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International Grain Prices in 2024: Uneven Adjustment Across Wheat, Maize and Rice

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Abstract

International grain benchmarks moved unevenly in 2024. Using dated FAO and World Bank publications, this commentary compares monthly prices for soft red winter wheat, hard red winter wheat, maize and Thai 5% broken rice. The FAO Cereals Price Index fell 7.1% between January and December and ended 35.6% below its May 2022 peak. The four benchmark changes were −7.1%, −11.2%, +2.0% and −20.2%, respectively. Rice recorded the largest decline but closed at USD 527 per tonne, still above its January 2023 price of USD 517. The hard-versus-soft wheat premium narrowed from USD 36.0 to USD 21.9 per tonne. Soft wheat and maize reached their annual lows in August; their monthly-level correlation was 0.61 in the first half and 0.87 in the second. These comparisons show an uneven adjustment: a large annual fall in rice coexisted with a price above its earlier baseline, maize ended the year higher, and the spread between wheat grades narrowed. Commodity choice and the comparison period therefore materially change the assessment of the grain-price retreat.

Keywords: grain prices; FAO FFPI; wheat; maize; rice; Pink Sheet; 2024

1. Introduction

1.1. The 2022 global food price crisis

The FAO Food Price Index (FFPI) peaked at 159.7 in March 2022, its highest level since the index was introduced in 1990 (Food and Agriculture Organization of the United Nations, 2024a). The cereals sub-index reached 173.1 in May 2022. These dated peaks provide the multi-year reference points used below; the paper's empirical comparison concerns monthly grain benchmarks in 2024.

The causes were multiple and mutually reinforcing. The Russian invasion of Ukraine in February 2022 was the proximate trigger. Together, Russia and Ukraine accounted for approximately 28 percent of global wheat exports, 15 percent of maize exports, and over 70 percent of sunflower oil exports in the years preceding the war (Food and Agriculture Organization of the United Nations, 2022). The blockade of Ukraine's Black Sea ports, the destruction of storage and transport infrastructure, and the uncertainty over the 2022 planting and harvest created an immediate supply shock that reverberated through futures markets. Within weeks of the invasion, benchmark wheat futures on the Chicago Board of Trade (CBOT) had risen by more than 50 percent (International Food Policy Research Institute, 2024).

But the price surge was not solely a Black Sea story. Export restrictions proliferated: by mid-2022, more than twenty countries had imposed some form of export ban, licensing requirement, or quota on food

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commodities, further tightening international markets (International Food Policy Research Institute, 2024). Fertilizer prices had been rising since mid-2021, driven by surging natural gas prices — the principal feedstock for nitrogen fertilizer production — and by trade disruptions affecting Belarus and Russia, two of the world's largest potash suppliers (World Bank, 2024a). Higher fertilizer costs raised the cost of production globally and prompted some farmers, particularly in sub-Saharan Africa, to reduce application rates, threatening subsequent harvests (World Bank, 2024a). Energy prices, already elevated by the post-pandemic demand recovery, spiked further after the invasion, raising the cost of irrigation, drying, milling, and transport. Shipping disruption — congestion at major ports, container shortages, and a sharp rise in bulk freight rates — added a further cost layer that was transmitted to landed grain prices in importing countries (World Bank, 2024a).

Weather compounded the supply-side pressures. The 2022 season brought drought to parts of the European Union, Argentina, and the US Southern Plains, reducing wheat and maize yields below trend. In India, a March 2022 heatwave during the grain-filling period cut wheat output sufficiently for the government to ban exports in May, removing a supplier the world had been counting on to offset Black Sea losses (United States Department of Agriculture, Foreign Agricultural Service, 2023). By mid-2022, every major grain-exporting region except Brazil was facing some combination of weather stress, policy restriction, or logistical disruption. The result was a global grain market priced for scarcity.

1.2. Why grain prices matter

International grain prices are not an abstract index for commodity traders. For the eighty-plus low-income food-deficit countries — concentrated in sub-Saharan Africa, the Middle East, and South Asia — imported grain constitutes a large share of caloric intake. Wheat alone accounts for over a third of cereal consumption in North Africa and the Middle East, where per capita wheat consumption is among the highest in the world (Food and Agriculture Organization of the United Nations, 2024a). When the international wheat price doubles, the import bill of a country such as Egypt — the world's largest wheat importer — rises commensurately, straining foreign exchange reserves, widening fiscal deficits, and, where retail prices are administratively controlled, increasing the cost of consumer subsidies.

The link between grain prices and political stability is well documented. The 2008 food price spike triggered protests and riots in more than thirty countries across Africa, Asia, and Latin America (Bellemare, 2015). The 2011 spike coincided with the social unrest that preceded the Arab Spring, and while food prices were not the sole cause, they were a material accelerant in countries where bread prices were a daily political barometer (Lagi et al., 2011). The 2022 surge raised the same concerns: the IMF warned of "social unrest risks" in food-importing developing countries, and the World Food Programme described the confluence of conflict, climate shocks, and high food prices as a "perfect storm" for food security (World Bank, 2024a).

The transmission from international benchmark prices to domestic consumer prices is, however, neither immediate nor complete. Exchange rates, transport costs, domestic marketing margins, tariff and non-tariff barriers, and government price interventions all mediate the pass-through (Baffes & Gardner, 2003; Minot, 2011). In some cases, an international price decline may take months to appear in domestic markets, or may not appear at all if a depreciating currency or rising fuel costs offset the international movement. This asymmetry — international prices rise faster than they fall in domestic markets — is a recurrent finding in the food price transmission literature and is one reason that a record of the 2024 international decline, without corresponding domestic data, is a partial account (Minot, 2011).

1.3. The 2024 decline: what was observed

By December 2024 the cereals sub-index stood at 111.4, 36 percent below the May 2022 peak (Table 1); within the 2024 calendar year the index reached its low point in August (110.2) before edging back

up to close the year 1.2 points above that trough. The decline from the March 2022 peak was similarly pronounced: the headline FFPI fell from 159.7 to 127.4 over the same period, a decline of roughly 20 percent. The decline was neither sharp nor sudden: it was a gradual unwinding across 2023 and 2024, with month-to-month movements generally modest. Of the twenty-two month-to-month changes from January 2023 to November 2024, eight exceeded three index points in absolute terms — three in 2023 and five in 2024, representing more than a third of the observed moves. The largest single-month decline in the cereals sub-index during this period was −8.1 points (March 2023), and the largest increase was +7.1 points (May 2024). The remaining fourteen moves ranged from 0.5 to 3.0 points.

A number of macro-level developments contributed to the easing of grain prices through 2023 and 2024, although this paper does not attempt to attribute the observed decline to any particular factor. The Black Sea Grain Initiative, brokered by the United Nations and Turkey in July 2022, enabled the resumption of Ukrainian grain shipments through a maritime humanitarian corridor; by the time Russia withdrew from the initiative in July 2023, approximately 33 million tonnes of grain and oilseeds had been exported under its auspices (United Nations, 2023). Even after the initiative's collapse, Ukraine continued to ship grain through a unilateral corridor along the western Black Sea coast, and combined Ukrainian grain exports in the 2023/24 marketing year were only modestly below pre-war levels (International Grains Council, 2024).

On the supply side, the 2023/24 season brought favourable harvests in several major exporting regions. Russia exported wheat aggressively into price-sensitive markets in North Africa and the Middle East (United States Department of Agriculture, Foreign Agricultural Service, 2024). Argentina recovered from the severe 2022/23 drought and returned as a major wheat and maize exporter. These developments increased competition in export markets, although the price series used here do not identify their individual contributions to the 2024 decline.

Global fertilizer prices fell sharply from their 2022 peaks as natural gas prices moderated in Europe and as new export volumes from Russia, China, and the Middle East entered the market. The World Bank's fertilizer price index declined by roughly 40 percent between the first quarter of 2023 and the fourth quarter of 2024, reducing the cost of production for the 2024/25 planting season (World Bank, 2024a). Shipping costs, as measured by the Baltic Dry Index, returned to roughly pre-pandemic levels, removing the freight premium that had inflated landed grain prices in 2022.

By the end of 2024, several benchmark prices were below their 2022 peaks, while the Thai rice benchmark remained above its January 2023 level (Table 2; supplementary data).

1.4. Purpose of this commentary

This paper does three things: it records the calendar-year 2024 price change for each of the three principal cereal commodities — wheat, maize and rice — using the FAO FFPI and the World Bank Pink Sheet monthly series; it documents how unevenly that decline fell across commodities and across the year, including cases where the calendar-year summary reverses under a different endpoint, baseline, or split of the year; and it records the narrowing of the premium that higher-protein wheat varieties commanded over soft wheat during the 2022 peak.

The paper records observed prices in international benchmark markets rather than modelling the supply, demand, and policy channels behind them. That distinction is maintained throughout: the paper establishes facts that other researchers can draw on for causal analysis, rather than substituting for that analysis.

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2. Background: grain price formation

2.1. How international grain prices are determined

International grain prices are not set at a single auction or by a single authority. They emerge from a multi-layered system of futures exchanges, physical spot markets, and benchmark price assessments. The two principal futures exchanges for grains are the Chicago Board of Trade (CBOT), a subsidiary of the CME Group, and Euronext (formerly MATIF) in Paris. CBOT contracts for wheat, maize, and rough rice are among the most widely referenced price benchmarks in international grain trade, and their daily settlement prices are incorporated, directly or through basis adjustments, into physical trade contracts across the Americas, Asia, and parts of Africa (Irwin & Sanders, 2015). Euronext milling wheat futures serve a similar function for European-origin wheat.

The link between futures prices and physical trade is the ”basis” — the difference between the local cash price at a specific delivery point and the nearest futures contract price. For US wheat, the basis is quoted at delivery points along the Mississippi River system and the Gulf of Mexico. The FOB (Free on Board) price at the US Gulf — the benchmark used in the Pink Sheet series analyzed here — reflects the futures price plus the Gulf basis, which varies with inland transport costs, barge availability, export demand, and the quality of grain available at the port (Irwin & Sanders, 2015). A parallel structure exists for Black Sea-origin wheat, where the FOB price at the deep-water ports of Novorossiysk (for Russian wheat) or the Greater Odessa ports (for Ukrainian wheat) serves as the benchmark for a large share of global trade. The difference between Gulf and Black Sea FOB prices — a spread that widened sharply during the 2022 disruption — reflects freight differentials, quality differences, and geopolitical risk premia (Food and Agriculture Organization of the United Nations, 2022).

For rice, the pricing structure differs from wheat and maize. Only a small share of global rice production — roughly 7–10 percent — is traded internationally, and the rice futures market is far less liquid than the wheat or maize markets (Food and Agriculture Organization of the United Nations, 2023). The Thai 5 percent broken white rice FOB Bangkok price, the benchmark used here, has historically served as the reference price for Asian rice trade, although Vietnamese and Indian benchmarks have grown in importance in recent years. Rice prices are more heavily influenced by government policies — export bans, minimum export prices, public stockholding — than wheat or maize prices, because the major rice exporters (India, Thailand, Vietnam, Pakistan) have a long history of state intervention in rice markets (United States Department of Agriculture, Foreign Agricultural Service, 2023).

2.2. The Black Sea in global grain pricing

The Black Sea region’s role in global grain pricing expanded steadily during the 2010s as Russian and Ukrainian wheat production and exports grew. By the 2021/22 marketing year, Russia had become the world’s largest wheat exporter, and Ukraine the fifth-largest, together accounting for roughly 28 percent of global wheat trade (Food and Agriculture Organization of the United Nations, 2022). For maize, Ukraine alone accounted for roughly 15 percent of global exports, and for sunflower oil, the combined Russian-Ukrainian share exceeded 70 percent.

The pricing influence of the Black Sea extends beyond its direct export volumes. Because Black Sea-origin wheat is typically priced at a discount to US and European wheat — owing to lower protein content, higher moisture, and a perception of higher delivery risk — it sets a floor for global wheat prices in normal times. When Black Sea wheat is available and cheap, it forces higher-cost origins to either match the price or lose market share in price-sensitive importing countries, particularly in North Africa, the Middle East, and Southeast Asia. When Black Sea wheat is disrupted — as it was in 2022 — the floor is removed, and competing origins can price at a premium (Food and Agriculture Organization of the United Nations, 2022).

The normalization of Black Sea exports, first under the Black Sea Grain Initiative and subsequently through Ukraine's unilateral corridor and continued Russian exports at or near record volumes, was therefore a material factor in the downward pressure on global wheat prices through 2023 and 2024 (United Nations, 2023; United States Department of Agriculture, Foreign Agricultural Service, 2024).

2.3. India's rice export restrictions

On 20 July 2023, India banned the export of non-basmati white (NBW) rice — semi-milled or wholly milled, HS code 1006.30.90 — a category that accounted for approximately 5.8 million tonnes, or roughly 27 percent, of India's rice exports in calendar year 2022, and is the principal rice type consumed in many African and South Asian importing countries (Durand-Morat, 2023; United States Department of Agriculture, Foreign Agricultural Service, 2023). NBW rice and broken rice together — the ban plus the simultaneous restriction described below — accounted for nearly 45 percent of India's 2022 rice exports (United States Department of Agriculture, Foreign Agricultural Service, 2023). The ban was followed, in August 2023, by a 20 percent export duty on parboiled rice and a minimum export price on basmati rice. The restrictions were imposed in response to rising domestic rice prices — retail rice prices in India had risen roughly 12 percent year-on-year by mid-2023 — and to concerns about the impact of El Niño on the 2023 kharif (monsoon-season) rice crop.

India is the world's largest rice exporter, accounting for roughly 40 percent of global rice trade. The ban covered a category that had accounted for 5.8 million tonnes of exports in 2022. That historical quantity describes the policy's prior-year trade scope; it is not an estimate of the realized reduction after July 2023. The Thai 5 percent broken benchmark, which had averaged USD 501.7/tonne over the six complete months preceding the July 2023 ban (January–June; range USD 476–517/tonne), rose to USD 635/tonne by August 2023 and stayed above USD 580/tonne for January–August 2024, easing to exactly USD 580/tonne in September before falling to USD 515/tonne in October, USD 511/tonne in November, and USD 527/tonne in December (Table 2; supplementary data). A full twelve-month pre-ban average (August 2022–July 2023) is not reported here because the underlying monthly Pink Sheet data for the second half of 2022 are not held in this project's verified evidence base. India extended the export restrictions through most of 2024, lifting them only gradually in September–October 2024. The result was an international rice market in which prices remained elevated for most of the year — and disconnected from the broader downward trend in wheat and maize — well into the second half of 2024 (Food and Agriculture Organization of the United Nations, 2024a).

2.4. The wheat-maize price ratio

The ratio of wheat to maize prices has historically served as a signal of the relative scarcity of food-quality grain versus feed-quality grain. Wheat and maize are partial substitutes in livestock feed rations — wheat can replace maize when the wheat price falls below a threshold premium over maize, typically around 1.1 to 1.2 — while maize cannot replace wheat in human food uses, particularly for bread-making, without additional processing (Wright, 2011). A wheat-to-maize price ratio above roughly 1.3 therefore indicates that wheat is priced predominantly as a food grain, with limited feed demand, while a ratio below 1.2 signals that wheat is competing with maize in feed rations.

In January 2024, the SRW-wheat-to-maize price ratio stood at 1.25, indicating that wheat was priced as a food grain. By December 2024, the ratio had fallen to 1.14, putting wheat within range of feed competition with maize. This compression — driven by a sharper decline in wheat prices than in maize prices — is one of the structural features of the 2024 decline examined in Section 4.

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3. Data and methods

3.1. FAO Food Price Index

The FFPI is a trade-weighted index of international prices for five commodity groups: cereals, vegetable oils, meat, dairy products, and sugar. The base period is 2014–2016 =

1. The index is constructed from 73 price quotations — predominantly export prices from major origins — weighted by the average export shares of each commodity group over the base period. Within the cereals sub-index, the principal commodities are wheat, maize, rice, barley, and sorghum, with weights reflecting their respective shares of global cereal trade (Food and Agriculture Organization of the United Nations, 2024a). Monthly values are published by the FAO as a public CSV without an API key. The cereals sub-index is the primary series used in this paper because it provides the broadest and most consistently constructed measure of international grain price movements. The twelve 2024 observations used here are verified against the November 2024 and June 2025 editions of Food Outlook: the former covers January–October, the latter May–December, and their six overlapping months agree (Food and Agriculture Organization of the United Nations, 2024b; Food and Agriculture Organization of the United Nations, 2025).

The FFPI methodology has three features that affect the interpretation of the results presented here. First, the trade-weighting scheme means a commodity that is traded in large volumes — such as wheat — influences the sub-index more than a commodity traded in smaller volumes, even if the smaller-volume commodity experiences a larger percentage price change. Second, the fixed base-period weights (2014–2016) mean that changes in the composition of global grain trade since the base period — such as the growth of Russian wheat exports relative to US exports — are not reflected in the weighting structure, a limitation noted in the methodological literature (Food and Agriculture Organization of the United Nations, 2024a). Third, the index is a composite that includes barley and sorghum alongside the three commodities examined in detail here; a decline in the cereals index does not correspond to any simple average of the wheat, maize, and rice price changes.

3.2. World Bank Pink Sheet

The World Bank Pink Sheet reports monthly nominal US-dollar prices for a set of standardized commodity benchmarks. Each benchmark specifies the commodity, grade, delivery point, and delivery terms — for example, ”Wheat, US, No. 2, Soft Red Winter, FOB US Gulf” (World Bank, 2025). The Pink Sheet prices are compiled from a combination of exchange settlement prices, trade publications (such as S&P Global Commodity Insights, formerly Platts), and government agency price reports. They are the most widely used source of monthly commodity price data in development economics and are the basis for the World Bank’s own Commodity Markets Outlook analysis (World Bank, 2024a).

The series used in this paper are: US soft-red winter (SRW) wheat (No. 2, FOB Gulf), US hard-red winter (HRW) wheat (No. 1, FOB Gulf), maize (US No. 2 yellow, FOB Gulf), and Thai rice (5 percent broken, FOB Bangkok). These four benchmarks were selected because they provide consistent coverage of the three principal cereal commodities and are available monthly for the full period of interest. This paper analyses the January 2023 through December 2024 window; the same four series are available monthly beyond that window at the most recent download (Section 3.5).

The four benchmarks represent specific origins and qualities. They do not represent Black Sea-origin wheat, South American maize, or Vietnamese rice — all of which are significant in global trade and may have followed different price paths. The representativeness of these benchmarks is discussed further in the limitations (Section 6).

3.3. Why nominal US dollars

All prices are reported in nominal US dollars. No deflator — such as the US Consumer Price Index or the GDP deflator — has been applied. The decision to report nominal prices is deliberate and follows the convention of the Pink Sheet and the majority of commodity market reporting (World Bank, 2024a). Three considerations support it.

First, the international grain market is a dollar-denominated market. Contracts are priced, invoiced, and settled in US dollars regardless of the origin or destination of the grain. The relevant comparator for a market participant — an importer in Egypt, a miller in Indonesia, a futures trader in Chicago — is the contemporaneous dollar price of alternatives, not a price adjusted for US inflation. Real prices, which divide nominal prices by a general price index, answer a different question: what is the purchasing power of the commodity in terms of a representative basket of goods? That question is relevant for long-run historical comparisons but not for a calendar-year record of market prices.

Second, the choice of deflator is itself contestable. Applying the US CPI deflator would adjust grain prices for changes in the purchasing power of the dollar over US consumer goods — a concept largely irrelevant to a wheat importer in Bangladesh, whose relevant inflation rate is the domestic rate in taka. Applying country-specific deflators to a dollar-denominated price series would conflate exchange-rate movements with inflation adjustments.

Third, the data are provided in the supplementary material. Readers who require real prices can apply their preferred deflator — US CPI, US PPI, the IMF's Special Drawing Rights (SDR) deflator, or a country-specific index — to the nominal series without loss of information. The reverse transformation — from real to nominal — is not possible without knowing the original deflator.

The limitation of nominal reporting is that it does not disentangle dollar price movements that arise from changes in the supply-demand balance for grain from those that arise from broad movements in the US dollar exchange rate. The US Dollar Index (DXY) was relatively strong through much of 2024, trading in a range of approximately 100–107, and a portion of the nominal decline in dollar-denominated grain prices may reflect dollar appreciation rather than softening grain markets (World Bank, 2024a). This paper does not attempt to disentangle the two effects. The nominal series record the price observed by market participants; the attribution of that price to commodity-specific versus currency-specific factors is a separate exercise for which the nominal record is an input, not a substitute.

3.4. The domestic price gap

This paper reports international benchmark prices in US dollars. It does not report domestic retail prices in local currency for grain-importing developing countries. An attempt was made to compile monthly food-specific consumer price indices for the twenty largest net food-importing developing countries, using the World Bank's World Development Indicators API and country-level statistical office portals. The World Bank API returned annual data only, not monthly, and seven of the twenty country-level statistical office portals returned HTTP errors at the time of access. The data that could be obtained — annual CPI aggregates without food-specific breakdowns — were judged insufficient for a meaningful comparison with the monthly international price series.

The limitation is acknowledged here so that it is not mistaken for an omission. The absence of domestic price data means that this paper cannot address the question of whether, or how quickly, the 2024 international price decline translated into lower consumer prices in food-importing developing countries. A companion paper in this issue addresses one country's domestic experience (India, in the context of the 2023 rice export ban); for the rest, the question is acknowledged as open.

3.5. Data retrieval and source dating

The evidence cutoff is 20 November 2025. FAO observations are drawn from the November 2024 and June 2025 editions of Food Outlook (Food and Agriculture Organization of the United Nations, 2024b; Food and Agriculture Organization of the United Nations, 2025). The four 2024 Pink Sheet series are verified against editions dated 4 March, 4 June, 4 September and 3 December 2024, and 3 January 2025 (World Bank, 2024b; World Bank, 2024c; World Bank, 2024d; World Bank, 2024e; World Bank, 2025). These dated tables cover every month used in the 2024 analysis. The January–June 2023 rice comparison is also checked against the March, June and September 2023 editions (World Bank, 2023a; World Bank, 2023b; World Bank, 2023c). The historical publications were retrieved or inspected in September 2026; their publication dates and actual retrieval dates are recorded separately.

4. Results

4.1. The FAO Cereals Price Index in 2024

The FAO Cereals Price Index fell from 119.9 in January 2024 to 111.4 in December 2024 — a decline of 7.1 percent over the calendar year (Table 1). From February onward, all eleven subsequent months were below the January level, although the decline was not monotonic: the index rose between September (113.6) and October (114.4) before resuming its decline through November and December.

Table 1. FAO Cereals Price Index, monthly, January–December 2024 (2014–2016 = 100).

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Index	119.9	113.8	110.9	111.6	118.7	115.2	110.7	110.2	113.6	114.4	111.4	111.4

Source. FAO Food Outlook, November 2024 (p. 47) and June 2025 (p. 101) (Food and Agriculture Organization of the United Nations, 2024b; Food and Agriculture Organization of the United Nations, 2025). The supplied supplementary series also contains January–December 2023; the historical-source check reported here covers the twelve 2024 observations.

The 7.1 percent calendar-year decline masks a much larger decline from the post-invasion peak: the index fell 35.6 percent from May 2022 (173.1) to December 2024. The calendar-year figure is the more conservative one, avoiding the selection bias inherent in choosing a multi-year peak as the starting point. A calendar-year comparison, while conventional, is not neutral — it depends on the arbitrary choice of 1 January and 31 December as endpoints. The sensitivity of the reported change to this convention is discussed in Section 5.

Monthly narrative. The monthly path of the cereals sub-index during 2024 reflects the interplay of seasonal supply patterns, weather events in key growing regions, and policy developments in grain markets.

January–March 2024: The cereals index declined by 9.0 points over the first quarter, from 119.9 to 110.9, with the largest single-month drop (−6.1 points) occurring in February. The decline coincided with the seasonal pressure of Southern Hemisphere harvests — Argentina's wheat harvest, substantially recovered from the 2022/23 drought, entered international markets in January and February — and with continued aggressive Russian wheat exports. Russian wheat was priced at a discount of roughly USD 20–30/tonne below Western European and US wheat through the first quarter, capturing market share in Egypt, Algeria, and Turkey (United States Department of Agriculture, Foreign Agricultural Service, 2024).

April–May 2024: The index rose from 110.9 in March to 118.7 in May, a gain of 7.8 points — the largest two-month increase of the year — with the single largest monthly increase (+7.1 points) registered in May. The rise reflected weather concerns in the Northern Hemisphere: dryness in parts of the US Southern Plains raised questions about the HRW wheat crop condition, while excessive moisture in Western Europe delayed spring planting and raised the risk of lower yields. In the Black Sea, a mid-May frost

in southern Russia and eastern Ukraine damaged winter wheat in the jointing-to-heading stage, prompting several analytical agencies — including Sovecon and IKAR — to cut their Russian wheat production forecasts by 5–10 million tonnes (International Grains Council, 2024).

June–August 2024: The index declined from 115.2 in June to 110.7 in July — the second largest monthly decline of the year (−4.5 points) — and eased further to 110.2 in August. The decline coincided with the arrival of the Northern Hemisphere winter wheat harvest, which confirmed that, while Russian production was below initial forecasts, the combined harvest of the major exporters was ample. The US winter wheat harvest yielded above-trend production, and the European Union's wheat harvest, while not a record, was sufficient to maintain exportable surpluses. The USDA's July 2024 WASDE report raised global wheat ending stocks estimates, and futures markets responded with a sell-off (United States Department of Agriculture, World Agricultural Outlook Board, 2024).

September–October 2024: The index rose from 110.2 in August to 114.4 in October, a recovery of 4.2 points. The rise was driven by two factors. First, dryness in Brazil and Argentina during the Southern Hemisphere spring planting raised questions about the 2024/25 maize and soybean crops, spilling over into wheat markets through the broader grain complex. Second, India's September 2024 decision to ease — but not fully lift — rice export restrictions on non-basmati white rice introduced a new policy variable: the partial reopening of Indian rice exports put downward pressure on rice prices but created uncertainty about the pace and volume of the resumption (United States Department of Agriculture, Foreign Agricultural Service, 2024).

November–December 2024: The index fell from 114.4 in October to 111.4 in November and was unchanged in December. The November decline was 3.0 points and reflected the arrival of the Northern Hemisphere maize and soybean harvests, which were large enough to offset the Southern Hemisphere weather concerns, and the continued flow of Russian wheat exports at competitive prices (World Bank, 2024a).

4.2. Disaggregation by commodity

The FAO cereals sub-index is a composite. The World Bank Pink Sheet provides separate monthly price series for individual commodity benchmarks, allowing a comparison of the decline across wheat, maize, and rice (Table 2). The full 2024 monthly series for each benchmark — including the annual minimum and maximum — is provided in the supplementary data; only the January and December endpoints are reported here.

Table 2. Pink Sheet benchmark prices, January and December 2024 (USD/tonne, nominal).

Commodity	Jan 2024	Dec 2024	Change	2024 range
Wheat, US SRW (No. 2, FOB Gulf)	247.9	230.3	−7.1%	205.8–253.2
Wheat, US HRW (No. 1, FOB Gulf)	283.9	252.2	−11.2%	250.9–289.4
Maize, US No. 2 yellow (FOB Gulf)	198.6	202.6	+2.0%	170.3–202.6
Rice, Thai 5% broken (FOB Bangkok)	660.0	527.0	−20.2%	511.0–660.0

Source. World Bank Pink Sheet (World Bank, 2025). The range reports the lowest and highest monthly price observed during calendar year 2024, irrespective of month. The analytical extract contains the twelve monthly observations for each of the four 2024 benchmarks.

Four features of the commodity-level results are noteworthy.

Wheat fell more than maize. SRW wheat declined by 7.1 percent and HRW wheat by 11.2 percent over the calendar year, while maize increased by 2.0 percent. The differential was not consistent throughout the year: in the first quarter, both wheat and maize declined together, but maize recovered more strongly in the second half of the year, ending 2.0 percent above January, while wheat did not regain its early-year losses.

The wheat-to-maize price ratio, as noted in Section 2.4, fell from 1.25 (SRW/maize) in January to 1.14 in December. The decline in the ratio reflects the asymmetric movement of the two commodities: wheat prices fell more sharply because the factors that had elevated them — the Black Sea risk premium and the protein scarcity discussed below — were specific to wheat, while maize prices were supported by steady demand from the US ethanol sector and by feed demand that proved relatively inelastic at the observed price levels (United States Department of Agriculture, World Agricultural Outlook Board, 2024).

Biofuel demand provides a structural floor for maize prices that wheat lacks. The US Renewable Fuel Standard mandates the blending of ethanol into gasoline; in the 2023/24 marketing year, approximately 37 percent of the US maize crop was used for ethanol production (United States Department of Agriculture, World Agricultural Outlook Board, 2024). When maize prices fall, ethanol margins improve and demand for maize as a feedstock is sustained, limiting the downside. Wheat has no comparable non-food demand floor; when wheat prices fall, the principal channel of additional demand is feed use, which competes with maize and is therefore limited by the maize price itself.

The HRW-SRW premium narrowed. In January 2024, HRW wheat commanded a premium of USD 36.0/tonne (14.5 percent of the SRW price) over SRW wheat. By December 2024 the premium had narrowed to USD 21.9/tonne (9.5 percent of the SRW price). To understand the narrowing, it is necessary to examine the premium's wartime peak.

During the price spike of May 2022, the HRW-SRW premium reached USD 83.9/tonne (19.1 percent). This wartime premium reflected two concurrent pressures. First, HRW wheat — a higher-protein variety typically exceeding 12 percent protein — is used primarily for bread flour and is less substitutable with lower-protein alternatives than SRW, which is used for cakes, crackers, and other soft-flour products. When global wheat supplies are constrained and protein content is at a premium, HRW wheat attracts a disproportionate price premium because millers cannot easily substitute SRW wheat in bread-making without supplemental protein (United States Department of Agriculture, Foreign Agricultural Service, 2024). Second, the 2022 US HRW wheat crop was itself affected by drought in the Southern Plains (Kansas, Oklahoma, Texas), reducing production and further tightening the availability of high-protein milling wheat. The combination of global protein scarcity — Ukrainian wheat, normally a source of medium-protein milling wheat with roughly 11 percent protein, was largely inaccessible — and reduced US HRW production pushed the HRW-SRW spread to historically wide levels.

The narrowing of the premium from USD 83.9/tonne in May 2022 to USD 21.9/tonne by December 2024 — a decline of USD 62.0/tonne across thirty-one months — reflected the gradual restoration of global protein wheat availability. Three factors contributed. First, the 2023 and 2024 US HRW wheat harvests were larger than the drought-affected 2022 crop, restoring domestic supplies of high-protein milling wheat. Second, the resumption of Ukrainian wheat exports, even at reduced volumes, returned a source of medium-protein wheat to international markets. Third, Russian wheat exports — while typically lower in protein than US HRW — expanded sufficiently to relieve the overall wheat supply constraint, reducing the premium that any specific protein class could command. By December 2024, the HRW-SRW premium, at USD 21.9/tonne, was approaching the range observed in 2019–2020, before the disruption (United States Department of Agriculture, Foreign Agricultural Service, 2024).

Rice: the India effect. The Thai rice benchmark fell 20.2 percent over the calendar year, but the decline must be interpreted in the context of India's export restrictions. The December 2024 price of USD 527.0/tonne was still above the January 2023 price of USD 517.0/tonne — its December 2024 price exceeded its January 2023 baseline (Table 2; supplementary data).

The trajectory of rice prices during 2023–2024 coincided with changes in India's export policy. In the six complete months preceding the July 2023 ban (January–June), the Thai 5 percent broken benchmark averaged USD 501.7/tonne, trading in a range of USD 476–517/tonne (Section 2.3). Following the ban, the

benchmark rose sharply, reaching USD 660/tonne by January 2024 and remaining above USD 580/tonne through August 2024 before easing to exactly USD 580/tonne in September before falling to USD 515, 511, and 527/tonne in October, November, and December respectively (Food and Agriculture Organization of the United Nations, 2024a).

Substitutability provides a plausible link between India's export restriction and the Thai benchmark used here. Non-basmati white rice competes with Thai 5 percent broken rice in many importing markets, particularly in sub-Saharan Africa. Importers could therefore turn to Thai and Vietnamese alternatives when Indian supplies were restricted. The restriction also coincided with El Niño concerns and increased rice import tenders in Indonesia, the Philippines and several African countries during the second half of 2023 (International Food Policy Research Institute, 2024; United States Department of Agriculture, Foreign Agricultural Service, 2023). The price record establishes this timing, but does not isolate the restriction's causal effect from those concurrent conditions.

India eased its rice export restrictions during September–October 2024. Over the same interval the Thai benchmark fell from USD 580 to USD 515 per tonne, a USD 65 decline. It ended December at USD 527. These observations locate the late-year fall alongside the policy changes (World Bank, 2024a).

Maize: the outlier. Maize increased by 2.0 percent over 2024, from USD 198.6/tonne in January to USD 202.6/tonne in December, making it the only one of the four benchmarks to end the year higher. US ethanol demand and competition from Brazilian and Argentine exports are relevant market context (United States Department of Agriculture, Foreign Agricultural Service, 2024; United States Department of Agriculture, World Agricultural Outlook Board, 2024), but the benchmark series cannot decompose their contributions. What the record establishes is that the maize price was relatively stable: the within-year range of USD 170.3–202.6/tonne was the narrowest of the four benchmarks in absolute dollar terms (a USD 32.3/tonne spread, against USD 38.5 for HRW wheat, USD 47.4 for SRW wheat, and USD 149.0 for Thai rice). In percentage terms — the range divided by the annual low — HRW wheat's high price base gives it the smallest spread (15.3 percent), followed by maize (19.0 percent), SRW wheat (23.0 percent) and Thai rice (29.2 percent).

4.3. Cross-commodity correlations during the decline

The monthly movements of the four Pink Sheet benchmarks during 2024 show a mixed pattern of co-movement rather than one uniform correlation. Because SRW and HRW wheat diverged over the year — the premium between them narrowed, as Section 4.2.2 records — the two series are reported separately below rather than combined into a single "wheat" figure.

Over the twelve monthly observations, the Pearson correlation between SRW and HRW wheat was 0.78 — the highest of any pair, consistent with both being US-origin wheat subject to related supply and demand conditions. SRW wheat correlated with maize at 0.70 and with Thai rice at 0.37; HRW wheat correlated with maize at 0.28 and with Thai rice at 0.62. Maize and rice showed essentially no linear association over the year (−0.13). These coefficients describe co-movement in monthly price levels; they do not identify which series, if any, drove another, and no causal relationship between the four benchmarks is inferred from them.

The SRW-maize correlation differed between the two halves of the year: the correlation was 0.61 in the first six months (January–June) and rose to 0.87 in the second six months (July–December) . The rise coincides with both series reaching their 2024 low in August and recovering over the following months (Sections 4.2.1 and 4.2.4). A twelve-month series split into two six-month halves is a short window for this kind of comparison, and the coincident trough-and-recovery pattern is reported here as an observation, not as evidence that wheat and maize prices became more causally linked in the second half of the year.

5. Discussion

The recorded decline raises questions that the price counts alone cannot answer. This section discusses five implications of the 2024 price record for policy and for further research, noting the boundaries where the descriptive record ends and the need for causal analysis begins.

5.1. Did food-importing countries benefit?

A decline in international grain prices should, in principle, reduce the import bill of food-importing developing countries and ease the pressure on consumer prices. The extent to which the 2024 decline provided such benefits is, however, uncertain, for three reasons.

First, the pass-through from international to domestic prices is incomplete and asymmetric. A body of empirical research, reviewed by Minot (2011) and Baffes and Gardner (2003), finds that international grain price changes are transmitted to domestic markets with a lag of one to six months, and that the transmission elasticity — the percentage change in domestic prices for a one percent change in international prices — is typically between 0.2 and 0.6 in developing countries, well below unity (Baffes & Gardner, 2003; Minot, 2011). Several mechanisms attenuate the pass-through: transport costs, which are a larger share of the landed price in landlocked and island countries; domestic marketing margins, which are often administered or oligopolistic; and government price interventions — including subsidies, price controls, and public stock releases — that decouple domestic prices from international benchmarks. A 20 percent decline in the international wheat price does not imply a 20 percent decline in the retail price of bread in Addis Ababa or Dhaka.

Second, exchange rate movements in 2024 offset some of the international price decline for importers whose currencies depreciated against the US dollar. Several major food-importing developing countries — including Nigeria, Egypt, Pakistan, and Kenya — experienced significant currency depreciation during 2024, driven by balance-of-payments pressures, debt service obligations, and domestic inflation differentials. For these countries, the dollar-denominated decline in grain prices was partially or fully offset by the increase in the domestic-currency cost of dollars, leaving the landed price in local currency little changed or, in some cases, higher than in 2023 (World Bank, 2024a).

Third, the calendar-year percentage decline is not the right measure of relief for rice importers, because it runs in the opposite direction from what a simple reading suggests. The Thai rice benchmark fell by 20.2 percent over 2024 — a larger percentage decline than either wheat series (SRW −7.1 percent, HRW −11.2 percent) — but rice entered the year at an elevated, policy-driven level, having risen to USD 660/tonne only after India's July 2023 export ban. Even after the 20.2 percent decline, the benchmark closed 2024 at USD 527/tonne, still above the USD 517/tonne level from which it had started 2023, before the ban. Wheat shows the opposite pattern: the SRW benchmark closed 2024 well below where it had started 2023. For countries in South and Southeast Asia and in coastal West Africa, where rice is the principal staple, the practical consequence is that the largest single-commodity decline of 2024 unwound only part of a price increase that predated the year under review, so the level paid by importers remained elevated even as the year-on-year change looked, on its face, the most favourable of the three commodities. The decline within 2024 also accelerated only late in the year, after India began to ease restrictions in September.

These three considerations caution against interpreting the 2024 international price decline as an unqualified improvement in food access for importing countries. The international benchmark prices reported here are a necessary input to any assessment of food import costs, but they are not a sufficient statistic for the welfare effects on consumers in importing countries.

5.2. *Futures markets and price discovery*

The prices reported in this paper are physical spot or near-delivery benchmark prices, but the price discovery process that generates them operates primarily through futures markets. The CBOT wheat and maize futures contracts are the most liquid grain derivatives in the world, with daily trading volumes that exceed global physical grain trade by a factor of ten to twenty (Irwin & Sanders, 2015). The prices at which these futures contracts trade incorporate — or are believed by market participants to incorporate — all publicly available information about current and expected supply, demand, stocks, weather, and policy. The FOB Gulf physical prices reported in the Pink Sheet are derived from futures prices plus the basis, which is itself discovered through a competitive bidding process among exporters, barge operators, and grain elevators along the Mississippi River system.

The distinction between futures-based price discovery and physical delivery is relevant to the interpretation of the 2024 price record for two reasons. First, futures prices reflect expectations as much as current conditions. A futures price decline in early 2024 may have reflected the market's anticipation of ample Northern Hemisphere harvests — an expectation that was only confirmed months later when the harvest actually occurred. The price record is therefore not a contemporaneous record of supply conditions; it is a record of market participants' collective assessment of those conditions at each point in time, an assessment that may prove, in retrospect, to have been too pessimistic or too optimistic. The May 2024 price spike, for example, reflected a reassessment of Russian wheat production — driven by frost damage — that subsequent harvest data partially, but not fully, confirmed (International Grains Council, 2024).

Second, the participation of financial investors in grain futures markets — through commodity index funds, exchange-traded funds (ETFs), and managed futures accounts — means that grain futures prices are influenced by factors beyond the physical supply-demand balance for grain. The ”financialization” of commodity markets since the mid-2000s has been the subject of an extensive academic and policy debate, with evidence on both sides of the question of whether financial investment amplifies or merely reflects commodity price movements (Gilbert, 2010; Irwin & Sanders, 2015). The 2024 price record cannot, on its own, distinguish between a price decline driven by improving grain supply fundamentals and a decline amplified by the unwinding of financial positions that had been accumulated during the 2022 price surge. This is a further dimension of the descriptive limit of the record.

5.3. *Climate conditions during the 2023–2024 observation period*

This paper makes no prediction about 2025 and reports no climate data beyond the sources cited for the 2024 events described below.

The 2023/24 El Niño event — classified as ”strong” by the NOAA Climate Prediction Center — brought drought to parts of Southeast Asia, Southern Africa, and Central America during 2024, although its effects on global grain production were less severe than the 2015/16 El Niño, owing to the geographic distribution of the rainfall deficits and to improved drought preparedness in several affected countries (International Food Policy Research Institute, 2024). Taken together with the multi-year La Niña that preceded it (2020–2023), the 2022–2024 period combined two opposite-phase ENSO episodes in quick succession. The price record examined in this paper does not separately isolate the contribution of either episode to the 2024 cereal price decline, and this paper does not extend the record into a claim about 2025 climate conditions or their effect on grain prices.

5.4. *Policy implications*

The 2024 price record, while purely descriptive, raises three policy-relevant observations that are noted here without prescriptive intent.

Strategic grain reserves. The 2022 price surge prompted several importing countries to draw down strategic grain reserves to stabilize domestic prices; the subsequent price decline in 2023–2024 has pro-

vided an opportunity to rebuild these reserves at lower cost. The observation that prices declined gradually, rather than collapsing, means the rebuilding window extended over at least eighteen months — a pattern that contrasts with the rapid post-2008 decline, which caught reserve managers off guard and left some countries unable to replenish stocks at the post-spike lows (Wright, 2011).

Export restrictions. India's rice export ban — and the extension of the ban through most of 2024 — is the most consequential trade policy intervention in grain markets since the 2022 export restriction wave. The ban insulated Indian consumers from the international price spike at the cost of transmitting the price shock to importing countries, particularly in sub-Saharan Africa, where Indian rice is a dietary staple. The episode illustrates a well-known collective-action problem in grain trade policy: each exporting country has an incentive to restrict exports when international prices rise, but when all exporting countries do so — or when one large exporter does so — the international price rises further, harming importing countries and, in some cases, feeding back into the domestic price the restriction was intended to control (Headey & Fan, 2010; International Food Policy Research Institute, 2024).

Price stabilization mechanisms. The divergence between the FAO cereals sub-index and the commodity-level benchmarks — and between the international benchmarks and domestic retail prices — underscores a point that is often lost in summaries of global food price trends: "international grain prices" are a statistical construct, not a price any consumer pays. Policy discussions that treat the FFPI decline as evidence of improving food affordability in developing countries are relying on an inference — that international price declines pass through to consumers — that the empirical evidence suggests is often incorrect. The data gap identified in Section 3.4 — the absence of monthly food-specific CPI data for the major food-importing developing countries — is not merely a limitation of this paper; it is a limitation of the global food-price monitoring infrastructure, and one that deserves attention from the international statistical community.

6. Limitations

The boundaries of this paper have been stated at several points. They are collected here for completeness, together with additional limitations identified during the review process.

Calendar-year accounting masks intra-year variation. The December-to-January comparison is a convenient summary but it depends on the arbitrary choice of endpoints. For wheat, the December 2024 price of USD 230.3/tonne was not the lowest in the series: August 2024 was lower, at USD 205.8/tonne, the calendar-year minimum (supplementary data). Table 2 reports the within-year range for each benchmark so that the reader can assess the sensitivity of the reported change to endpoint choice. Reporting the calendar-year change is a convention; it is not a finding that December was the minimum.

The FAO composite is not a price. The FFPI is an index. A 7.1 percent decline in the cereals index does not mean wheat, maize, and rice prices fell by 7.1 percent on average — it means the trade-weighted composite of all cereals, including barley and sorghum, fell by that amount. The weighting scheme — based on 2014–2016 export shares — determines the contribution of each commodity to the index. The commodity-specific figures in Table 2 are more informative for a reader interested in a particular grain.

Nominal prices are reported, not real prices. All figures are in current US dollars. No deflator is applied. The US Dollar Index was relatively strong through much of 2024, and a portion of the nominal decline may reflect dollar appreciation rather than softening grain markets. The dollar-denomination effect is not quantified here.

The Pink Sheet benchmarks represent specific origins and qualities. US Gulf FOB wheat and maize and Thai FOB rice are standard references but they do not represent the full range of origins, qualities, and delivery terms relevant to global grain trade. Black Sea-origin wheat — a larger share of global

trade — may have followed a different price path. Vietnamese rice, typically priced below Thai rice, may have offered a different price trajectory for importing countries able to source from both origins.

The absence of domestic price data limits the usefulness of the record. International benchmark prices are a signal, not a consumption price. The paper does not report domestic retail prices for grain-importing developing countries, and therefore does not claim anything about whether, or how fast, the international decline translated into lower consumer prices in any specific country.

Data revision risk. The FAO FFPI and World Bank Pink Sheet series are subject to periodic revision. The data reported here correspond to the officially dated editions identified in Section 3.5 (FAO *Food Outlook*, November 2024 and June 2025; World Bank Pink Sheet editions covering through February, May, August, and November 2024, and the 3 January 2025 edition covering through December 2024) and may differ from values published in earlier or later vintages of the same underlying series.

7. Conclusion

The 7.1% decline in the FAO Cereals Price Index during 2024 combined different commodity outcomes. SRW wheat fell 7.1%, HRW wheat fell 11.2% and Thai rice fell 20.2%, while maize rose 2.0%. Rice's larger annual decline left its December price at USD 527 per tonne, still USD 10 above January 2023. The size of its fall therefore differs from the question of whether it had returned to its earlier level.

The wheat-grade premium narrowed from USD 36.0 to USD 21.9 per tonne. Meanwhile, SRW wheat and maize shared an August trough and a subsequent recovery, with a higher monthly-level correlation in the second half of the year. The price retreat was thus uneven both across commodities and within the calendar year. Assessments of import costs gain precision by retaining the commodity, grade and baseline behind the aggregate index.

8. Declarations

Data. All data are from publicly available sources, as identified in Sections 3.1–3.5 and the reference list. The FFPI CSV, the Pink Sheet Excel workbook, and the extraction script are included with this submission.

Statements

Data availability. All data used in this study are from publicly available sources as cited.

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