

**ZEF POLICY BRIEF NO 40**      Speculation risks in food commodity markets in the context of the 2022 price spikes - Implications for policy

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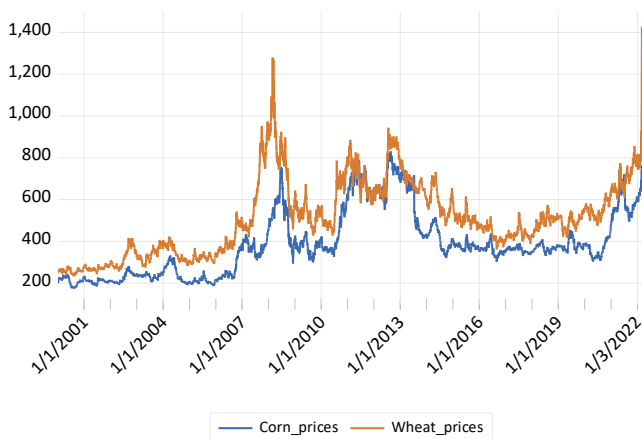
### Summary

- The structural and acute causes of the food price crisis in 2022 are more complex and more severe than in 2008, but with regard to the risk of excessive speculation, lessons can be learned from the experience of the past price crises. Preventing excessive speculation in commodity futures markets is again crucial to ensure market integrity and functioning.
- Somewhat reassuringly, market transparency has improved, as compared to 2008-2011. For example, early warning indicators have been implemented and data availability has significantly improved, e.g., through Agricultural Market Information System (AMIS).
- Also noteworthy is that financial markets in the U.S. and Europe are now more strictly regulated than they were before 2007/2008. However, it is doubtful whether the current regulations in food commodity markets related to position limits (number of contracts an investor can hold) and increased market transparency are fully effective against excessive speculation.
- The share of speculative market activity in agricultural commodities has already increased since the end of 2020, which is also the result of increased hedging demand. High levels of inflation, and expected monetary policy shifts add to speculative tendencies between stocks markets, bonds-, and commodity markets. This increases the risks that food price formation will be decoupled from food market fundamentals and more influenced by financial market strategies.
- When market uncertainties remain high or increase due to war, discretionary trade policies, and climate shocks, this also increases the risk that excessive food speculation will further soar prices.
- At this time, we cannot rule out the risk that excessive speculation already contributes to food price volatility and amplified spikes. Therefore, a mix of policy instruments should be considered that include: information and diagnostics, coordinated trade and stock release policies, strengthened regulation of food commodity futures, encouraging voluntary non-speculative behaviour, and investment in de-risking food systems. Further details of actions are elaborated in this brief.

## Changed market and risk conditions in international food markets 2022

The current price developments of agricultural products, in particular cereals and oilseeds, are causing worldwide concern and are a significant part of rising inflationary pressures. Prices for agricultural products are often subject to strong fluctuations. Nevertheless, price spikes and volatility, as currently observed, are highly unusual and indicate an abnormal market situation.

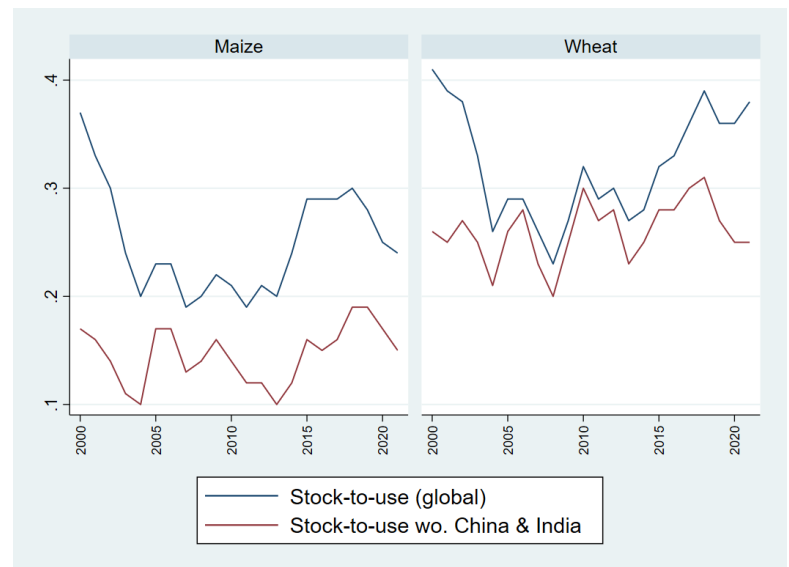
It seems that the price crisis of 2008-11 and the current one of 2020-22 are similar, but structural and acute causes differ. This needs to be taken into account when considering short- and long-term policy actions.<sup>1</sup> For instance, the importance of climate shocks (unexpected weather events, such as the scant rain in South America caused by La Niña in 2020) and the politicization of international relations between major agricultural superpowers (US, EU, China, India, Brazil) have increased since 2008-11. During the Covid-19 pandemic, epidemiological containment measures severely disrupted markets and the Russian invasion of Ukraine dramatically increased expected supply shortages globally, as both countries are important agricultural exporters. They account for 30% of wheat exports and more than half of sunflower oil exports in highly concentrated export markets, while Russia and Belarus are also leading fertilizer exporters. These developments are reflected in the dynamics of agricultural commodity futures prices (Fig. 1).<sup>2</sup>



**FIGURE 1:** Future prices of wheat and maize

Source: Elaborations on Bloomberg (2022) tickers C1 and W1. Time span: 04/Jan/2000-12/April/2022

Increased market uncertainty, also for other commodities and asset classes, can lead to increased speculative activity in agricultural commodities, which then contribute to further increases in food prices, like during the 2008-2011 food crises.<sup>3</sup> The G7 Agriculture Ministers, during their extraordinary meeting in Berlin on March 11<sup>th</sup> pointed out, “we will not tolerate artificially inflated prices that could diminish the availability of food and agricultural products. We will also fight against any speculative behaviour that endangers food security [...] Therefore, we are closely monitoring markets affecting the food system, including futures markets”.<sup>4</sup> This brief



**FIGURE 2:** Global stocks (stock-to-use) including and excluding India and China.

Sources: AMIS (2022).

discusses, in this complex context, the importance of commodity futures markets and financial speculation and how excessive speculation can be controlled.

Our research findings from the 2008-11 price crisis are quite relevant. Supply shocks in view of tight market situations with low inventories and high energy prices were the starting point of both food crises. Current global inventories seem to be higher than in 2007, but they are concentrated in few countries and the share of inventories owned by China and India has increased sharply (Fig. 2). By mid-2022, China is expected to hold 69% of the world’s maize reserves, 60% of the world’s rice and 51% of the world’s wheat.<sup>5</sup> Understandably China and India attempt to protect their consumers from shortages and exposure to volatile world markets, but the two nations also have a responsibility to contribute

with some release of these stocks to stabilizing international food markets, as do EU and U.S..

## Box 1: Commodity futures markets for staple foods – benefits and risks

Commodity futures markets have three important economic functions. First, they help producers, merchants, and processors (the so-called commercials or hedgers) to hedge against price changes (reduce price risks). For instance, a farmer could negotiate today with a futures contract the price of wheat the farmer would get at harvest time in six months. In this way, the farmer would hedge against any price drop. Likewise, a buyer may hedge against a price increase by buying wheat at a fixed price today for delivery in six months. Second, futures markets are important for price discovery in spot markets by enabling commodity traders to establish benchmarks for current prices. Finally, derivatives markets facilitate transactions by reducing transaction costs (high efficiency). As a result, investments become more productive and price volatility decreases.<sup>6</sup>

Financial speculation comprises buying, holding, selling, and short-selling of commodities to profit from price fluctuations. Speculators, also defined as non-commercials, do not have a specific interest in the use of the commodity (no interaction with the physical commodity), but their main objective is to profit from price changes (achieve returns). By increasing market liquidity and bearing the risk, financial speculators aide markets to fulfill their institutional role. For these reasons, speculation is a necessary part of financial markets. It would be counterproductive to completely exclude food commodities from speculative transactions, as this would impede risk-sharing and price discovery processes, and even increases volatility. However, when speculation becomes excessive, it distorts price dynamics and causes severe problems.

Both speculators and hedgers could take long (buy) or short (sell) positions in commodity futures markets, and generally, they hold opposite sides. Thus, speculators in the futures market may act as both the long and short sides of a transaction but in the aggregate, the speculators' commitments must offset the imbalances in the long and short positions of the commercial market players.<sup>7</sup>

Excessive speculation can cause price shocks in commodity futures markets and jeopardize financial

market stability once speculators' behaviors are driven by financial market strategies rather than food market fundamentals. For example, speculators' risk considerations and portfolio strategies may result in a change in commodity futures positions that are not driven by supply or demand in the commodity market.<sup>8</sup> Following the stock market crash in 2002, agricultural commodities became a popular asset class in the portfolios of financial institutions and the general investment community because of their relatively low correlation with returns of other asset classes. During this period, trading in agricultural commodity futures and options contracts increased sharply.<sup>9</sup> As a result, speculative activity also increased dramatically. Speculation was partly responsible for the commodity price boom in the 2000s.

In the agricultural commodities sector, the most important exchanges are located in the US. The Chicago Mercantile Exchange and the Chicago Board of Trade are the reference exchanges for several agricultural commodities, especially wheat, maize and livestock. In the EU, agricultural commodity exchanges are less active, but trading activity has increased in recent years. The main agricultural contracts are traded on the London International Financial Futures and Options Exchanges (cocoa, coffee, sugar, feed wheat) and the Marché à Terme International de France in Paris (wheat, rapeseed, maize). In Asia, the most important commodity exchanges, Dalian, Shanghai and Zhengzhou Commodity Exchanges, are located in China. Other important commodity futures exchanges in food exporting countries are the National Stock Exchange of India and the Thailand Future Exchange (formerly the Agricultural Futures Exchange of Thailand). In recent years, the importance of commodity futures exchanges outside the US and Europe has increased significantly, which can also be seen in the trading volumes of the respective exchanges.<sup>10</sup>

Key factors during the 2008-2011 food crisis were low stocks, supply shortages, rigid bioenergy policies (biodiesel and bioethanol) and restrictive trade policy measures by food exporting countries and (to a lesser extent) food importing countries that reduced international food supplies and increased market uncertainties. Similar developments emerge in the current situation. Signs of restrictive trade policies include e.g. in January 2021 Argentina, the world's No. 3 supplier of maize, imposed a cap on maize exports; in

March 2022 Russia temporarily banned grain exports to ex-Soviet countries. Russia has suspended fertilizer exports and Belarus was forced to halt exports through international sanctions. This adds to market risk, and thus, the likelihood of excessive speculative activities in the commodity futures markets.<sup>11</sup> So far, this has not impacted on the rice market but possible spill-overs need to be monitored carefully due to the high concentration of rice exports. On a positive note, market transparency has increased significantly since 2008-2011. Early warning indicators have been developed and data availability improved through AMIS<sup>12</sup>, although further steps are required.

## Appropriate Financial Market Regulation

**Under normal circumstances, it is not speculation that destabilizes markets, but problems arise when excessive speculation** comes about in the context of emerging abnormal scarcity expectations, i.e., speculation that goes far beyond the need for hedging. Excessive speculation causes prices to deviate from economic market fundamentals. In this case, laws and regulations are important for maintaining functionality of financial and commodity markets. The food price crisis of 2008-2011 also originated from poorly regulated financial system that exacerbated supply and demand shocks in food markets.<sup>13</sup>

**Historically, regulation of commodity futures markets to curb excessive speculation has been the rule rather than the exception.** The focus of financial market regulation is on commodity futures exchanges and so called over-the-counter (OTC) trading in the U.S. where the majority of commodity futures trading continues to take place. The Commodity Futures Trading Commission (CFTC) has been the regulating authority since 1974. Position limits (number of contracts an investor can hold) existed widely until the 1990s. However, during the liberalization period of the 1990s and 2000s, they were first suspended for OTC and futures markets or left to the commodity futures exchanges themselves; and later converted to position accountability by the Commodity Futures Modernization Act. In addition, OTC trading was exempted from CFTC oversight and the strict separation

between investment and commercial banks was removed by the Financial Services Modernization Act. This favoured the sharp expansion of securities and commodities trading, the emergence of a vast web of hidden interconnections that led to misinterpretation in risks and losses, and the marked surge in speculative (non-commercial) activities. Deregulation also led to an increase in position limits on official commodity futures exchanges, such as the Chicago Board of Trade (CBOT), which were reintroduced only under CFTC supervision during the 2008 food crisis.<sup>14</sup>

**Following the commodity price boom of the 2000s, financial market regulation considerations began in the U.S. and the EU.** The Dodd-Frank Act signed in 2010 under President Obama largely rolled back the preceding liberalization of OTC and exchange trading. The Act involved regulations that required banks to be better capitalized and commercial banks to focus more on credit transactions. Furthermore, OTC derivatives trading has been largely formalized and must be centrally cleared and transparently executed on exchanges or trading platforms to increase transparency. This primarily affects "swaps" and "security-based swaps."<sup>15</sup> The CFTC, under President Obama, issued a comprehensive position limits rule, although it failed to use its Dodd Frank Act authority to also regulate destabilizing commodity index and similar funds. These position limits were challenged and stopped by the courts and were not implemented by the CFTC until 2020 and applied since March 2021. Position limits now apply not only to trading at commodity exchanges, but also to OTC trading of *economically equivalent swaps*. However, more relaxed speculative position limits per commodity (maize and wheat) have been adopted.

In the Markets in Financial Instruments Directive II (MiFID II), the EU decided to restrict trading in food products and introduced position limits and improved transparency (pre-trade and post-trade transparency rules). Short-term trading suspensions are possible to address the risks of high-frequency trading. Destabilizing financial products can be banned preventively under certain circumstances. Furthermore, the requirements

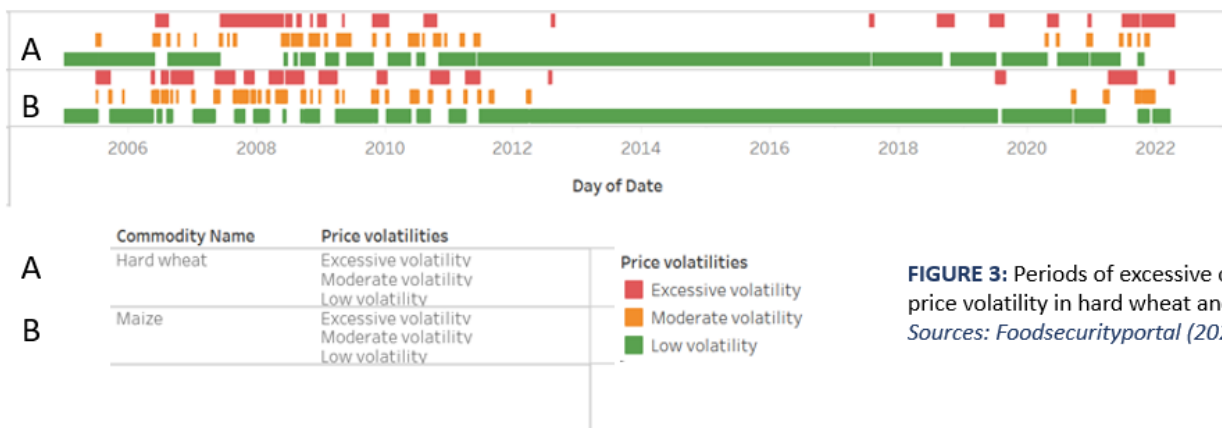
for trading venues have been increased and the conditions for competition in trading have been improved. The rules apply since January 2018.<sup>16</sup>

**Whether these regulatory measures, especially the position limits, are effective against excessive market speculation is doubtful.** With regard to the position limits, the concern does not exclusively refer to the possibly too high limits, but also to implementation of regulatory issues such as the frequency of review, the inclusion of index funds in the regulations, and exceptions under the bona fide rule.<sup>17</sup>

In China too, the role of financial speculation and the need for regulation of commodity futures markets is a recurring topic of discussion. Despite long-standing position limits for agricultural commodities and strong access restrictions for international investors, there is evidence that speculation has contributed to increased market volatility.<sup>18</sup> However, for China, as well as for India, the integration between futures markets and spot markets is much less advanced than in the U.S. or Europe due to increased market regulation, such as public food procurement and price stabilization.

bonds and even real estate given that agricultural commodities are particularly attractive for investors due to their diversification potential. Here we use a set of alternative indicators to shed light on the current developments. This assessment focuses on trading activity in agricultural commodity futures markets since 2020, particularly the CBOT, the leading agricultural exchange. The analysis covers two major commodities: maize and wheat (with focus on hard wheat). To capture the extent and change of speculative behaviour in agricultural commodity trading, we analyse **three indicators** below: (1) excessive price volatility of commodity futures prices (2) volume of futures contracts and open interest in futures contracts, (3) futures positions held by financial speculators and the share of these in total long positions.

**Re Indicator 1) Since the end of 2021, excessive price volatility of commodity futures prices has increased significantly.** Price volatility is a measure of the extent of the variability of a price that occurs with respect to its trend. The excessive volatility measure (Fig. 3) is based on a statistical model that describes the fluctuations of daily percentage changes in agricultural commodity prices.<sup>19</sup> It shows emerging tendencies as in 2007. The indicator serves as an early warning system for



**FIGURE 3:** Periods of excessive commodity price volatility in hard wheat and maize. Sources: Foodsecurityportal (2022).

### Potential financial market speculation in the current price development (2020-22)

It is not trivial to distinguish the role of financial speculation in food price developments from market trading or financial investment strategies. Agricultural commodities must also be considered in the context of other asset classes, such as equity markets, government

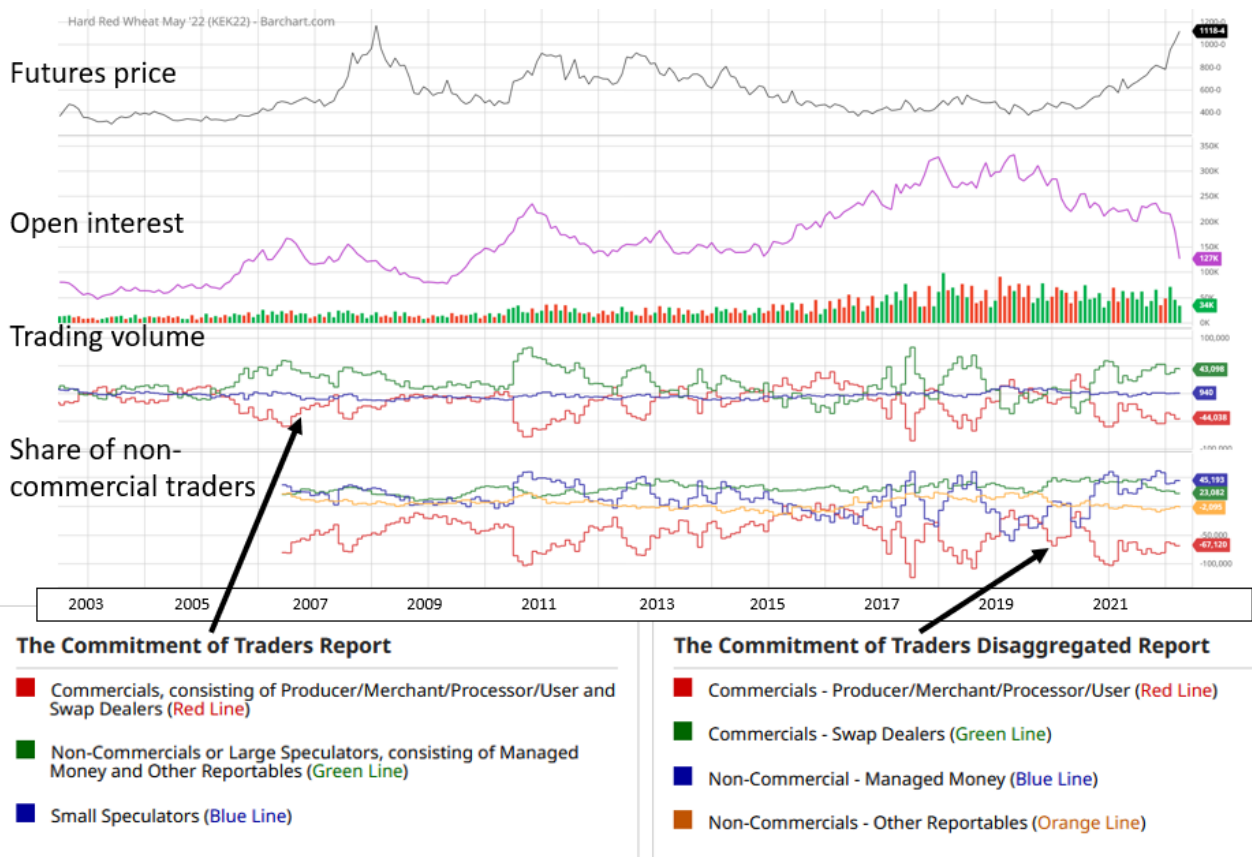
periods of excessive price volatility on commodity futures markets. Excessive volatility gives an indication of market irregularities that opens the windows for excessive financial market speculations. Figure 3 shows periods/days of extreme market volatility in hard wheat and maize at the CBOT since 2006. The period of extreme market volatility between 2007 and 2011 is clearly visible. Subsequently, market volatility was largely low

until 2020 and only increased with the onset of the Covid-19 pandemic. This development began even before the Russian invasion of Ukraine, which, however, further increased market volatility.

**Re Indicator 2) The trading volume in agricultural commodities and the level of open interest have not changed systematically since 2020.** These two indicators measure the trading activity of a commodity. Trading volume captures commodity futures trading on the CBOT within a time frame, while open interest measures total number of futures contracts for a particular commodity that has entered into and has not yet been offset by an opposite transaction (either long or short) or satisfied by delivery of the commodity. Open interest indicates how much money is flowing into the market. Rising open interest means money (liquidity) is flowing into the commodity futures market, while falling open interest indicates an outflow of capital. The ratio of trading volume to open interest shows the relative importance of speculative activity compared to hedging demand for a specific contract. CBOT trading data do not suggest a significant change in market conditions since 2020 (Fig. 4

for hard wheat; the figure for maize shows similar patterns and is therefore not included).

**Re Indicator 3) The share of speculators (non-commercial traders) in hard wheat and maize corresponds to price spikes and has risen sharply since the end of 2020.** The share of speculative market activity can be derived from the composition of market actors trading an agricultural commodity and their open interest position. The CFTC classifies all reportable commodity futures positions of a trader as either "commercial" or "non-commercial", i.e. whether hedger or speculator.<sup>20</sup> A change in the share of different traders, therefore, indicates the extent to which the behaviour of financial market actors has changed. The bottom of Fig. 4 shows that the share of non-commercial traders in hard wheat increases when prices are high (the data for maize looks alike but is omitted here). When the non-commercial long positions are higher than average, investors believe prices will move upward. This alone is not necessarily indicative of the influence of financial market speculation on commodity futures prices but could also show increased liquidity due to hedging



**FIGURE 4:** Trading and Commitment of Traders data for hard wheat.  
 Source: Chart provided by Barchart.com.

pressure. The pressure of speculative market activity is measured by the level of "non-commercial" positions relative to open interest or total "commercial" positions.<sup>21</sup> The share of long-position held by non-commercial traders is currently around 50%, which is like the speculative pressure index at the level in 2007/2008. **Overall, the increasing share of speculators increases the risk that price formation could become decoupled from market fundamentals and more strongly influenced by financial market strategies.**

### Course of action for policy:

The overall market conditions are comparable with the situation that emerged in 2008 but structural and acute causes of price spikes differ. In our preliminary assessment, based on three indicators (extreme futures prices volatility, trading volume and open interest, and the share of non-commercial traders) we cannot rule out that excessive speculation already contributes to food price volatility and spikes.

A mix of policy instruments should be considered to protect the food system, preserve food commodity markets' integrity and functioning, and prevent excessive speculation. The policy instruments should include information and diagnostics, coordinated trade and stock release policies, strengthened regulation of food commodity futures, encouraging voluntary non-speculative behaviour, and investment in de-risking food systems. These policies thus mean:

1. Provide strong **market diagnostics and transparency**, enhanced with information systems on emerging risks, that result from the increasing complexity of the drivers of price formation (climate shocks, wars, political conflicts, pandemics). For instance, the CFTC

releases only weekly data on trading positions, although daily data exist.

2. Put policy emphasis on **keeping food markets open and enhancing cooperation across nations for stock releases**. Countries with significant grain reserves (EU, U.S., China, India) need to counter acute shortages in international food markets and reduce speculative tendencies.
3. Strengthening **regulation of financial trading in food commodities**. All commodity exchanges should establish more harmonized and clearer rules and foster controls to limit the destabilizing influence of high-frequency trading. More transparency and effective implementation of position limits would be helpful.
4. Encourage the **voluntary withdrawal from speculation in food** of banks and other financial institutions such as funds. This should become a criterion of sound corporate environmental, social and governance (ESG) behaviour.<sup>22</sup>
5. Increased **investment in structures and insurance for food system risk reduction** considering resilience strengthening for the entire production and processing elements in the food systems.

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### Endnotes

<sup>1</sup> The distinction between trend, volatility and price spikes is relevant for the policy measures to be taken. Extreme price spikes particularly affect the poor and should be prevented as a priority. The increase in price volatility, and especially that of extreme price spikes, also poses a threat to the political,

economic and social stability and sustainable development of poorer countries.

<sup>2</sup> Kornher and von Braun 2022. [Higher and more volatile food prices – complex implications of the Ukraine war and the Covid-19 pandemic](#). ZEF Policy Brief 38.

<sup>3</sup> Tadesse, Algieri, Kalkuhl, von Braun (2014). Drivers and triggers of international food price spikes and volatility. Food Policy, 47, 117–128. und Algieri (2016). Conditional price

volatility, speculation, and excessive speculation in commodity markets: sheep or shepherd behaviour? International Review of Applied Economics, 30(2), 210–237.

<sup>4</sup> G7 Extraordinary Agriculture Ministers' Meeting. [Statement on the invasion of Ukraine by armed forces of the Russian Federation](#)

<sup>5</sup> Minter A. (2022). [One Reason for Rising Food Prices? Chinese Hoarding.](#)

<sup>6</sup> Algeri (2018). [A Journey Through the History of Commodity Derivatives Markets and the Political Economy of \(De\)Regulation.](#) ZEF Discussion Paper No. 268.

<sup>7</sup> Robles, Torero and von Braun (2009). [When speculation matters.](#) IFPRI Policy Brief 57.

<sup>8</sup> von Huellen (2018). How financial investment distorts food prices: Evidence from US grain markets. Agricultural Economics 49(2):171-181.

<sup>9</sup> von Braun et al. (2014). ZEF Policy Brief 26. [Food Price Volatility - Implications for Development Policy.](#) Please also refer for technical terms.

<sup>10</sup> World Federation of Exchanges. Annual Statistical Guide.

<sup>11</sup> Kalkuhl, Torero, von Braun (2016). [Food price volatility and its implication for food security and policy.](#) Springer, Berlin.

<sup>12</sup> Agricultural Market Information System (AMIS). More information available at <http://www.amis-outlook.org/amis-about/en/>.

<sup>13</sup> von Braun and Kalkuhl (2012). [Einfluss der Spekulationen auf den Finanz- und Kapitalmärkten auf die Nahrungsmittelpreise und Vorschläge zu deren Eindämmung unter Berücksichtigung der aktuellen EU-Vorschläge.](#) Written statement of the hearing of Prof. Dr. J. von Braun as expert in the parliamentary committee for economic cooperation and development on 27<sup>th</sup> June 2012.

<sup>14</sup> Reitman and Nabors (2019). [From inception to today: the development of commodity position limits in the United States.](#) DLA Piper. White paper on CFTC position limits.

<sup>15</sup> Section 737 of the Dodd-Frank Act required the CFTC to establish speculative position limits, "as necessary," to prevent price volatility in derivatives markets and key commodities.

<sup>16</sup> Bundesanstalt für Finanzdienstleistungsaufsicht available at [https://www.bafin.de/DE/Aufsicht/BoersenMaerkte/Derivate/PositionslimitsWarenderivate/positionslimits\\_warenderivate\\_node.html](https://www.bafin.de/DE/Aufsicht/BoersenMaerkte/Derivate/PositionslimitsWarenderivate/positionslimits_warenderivate_node.html)

<sup>17</sup> In contrast, more effective is the formalization of OTC trading, which greatly increases market transparency and also improves early detection of market irregularities. However, the complete formalization of OTC trading also reduces flexibility in the choice of financial market instruments. This is an area where trade-offs exist.

<sup>18</sup> Bohl, Siklos, Wellenreuther (2018). Speculative activity and returns volatility of Chinese agricultural commodity futures. Journal of Asian Economics, 54(1), 69-91.

<sup>19</sup> Martins-Filho, Torero, Yao (2018). Nonparametric Estimation of Conditional Value-at-Risk and Expected

Shortfall Based on Extreme Value Theory. Econometric Theory 34(01):23-67.

<sup>20</sup> The CFTC has developed three reports: the Commitments of Traders (COT) report, the Supplemental Commitments of Traders (SCOT) report and the Disaggregated Commitments of Traders (DCOT) report. The correspondence between reports however is not precise and there is not much transparency on some trader categories. Initially, the CFTC published the COT report, in which traders were categorized in hedgers (commercials), speculators (non-commercials) and non-reportables. In 2006, the CFTC introduced the SCOT report, which added a new trader categories to the existing ones.

<sup>21</sup> The speculative pressure index is calculated as the ratio between the sum of short and long positions of non-commercial traders (speculators) and the total open interest or as the difference in non-commercial short and non-commercial long positions divided by total non-commercial positions.

<sup>21</sup> In recent years, several banks and fund companies have declared their intention to refrain from trading in food commodities in the future. These include, for example, Barclays, DZ Bank incl. subsidiary Union Investment, Commerzbank, various Landesbanken, DekaBank of the savings banks and others.

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