Special Focus

Post-Pandemic Commodity Cycles: A New Era?

Since the onset of the COVID-19 pandemic, commodity prices have experienced marked swings. Starting with a widespread decline in early 2020, prices reached a record high in 2022 but retreated again in 2023-24. This Special Focus presents a comprehensive, 55-year analysis of commodity price cycles for 27 key commodities using a novel cycle-dating algorithm. On average, commodity prices experienced 14 turning points—roughly a change every four years—with downturns lasting 52 months and booms 38 months, indicating a marked asymmetry in cycle duration. Industrial commodities exhibit substantial synchronization driven by global macroeconomic factors, whereas agricultural commodities are more prone to localized supply shocks. In the post-pandemic period, commodity prices experienced record-high volatility, with cycles showing significant differences compared to past norms. Cycle durations have halved, occurring roughly every two years, with booms becoming more intense. This shift appears to be driven by a confluence of adverse events—including the global pandemic recession, natural disasters, and geopolitical conflicts—and long-term trends such as the energy transition and rising geoeconomic fragmentation.

Introduction

Commodity prices have seen pronounced movements following the outbreak of the COVID-19 pandemic. Prices declined sharply in early 2020 due to collapsing demand, followed by a rapid surge to historical highs in 2022, driven by supply chain disruptions, strong post-pandemic demand, and geopolitical tensions. In 2023-24, commodity prices have eased somewhat but continue to exceed pre-pandemic levels (figure SF.1.A). More recently, amid heightened global uncertainty, shifting trade policies, and a subdued growth outlook, commodity prices have experienced renewed fluctuations. Driven by a confluence of overlapping shocks, the decadal volatility of the World Bank's Commodity Price Index is on course to reach record levels in the 2020s (figure SF.1.B). Heightened variability can be indicative of evolving patterns in commodity price cycles. Beyond repeated short-term perturbations, structural factors such as the global energy transition and geoeconomic fragmentation are also shaping price dynamics in the post-pandemic period.

This Special Focus examines commodity price cycles, a defining trait of commodity markets, through a systematic, cross-commodity analysis spanning more than five decades. A contribution of the study is the measurement of cycles using a novel dating algorithm that identifies turning points for 27 commodities over the last 55 years, from 1970 to 2024. This enables a comprehensive examination of cycle characteristics, including the length and intensity of price swings, the asymmetry between booms and slumps, and the degree of synchronization across commodities (see Terminology and concepts section for definitions).

The analysis addresses three central questions.

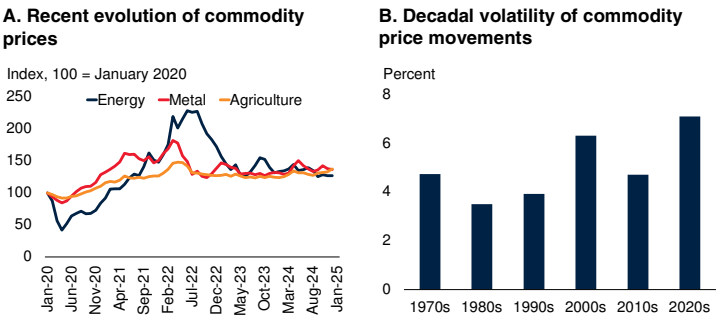
- *First, how can commodity price cycles be defined and measured?* Unlike business cycles, commodity price cycles lack a standardized classification, requiring a tailored methodology to identify turning points.
- *Second, what are the key features of commodity price cycles?* The study highlights commonalities and heterogeneity across commodities, revealing that downturns tend to be longer than upswings, with notable synchronicity across commodities.
- *Third, how do post-pandemic commodity price cycles compare with historical trends?* By placing recent price movements within a historical context, the study indicates that the post-pandemic period could mark a significant deviation in commodity price behavior, departing from established patterns.

Commodity prices are critical for emerging markets and developing economies (EMDEs), with about two-thirds relying on commodities for a significant share of their exports, fiscal revenues, and overall economic activity. The characteristic volatility of commodity prices has significant

Note: This Special Focus was prepared by Mirco Balatti and is based on Balatti (forthcoming). Helpful comments were provided by Paolo Agnolucci, Carlos Arteta, John Baffes, Jeetendra Khadan, Philip Kenworthy, Ayhan Kose, Gitanjali Kumar, Dawit Mekonnen, Dana Vorisek, and Hamza Zahid. Research assistance was provided by Juan Felipe Serrano Ariza.

FIGURE SF.1 Commodity market dynamics: Prices, volatility, and cyclical behavior

Commodity prices have experienced significant volatility since 2020, initially declining sharply due to collapsing demand before surging to historical highs in 2022. While prices have moderated, they remain elevated relative to pre-pandemic levels.



Source: World Bank.
Note: Last observation is December 2024.
A. Monthly average commodity prices, in U.S. dollar terms. Index base period is January 2020.
B. Volatility of composite commodity index by decades, measured as average standard deviation of monthly price changes.

macroeconomic implications, influencing inflation, external balances, and growth prospects in both commodity-exporting and commodity-importing EMDEs. Understanding the nature and drivers of commodity price cycles is, therefore, essential for policymakers seeking to navigate the economic fluctuations associated with commodity market developments.

The Special Focus presents the following key findings.

- Among the 27 commodities analyzed, price cycles exhibit an average of 14 turning points over the past 55 years—equivalent to a phase change every four years, on average. Slumps tend to last significantly longer than booms, with average durations of 52 months and 38 months, respectively, while the amplitudes of booms and slumps are broadly similar, indicating symmetrical price swings. On average, commodities are in the same cyclical phase almost two-thirds of the time, highlighting significant synchronization. Industrial commodities, such as base metals, display higher cycle comovements due to their sensitivity to global macroeconomic developments. In contrast, agricultural commodities exhibit lower synchronization, reflecting their vulnerability to localized, idiosyncratic supply shocks such as weather disruptions and disease outbreaks.
- The evolution of commodity price cycles reflects significant shifts in drivers and dynamics. Between 1970 and 1985, cycles were predominantly influenced by commodity supply shocks, especially in energy markets, resulting in frequent and severe swings. The period from 1986 to 2001 was marked by greater stability, with longer cycles driven by technological advancements and market liberalization, which bolstered productivity and trade. However, from 2002 onwards, commodity price volatility surged, leading to shorter and sharper cycles. In the twenty-first century, major global events—including financial crises, global recessions, oil price collapses, and wars—have contributed to volatility. Structural shifts, such as the energy transition, weather-related disruptions, and rising trade fragmentation, are also reshaping commodity markets, replacing the strong integration and growth trends seen at the beginning of the twenty-first century.
- Buffeted by a series of shocks, post-pandemic commodity markets have witnessed record price volatility. Since 2020, commodity price behavior has diverged from historical patterns, with more frequent and asymmetric cycles. The duration of phases has nearly halved, averaging less than 25 months compared with almost 50 months pre-pandemic. Booms have been more intense, while slumps have moderated, thereby generating the asymmetry. Commodity price swings have intensified in the 2020s due to short-term shocks and longer-term shifts. A combination of global and commodity-specific shocks—including the global pandemic, geopolitical tensions and conflicts, and extreme weather events—has driven short and sharp cycles. At the same time, the energy transition, climate-related supply risks, and rising geoeconomic fragmentation are also influencing the dynamics of commodity price cycles. These factors amplify price variability in commodities and introduce supply frictions while supporting sustained demand for key commodities.

Methodology, database, and definitions

Methodology and literature

Commodity prices tend to behave cyclically due to a combination of structural, financial, and external factors.[1] The methodology for this analysis begins with the measurement of commodity price cycles—a critical first step in understanding their dynamics. Drawing on the insight that "the study of cycles necessarily begins with the measurement of cycles" (adapted from Baxter and King 1999), a novel cycle-dating algorithm proposed by Balatti (forthcoming) is used. The approach refines existing methods to identify turning points in commodity price series systematically.[2]

There are two methodological approaches to the study of commodity price cycles in the literature. The first strand decomposes prices into components, with different filtering techniques introduced by Baxter and King (1999) to differentiate the trend and the cycle (Baffes and Kabundi 2023; Ojeda-Joya, Jaulin-Mendes, and Bustos-Pelaez 2019). The second strand follows the business cycle dating literature and aligns closely with the approach adopted in this Special Focus.[3] The identification of turning points to precisely date recessions has been central to understanding economic cycles. Foundational work by Bry and Boschan (1971) and subsequent refinements by Harding and Pagan (2002) have established robust frameworks for dating business cycle phases, while adaptations of these methodologies by Cashin, McDermott, and Scott (2002), World Bank (2022a), and others have extended the analysis to commodity markets.

This study uses a novel cycle dating algorithm introduced by Balatti (forthcoming) to identify turning points in commodity price series without resorting to smoothing or detrending techniques. Building on the Harding and Pagan (2002) framework and following Cashin, McDermott, and Scott (2002), the methodology imposes a minimum phase length of 12 months—ensuring that seasonal effects, such as those in annual crops, do not confound cycle detection—and a minimum full cycle duration of 36 months. A key difference compared to the previous literature is the inclusion of an explicit amplitude restriction to prevent the identification of negligible fluctuations as "regular" cycles and to distinguish between boom and slump phases accurately. Calibrated at a 15 percent threshold, this criterion addresses limitations observed in previous methodologies, ensuring that only suitable price movements are classified as cycles.[4]

Database

Monthly commodity prices are collected from the World Bank's *Pink Sheet* and are deflated using the U.S. Consumer Price Index (CPI), following previous literature. The inclusion of 27 different

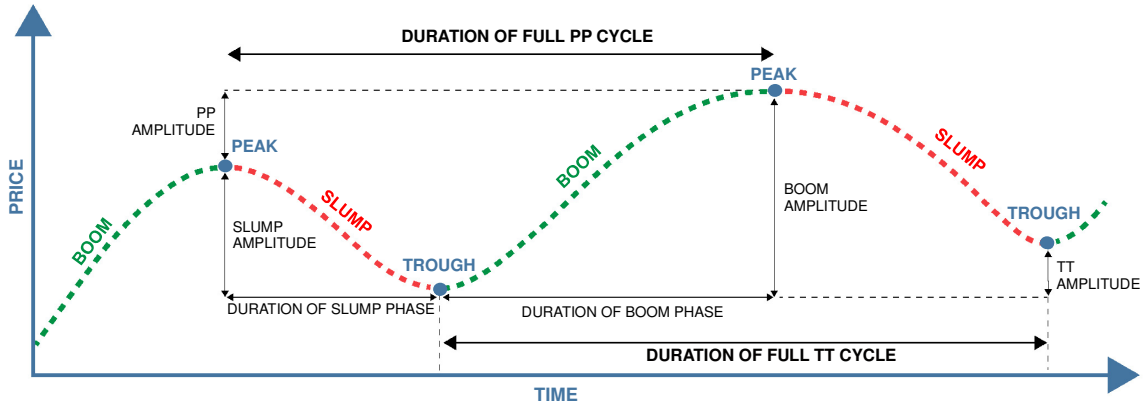
[1] On the supply side, long investment lead times and high capital intensity mean that production responds slowly to price changes, often resulting in overinvestment during booms and persistent excess capacity during slumps. Inventory dynamics also contribute—while stockpiles can buffer short-term imbalances, low inventories amplify price spikes, and excess stocks prolong downturns. Financial speculation further reinforces cycles, as investor sentiment drives price overshooting during upswings and sharp corrections during downturns. Moreover, commodity demand is closely linked to the global business cycle, rising during economic expansions and contracting during recessions. Finally, exogenous shocks—such as geopolitical conflicts and extreme weather events—can cause abrupt supply disruptions, often aligning with or amplifying existing cyclical patterns.

[2] In contrast to business cycle analysis—where classifications such as the NBER provide standardized definitions for recessions and expansions—commodities lack such a benchmark due to the inherent differences between GDP time series and commodity price series. As argued by Deaton (1999), "what commodity prices lack in trend, they make up for in variance." When contrasted to GDP, a quantity variable with more gradual movements and overall upward trend, commodity prices are characterized by sharp and frequent fluctuations and the absence of a pronounced trend component. Also, GDP contractions are broadly negative, but commodity price shifts have mixed effects, benefiting producers or consumers depending on direction. These distinctive features necessitate a specialized algorithm tailored to the unique behavior of commodity prices to accurately date turning points and support rigorous empirical research and policy analysis.

[3] The identification of lower-frequency commodity price movements (often termed "super-cycles") through filtering methods has raised debate about the appropriateness of the term "cycle." While short- to medium-term approaches make no assumptions about regularity, some authors caution that labeling these longer movements as cycles implies regular repetition, whereas "waves" may better capture their irregular nature over longer time frames.

[4] In a nutshell, the algorithm systematically detects turning points—peaks and troughs—in price data. It first pinpoints local maxima and minima in price series and then applies the predefined duration and amplitude rules to only select economically meaningful turning points, discarding non-eligible ones. The intervals between these points are subsequently classified as either boom or slump phases.

DIAGRAM SF.1 Cycle terminology and concepts: Stylized example of commodity price cycles



Source: World Bank.
Note: Slumps refer to the periods between a peak and a subsequent trough, while booms are the periods between a trough and a subsequent peak. A peak-to-peak (PP) cycle includes a slump followed by a boom; a trough-to-trough (TT) cycle includes a boom followed by a slump. Duration measures the time between turning points, and amplitude captures the magnitude of price changes within each phase or full cycle.

commodities from January 1970 to December 2024—ranging from energy, agriculture, metals and minerals, fertilizers, and precious metals—allows a long-term, broad overview of commodity markets. The selection follows Baffes and Kabundi (2023) and is designed to be sufficiently broad to capture commodity heterogeneity while remaining focused enough to provide a relevant analysis of the most significant commodities with market-based price mechanisms.[5]

Terminology and concepts

The following conceptual definitions are consistently applied when examining the time series and turning points derived from the algorithm (diagram SF.1).

Peaks and troughs. Among the identified turning points, local maxima are defined as peaks, while local minima are defined as troughs. The algorithm ensures an alternation between peaks and troughs.

Slumps and booms. Time periods between a peak and a trough are referred to as slumps (or downward phases), while periods between a trough and a peak are termed booms (or upward phases). Together, booms and slumps constitute the phases of a full cycle. A full peak-to-peak (PP) cycle is defined as a slump followed by a subsequent boom, while a full trough-to-trough (TT) cycle is defined as a boom followed by a subsequent slump.

Duration. Duration refers to the length, measured in months, of individual phases and full cycles. Specifically, it represents the number of months separating identified turning points—from peak to trough (slumps), trough to peak (booms), or from peak to peak (PP cycles) and from trough to trough (TT cycles).

Amplitude. Amplitude, measured in log differences, represents the magnitude of price movements during each phase or full cycle. Using log differences, rather than simple percentage changes, ensures symmetry and comparability between upward and downward phases.[6]

Concordance. Concordance ratios serve as a valuable metric in the context of assessing synchroniza-

[5] Commodity selection follows Baffes and Kabundi (2023) and were "judiciously [chosen] from a larger set of prices based on several criteria, including the importance of the respective markets throughout the sample period, the desire to represent all major commodity groups, and the way in which price signals are formed." The sample includes 27 commodities: 7 agricultural (annual), 4 agricultural (perennial), 6 base metals, 3 energy, 4 fertilizers, and 3 precious metals.

[6] This methodological choice is standard in the literature and offers several advantages, particularly in the context of examining commodity price booms and slumps. Log differences provide a symmetric and more consistent measure of proportional changes, ensuring that increases and decreases of the same magnitude are treated equivalently. Unlike percentage changes, which are inherently asymmetric, log differences avoid this distortion, leading to a more accurate representation of the volatility and magnitude of price fluctuations during booms and slumps.

tion across pairs of commodities. They measure the proportion of time two commodity prices are in the same phase of the cycle (boom or slump), providing an indicator of the synchronization of their cyclical behavior. This metric provides insights into the degree of simultaneous time spent in the same phase between two commodities, indicating whether their cyclical behavior over time is similar. The concordance ratio ranges between 0 and 1, indicating the percentage of time spent in the same state. Consequently, independent time series are expected to have a concordance ratio of 0.5.[7]

Main features of commodity cycles

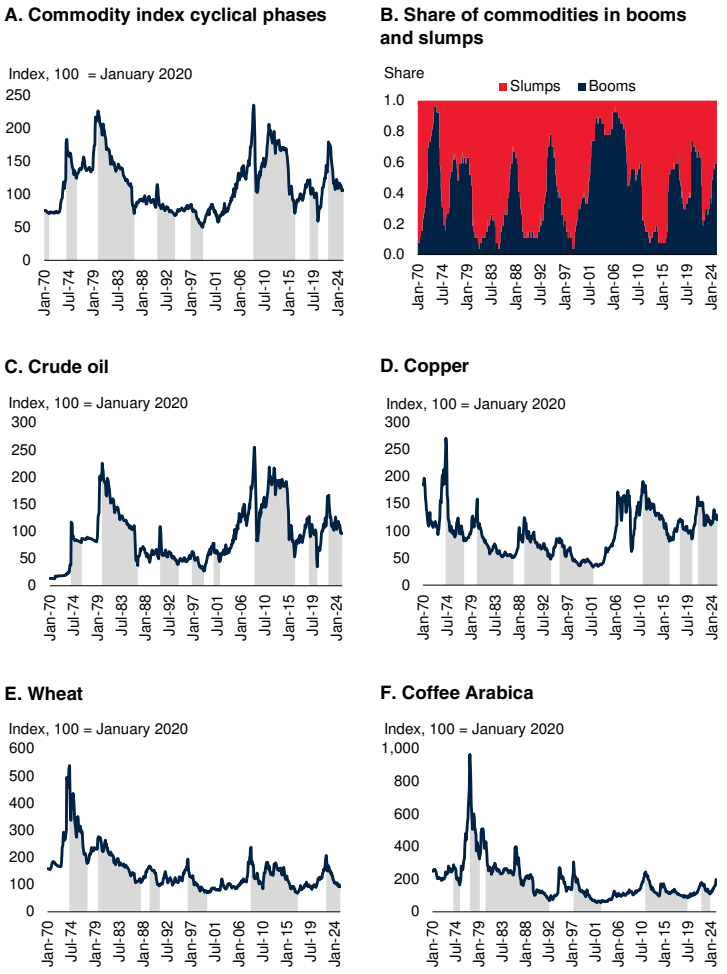
A systematic assessment of commodity cycles requires an understanding of their key features. This section starts with a brief analysis of the turning points in commodity price cycles over time. It then presents key stylized facts on cycle duration and amplitude over the 1970-2024 period. Next, it analyzes the similarities and differences across commodity groups. It concludes with an analysis of the synchronization of cycles.

Turning points of commodity cycles

Global commodity prices. In line with the previous literature, real commodity prices have been subject to significant fluctuations over the last 55 years, though no strong long-term trend is evident (figure SF.2.A). These prices have been characterized by repeated cycles, and have experienced seven troughs and seven peaks since 1970.[8] Several of the identified troughs—specifically those in 1975, 1986, 1999, and 2020—coincided with periods of global recessions or economic slowdowns. The 1975 global recession and accompanying oil price slump followed the sharp increase in oil prices triggered by the Organization of the Petroleum Exporting Countries' (OPEC) price hike and the Arab oil embargo initiated in October 1973. The commodity price slump of 1986 largely resulted

FIGURE SF.2 Commodity price cycles and turning points

Commodity prices have exhibited recurring cycles over the past five decades, with repeated peaks and troughs often coinciding with global economic shocks or commodity-specific disturbances.



Source: World Bank.

Note: Monthly prices deflated using U.S. Consumer Price Index. Last observation is December 2024. Indexes base period is January 2020. Shaded areas indicate slump phases.

A. Monthly composite commodity index.

B. Monthly share of commodities in booms and slump phases since 1970. Sample includes up to 27 commodities.

C. Average price of Brent (38° API), Dubai Fateh (32° API), and West Texas Intermediate (WTI, 40° API).

D. Copper (LME), Grade A, minimum 99.9935% purity; cathodes and wire bar shapes; settlement price.

E. Wheat (U.S.): No. 1, Hard Red Winter (HRW), ordinary protein; export price, delivered at the U.S. Gulf port for prompt or 30-day shipment.

F. Coffee Arabica (ICO): International Coffee Organization indicator price; other mild Arabicas; average New York and Bremen/Hamburg markets; ex-dock.

[7] In contrast to concordance ratios, correlation coefficients capture the strength and direction of the linear relationship between two commodity price series over time. While correlation coefficients reflect comovement in price changes, concordance ratios focus on the alignment of cyclical phases, making them particularly useful for assessing the degree of synchronization in commodity price cycles.

[8] Over the sample, 14 turning points are identified, with peaks in February 1974, November 1979, October 1990, December 1996, June 2008, October 2018, and March 2022. The troughs are in December 1970, December 1975, July 1986, December 1993, February 1999, January 2016, and April 2020.

from changing oil supply dynamics, as OPEC shifted to higher production targets following substantial output cuts in the early 1980s. Although the mid-1980s did not encompass a global recession, economic growth slowed considerably during this period, intensifying downward pressure on commodity prices. Similarly, the decline in commodity prices in 1999 reflected weakening global demand in the aftermath of the 1997-98 Asian financial crisis. The most recent trough, recorded in April 2020 at the onset of the COVID-19 pandemic, followed the steepest commodity price collapse on record. This downturn was driven by a sharp contraction in global commodity demand amid the deepest global recession since World War II, compounded by widespread restrictions on transport and travel—sectors that together account for approximately two-thirds of global oil consumption (World Bank 2022a).

Individual commodity prices. Further insights emerge from analyzing the cyclicality of individual commodity price fluctuations. Since 1970, the share of commodities in slumps and booms has experienced significant swings (figure SF.2.B). Over the sample, on average, 42 percent of commodities were in a boom phase, while 58 percent were in a slump phase. The share of commodities in a boom reached levels above 90 percent in 1972-73 and in 2005-06, when commodity prices experienced strong and broad-based increases. The share of commodities in a slump has reached levels above 90 percent more frequently in 1970, 1981, 1984, 1998, 2012, and 2014-15. More recently, several economic shocks buffeted commodity markets, causing significant volatility and turning points in price cycles. For instance, in February 2020, around two-thirds of commodities were in a downward phase due to the pandemic-induced recession. The economic recovery over 2021-22 also coincided with a large share of commodities in boom phases, reaching a peak in 2022 following the Russian Federation's invasion of Ukraine. In 2024, an average of 54 percent of commodities were in a boom, while the remaining 46 percent remained in a slump.

A closer look at the turning points of four representative commodities—crude oil, copper, wheat, and coffee—provides further insight into the nature of commodity price cycles.

Crude oil prices have experienced seven troughs since 1970 (figure SF.2.C). These declines have largely coincided with global recessions and OPEC production decisions. The most recent collapse occurred in April 2020, as the sharpest global economic downturn since World War II, combined with widespread mobility restrictions, led to a sudden drop in oil demand (Baffes and Nagle 2022). A strong rebound followed, with prices peaking in June 2022, driven by the post-pandemic recovery and disruptions in commodity markets due to Russia's invasion of Ukraine. Despite ongoing volatility due to geopolitical risks and supply adjustments, oil prices have since entered a slump phase, repeatedly returning to an overall downward price trend after short-lived geopolitical surges, amid ample spare supply capacity within OPEC+ (World Bank 2024).

Copper prices have experienced six troughs since 1970 (figure SF.2.D), typically triggered by global recessions, technological advancements, shifts in demand, and the entry of new producers into the market (World Bank 2022a). While economic activity remains the primary determinant of long-term price trends, short-term volatility is largely driven by inventory fluctuations, consumption demand, and supply shocks (World Bank 2022b). The most recent decline occurred between January and April 2020, as the COVID-19 pandemic disrupted global markets. This was followed by a rapid rebound, fueled by economic recovery and supply constraints, leading to a post-pandemic price surge that peaked in May 2021—the most pronounced upswing in over a decade. Real copper prices subsequently declined amid continued weakness in China's real estate sector and softening global demand, but have recently trended upward, supported in part by rising demand from clean technologies (World Bank 2023).

Wheat prices have experienced several notable swings since 1970, with five troughs (figure SF.2.E). Price cycles have been driven primarily by supply disruptions, trade policy shifts, and weather-related impacts on yields. The major

troughs in wheat prices have often coincided with periods of oversupply, such as the early 1980s and mid-1990s, when high global stocks depressed prices (Baffes and Nagle 2022). In contrast, price spikes have been linked to supply disruptions caused by droughts, geopolitical events, and export restrictions (World Bank 2022b). The 1970s' wheat price spike resulted from a confluence of supply and demand shocks. Adverse weather constrained production, while surging Soviet grain imports drove up demand. The oil crisis exacerbated inflation and production costs, amplifying price pressures and leading to a boom phase. One of the sharpest price increases occurred in 2007-08 when a combination of poor harvests, high energy costs, and policy-driven export bans led to a significant tightening of global wheat supplies. A similar surge took place in early 2022 following Russia's invasion of Ukraine, which initially halted a substantial portion of global wheat exports. In 2023-24, stock-to-use ratios, a key gauge of global supply tightness, have remained at adequate levels, reflected in the ongoing downward phase.

Arabica coffee prices have experienced six troughs since 1970 (figure SF.2.F). Dynamics are driven primarily by weather-induced supply disruptions, the rise of new producers, and evolving global demand patterns (World Bank 2022a). Some of the most dramatic price surges have stemmed from extreme weather events in key growing regions. The most pronounced occurred between 1975 and 1977, when a severe frost in Brazil—the world's largest coffee producer—triggered a threefold increase in real coffee prices, reaching a historic peak in April 1977. Similarly, severe weather conditions in Brazil and Peru in 1994 and 1997 fueled sharp price increases, leading to a prolonged five-year boom that ultimately gave way to a downturn (World Bank 2022a). More recently, prices soared in 2021, peaking in February 2022, as another severe frost in Brazil curtailed supply. However, during 2022-23, prices declined amid favorable weather conditions and expectations of a production rebound (World Bank 2023). Following the trough in October 2023, Arabica coffee prices have entered a new boom phase, driven by concerns over supplies from key Robusta producers, including Brazil and Indonesia.

Duration and amplitude of commodity cycles

Over the last 55 years, the analyzed set of commodities has experienced an average of 14 turning points—roughly one every four years. Figure SF.3.A plots the average duration of the resulting spells. Booms last 38 months on average, while slumps last 52 months, and their difference is statistically significant. In other words, the duration of slumps is usually 1.4 times longer than that of booms. Full cycles can be defined either as peak-to-peak (PP) or trough-to-trough (TT), and both have an average length of 90 months. By construction, these full cycles partially overlap, so similarities in their average statistics are expected.

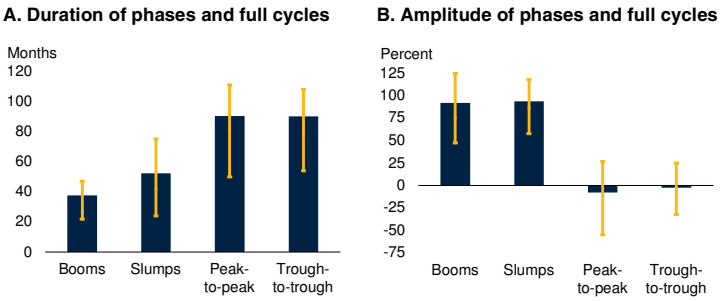
Figure SF.3.B presents the distribution of log amplitudes. Downward phases are shown in absolute terms—meaning their negative values are converted to positive—to allow for a direct comparison with upward phases. Amplitudes are measured in log differences rather than percentage changes, as log differences provide a more consistent and symmetric way to compare price increases and decreases. Booms and slumps record an average amplitude of 92 percent and 93 percent, respectively. Their difference is, however, not statistically significant. Reflecting the somewhat higher amplitude of downward phases, the average amplitude of PP and TT cycles is negative, at -8 percent and -3 percent, respectively. The wide interquartile ranges indicate significant variance in the intensity of full cycles.[9]

Several factors explain why slumps tend to last longer than booms in commodity markets. First, productivity gains in commodity production can

[9] The relatively narrow interquartile ranges for phase duration and amplitude suggest a degree of regularity in commodity price cycles. While fluctuations in commodity prices are influenced by a range of macroeconomic and sector-specific factors, the observed consistency in these metrics suggests that price movements, while volatile, exhibit some recurring patterns over time. This does not imply, however, that commodity cycles follow a predictable, uniform trajectory. Unlike a perfectly periodic cycle, commodity price movements are shaped by shifting economic conditions, policy interventions, technological improvements, supply shocks, and demand shifts, leading to variations in timing and magnitude.

FIGURE SF.3 Main features of commodity cycles

Commodity price cycles exhibit differences in phases, with slumps consistently outlasting booms. However, their amplitudes are broadly similar, with no statistically significant differences between upward and downward swings.



Source: World Bank.
Note: Last observation is December 2024. Sample includes 27 commodities. Yellow whiskers indicate the interquartile range.
A. Average duration of completed phases and full cycles across the sample. Duration refers to the average length in months.
B. Average amplitude of completed phases and full cycles across the sample. Amplitude measures the average real price change (in log differences) between turning points. For slumps, the absolute value of the amplitude is shown to facilitate comparison with booms.

lead to sustained declines in real prices, gradually reducing costs and increasing supply over time. Second, inventory management has limitations and cannot fully absorb demand fluctuations. High storage costs and perishability constraints amplify downward price pressures, as seen in the 2020 oil crash, when storage shortages led to a historic collapse in prices. Third, while demand can contract abruptly due to economic slowdowns, recessions, or efficiency improvements in commodity-intensive industries, positive supply-side adjustments are typically more gradual. Many com-modities are capital-intensive, with long production lags, prompting suppliers to maintain output despite short-term demand fluctuations. In contrast, booms tend to be sharp but shorter-lived, often triggered by sudden supply-side disruptions such as trade embargoes, extreme weather events, or geopolitical shocks that temporarily constrain availability before markets adjust.

Cycle characteristics across commodity groups

Commodity price cycles exhibit similarities and differences across commodity groups, reflecting distinct demand and supply dynamics and sensitivity to macroeconomic and financial conditions.

Slumps consistently last longer than booms across all categories (figure SF.4.A). However, this asymmetry is particularly pronounced in precious metals, fertilizers, and perennial agricultural commodities, where downturns tend to be persistent. In contrast, energy and base metals, which are closely linked to global industrial activity, exhibit relatively shorter booms and slumps.

A similar pattern emerges when analyzing full cycle durations (figure SF.4.B). TT cycles are generally comparable to PP cycles across most commodity groups, but precious metals stand out with notably longer and more variable cycles. This reflects the unique characteristics of precious metals markets, where price movements are often influenced by their role as safe-haven assets and their strong linkages to financial markets. Unlike industrial commodities, which are primarily influenced by supply and demand fundamentals, precious metals such as gold, silver, and platinum tend to rise in periods of economic uncertainty, inflationary pressures, or geopolitical instability, leading to prolonged booms. Conversely, as macroeconomic conditions stabilize, demand for these assets weakens, resulting in extended cycles.

The magnitude of price fluctuations between turning points is sizable across all commodity groups, with limited variation (figure SF.4.C). In agricultural commodities and base metals, booms exhibit lower amplitudes than slumps, while the opposite holds for energy, fertilizers, and precious metals. In contrast to the latter three groups, agricultural commodities—particularly annual crops—exhibit relatively lower price volatility across cycles. The wider interquartile ranges of full cycle amplitudes in energy, fertilizers, and precious metals, compared to other commodity groups, further underscore greater variability (figure SF.4.D).

Energy, fertilizers, and precious metals exhibit the most pronounced and variable swings in price cycles, reflecting structural and financial factors that amplify volatility. Energy markets are dominated by a few major producers, with OPEC+ supply decisions, geopolitical disruptions, and production shocks creating price fluctuations beyond standard demand-supply dynamics.

Precious metals, which act as both commodities and financial assets, are highly sensitive to speculative trading, changes in investor sentiment, and frequent shifts in inflation and interest rate expectations. Fertilizer prices are closely tied to energy costs, as natural gas is a key input in their production, causing energy price shocks to impact fertilizer markets directly.

In contrast, agricultural and base metal markets tend to be competitive, with moderately concentrated production resulting in somewhat lower amplitudes. Among agricultural commodities, perennial crops experience larger booms and slumps due to inherent supply rigidities. Unlike annual crops, their production cannot be quickly adjusted to market conditions, making supply less responsive to demand fluctuations.

Synchronization of commodity cycles

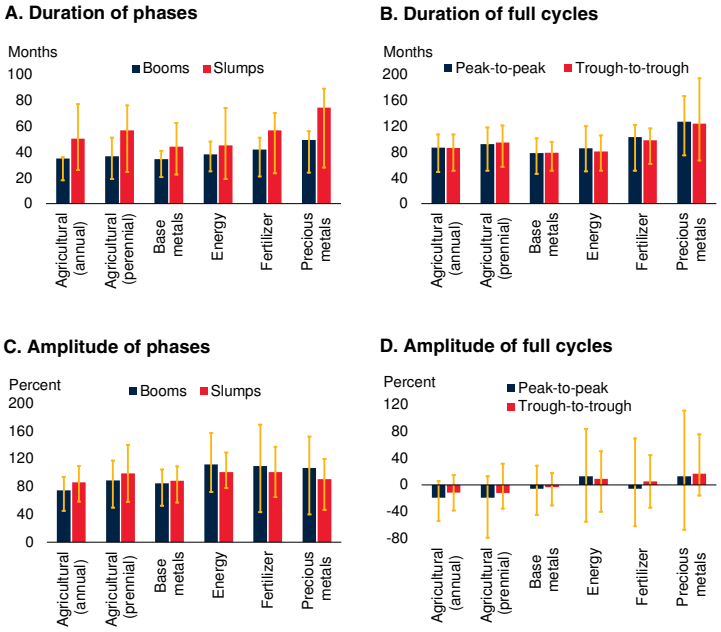
Commodity prices often exhibit synchronized movements, reflecting the influence of multiple economic and financial factors. The literature addressing commodity synchronization comprises three primary strands. The first emphasizes synchronization driven by common macro-economic shocks and fundamental market forces. The second, known as the excess comovement hypothesis, argues that commodity prices tend to move more closely together than fundamentals alone would justify, indicating the possible role of speculative behavior and market sentiment. The third highlights how increased financialization has strengthened linkages across commodity markets through speculative investments and portfolio diversification strategies, further amplifying price comovements.

Concordance ratios are computed for all possible commodity pairs to assess the degree of synchronization across commodities. The concordance ratio measures the proportion of time two commodities are in the same phase of the cycle, providing a gauge of cycle comovement within and across commodity groups. The average pairwise concordance ratio across all commodities stands at 0.64, indicating that two randomly chosen commodities typically shared the same phase 64 percent of the time (figure SF.5.A). Since positive comovements in commodity markets are well documented in the literature (World Bank 2024), concordance ratios above 0.5 are to be expected. Among individual commodities, rubber, copper, and the fertilizer triple superphosphate (TSP) exhibit the highest average pairwise synchronization with all other commodities, with concordance ratios close to 0.7, while tea, cocoa, and Robusta coffee display the lowest synchronization, with ratios between 0.5 and 0.6.

Beyond individual commodities, synchronization patterns within and across commodity groups provide further insights. The within-group concordance ratio measures the average degree of synchronization among commodities within the same category, while the across-group ratio captures synchronization between commodities from different groups. The results indicate that within-group synchronization tends to be higher

FIGURE SF.4 Cycles characteristics across commodity groups

Across commodity groups, slumps consistently last longer than booms—energy and base metals exhibit shorter cycles, while precious metals display extended cycles. Amplitudes are broadly similar, with energy, fertilizers, and precious metals showing the most pronounced swings.



Source: World Bank.

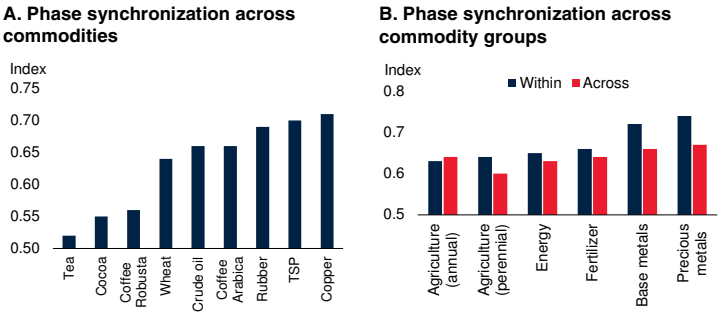
Note: Last observation is December 2024. Sample includes 27 commodities. Yellow whiskers indicate the interquartile range.

A.B. Average duration (in months) of completed phases and full cycles within groups.

C.D. Average amplitude (in log differences) of completed phases and full cycles within groups. For slumps, the absolute value of the amplitude is shown to facilitate comparison with booms.

FIGURE SF.5 Comovements of commodity cycles

Commodity price cycles exhibit robust synchronization at both the individual and group levels. Metals show the highest within- and across-group synchronization, driven by shared demand dynamics and common cost structures. In contrast, agricultural commodities exhibit lower synchronization due to lower substitutability, distinct production cycles, and greater exposure to idiosyncratic supply shocks.



Source: World Bank.

Note: Synchronization is measured by the concordance statistic, defined as the proportion of time two price series spend in the same cyclical phase. It equals one if both series always coincide in the same phase.

A. Average pairwise concordance ratio between each commodity and other commodities in the sample. The chart displays a selected subset of the commodity sample, including the three most synchronized, the three least synchronized, and four representative commodities analyzed in the text and shown in figure SF.2. The total number of commodities shown is nine, as copper is both a representative commodity and the most synchronized one.

Cocoa: International Cocoa Organization daily price; average of the first three positions on the terminal markets of New York and London (nearest three future trading months). Coffee Robusta: International Coffee Organization indicator price; Robustas, average New York and Le Havre/Marseilles markets; ex-dock. Coffee Arabica: International Coffee Organization indicator price; other mild Arabicas; average New York and Bremen/Hamburg markets; ex-dock. Copper: Standard Grade A; cathodes and wire bar shapes. Crude oil: Average price of Brent (38° API), Dubai Fateh (32° API), and West Texas Intermediate (WTI, 40° API). Rubber: RSS3 grade; Singapore Commodity Exchange Ltd (SICOM) nearby contract. Tea: Mombasa; African origin; all tea; arithmetic average of weekly quotes. TSP: Triple superphosphate; spot import U.S. Gulf. Wheat: No. 1 Hard Red Winter (HRW), ordinary protein; export price delivered at the U.S. Gulf port for prompt or 30-day shipment.

B. Average pairwise concordance ratio for commodity pairs belonging to the same group (within-group) and for pairs comprising commodities from different groups (across-group).

than across-group synchronization, reflecting similarities in production processes, demand drivers, and substitutability, as well as complementarity, within each category (figure SF.5.B). Energy, fertilizers, base metals, and precious metals exhibit the highest within-group concordance ratios, ranging from 0.65 to 0.75. The high synchronization among these industrial commodities reflects their shared substitutability and complementarity on the demand side—such as copper and aluminum in industrial applications—as well as common cost drivers affecting extraction and production costs.

Conversely, agricultural commodities display the lowest within-group synchronization, with a concordance ratio of approximately 0.63. The lower comovement among agricultural commodities stems from limited substitutability in production factors and greater exposure to idiosyncratic supply shocks, such as weather conditions, disease outbreaks, and land constraints.

Across groups, industrial commodities—base metals, energy, and precious metals—and fertilizers show strong synchronization, reflecting their shared sensitivity to global macroeconomic conditions. Economic expansions tend to drive simultaneous increases in demand across these commodities, while downturns lead to broad-based declines (World Bank 2024). In contrast, perennial crops like coffee and cocoa exhibit particularly low synchronization due to long production cycles and localized supply constraints.

Commodity cycles over time

Commodity cycles: 1970-2024

Commodity price cycles have undergone significant transformations over the past five decades, driven by shifts in global economic conditions, evolving market structures, and changing policy environments. Previous research on commodity price dynamics has typically divided recent history into three broad periods since 1970, each distinguished by unique drivers and cycle characteristics (Baffes and Nagle 2022). This section presents a systematic temporal analysis of these cycles, focusing on changes in duration, amplitude, and underlying factors across three sub-periods commonly referenced in the literature: 1970-85, 1986-2001, and 2002-24. The analysis reveals notable contrasts across these periods. The 1986-2001 period stands out for its relatively smoother dynamics, characterized by longer cycles with moderate amplitudes, while the first and last periods experienced more abrupt and frequent fluctuations (figure SF.6.A-B).

The first period (1970-85) was marked by heightened volatility, primarily driven by widespread supply shocks, particularly in energy markets. Oil price shocks during the 1970s and 1980s emerged as the principal source of global commodity price fluctuations. The collapse of the Bretton Woods system further intensified inflationary pressures and geopolitical uncertainties, amplifying commodity price swings. In terms of cycle duration, booms during this period

averaged 31 months, while slumps were notably longer. The amplitude of price movements was substantial, reflecting the intensity of supply-side disruptions and market instability. This period underscores the significant role of supply shocks in shaping commodity price behavior, with energy markets disproportionately affected.

The second period (1986-2001) exhibited comparatively tranquil market dynamics. Turning points were further apart, and full cycles averaged the longest duration among the three periods, indicating more stable market conditions. Compared to pre-1986, booms extended to an average of 47 months, while slumps stretched to 56 months, suggesting prolonged periods of more gradual price adjustments. Price amplitudes during this phase were relatively more muted and homogeneous, with both PP and TT full cycles exhibiting positive average values—unlike in other periods. This moderation in commodity price cycles can be attributed to significant productivity gains, particularly from advancements in biotechnology that boosted crop productivity. Market liberalization in emerging economies also played a key role by fostering global trade flows and expanding access to commodity markets. This combination of technological progress and structural economic reforms contributed to a more stable global commodity market environment, as increasing commodity supply was generally met by steady demand growth.

The third period (after 2002) saw a resurgence of volatility, driven by broad-based demand shocks and linked to rapid economic growth in EMDEs and their integration into the global economy. Cycle duration shortened compared to the previous period: booms averaged 35 months, while slumps declined to 46 months. Despite the notably shorter phases, amplitude statistics point to similarly pronounced booms and slumps compared to the past, suggesting faster price swings. Major events contributing to commodity price volatility during this period included the 2008 global financial crisis, the 2014-15 oil price collapse, the COVID-19 pandemic, and geopolitical shocks in the 2020s, notably the conflicts in Ukraine and the Middle East. In contrast to earlier decades, global macroeconomic shocks—especially demand shocks—became the predominant factor influencing commodity markets. The financialization of commodity markets has significantly strengthened price synchronization and likely increased their sensitivity to global economic developments, especially since the commodity price boom of the late 2000s (Baffes and Nagle 2022).

The intensified nature of commodity price cycles in this period reflects long-term structural shifts driven by two key global economic trends. First, the turn of the century was marked by rapid global economic integration, driven by surging demand associated with China's industrialization and urbanization and facilitated by numerous trade agreements and liberalization initiatives. This momentum slowed considerably following the global financial crisis, giving way in the 2010s to a period of sluggish global growth. A lackluster recovery in the United States, the euro area sovereign debt crisis, and the onset of slowing potential growth in China all contributed to a weaker global demand environment. This shift was reflected in commodity markets, most notably in the sharp collapse of oil prices in 2014-15, marking a departure from the earlier boom years and contributing to a more volatile cycle pattern. Since the late 2010s, the macroeconomic environment has been characterized by even weaker global growth, set back by the pandemic-related global recession of 2020, and by escalating geopolitical tensions and a resurgence of protectionist measures (see Post-pandemic commodity cycles section). Second, climate-related factors and the global energy transition have gradually emerged as significant influences on commodity markets, progressively reshaping supply conditions and demand patterns. The increasing frequency of extreme weather events has steadily affected production, particularly in agricultural and energy commodities. Meanwhile, long-term policy initiatives supporting renewable energy sources have structurally boosted demand for critical minerals.

Collectively, these three sub-periods highlight a clear transition in the drivers of commodity price volatility over the last 55 years. The 1970-85 period was dominated by commodity supply-

driven shocks linked to geopolitical instability and inflationary pressures. The 1986-2001 period marked a shift toward more stable, supply-adjusted cycles influenced by technological advancements and market liberalization. In contrast, the post-2002 period has been shaped primarily by commodity demand dynamics, reflecting the increasing integration of EMDEs into global commodity markets and significant global events. In the latter part of this period, however, rising economic fragmentation and climate-related factors, combined with the energy transition, may have introduced new, persistent forces into commodity markets.

Post-pandemic commodity cycles

The most recent period of commodity price fluctuations, beginning with the COVID-19 pandemic, offers critical insights into the evolving dynamics of commodity cycles. Given the geographic dependencies inherent in the production of many commodities, which create supply rigidities, and generally low demand elasticities, commodity markets are inherently susceptible to large price swings when adverse events occur. The pandemic itself may have been a singular event in this regard but longer-term trends—including rising economic fragmentation, more frequent weather shocks, and the energy transition—are likely to become increasingly influential for commodity prices, potentially increasing their sensitivity to macroeconomic shocks. By placing the 2020s in historical context, findings suggest that post-pandemic commodity behavior may signal a significant shift, marked by more frequent turning points and greater volatility.[10]

Results indicate a more compressed cyclical structure in commodity markets since 2020, with shorter phases driven by the increased frequency of turning points (figure SF.6.C). Post-pandemic boom phases average 24 months, significantly below the 38-month average recorded over the 1970-2019 period. The duration of slumps has contracted even more markedly, halving from an average of 54 months before 2020 to 23 months in the post-pandemic period. This translates to roughly a turning point every two years. In contrast with the full sample, the difference in duration between upward and downward cycles is not statistically significant. As a consequence of the lower phase duration, full cycles have become considerably shorter as well. While peak-to-peak and trough-to-trough cycles averaged 90 months prior to the pandemic—exceeding 100 months during the relatively stable 1986-2001 period—post-pandemic cycles have been completing in just 45 months. While long cycles cannot yet have occurred in the 2020s by definition, the preponderance of already complete shorter cycles suggests a genuine shift in cycle durations, supported by comparisons of 2020-24 with other five-year periods.

The amplitude of commodity price fluctuations has also shifted markedly in the post-pandemic period (figure SF.6.D). Booms have intensified, averaging 113 percent—up from 89 percent over the 1970-2019 period and 94 percent during the highly volatile 1970-85 period. In contrast, slumps have become less severe, with an average price decline of 79 percent compared to 94 percent over the preceding five decades. Even

[10] For both the full sample and individual sub-periods, including the 2020s, the cycle identification algorithm is applied to the complete time series to mitigate short-sample biases and ensure consistent turning-point detection. The analysis considers only those phases and cycles that are complete, thereby preventing ongoing cycles from skewing the average estimates.

In the post-pandemic period, more than 50 individual phases are observed across commodities, with an average of two turning points per commodity. This reflects a high frequency of fluctuations and provides a sufficient sample for analysis. The widespread nature of cycles since 2020 further supports the findings: 26 out of 27 commodities experienced at least one turning point, suggesting that the observed patterns are not driven by a single commodity but rather reflect broader market trends. Statistical tests confirm that duration and amplitude metrics in the post-pandemic period differ significantly from most benchmark periods.

To address concerns about the limited time span of the 2020s (2020-24), a comparable analysis was performed using rolling five-year windows starting from 1970. Relative to earlier five-year periods, the post-pandemic window stands out for having the highest number of turning points, with duration and amplitude metrics diverging notably from historical norms—supporting the conclusion that recent cycles are shorter and marked by asymmetric intensity.

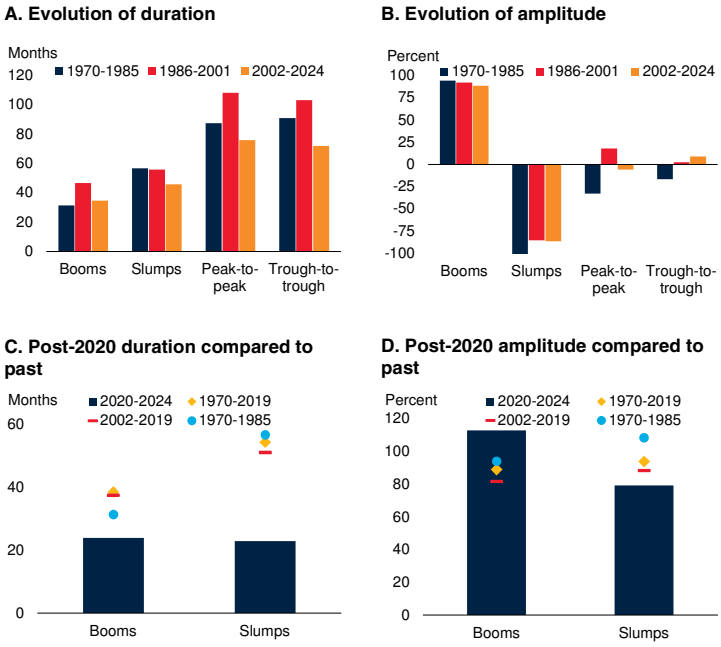
Nevertheless, while the post-pandemic period exhibits a considerable number of phases due to heightened commodity price fluctuations, the five-year sample provides only an initial assessment of these dynamics. A more comprehensive evaluation will require additional years of data to fully capture the evolving nature of commodity price cycles in the 2020s.

relative to the more subdued 1986-2001 period, post-pandemic slumps are milder on average. The divergent pattern leads to a pronounced and statistically significant asymmetry in amplitude between booms and slumps, differing from the more balanced pattern observed in the full sample. The combination of stronger upward price movements and more moderate downturns suggests an important transformation in commodity price behavior during the five years post-pandemic, with cycles characterized by sharper spikes and less pronounced declines.

Multiple factors contribute to the observed deviations from historical commodity price patterns. Short-term macroeconomic shocks—including the COVID-19 pandemic, geopolitical conflicts, monetary policy shifts, and China's economic slowdown—have played a key role in driving sharp price fluctuations. These global disruptions have heightened commodity price volatility and increased the frequency of cycles in the 2020s. Unlike previous economic recoveries, the post-2020 rebound was marked by a greater influence of commodity-specific shocks, such as disruptions to commodity trade and geopolitical tensions. This contrasts with previous episodes, such as the recovery following the 2009 global recession, where financial and demand-driven shocks played a major role in commodity price developments (World Bank 2024). Looking ahead, amid generally higher volatility, the amplitude of slumps may increase as well, particularly in response to adverse demand shocks.

FIGURE SF.6 Evolution of commodity cycles

Commodity price cycles have undergone significant shifts over the past five decades, reflecting changes in global economic conditions, market structures, and policy environments. These cycles have become shorter and more intense in the post-pandemic period, with more frequent turning points and sharper recoveries. Post-2020 commodity volatility has been driven by overlapping shocks—including the COVID-19 pandemic and geopolitical conflicts—combined with long-term trends such as the energy transition and rising geoeconomic fragmentation.



Source: World Bank.

Note: Phases and cycles are assigned to the period in which they commence. Sample includes 27 commodities.

A.B. Average duration (in months) and amplitude (in log differences) of completed phases and full cycles for the indicated periods.

C.D. Average duration (in months) and amplitude (in absolute log differences) of completed phases for the indicated periods.

Beyond the post-pandemic economic rebound due to the natural resumption of activity, strong monetary and fiscal policy support further fueled commodity booms in the early 2020s, particularly in industrial sectors. As inflation surged, central banks rapidly tightened monetary policy, pushing global interest rates into restrictive territory. This policy shift dampened economic activity and weighed on commodity demand. Persistent weakness in China's property sector, along with broader concerns about a slowdown in China's growth, has further weighed on prices for some industrial commodities, such as iron ore. Food and energy prices spiked in the immediate aftermath of Russia's invasion of Ukraine, driven by supply disruptions, rising input costs, and heightened geopolitical risk premia. Energy markets have been particularly sensitive to OPEC decisions and ongoing geopolitical tensions. These factors indicate that the observed volatility is not solely a consequence of the pandemic but rather the result of multiple overlapping shocks. Recent developments since January 2025 have seen renewed large price swings, further adding to the elevated post-2020 volatility and underscoring the continued vulnerability of commodity prices and the tendency toward shorter cycles (see Executive Summary). However, whether this pattern marks the continuation of a broader regime shift toward shorter, sharper cycles and a fundamentally more

volatile era for commodity markets remains uncertain.

Intertwined longer-term trends are also shaping commodity price dynamics. The global energy transition continues to drive sustained demand for critical minerals—such as lithium, copper, nickel, and rare earth elements—putting upward pressure on prices in these markets. Simultaneously, the growing frequency of extreme weather events has heightened supply risks, particularly for agricultural commodities, where production remains highly sensitive to climate conditions. Meanwhile, supply disruptions caused by adverse weather, disease outbreaks, and the high geographic concentration of production for certain key food commodities have tended to push up agricultural prices.

Additionally, the slowdown in global integration since the early 2000s has given way to rising geoeconomic fragmentation, marked by increased trade barriers, sanctions, and reshoring efforts aimed at securing strategic supplies—all potential sources of commodity market disruption. Recent evidence suggests that the global economy is becoming increasingly fragmented, as trade, industrial, and security policies grow more restrictive, reflecting rising constraints on the flow of goods and capital (Fernández-Villaverde, Mineyama, and Song 2024; World Bank 2025).[11] Commodity markets are especially vulnerable to fragmentation due to their concentrated production, limited supply chain diversification, and low demand elasticity, which make them particularly sensitive to shocks (IMF 2023). Escalating trade tensions between major economies have further deepened fragmentation, heightening the risk of sharp commodity price swings, exemplified by the recent surge in gold prices, driven by safe-haven demand amid growing uncertainty.

[11] Empirical evidence from IMF (2023) points to increasing fragmentation in commodity markets. First, trade restrictions on commodities have risen sharply since 2018, exceeding those imposed on other goods. Second, foreign direct investment (FDI) and cross-border mergers and acquisitions in the commodity sector have been declining—a trend already underway before Russia's invasion of Ukraine. Third, widening price differentials across geographic markets for key commodities suggest a shift toward more segmented and less integrated markets.

Conclusion

Since the onset of the COVID-19 pandemic, sharp swings in commodity prices have driven volatility to record highs, raising the question of whether these recent movements represent relevant changes in commodity price cycles or remain broadly within historical norms. To shed light on this issue, this Special Focus provides a comprehensive examination of commodity price cycles spanning more than five decades, analyzing key cyclical characteristics across 27 major commodities. It contributes to the wider literature by applying a novel cycle-dating algorithm specifically designed to identify commodity price cycles.

This examination yields several important conclusions. On average, commodity prices exhibit a turning point every four years. Downward phases tend to last significantly longer than upward phases, with slumps averaging 52 months compared to 38 months for booms, although the amplitude of price movements is broadly similar. Synchronization across commodities is substantial, particularly among industrial commodities, which exhibit higher comovement due to their sensitivity to common macroeconomic drivers. In contrast, agricultural commodities display lower levels of synchronization, reflecting their greater exposure to localized, idiosyncratic supply shocks.

A comparison of post-pandemic cycles with historical trends reveals significant shifts in commodity price behavior. Since 2020, full cycle durations have nearly halved, averaging 45 months compared to 90 months pre-pandemic. This transformation reflects a mix of short-term macroeconomic shocks—such as the 2020 global recession, geopolitical conflicts, and extreme weather events—and structural factors, including the energy transition and increasing geoeconomic fragmentation. Looking ahead, the interplay of possible supply disruptions, set against the backdrop of geopolitical risks, fragmentation, adverse weather conditions, and sustained demand for critical minerals, could heighten market vulnerabilities, leading to frequent and intense commodity cycles.

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