A World Bank Report

OCTOBER 2023

Commodity Markets Outlook

Under the Shadow of Geopolitical Risks

WORLD BANK GROUP

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The World Bank's *Commodity Markets Outlook* is published twice a year, in April and October. The report provides detailed market analysis for major commodity groups, including energy, agriculture, fertilizers, metals, and precious metals. Price forecasts for 46 commodities are presented. Commodity price data updates are published separately at the beginning of each month. The data cutoff date of this report is October 23, 2023.

The report and data can be accessed at: www.worldbank.org/commodities.

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Executive Summary

The latest conflict in the Middle East has introduced significant uncertainty into commodity markets that have been coping with the effects of an extraordinary series of shocks in recent years. Before the conflict began, voluntary oil supply withdrawals by OPEC+ producers pushed energy prices up 9 percent in the third quarter. As a result, the World Bank's commodity price index rose 5 percent over that period and is now 45 percent above its 2015-19 average. For now, the impact of the conflict on commodity prices has been muted. Prices of oil and gold have risen moderately, but most other commodity prices have remained relatively stable. Nevertheless, history suggests that an escalation of the conflict represents a major risk that could lead to surging prices of oil and other commodities—an outcome that would intensify food insecurity in the region and across the world. This report includes a Special Focus section that provides a preliminary assessment of the potential impact of the conflict on commodity prices. It finds that the effects of the conflict are likely to be limited, assuming it does not widen. Under that assumption, the baseline forecast calls for commodity prices to decline slightly over the next two years. If the conflict does escalate, the assessment also includes what might happen under three risk scenarios, relying upon historical precedents to estimate the effects of small, moderate, and large disruptions to the global oil supply. The magnitude of the effects will depend on the duration and scale of the supply disruptions. Trade restrictions and weather-related disruptions could also result in higher prices; conversely, weaker-than-expected global growth represents a key downside risk to commodity prices.

Recent developments

The latest conflict in the Middle East has raised geopolitical risks for commodity markets. So far, its impact on prices has been small. However, previous military conflicts in the region often resulted in higher prices and volatility in commodity markets. This suggests that an escalation of the conflict could trigger sharp oil supply disruptions, depending on the duration and scale of the escalation (see Special Focus).

In the third quarter, before the latest conflict, the World Bank commodity price index rose 5 percent over the previous quarter, driven mainly by an 11 percent surge in oil prices. Because oil accounts for 52 percent of the index, this more than offset price declines in 24 of the 43 commodities in the index. The increase occurred against the backdrop of a notable fall in prices the previous year (figure 1.A). Stronger-than-expected activity in the third quarter supported oil prices, complemented by a series of supply cuts by the Organization of Petroleum Exporting Countries and 10 affiliated member countries (OPEC+), pushing prices up. Non-energy prices fell by 2 percent amid plentiful supplies, particularly of grains and base metals. Overall, before the conflict in the Middle East, commodity prices remained relatively high, about 45 percent above the 2015-2019 average in nominal terms and 25 percent in inflation-adjusted terms (figure 1.B).

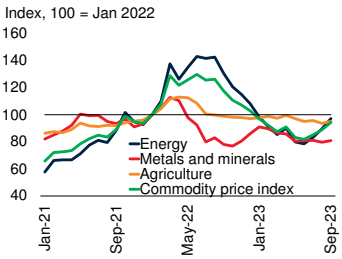
Energy prices have often registered substantial volatility following previous episodes of military conflict in the Middle East. Since the beginning of the latest conflict, overall energy prices have increased by 9 percent. Oil prices have risen 6 percent amid uncertainty about the impact of the conflict on supply. European natural gas prices have risen since September due to ongoing labor strikes at Australian LNG facilities. They surged by an additional 35 percent after the shutdown of a gas field off the Israeli coast, an explosion at an interconnector in the Baltic Sea, and concerns about the escalation of the conflict in the Middle East.

Energy prices rose by 9 percent in 2023Q3 (q/q). Waning concerns about banking stress in advanced economies, coupled with better-than-expected global activity—as air travel and transport rebounded—supported oil prices above $70/bbl. In addition, resilient consumption growth in China offset the continued weakness in the country's real estate sector. Global oil demand is estimated to have reached a record 103 million barrels per day (mb/d) in 2023Q3 (IEA 2023a).

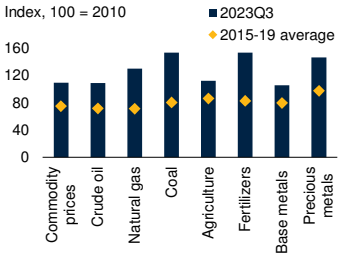
FIGURE 1 Commodity prices, outlook, and risks

Prior to the latest conflict in the Middle East, commodity prices rose in 2023 Q3 led by energy. They remain only slightly below levels just before the Russian invasion of Ukraine and well above pre-COVID levels. Though food inflation worldwide is trending down, food insecurity remains a concern, especially for those living in fragile and conflict situations. Commodity prices are set to fall gradually in 2024 and stabilize in 2025. As suggested by historical precedents of conflict-driven oil supply disruptions, an escalation of the latest episode represents a major upside risk to the price forecasts, depending on the duration and scale of the supply disruption.

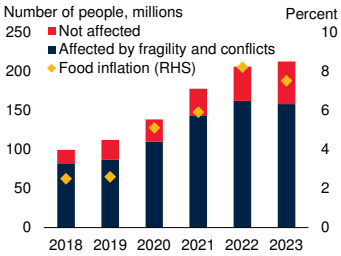
A. Commodity prices



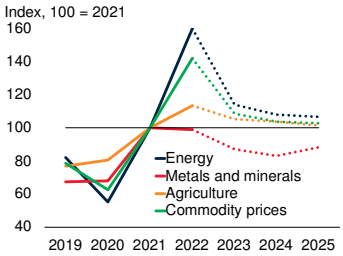
B. Commodity price levels



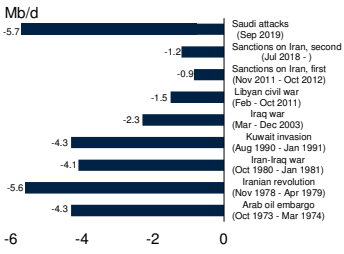
C. Food insecurity in affected countries



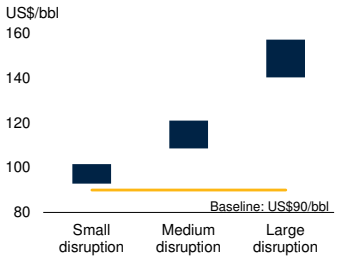
D. Commodity price projections



E. Conflict-driven oil supply disruptions



F. Initial changes in oil prices under different scenarios



Sources: Bloomberg; Food and Agriculture Organization of the United Nations; International Energy Agency; World Bank; World Food Programme.

A. Monthly data, last observation is September 2023.

B. Crude oil refers to Brent benchmark. Natural gas refers to EU natural gas benchmark. Coal refers to the Australian benchmark.

C. International Food Security Phase Classifications (IPC) include (1) minimal/none, (2) stressed, (3) crisis, (4) emergency, and (5) catastrophe/famine. Bars represent the number of people worldwide that face crisis or more severe (IPC3+) food insecurity. Sample includes 19 economies in fragile and conflict affected areas. Year-on-year food price inflation data, regional medians for MNA (15 countries), SAR (7 countries) and SSA (25 countries). Food inflation data for 2023 is the average of January to August 2023.

D. Commodity prices line refers to the World Bank commodity price index, excluding precious metals. Dashed lines indicate forecasts.

E. Oil supply disruptions during geopolitical events as defined by International Energy Agency (IEA 2014), except "Sanctions on Iran" and "Saudi attacks".

F. Range of initial prices of Brent crude oil in response to supply disruptions under three scenarios.

On the supply side, production cuts by OPEC+ helped raise prices above $90/bbl in September. Saudi Arabia's 9 mb/d crude output for the rest of 2023 is 2 mb/d lower than in September 2022 and the lowest in more than a decade outside of recessions. Nevertheless, production outside of OPEC+ in 2023 has been robust, and the group's announced reduction has been roughly offset by production increases in the Americas, led by the United States, the world's largest producer.

The EU has replaced lost Russian pipeline gas with liquefied natural gas (LNG) imports and higher piped gas from Norway and North Africa. Lower natural gas demand in Europe has been driven by efficiency gains, policies to administer demand, and weaker production in the industrial sector. Slower-than-expected imports into China have also relieved pressure on natural gas prices. This has allowed EU natural gas inventories to reach 95 percent of full capacity ahead of winter. Despite these developments, European natural gas prices remain 82 percent above their 2015-19 average. Coal prices continued to decline on improved supply and greater substitution to cleaner fuels in power generation. Fertilizer prices rose slightly, though the fertilizer affordability index is almost at pre-2022 levels. Still, the fertilizer price index remained 85 percent above 2015-19 average levels.

Prior to the latest conflict in the Middle East, **agricultural commodity prices** fell 3 percent in the third quarter, mainly driven by declines in the price of food (the index's main component). The food price index fell by 3 percent, led by a 7 percent drop in grains. The non-renewal of the Black Sea Grain Initiative, India's export ban of non-basmati rice, and the impending El Niño drove volatility in agricultural prices, but ample supplies kept prices on a mild downward trend. Agricultural prices have risen since September and ticked up almost 4 percent since the beginning of the conflict. Domestic food inflation has moderated but remains at double-digits in four out of ten low-income countries and a third of middle- and high-income countries, adding to the burden of food insecurity in many parts of the world.

Food insecurity has been rising for several years, and as of August of this year affected over 210 million people living in countries facing conflict and violence (figure 1.C). Stretched resources have hampered food distribution by aid agencies as they respond to several conflicts and disasters, including Afghanistan, the Middle East, Sub-Saharan Africa, and Ukraine (WFP 2023). In particular, the latest conflict in the Middle East has exacerbated food insecurity in the region as 53 percent of the population in Gaza was already facing insecurity prior to the conflict. Beyond its direct impact on the affected populations, an escalation could worsen food insecurity at the global level, particularly if food prices jump and funds for food distribution are further stretched.

Metal prices have edged down 1 percent since the onset of the conflict. However, gold prices—which usually move in tandem with geopolitical concerns—have increased 8 percent. An escalation of the conflict would push metal prices up, mainly through indirect channels. Prolonged disruptions to energy markets can raise production costs of energy-intensive metals such as aluminum and zinc. Heightened geopolitical risk could lead to much higher gold prices, as investors shift to safe-haven assets.

Before the conflict in the Middle East, metal prices fell 2 percent in the third quarter. Weighing on prices was continued weakness in China's heavy industry sector and housing construction, offsetting resilient demand in the manufacturing of metals-intensive renewable energy products. Globally, elevated interest rates have weighed on construction and investment, contributing to weaker metals demand amid plentiful supplies. Gold prices also fell 3 percent last quarter because of a stronger U.S. dollar and concerns about higher for longer interest rates. Prices for minerals used in electric vehicles and battery production, such as cobalt, lithium, and molybdenum, have followed the downward trend in base metals prices. However, prices remain volatile due to the stratified and concentrated nature of mineral markets.

Outlook

The baseline forecasts assume that the latest conflict will have a limited impact on commodity prices, with prices ultimately being driven by fundamental demand and supply factors.

Under the baseline forecast, after a projected 24 percent drop this year, commodity prices are expected to fall a further 4 percent in 2024 and 0.5 percent in 2025 (table 1). A key driver of the continued weakness in commodity prices in 2024 is weak global growth amid tight financial conditions. Subdued global goods trade and weakness in China's highly leveraged property sector will also weigh on energy and industrial metals into 2024. Increased supply of major commodities (crude oil, grains, metals, and most food commodities) will also dampen prices (figure 1.D). Critically, this forecast assumes that the latest conflict will remain contained, with minimal effects on commodity markets.

Firming global growth, along with policies to expand renewable energy infrastructure, are expected to underpin a rebound in commodity prices in 2025. Global investment in clean energy infrastructure is estimated to have increased by almost 40 percent between 2020 and 2023 and is rising rapidly, propelling a demand surge for copper, lithium, and nickel, in particular.

Energy prices, after dropping by an estimated 29 percent in 2023, are expected to fall 5 percent in 2024 as subdued global growth reduces demand pressure. They are then projected to edge further down 0.7 percent in 2025. The Brent crude oil price forecast for this year has not changed since the April edition of the Commodity Markets Outlook and is expected to average $84/bbl for 2023, which implies that prices will average almost $90/bbl in the last quarter. Continued concerns about the conflict in the Middle East and other geopolitical risks, the contraction of OPEC+ supply, and pressures from middle-distillate demand are also expected to support prices in the last quarter. However, these forecasts as a whole highlight the expectation that the conflict will

have a limited impact—assuming it does not escalate into a wider conflict. The forecast also assumes that global oil production will increase within and outside OPEC+, provided that some OPEC+ supply cuts are reversed in early 2024.

Following a record plunge in European natural gas prices earlier in 2023, natural gas prices are projected to decline 4 percent in 2024 on slower demand. The forecast assumes relatively mild weather in the Northern Hemisphere and no disruption in supplies. Coal prices are envisaged to continue a downward trend on rising supply and weakening demand as coal consumption continues to be displaced in power generation and industry.

Agricultural prices are forecast to fall by 7 percent in 2023 and a further 2 percent in 2024 and 2025 owing to ample supplies. Food and beverage prices will decline slightly more, while agricultural raw materials will rise by over 1 percent. Following a more than 11 percent fall in 2023, the grains price index is projected to fall by 4 percent on average in 2024 and 2025 amid ample supplies and adequate stock levels. However, rice prices will remain high into 2024, assuming India maintains its export restrictions. The outlook assumes a moderate-to-strong El Niño. Sugar and cocoa prices are expected to decline from 2023 highs, though fruit prices should remain high in 2024 on weather-affected supply shortfalls. Fertilizer prices are expected to decrease as more supplies come online, but they are likely to stay above historical averages due to some supply constraints and China's ongoing fertilizer export restrictions.

Base metal prices are projected to fall 5 percent in 2024 due to slowing demand and rebound in 2025 on recovering global industrial activity. Even though activity in China's property and construction sectors is anticipated to stabilize by 2024, these sectors will increasingly have less influence on global metals demand than they did in the previous two decades.

Risks

Geopolitical risks have sharply increased in the wake of the latest conflict in the Middle East and constitute the most important upside risk to commodity prices. If the conflict intensifies and becomes a wider regional conflict, the impact on commodity markets could be significant. Historical precedent indicates that, depending on the duration and scale of an escalation of the conflict, substantial supply disruptions and soaring prices are possible (figure 1.E).

The Special Focus presents three risk scenarios that are contingent on the severity of the impact of an escalation of the conflict on oil supply. Each scenario considers a range of possible initial supply declines in light of earlier episodes and presents a corresponding range for the initial impact on prices (figure 1.F). In a small disruption scenario, global oil supply would be reduced by 0.5 mb/d to 2 mb/d (0.5 and 2 percent of 2023 supply). As a result, oil prices would initially increase by 3 to 13 percent above the 2023Q4 baseline forecast of $90/bbl. In a medium disruption scenario, global oil supply is reduced by 3 to 5 mb/d (approximately 3 to 5 percent of 2023 supply). This would push oil prices about 21 to 35 percent above the baseline forecast in 2023Q4. Finally, in a large disruption scenario, global oil supply would fall by 6 to 8 mb/d (approximately 6 to 8 percent of 2023 supply). This would push oil prices about 56 to 75 percent above the 2023Q4 baseline.

These types of disruptions in oil supplies can have a cascading impact on the prices of other commodities—especially natural gas prices, which are even more susceptible to transportation disruptions than oil. Beyond the impacts on energy prices, they would also push up prices of metal and agricultural commodities for the reasons mentioned earlier. These scenarios refer to the initial impacts of an escalation, whereas forecasts for oil and other commodity prices shown in this report refer to annual prices. Ultimately, the impact of any of these scenarios, should they materialize, on annual prices will greatly depend on the duration and scale of the underlying shock to commodity markets.

Other geopolitical risks, additional trade restrictions, and continuation of production cuts by OPEC+ into 2024 also cloud the outlook. The cessation of the Black Sea Grain Initiative has limited the scope for Ukrainian grain and oilseed exports, and further disruptions to bulk transport

and power distribution could push food and energy prices higher. Moreover, export restrictions on certain commodities could lead to price spikes. Geopolitical motives for securing supplies of critical minerals from major consumers are already high, and the number of restrictive trade interventions in metals and minerals has increased by more than four times as of end-2022 compared to the average number in 2015-19. Trade fragmentation would make low-income countries particularly vulnerable, given their high dependence on imports of agricultural goods (IMF 2023a).

Severe weather events primarily driven by El Niño over the next six months, such as floods, could impact both agriculture and metal mining production, as evidenced by recent episodes in Chile and Peru, and push up prices. There have also been floods at Australian ports and coal mines, which damaged transport infrastructure. Some areas will experience drier weather, so upside risks include the possible impact of heat waves and El Niño-induced droughts.

On the downside, **weaker-than-expected global growth**, particularly in manufacturing and trade, is a key downside risk. Tighter global financial conditions could further weigh on demand for commodities used in industry and construction and lead to lower industrial commodity prices.

TABLE 1 World Bank Commodity Price Forecasts

							Percent change from previous year			Differences in levels from April 2023 projections	
Commodity	Unit	2021	2022	2023f	2024f	2025f	2023f	2024f	2025f	2023f	2024f
INDEXES (in nominal U.S. dollars, 2010 = 100)											
Total [1]		101.0	143.3	109.6	105.1	104.6	-23.5	-4.1	-0.5	-3.3	-7.0
Energy [2]		95.4	152.6	108.6	103.7	103.0	-28.8	-4.5	-0.7	-4.6	-9.6
Non-Energy		112.5	124.4	111.5	108.0	107.8	-10.4	-3.1	-0.1	-1.0	-1.5
Agriculture		108.3	122.7	113.9	112.2	109.7	-7.2	-1.5	-2.2	0.0	0.6
Beverages		93.5	106.3	106.3	100.9	100.4	0.0	-5.1	-0.5	5.3	3.3
Food		121.8	143.7	131.1	129.1	124.7	-8.8	-1.5	-3.4	-1.3	0.4
Oils and Meals		127.1	145.2	120.4	117.3	114.1	-17.1	-2.5	-2.7	-4.3	-5.1
Grains		123.8	150.4	133.4	129.6	122.9	-11.3	-2.9	-5.2	-2.4	4.3
Other food		113.1	135.6	142.9	144.1	140.3	5.4	0.8	-2.6	3.6	4.0
Raw Materials		82.9	80.3	76.0	76.9	78.1	-5.3	1.1	1.5	0.3	-0.4
Timber		90.4	80.1	79.9	81.2	82.5	-0.2	1.6	1.6	-0.8	-0.8
Other raw materials		74.8	80.5	71.8	72.2	73.2	-10.8	0.6	1.4	1.6	-0.1
Fertilizers		152.3	235.7	156.5	132.4	119.5	-33.6	-15.4	-9.7	7.8	-5.8
Metals and Minerals [3]		116.4	115.0	101.4	96.6	102.6	-11.8	-4.8	6.2	-3.9	-5.2
Base Metals [4]		117.7	122.4	107.8	102.3	110.5	-12.0	-5.1	8.0	-3.7	-5.6
Precious Metals [5]		140.2	136.8	138.4	145.1	131.5	1.2	4.8	-9.4	-5.9	11.1
PRICES (in nominal U.S. dollars)											
Energy											
Coal, Australia	$/mt	138.1	344.9	175.0	130.0	110.0	-49.3	-25.7	-15.4	-25.0	-25.0
Crude oil, Brent	$/bbl	70.4	99.8	84.0	81.0	80.0	-15.9	-3.6	-1.2	0.0	-5.0
Natural gas, Europe	$/mmbtu	16.1	40.3	13.0	12.5	13.0	-67.8	-3.8	4.0	-6.0	-4.5
Natural gas, U.S.	$/mmbtu	3.9	6.4	2.7	3.3	4.0	-57.6	20.4	23.1	0.0	-0.4
Liquefied natural gas, Japan	$/mmbtu	10.8	18.4	14.0	13.0	14.0	-24.0	-7.1	7.7	-4.0	-3.0
Non-Energy											
Agriculture											
Beverages											
Cocoa	$/kg	2.43	2.39	3.20	2.90	2.87	33.7	-9.4	-1.0	0.50	0.30
Coffee, Arabica	$/kg	4.51	5.63	4.45	4.40	4.38	-21.0	-1.1	-0.4	-0.30	-0.20
Coffee, Robusta	$/kg	1.98	2.29	2.60	2.40	2.38	13.8	-7.7	-0.8	0.30	0.10
Tea, average	$/kg	2.69	3.05	2.80	2.75	2.77	-8.2	-1.8	0.8	0.10	0.00
Food											
Oils and Meals											
Coconut oil	$/mt	1,636	1,635	1,070	1,100	1,050	-34.5	2.8	-4.5	-30	-200
Groundnut oil	$/mt	2,075	2,203	2,080	2,150	2,145	-5.6	3.4	-0.2	80	100
Palm oil	$/mt	1,131	1,276	920	900	850	-27.9	-2.2	-5.6	-60	-120
Soybean meal	$/mt	481	548	532	520	521	-2.9	-2.3	0.2	-58	-50
Soybean oil	$/mt	1,385	1,667	1,120	1,105	1,095	-32.8	-1.3	-0.9	0	0
Soybeans	$/mt	583	675	615	585	560	-8.9	-4.9	-4.3	25	45
Grains											
Barley	$/mt	…	…	210	190	189	...	-9.5	-0.5	0	0
Maize	$/mt	260	319	250	230	220	-21.6	-8.0	-4.3	-20	-10
Rice, Thailand, 5%	$/mt	458	437	560	595	550	28.2	6.3	-7.6	50	105
Wheat, U.S., HRW	$/mt	315	430	345	335	320	-19.8	-2.9	-4.5	-10	0
Other Food											
Bananas, U.S.	$/kg	1.21	1.49	1.60	1.65	1.61	7.5	3.1	-2.1	0.00	0.00
Beef	$/kg	5.39	5.78	5.15	5.30	5.36	-10.9	2.9	1.1	-0.10	-0.10
Chicken	$/kg	2.26	3.35	3.10	3.15	3.12	-7.4	1.6	-1.1	-0.20	0.00
Oranges	$/kg	0.65	0.92	1.40	1.44	1.37	52.3	2.9	-5.2	0.20	0.30
Shrimp	$/kg	13.70	13.51	9.90	10.70	11.10	-26.7	8.1	3.7	-2.10	-1.80
Sugar, World	$/kg	0.39	0.41	0.52	0.49	0.45	27.5	-5.8	-8.2	0.00	0.00

TABLE 1 World Bank Commodity Price Forecasts (*continued*)

							Percent change from previous year			Differences in levels from April 2023 projections	
Commodity	**Unit**	**2021**	**2022**	**2023f**	**2024f**	**2025f**	**2023f**	**2024f**	**2025f**	**2023f**	**2024f**
PRICES (in nominal U.S. dollars)											
Non-Energy											
Raw Materials											
Timber											
Logs, Africa	$/cum	414	369	380	390	394	3.0	2.6	1.1	0	0
Logs, S.E. Asia	$/cum	271	228	220	225	231	-3.5	2.3	2.6	-10	-10
Sawnwood, S.E. Asia	$/cum	750	675	680	689	699	0.8	1.4	1.4	0	0
Other Raw Materials											
Cotton	$/kg	2.23	2.86	2.10	2.20	2.23	-26.7	4.8	1.2	-0.10	-0.10
Rubber, TSR20	$/kg	1.68	1.54	1.40	1.45	1.51	-9.3	3.6	3.9	0.00	0.00
Tobacco	$/mt	4,155	4,270	4,500	4,300	4,291	5.4	-4.4	-0.2	400	180
Fertilizers											
DAP	$/mt	601	772	540	450	400	-30.1	-16.7	-11.1	-40	-120
Phosphate rock	$/mt	123	266	340	290	250	27.7	-14.7	-13.8	80	50
Potassium chloride	$/mt	543	863	385	300	275	-55.4	-22.1	-8.3	-90	-125
TSP	$/mt	538	716	480	400	350	-33.0	-16.7	-12.5	-80	-110
Urea, E. Europe	$/mt	483	700	360	315	300	-48.6	-12.5	-4.8	35	0
Metals and Minerals											
Aluminum	$/mt	2,473	2,705	2,300	2,200	2,400	-15.0	-4.3	9.1	-100	-250
Copper	$/mt	9,317	8,822	8,200	7,800	8,500	-7.1	-4.9	9.0	-300	-200
Iron ore	$/dmt	161.7	121.3	108.0	105.0	100.0	-11.0	-2.8	-4.8	-7	-5
Lead	$/mt	2,200	2,151	2,100	2,050	2,100	-2.4	-2.4	2.4	0	50
Nickel	$/mt	18,465	25,834	22,350	20,000	20,500	-13.5	-10.5	2.5	350	0
Tin	$/mt	32,384	31,335	26,000	25,000	27,000	-17.0	-3.8	8.0	2000	500
Zinc	$/mt	3,003	3,481	2,500	2,400	2,500	-28.2	-4.0	4.2	-300	-300
Precious Metals											
Gold	$/toz	1,800	1,801	1,800	1,900	1,700	0.0	5.6	-10.5	-100	150
Silver	$/toz	25.2	21.8	23.5	23.7	22.5	7.8	0.9	-5.1	0.5	1.7
Platinum	$/toz	1,091	962	1,000	1,050	1,150	4.0	5.0	9.5	0	0

Source: World Bank.
1. The World Bank's *commodity total price index* is composed of energy and non-energy prices (excluding precious metals), weighted by their share in 2002-04 exports. The energy index's share in the overall index is 67 percent.
2. Energy price index includes coal (Australia), crude oil (Brent), and natural gas (Europe, Japan, U.S.).
3. Base metals plus iron ore.
4. Includes aluminum, copper, lead, nickel, tin, and zinc.
5. Precious metals are not part of the non-energy index.
f = forecast.

SPECIAL FOCUS

Potential Near-Term Implications of the Conflict in the Middle East for Commodity Markets: A Preliminary Assessment

The latest conflict in the Middle East has heightened geopolitical risks for commodity markets, in an already uncertain global environment. Markets' response has been muted so far, which is consistent with baseline forecasts that the conflict will have only a limited impact on commodity prices. In addition, current conditions in oil markets are notably different from supply shocks in the past, which implies the conflict could have a more moderate effect on markets. Nonetheless, history suggests that an escalation of the conflict in the region could trigger substantial oil supply disruptions. Accordingly, there are many possible effects on oil and other commodity markets should the conflict expand. In particular, a major escalation could cause an initial surge in oil prices, with disruptive knock on effects on other commodity markets. The degree of the surge and the extent of the disruptions would depend on the scale and duration of the conflict.

Introduction

The attacks on Israel in early October and the ensuing conflict have led to substantial loss of life and to a grave humanitarian crisis of increasing proportions. Beyond these tragic outcomes, the latest conflict in the Middle East has significantly heightened geopolitical risks in the region, with potentially large global repercussions. Because the region accounts for a substantial share of the global energy supply, these risks are acute for energy markets, particularly for oil.

Commodity markets so far have responded calmly to the onset of the conflict (figures SF.1.A-D). This is consistent with the assumptions underlying the baseline forecast for oil, as presented in the energy section of this report, which was finalized after the outbreak of the latest conflict. Having reached an average of almost $100 per barrel (bbl) in 2022, oil prices are expected to average $84/bbl this year. This forecast implies that prices will average about $90/bbl in the current quarter. The year-over-year oil price decline for 2023 is predicated on lower demand because of weak global growth. These forecasts highlight the expectation that the conflict will have a limited impact on commodity prices—assuming no escalation.

Nevertheless, historical precedent suggests that escalating conflict in the region could substantially disrupt commodity supply. Although neither Israel nor Gaza is a major energy producer, an escalation of the conflict and its spread to the wider region could lead to large increases in the prices of oil and other commodities. Historical precedent also indicates this could have destabilizing implications for the global economy. Moreover, spillovers to food prices could exacerbate food insecurity in conflict-afflicted areas in the region and around the world.

Against this backdrop, this Special Focus presents a preliminary assessment of the potential near-term implications of the latest conflict in the Middle East for oil and other commodity markets, with a focus on the initial impact on the supply and price of oil. In particular, it aims to answer the following questions:

- How did oil markets react to previous conflicts in the Middle East?
- How do current oil market conditions differ from those in earlier episodes of conflict?
- What are the possible near-term implications of an escalation of the conflict for energy markets?
- What are the possible near-term implications of an escalation of the conflict for other commodity markets?

How did oil markets react to previous conflicts in the Middle East?

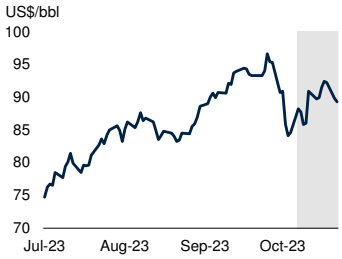
Since the early 1970s, a series of significant geopolitical events, often marked by military conflicts, have exerted a pronounced influence on oil supply, resulting in spikes in oil prices and heightened volatility (figure SF.1.E; Baffes and Nagle 2022; Huntington 2018).

Note: This Special Focus was prepared by a team led by Carlos Arteta, John Baffes, and Ayhan Kose, and included Paolo Agnolucci, Jeetendra Khadan, Dawit Mekonnen, Valerie Mercer-Blackman, Shane Streifel, and Guillermo Verduzco.

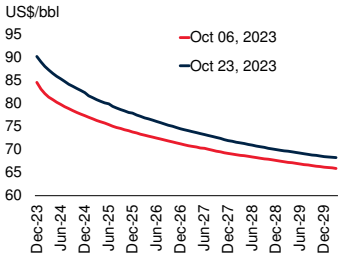
FIGURE SF.1 Commodity prices and geopolitical conflict

Commodity market responses to the onset of the latest conflict have so far been generally modest, and prices are expected to decline in 2024 under the baseline forecast. Nevertheless, similar geopolitical events since the early 1970s, often marked by military conflicts, have been associated with higher oil prices and heightened volatility.

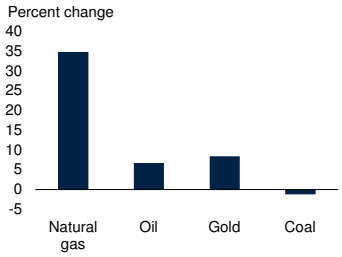
A. Daily prices of Brent crude oil



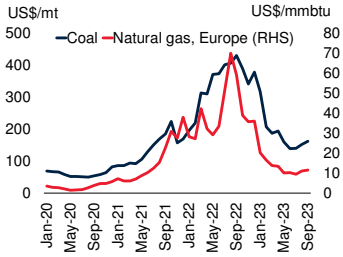
B. Brent future prices before and after the attacks on Israel



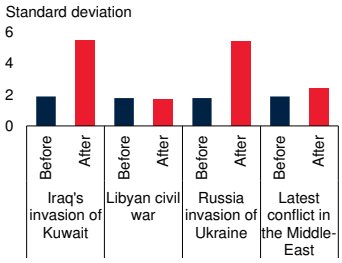
C. Price changes in selected commodities since the onset of the conflict (October 6, 2023)



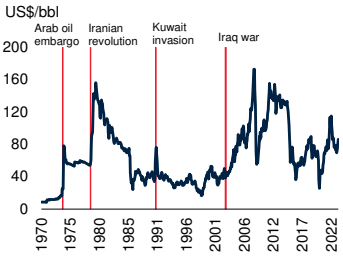
D. Coal and natural gas prices



E. Oil price volatility before and after conflicts



F. Real oil prices



Sources: Bloomberg; International Energy Agency; World Bank.
A. Daily price data of Brent crude oil, last observation is October 23, 2023. Shaded area indicates post conflict period.
B. Brent futures prices on the day before (October 6, 2023) the conflict and the latest observation (October 23, 2023).
C. Commodity price changes on October 23, 2023 compared to October 6, before the conflict. Natural gas refers to the European benchmark.
D. Monthly data, last observation is September 2023.
E. 30-day volatility in Brent crude oil prices, before and after geopolitical events. For the latest conflict in the Middle East, the period "after" consists of data from October 9 to October 23, 2023 (11 days).
F. Monthly Brent crude oil prices deflated by U.S. Consumer Price Index (CPI), 100 = January 2022.

- The first major disruption resulted from **the Arab oil embargo**, which was directed at nations that supported Israel during the Yom Kippur War. The embargo—which ran from October 1973 to March 1974—led to the removal of 4.3 million barrels per day (mb/d) from the global oil market, equivalent to approximately 7.5 percent of global supply in 1973. During the embargo, the Organization of the Petroleum Exporting Countries (OPEC) quadrupled official prices from $2.70/bbl in September 1973 to $13/bbl in January 1974. The episode is often called the first oil price shock. Although the embargo lasted only five months, real oil prices remained elevated and never returned to pre-embargo levels (figure SF.1.F). The repercussions of the first oil price shock were severe. It led to a spike in global inflation and played a major role in triggering the 1975 global recession (Kose and Terrones 2015). The episode also resulted in numerous policy initiatives, including the establishment of the International Energy Agency (IEA).

- The second major disruption to the global oil market occurred during **the Iranian revolution**, which started in late 1978. Up to 5.6 mb/d of oil were withdrawn from the global market during a six-month period. This episode, which led to a more than doubling of oil prices, is referred to as the second oil price shock. The sharp increase in prices triggered a significant reduction in oil demand and global economic activity and contributed to a sharp increase in global inflation.

- The **Iran-Iraq war** (September 1980 to August 1988) caused another disruption to the global oil market. Both countries halted exports, and 4.1 mb/d of oil were removed from global markets. Although prices rose approximately $7/bbl, or 20 percent, from September to November 1980, they soon retreated because of growing surplus capacity within OPEC alongside falling demand (Looney 2003).

- **The Iraqi invasion of Kuwait** in August 1990 resulted in a removal of 4.3 mb/d from the global market, causing prices to double by

October 1990. In response to the invasion, OPEC gradually raised production, while the IEA helped coordinate the release of a substantial amount of emergency oil stocks. When the Gulf War started in mid-January 1991, and it became apparent that the Western alliance would be successful in removing Iraqi forces from Kuwait, prices collapsed.

More recent conflicts in the region associated with oil supply disruptions, such as the Libyan civil war (2011), attacks on Saudi oil facilities (September 2019), and sanctions against Iran, have triggered somewhat less severe and more short-lived price spikes (Yang et al. 2022). The availability of supply from other sources mitigated the impact of these disruptions.

How do current oil market conditions differ from previous episodes of conflict?

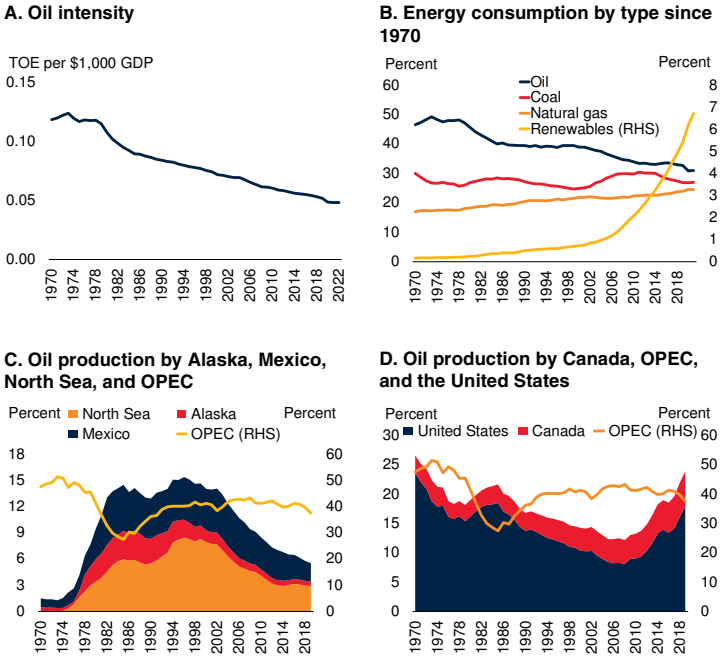
Current market conditions differ markedly from those surrounding the oil price shocks detailed above in several dimensions: the global economy is less reliant on oil; there is a more diversified base of oil suppliers; several countries have strategic stocks of oil; futures markets help price discovery and hedging; and the IEA helps formulate responses to energy price shocks. These features of current energy markets suggest that any escalation of the latest conflict in the Middle East would have more moderate effects than what would have ensued during a similar episode in the past.

Reduced oil dependence. The global economy's reliance on oil has diminished considerably since the 1970s. For instance, oil intensity (that is, the amount of oil required to produce one unit of GDP) declined from 0.12 tons of oil equivalent (toe) in 1970 to 0.05 toe in 2022 (figure SF.2.A). Most of the reduction is the result of efficiency improvements in the transport sector and the substitution of other energy sources for oil. The ongoing green transition also implies diminishing reliance on fossil fuels, resulting in slower demand growth for oil (figure SF.2.B). Although oil demand is expected to grow by an estimated 6 percent by 2028 (reaching nearly 106 mb/d), oil consumption is likely to peak around 2030 as the efficiency of energy use improves, the growing use of electric vehicles reduces transport fuel consumption, and the diffusion of renewable technology-based energy supplies substitutes for fossil fuels (IEA 2023b).

Diversification of supply sources. Unlike the 1970s, when the global oil market relied heavily on a few producers, especially in the Middle East, oil supplies now come from many sources. For example, following the second oil shock, new sources of supply emerged—in the North Sea, Mexico, and Alaska (figure SF.2.C). Similarly, the high prices during 2010-14 saw an increase in

FIGURE SF.2 Differences between current oil market conditions and earlier conflicts

Current market conditions differ markedly from those that accompanied conflict-induced oil price shocks of previous decades. The reliance of the global economy on oil has lessened considerably since the 1960s. The ongoing green transition implies diminishing reliance on fossil fuels. Oil supplies now come from more diversified sources.



Sources: BP Statistical Review; Energy Institute; International Energy Agency; World Bank.
Note: OPEC = Organization of the Petroleum Exporting Countries.
A. Oil intensity defined as consumption over GDP for each year. Last observation is 2022.
TOE = tons of oil equivalent.
B. Energy consumption as share of total primary energy consumption. Last observation is 2021.
C.D. Crude oil production as a share of global crude oil production. North Sea includes Norway and the United Kingdom.

supply from higher-cost sources—Canadian oil sands, U.S. shale oil, and biofuels. These three added an estimated 5.6 mb/d during 2010-14 (figure SF.2.D).[1]

Strategic reserves. Following the oil crises of the 1970s, several large oil-importing countries set up strategic reserves for emergencies. These are held in crude oil and products form; some are under complete state control, while others are held or pledged by private entities.[2] The United States established the world largest Strategic Petroleum Reserve (SPR) in 1975 to mitigate possible supply disruptions. It can have reserves of more than 700 million barrels of oil (MMbbl), equivalent to five weeks of domestic oil consumption or one week of global oil consumption. Following a peak of 727 MMbbl in 2010, the U.S. SPR dropped to 350 MMbbl in September 2023, after several releases, most recently during the oil price spike that followed the Russian invasion of Ukraine. Some other countries also established similar inventory schemes, mainly as part of the IEA International Energy Programme. For example, Japan holds strategic and commercial oil reserves in both crude oil and oil products with a combined storage capacity of over 850 MMbbl, and the Republic of Korea has one with almost 400 MMbbl. Government stocks and international joint oil stockpiling account for 29 percent and 35 percent, respectively, of the storage capacity of these countries, while the remaining capacity relates to commercial facilities, including those obligated or pledged for emergency purposes.[3]

Development of oil futures markets. Oil prices once were officially set both on the supply side (by the oil companies) and on the demand side (by governments). When OPEC nationalized oil company assets in the 1970s and began setting official prices, active spot markets were developed as companies became buyers of crude oil. The introduction of futures contracts—the West Texas Intermediate (WTI) contract in the United States (a domestic benchmark) in 1983 and the Brent contract (an international benchmark) in 1988—marked a significant change in the oil market. Additional oil futures contracts were subsequently launched, including the latest one in China, at the Shanghai International Futures Exchange (Yu, Yang, Webb 2022). These contracts—perhaps the most liquid of commodity contracts, some trading up to more than 10 years ahead—enable market participants to engage in price discovery and hedging.

Establishment of the IEA. The IEA, an intergovernmental organization with 31 member countries, was founded under the aegis of the OECD shortly after the first oil price shock. It provides policy recommendations, analysis, and comprehensive data on the global energy sector. During several episodes, the IEA has played a key role, including establishing rules on reducing the reliance of its members on oil as well as coordinating the release of emergency reserves by its members during crises (IEA 2023a). These episodes included the invasion of Kuwait and the attack on the Saudi oil facilities. The IEA also helped attenuate market concerns during other events—for example, when oil prices turned negative early in the COVID-19 pandemic.

What are the possible near-term implications of an escalation of the conflict for energy markets?

The modest impact of the latest conflict in the Middle East on energy markets so far is consistent with the baseline forecasts presented in this report. Energy prices are expected to decline 29 percent in 2023 and a further 5 percent in 2024, as subdued global growth dampens demand. Under the baseline, oil prices are projected to average $90/bbl in the current quarter, and $84/bbl in 2023 as a whole, down from $100/bbl in 2022 (figure SF.3.A). Production cuts by OPEC+,

[1] In 1970s, oil producers in the Middle East accounted for an average of 34 percent of global oil supplies (their peak share was 37.4 in 1974). Today, their share is 29.5 percent.

[2] Strategic reserves, usually held by oil importers, complement spare capacity by oil exporters. Currently there is an estimated spare capacity of over 5 mb/d. As a result, a shortfall in the oil market could in principle be offset by increased production from the countries holding such capacity.

[3] There are also numerous oil-sharing pacts overseen by the IEA—including agreements between Japan, New Zealand, and the Republic of Korea; the United States and Israel; and France, Germany, and Italy. Outside the IEA, there are also strategic reserves, notably in China with an estimated reserve of more than 900 MMbbl.

expected to be in place until the end of 2023, have mostly been offset by supply increases from other sources, resulting in a muted impact on oil prices. As production cuts by the major producers of OPEC+ are removed and global activity slows, including a continued deceleration in China, oil prices are expected to edge down to an average of $81/bbl in 2024.

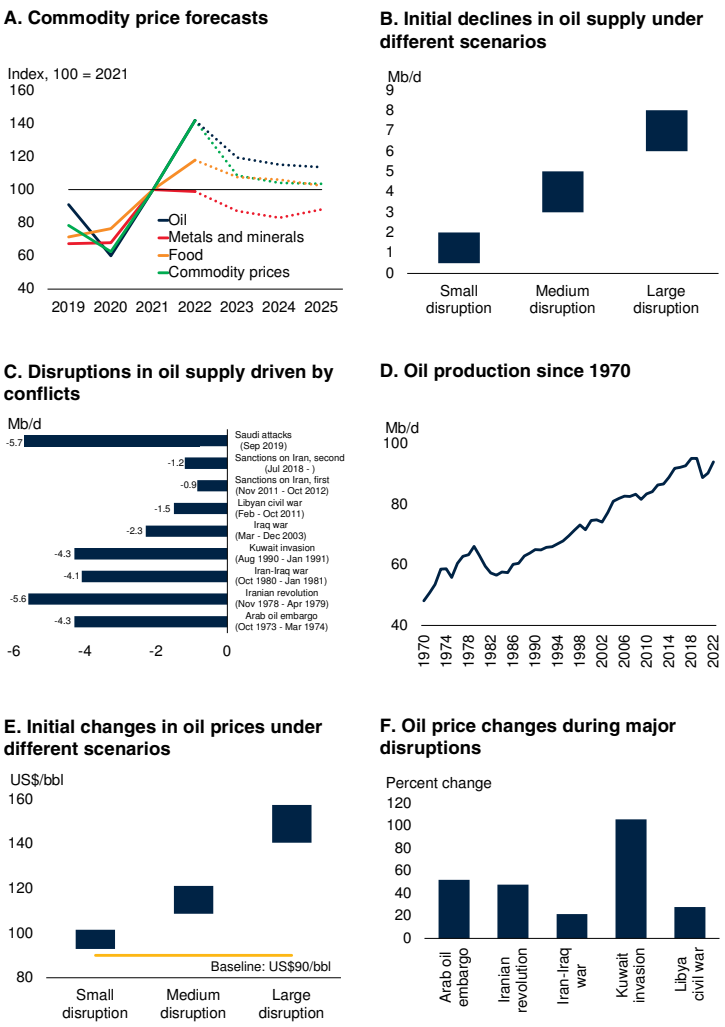
An escalation of the conflict could result in substantial energy supply disruptions, posing a major risk to these baseline projections. To assess the potential implications of such an escalation for oil and other energy markets, three risk scenarios are considered, each reflecting the severity of the impact on supply: small disruption, medium disruption, and large disruption scenarios (figure SF.3.B). These scenarios do not speculate about the potential triggers of the escalation of the conflict and the ensuing supply disruptions, because the situation is fluid and previous episodes were driven by a variety of factors. However, these scenarios do take into account similarities with previous geopolitically-driven supply disruptions. Additionally, while these scenarios are based around declines in oil supply, anticipated supply disruptions could also raise prices even in the absence of actual declines in production.

Specifically, each scenario considers *a range of possible initial supply declines* in light of earlier episodes and presents a corresponding range for *the initial impact on prices.* The assessments of the initial price impact are based on the elasticities estimated from the empirical relationship between supply disruptions and price changes in earlier episodes.[4] This simple calculation aims to provide a sense of the range of possible initial changes in oil supply and corresponding initial spikes in prices rather than attempting to produce alternative price forecasts under different scenarios over a given period. The wide range of possible outcomes reflects uncertainty about the

[4] In the medium disruption scenario, the impact on the price was obtained by using the supply shock impulse response functions (IRF) reported by Caldara, Cavallo, and Iacoviello (2019). In the other scenarios, the estimates were informed by the within-month price impact observed in a few historical episodes. For a broader discussion of the impact of supply shocks on oil prices, see Baumeister and Peersman (2013) and Boer, Pescatori, and Stuermer (2023).

FIGURE SF.3 Implications of risk scenarios

Under the baseline forecast, the conflict will have a limited impact on commodity prices. Under a small oil supply disruption scenario, prices would initially increase between 3 and 13 percent above the baseline of $90/bbl. However, under scenarios that involve more widespread supply disruptions, initial changes in prices could be larger. In a large disruption scenario, prices could initially increase up to 75 percent above the baseline. Historical precedent highlights that depending on the duration and scale of any escalation, substantial disruptions, and soaring prices are possible.



Sources: Bloomberg; BP Statistical Review; Energy Institute; International Energy Agency; World Bank.
A. Forecasts as of October 26, 2023.
B. Range of initial supply disruptions under three scenarios.
C. Oil supply disruptions during geopolitical events as defined by International Energy Agency (IEA 2014), except "Sanctions on Iran" and "Saudi attacks".
D. Last observation is 2022.
E. Range of initial prices of Brent crude oil in response to supply disruptions under three scenarios.
F. Changes in average monthly oil prices three months after the onset of geopolitical events.

underlying source of disruption, the extent to which supply would fall in the affected countries, and the extent to which other oil producers would quickly step in to fill the drop in supply.

The initial spikes in prices often reversed rapidly in earlier episodes. For example, there was only a brief uptick in oil prices during September–November 1980, following the outbreak of the Iran-Iraq war in September 1980. Similarly, the price spike after Iraq's invasion of Kuwait in August 1990 was short-lived, subsiding as soon it became apparent in early 1991 that Kuwait would be liberated by Western forces. However, a few episodes, such as the first and second oil shocks, involved sharper and more lasting disruptions that resulted to more persistent increases in prices. Recognizing that the path of prices following a shock would depend to a significant degree on inherently unpredictable geopolitical contingencies, the scenarios presented below focus exclusively on the initial price impact of oil market disruptions.

- **Small disruption scenario.** This scenario assumes that global oil supply is reduced by 0.5 mb/d to 2 mb/d (0.5 and 2 percent of 2023 supply), depending on geopolitical developments. This decline is comparable to the supply change observed during the Libyan civil war in 2011 (nearly 2 percent decline in global supply at the time) (figures SF.3.C and SF.3.D). Under this scenario, oil prices would initially increase by 3 to 13 percent ($3/bbl to $12/bbl) above the 2023Q4 baseline of $90/bbl.

- **Medium disruption scenario.** Historical precedent suggests the possibility of wider disruptions, however (figures SF.3.E and SF.3.F). Depending on how much the conflict escalates, the medium disruption scenario assumes that global oil supply is reduced by 3 to 5 mb/d (approximately 3 to 5 percent of 2023 supply). This reduction would be comparable with the loss of 3 percent of global oil supply during the Iraq war in 2003. Under this scenario, oil prices would initially increase by about 21 to 35 percent ($19/bbl to $31/bbl) above the baseline forecast in 2023Q4.

- **Large disruption scenario.** In this scenario, the crisis is assumed to morph into a regional conflict that sharply disrupts oil supply. Global oil supply would fall by 6 to 8 mb/d (approximately 6 to 8 percent of 2023 supply). This scenario is comparable to the initial disruption associated with the Arab oil embargo in 1973, which resulted in a loss of nearly 7.5 percent of the global oil supply at that time. Under this scenario, oil prices would initially increase by 56 to 75 percent ($50/bbl to $67/bbl) above the 2023Q4 baseline.

Although not modeled here, disruptions in oil supplies can have a cascading effect on the prices of other energy commodities. This effect is most pronounced in the natural gas market, particularly in Europe and Asia, where a significant portion is traded in the form of liquified natural gas (LNG).[5] Natural gas prices are very susceptible to transportation disruptions, implying that any surge in oil prices would swiftly translate into higher LNG costs.

What are the possible near-term implications of an escalation of the conflict for other commodity markets?

Although the baseline projections assume the conflict will have minimal impact on non-energy commodities, the risk scenarios presented above have potentially significant near-term implications for other commodity prices. Supply disruptions affect other commodities mainly through higher energy prices, which raise production costs of food and metals. By increasing global uncertainty, the conflict could also raise the price of gold, often considered a safe haven asset.

[5] European natural gas prices surged 35 percent since October 6 in response to multiple developments, including a shutdown of a gas field off the Israeli coast on security reasons, an explosion at an interconnector in the Baltic Sea, overall concerns about the escalation of the conflict in the Middle East, and ongoing worries about the availability of natural gas during winter, notably in Europe.

Food prices. A sustained oil price spike would raise food prices by increasing production and transportation costs for both food and fertilizers, as happened during earlier oil price spikes.[6] Fertilizer prices could also increase if the prices of natural gas and coal were to rise markedly or if the conflict spread to affect the world's largest exporters of nitrogen-based fertilizers in the region.

The conflict has already exacerbated food insecurity in Gaza: In 2022, 1.2 million people in Gaza (53 percent of the population) were food insecure (figure SF.4.A). Recent developments resulted in the entire population in Gaza (2.3 million people) needing immediate humanitarian assistance. An escalation of the conflict could have wider regional implications. About 34 million people in Lebanon, the Palestinian territories, Yemen, and Syria already were acutely food insecure before the latest hostilities.

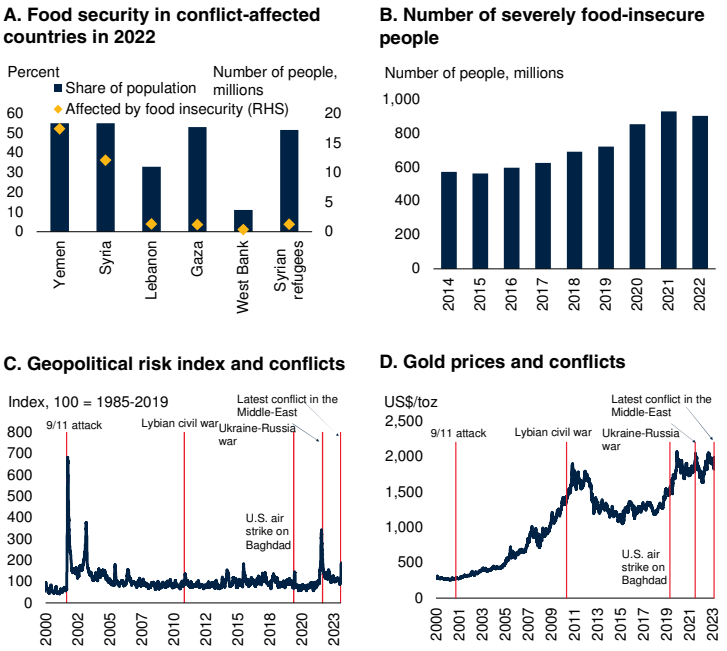
More generally, conflict situations exacerbate food insecurity by disrupting market access, destroying infrastructure, reducing incentives to invest, and rendering contracts unenforceable and property rights insecure. They also reduce farm and labor productivity and shift the orientation of agricultural production from markets to subsistence, and displace people from their homes and villages, leaving them in dire humanitarian conditions without basic access to food, water, and shelter. Beyond the direct impact of the conflict on the affected populations, an escalation would worsen already high global food insecurity (figure SF.4.B). The number of severely food-insecure people globally has risen from 624 million in 2017 to an estimated 900 million in 2022 (FAO 2023).

Prices of industrial metals. Disruptions to energy markets can raise production costs of energy-intensive metals such as aluminum and zinc—especially those produced in European smelters, many of which have not fully recovered from the rise in natural gas prices that followed Russia's invasion of Ukraine. Higher oil prices could also result in increased transportation costs for minerals, such as iron ore, a key input to steel production.

Gold prices. Gold has a unique status among assets, because its price often increases with rising geopolitical concerns. The conflict has already heightened global uncertainty (figure SF.4.C). Although the initial impact has been moderate, an escalation of the conflict would likely exacerbate such uncertainty, which would lead to reduced

FIGURE SF.4 Food insecurity and geopolitical risks

A further escalation of the conflict in the Middle East could have severe implications for already high food insecurity, both in areas afflicted by conflict directly and at the global level. While geopolitical risk has so far not substantially increased, gold prices, often viewed as a barometer of global uncertainty, have risen.



Sources: Bloomberg; Caldara and Iacoviello (2022); Food and Agriculture Organization of the United Nations; World Bank.

A. Food insecurity measured using International Food Security Phase Classifications (IPC): (1) minimal/none, (2) stressed, (3) crisis, (4) emergency, and (5) catastrophe/famine. Bars represent the number of people who face a crisis or more severe (IPC3+) food insecurity in selected countries in the Middle East. Diamonds represent the share of people who face critical or more severe (IPC3+) food insecurity in these countries.

B. Global number of people facing food insecurity at a severe level, based on *The State of Food Security and Nutrition in the World 2023* report, page 21, Table 4.

C. Geopolitical risk index (GPR) reflects automated text-search of electronic articles from 10 newspapers, related to adverse geopolitical events in each newspaper for each month. A higher index is related to lower investment, stock prices, and employment.

C.D. Daily data. Last observation is October 23, 2023. Red vertical lines show adverse geopolitical events.

[6] High energy prices would increase the cost of production due to high fuel prices (in response to higher oil prices) and higher fertilizer prices (in response to higher natural gas and coal prices, used as inputs to fertilizer production). Estimates suggest that a 10-percent increase in energy prices is associated with about 0.2 to 0.3 percent increase in food prices and a 3.3 to 5.5 percent increase in fertilizer prices (Baffes 2007, 2010).

risk appetite and lower consumer and investor confidence. The potential impact of these developments can be seen in movements in the price of gold, which has increased over 8 percent since the onset of the conflict. Previous conflicts and other episodes of geopolitical uncertainty have also been accompanied by gold prices (figure SF.4.D). In the event of a more widespread conflict in the Middle East, gold prices would likely increase from already high levels as investors shift to safe-haven assets (Bilgin et al. 2018).

Conclusions

The relatively muted effect of the latest conflict in the Middle East on oil and energy markets so far aligns with baseline forecasts in this report, which expect weaker global demand to result in a decline of 29 percent in energy prices this year and a further 5 percent fall in 2024. These projections assume that a contained conflict will have a minimal impact on commodity prices. Moreover, as a result of notable changes in the overall conditions of oil and other energy markets and improvements in the global economy's resilience to energy price shocks over the past few decades, the overall impact of the latest conflict could be smaller than what occurred in comparable episodes in the past.

Nonetheless, an escalation of the conflict is a major risk to commodity markets because the region has a substantial share of the global oil supply. Historical precedents of military conflicts in the Middle East point to the possibility of significant disruptions in oil markets, with associated surges in prices. The ultimate impact of any escalation would likely depend on the magnitude and duration of oil supply disruptions that followed. While a risk scenario involving a small decline in oil supply may lead to only a modest increase in oil prices, risk scenarios featuring more widespread disruptions could result in substantial dislocations in oil markets, with initially sharp increases in prices. Disruptions to energy supplies and spikes in energy prices would affect other commodities through higher production costs, raising food and metals prices. In particular, as food prices increase, global food insecurity, already on the rise, could reach new heights.

The global economy is now in a better position to cope with energy price shocks than in previous decades. However, the latest conflict is coming on the heels of another recent major geopolitical disruption—Russia's invasion of Ukraine in early 2022—which had dislocating effects on commodity markets and on the broader global economy that persist. The continuation and escalation of either or both conflicts would raise the specter of dual and compounding shocks to commodity markets that could test the resilience of the already fragile global economy.

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Commodity Market Developments and Outlook

Energy

The World Bank's energy price index rose 9 percent in 2023Q3 compared to the previous quarter, led by an 11 percent increase in oil prices, which makes up almost 80 percent of the index. Oil prices rose in response to a series of supply cuts by OPEC+, which effectively withdrew an additional 1 percent of total supply from July 2023 onward. Since the beginning of the conflict in the Middle East in early October, energy prices have increased 9 percent. Assuming that the conflict does not escalate, the energy price index is projected to decline by 29 percent in 2023 from 2022, driven by markedly lower natural gas and coal prices. The energy price index is forecast to drop a further 5 percent in 2024 and 1 percent in 2025 but will remain high in historical terms. Brent crude oil prices are projected to average $84 per barrel (bbl) in 2023, moderate further in 2024 amid weakening global growth and rising supply, and remain almost steady in 2025, as both demand and supply recover. European natural gas price is projected to fall further in 2024, before rebounding in 2025 amid increasing demand. Coal prices will likely fall further in 2024 and 2025 from historically high levels on improved supply. The main upside risk to the energy price forecast is a potential escalation of the conflict, which could lead to substantial supply disruptions and soaring prices. Other upside risks include prolonged voluntary supply cuts by OPEC+ and protracted supply disruptions of liquefied natural gas (LNG) exports. Downside risks to energy prices include slower-than-expected economic activity and moderating demand for oil in China.

Crude Oil

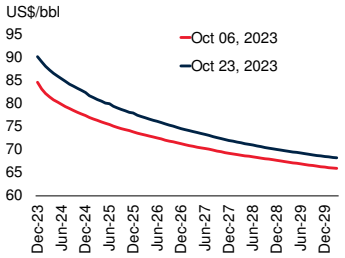
Recent developments

Since the beginning of the latest conflict in the Middle East, the Brent price has increased 6 percent owing to uncertainty about the impact of the conflict on supply and is likely to face continued volatility (figures 2.A and 2.B). Prior to the conflict, the price of Brent crude oil averaged $87/bbl in 2023Q3, an increase of 11 percent from the previous quarter following a 4 percent drop in 2023Q2 (figure 2.C). By mid-October

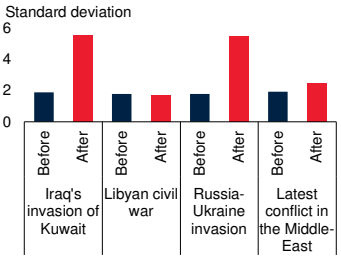
FIGURE 2 Oil market: demand developments

The latest conflict in the Middle East has so far caused a small increase in oil prices. The ensuing immediate volatility has been modest relative to previous to similar episodes. Prior to the conflict, oil prices increased in the third quarter of 2023. The gap between the Russian Urals benchmark and Brent has recently decreased as the market has become tighter. Oil demand has been strong in China despite the weakness in some sectors and is expected to grow by 10 percent in 2023, faster than in any other region. Increasing demand in China is taking place through a wide range of oil products. Demand in Advanced Economies (AEs), representing about half of the global market, has been stable.

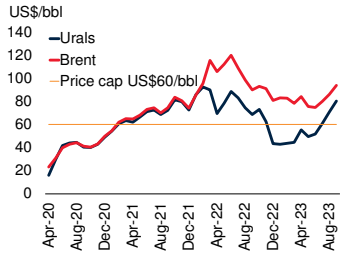
A. Brent future prices before and after the attacks on Israel



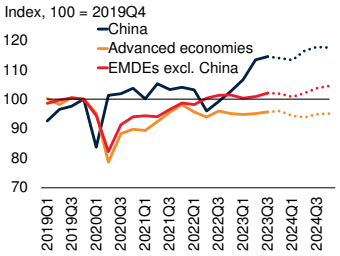
B. Brent crude oil price volatility before and after conflicts



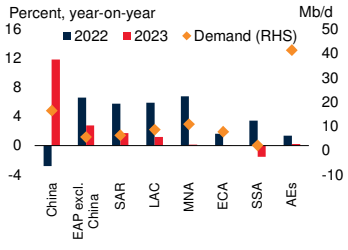
C. Brent versus Urals oil price



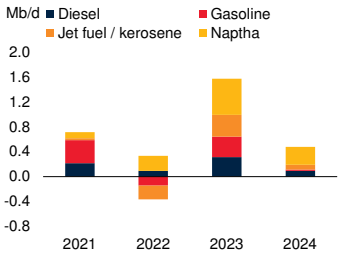
D. Oil demand



E. Regional oil demand growth and shares



F. China: Consumption of oil products



Sources: Bloomberg; International Energy Agency; World Bank.

Note: AEs = advanced economies; EAP = East Asia and Pacific; ECA = Europe and Central Asia; LAC = Latin America and the Caribbean; MNA = Middle East and North Africa; SAR = South Asia.

A. Brent futures prices on the day before (October 6, 2023) the conflict and the latest observation (October 23, 2023).

B. 30-day volatility in Brent crude oil prices, before and after geopolitical events. For the latest conflict, the period 'after' consists of data from October 9 to October 23, 2023 (11 days).

C. Monthly data. Data for Russian Urals prices from IEA's Oil Market Reports. Last observation is September 2023.

D. Dashed lines indicate IEA forecasts for 2023Q4 and 2024.

E. Bars shows the percent year-on-year change of oil demand. Orange diamond shows demand for oil per region, in million barrel per day (mb/d).

F. Data for 2023 and 2024 indicate IEA forecasts.

2023, the Brent price was down 23 percent from its peak of $120/bbl in June 2022. Prices have been volatile since March 2023, with moves largely driven by shifting expectations for economic growth amid tight monetary policy in advanced economies, and OPEC+ oil cuts. Prices fell in April and were relatively stable in May and June, as the failure of major banks reinvigorated fears of a global recession. An unexpected announcement of a production cut by OPEC+ in June had a small impact on prices since the group's reduction was roughly equivalent to production increases by the Islamic Republic of Iran and the United States. Additional cuts of 1 million barrels per day (mb/d), implemented by Saudi Arabia since July, and 0.3 mb/d by Russia since October tightened the supply-demand balance. Oil prices rose steadily from a low of $72/bbl in mid-June to $95/bbl at end-September. This increase was also supported by resilient oil demand in China and faster-than-expected U.S. economic growth in 2023Q3.

Tightness in diesel and sour crude markets, particularly in Europe, led to increased demand for benchmark light crudes. Declining refining capacity, particularly in Europe and the United States, has reduced the ability to manufacture diesel, although new capacity is coming online, notably in the Middle East. The ban on Russian oil product exports, introduced on September 21 and lifted on October 6 for most diesel exports, added to the tightness, although primarily aimed at addressing Russia's domestic prices and fuel shortages.

Oil demand increased by 2.3 mb/d in EMDEs in the first nine months of the year (2023Q1-Q3; year-on-year), primarily driven by China (figures 2.D and 2.E). Given subdued GDP growth in 2023Q2 and strains in the real estate sector, oil demand in China was surprisingly resilient, increasing an estimated 12 percent compared to the same period in 2022. Chinese oil demand is driven by a wide range of factors, including transportation activity, which has continued to recover. As such, real estate weakness is unlikely to bring down overall oil demand in 2023 (figure 2.F). Oil consumption in India increased by about 4 percent in 2023Q1-Q3. Oil demand in advanced economies was stable in the first nine months of the year, as declines in Europe were offset by increases elsewhere. A 0.5 percent decline in European oil demand reflected softness in the industrial sector and expectations of prolonged higher interest rates. Robust demand for jet/kerosene and LPG/ethane in the United States reflected robust labor markets and still strong economic activity, which has proven more resilient to higher interest rates than initially anticipated.

A series of announcements and voluntary oil supply cuts by OPEC+ during 2023Q3 helped drive Brent price up by almost $25/bbl between mid-June and end-September (figure 3.A). In June, OPEC+ announced that all voluntary cuts, initially due to expire in December 2023, would be extended until December 2024, and Saudi Arabia volunteered an additional cut of 1 mb/d starting in July. The fiscal positions of Russia and Saudi Arabia benefit from high oil prices. Elevated export revenues have helped Russia fund the invasion of Ukraine, while aiding Saudi Arabia in financing its ambitious "Vision 2030" government plan.[1] Saudi Arabia is estimated to need an oil price of at least $81/bbl to balance its current fiscal budget (IMF 2023a). As of September 2023, the OPEC+ alliance held 5.4 million barrels per day (mb/d) of spare capacity, about 5 percent of global demand (figure 3.B).

Production and exports from Russia have been relatively stable. In contrast, output from the Islamic Republic of Iran, a member of OPEC+ but exempt from production targets, was estimated to be 3.0 mb/d in 2023Q2, its highest level since 2019Q1 (IEA 2023a). The share of Russian oil exports going to China, India, and Türkiye has increased by 40 percentage points between 2021 and 2023, partially offsetting the 53 percentage point decrease in exports to the EU, the United Kingdom, the United States, and OECD Asia (figure 3.C). Among non-OPEC+ countries, production grew by 0.5 mb/d in

[1] Saudi Vision 2030 aims at fostering economic diversification away from fossil fuels and improving competitiveness. It is built around three main themes setting out specific objectives to be achieved by 2030: a vibrant society, a thriving economy, and an ambitious nation (Kingdom of Saudi Arabia 2023).

2023Q3 (q/q). In the United States, the world's largest producer, supply rose 1.4 mb/d in the first nine months of 2023 relative to the same period the previous year. About half of the additional production was exported to Europe and China. This occurred despite a slight decline in the rig count since the start of 2023 (figure 3.D; EIA 2023a). However, some capacity constraints have started to show as production costs increase. The number of drilled but uncompleted (DUC) wells has continued to fall, which will constrain the ability of companies to quickly ramp up future production.[2] Outside the United States, production increased by 0.3 mb/d in Brazil and more than 0.1 in Guyana, Mexico, and Norway.

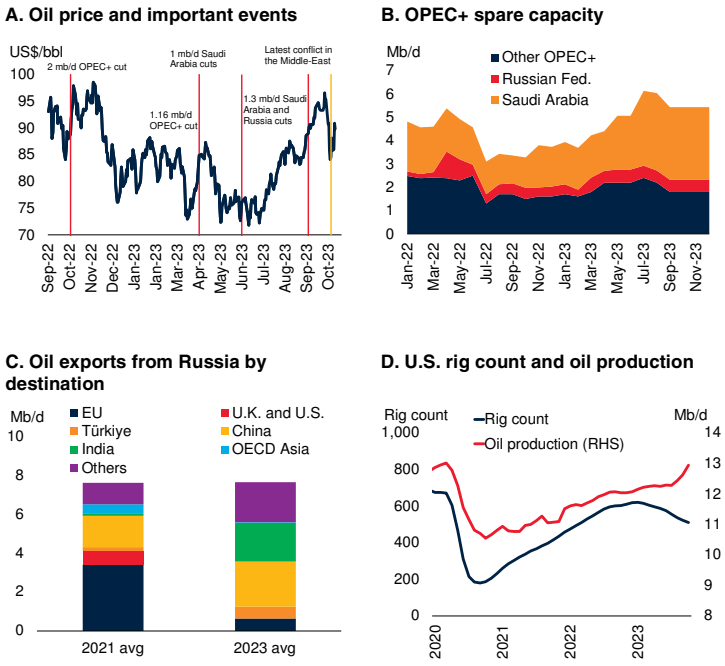
The price cap on Russian crude oil introduced in late 2022 appears increasingly unenforceable given the recent spike in Urals prices (figure 2.C). The cap has not created significant supply disruptions, with the volume of Russian oil production and exports remaining relatively constant, in part reflecting the redirection of Russian exports from EU and G7 countries to China, India, and Türkiye (figure 3.C). There has been increasing uncertainty regarding the discount at which Russian oil trades, as the price quotes for the Urals benchmark are opaque, and shipping cost estimates from European brokers have become more uncertain as their market share has dropped. Average sale prices higher than the official Urals benchmark have been computed based on Russian customs and Ministry of Finance data (Babina et al. 2023). It seems that by putting together a "shadow fleet", Russia has been able to trade outside of the cap; the official Urals benchmark recently breached the cap for more than three months, averaging $80 per barrel in August (Brooks, et al. 2023; IEA 2023a).

Global oil inventories in August decreased by 64 mb, although they remain at adequate levels, while oil product inventories increased by 39 mb. Among OECD countries, commercial inventories surged in September 2023 by 12 mb. Governments' strategic stockpiles have yet to be replenished to 2021 levels after the substantial drawdowns during the initial phases of Russia's invasion of Ukraine and are unlikely to be filled unless oil prices hit $70/bbl or below.

[2] The falling number of DUC wells is due to favorable oil price prospects, as oil shale companies are able to calibrate the extraction rate of wells with limited timespan to obtain maximum profits.

FIGURE 3 Oil market: supply developments

Prior to the conflict in the Middle East, the oil market was affected by several events over the last year. A series of announcements by OPEC+ to reduce supply, including large voluntary cuts by Russia and Saudi Arabia pushed prices up, while increasing OPEC spare capacity. Russia has increasingly diverted its oil exports to India and China, reducing its supply to advanced economies. Production has continued to increase in the United States, despite a falling rig count.



Sources: Baker Hughes; Bloomberg; International Energy Agency; U.S. Energy Information Administration; World Bank.

A. Daily Brent prices and important events. Red lines show two mb/d cuts by OPEC+, 1.16 mb/d cuts by OPEC+; 1 mb/d cut (Saudi Arabia) and extension of previous cuts to the end of 2024, and 1.3 mb/d cut extension (Saudi Arabia and Russia). The yellow line shows the start of the conflict. The last observation is October 16, 2023.

B. Spare capacity for OPEC+ members as reported in IEA's Oil Market Monthly reports until September 2023, extended to December 2023 assuming no change in supply. Other OPEC + includes Algeria, Angola, Congo, Equatorial Guinea, Gabon, Iraq, Kuwait, Nigeria, and the United Arab Emirates. Azerbaijan, Kazakhstan, Mexico, Oman, and others.

C. Total Russian oil exports in 2023 compared to the average of 2021. Other sources include Africa, the Middle East, non-OECD Asia, Oceania, and South America. The last observation is September 2023.

D. 3-month rolling average of rig count and oil production. The last observation is October 13, 2023, for rig count and October 06, 2023, for oil production.

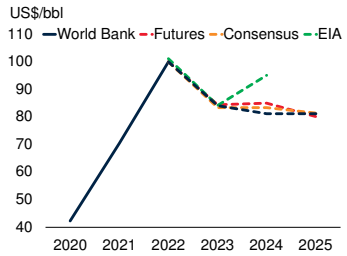
Outlook

Assuming that the conflict in the Middle East does not escalate, the price of Brent crude oil is projected to average $84/bbl in 2023, down from almost $100/bbl in 2022, which will require

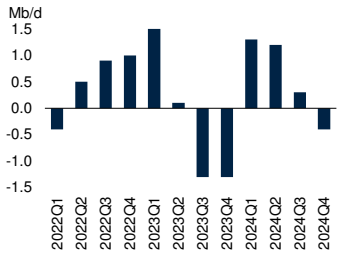
FIGURE 4 Outlook for oil markets

Assuming the conflict does not escalate, oil prices are forecast to decline in 2023 before a further decline in 2024 and remain stable in 2025. The market is expected to become less tight in 2024H1, leading to increased stocks. The possibility of the conflict spreading in the region is the main upside risk to oil prices, with the ultimate impact depending on the degree of disruption to oil supplies. Price forecast could also be affected by changes in economic activity influencing oil demand, especially demand for transport, where most of the oil is used. Despite rising costs for United States oil companies for 11 quarters in a row, their outlook is more optimistic amid high profits.

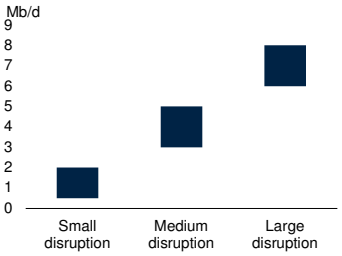
A. Oil price forecasts



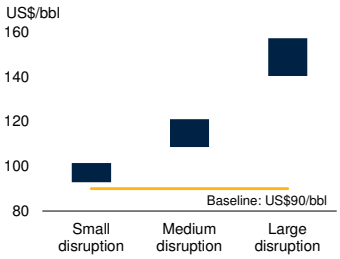
B. Changes in oil inventory levels



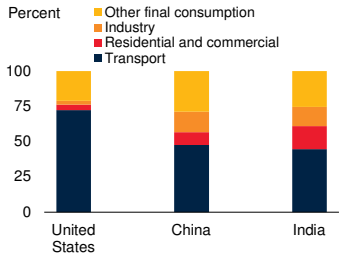
C. Initial declines in oil supply under different scenarios



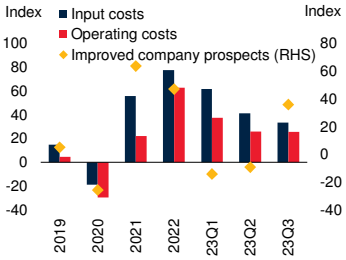
D. Initial changes in oil prices under different scenarios



E. End use of oil (final consumption) by sector



F. Costs and sentiment of United States oil companies



Sources: Bloomberg; Consensus Forecasts; Dallas Fed.; International Energy Agency; U.S. Energy Information Administration; World Bank.

A. Forecasts for 2023, 2024, and 2025 for Brent crude oil. Futures data as of October 16, 2023. Consensus data as of September report 2023. EIA data from *Short-term Energy Outlook report*, October, 2023.

B. Stock change is the difference between supply and demand for each quarter. Data based on IEA Monthly report, October 2023 edition.

C. Range of initial supply disruptions under three scenarios.

D. Range of initial prices of Brent crude oil in response to supply disruptions under three scenarios.

E. Data for 2020. Other final consumption includes electricity, heat pumps and heat plants.

F. Based on the Dallas Fed quarterly survey of about 200 oil and gas firms located or headquartered in the Eleventh District—Texas, southern New Mexico, and northern Louisiana—which operate regionally, nationally or internationally. LHS index shows the difference between the percentage of firms reporting an increase in costs and those reporting a decrease in costs. RHS index shows the difference between the percentage of firms reporting an improvement in outlook and those reporting a deterioration.

prices to average almost $90/bbl in the last quarter of 2023. Supply from OPEC is projected to increase, assuming voluntary cuts from Saudi Arabia are shelved in January 2024. Growth of non-OPEC+ production is expected to slow from about 2 mb/d this year to 1.4 mb/d in 2024, with production rising in Brazil, Canada, Guyana and the United States. Prices are forecast to decrease slightly in 2024 and edge down in 2025, but hover approximately 16 percent above their previous 5-year average of $70/bbl (figure 4.A).

Oil consumption is expected to rise by 2 percent in 2023 to an all-time high of 101.9 mb/d (IEA 2023a). Growth in global demand is expected to slow to 1 percent in 2024, reflecting the delayed impact of tighter monetary policy in advanced economies. Demand in China is expected to increase only 0.6 mb/d in 2024, as the economy moderates. Other Asian countries account for most of the rest of anticipated global oil demand growth in 2023 and 2024. In advanced economies, oil demand is expected to be stable in 2023 and decrease in 2024, according to the IEA. In 2025, demand should increase slightly as global growth reverts to its long-run trend. Despite the increasing penetration of EVs in the passenger transport fleet—EVs comprise an estimated 20 percent of new global passenger car sales in 2023—oil will continue to be the dominant transport fuel over the forecast horizon (IEA communique).

The outlook for oil production assumes no escalation of the conflict in the Middle East. It also assumes a production increase of 1.5 percent in 2024, about the same as in 2023, due to both increases within and outside OPEC+. Among non-OPEC+ countries, U.S. production growth is expected to slow to 0.5 mb/d, with smaller additions from Brazil, Canada and Guyana providing nearly 0.7 mb/d combined (EIA 2023a; IEA 2003a). Overall, OPEC+ output is expected to edge up in 2024. Saudi Arabia is not expected to extend its voluntary cuts past December 2023 due to budgetary concerns. Russia's production, however, is expected to decline by up to 0.3 mb/d in 2023 and remain stable in 2024 (EIA 2023a; IEA 2023a). Supply from other OPEC+ members is assumed to remain near current levels in 2024,

in line with the group's guidance in 2023, but moderately lower than in 2022. Consequently, supply is expected to outpace demand in 2024H1 and match demand in the remaining part of the year so that inventories should rise (figure 4.B). In 2025, oil production and demand are expected to rise as global growth firms and non-OPEC supplies continue to grow.

Risks

Geopolitical risks have sharply increased in the wake of the conflict in the Middle East and constitute the most important upside driver of oil prices. If it becomes a wider regional conflict, the impact on oil markets could be significant. There is therefore a heightened probability of reduced supply from the Middle East. Three risk scenarios, contingent on the severity of the impact of an escalation of the conflict on oil supply, are considered (Special Focus). Each scenario explores a possible range of initial supply decline in light of earlier episodes and presents a corresponding range for the initial impact on prices.

- In a *small disruption scenario*, global oil supply would be reduced by 0.5 mb/d to 2 mb/d (approximately 0.5 and 2 percent of 2023 supply)—a range of cuts that have been seen among oil producers in the region (figure 4.C). As a result, oil prices would initially increase by 3 to 13 percent above the 2023Q4 baseline forecast of $90/bbl (figure 4.D). This increase is comparable to the price change observed one quarter after the Libyan civil war in 2011 as well as changes in prices following the reductions recently implemented by OPEC+.

- In a *medium disruption* scenario, global oil supply is reduced by 3 to 5 mb/d (approximately 3 to 5 percent of 2023 supply; figure 4.C). This would push oil prices about 21 to 35 percent above the baseline forecast in 2023Q4 (figure 4.D).

- In a *large disruption scenario*, global oil supply would fall by 6 to 8 mb/d (approximately 6 to 8 percent of 2023 supply; figure 4.C). Under this scenario, oil prices would increase by 56 to 75 percent above the 2023Q4 baseline (figure 4.D).

These scenarios refer to the initial impacts of an escalation, whereas baseline oil forecasts refer to annual prices. Ultimately, the impact of any of these scenarios, should they materialize, on annual prices will greatly depend on the duration and magnitude of the underlying shock to oil markets.

With estimated spare capacity above 5 mb/d, such shortfalls could be offset by increased production from some OPEC+ countries or by the United States releasing oil from the Strategic Petroleum Reserve. However, reserve levels are relatively low compared to recent historical standards.

Independent of these risks, oil prices could ease, prompted by a decline in the demand from China, which could unfold as part of a broader slowdown in global economic activity. Oil prices could also rise if Saudi Arabia and Russia extend their voluntary cuts into 2024 or if U.S. shale production stalls starting in 2024. Neither of these two events, however, is part of the baseline scenario envisaged by the International Energy Agency.

- *Global growth.* The primary downside risk is associated with worse-than-expected performance of the global economy, particularly in China. Consensus forecasts for global economic growth have been down-graded by half a percentage point to 2 percent over the course of 2023. Should this trend continue, it poses a material downside risk to demand and ultimately to the global oil price by end-year and into 2024. In the case of China, should the expected slowdown in growth intensify, demand for transport and tourism may be affected by lower confidence (figure 4.E).

- *OPEC+ supply cuts.* The major upside risk is further extensions or even increases in production cuts by Saudi Arabia and Russia. There is also an upside risk related to Russia's production in 2024 and beyond, especially if the war with Ukraine continues. Russian oil producers may have to cut production and export levels further due to extended

maintenance periods or limited access to firms that provide oil extraction and transport services. Decisions of the largest providers of gas and oil services could adversely affect Russian longer-term production growth and productivity.

- *North American oil output.* Another upside risk to prices is related to the possibility that the U.S. shale oil industry may be unable to meet the production increases assumed in the forecast, especially by 2025. Increasing input costs reported by oil shale firms for 11 consecutive quarters since 2021Q1 impacted the industry's outlook in the first two quarters of 2023. However, these rising costs have had limited effects on profits, especially in 2023Q3, as higher prices provided windfall revenues (figure 4.D; Dallas Fed 2023). The current forecast for 2024 assumes the number of active United States rigs and their productivity continue to rise, leading to crude oil production growth of 0.4 mb/d (EIA 2023a). However, the lengthy period of increasing input costs has necessitated financial discipline within the shale industry. If oil explorers prioritize share buybacks and dividends at the expense of investments in future production, it could adversely impact industry output and push prices higher.

If the conflict in the Middle East escalates and leads to markedly higher oil and energy prices, it may exacerbate various policy challenges around the world. Policy makers need to refrain from responding to rising prices of oil with price controls or subsidies. In the near term, policy makers can respond to the adverse effects of higher oil and energy prices on real income by extending targeted support to vulnerable groups, avoiding more distortive measures that subsidize oil consumption, and carbon energy consumption more generally, on a large scale.

Natural gas

Recent developments

The conflict in the Middle East has led to heightened volatility in natural gas prices. Following the onset of the conflict in early October, the European natural gas price surged 35 percent after the shutdown of a gas field off the Israeli coast, an explosion at an interconnector in the Baltic Sea, and concerns about the escalation of the conflict in the Middle East. Prior to the conflict, the World Bank's natural gas price index rose 2 percent in 2023Q3 compared to the previous quarter. This followed large declines in the previous three quarters, as markets rebalanced after the loss of Russian gas exports to Europe due to the war in Ukraine. The three benchmarks that comprise the index took different trajectories during the third quarter, but prices remained high, with the 2023Q3 index still 34 percent higher than the 2015-19 average. The U.S. benchmark (Henry Hub) has been volatile, as a 20 percent rise in 2023Q3 followed a roughly equal drop in 2023Q2 (figure 5.A). The European benchmark (TTF) continued its decline, but at a more modest rate of 5 percent, while Japan LNG fell 6 percent.

Lower natural gas prices led to some bounce-back in European industrial consumption in 2023Q3 but not in other sectors. OECD Europe's gas demand is expected to decrease by 9 percent in the first nine months of 2023, driven by lower consumption in the power sector, fuel switching, efficiency gains, production curtailments in the industrial sector, and the impact of the European Gas Demand Reduction Plan[3] (figure 5.B; IEA 2023b). Gas demand in the Asia Pacific region rose by an estimated 2.5 percent in the first eight months of 2023, mainly prompted by increases in China's industrial and power sectors. India's gas consumption also bounced back strongly this year in response to lower prices (IEA 2023c). Consumption in North America increased by an estimated 1 percent in the first nine months of the year (2023Q1-Q3; y/y), primarily driven by the power sector.

On the supply side, lower production in Russia has been broadly offset by increases in most other

[3] This plan includes best practices and guidance for member states of the European Union to help them reduce gas demand by 15 percent from August 2022 to March 2023 and to prioritize which industrial sectors should make savings. Options include switching away from gas, reducing consumption, and reducing heating and cooling. Originally intended to last until March 2023, it was extended to March 2024.

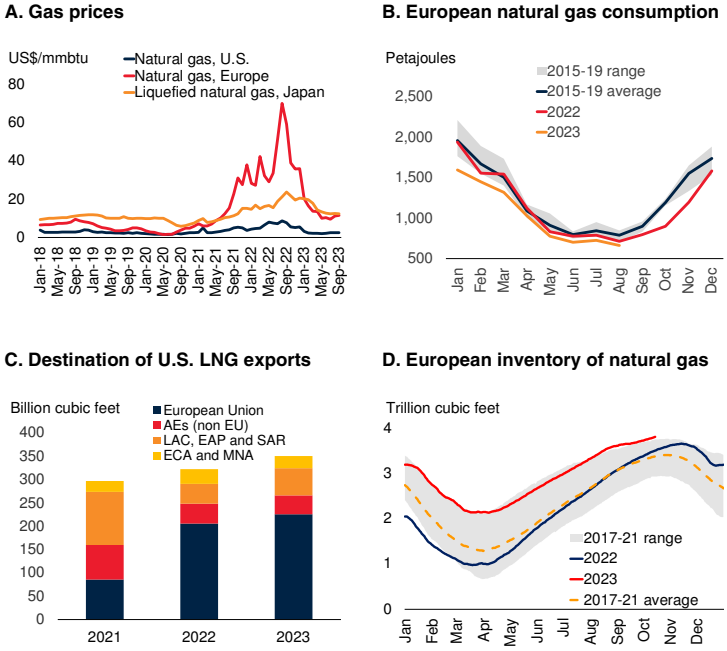
regions, particularly the United States (IEA 2023b). During 2023Q1-Q3, the increase in U.S. supply varied across "shale gas plays,"[4] but overall production increased by 5 percent (y/y), with 2023Q2 output delivering the highest quarterly production on record (EIA 2023b). Russian output is expected to shrink in 2023 by a further 8 percent, after decreasing by 12 percent in 2022, as increased exports to China and Central Asia did not fully compensate for the drop in pipeline exports to EU countries (IEA 2023c). Production increased in China in 2023H1 as part of the government strategy to increase energy security, and in the Middle East, as part of long-term efforts to raise the region's share in the global LNG market.

The structure of the global gas export market has changed fundamentally since the invasion of Ukraine, with more reliance on LNG, particularly in Europe, but also increasing price volatility. In 2023, trade patterns have shifted notably. Lower imports in Japan (-13.3 percent in 2023H1) enabled China's imports to increase by 13 percent in 2023Q1-Q3 and European imports to increase by 2.7 percent in the same period, despite labor unrest in French terminals (IEA 2023c). In the United States, exports rose 8 percent in 2023Q1-Q3 to record levels, with two-thirds of flows directed to Europe (figure 5.C).

Lower prices have been partly driven by large quantities of natural gas stored across the main markets. In the European Union, seasonal inventory levels since November 2022 have been very high compared with historical averages due to higher imports, reduced demand, and unseasonably mild weather (figure 5.D). This helped the European Union reach the 90 percent fill level target in August 2023, well ahead of November, when winter demand commences. In the United States, storage levels in September were about 5 percent higher than the 5-year average. Storage levels are also high in East Asia, with those in Japan and Korea nearly 30 percent above their five-year average (IEA 2023b). As of June 2023, global LNG floating storage was estimated to be at its highest levels since 2019.

FIGURE 5 Natural gas markets

Natural gas prices fell in the first quarter of 2023. Consumption continued to decrease in Europe while higher LNG deliveries, especially from the United States, helped keep the European market well supplied. Consequently, storage operators were able to maintain inventories at a record level for this time of year.



Sources: Bloomberg; Eurostat; Gas Infrastructure Europe (AGSI+); U.S. Energy Information Administration; World Bank.
Note: AEs = advanced economies; EAP = East Asia and Pacific; ECA = Europe and Central Asia; LAC = Latin America and the Caribbean; MNA = Middle East and North Africa; SAR = South Asia; LNG = liquified natural gas.
A. Monthly data. Last observation is September 2023.
B. Monthly data. Last observation is August 2023.
C. Averages of monthly exports. Last observation is July 2023.
D. Gray area indicates 2017-2021 range. Sample includes 20 EU countries and the United Kingdom. Last observation is October 14, 2023.

Outlook

Assuming that the conflict in the Middle East does not escalate and that recent price spikes level off, natural gas prices are forecast to be significantly lower in 2023 compared to 2022, as markets rebalance from earlier disruptions related to the Russian invasion of Ukraine. The European price is expected to decrease from its current level, as full storage facilities temper requirements for

[4] "Shale gas plays" indicate geologic formations containing significant accumulations of natural gas and other oil resources. Extraction is determined by profitability, with oil extraction being more profitable than gas. In "associated" shale gas plays, where activity is driven by the oil price, extraction of natural gas continued to increase at a slower rate. In gas-driven shale plays, however, it decreased due to the lower gas price.

LNG imports. This implies a 68 percent price decline in 2023, followed by a further 4 percent decline in 2024 and a 4 percent increase in 2025. The U.S. benchmark price is expected to be 58 percent lower in 2023, in line with declines in global LNG prices, and partly because of increased domestic production and constrained export capacity at the beginning of the year. This is to be followed by a 20 percent increase in 2024, and a 23 increase in 2025, driven by higher export demand. The trend in Japan's LNG price is expected to continue closely tracking the European LNG price, although with a smaller amount of volatility due to the contract nature of the benchmark.

The forecast assumes that global demand for natural gas in 2023 will remain broadly flat compared to 2022 and increase by 1.6 and 1.9 percent in 2024 and 2025, respectively. Demand in North America is expected to decline at about 1 percent per year. In contrast, demand in Europe is assumed to remain stable at 2023 levels, with a decline in the power sector (due to increased renewables) offsetting higher consumption from price-sensitive residential and industrial sectors. Consumption in China is assumed to increase on average by 7 percent per year between 2022 and 2025 (National Energy Administration; IEA 2023b) and is expected to expand in the Middle East and Africa.

After a small decline in 2023, global production is anticipated to increase by about 1.6 percent in 2024 and 2025. As this change is slightly lower than anticipated increases in demand, the global natural gas market is set to remain tight throughout the forecast period. In 2024 and 2025, output is assumed to increase by about 2.5 percent in the Middle East and about 3 percent in Russia. Growth in U.S. output is expected to slow but remain positive. LNG trade will continue to increase due to rising exports from the United States and Eurasia, with recently built U.S. infrastructure becoming operative in 2024 and 2025. East Asia is expected to absorb much of the increase in LNG supply throughout the forecast period, with China's LNG imports projected to double by 2026 compared to 2022 levels (IEA 2023b).

Risks

Risks are tilted to the upside. The most important risk to natural gas prices relates to the possible impact of an escalation of the conflict in the Middle East. Natural gas prices could also rise if supply is reduced by labor strikes, maintenance issues, other geopolitical tensions, or demand surges following weather-related events. Conversely, lower natural gas prices could materialize if economic growth stalls in 2024 and 2025.

- *Escalation of the conflict in the Middle East*. Disruptions in oil supplies due to an escalation could have a cascading impact on natural gas prices, particularly in Europe and Asia, where a significant portion is traded in the form of Liquified Natural Gas (LNG).

- *Trade issues*. As LNG has become a vital component of an emerging global natural gas market, any interruption in the timely delivery of cargoes can have a sustained upside impact on prices. Recent examples of problems hindering the flow of gas that have rattled markets include suspected sabotage of the Estonia-Finland pipeline; the shutdown of the Tamar gas field in Israel; and industrial actions at two LNG plants in Australia and at three French import facilities. An escalation of geopolitical conflict could push prices up either due to increases in precautionary demand for LNG (particularly in Europe) or further reductions in supply.

- *El Niño and weather changes.* El Niño could have an impact on natural gas prices by causing an increase in power demand. El Niño is known for delivering warmer summers in the United States, increasing demand for air conditioning. The 2023 summer was the hottest on record in the United States, and hot summers are increasingly likely due to climate change. In the case of Northern Europe, El Niño is associated with drier and colder winters, requiring more natural gas for heating, with a potential upward impact on prices.

- *Economic growth.* On the downside, any worsening of the slowdown in the global or Chinese economies in 2024 and 2025, particularly in industrial production, could reduce demand and global natural gas prices.

Coal

Recent developments

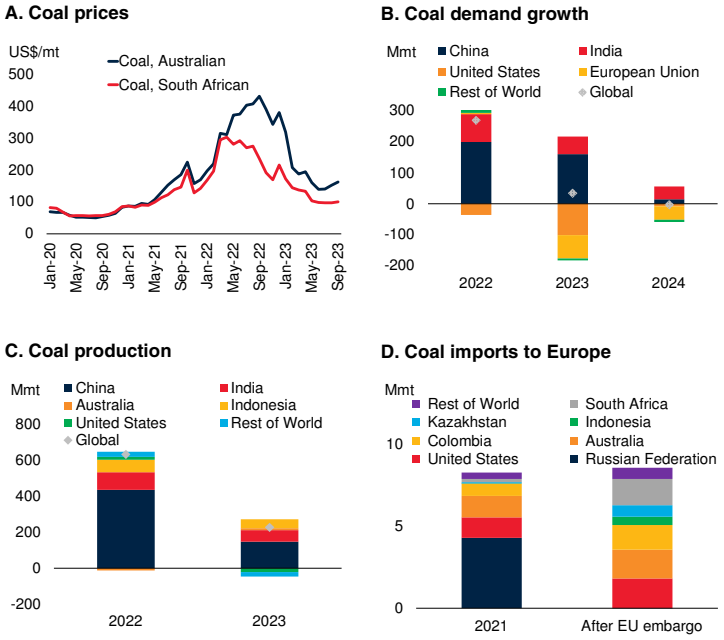
The conflict in the Middle East has led to a modest uptick in coal prices. Prior to the conflict, coal prices fell in 2023Q3 relative to the previous quarter, extending the decline that began in 2022. Australian coal prices fell by 8 percent (q/q) in 2023Q3, following a 31 percent drop in 2023Q2, with South African coal prices changing similarly (figure 6.A). By mid-October 2023, Australian coal prices were at about one-third of their peak level after Russia's invasion of Ukraine. Several factors have contributed to the drop in prices. The most important were fuel substitution—related to declining natural gas prices and high EU Emissions Trading System (ETS) allowance prices—and high levels of storage, particularly in Europe. Increasing supply in all major producers and higher levels of exports from Indonesia also helped reduce market prices.

After posting record-high growth in 2022, global coal consumption growth decelerated, rising about 1.5 percent in 2023H1, due to rising demand for power generation and industry (figure 6.B). Recent estimates point to a slowdown in coal consumption in 2023 with smaller increases in China and India and larger falls in the United States and European Union. Decelerating demand for electricity and increased hydropower output reduced demand growth in India and China, respectively. Consumption in the United States shrank by 24 percent in 2023H1, due to mild weather and strong growth in renewable output. Demand in Indonesia increased by more than 30 percent in 2022 driven by strong economic growth, higher power demand, and industrial expansion.

Global production slowed in 2023H1 after growing by 8 percent in 2022 in response to soaring prices after the Russian invasion of Ukraine (IEA 2023d). Output in China and India increased in 2023H1, but at a lower rate than in 2022 (figure 6.C). In the case of Indonesia, the increase in 2023H1 was driven by higher domestic and export demand, as two-thirds of coal production were shipped overseas, chiefly to India and China. In contrast, supply in Australia fell 3 percent due to disruptions from flooding caused by La Niña, the sea surface temperature phenomenon that affects global weather. Output was flat in South Africa affected by labor unrest and railway disruptions. Production was stable in Russia, despite sanctions and infrastructural bottlenecks hindering the redirection of exports. U.S. production was also stable.

FIGURE 6 Coal markets

Coal prices fell in 2023Q3 as increasing demand in China and India was met by domestic production increases, and exports from Indonesia. Consumption in the United States and the European Union continued to shrink. After introducing the ban on Russian coal imports, the European Union has been successful in sourcing its supply elsewhere, mainly from the United States, Australia, Colombia, and South Africa.



Sources: Bloomberg; Eurostat; International Energy Agency; World Bank.
Note: AEs = advanced economies; EAP = East Asia and Pacific; ECA = Europe and Central Asia; LAC = Latin America and the Caribbean; MNA = Middle East and North Africa; SAR = South Asia.
A. Monthly data. Last observation is September 2023.
B. C. Annual data. Data for 2023 and 2024 are IEA forecasts.
D. Monthly averages. The 'After EU embargo period' covers observations between September 2022 and June 2023. Last observation is June 2023.

International coal trade continued to increase, with growth of 6.5 percent expected in 2023 following a 1.6 percent increase in 2022. Russian exports continued to be diverted from the European Union, mainly to India and China, after the EU embargo came into force on August 10, 2022. Russian exports to the EU were substituted mainly by exports from Australia, Colombia, Indonesia, Kazakhstan and South Africa (figure 6.D). Globally, about 16 percent of coal consumed in 2022 was supplied by international trade, with Indonesia providing a remarkable 45 percent of global exports. About 8 percent of 2022 global exports were supplied by small producing countries, which increased exports by 16 percent. As these are higher cost producers, prices will need to remain well above long-term averages for them to continue contributing to the growth of global coal supply.

Outlook

Assuming the conflict in the Middle East does not escalate, coal prices are forecast to fall 49 percent in 2023, 26 percent in 2024, and 15 percent in 2025, but remain well above the 2015-19 average.

The forecast assumes that recent consumption growth will moderate in 2024 and 2025, with smaller increases in China and India and larger declines in the United States and the European Union. As a result, global consumption will plateau in 2024 and 2025 at the high levels seen in 2022. Consumption continues to move away from OECD countries towards Asia, with China and India expected to account for 70 percent of coal consumption by the end of 2023 (IEA 2023d). Coal consumption is expected to decline in the power sector due to strong growth in output from renewables and lower-cost natural gas. However, it will increase in the industrial sector by end-2024 and 2025, amid an improving economic outlook, notably in Asia. Coal production is expected to exceed consumption, with strong growth in the three largest producers (China, India, and Indonesia) and sustained production in high-cost countries, supported by coal prices well above historical averages. The forecast assumes that international coal trade remains strong, despite continued sanctions on coal from Russia.

Risks

In the short term, coal prices are subject to various upside risks. An escalation of the conflict could push up coal prices if natural gas prices are subject to a spike. In addition, weather disruptions, such as heat waves and droughts induced by El Niño, represent another upside risk. These can increase power demand while reducing the contribution of hydropower. Coal produces the largest amount of greenhouse gases compared to other fossil fuels, so policies to reduce its demand create downside risks for prices.

- *Weather and climate events.* Coal prices can increase due to the impact of extreme weather events on coal production, as experienced by Australia in 2022. In addition, heat waves increase demand for electricity for air conditioning, and hence demand for coal for power generation. The average length of a heat wave season has doubled in the last 50 years (EPA 2022). Frequent droughts can severely constrain electricity generation from hydropower, leading to greater demand for coal. At times in the last few years, coal-fired power plants have been required to fill gaps arising from dry conditions in China, France, and the western United States.

- *Climate policies.* Coal is increasingly being squeezed out of the power sector partly due to rapid growth of renewable energy generation (and natural gas). In the United States, renewable electricity production, including hydropower, surpassed electricity from coal in 2022. These trends are expected to continue, partly driven by local and federal policies. In China, the largest user of coal, non-fossil fuel energy sources exceeded 50 percent of installed electricity capacity in 2022, three years earlier than planned.

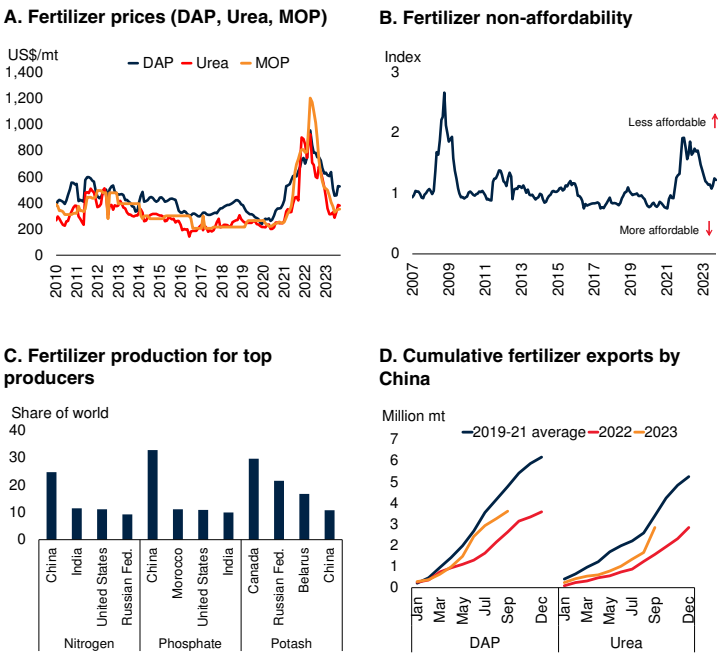
Fertilizers

The World Bank's fertilizer price index rose slightly more than 3 percent in 2023Q3 relative to the previous quarter, driven by significantly higher urea prices due to production outages, partly offset by declines in phosphate and potash prices. However, the index is down nearly 35 percent compared to a year ago, following commensurate declines in energy prices, especially natural gas—a key input. The recent declines in fertilizer prices brought the affordability index closer to its 2012-19 average. Following an estimated decline of 33 percent in 2023, the index is expected to soften by a further 15 percent in 2024, as more supplies come online. Risks to the price forecast include shocks to input costs, especially natural gas.

Nitrogen (urea) prices gained 18 percent in 2023Q3 quarter-on-quarter on global production outages for both urea and ammonia (key feedstocks); however, prices remain 41 percent lower than a year ago (figure 7.A). The recent strength in urea prices also reflects an increase in natural gas prices and strengthening demand following last year's weakness. After a 5 percent consumption reduction in 2022, partly due to lower exports by Russia (related to sanctions and logistical issues related to the invasion of Ukraine) and China (related to export restrictions), usage of nitrogen-based fertilizer is expected to grow moderately in 2023. Following an estimated 49 percent decline in 2023, urea prices are expected to fall a further 13 percent in 2024 as production recovers and new capacity comes online. Key upside risks to the price outlook include less new capacity coming online, continuing trade restrictions, especially from China, spikes in natural gas prices resulting from an escalation of the conflict in the Middle East, and self-sanctioning by companies that trade Russian fertilizer. Longer-term headwinds for urea consumption (and prices) concern its high carbon content. However, as the green transition intensifies, possible opportunities for the sector include using clean nitrogen in energy-efficient projects.

FIGURE 7 Fertilizer markets

Fertilizer prices have come down from their 2022 record-highs, bringing affordability closer to the 2012-19 average. Following an estimated decline of 33 percent in 2023 (commensurate with energy prices), fertilizer prices are expected to fall another 15 percent next year as more supply comes online. Risks to the price forecast include the trajectory of input costs, as well as export restrictions from China, reduction in supplies from Morocco, and the intensification of geopolitical risks in the Middle East, which could affect exports of nitrogen-based fertilizers and natural gas.



Sources: Bloomberg; Food and Agriculture Organization of the United Nations; General Administration of Customs (China); UN Comtrade; World Bank.
Note: DAP = diammonium phosphate; MOP = muriate of potassium; mt = metric tons;
A.C. Monthly series. Last observation is September 2023.
B. Ratio of Fertilizer prices over Food price index. Last observation is September 2023.
C. Three-year average (2019, 2020 and 2021) of fertilizer production share for top four producers.
D. Monthly series. Last observation is September 2023.

DAP (diammonium phosphate) prices fell 5 percent in 2023Q3 (q/q) and are down almost 34 percent from a year ago. Overall, DAP prices have fallen in line with prices for natural gas (which is used to produce ammonia, an input to DAP). Still, recent increases in the cost of natural gas and ammonia, rebounding demand, and tight supplies have kept DAP prices relatively firm. Prices have also been aided by policy measures, including export quotas imposed by China as well as Morocco's limits on exports. DAP consumption has been extremely weak during the past two seasons, following the price tripling from 2020Q1

($273/mt) to 2022Q2 ($860/mt). DAP application rates fell in several agricultural-producing regions, notably in Asia, where affordability was the main driver (figure 7.B). While demand is recovering, a cut in India's subsidy for the second half of the season (beginning in October) could further impact demand. Export restrictions on phosphate from China and ammonia from Russia have impacted global trade flows and prices. This is evident in Europe, which replaced imports from China and Russia with imports from other exporters, including Egypt (ammonia), Morocco (phosphate), Trinidad and Tobago, Saudi Arabia, and the United States (figure 7.C and 7.D). Following a projected decline of 30 percent in 2023, DAP prices are expected to fall further in 2024 and 2025 as supplies recover and new capacity comes online. The outlook assumes that Russia will continue redirecting most exports toward Brazil and India, but further trade restrictions and higher ammonia and natural gas prices could push DAP prices upward.

MOP (muriate of potash, or potassium chloride) prices decreased 6 percent in 2023Q3 (q/q) and are more than 60 percent lower than a year ago. Although sanctions imposed on Belarus and Russia, which account for 40 percent of global MOP output, have reduced exports, trade from both countries has been much higher than expected reflecting significant export redirection. Belarus increased its potash exports to China, while Russia has expanded rail capacity to facilitate Belarus' shipments. Meanwhile, Canadian exports have been diverted to Europe. On the demand side, some crop producers have significantly reduced MOP-based fertilizer applications (which is easier to do than with nitrogen), while others have delayed purchases. Following an estimated 55 percent decline in 2023, MOP prices are expected to drop a further 22 percent in 2024 before stabilizing in 2025 as demand recovers. A downside risk to prices (assuming the continuation of sanctions) stems from the possibility that Belarus may expand its exports through alternative routes. As with nitrogen-based fertilizers, self-sanctioning by companies that trade Belarusian and Russian fertilizers presents an upside price risk.

Agriculture

Since the onset of the conflict in the Middle East, agricultural prices have ticked up about 4 percent, mostly due to price increases of tropical commodities. Prior to the conflict, the World Bank's agriculture price index declined 3 percent in 2023Q3 relative to the previous quarter, mainly driven by a 3 percent decline in food (food comprises nearly two-thirds of the agriculture index). Robust grain harvests weighed on prices, offsetting weather-related disruptions and Russia's withdrawal from the Black Sea Grain Initiative. Nonetheless, the advent of El Niño caused significant price spikes for some agricultural commodities produced mostly in regions that are usually negatively affected by the weather phenomenon. As such, rice and cocoa prices recently reached their highest levels since 2008. The food price index is nonetheless expected to be 9 percent lower in 2023 compared to 2022, and to decline by 2 percent in 2024 and 3 percent in 2025, as improved global supply outlooks for grains and oilseeds ease pressures on markets, and as the impacts of El Niño subside. Food insecurity has worsened in lower-income and lower-middle-income countries so far in 2023, following a more than 12 percentage point increase in moderate or severe food insecurity between 2015 and 2022.

Grains, oils and meals, and other foods

Recent developments

The World Bank's *grains price index* eased more than 7 percent in the third quarter of 2023, however, grain prices remained 20 percent higher than their 2015-2019 average in inflation adjusted terms (figures 8.A and 8.B). Higher global production in 2022/23 and an improved supply outlook eased pressure on markets created by extreme weather and Russia's withdrawal from the Black Sea Grain Initiative. Notably, maize prices dropped 18 percent in 2023Q3, while wheat prices declined more than 10 percent (figure 8.C). Ukraine had a bumper harvest in 2023, with wheat and maize production increasing by 9 and 4 percent, respectively, compared to 2022 (prior to the conflict, Ukraine was the 4th largest global maize exporter and 6th largest wheat exporter). Despite repeated attacks on its ports, grain

shipments continued to flow out of Ukraine, primarily through the Danube River. This has become Ukraine's primary export route for agricultural output since Russia pulled out of the Black Sea grain deal in July 2023, but frequent drone attacks are straining its viability.

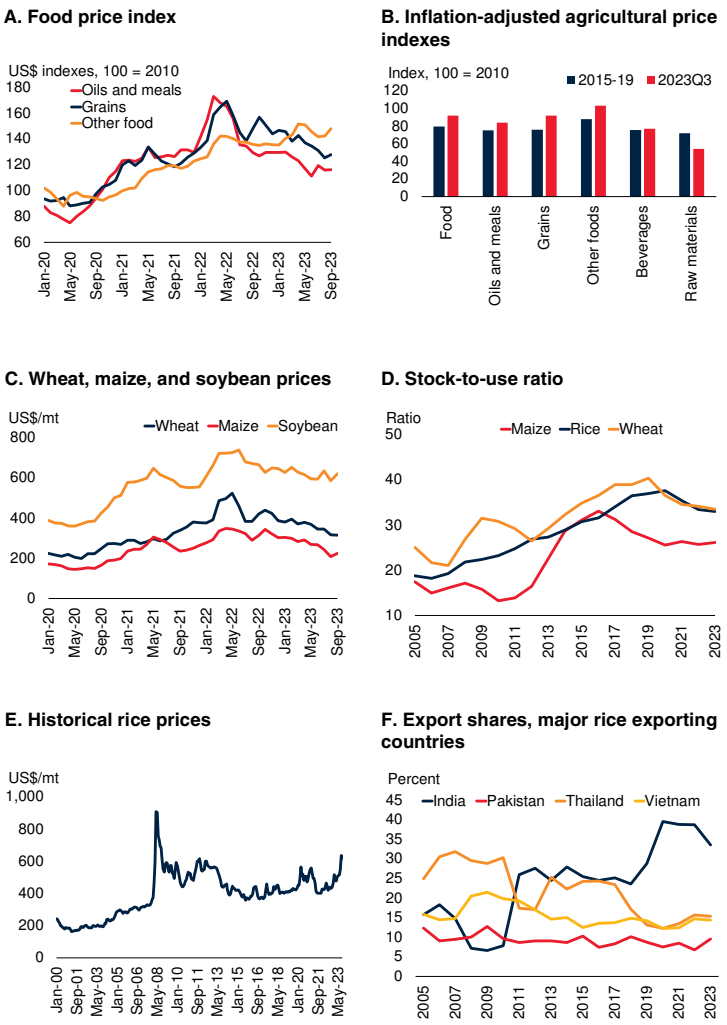
Rice prices soared by 18 percent in 2023Q3, reflecting export bans and other trade restrictions on rice from India, which overtook Thailand to become the world's largest rice exporter in 2011 (figures 8.E and 8.F). India banned exports of non-Basmati rice in response to increased domestic prices (due to flooding in northern India) and fears of potential El Niño impacts in crucial rice-growing areas. These measures have roiled global markets since mid-July. Rice prices in August and September 2023 reached the highest levels since the 2007/08 food price crisis. El Niño-related supply concerns in other major producers and higher demand from countries rushing to ensure rice supplies supported the elevated prices. So far, other major producers in South Asia have not responded with their own export restrictions (except Myanmar, the world's fifth largest rice exporter, which banned rice exports for 45 days). India is also expected to cut the minimum export price for Basmati rice following a sharp drop in overseas sales. Consequently, the August spike in rice prices began to recede in September and early October.

The *oils and meals price index* remained stable in 2023Q3 as a sharp decline in palm oil prices offset increases in other edible oils (figure 8.A). Prices of soybean oil, groundnut oil, and coconut oil increased by 12 percent, 6 percent, and 3 percent, respectively, in 2023Q3. This was due to drought conditions across the U.S. Midwest, which slashed soybean yields, and difficulties transporting Ukrainian rapeseed and sunflower seeds. In contrast, palm oil prices declined 7 percent due to higher production and exports from Indonesia and Malaysia, which together account for more than 85 percent of global palm oil exports. Global palm oil exports in 2022/23 increased by almost 15 percent compared to the previous year as the pandemic-induced labor shortages eased.

The *other food price index,* which includes sugar, meat, and fruits, fell by 4 percent in 2023Q3, driven by weaker meat prices. Chicken and beef prices declined 12 and 8 percent, respectively, partly reflecting the falling cost of feed grains and transportation. World sugar prices reached their highest level since 2011 in 2023Q3, up 24 percent

FIGURE 8 Agricultural prices

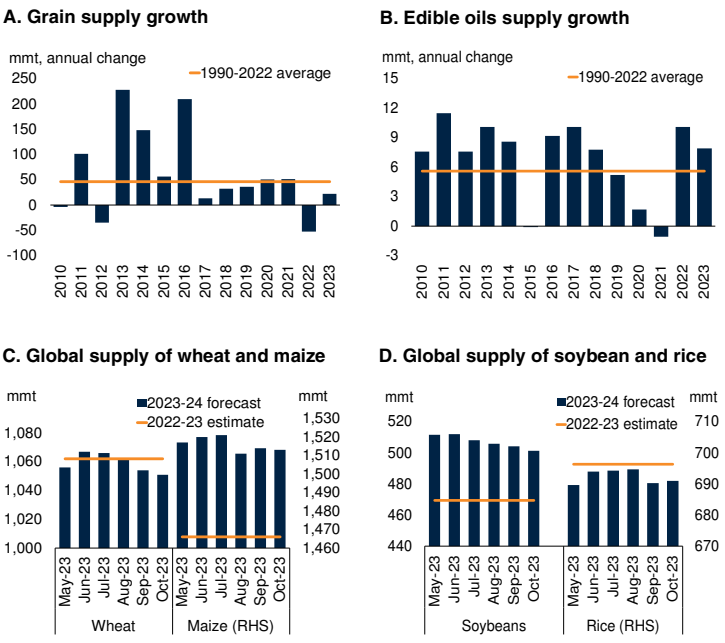
Prior to the onset of the conflict in the Middle East, food commodity prices fell in 2023Q3, led by price declines in grains, meat, and sugar. However, food prices are still much higher than pre-COVID-19 levels in inflation-adjusted terms. Developments in the Black Sea, India's export ban of non-basmati rice, and the ongoing El Niño weather pattern pose near-term risks to agricultural prices. Rice export restrictions by India—the world's largest rice exporter—have pushed rice prices to historically high levels.



Sources: Bloomberg; S&P Global, U.S. Department of Agriculture; World Bank.
A.C.E. Monthly data, last observation is September 2023.
B. Nominal indexes deflated by U.S. Consumer Price Index (CPI). Last observation is September 2023.
C. Wheat refers to the U.S. hard red winter (HRW) benchmark. mt = metric tons.
E. Rice refers to Thai 5% benchmark. mt = metric tons.

FIGURE 9 Supply conditions for grains and edible oils

Average and better-than-average supply outlooks for grains and edible oil in 2023/24 eased the pressure on markets from Russia's withdrawal from the Black Sea Grain Initiative. Global supply of maize and soybeans for 2023/24 is forecast to be much higher than the 2022/23 season, while supply will be about the same for wheat and lower for rice.



Sources: U.S. Department of Agriculture; World Bank.
Note: mmt = million metric tons.
A.B. Years represent crop season (for example, 2021 refers to 2021-22). Data updated as of October 2023. Supply is the sum of beginning stocks and production.
C.D. Blue bars denote revisions to the 2023-24 supply assessment (based on monthly USDA updates). Orange lines denote the latest (October 2023) estimate for the 2022-23 season.

since 2023Q1. Prices have risen on concerns of lower production in India and Thailand due to El Niño and expectations that India may impose export restrictions. Bumper sugar harvests from Brazil kept prices from increasing even more. Together, Brazil, India, and Thailand account for 70 percent of global sugar exports.

Falling grains and edible oil prices have seen the food price index ease in inflation-adjusted terms after it reached its highest levels in 2022 since the 1973/74 grains embargo (as reported in the April edition of the *Commodity Markets Outlook*). However, the "other foods" price index reached a record high level in 2023Q3 in inflation-adjusted terms, driven by surging fruit and sugar prices, including record high orange prices due to droughts in Spain.

Outlook

Following a decline of more than 11 percent in 2023, and assuming the conflict in the Middle East does not escalate, the grains price index is expected to fall by 3 and 5 percent in 2024 and 2025, respectively. Higher rice prices in 2024 due to the ongoing El Niño and India's export restrictions are forecast to be offset by the continued decline in maize and wheat prices because of improving global grain supplies. Global maize supply is expected to rebound strongly in 2024 due to favorable growing conditions in Argentina, Brazil, and the United States, while wheat supply will stabilize around 2023 levels (figures 9.A and 9.C). Stock-to-use ratios for maize are slightly higher in 2023/24 than in 2022/23, while the ratio is somewhat lower for wheat and rice, and stable for the food aggregate (figures 8.D and 10.A). Edible oils supply has continued growing, particularly soybean oil: soybean production is estimated to be 9 percent higher this crop year (figures 9.B and 9.D). Maize prices are expected to finish the current year 22 percent below their levels in 2022, and then decline a further 8 and 4 percent in 2024 and 2025, respectively. Similarly, wheat prices are trending in 2023 to average about 20 percent below their 2022 levels and should decrease by about 3 percent in 2024 and 5 percent in 2025.

In contrast, the price of rice is expected to average 28 percent higher in 2023 than 2022, and to increase 6 percent in 2024, partly due to the threat of El Niño, policy responses from significant exporters and importers, and the geographic and market concentrations of rice production and exports. El Niño is expected to weaken in the Spring of 2024, with neutral conditions of the El Niño-Southern Oscillation (ENSO) weather event becoming the most likely category from May to July 2024, easing rice prices in 2025.

Longer-term trends in global grain markets help explain the resilience of agriculture to overlapping shocks, beyond short-term price fluctuations. Global grain yields (measured as production per area harvested) have been growing steadily, with annual yields in 2020-23 averaging three times higher for corn and wheat, and 2.5 times higher

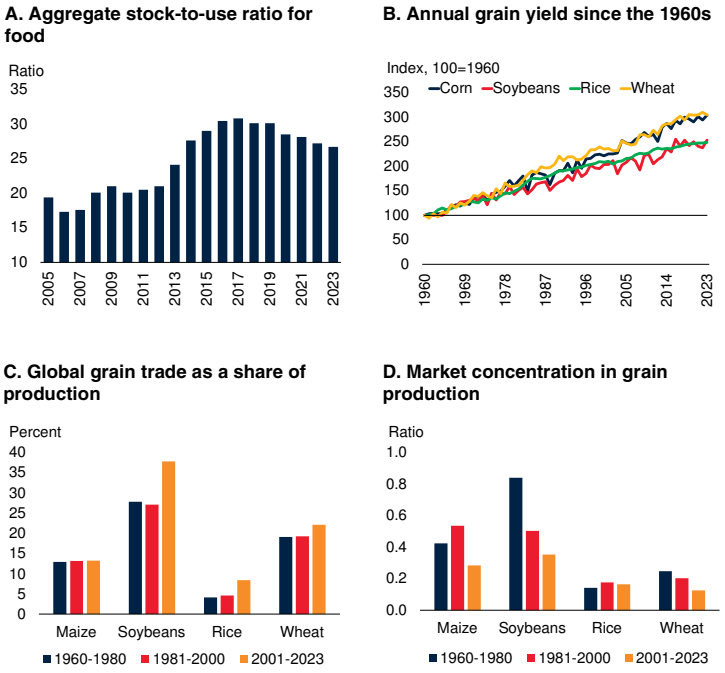
for soybean and rice than 60 years ago (figure 10.B). Moreover, the world is trading an increasing share of its production (figure 10.C), and except for rice, grain export markets are becoming more diversified (figure 10.D). Consequently, supply and demand quickly adjust to price changes. Recent grain price surges due to localized declines in supply (from floods, droughts, and temporary trade restrictions) were short-lived, as supply from elsewhere was quickly mobilized.

The oils and meals price index in 2023 is expected to be about 17 percent below its 2022 average, reflecting the unwinding from the surge following the Russia-Ukraine war. The index is expected to decline by nearly 3 percent in both 2024 and 2025, due to increased global oilseed supply. The prices of soybeans, soybean oil, and soybean meal are expected to weaken further in 2024 and 2025, as elevated soybean production in South America, which historically receives above-average rainfall during El Niño seasons, is expected to more than compensate for lower production in the United States, which experienced hot, dry conditions in key growing regions and lower area planted for the 2023/24 season. Argentina, Brazil, Paraguay, and the United States are the top four soybean exporters, accounting for 94 percent of the world's total. Global supply of the eight most important edible oils is expected to increase by 5.3 million tons, which is lower than the 10.9 million tons increase in 2022/23. Palm oil production in 2023/24 will rise only by 0.2 million tons, much lower than the average annual growth of 2.5 million tons in the past ten seasons, as El Niño-related moisture deficits are reported in several parts of Indonesia between August and October.

Prices of "other foods," comprising fruit, meat, poultry, and sugar, are expected to be stable in 2024 and fall slightly in 2025. Unfavorable rain in major sugar exporters in the current El Niño season and concerns about export restrictions should lead to higher sugar prices in 2024. Severe drought could cut sugar production in Thailand, the world's second-largest exporter, by almost 20 percent in 2024, while drought conditions in India could cut production by more than 3 percent. However, record-high sugar production for the 2023/24 season in Brazil, the world's largest sugar exporter, will help temper prices. Higher sugar prices also incentivize Brazilian mills to favor sugar production over ethanol. The 2023 drought in Spain, Europe's largest orange producer, will put pressure on orange prices in 2024. Beef prices in the United States (the reference market for beef) in 2023 are expected to step down about 11 percent, on average, from high levels in 2022, but they are expected to increase in 2024 based on lower production projections compared to 2023.

FIGURE 10 Food markets

Stock-to-use ratios for food have fallen slightly, but indicate adequate supply. Global grain yield has been growing steadily for the major grains, including in 2023 for maize and soybeans. In addition, the world is trading an increasing share of its production, with most grain markets becoming less concentrated.



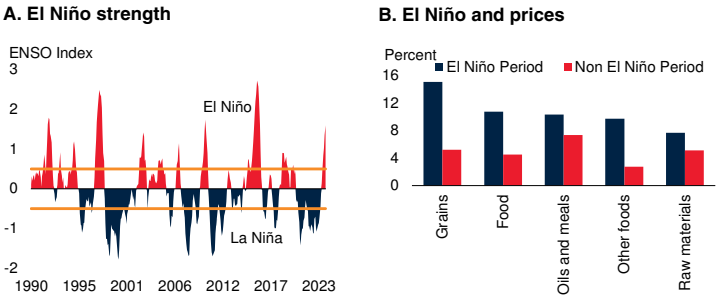
Sources: U.S. Department of Agriculture; World Bank.
A.B. Years represent crop season (for example, 2021 refers to 2021-22). Data as of October 2023.
B. Yields show production data over area harvested using annual data since 1960. Crop year 2023/24 as based on USDA forecasts.
C. Global trade refers to exports.
D. Herfindahl-Hirschman index (HHI) of market concentration. An HHI reading below 0.15 is considered competitive; an HHI of 0.15 to 0.25 is moderately concentrated; and an HHI above 0.25 indicates high market concentration.

Risks to the food price forecasts

A key risk to food prices is related to an escalation of the conflict in the Middle East. A sustained oil

FIGURE 11 El Niño: strength and prices

The strength of current el Niño is moderate, with a 75 to 85 percent chance of a strong El Niño by winter in the Northern Hemisphere. El Niño is historically associated with higher prices for agricultural commodities.



Sources: Bloomberg; National Oceanic Atmospheric Administration (NOAA); World Bank.
A. The ENSO (El Niño Southern Oscillation) Index represents a centered three-month mean SST (Sea Surface Temperature) anomaly for the Niño 3.4 region (i.e., 5oN-5oS,120o-170oW). According to NOAA, events are defined as five consecutive overlapping three-month periods at or above the +0.5o anomaly for El Niño events and at or below the -0.5o anomaly for La Niña events. The orange lines indicate the +0.5o and -0.5o anomaly.
B. 12-month lagged year-on-year price changes in percent based on El Niño and non-El Niño years between 1970 and 2022. The chart show the prices of key commodities in the year after El Niño.

price spike due to an escalation of the conflict would raise food prices by increasing production and transportation costs for food and fertilizers, as has been the case during earlier oil price spikes. Fertilizer prices could also increase if natural gas and coal prices rise markedly, given that they are inputs to fertilizer production, or if the conflict spreads and involves large exporters of nitrogen-based fertilizers in the region.

Other risks to the food price forecasts are tilted to the upside for grains and oilseeds and to the downside for beverages, raw materials, rice, and sugar. The price forecasts assume moderate to strong El Niño effects, export restrictions in major rice and sugar exporters, and favorable supply from important grain and oilseed producers. The direction of price movements could change if these assumptions are not realized, including if growing conflict exacerbates geoeconomic fragmentation and reduces trade. In addition, biofuel mandates and climate change could disrupt the forecast, especially in the longer term.

- *El Niño.* In June, the U.S. National Oceanic and Atmospheric Administration declared that El Niño had arrived (figure 11.A). Its current strength is moderate, with a 75 to 85 percent chance of a strong El Niño by Winter in the Northern Hemisphere. The impact of El Niño on yields and prices varies across geographies, crops, and seasons. Historically, El Niño is associated with rising prices of agricultural commodities (figures 11.B). El Niño reduces the global average yield for maize, wheat, and rice by 2.3 percent, 1.4 percent, and 0.4 percent, respectively, while it increases soybean yields by 3.5 percent (Iizumi et al. 2014). El Niño could push up prices late this year and into 2024 for commodities such as cocoa, food oils, natural rubber, rice, and sugar—whose production is concentrated in regions where El Niño typically causes dry conditions, such as Northeast Africa, Southern Africa, and the Sahel; South Asia and Southeast Asia; Central America and northern South America; and Australia. However, no two El Niño's are the same in their strength. A weaker-than-expected El Niño, or muted effects of El Niño due to its interactions with short-term weather patterns, pose a downside risk to agricultural prices.
- *India's rice export restrictions.* India banned the export of non-basmati rice in July, a preemptive move triggered by concerns about the impacts of El Niño. However, an easing of these restrictions, including because of better-than-expected weather conditions, could help stabilize rice prices. India accounts for 40 percent of the world's rice exports (figure 8.F). India is also a large sugar producer, and there is a risk that it may impose export restrictions on sugar.
- *Black Sea Grain Initiative.* Although Russia's withdrawal has disrupted the Black Sea Grain Initiative, the forecast assumes that grains will continue to flow out of Ukraine. However, if hostilities from the invasion of Ukraine escalate further or the Danube River becomes unnavigable, grain and oilseed markets could tighten, leading to upward price pressure.
- *Biofuels.* Growing demand for biofuel and ethanol in countries such as Brazil, Malaysia, and the United States supports prices for

maize, palm oil, and soybeans. The International Energy Agency estimates that nearly two-thirds of biofuel demand growth in 2023 and 2024 will occur in emerging economies, primarily Brazil, India, and Indonesia (IEA 2023e). Many biofuel producers have expanded mandates as part of their energy security and climate change policies. Biodiesel blending mandates in Brazil increased to 12 percent in 2023 and are expected to increase by 1 percent annually until 2026, increasing demand for soybeans. Demand for palm oil for biodiesel will increase in the world's top two palm oil producers; Indonesia increased its biodiesel mandate from 30 percent to 35 percent earlier this year, while a 20 percent biodiesel mandate in Malaysia started to take effect. Higher crude oil prices incentivize countries to invest more in biodiesel production, and the forecast calls for high prices to 2025. Argentina, India, and Indonesia accelerated biofuel production in 2022 due to higher oil prices and diesel shortages. In April 2023, the U.S. Environmental Protection Agency provided a waiver to allow gasoline blended with 15 percent ethanol to be sold during the summer driving season, as it did in 2022. If a year-round sale of such high-ethanol gasoline is allowed, it will increase the demand for maize and support higher prices.

- *Climate Change:* The increased frequency of extreme weather events, such as heat waves, floods, storms, droughts, hurricanes, wildfires, and worsening water scarcity, pose upside price risks to agricultural commodities. A recent study projects that in the absence of historically unprecedented adaptation, future warming will cause global increases in annual food inflation of 0.9 to 3.2 percentage points, while headline inflation would increase by 0.3 to 1.2 percentage points per year to 2035 (Kotz et al. 2023). Other studies show that climate change has reduced global agricultural total factor productivity by about 21 percent since 1961, a slowdown equivalent to losing seven years of productivity growth (Ortiz-Bobea et al. 2021).

Implications for food insecurity and food price inflation

Decades of progress in improving food security worldwide have reversed in the last 10 years. In low-income countries, the share of the population with severe food insecurity increased from 22 percent in 2015 to 29 percent in 2022 (FAOSTAT 2023). In the same period, the share of severely food insecure people in lower-middle-income countries increased from 11 percent to 16 percent. The worsening food insecurity problem pre-dates the COVID-19 pandemic; the number of people facing crisis, emergency, or famine level food insecurity increased by more than 27 percent between 2016 and 2019, then surged further, by more than 90 percent, between 2019 and 2022 (FSIN 2023). The risk of acute food insecurity is high in countries facing fragility, conflict, and violence, and it is increasingly likely to affect low-income countries experiencing natural disasters (figures 12.A and 12.B).

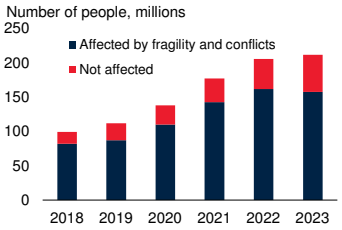
While food insecurity is increasing in fragile and conflict-affected states, the United Nations World Food Programme—the leading humanitarian agency charged with delivering food assistance in such contexts—is facing critical funding shortages (WFP 2023). Transportation and distribution bottlenecks to conflict-affected areas also keep food costs high. The recent surge in rice prices will exacerbate the food insecurity problem, given that rice provides more than 20 percent of the calories consumed worldwide and 60 percent in parts of Africa and Southeast Asia.

In the third quarter of 2023, global median year-on-year domestic food price inflation was above 8.5 percent, although this is lower than its peak in November 2022 at 13.8 percent. The declining global prices of many agricultural commodities contributed to decreased domestic food price inflation. Despite its recent drop, sustained high food price inflation over the past three years has taken a toll on households worldwide. In August 2023, food prices were more than 27 percent higher than their levels in August 2020 in half of the countries and three times higher than the price increase over the preceding three years (figure

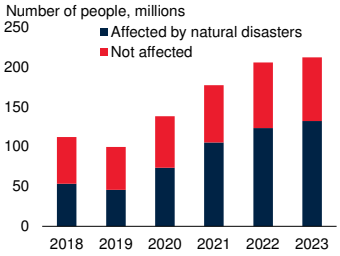
FIGURE 12 Food markets: security and inflation

Decades of progress in improving food security worldwide have reversed in the last ten years. The risk of acute food insecurity is high in countries facing fragility, conflict, and violence and those affected by natural disasters. Domestic food price inflation is easing in many regions but is still at high levels. The declining prices of many agricultural commodities likely contributed to the decline in food price inflation. Cumulative food inflation since 2020 has been drastically higher than in the preceding three years.

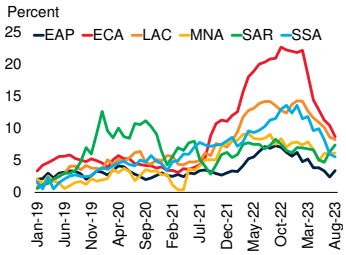
A. Number of people with food insecurity by fragility and conflict situations



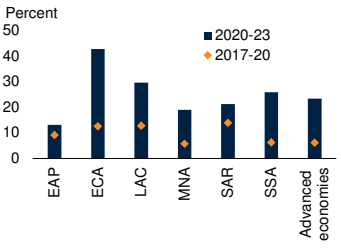
B. Number of people with food insecurity by occurrence of natural disasters



C. Regional food price inflation



D. Cumulative 3-year regional food inflation



Sources: EM-DAT (database); Food and Agriculture Organization of the United Nations; Haver; World Bank; World Food Programme.

Note: EAP = East Asia and Pacific; ECA = Europe and Central Asia; LAC = Latin America and the Caribbean; MNA = Middle East and North Africa; SAR = South Asia; SSA = Sub-Saharan Africa.

A.B. Food insecurity measured using International Food Security Phase Classifications (IPC): (1) minimal/none, (2) stressed, (3) crisis, (4) emergency, and (5) catastrophe/famine. Bars represent the number of people worldwide that face crisis or more severe (IPC3+) food insecurity. Data includes a sample of 45 countries which have data for all four years. Data for 2023 has been updated with Global Report on Food Crisis (GRFC) mid-year report.

B. Natural disasters are floods, droughts, or wildfires that affected at least 4 million people, as recorded in the EM-DAT database.

C. The chart contains median food CPI regional data. Sample includes 144 countries, including 13 EAP, 20 ECA, 22 LAC, 15 MNA, 7 SAR, 30 SSA, and 37 advanced economies. Blue bar refers to median value of food inflation between August 2020 and August 2023. The diamonds refer to median value of food inflation from August 2017 to August 2020.

D. Sample includes 107 EMDEs, including 13 EAP, 20 ECA, 22 LAC, 15 MNA, 7 SAR, and 30 SSA. Data is up to August 2023.

12.D). Moreover, food price inflation is still high in many parts of the world. Four in ten low-income countries, a third of middle-income countries, and three in ten high-income countries have seen double-digit food price inflation in 2023Q3. Food price inflation has been highest on average in Europe and Central Asia, reflecting trade and transportation bottlenecks emanating from the war in Ukraine, followed by Sub-Saharan Africa and Latin America (figure 12.C). In South Asia and the East Asia and Pacific, food price inflation had been declining, but that reversed in July, largely reflecting the increasing price of rice.

The conflict in the Middle East could substantially exacerbate food insecurity. It has already worsened food insecurity in Gaza, and a likely escalation could have wider regional implications—prior to the conflict, about 34 million people in Lebanon, the Palestinian territories, Yemen, and Syria faced acute food insecurity. Beyond the direct impact of the conflict on the affected populations, an escalation would worsen already-high food insecurity at the global level. Disruptions to oil supply due to an escalation of the conflict could lead to a sustained oil price spike, which would raise food prices by increasing production and transportation costs for food and fertilizers, as has been the case during earlier oil price spikes.

To tackle rising food prices, price controls and subsidies need to be avoided to the extent possible. Price controls can generate significant distortions, and their adverse consequences for growth, poverty reduction, and government policies can increase over time. Widespread subsidies negatively affect fiscal balances, limiting the ability to fund growth-enhancing investments. In addition, price controls often prove difficult to roll back after the crisis that led to their implementation has abated. In exceptional circumstances, a combination of price controls and subsidies may be warranted to cushion the short-term impact of rising food prices in the absence of social protection programs. Nonetheless, price controls should be used as a last resort, and should include automatic sunset clauses. In the near term, targeted interventions, such as nutrition programs and direct income support, can help the most in need. In the longer term, well-targeted investments in agricultural R&D, green innovations, measures that improve the uptake of new technology, and diversification of food sources and food supply chain systems are all key to boosting food production and building resilient food systems.

Beverages

The World Bank's beverage price index declined marginally in 2023Q3, with a 16 percent increase in cocoa prices offset by a 14 percent decline in Arabica coffee prices. The index remains about 1 percent lower than a year ago. While the index is projected to remain broadly stable in 2023, it is expected to decline by more than 5 percent in 2024 as additional supplies of coffee and cocoa come into the market.

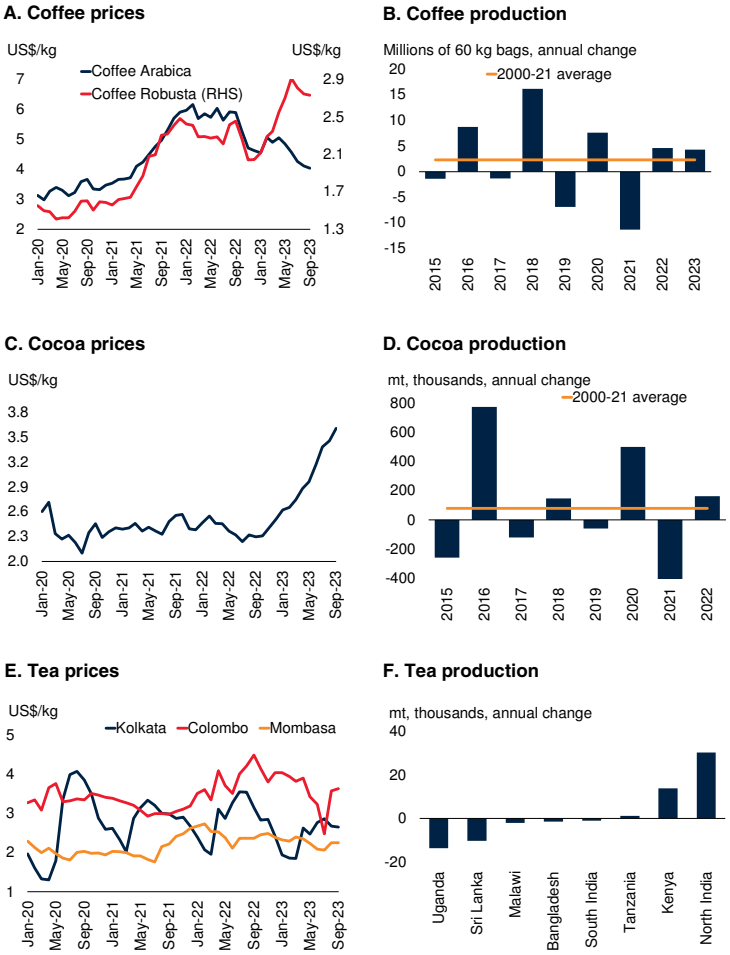
Coffee. Following a 14 percent decline in 2023Q3 (q/q), Arabica coffee prices stand almost 30 percent lower than a year earlier (figure 13.A). The weakening reflects favorable conditions for Brazilian and Colombian crops (both key Arabica producers), production of which is expected to increase production by nearly 14 percent during the upcoming (2023-24) season (figure 13.B). These countries account for more than 60 percent of global Arabica production. Robusta prices, on the other hand, gained marginally in the quarter (2 percent) but are currently more than 17 percent higher than a year ago. The Robusta market is expected to remain tight as a decline in Indonesia's and Uganda's production (-2.1 million bags) outweighs Vietnam's output increase (+1.4 million bags). The three countries account for more than two-thirds of global Robusta production. Following an estimated decline of more than 20 percent in 2023, Arabica prices are expected to soften marginally in 2024 and remain broadly stable in 2025. In contrast, Robusta prices are expected to decline nearly 8 percent in 2024, followed by a small decrease in 2025, after gaining almost 14 percent in 2023. The intensification of El Niño and a more severe downturn of the global economy present key upside and downside price risks, respectively.

Cocoa. Prices of cocoa rose nearly 16 percent in 2023Q3 from the previous quarter, reflecting lower-than-expected exports from Côte d'Ivoire (the world's largest supplier) due to heavy rains, as well as higher grindings—a barometer of demand—earlier in the year (figure 13.C). These forces reduced global cocoa inventories for the ongoing season by 7 percent. Cocoa prices are more than 50 percent higher than a year ago. Given expected improvements in global supplies, cocoa prices are expected to decline 9 percent in 2024, following a projected increase of almost 34 percent this year (figure 13.D). Barring adverse weather in West Africa, price risks are tilted to the downside, reflecting better-than-expected crops in West Africa and the headwinds to global growth.

Tea. In 2023Q3, average tea prices fell 3 percent, reflecting large declines at the Colombo auction

FIGURE 13 Beverage markets

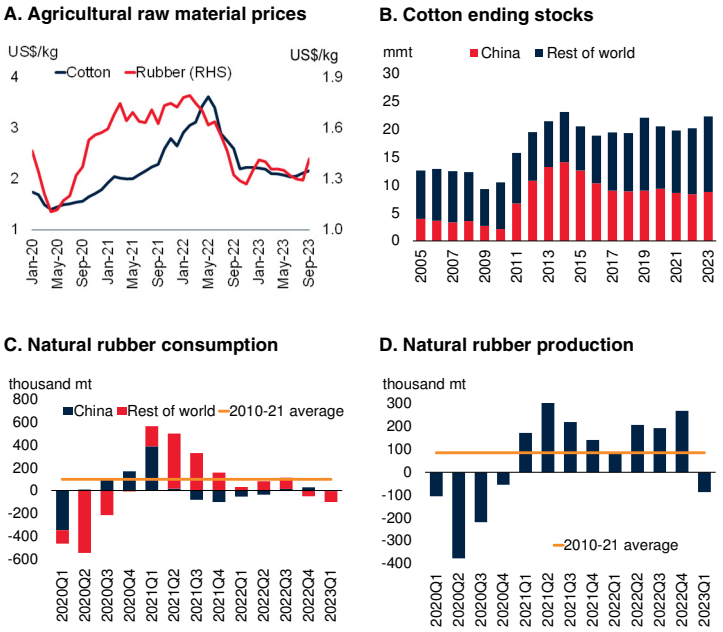
The Robusta market remains tight as a marginal increase in Vietnam's output was offset by declines in Indonesia and Uganda. In contrast, plentiful Arabica supply from major producers (Colombia and Brazil) reduced prices. Surging cocoa prices reflect lower-than-expected exports from Côte d'Ivoire (the world's largest supplier) due to heavy rains and higher demand. The weakening in tea prices reflects robust tea supplies, including from Indian and East African producers.



Sources: Africa Tea Brokers Limited; International Cocoa Organization; Tea Board India; Tea Exporters Association Sri Lanka; U.S. Department of Agriculture; World Bank.
A.C.E. Monthly data, last observation is September 2023.
B. Years represent crop seasons (for example, 2020, refers to 2020-21). Data updated through September 11, 2023.
D. Data for 2022/2023 is ICCO forecast.
F. 12 month change in production from August 2022 to July 2023.

FIGURE 14 Agricultural raw materials markets

Prices of cotton and rubber declined, reflecting an estimated 8 percent decline in global consumption during the current season, amid plentiful stocks. The price decline in rubber reflects weakness in tire manufacturing in 2023, alongside growing rubber production.



Sources: International Cotton Advisory Committee; International Rubber Study Group; Rubber Bulletin; World Bank.

A. Monthly data, last observation is September 2023.

B. Ending stocks, 2023/2024 is ICAC projection. Years represent crop season (for example, 2020 refers to 2020-21 crop season).

C.D. Changes from the same quarter in the previous year. Last observation is 2023Q1.

(-8 percent). Prices at the Mombasa auction declined 2 percent, while Kolkata auction prices gained 4 percent (figure 13.E). The tea price index sits 20 percent lower than in 2022Q3. Lower tea prices reflect robust supply from major producers and exporters, including India and Kenya (East Africa's largest tea supplier) as well as weak demand by key importers, including Iran (figure 13.F). Following a projected 8 percent decline in 2023, tea prices are expected to decline a further 2 percent in 2024 before stabilizing in 2025 as supply in South Asia, especially Sri Lanka, recovers.

Agricultural raw materials

The raw materials price index slid 1 percent in 2023Q3, as gains in cotton and timber prices only partly offset declines in natural rubber. The index is down nearly 2 percent compared to a year ago. Following an estimated 5 percent decline in 2023, the index is expected to gain marginally in 2024 as demand strengthens.

Cotton. Cotton prices were little changed in 2023Q3 compared to the previous quarter but are down by 23 percent compared to the same period last year (figure 14.A). This year's drop is primarily due to an estimated 8 percent decline in global consumption during the season that ended in July, attributed to concerns of a slowdown in global growth. Early data for the ongoing season that started in August point to a partial recovery in demand of 2 percent (year on year), while global production is expected to increase by an estimated 7 percent. Favorable weather conditions in major producing countries, including Pakistan, the United States, and, to a lesser extent, India, will account for most of the production increase. The surge in output is expected to push the stock-to-use ratio (a rough measure of supplies relative to demand) to a record high of 0.80 in the current season, up from 0.72 in 2022-23 (figure 14.B). Nearly 40 percent of global stocks are expected to be held by China. Following an estimated decline of nearly 27 percent in 2023, cotton prices are expected to rise almost 5 percent next year as demand gains momentum.

Natural rubber. Prices of natural rubber remained relatively stable in the quarter, but are almost 8 percent lower than a year ago (figure 14.A). Global natural rubber demand has remained relatively flat during the 12 months ending in September 2023, as lower tire production in the Republic of Korea, Russia, and the United States has been offset by increases in China, Germany, and India (figure 14.C). On the supply side, global production increased by less than 1 percent during the same period (figure 14.D). Weather-induced output declines in Indonesia and Malaysia (-16 and -13 percent, respectively) have been partly offset by increases in India (+10 percent) and Côte d'Ivoire (+19 percent). Output in Thailand, the world's largest natural rubber supplier, changed little. Following a projected decline of 9 percent in 2023, natural rubber prices are expected to gain nearly 4 percent in 2024, followed by a further increase in 2025 as global consumption recovers.

Metals and Minerals

Since the onset of the conflict in the Middle East, metal prices have been little changed; however, gold prices—which tend to move in tandem with geopolitical concerns—have increased 7 percent. Prior to the conflict, the World Bank's metals and minerals price index fell 2 percent in the third quarter of 2023, reflecting the impact on demand of slowing economic activity in major economies. Despite weakness in the real estate sector, metals demand in China, which accounts for 60 percent of global metals demand, has been propped up by sectors such as infrastructure and manufacturing, including EVs. Following an expected decline in 2023, metal prices will likely fall further in 2024 on slowing demand and ample supply before stabilizing in 2025 as demand recovers. The transition away from fossil fuels is expected to significantly lift demand for some metals by 2025—notably aluminum, copper, nickel, and tin. An escalation of the latest conflict and associated disruptions represents a key upside risk to prices of industrial metals and gold. Other upside risks to the price forecast include an earlier-than-expected recovery in China's real estate sector in 2024 and supply disruptions, including those resulting from trade restrictions.

Metals and iron ore

Recent developments and outlook

The metals and minerals price index fell 2 percent in the third quarter of 2023 from the previous quarter, continuing steady price declines since early 2022 (figure 15.A). This largely reflects slowing economic activity in major economies amid ample supply in 2023, particularly for copper, nickel, and zinc.

Weak demand for base metals and iron ore came mostly from China, which consumes about 60 percent of the total global metals supply. After decelerating in the second quarter of 2023, China's growth recovered somewhat in the third quarter supported by firming consumption and stronger construction (figure 15.B). Real estate investment and property sales continued to decline throughout the third quarter as financial conditions in China's real estate sector worsened (figure 15.C). By mid-year, China implemented a series of stimulus measures, including easing monetary policy and relaxing home-purchase restrictions, to boost consumer confidence and stabilize the beleaguered property sector. These measures are expected to steady activity in the property sector starting in 2024. Nonetheless, structural challenges in China's real estate sector will likely keep demand and prices subdued in the near term. Elsewhere, higher interest rates, particularly in the Euro area and the U.S., are impacting construction activity and demand for metals-intensive durable goods.

Base metals prices are expected to continue their steady decline into 2024 as economic activity in China and other major economies is anticipated to remain subdued and supply continues to improve. Prices should fall by 12 percent in 2023 compared to 2022 and by 5 percent in 2024. Outside of China, high borrowing costs could reduce demand for metals, such as lead and tin, which are intensively used in industry and consumer durables. A further slowdown in new building construction in 2024, especially in Europe, stemming from high interest rates and lackluster activity, could further dampen demand for some metals (figure 15.D). Prices are expected to inch up in 2025 as global growth improves and demand for electric vehicle (EV) production and renewable infrastructure builds.

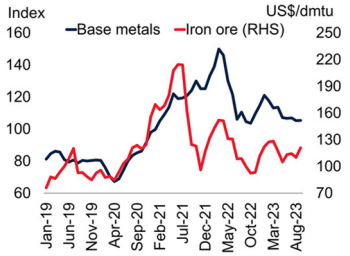
Although the metals supply is increasing, the mining sector faces several challenges. These include permitting, the quality of ores, and geoeconomic fragmentation. Demand trajectories also differ across metals, based on their uses. The following section discusses the outlook for each base metal and iron ore.

Aluminum prices fell 5 percent in 2023Q3 from the previous quarter on sluggish demand and improving supply. A slowdown in global manufacturing activity, continued weakness in China's property sector, and contracting consumption in some advanced economies weighed on prices. Aluminum supply has improved, notably from China, as better-than-expected rainfall in Yunnan province—where smelters depend heavily on hydropower—has

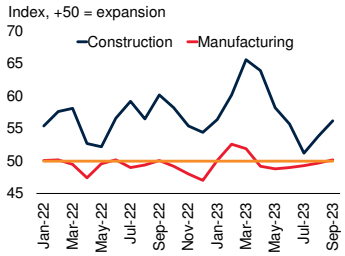
FIGURE 15 Metals and minerals market

Metal prices fell in 2023Q3, reflecting slowing economic activity in major economies. Metal prices are projected to fall further in 2024 and stabilize in 2025. As escalation of the conflict in the Middle East, slower-than-expected stabilization in China's real estate sector, weaker-than-expected demand in advanced economies, or major disruptions to production are key risks to the price forecasts.

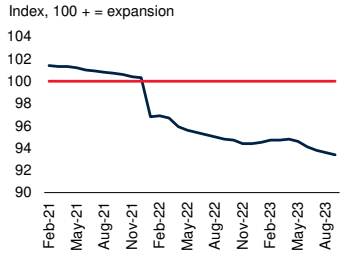
A. Base metals index and iron ore prices



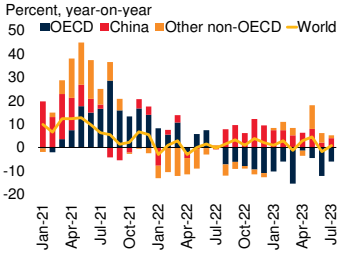
B. China's PMI for construction and manufacturing



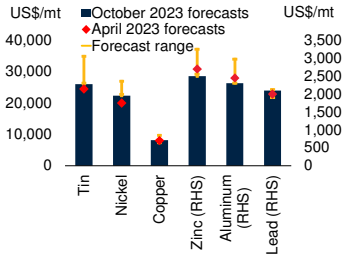
C. China real estate sector activity



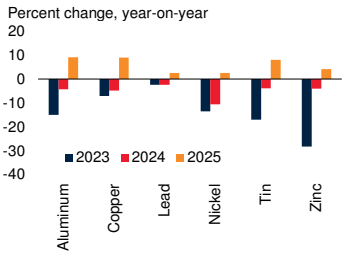
D. Metal demand growth



E. Metal price forecasts for 2024



F. Changes in base metals prices



Sources: Haver Analytics; National authorities; World Bank; World Bureau of Metal Statistics.
A. Monthly data, last observation is September 2023.
B. PMI above 50 (below 50) indicates expansion (contraction). Last observation is September 2023.
C. A reading above 100 indicates economic growth and a reading below 100 indicates a slowdown in China's real estate market. Last observation is September 2023.
D. Chart shows year-on-year percent change in metal consumption since January 2021. OECD = Organization for Economic Co-operation and Development. Last observation is July 2023.
E. The blue bars indicate 2024 forecasts. Yellow whiskers show results for the most optimistic to pessimistic models as presented in Arroyo Marioli et al. (2022).
F. Year-on-year change in prices.

allowed significant capacity restarts and reduced risks of power-related production cuts in the last quarter of 2023. Producers globally have also benefited from falling energy costs (aluminum processing is energy-intensive). As a result, aluminum prices are expected to be 15 percent lower in 2023. China continues to add new production capacity in Southeast Asia—primarily in Indonesia, as it approaches its self-imposed annual domestic production cap of 45 million tons of aluminum to curb carbon emissions. Subdued global activity and easing of supply constraints are expected to further lower prices in 2024. Prices are expected to rebound by 9 percent in 2025, supported by growing demand from EVs, renewable power, and associated electric grid infrastructure, amid slower supply growth due to China's capacity cap and higher energy prices.

Copper prices fell 1 percent in 2023Q3 from the previous quarter on ample supplies, rising stocks, and weakening demand. Protracted weakness in China's real estate sector and deteriorating demand in other major economies were partly offset by copper demand from clean technologies, including EVs and wind and solar power equipment, as well as from infrastructure, including the construction of EV charging capacity. On the supply side, production outages in Chile, China, and Indonesia in the first half of the year have supported prices. Prices are forecast to fall further in 2024 by 5 percent, reflecting weakening global demand and strong supply growth (figure 15.E). Mining output is set to increase strongly in the latter part of 2023 and throughout 2024 due to start-ups and expansions in several countries, including Chile, the Democratic Republic of Congo, Indonesia, Peru, Russia, and Uzbekistan. Prices should rebound by 9 percent in 2025 as global demand recovers and the green transition intensifies. Key demand drivers in the coming years will be from EVs, renewable power, and associated electric grid infrastructure, requiring additional investment in copper mines and refining capacity. The geographic concentration of production and refining, reduced ore qualities, slow permitting procedures for new mines, and capital cost inflation all create upside risks for copper prices in the medium term (IEA 2023f).

Lead prices rose 3 percent in 2023Q3 from the previous quarter on stronger demand. Stimulus measures in China and speculation that major economies are nearing the end of their monetary

tightening cycle lifted sentiment for the automotive sector—a major consumer of lead-acid batteries. About 85 percent of lead demand is for batteries, of which half is for replacement automobile batteries. Thus, lead is cushioned against cyclical demand declines that affect other industrial metals. Lead prices are expected to decline by 2 percent in 2023 and remain relatively stable in 2024 and 2025 amid a steady increase in supply. Mine production growth is expected to accelerate in 2024 and grow moderately in the medium term. Primary lead production is increasing from Australia, Canada, China, India, and South Korea, while secondary supply (recycled batteries) is also expanding. Lead demand faces structural headwinds from increased production of EVs, which predominantly use lithium batteries. Although lead-acid batteries are still used for secondary functions in EVs, there are indications that some manufacturers may phase them out. The outlook for industrial lead batteries is also uncertain given technology developments.

Nickel prices fell 9 percent in 2023Q3 from the previous quarter on slowing battery demand in China and rapid nickel supply growth, mainly from Indonesia (which accounts for just over 50 percent of global supply). The weakness has been mainly due to a growing surplus of Class 2 nickel (which represents about two-thirds of the global nickel market and is primarily used in stainless steel) as new capacity in China and Indonesia comes onstream. At the same time, technological developments are slowing growth in China's nickel usage, as companies shift to batteries, such as lithium iron phosphate (LFP) packs, that do not require Class 1 nickel. Nickel prices are expected to drop by 14 percent in 2023 and another 10 percent in 2024 as production in Indonesia and the Philippines (the two largest global producers) continues to grow. Rising demand for EV batteries is expected to support a rebound in prices in 2025 and will be the main future demand driver.

Tin prices increased by 2 percent in 2023Q3 from the previous quarter due to supply disruption concerns. The closure of mines in Myanmar, aimed at preserving remaining tin resources, is impacting China's raw material supply. Myanmar is one of the largest tin suppliers to China, which accounts for almost half of global tin consumption. Nonetheless, earlier declines mean that prices for 2023 will likely decline by 17 percent, relative to 2022, and are expected to decrease by an additional 4 percent in 2024. Demand for tin, a key component of electronic manufactures, is expected to remain subdued reflecting weak economic activity in major economies in 2024. Tin prices are expected to partially rebound by 8 percent in 2025: tin demand will benefit from the energy transition as a key input metal for solar photoelectric cells, EVs, and electronics.

Zinc prices dropped 4 percent in 2023Q3 on weak demand and rising inventories. Slowing industrial activity in China and other major economies curtailed demand for zinc, which is mainly used to galvanize steel for construction and manufacturing. On the supply side, some major European smelters have not recovered following closures in 2022 due to high energy costs. Adverse weather, operational issues and labor strikes have affected smelter production in Australia, Canada, Mexico, and Peru. In contrast, China's refined zinc production has rebounded strongly from curtailments in 2022. Zinc prices are expected to drop in 2023 and fall by a further 4 percent in 2024 on weak demand and growing supply (figure 15.F). Zinc supply is set to expand in the medium term, particularly from large projects in the Democratic Republic of Congo, Russia, and South Africa. Prices are expected to increase by 4 percent in 2025 as recovering global demand is expected to lift sentiment somewhat, but supplies are expected to be ample. Zinc stands to benefit from the energy transition, given its use in galvanized steel for EVs, and zinc coatings to protect solar panels and wind turbines.

Iron ore prices increased 3 percent in 2023Q3 relative to the previous quarter on strong steel production in China. Although China's property sector remains weak, demand for construction completions, infrastructure and steel exports went up sharply in the third quarter. A seasonal fall in China's steel production is expected in the fourth quarter, further supported by government-mandated cuts to improve air quality. Subdued

construction and manufacturing activity in China, weak demand elsewhere, and growing iron ore supply are expected to keep a lid on iron ore prices. On the supply side, seaborne iron ore trade remains robust, with increased exports from Australia, Brazil, and India. Strong imports into China reflect tightening domestic supply and growing reliance on ore for steel production partly due to the rising cost of steel scrap. For the remainder of 2023 and into 2024, steel production cuts in China and subdued global economic activity are expected to weigh on iron ore demand. As a result, iron ore prices are expected to be 11 percent lower in 2023 and fall further in 2024 and 2025. Over the longer term, the outlook is for steady supply growth from new mines in Africa, Australia, and Brazil but more sluggish demand growth as China transitions to less steel-intensive activities.

Risks to base metals outlook

Key risks to the base metals price forecast include, on the upside, an escalation of the conflict in the Middle East, metal production constraints, intensifying trade restrictions, and the uncertain pace of the energy transition, and, on the downside, weaker-than-expected growth in China and sluggish global demand.

- *Escalation of conflict in the Middle East*. An escalation could lead to substantial disruptions in energy markets, which in turn would raise production costs of energy-intensive metals such as aluminum and zinc—especially those produced in European smelters, as many have not fully recovered from high natural gas prices following Russia's invasion of Ukraine. Higher oil prices could also result in increased transportation costs for ores, such as iron ore, a key input to steel production.

- *Trade restrictions*. Indonesia imposed an export ban on nickel ore in 2022 and is reportedly considering a ban on tin exports to attract value-added processing investments. These export restrictions could tighten supply and raise prices. Other policy actions, such as increased sanctions on Russia and China's impending aluminum production cap, could also limit supply.

- *Supply disruptions*. Environmental concerns, weather, technical problems, labor disputes, and power or water constraints may disrupt mining operations and adversely affect the supply of metals in several regions, especially Africa, the Americas, Australia, and Indonesia. Permitting issues are a growing concern for developing new mines. As demand for clean energy accelerates, these bottlenecks could tighten markets further and raise prices for metals, particularly copper and nickel.

- *Uncertain pace of the energy transition.* A faster transition would further support prices of some metals—notably aluminum, copper, nickel, and tin. Their usage spans a wide range of renewable technologies and supporting infrastructures. Greater-than-expected momentum for energy transition could push prices above near-term forecasts. New technologies, such as hydrogen-based energy, could also create additional demand for nickel.

- *Weaker-than expected growth in China*. The forecast assumes that real estate sector activity in China will stabilize in 2024. A sharper slowdown is, therefore, the main downside risk to the price forecast, especially for metals used in construction—such as aluminum, copper, iron ore, and zinc. Demand for base metals could be further dampened if growth among the advanced economies slows more than anticipated in 2024.

Critical minerals

Recent developments

The slowdown in global economic activity, geopolitical tensions, and a pressing need for energy transition have buffeted critical minerals prices. In 2023Q3, the prices of essential minerals like lithium, molybdenum, cobalt, and rare earth metals continued to decline (figure 16.A). In particular, lithium and cobalt prices decreased by 20 percent and 4 percent in 2023Q3 from the

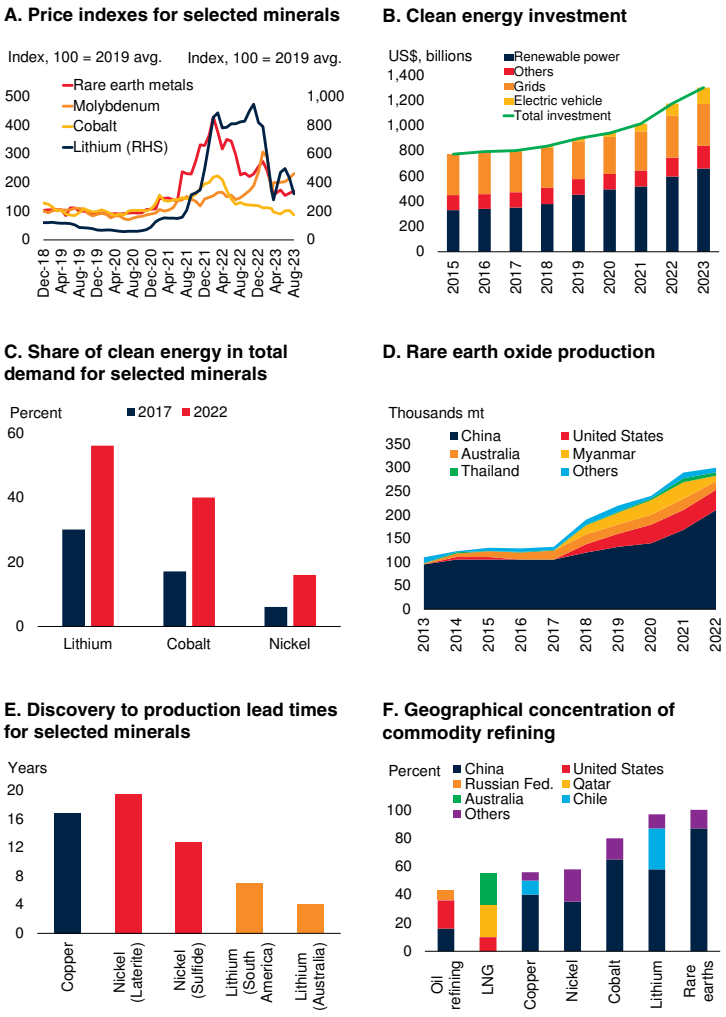
previous quarter. Meanwhile, rare earth metals and molybdenum prices remained broadly stable, despite some volatility. The decline in prices for critical minerals is part of a broader trend affecting metals, driven by a deceleration in global economic activity that has reduced demand (see metals section). In August, lithium carbonate prices in China dropped to a three-month low, approaching their lowest point in almost thirty months, due to decreased demand from new electric vehicle battery manufacturers. The decline is attributed to manufacturers' high input inventories and reduced government subsidies for EVs.

The current slowdown in demand for these minerals is expected to be temporary, giving way to long-term structural demand growth tied to the global shift toward sustainable energy. Projections indicate a substantial rise in total clean energy investments, with a 24 percent increase from 2021 to 2023. This significant boost is primarily fueled by sectors such as battery storage, EVs, and renewable power (figure 16.B). The rise in investment in these sectors would increase the demand for critical minerals, given their role in renewable technology (Agnolucci et al. forthcoming). In particular, the demand for battery metals, such as lithium and nickel, is expected to expand. Additional demand for these essential commodities comes from other growing industries such as those linked to digitalization; in 2022 most demand for nickel and cobalt still came from industries other than clean energy (figure 16.C).

Significant investments have been made in the critical minerals pipeline in recent years, leading to an expansion in global production. A notable development is the increased mining of rare earth elements, with production outside China more than doubling since 2017 (figure 16.D). Despite this, supply risks persist due to the extended lead times required to operationalize new mining projects. Typically, the timeframe from discovery to production commencement for critical minerals, such as copper, lithium, and nickel, spans 4 to 20 years, contingent upon several factors, including commodity type, regional

FIGURE 16 Critical minerals market

Critical mineral prices fluctuated in the third quarter of 2023, in response to global economic shifts and geopolitical dynamics. Lithium and cobalt prices declined, while rare earth metals and molybdenum exhibited intra-quarter volatility. These trends are set against a backdrop of subdued global economic activity, geopolitical tensions, and the energy transition. Despite significant investments expanding global production, supply risks and bottlenecks persist, influenced by long project lead times and geographical concentration in processing capacities.



Sources: Bloomberg; International Energy Agency (IEA); United States Geological Survey (USGS); World Bank.

A. Prices refer to the following: Cobalt = China Shanghai Changjiang Cobalt; Lithium = China Lithium Carbonate 99% Battery Grade; Molybdenum = China Molybdenum Trioxide 51% Industrial Grade; and Rare Earth Metals = China Shanghai Rare Earth Carbonate REO >= 45%. Monthly data. Last observation is October 13, 2023.

B. Investment for 2023 is based on estimated values. Others = end-use renewable energy, electrification in building, transport, and industrial sectors, and battery storage.

C. Bars indicate the share of clean energy in total mineral demand.

D. Annual data. Last observation 2022. Data from USGS Mineral Commodity Summaries (2015-2023). Data based on observed and estimated production values.

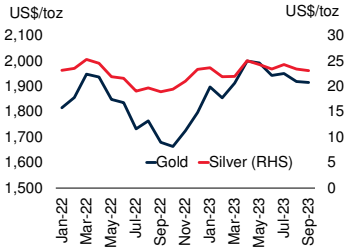
E. Bars show the global average duration from discovery to production for selected minerals. Data from 2010 to 2019.

F. Percentage contribution of major producing countries in the total processing of selected critical minerals and fossil fuels in 2019.

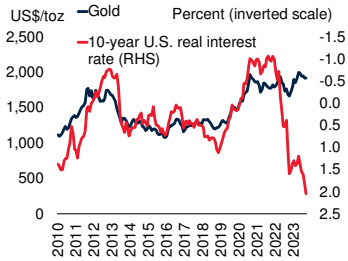
FIGURE 17 Gold and silver

Gold prices fell moderately in 2023Q3. The price of gold has decoupled from inflation-indexed interest rates, suggesting geopolitical issues are pushing up prices. Gold prices are expected to increase in 2024 but recede in 2025 as inflation and recession fears fade. An escalation of the conflict in the Middle East could result in sharply higher prices due to increased demand for safe-haven assets.

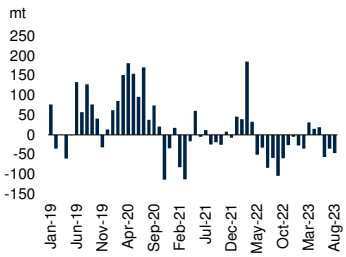
A. Gold and silver prices



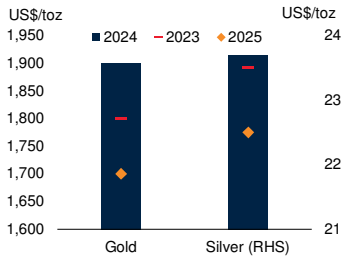
B. Gold price and interest rates



C. Changes in gold exchange-trade funds



D. Gold and silver prices forecasts



Sources: Bloomberg; Federal Reserve Bank of St. Louis; World Bank.
A. Monthly series. Last observation is September 2023.
B. Interest rate is the 10-year U.S. Treasury inflation-indexed security with constant maturity (not seasonally adjusted), inverted scale. Last observation is September 2023.
C. Month-on-month changes in gold exchange-traded funds. Last observation is August 2023.
D. Forecasts as of October 26, 2023.

regulatory frameworks, the nature of deposits, and the mining and processing methods employed (figure 16.E). Environmental, social, and governance (ESG) issues are also becoming more pertinent, especially as many mineral resources are situated in regions with significant environmental and social sensitivities. For instance, the mining of rare earth elements is linked to deforestation and environmental contamination due to chemical usage in extraction, while water-intensive lithium extraction has led to water depletion for local communities (IEA 2023f).

Geopolitical factors add another layer of complexity. In July 2023, the Chinese government instituted a policy requiring export licenses for gallium and germanium, metals vital for sectors like green energy, digital technology, and defense. China is a dominant player in the mining and processing of these materials. Gallium prices jumped 6.2 percent in July, while the increase in germanium was more modest at 3.2 percent. Similarly, the United States' Inflation Reduction Act encourages domestic sourcing of EV battery minerals or procurement from select trade partners, an initiative recently expanded through a trade agreement with Japan. Despite global efforts to diversify supply chains, the market for these minerals remains concentrated and susceptible to geoeconomic fragmentation. Critical minerals' mining and processing capacity is much more concentrated geographically than that of fossil fuels (figure 16.F).

Precious Metals

Recent developments and outlook

Gold prices fell 3 percent in 2023Q3 due to a stronger U.S. dollar and expectations of higher-for-longer interest rates. However, prices remained resilient on relatively strong demand from investment and jewelry consumption, despite strong supply growth and increasing mine production in the first half of the year (figure 17.A). The recent divergence between gold prices and the yields on 10-year Treasury Inflation Protected Securities (TIPS) suggests that geopolitical risks and economic uncertainty have outweighed the effect of high interest rates on the carrying cost of holding gold (figure 17.B). Gold holdings in exchange-traded funds fell in 2023Q3 (figure 17.C). Short-run price volatility is likely to continue in view of elevated geopolitical risks. At the same time, the path of inflation and interest rates will be the key factors driving gold prices in the medium term. Gold prices are expected to average $1,900 per troy ounce in 2024—6 percent higher than in 2023, before retreating in 2025 as inflation and recession fears fade.

The conflict in the Middle East is set to lead to heightened global uncertainty, with substantial implications to gold prices if the conflict escalates. Although the initial impact has so far been moderate, its escalation would exacerbate such uncertainty, which would lead to reduced risk appetite as well as lower consumer and investor

confidence. These developments could lead to sharply higher gold prices. Indeed, gold prices have spiked during previous episodes of geopolitical uncertainty such as conflicts. In the event of a more widespread conflict in the Middle East, gold prices are likely to increase from already high levels as investors shift to safe-haven assets.

Silver prices decreased 3 percent in 2023Q3 over the previous quarter, driven by similar factors as those affecting gold. Prices have remained resilient on relatively strong investment demand. Industrial demand for silver continues to be supported by expanding demand related to vehicle electrification, solar photovoltaic products, and electronics components—industrial activity accounts for almost half of consumption. Silver supply is expected to improve for the remainder of 2023 after falling in 2022, with increased output from Chile and Mexico, and a modest increase in recycling (recycled silver accounts for almost 20 percent of global supply). Silver prices are expected to increase by 8 percent in 2023, remain firm in 2024, and fall in 2025 as inflation and recession fears fade and economic recovery ensues, albeit with a reduction in safe-haven demand (figure 17.D).

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Commodity Markets Outlook: Selected Topics, 2011-23

Topics	Date
Potential near-term implications of the conflict in the Middle East for commodity markets: A preliminary assessment	October 2023
Forecasting industrial commodity prices	April 2023
Pandemic, war, recession: Drivers of aluminum and copper prices	October 2022
The impact of the war in Ukraine on commodity markets	April 2022
Urbanization and commodity demand	October 2021
Causes and consequences of metal price shocks	April 2021
Persistence of commodity shocks	October 2020
Set up to fail? The collapse of commodity agreements	April 2020
A shock like no other: The impact of COVID-19 on commodity markets	April 2020
The role of substitution in commodity demand	October 2019
Innovation, disruptive technologies, and substitution among commodities	October 2019
Oil market implications of the strike on Saudi Arambo facilities	October 2019
Food price shocks: Channels and implications	October 2019
The implications of tariffs for commodity markets	October 2018
The changing of the guard: Shifts in commodity demand	October 2018
Oil exporters: Policies and challenges	October 2018
Investment weakness in commodity exporters	January 2017
OPEC in historical context: Commodity agreements and market fundamentals	October 2016
From energy prices to food prices: Moving in tandem?	July 2016
Resource development in era of cheap commodities	October 2016
Weak growth in emerging market economies: What does it imply for commodity markets?	January 2016
Understanding El Niño: What does it mean for commodity markets?	October 2015
Iran nuclear agreement: A game changer for energy markets?	October 2015
How important are China and India in global commodity consumption?	July 2015
Anatomy of the last four oil price crashes	October 2015
Putting the recent plunge in oil prices in perspective	January 2015
The role of income growth in commodities	October 2014
Price volatility for most commodities has returned to historical norms	July 2014
The nature and causes of oil price volatility	January 2014
A global energy market?	July 2013
Global reserves, demand growth, and the “super cycle” hypothesis	July 2013
The “energy revolution,” innovation, and the nature of substitution	January 2013
Commodity prices: levels, volatility, and comovement	January 2013
Which drivers matter most in food price movements?	January 2013
Induced innovation, price divergence, and substitution	June 2012
The role of emerging markets in commodity consumption	June 2012
WTI-Brent price dislocation	January 2012
Metals consumption in China and India	January 2012
China, global metal demand, and the super-cycle hypothesis	June 2011

The conflict in the Middle East—the latest of an extraordinary series of shocks in recent years—has heightened geopolitical risks for commodity markets, in an already uncertain global environment. Before the conflict began, voluntary oil supply withdrawals by OPEC+ producers pushed energy prices up 9 percent in the third quarter. As a result, the World Bank's commodity price index rose 5 percent over that period and is now 45 percent above its 2015-19 average. For now, the war's impact on commodity prices have been muted. Prices of oil and gold have risen moderately, but most other commodity prices have remained relatively stable. Nevertheless, history suggests that an escalation of the conflict represents a major risk that could lead to surging prices of oil and other commodities.

A Special Focus section provides a preliminary assessment of the potential impact of the conflict on commodity prices. It finds that the effects of the conflict are likely to be limited, assuming the conflict does not widen. Under that assumption, the baseline forecast calls for commodity prices to decline slightly over the next two years. If the conflict does escalate, the assessment also includes what might happen under three risk scenarios, relying upon historical precedents to estimate the effects of small, moderate, and large disruptions to the global oil supply. The magnitude of the effects will depend on the duration and scale of the supply disruptions.

The World Bank's *Commodity Markets Outlook* is published twice a year, in April and October. The report provides detailed market analysis for major commodity groups, including energy, metals, agriculture, precious metals, and fertilizers. Price forecasts for 46 commodities are also presented together with historical price data. Commodity price data updates are published separately at the beginning of each month.

The report and data can be accessed at:

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