiscal stimulus in response to the GFC was meant to shore up financial stability (aid packages were aimed at recapitalizing the banking sector), COVID-related measures were intended to meet social need (providing relief payments to workers). We expect fiscal deficits to stay high in the coming years as governments are compelled to spend to stem fraying social cohesion<sup>7</sup>, fend off populist political movements<sup>8</sup> and care for aging populations. Governments are now focused on reducing income inequality, and assistance to lower-income households has an outsized effect on consumption, which in turn supports commodity demand.<sup>9</sup> Government support measures, such as those generally being considered/implemented across Europe, aim at cushioning households from the recent energy prices hikes. These measures are likely to have the perverse effect of preventing demand destruction and fueling even greater pressure on prices. While policymakers are on the watch for signs of wage-price spirals due to expansive post-pandemic fiscal stimulus and the Russian invasion of Ukraine, the fiscal stance is still likely to be loose in the coming years.

## 2. Global Reindustrialization

### Energy Transition Demand (or Greenflation)

The transition to more sustainable energy alternatives will be the most significant long-term driver for commodity price inflation over the next decade, as governments and the private sector significantly ramp up investment in green energy infrastructure to reduce carbon emissions and combat climate change. Green energy infrastructure investment requires a massive amount of raw material inputs, which is likely to substantially increase demand for key building block metals such as copper, nickel, cobalt, and lithium. Production of an electric car, for example, requires roughly five times the amount of these metals as is typically used in the production of a gasoline powered car. Wind turbines and solar farms are also commodity intensive (see figures 5 & 6).

Figures 2 & 3: Green Investment Requires Massive Amounts of Commodity Inputs



Source: International Energy Agency as of October 2022.

<sup>7</sup> Labor in developed economies saw a loss in its relative economic position (and stagnant wage gains) in the most recent phase of globalization over the past several decades due to increased competition from cheaper emerging market labor.

<sup>8</sup> In addition to spending on incentives and direct investment to facilitate decarbonization of the global economy which we discuss later in this section.

<sup>9</sup> Lower-income households have higher marginal propensities to consume from additional income. Further, because commodities constitute a higher proportion of their spending baskets, and these households are greater in number, they therefore consume more commodities volumetrically.

Over the next five years, Wood Mackenzie<sup>10</sup>, an energy research and consulting firm, expects industrial metals will experience greater growth in demand than seen during the last commodity bull phase (from the late 1990s to 2008). The International Energy Agency forecasts that setting the world on a path for net zero emissions by 2050 will require clean energy-related investment to accelerate from current levels (of around \$1 trillion annually in 2016-20) to approximately \$4 trillion annually by 2026-30.

Although the global economy is stepping up efforts to decarbonize, demand for fossil fuels is still expected to steadily rise over the next five to 10 years. The general consensus is for oil demand to peak between the late 2020s and early 2030s. While developed economies continue to make significant progress towards decarbonization, growth in industrial and transportation-related demand, especially from emerging economies, is expected to keep oil demand in an uptrend.

### **Geopolitics: The Return of History**

Even as governments and corporations plan for a transition to a post-carbon world, sufficient access to fossil fuel energy remains a necessity today. Lest a reminder is needed, increased geopolitical tensions and Russia's invasion of Ukraine have underscored this point to global policymakers. European countries in particular are attempting to diversify their energy sources quickly and build new energy supply chains, with cost as a lower priority under the threat of interrupted or discontinued energy flows from Russia.

Russia's invasion of Ukraine serves as an amplifier of existing trends toward increased commodity demand combined with challenged supply given that Russia is one of the world's largest commodity exporters and Ukraine is a major breadbasket. Russian aggression has reinvigorated NATO and the "western" alliance (led by the US) more generally. Higher military spending among NATO's European members will increase demand for oil, natural gas, base metals, and steel. War-related supply challenges stemming from sanctions, embargoes, and other logistical/security complications are likely to endure as the conflict continues.

The trend of global multinationals seeking to diversify their manufacturing footprints and rethink their supply chains amid increased tariffs and geopolitical uncertainty has accelerated in recent years, most notably in the wake of the pandemic. Trade tensions during the Trump Administration led to the 2018 tariffs on China, an initial catalyst for companies to reexamine supply chains. Since then, the pandemic has exposed the weakness of concentrated global supply chains optimized purely for efficiency rather than resiliency and/or redundancy, leading some firms to bring manufacturing closer to home or move operations to countries that are more geopolitically aligned with their home country. This reorganization of supply chains has required investment in plant and equipment, leading to rising base commodity demand.

The past three decades saw the integration of China and Eastern Europe into the global economy, providing an abundance of cheap labor and production, which exerted downward pressure on goods prices globally. However, political support for globalization in developed economies has eroded in recent years as labor in those economies did not benefit from the gains that accrued to multinationals and owners of capital. Furthermore, aging populations in China and other countries, accompanied by higher domestic wages that diminished the benefits of cost reduction, have resulted in global manufacturers shifting investment to ASEAN countries, most notably Vietnam.

### **3. Revenge of the Old Economy: Post-GFC Dearth of Commodity Investment**

The seeds of the current bull phase in commodities were planted long before the pandemic and have their roots in the decade following the GFC. That period comprised a brutal commodity bear market, an intensification of government policies promoting energy transition (from increasing regulations targeted at fossil fuels to increasing incentives for development of clean energy), and the rise of ESG investing. This period was characterized by "a decade of falling returns and chronic underinvestment in the old economy," according to Jeff Currie, head of Commodity Research for Goldman Sachs.<sup>11</sup>

We wrote about some of these trends in March of 2021<sup>12</sup>:

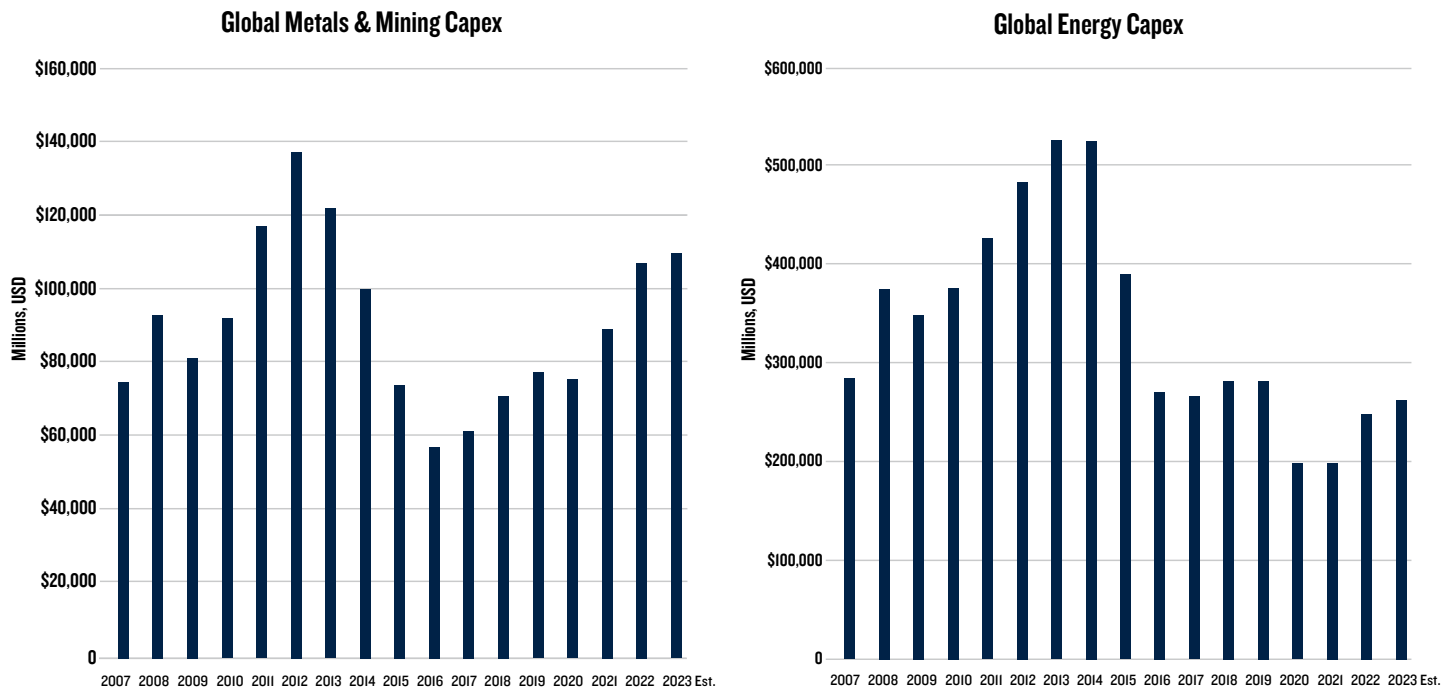
"We believe the pandemic caused a final washout for the 12-year long commodity bear market, which saw prices decline by more than 70% during that period [2008-2020]. The dramatic capitulation point was likely marked by sharply negative oil prices on the front-month futures contract in [April of 2020]. We think commodity markets have likely entered a new up cycle driven by a number of factors: a robust post-pandemic global economic recovery, ultra-loose fiscal and monetary policies, increased inflation pressure, a dearth of investment in new capacity over the past decade due to falling prices, environmental policies [designed to promote renewables and discourage investment in fossil fuels], and ESG investing [which played a role in starving the traditional energy sector of capital]."

<sup>10</sup> Wood Mackenzie is a global research and consultancy business providing data, analytics, and insights about the natural resources industry. <https://www.woodmac.com/>

<sup>11</sup> The Revenge of the Old Economy: <https://www.ft.com/content/c7732d53-2e34-4fde-b5fb-6f45f114111f>

<sup>12</sup> PGIM Quantitative Solutions Q2 2021 Outlook. <https://www.pgimquantitativesolutions.com/outlook/2021-q2-outlook>

## Figures 4 & 5: A Dearth of New Investment in Oil and Mining



Source: FactSet as of December 31, 2021.

In addition to the forces discussed above, shareholder demands for greater capital discipline in a sector that has historically been a poor steward of investor capital have also played an important role in reinforcing the trend toward declining investment in traditional energy and commodity sectors. A McKinsey assessment of 35 large mining projects completed between 2002 and 2015 showed that 30 of them went over budget and 27 were significantly delayed. Mining companies appear to have learned from past investment cycles and have been circumspect about stepping up investment and bringing new mining projects online in the current cycle. Similarly, oil exploration and production companies climbed a steep learning curve during the 2000s to manage new production and cost profiles for new extraction technologies such as fracking and shale drilling.

Free cash flow has taken precedence over expansion as investors frustrated with years of excesses followed by the wealth destruction stemming from the sector's financial distress after 2015's oil price collapse now demand that companies deliver on increased cash flow returns (in the form of growth in dividends and buybacks), debt reduction, and reduced capital spending. Two years into a new energy bull market, this capital discipline and reluctance to invest still shows no signs of abating.

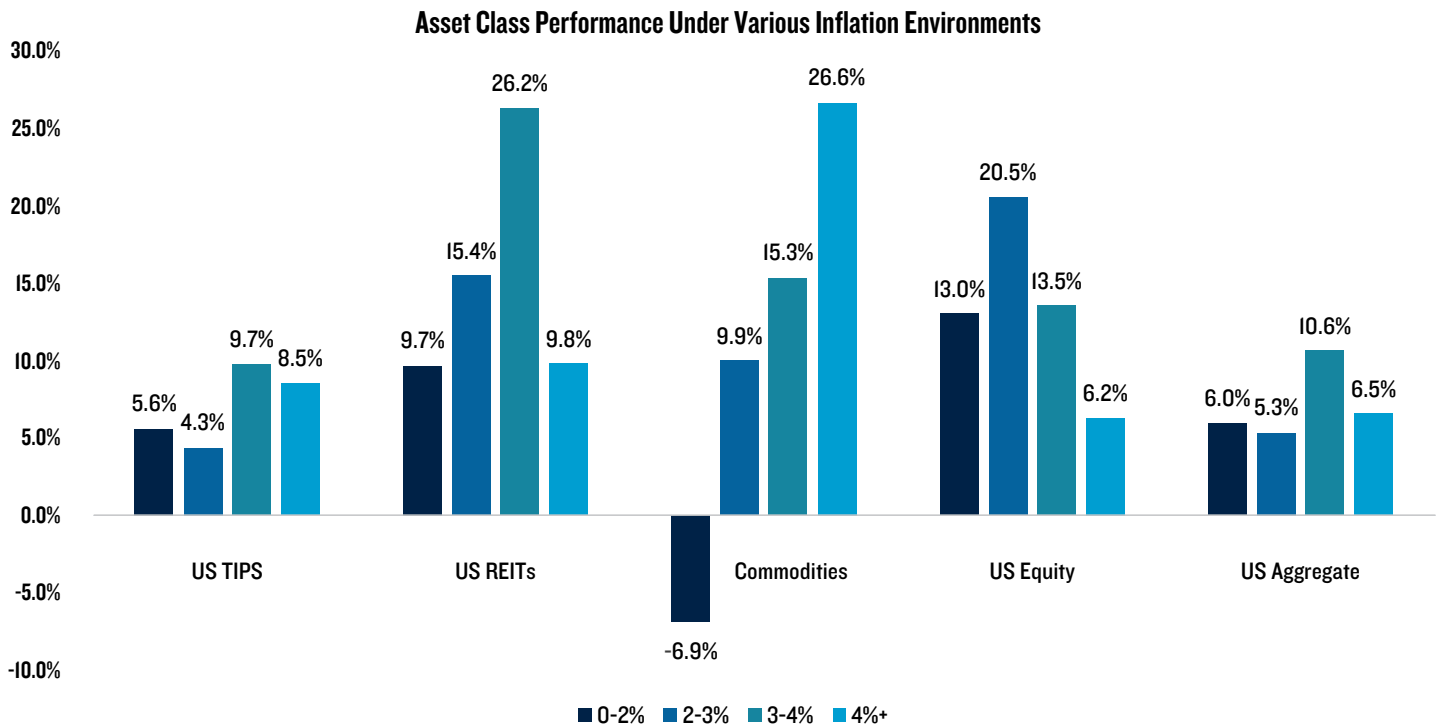
Looking ahead, supply from existing proven and developed reserves is expected to satisfy only a portion of projected commodity demand in coming years. If the capital discipline imposed by the markets remains in force, structurally limited supply would result in continued upward pressure on commodity prices.

### COMMODITIES AS AN INFLATION HEDGE

As covered in an earlier paper about inflation's revival, we believe the four-decade trend of declining inflation ended with the pandemic and its aftermath and we may remain in a higher-inflation regime through the rest of the decade.<sup>13</sup> Commodities are a natural inflation hedge because inputs such as food and energy are components of the consumer basket. Energy and industrial metals, in particular, have provided a good hedge against inflation surprises. Figure 6 shows the performance of major asset classes under various inflation environments. Commodity futures are the only asset class whose returns improve sequentially as inflation moves to increasingly higher levels.

<sup>13</sup> Is Inflation About to Revive? Real Assets Can Help Insulate Your Portfolio, June 2021, Tokat-Acikel, Campbell, Brundage, Cummings, Ahmed, Rengarajan. <https://www.pgimquantitativesolutions.com/research/inflation-about-to-revive>

**Figure 6: Commodities Perform Better in Higher-Inflation Environments**



Source: Datastream from June 30, 1973 - September 30, 2022.

In a more recent inflation paper, we concluded “traditional allocations to equities and bonds in an environment of elevated and uncertain inflation are likely to perform poorly in nominal and particularly real terms. Investors should consider larger allocations to asset classes with a positive direct exposure to inflation [such as commodities] given their historical strength in high-inflation environments.”<sup>14</sup> The same paper shows that the diversification power of commodities increases relative to equities while the diversification power of bonds relative to equities declines in a higher-inflation regime. More specifically, a positive correlation of 0.3 exists between US Treasuries and equities during periods of high inflation and a negative correlation of -0.3 during periods of lower inflation. Meanwhile, in low-inflation periods, commodities have a positive correlation of 0.3, though in high-inflation periods they provide a more powerful diversifying exposure to equities with a correlation of -0.3.

## CONCLUSION

Several elements of the current macroeconomic environment are consistent with the beginning of a new structural bull market cycle in commodities. Leveraging research from the Bank of Canada we note these cycles tend to start with large, unexpected demand shocks and trigger prolonged, slow-moving supply responses. Up cycles also tend to coincide with rapid industrialization of significant areas of the global economy. The current environment checks all of these boxes. Massive fiscal and monetary policy stimulus in response to the pandemic drove a significant positive global demand shock. Decarbonization and the global transition to green sources of energy are requiring massive amounts of new infrastructure and raw material inputs, a process akin to a global re-industrialization. Increased geopolitical tension and lessons learned from the pandemic are leading to global supply chain adjustments that will require commodity-intensive capital spending. On the supply side, chronic underinvestment in commodity production over the past decade due to sharply falling prices, environmental policies and the rise of ESG investing, and investor demand for capital discipline have led the commodities sector to be able to satisfy only a portion of expected demand in the coming years. The Russia-Ukraine war is an amplifier of increased commodity demand and supply scarcity. Lastly, we updated the supercycle measure from the BoC’s study from 2016-2021 and found a distinct uptick that suggests the beginnings of a new supercycle may already be underway. Given this macroeconomic and fundamental backdrop, along with the historically strong performance of commodities during inflationary environments, we strongly believe it is time to consider establishing/increasing strategic exposure to commodities in multi-asset portfolios.

<sup>14</sup> Portfolio Implications of a Higher US Inflation Regime, May 2022, Johnson, Aiolfi, Hall, Patterson, Rengarajan. <https://www.pgimquantitativesolutions.com/research/portfolio-implications-higher-us-inflation-regime>

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