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"SUPPLY-CHAIN INFLATION: TRANSITORY OR DURABLE?"

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Supply-Chain Inflation: Transitory or Durable?

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Introduction

Early-2021 saw synchronous gains for commodity prices, prompting predictions of an imminent commodity super cycle. Price increases both resulted from, and contributed to, supply-chain bottlenecks and broader price inflation in the world economy. This “perfect storm” may prove temporary, and commodity prices themselves have already diverged since mid-year. Nonetheless, asymmetric economic recovery, ongoing COVID-19 risks, and supply dislocations in shipping, manpower and materials persist, sustaining demand for commodities as an inflation hedge for investors. Ultimately, physical dislocations should ease as the world continues to recover from the worst of the pandemic. However, COVID-related issues were compounded by events also illustrating some fragilities inherent in long-haul trade – including extreme weather, transit choke points and cyber-attacks. Simmering geopolitical and trade tensions have also proved disruptive. Looking ahead, while cyclical inflation drivers may ease, policy choices on economic regeneration, energy transition, and the reshoring of manufacturing could raise supply-chain costs on a more structural basis over the longer term.

Synchronous Commodity Gains Have Diverged Since Mid-2021

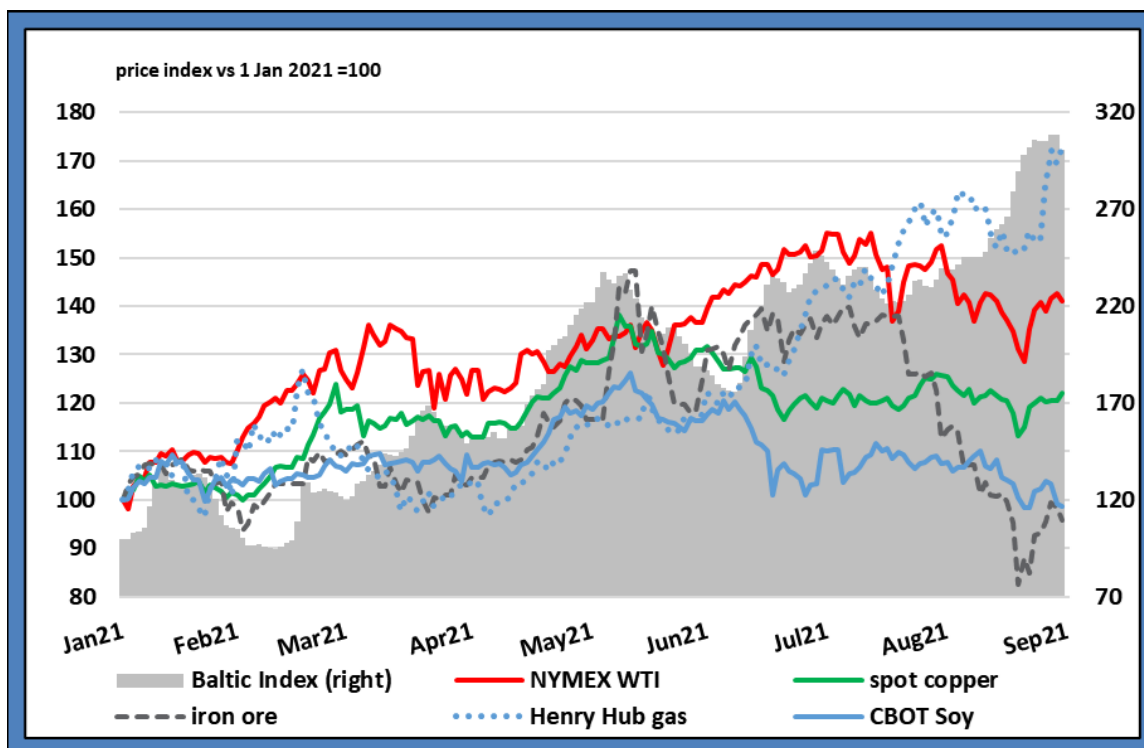
Market optimism for the global economy and commodity markets experienced a sea change around November 2020. This coincided with the U.S. Presidential election (and the anticipation of a proposed new administration spending program) and news of imminent widespread vaccine deployment. Through 1H-2021, robust economic recovery, declining global infection rates, supply-chain disruptions and rising general price inflation coincided with a synchronous strengthening of the commodity complex. Banks and consultancies began predicting an imminent commodity super cycle, overlooking the cyclical distortions inherent in the initial post-crisis recovery, and the disparate state of supply/demand fundamentals prevailing for different commodities, which we also discussed in Fyfe (2021).

Erstwhile strength in iron ore and copper has receded since June as Chinese import demand has fallen. The opposite holds true for coal and natural gas, with bottlenecks caused by the China-Australia trade dispute and supply-chain inflexibilities for liquefied natural gas (LNG) respectively coinciding with strong weather-related demand into Asia.

Crude oil prices also rose strongly through mid-2021 as OPEC+ supply management and recovering demand helped to drain much of the one billion barrels of surplus inventory accumulated in first-half 2020. However, the market has traded sideways since mid-year with one eye on the potential re-emergence of oversupply once again in 2022. Agricultural commodities are also now diverging, with soybeans weakening alongside lower Chinese demand, while coffee and sugar remain buoyed by weather- and COVID-related tightness in Brazilian supplies.



Figure 1
Commodity Prices No Longer a One-Way Bet



Sources: Argus Media, Refinitiv.

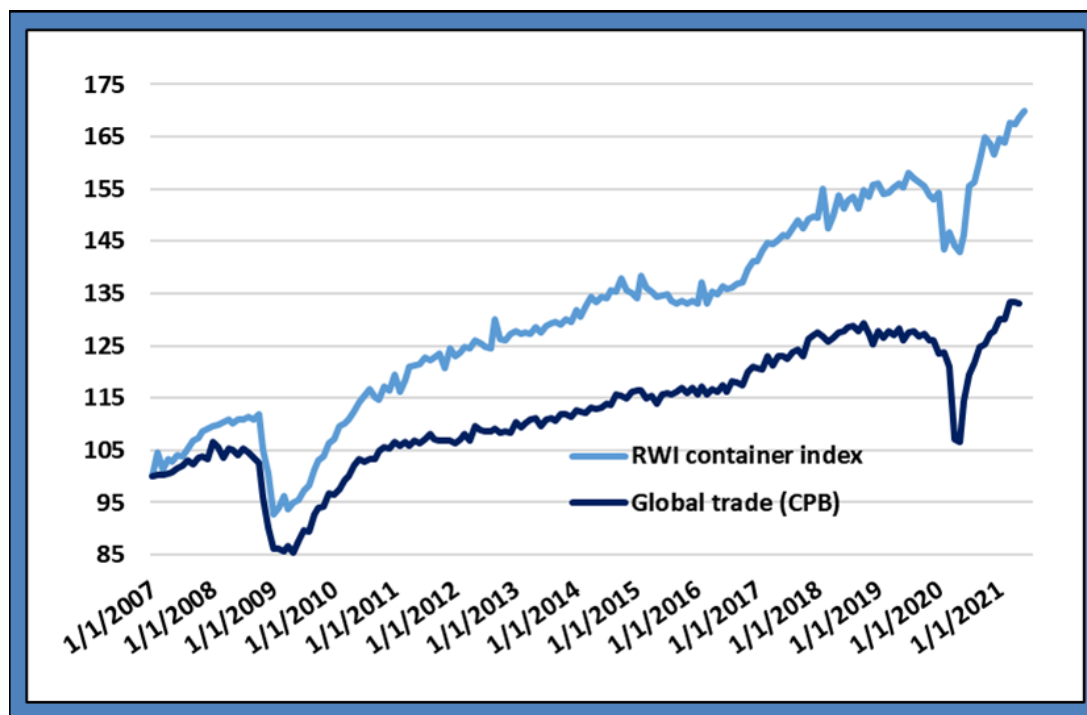
Figure 1 illustrates the recent divergence in performance across commodities. In short, commodity fundamentals do not appear sufficiently aligned to underpin a cross-commodity super cycle in the short term. Longer term, the energy transition might herald a concerted tightening of fundamentals due to a combination of under-investment in hydrocarbon supply and a potential step-change in demand for key metals and minerals resulting from electrification. However, those are issues for the longer term. What cannot be discounted in the shorter term is a degree of ongoing support for commodities as an asset class if broader inflationary pressures due to supply-chain bottlenecks persist in the world economy.

Resurgent World Trade Highlights Supply-Chain Vulnerabilities

Global trade has rebounded more quickly after the 2020 recession than was evident in the aftermath of the Great Financial Recession a decade ago. See Figure 2 on the next page. Trade growth in 2021 is likely to come in at 8%-10%. A combination of accommodative monetary and fiscal policy (including \$6 trillion of proposed U.S. stimulus spending), and excess accumulated household savings (\$5 trillion in the advanced economies) has sustained demand for container fleets amid economic recovery.



Figure 2
World Trade Rebounds Faster than in 2009/2010



At the same time, the last six months have seen a spate of commodity and manufactured goods supply disruptions due to weather extremes. An exceptional winter freeze hit U.S. energy producers and manufacturers alike in February. More recently, Hurricane Ida shuttered most of the U.S. Gulf's offshore oil and gas production, while power outages have forced shut-downs of Louisiana's refining capacity. A combination of freeze and drought caused by El Niño risks slashing Brazilian agricultural production and exports for two years in succession.

Meanwhile, the worst drought in 55 years in Taiwan has exacerbated a shortage of semiconductors worldwide (Taiwan produces 75% of the world's more complex semiconductors). Again, resurgent demand has coincided with supply-chain shortages to drive prices higher. BMW, Toyota and others have been forced to suspend car production. *Oxford Economics* estimates that supply shortages in the \$40 billion global semiconductor market may have reduced 1H 2021 GDP in key automotive producing countries by between 0.1pp and 0.3pp. Moreover, semiconductor shortages are seen persisting through 2022 and into 2023; with limited spare capacity, complex manufacture and high barriers to entry ensure supply chains will remain fragile for the foreseeable future.

In May 2021 the 2.5 mb/d Colonial Pipeline System, which feeds refined products from the U.S. Gulf Coast refining system to southern and eastern seaboard states, was hit by a ransomware attack. Although this instance of cyberattack resulted in a disruption lasting only around one week, it highlighted the rising vulnerability of manufacturing, power supply, energy systems and the marine transportation sector to such attacks. The ongoing trend towards industrial process automation (itself accelerated by a low

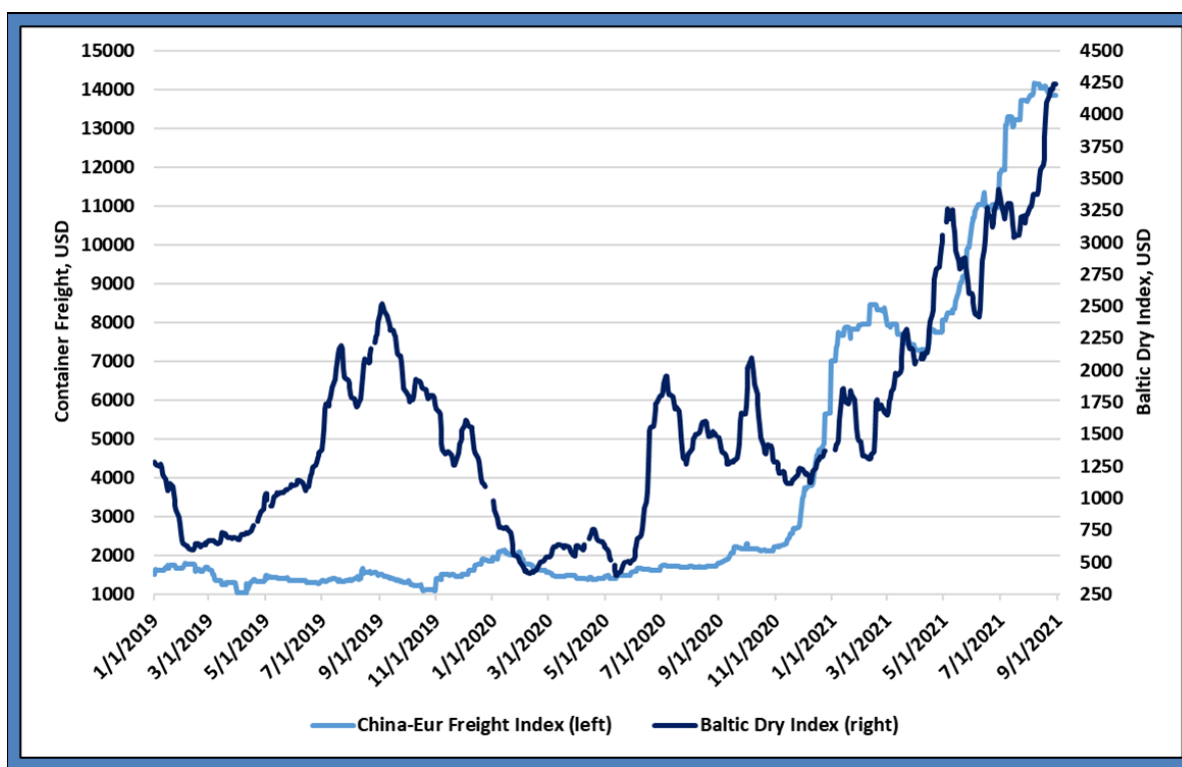


prevailing cost of capital), and the progressive electrification of the world economy, implies that future attacks are both more likely and potentially more economically damaging.

Shipping Issues Feed Broader Supply-Chain Tightness

Container and dry bulk shipping costs have scaled decade-highs, as shown in Figure 3, amplifying supply-chain cost increases that are feeding broader world price inflation. Sustained higher inflation could see Central Banks respond by raising interest rates in 2022 or 2023. However, despite longer-term concerns over the damage an inflationary spiral (and higher interest rates) could have for economic recovery, more immediately the inflationary narrative has tended to reinforce commodity price rises, with commodities traditionally seen by investors as a good hedge against broader market inflation.

Figure 3
Bulk and Container Freight Surge Continues



Sources: Argus Media, Refinitiv.

Essentially, shippers have confronted a “perfect storm” in recent months, as a strong (if unevenly distributed) rebound in commodity and merchandise goods demand combined with manpower and logistical infrastructure bottlenecks on the supply-side. Varying combinations of depleted inventory, mothballed supply capacity, displaced or idled logistical and transportation capacity and a squeeze on manpower availability have seen the supply side of the global economy, both for manufacturing and selected commodities, slow to respond to resurgent demand. And as noted above, some logistical bottlenecks could persist for another 12-18 months.



Stranded or displaced maritime crews have contributed to market tightness, so too manpower shortages and resultant delays at ports, both for loading and unloading containers and bulk cargo (Brazil and China have been particularly hard hit). Moreover, a recent BIMCO/ICS study highlighted that while short-term dislocations should ease, there is the risk of a growing structural shortage of certified maritime crews, potentially trebling today's 25,000 seafarer shortfall by mid-decade. Nor is maritime transport the only pinch point in supply chains, with widespread truck driver shortages reported throughout Europe, North America and Asia bidding up wage costs. Rail freight rates in North America have also risen sharply in 2021.

Barriers to Trade & Geopolitics

Geopolitical tensions and trade disputes pre-date the Coronavirus pandemic, but the aftermath of COVID-19 is unlikely to see a speedy resolution of many of the issues. Despite 2019/2020 seeing the signing of a preliminary U.S.-China trade deal, the intra-Asia Regional Comprehensive Economic Partnership (RCEP) free-trade agreement and announcement of an EU-China Comprehensive Agreement on Investment, the new decade may instead be seen in retrospect as a period of fraying international and trade relations.

Many of China's Asian neighbors are trying to reverse their rising economic dependence on the Middle Kingdom. Territorial disputes and trade bans simmer between China on the one hand, and Australia, India and several Southeast (SE) Asian countries on the other. U.S.-Russia and U.S.-China trade relations have been soured by recent sanctions, U.K. and European suppliers are suffering from the trade frictions that have followed Brexit, and political instability in Latin America and the Middle East also has the potential to impede the trade of critical commodities.

It would be wrong solely to focus on China in considering these issues. However, it is the world's first industrial power, accounting for nearly 30% of world manufacturing. Also, taking 10 key energy, metals, agriculture, petrochemical (petchem) and fertilizer commodities, China's imports collectively account for 27% of the world's total trade in those materials. Hence the evolution of China's own policies to boost self-sufficiency, and those of its trading partners to diversify their sources of manufactured goods supply, will profoundly affect supply chains and potentially raise costs in the years ahead.

Energy Transition and Decarbonization

A further key structural influence on supply chains for the post-pandemic era will be the evolution of government targets, mandates and regulations covering energy transition, decarbonization and associated environmental imperatives.

An energy transition will primarily hinge on deeper and broader electrification of the global economy. Recent work by the International Energy Agency (IEA) suggests this could see a six-to-eight-fold increase in demand for key metals and minerals per vehicle or a similar increase in electricity demand compared to current technologies. This increased trade in copper, cobalt and lithium will moreover be additive to world commodity trade. Ultimately, though hydrocarbon fuels will lose market share, they will continue to be traded in huge volumes internationally for decades to come, as also noted in Till (2021).



For the petrochemical sector, the pandemic may in the short term provide a stay of execution for hitherto derided single-use plastics. Without access to the huge volumes of personal protective equipment, sanitization materials and protective wrapping provided by the chemical sector in the last eighteen months, health outcomes for COVID-19 would have been many times worse than they already have been. Plastics recycling as an issue will not disappear however, with major implications for the polyethylene sector in particular. This despite the fact that, on a prevailing cost basis, new plastic is half as expensive to manufacture as recycled plastic.

Finally, with 80% of traded global merchandise moving by sea, supply-chain costs will be heavily influenced by environmental regulation of the shipping industry. While the International Maritime Organization's (IMO's) 2030 GHG emission reduction targets can largely be met from a combination of vessel efficiency improvements, slower sailing speeds and a switch to LNG, longer-term limits for 2050 would require 40%+ of propulsion to come from non-hydrocarbon sources such as ammonia or hydrogen, with clear upward cost implications.

A Policy Impetus Towards Supply-Chain Resilience

Some of the cyclical factors driving the current bout of supply-chain fragility and inflation will prove temporary. Disruption and dislocations were almost inevitable following the shutdown of the global economy for much of 2020. The more intense among these cost and logistical pressures could ease by 2022 as new manufacturing capacity comes onstream, manpower shortages ease and logistical assets are re-optimized to reflect shifting trade flows. Moreover, cost pressures could recede as growth rates for both the economy and world trade moderate towards historical norms.

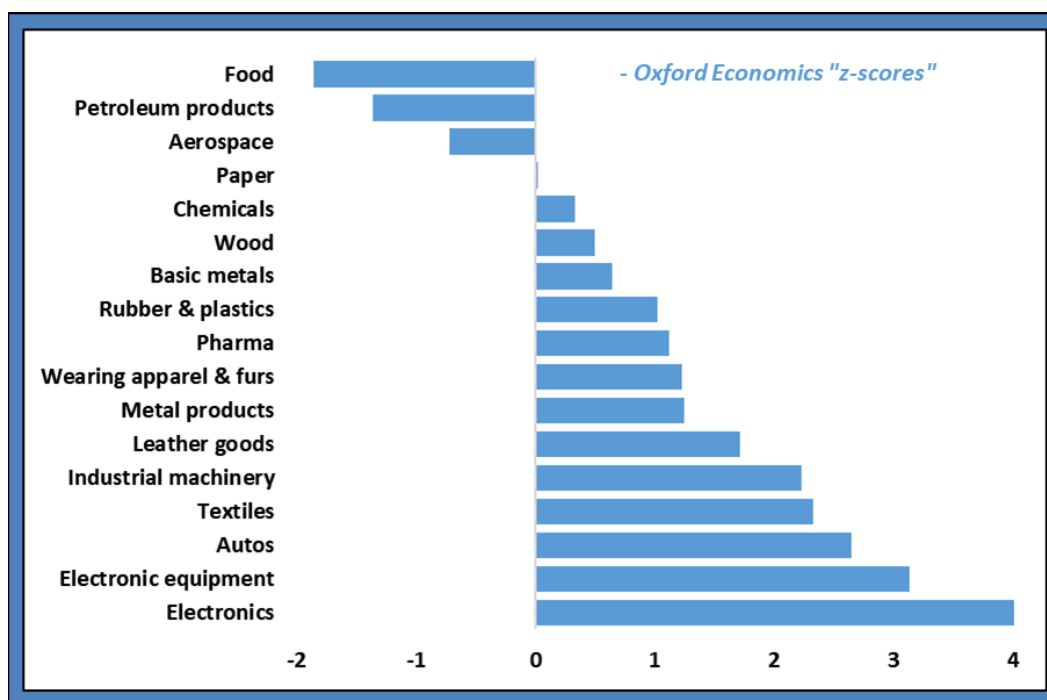
Longer term, this “mean reversion” in costs may however be counteracted by other structural supply-chain drivers. The world will not have to wait another 100 years until the next global pandemic. Cyber-crime risks will only intensify as automation and electrification increase. Massive investment running to hundreds of trillions of dollars will be required to diversify the fuel mix by 2050, with new grids, storage systems and shipment infrastructure required. Although the prediction of future changes in earth surface temperatures amid different emission scenarios is prone to massive margins of error, it seems reasonable to assume that extreme weather events could become more frequent. That too implies that greater supply-chain resilience will be necessary.

The pandemic and ensuing supply-chain disruptions is encouraging many countries to develop either indigenous manufacturing capabilities, increased stockpiles or to loosen reliance on any one predominant supplier for a wide range of strategic goods and commodities. There is growing political awareness of a need for supply-chain resilience, even if that undermines supply-chain optimization (cost reduction). By definition, this implies greater future acceptance of higher cost transport and storage solutions, in return for more secure, diversified or local sources of supply.

Nor are the industrial vulnerabilities to supply-chain disruption evenly distributed. As an example, *Oxford Economics* recently cited a ranking of sectoral vulnerability (“z-scores”) based on product complexity, sources of imports, current inventory levels and the likely pace of 2021 recovery. See Figure 4 on the next page.



Figure 4
Sector Vulnerability to Supply-Chain Disruption



This suggests that electronics and electrical equipment, automotive, textiles and industrial machinery are the sectors most vulnerable to supply-chain disruption. Although the fuel and petrochemical sectors compare favorably in terms of their own supply-chain fragilities, they too could be prone to unpleasant offtake surprises if supply-chain resilience is not improved across the economy in the months and years ahead.

Predicting the future for commodities, supply logistics and global inflationary pressures while the world continues to grapple with a pandemic is well-nigh impossible. But while today's elevated short-term price inflation could be revised down as cyclical supply bottlenecks recede, we should not be surprised if higher supply-chain costs become structurally embedded for the medium and longer term.

Endnote

David Fyfe [presented](#) on topics related this article at the JPMCC's [4th Annual International Commodities Symposium](#) on August 17, 2021. The Symposium's Program Committee Co-Chairs were Dr. Jian Yang, J.P. Morgan Endowed Chair & JPMCC Research Director and [Dr. Thomas Brady](#), Executive Director of the JPMCC.

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David Fyfe is Group Chief Economist for Argus Media based in London. Argus provides pricing benchmarks, market intelligence and advisory/consulting services to the global commodity industry. David has over 30 years of oil, energy and commodity market experience. Prior to joining Argus in April 2019, he spent six years as Chief Economist for global commodity trader Gunvor in Geneva. That was preceded by ten years at the IEA in Paris, where David headed the IEA's Oil Industry and Markets Division and edited the monthly *Oil Market Report*. He has also worked in oil and gas market fundamentals consulting and began his career with an engineering consortium supplying North Sea oil and gas operators. David has a degree in geological sciences and a Master's in Energy Policy & Economics from Imperial College in London.



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