

Research paper

Rising commodity prices: Challenges and repercussions on Global Supply Chains

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Since 2020, commodity prices have been rising steadily, exacerbated by geopolitical tensions (notably the war in Ukraine), disruptions linked to the COVID-19 pandemic, as well as climate shocks and logistical constraints. This surge affects agricultural commodities as well as energy and metal products, causing systemic repercussions on global supply chains. This article analyzes the transmission mechanisms of this inflation within logistics networks, identifying the vulnerabilities specific to each sector (agri-food, manufacturing, energy). It also examines the role of the financialization of commodity markets and the differentiated effects across regions. Avenues for resilience and strategic reorganization of supply chains are proposed through a cross-examination of economics, geopolitics, and sustainability.

Abstract

INTRODUCTION

Commodity prices have been on the rise for well over a year, and for many commodities, increased prices have persisted for four consecutive quarters since early in 2020. Commodity prices are not merely one object of economic interest, but rather a medley of independently traded assets, ranging from standard market-traded oil and precious metal to agricultural produce local to a cabal of isolated nations. The unprecedented outbreak of geopolitical tensions related to the Russia-Ukraine war has compounded existing worries about inflation, supply shortages, and the global economic outlook. All these factors have prompted a scramble for primary goods and further uphill commodity prices, yet the repercussions and measures on industries related to commodity companies remain unsatisfied. The inflation in global commodity prices amid the COVID pandemic has been a major concern, and the presently growing geopolitical tensions and shake-up have added to it. However, a complete overview on the challenges and inflation affecting each regional critical supply chain and the emergence of uncertainty and unexpected price jumps due to social, political, and environmental issues is still lacking. This assessment attempts to take stock of the present prices of critical commodities and the challenges key industries and regions face while delivering a broader view on commodity price inflation, transmission mechanisms, and

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informational efficiency. Moreover, the assessment offers suggestions on potential measures mitigating the operative risks posed by commodity price rises and transmission uncertainties. Rising temperatures due to human activities, at the heart of the climate change problem, can lead to severe damage to societies and nature, thus affecting the wider economy. Most importantly, there is a growing realization that climate change causes or aggravates extreme events, and there are increasing signs, based on scientific research, that the climate is changing faster and in more threatening ways than first assumed. Commodity price inflation associated with extreme inflationary scenarios can negatively influence a wider range of industries from energy to logistics, and an entire supply chain, an industrial backbone, and the world economy at large. To address the accelerating challenges posed by commodity price inflation, specific measures can be tailored to targeted commodities within the network based on inflation assessments and valuations (Valiante, 2011).

1. Understanding commodity prices

Business cycles at the global level exhibit boom-and-bust cycles in real activity and prices. The booms and busts of commodity prices, particularly food prices, and house prices, were among the most prominent examples in the 2000s and the 2010s. The boom, bust, and subsequent rally of commodity prices in the 2000s have drawn renewed attention from academics and policymakers to other types of boom-and-bust cycles. A number of structural changes in the demand and supply fundamentals of food commodities and oil are examined. In addition to this, the role of the financialization of commodity markets and the associated changes in the structure and behavior of traders is analyzed. Macro prudential policies are suggested to take the wind out of the sails of the current boom in commodity prices and reduce the likelihood of excessive price volatility in the future. Inflation is affecting food commodities, as the price of oil affects all incomes and costs. Oil is about 30% of the price of food; when oil rises, food follows, creating food inflation, as in the 1070s (Iqbal, 2023).

Consequently, cereal prices have risen sharply since 2007. The situation is not only serious for the FAO but also for the whole world. Perceptions of food insecurity may cause unrest to spread from one country to another, as illustrated by events in Tunisia and Egypt. Prices of meat products and vegetable oil have also risen because of the rising price of grain. Besides, the price of crude oil is a serious concern because of the insecurity of supply. The ongoing unrest in North Africa and the Middle East has raised the specter of a new oil crisis (Valiante, 2011). The world still remembers the oil crisis of 1973-1974, which raised oil prices four-fold, triggering stagflation. In the 1970s, inflation expectations became entrenched in industrial economies. All boardrooms in the West worried that Coriolanus would come to Rome and starve the Patricians.

1.1. Definition and Types of Commodities

Economic goods are defined as raw materials used as inputs in the production of goods and services. At the global scale, they are commonly called commodities. Commodities can be broadly divided into two classes: hard commodities, which generally include natural resources such as oil and precious metals, and soft commodities, such as livestock and agricultural products. Commodities can also be classified as either physical (or spot) commodities, which consist of tangible goods and products, and financial commodities include financial contracts concluded on an organized stock exchange that (i) are subject to set regulations, such as terms and dues, and (ii) are listed and traded on a commodity trading platform, the so-called derivatives market (Bongers & Casas, 2022).

Price variability in commodity markets is to be expected as the consequence of shocks in supply and demand. However, from 2003 the levels of prices of commodities, including oil, gold, silver, and soft commodities, have surged at rates that have never been experienced before in the history of international markets. Furthermore,

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increasingly prices of commodities have been increasingly volatile. Besides systematic shifts in the basic economic fundamentals, at the onset of commodity price booms-and-bust cycles, markets have entered speculative states, and positive feedbacks between price derivatives and price growth rates have become dominant (Valiante, 2011). As a consequence, major implications for business environment, such as the economic crisis and political uprisings, have been produced by these cycles.

The commodity price boom has occurred at a time when the European and American economies were still trying to shake off the effects of the global financial and economic crises. Concerns of policymakers in the last year have been in response to high rates of commodity prices increasing physical costs and reducing financial profits at a time when financial rescue and bailout activities have diverted major resource allocations. Food crises have swept far and low in the last few periods. Fears of a second wave of economic down-turn in emerging markets that have experienced rapid growth and stock market rallies for years have raised. Food prices in India surged by 18% (in year-on-year basis), and wheat prices soared by about 80% worldwide, resulting in famines and social turmoils in emerging countries.

1.2. Historical Trends in Commodity Prices

Historical price developments dating from 1990 show a complex dynamics of various commodity prices. Commodity prices showed an initial decline and extreme volatility that continued through the late 1990s. This volatility stemmed from the fact that prices exhibited a mixed underlying pattern. The trend can be split into three different periods. In the first period, from 1990 until 2000, large declines in both industrial metals and oil prices were recorded. The investments being undertaken in OECD states at that time had an enormous impact on the demand for energy and metal inputs, and product prices in turn eased inflationary pressures. Economic growth in the United States and Europe slowed around the change of the millennium, and this was a major shock to many commodities as these economies had a large import share in many groups. The downturn of stock prices during the bursting of the internet bubble at the beginning of the century interrupted the growth in oil prices during the previous years (Valiante, 2011).

In this context, the bursting of the Asian crisis and the internet bubble resulted in sharp drops of prices in most regional commodity markets. The dollar-denominated prices of commodities fell on average by approximately ten percent over the year 1997 and 2001, respectively. Basic metal prices diminished preconditions for a commodity boom and fell sharply by up to 85%. This period was similar to previous busts in commodity prices in the late 1970s, the end of the 1980s, and the late 1990s. However, something different occurred with oil prices, the price band that had realized itself at fifteen and forty-five dollars per barrel was broken in late 2003 (Taskinsoy, 2022).

As the new decade unfolded, commodity prices, aggregate measures thereof, and oil prices appeared to rise more than either had done so in the previous years. With regard to prices, there was in particular a commodity boom that affected food grains, metals, and fuels. The developments were pronounced and spread further to agricultural prices than during previous boom experiences.

2. Factors Contributing to Rising Commodity Prices

Prices for many commodities have risen sharply in recent years after a prolonged period of low prices. After falling sharply in the late 1990s and early 2000s, commodity prices, measured as indexes of commodity export prices, generally trended upward until mid-2008, when these prices peaked and then fell sharply (van der Mensbrugghe et al., 2009). Since the 2008 price collapse, commodity prices have trended steadily upward, with

prices for most commodities rising to all-time highs in 2021, nearing previous peaks in 2022, and remaining elevated in early 2023. Coal prices have remained especially elevated, having skyrocketed from an average price of 55 U.S. dollars per short ton in 2020 to an average of over 280 U.S. dollars per ton in 2022. The findings and policy recommendations are discussed at the beginning of this note.

Many interrelated factors are at play in explaining the recent rise in commodity prices, including real commodity demand growth, unanticipated demand shocks, pandemic effects on supply, supply disruptions, geopolitical tensions, and the interplay among these various factors. These policy recommendations are geared toward regulators and the regulatory processes and institutions in the OECD, the EU, and the U.S. regulatory space (Valiante, 2011). Prices for many commodities have risen sharply in recent years after a prolonged period of low prices. After falling sharply in the late 1990s and early 2000s, commodity prices, measured as indexes of commodity export prices, generally trended upward until mid-2008, when these prices peaked and then fell sharply.

Since the 2008 price collapse, commodity prices have trended steadily upward, with prices for most commodities rising to all-time highs in 2021, nearing previous peaks in 2022, and remaining elevated in early 2023. Vitamins and feed phosphate prices have risen in recent years after falling sharply from the late 2010s to early 2020s. Supply disruptions stemming from China's Covid Zero policy and geopolitical uncertainty regarding Ukraine are driving current retail fertilizer price spikes, though current prices are expected to fall over the next five years (Dmytrów et al., 2021).

2.1. Supply Chain Disruptions

Then the unexpected arrival of the COVID-19 pandemic created widespread disruption and distress across the global supply chain. Organizations have been directly or indirectly impacted by the pandemic, with many facing disruptions to supply, demand, and transportation (Hossein Ghadir et al., 2022). The coronavirus outbreak in China has put global supply chains at risk, due to the country's key position as the largest producer and exporter of consumer products, and companies' reliance on it. The temporal and spatial spread of the virus continues to impact supply chains, operations, and businesses. A sudden wave of lockdowns across the world in 2020 hindered production and restricted consumer access to goods and services. Companies of all shapes and sizes are grappling with unprecedented levels of disruption across their supply chain networks. Demand and supply shocks are occurring simultaneously, stressing existing vulnerabilities in manufacturing, transport, weaving, and sourcing, especially when there are multiple links in the supply chain.

Supply chains disrupted significantly around the world in 2020, and industry experts warn that the fallout from COVID-19 could persist for years. The important role that oil price, energy, production, import/export, and economic variables play in the mitigation of COVID-19 impacts on the supply chain is brought into perspective. Supply chain disruptions are inevitable through a world of more uncertainty and swift changes. That is, things are going wrong. From the historic 1970s Arab oil embargo to subsequent effort at OPEC unilateral production cuts to subsequent OPEC+ production cuts, through 9/11 sports events, through major natural disasters such as Chinese Taipei and Southeast Asia earthquakes, to plant explosions and mega mergers & acquisitions, the attention of both academia and the industry has focused increasingly on understanding the underlying mechanism of these disruptions and ways to combat them (Alabi & Ngwenyama, 2023). All markets and industries have their own disruptions rooted in their own points of vulnerability. Supply chains are not exempt.

2.2. Geopolitical Tensions

Rising commodity prices reflect recent geopolitical tensions (Valiante, 2011). The ongoing war in Ukraine has exacerbated an already difficult situation for global supply chains following the large-scale disruption of trade by COVID-19's associated lockdowns. While rising commodity prices certainly impact the cost of customers for suppliers, whether that leads to reduced supply for those commodity items is more context dependent. One key context is the relationship between the commodity item itself and the industry's overall product offering. If a manufacturer only produces something using one commodity item, then yes, costs could substantially rise on that item but it is likely non-profitable to continue operation just to service that one revenue stream. On the flip side, suppliers often raise costs across a product offering based on value. A key indicator to watch is the spread between commodity price increases to customer selling price increases as it is not uncommon to find many suppliers operating at a cost advantage when the gap is quite large.

Increasing regulation and tariffs also form a significant portion of how commodity prices fade through the supply chain. Very large suppliers with strong accounting and legal teams are still often caught off guard by complex changes to regulation and tariff policy. Each instance results in additional costs to suppliers that need to be passed through to customers, this often takes months due to the strong relationships between the two parties. Monitoring these changes across the regions and categories of supply is crucial to remain agile against volatility (Valiante, 2011). Political unrest for commodity-producing regions can impact supply and requirement to have a procurement strategy across developed markets means a buyer must be able to navigate instability in other regions. Data analytics and modelling should be focused on extensive what-if supply chain scenarios to expand learning around mitigation and leverage opportunities within volatile supply markets.

2.3. Economic Recovery Post-Pandemic

The pandemic has dramatically changed the world economy, leading to a rapid decline in activity, trade, and investment in early 2020. Lockdown measures taken by nearly all countries to curb the spread of the virus have affected both the supply side and the demand side of the economy in all countries. The result is an unprecedented global economic shock comparable to the Great Depression. The sharp decline in economic activity has led to a dramatic decline in commodity prices, too. Worldwide, prices for oil and energy commodities have fallen by more than 70% since the outbreak of the COVID-19 crisis in early January 2020. Brazil's exports of iron ore fell by over 40% in March 2020 compared to the previous month, leading to price declines by around 20%. Research addresses the commodity price shocks that have occurred during the COVID-19 crisis and their implications for commodity-dependent countries (Tröster & Küblböck, 2020).

Different supply and demand shocks at the national and international level explain the dramatic price drops in oil and other commodity markets. Selective crisis interventions at the national level, such as output cuts in the oil industry, are considered in the analysis, but more general structural measures may be required. Before the spreading of the COVID-19 crisis, the global economic backdrop was characterized as the Global Expansion, with robust levels of economic activity, exceedingly low unemployment rates, rising equity prices, and somewhat manageable inflation rates. The pandemic changed this outlook for the economy abruptly from one week to the next. The sharp decline in economic activity, significant drops in incomes, and abortive global demand, has dramatically changed the world economy (Ajmal et al., 2021).

2.4. Inflationary Pressures

As anticipated, the price surge witnessed over the past six months had enormous inspiration outside the euro zone area in the emerging economies especially in food and raw materials inflation that substantially accelerated at the global level around May 2010. Earlier on, monetary conditions had become moderately loose in the euro zone area, as interest rates had been ranging around 1% since June 2009, especially compared with historical standards (Valiante, 2011). Recent developments in the US and Europe that created risks of a double-dip recession, together with delayed exit strategies among major central banks, have led to fears of inflation shocks, making the euro zone more prone to a global inflationary wave. Price accommodation by central banks has also sent the message that inflation control would be a lower policy priority compared to buoying growth at this point in time, leading to rising inflationary expectations worldwide (Valiante, 2011).

On the one hand, if inflation expectations rose again, oil and raw material price expectations would follow suit. Moreover, swings of price capital via asset reallocation from more price-sensitive stock/fixed income to less price-sensitive fixed income equity/commodities could induce a sustained price surprise in flexible products with a more long-oriented and speculative trading nature. On the other hand, monetary conditions facing breadwinner economies have broadly eyed price stabilization subject to a moderate accommodative stance. Inflation risk has then engendered stress on volatility and lack of price stickiness across the board.

3. Impact on Global Supply Chains

The increasing oil prices are anticipated to adversely affect global supply chains, with repercussions on producers and consumers (Escaith, 2009). Recent analyses focus on two kinds of transmission effects: the increase of transport costs for bulk commodities, which are liquid, and of commodity prices passed through the supply chain, which are more or less processed. The analyses project short-term and long-term commodity price indices consistent with oil price trajectories. Also estimated are the price transmission elasticities of a selected set of commodity prices towards crude oil prices, with emphasis on the improvements in supply chain transmission models with respect to raw price indices. Shipping costs greatly increase due to steady increases in oil prices after 2005, causing commodity price increases through the shipping chain. It is believed that commodity prices will level off even if oil prices increase further, and hence no further effects are expected on upstream and downstream supply chains concerning price increase. Oil price transmission is fairly rapid, and the increase in crude oil price to \$157 in mid-2008 from \$67 in mid-2007 is believed to have increased the crude price by over 160%, with tough supply chain repercussions on agricultural, industrial input, final goods, and soft commodities dispatched from harbor locations around the world.

Since 2000, supply chains have undergone profound changes. First, the structure of supply chains in a range of industries has altered, partly in response to massive, low-priced imports from China. Second, firms with manufacturing capabilities in emerging markets, and especially in China, are expanding their outreach into nontraditional markets in Latin America, India, Eastern Europe, and the Middle East. Finally, there is growing interest in environmental issues related to supply chain operations. Attention to the environmental performance of supply chains is now mentioned in the annual reports of firms publicly traded in the United States and the European Union, and supply chain service providers in these markets are prioritizing environmental mode conversion (Singh & Kashyap, 2024).

4. Sector-Specific Challenges

Due to rising crude oil prices in 2022, soaring diesel fuel prices resulted in a risk of diesel fuel shortages or crisis conditions in Western Europe. Rising commodity prices lead to an excessive increase in production costs, which

may lead to stagnant wages and decline. If production costs increase an excessive amount, companies cut production and/or conduct layoffs. The increase in commodity prices leads to inflation and monetary tightening, which may hinder global economic growth. Therefore, there is a need to understand or analyze the details of the commodity price rise. In 2022, all commodity prices surged in unison. From the second half of 2022, it shifted towards being unrealistically high and above what is perceived as the equilibrium level. The five major commodities of crude oil, natural gas, coal, corn, and wheat saw a decrease in prices. However, the important precious metals, gold and silver are not significantly declining in prices. The rise in prices of crude oil and LNG was already expected due to coordination among OPEC+ and the change in the Russian's Ukraine situation. The risk of shortages was envisioned due to these rises. The increase in natural gas prices is attributable to a source of energy competitiveness compared to oil in electric power generation and lower coal prices. The recent apparent normalization of coal prices reflects lower demand and less chance of a global fall back to once used fuel in fire incidents (Tröster & Küblböck, 2020).

Soft commodities can have complicated vagaries in prices and applicable models of price formation. The Turkish Inflation and Consumption Forecast Monetary Policy in 2021 shows the rapidly increasing utility and non-alcoholic beverage prices. It is attributable to the double jeopardy of energy and food price increases. Inflation and price formation with the current commodity price increases are simply Deaton's model. The most worrying is the largest price volatility concerning agriculture, grain, palm oil, etc.

4.1. Agriculture and Food Supply

Food inflation, driven by rising crude oil prices, rectified for rising price trends in cereals and vegetable oils in early 2007 (P Rao et al., 2008). However, surges in food prices were exacerbated by speculation in food commodities, increased river and rail freight rates, fiscal measures adopted by many countries, and lower food stocks with a sharp rise in demand for bio-fuels. Prospects for the future showed no certainty of a price crash or moderation in price volatility. Agricultural commodity prices increased during the 1980s and 1990s. However, the real prices of many agricultural commodities rose in the 1970s again. Analysis of long-term price trends indicated that cereal prices rose during the 1970s and declined during the 1980s and 1990s. Such prices were stable and showed a moderate increase since 2000. The factors contributing to the decline in prices included the introduction of synthetic substitutes for natural fibers, other developments that curtailed their demand like the slowing of population growth, stability in the demand for food grains in developed economies, worldwide agricultural technological improvements leading to increased productivity cattle herds, and decreased expectancy on output to exert downward pressure on prices due to the big increase in global supplies (Erten & Ocampo, 2021).

4.2. Manufacturing and Raw Materials

Manufacturers rely on raw materials for production, and commodity prices represent purchase costs. Increases in commodity prices have broad economic ramifications that affect firms but impact their supply chains as well. In recent years, commodity prices have shown relatively steady price behavior, but since mid-2002, price swings have been observed across commodity categories. For example, crude oil prices more than doubled from \$25 per barrel in mid-2003 to \$55 in September 2005. Concerns exist about the economic sustainability of such price swings, and raw-material price increases and volatility affect a firm's quality of life. Conventional wisdom suggests that engineering or financial strategies can reduce vulnerability, and commodity prices can be modeled using a standard Carter-type, two-stage stochastic programming model, though it requires further development (Min, 2022).

A firm's supply chain relies on raw materials, which represent the endpoints of passenger activity. The commodities sector includes goods with largely price-determined uniform or similar usage characteristics. Corporations compete on schedule, reliability, and sensitivity to price in this sector. Where competition exists in the supply base, price histories demonstrate widespread stability, with high-grade ore and steel prices changing on average only 4% yearly from 1982 to 2002. However, in recent years, commodity prices have demonstrated a much-feared follow-on increase in systemic price behavior. As steel prices skyrocketed 50% from 2002 to 2005, a 10% change in commodity price expressed as a percent of sales equates to a 120% change in gross cash flow. Price behavior affects worker demand and supply chain reliance on price. When commodities become scarce or expensive, demand can move to substitutes, stressing those resources (Valiante, 2011).

4.3. Energy and Fuel Costs

One of the largest impacts of commodity inflation will be on the rising cost of oil and transportation. One month into the war in Ukraine, oil prices had reached over \$125 a barrel for the first time in ten years. Amidst the invasion, the U.S. banned Russian oil imports, prompting further concern and elevated prices (Bok Cho, 2006). Global price increases are still having rippling effects at the port and truck analysis levels, despite prices dropping recently to just over \$80 per barrel. National economic pressures such as inflation, a fragile labor market, and lingering pandemic impacts will all keep price levels elevated compared with the pre-pandemic period and as the worries persist. The most obvious impact of sustained high oil prices is that the cost of energy will go up. Fuel bills will rise due directly to the increased cost of delivering products and potentially through price increases at the pump for consumers. Skyrocketing global oil prices raised fears of a recession in the U.S. economy as inflation returned. It predicts U.S. drivers will pay an average of \$3.38 a gallon for regular unleaded gasoline in 2022, up from about \$3.04 in 2021. Diesel prices will hit an all-time high, averaging \$3.63 in 2022 versus \$3.30 the previous year. Airlines would have to absorb higher fuel costs of \$22 billion in 2022, up from \$14 billion in 2021. Southwest Airlines, Delta Air Lines, and American Airlines may seek to raise fares in response to the increased fuel costs. Bus and train operators may also seek to raise fares, with consumer products makers potentially raising prices too. Sustained high oil prices could potentially slow down the world economy.

A related issue is the cost of shipping goods. After rising for much of 2020, the cost of shipping containers through ocean freight has recently fallen significantly; however, the price remains elevated compared with pre-pandemic levels and busier shipping ports. Many industry experts anticipate that prices for shipping goods or commodities will remain high as pandemic repercussions are regularly felt and the hope for service recovery remains moderate. Sustainability trends for businesses over the next ten years will have implications for shipping goods. COVID-19 has pushed the demand for e-commerce, fueling a boom in the last-mile delivery sector. Elevated consumer demand for parcel shipping services continues to outstrip pre-pandemic growth expectations of roughly 8% to 10%, even with the tapering of pandemic-driven demand (Burigana, 2022).

5. Future Outlook

The situation in world commodity markets, primarily raw materials, fuel, and food, is precarious. Commodity fears emerged with US debt and budget problems. War in Libya pushed oil prices upwards. Conversely, grain prices have fallen markedly as crop forecasting improves for the 2011 crop year. However, crude oil and many other commodities are still significantly higher in 2011 than in 2010 (Escaith, 2009). The impacts on inflation and global growth as commodity prices flare up, similar to 2008, just as consumers are being asked to endure austerity in terms of tax hikes or services cut, are highly visible. Passenger ticket taxes and VAT hikes in Europe, fuel taxes in Japan and South Korea, and sales taxes and gasoline surcharges in India are all the latest. Higher

commodity prices spur panic in stock markets first, primarily those in developing countries. As inflation expectations catch on, stocks in Europe and the US are also in flight, though indices show sharp divergences between sectors.

Rising commodity prices compress global demand, generate added inflation worries, introduce risks from monetary tightening, and reroute cash away from different channels of consumption. This generally puts pressure on growth and ordered sectoral development. Markets that were considered insulated a few years ago are now deeply affected. Countries that have benefited from the commodity boom now brace for challenges arising from rising prices, lower export demand from rich economies, and monetary tightening by advanced central banks. Difficulties in balancing the macro-economic situation will weigh heavily on countries like Brazil, India, Turkey, Indonesia, and South Africa (Escaith, 2009). The Russian economy has also been affected by a slower pace of export demand growth from Europe, while domestically controlled pricing of natural monopolies stirs inflationary worries. Effects of sudden shocks, such as the recent political turmoil, breakout of war, and earthquake in Japan, may come later than the price moves elsewhere.

5.1. Predictions for Commodity Prices

An increase in Covid-19-related restrictions in the Spring of 2021 gave way to a gradual normalization of demand. A shift from durable goods to services reduced demand pressure on goods for several months. Lower shipping activity on long-distance routes was also reflected in smaller volumes reported for several major shipping companies (Valiante, 2011). In 2021, consumer price inflation surfaced, initially benefitting from the base effect due to sharp price increases a year ago. Underlying inflation measures generally remained low as demand returned to normality, but an acceleration was shown in early 2022. The negative developments this year are manifold and evolving. However, the impacts of the sanctions on the global grain supply are expected to be felt far and wide. Agricultural commodity prices already had one shock earlier due to the pandemic. Now soaring energy prices should be felt everywhere through supply chains and agricultural input prices.

As a result, commodity prices are projected to rise in the short term. A full embargo on Russian material cuts would imply concerns on both energy and agriculture. The consequences on the world economy would not only transcur through energy prices but also through agricultural commodity prices which are already at record highs. The war in Ukraine is seen as an underlying factor boosting the sentiment on all prices. A historic widening has unfolded in the soy complex with the US arbitrary linked to concerns on the drought, whereas South American soybeans were traded at a premium. In the US, corn prices surged due to both fears on Russian and Ukraine grain supply, and demand for alternatives - US farmers switching from soybeans to corn, possibly leading to lower US soybean stocks.

5.2. Long-Term Supply Chain Strategies

Ultimately, the Corrective Policy Measures, Technology Promotion Measures and Market-based Criteria and Measures should all aim to ensure the availability of competitive biomass feedstocks in the main demand markets in order to enhance market access by the non-food sector (Baldassarre & Campo, 2015). These viable long term supply chain strategies will move forward according to planned timing to become targeted feasible options. It is preferable to run new interventions and actions in parallel with existing policy actions respectively; hence different collaborative arrangements are recommended in market-oriented sectors as alternative/competing categories of policies measures. In transition phase towards the long term strategies it will be essential to tackle the more pressing local supply chain barriers at feedstock and regional level. It is better to start with preliminary

mapping of the local industry and engagement of local stakeholders; instead of substantial financial or material support broad technical assistance and facilitation roles is recommended for the starting phase. Proper deliverables and tasks specifications will ultimately steer the design of concrete work plans, activities and responsibilities (Luke & Heyns, 2018). Countries which are highly reliant on both diesel and its import are more affected by oil price shocks on vegetable oils and biofuels. Imported biodiesel is sensitive to the USD foreign exchange movements, and domestic products are less exposed to international biodiesel shocks, but have stronger linkages with palm oil shocks. External shocks can be internalized into domestic markets. Heavy reliance on imports means a higher welfare loss associated with the oil price shocks, while oil refining or biofuel production does not have a structural effect. A buffer stock scheme can reduce the price transmission coefficient between crude oil and biodiesel prices to less than half, and significantly lower welfare loss and price volatility.

Conclusion

The rising prices of commodities, from food to fuel and metals, have triggered a profound concern about their repercussions for inflation, growth, and the global economy as a whole. The pandemic, financial stimulus, and an increase in inventories across the supply chain triggered an underestimate of the onset of inflation, along with a trifecta of supply-demand shocks. Initially, inflation was seen as ‘transitory’ in nature; price levels were destined to reset to their previous regime once bottlenecks had cleared. But instead, inflation gained momentum. Inflation expectations have risen perceptibly, and it has become abundantly clear that ‘tapering’ monetary policy would be needed sooner than previously assumed (Valiante, 2011). Understanding the causes of inflation rises is paramount to grasping the direction of monetary policy. Financial asset prices, best represented by the S&P 500 index, bond spreads on corporate versus treasuries, and EM versus core, all reached new highs. By contrast, commodity prices have tested records not seen since the Great Financial Crisis. Interest rates on swaps to hedge inflation have also risen, while the gap between inflation-linked and nominal rates on treasury securities widened significantly across tenors. But if norms of economic stability are a concern, should policy-makers focus on financial assets or commodities? The two analytical streams are intertwined. Starved for yield, financial investors have reallocated capital to commodities since May 2020. Financialization has raised unwarranted concerns about a bubble in commodities. Realized price diversity is low across metals or energy, but high for food assets. Trends in wheat and corn prices predict trends in all other food items, from sugar to meat. The absence of price discovery raises the concern about the repercussions on the food insecure. The fertile crescent is at the crossroads of the main wheat-producing regions: Europe, the Black Sea, and North Africa. Ten years ago, the Arab Spring emerged from exacerbated grievances over food – conflicts refueled by the price rise following Russia’s 2021 wheat export ban on the eve of the invasion of Ukraine. Leverage is crucial to understanding these dynamics. But the pandemic and subsequent monetary easing reshaped the expectations of the future equilibrium price. The future price level was therefore revised upward on the whole, hence a dot-com style bust is unlikely. But if policymakers choose to focus on commodities, price discovery is paramount. Safe and rapid storage raises upside price risk. Zero bid-ask spreads reveal tight conditions. To prevent strategic price aggregation by strong players in the food futures markets, safeguards must be activated. But if grain prices boom, on the back of climate shocks, discretionary cash transfers to the food insecure would be warranted too. In the end, the new equilibrium financialization, still at moderate levels, must reap the reward that best practices price agriculture.

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