

Original Paper

The International Market of Wheat and the Food Security

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Abstract

The article reveals the situation at the international market of wheat in retrospective period with a stress on the previous three years. It examines the connections between the initial indicators such as production, consumption, export, import, stocks, etc. Derivative indicators are studied in order to find export orientation and import dependency at the wheat market. The ratio between the supply and the demand is calculated and the functioning of the market mechanism is explained. The balance method is applied which is very adequate for empirical proof of the interaction between supply, demand, and prices. The fluctuations of international prices of wheat are explained on the basis of the results from the calculations. The prices can be considered as one of the best indicator for studying and forecasting of the market situation. A short-term forecast for the future development of the market and market prices is prepared. The most vulnerable up-to-date issues of the food security are discussed and recommendations are made, because the agricultural products are very important for the life of human beings and are of great concern of the policy makers. The methodology, the research methods, and the results will enrich the existing knowledge in this sphere.

Keywords

markets of wheat, prices of wheat, wheat forecast, food security

JEL: O13, Q02

1. Introduction

During the pandemic a disruption in the supply chains appeared. It was connected with a sharp increase in the freight rates which influenced the transport cost and even the ability to find vessels for hiring. On the other hand, a state nationalism has embraced almost all countries around the globe. The world realized that there was a strong interdependence and many countries could not survive without a fair international trade.

After the start of the war in Ukraine the prices of wheat rose significantly (as well as the prices of many other commodities) and questions about the short-term food security appeared. For 2020 China is the top number one producer of wheat, followed by India, the Russian Federation, the USA, France, Canada, Germany, Pakistan, Australia, Ukraine (World Economic Forum). And the most vulnerable countries again appeared to be the developing ones and especially those that do not have conditions for growing up wheat. Threats for upcoming hunger started to appear from different sides. In fact, the situation during the spring of 2022 was very nervous.

In March 2022 the prices of many products and commodities reached their highest levels. For example, the Food Price Index of Food and Agricultural Organization (FAO) averaged 159.3 points in March, up 12.6 percent from February and reached its highest level since its inception in 1990 (FAO, 2022). After the highest level ever FAO Food Price Index started to post several consecutive months of decline. In February 2023 the Index reached 129.8 points which was 0.6 % lower compared to January 2023 and 18.7 % lower compared to March 2022 (FAO, 2023), but the inflation in food prices remains.

The situation with the production and consumption, as well as with the prices started to calm down after the new harvest in the autumn of 2022. But the markets are very sensitive and any information (even false one) could disrupt them.

The main goal of the article is to correctly assess the situation at the international market of wheat on the basis of the empirical data. Furthermore, the task is to calculate the balance between the supply and the demand and to find out their connections with the prices. A short-term forecast for the market situation is prepared and the guarantees for short-term food security are proposed.

2. Literature Review

The problems of the development of international market of wheat and the food security are in the focus mainly of such organization as FAO, The World Bank (WB), and International Grains Council (IGC) in their periodical news and publications.

IGC publishes 'Grain Market Report' which deals with the current market situation and gives empirical data. FAO issues 'Statistical Yearbook' where information about production, trade and prices of commodities can be found, as well as about food security and nutrition and sustainability and environmental aspects of agriculture. The issues are connected with the rise of hunger, the prevalence of undernourishment, the prevalence of food insecurity, dietary energy supply, increase of obesity, etc. The recommendations, which are made, are usually for long run implementation or will have effect in the long-term period and can be found in FAO, 2022, Statistical Yearbook. World Food and Agriculture. The WB publishes monthly updates of prices of food and agriculture commodities and the publications are in the spheres like 'future of food', 'repurposing agricultural policies and support', 'addressing food loss and waste', etc. (WB, 2023).

The United States Department of Agriculture publishes 'Grain: World Markets and Trade'. This monthly report includes data on U.S. and global trade, production, consumption and stocks, as well as

analysis of developments affecting world trade in grains. It covers wheat, rice and coarse grains.

There are some separate publications which deal with the international market of wheat but for a period far from now or with the market in one specific country. The food security is a topic which is discussed in other publications but with a long-term focus.

The focus of the article will be on the current situation at the international market of wheat, on the short-term forecast, and on the food security problem now as perceived by the author. At the moment the author considers food security as actions to deal with:

- the difficulties of farmers in growing up and selling their produce;
- the high inflation of food products;
- the malnutrition and lack of deliveries to poor countries.

The latter is connected with the situation at the world commodity markets, with the lack of cheap fertilizers, with refuse to grow up plants, and with turbulences along the supply chains.

3. Methodology

The research method is based on the so-called 'Balance Method' which main purpose is to define the supply and the demand on specific commodity market and to compare the results with the dynamics of the prices of this certain commodity. After that a forecast for the situation in short-term period can be made.

The 'Balance Method' means to calculate the supply and the demand according to the following formulas:

Supply=production + import +stocks at the beginning of the season

Demand=consumption + export +stocks at the end of the season

The import is in fact the supply from the international market while the export is the demand at the international market.

When we compare the supply and the demand we can find out whether there is a deficit or a surplus at the specific market. If the supply surpasses the demand, there is a surplus or the so-called buyers' market when the buyers are in more favorable position and the prices are falling.

If the demand exceeds the supply, there is a deficit or sellers' market and the prices start to increase. So we can forecast what will be the movement of prices in the next year if there are no force majeure reasons.

By applying the balance method, we can trace in retrospective period whether the market mechanism was functioning properly which means whether the prices are determined only by the interaction between the supply and the demand. If for example, we have a surplus and the prices are not falling that means that there are other more important cyclical, long-term non-cyclical, or short-term factors and we can find them and try to predict their influence.

In some cases, we have approximate equal quantity of supply and demand and this market situation is called a balance market.

By applying the balance method, we will try to find the situation at the international market of wheat and what will be the influence on the food security on a global scale.

The data predominantly is taken from the website of International Grains Council which is the most representative one for the international market of wheat.

4. Results

A brief overview of the international markets of wheat, maize, soybeans, and rice as a whole can be found in Table 1.

Table 1. Initial Market Indicators in the Period 2018/19 – 2022/23

m. tons	2018/19	2019/20	2020/21	2021/22 (est.)	2022/23 (f' cast)
Opening Stocks	649.0	622.8	615.5	602.0	597.6
Production	2144.6	2192.7	2227.1	2290.5	2248.2
Imports	364.7	396.7	425.8	423.8	407.4
Total Availability	2793.6	2815.5	2842.7	2892.5	2845.8
Food	720.6	731.6	745.2	750.4	753.5
Feed	964.3	991.6	1008.4	1040.5	1013.7
Industrial	368.5	356.9	359.9	369.1	366.0
Other	117.3	119.9	127.3	134.9	133.2
Total Consumption	2170.7	2200.0	2240.7	2294.9	2266.5
Exports	364.7	396.7	425.8	423.8	407.4
Ending Stocks	622.8	615.5	602.0	597.6	579.3

Source: International Grains Council, <https://www.igc.int/en/markets/marketinfo-sd.aspx>, (as of March 17th 2023)

Note. 2021/2022 estimation and 2022/2023 forecast

For agricultural products the information is for agricultural year which starts on October the 1st and ends on September the 30th. The agricultural cycle differs from the business cycle because the consumption of agricultural products decreases with lower rate compared to the other products during a crises or a recession and increases with lower rate during the recovery. It is connected with the possibility to consume. Another reason is that some agricultural products can start to give fruits after two or more years.

A slight increase in the production and the consumption can be traced for the observed period. For 2022/2023 a decrease in all indicators is expected. The updated forecast of IGC for production in the current agricultural year is raised by 2 m. tons (as of March 17th 2023). The conclusion is that the production is always less than the consumption during the period 2018/2019 – 2022/2023.

The focus is now at the international market of wheat (Table 2). It can be stated that for the 3-years retrospective period there is a slight increase in all indicators, including the production and the consumption. The trend is almost the same and the expected quantities will increase slightly for 2021/22 and for 2022/23. The projections of IGC for agricultural year 2022/23 are for 2.0 % increase in the production and for 0.75 % increase in the consumption, which can be considered as a positive trend in order to balance to some extent the two spheres of reproduction. Another interesting fact that should be mentioned is that IGC expects increase in the ending stocks as of September 30th 2023.

Table 2. Initial Market Indicators for Wheat in the Period 2018/19 – 2022/23

m. tons	2018/19	2019/20	2020/21	2021/22 (est.)	2022/23 (f' cast)
Opening Stocks	266.3	259.2	274.7	277.0	274.8
Production	732.1	760.8	773.8	781.1	796.1
Imports	168.9	185.5	189.7	196.7	196.6
Total Availability	998.4	1020.0	1048.6	1058.1	1070.9
Food	519.4	524.2	533.6	545.2	545.6
Feed	138.5	135.2	149.8	147.0	150.1
Industrial	24.4	24.4	23.3	24.2	23.6
Seed	36.5	37.1	37.9	38.1	37.8
Other	20.4	24.4	26.9	28.8	32.1
Total Consumption	739.2	745.3	771.6	783.3	789.2
Exports	168.9	185.5	189.7	196.7	196.6
Ending Stocks	259.2	274.7	277.0	274.8	281.7

Source: International Grains Council, <https://www.igc.int/en/markets/marketinfo-sd.aspx>, (as of March 17th 2023)

Note. 2021/2022 estimation and 2022/2023 forecast

Table 3. The Supply/Demand Ratio for Wheat ('Balance Method' Applied)

m. tons	2018/19	2019/20	2020/21	2021/22 (est.)	2022/23 (f' cast)
Supply (S)	998.4	1020	1048.6	1058.1	1070.9
Demand (D)	1167.3	1205.5	1238.3	1254.8	1267.5
S-D	-168.9	-185.5	-189.7	-196.7	-196.6

Source: Author's calculation

Note. 2021/2022 estimation and 2022/2023 forecast

Although there is a relative balance between the production and the consumption, when applying the balance method, we can see that there is a constant deficit at the international market of wheat. The

production is increasing but the necessities also increase. So we observe a seller's market and the prices should increase throughout the years. One of the main reason is the increase of the population on the planet, and another is the extravagant consumption of the so-called 'West'. When deficit increases the prices also increase. So if countries compete for purchase of wheat the winners will be always the rich ones. It deprives the poorest country from the access to international market of wheat and they can rely only on the mercy of developed countries for some concessions, but the result is always lower quality of wheat.

Table 4. Derivative Indicators for the International Markets of Wheat

m. tons	2018/19	2019/20	2020/21	2021/22 (est.)	2022/23 (f'cast)
Export orientation	0.23	0.24	0.24	0.25	0.24
Import Dependency	0,22	0,24	0,24	0,25	0,25

Source: Author's calculation

Note. 2021/2022 estimation and 2022/2023 forecast

The indicator 'Export orientation' (Note 1) shows the percentage of production which is exported. In the period 2018/2019 – 2021/2022 a slight increase is observed. For the current agricultural year there will be a small decrease.

The indicator 'Import dependency' (Note 2) shows the dependency of the consumption from import. There is a constant increase in this dependency, although the percentage changes are small.

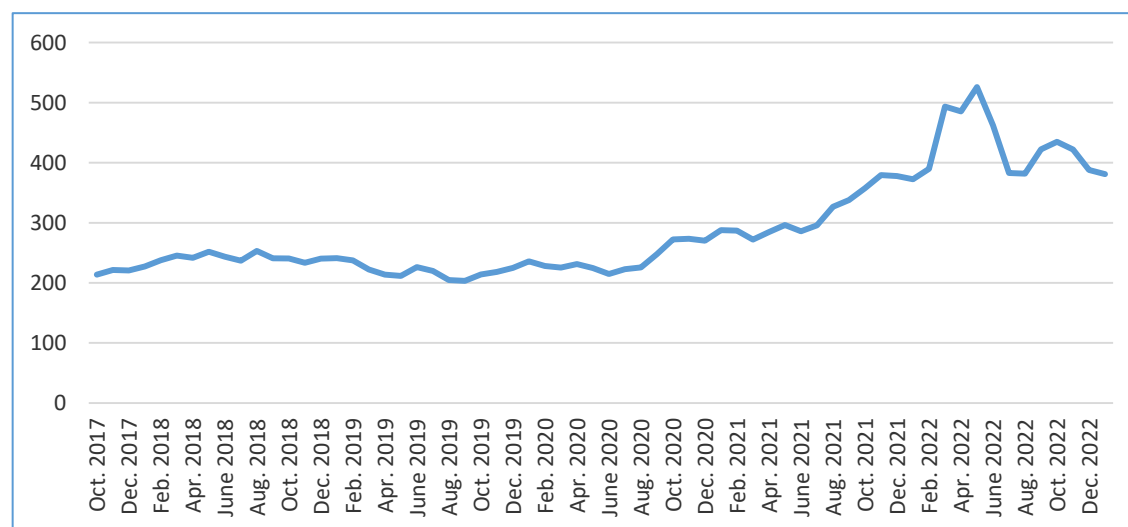


Figure 1. The Prices of Wheat for the Period October 2017-December 2023 (US dollars/ton)

Source: <https://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx>, (The figure is made by the author).

Note. The quotation - Wheat, United States, n °2 Hard Red Winter (ordinary), FOB Gulf (\$/t).

Although the short-term movements up and down we can track that the trend in the prices of wheat is to increase which can be explained by the constant market deficit. In 2017 the price was below 215 US dollars/ton while in January 2023 it is close to 382 US dollars/ton. There is also seasonality in the price movements of wheat - the prices are higher before the harvest, they are lower immediately after the harvest, and start to grow in December if there are not some force majeure reasons.

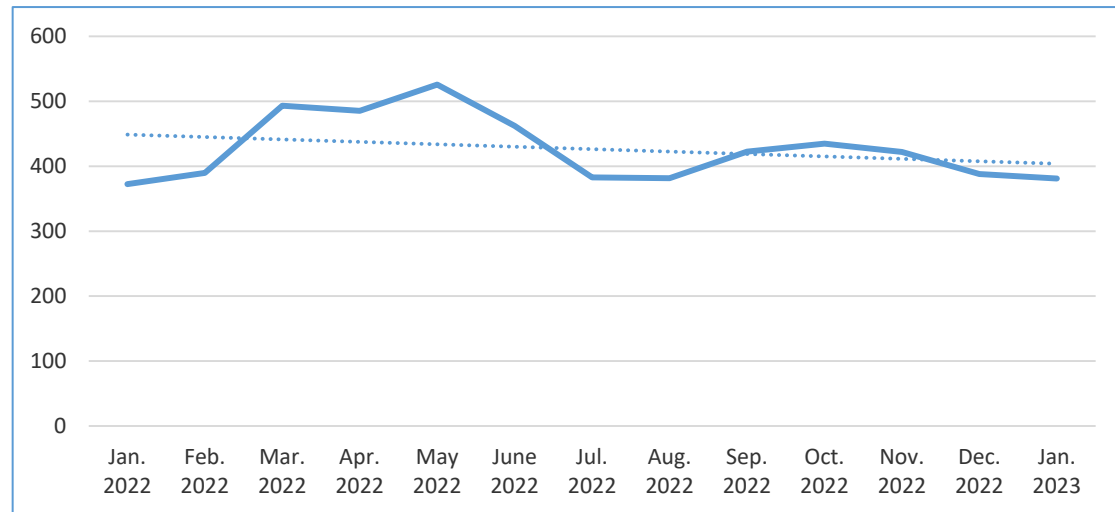


Figure 2. The Prices of Wheat for the Period January 2022-January 2023 (US dollars/bushel)

Source: <https://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx> (The figure is made by the author).

Note. The quotation - Wheat, United States, n^o 2 Hard Red Winter (ordinary), FOB Gulf (\$/t).

After the start of the war in Ukraine there were worries that the lack of wheat from Ukraine will lead to dramatic shortages. This led to enormous increase in the prices. Some governments banned the export of wheat and deprived the producers from posting a profit. But we can see a stable trend of price decrease after October 2022. Nowadays the warehouses are full and the new harvest in the Northern hemisphere will start in a few months which can lead to further decrease in the prices.

We can conclude that the market mechanism is working properly because there is a constant deficit and the prices increase. But there are also short-term factors, speculative factors, or random factors which could not be predicted but cause volatility in the price movements.

5. Discussion

The international market of wheat is unbalanced and there is a constant deficit. The latter means that this market can be defined as sellers' market where the sellers are in more favorable position. The sellers can insist on higher prices and the buyers are willing to purchase. Excluding the short-term fluctuations there is an upward trend in the prices which make the access of the poor and the developing countries more and more difficult.

Starting from 2017 we can state that a new ‘super cycle of wheat’ began with the exclusion of the market situation after the autumn 2022. Nowadays, the international market of wheat to some extent is influenced by temporary measures and some regulations, especially within the European Union (EU). Some countries close to Ukraine were forced to buy wheat, while the national produce is in the warehouses. It is not a market behavior at all because the wheat from Ukraine doesn’t meet the EU requirements. At the same time high quality wheat is in the warehouses.

Having in mind the current trends and conditions the price of wheat will remain at the same level or a little bit lower at least till the end of the calendar year. One of the main reason is that there are high levels of stock and with the new harvest an oversupply will be formed. Concerning the long-term movement of prices, they will continue their upward trend without some drastic changes. The reason is that the consumption will continue to increase.

The situation connected with the food security is far more complex. First, it becomes clear that the poor countries have access only to low quality wheat. Second, the production and the consumer inflation make it very difficult for farmers to seed and to grow up wheat due to the higher prices of energy resources and fertilizers, as well as to the pressure to increase wages. Third, the supply with wheat and wheat products becomes a problem not only for poor countries, but also for the UK and for some members of the EU. Fourth, the malnutrition continues to rise and many countries from the less-developed world are facing serious problems.

6. Recommendation

Some measures that can be undertaken to increase the food security in short-term period:

- to support farmers who export to poor countries with some kind of subsidies in order not to go bankrupt under the pressure of high prices of fuel, electricity, and fertilizers;
- to develop more fair schedule and programme for wheat supplies to countries who suffer difficulties (offering postponed payments or some kind of barter);
- to apply joint measures to lower inflation which is not only a result of the war in Ukraine, but also due to supply chains disruptions, increased demand, and not enough supply;
- to return to fair and free international trade and to some extent to lower the sanctions on the Russian Federation – those which are connected with the agricultural products and their production and sale;
- to guarantee free access for products from developing countries to the markets of the developed ones;
- to increase the financial help from international organizations and from the developed countries.

It should be difficult to take such decisions in times of crisis but the war in Ukraine is not the only one serious world issues. The pandemic, the inflation, the low economic growth, and the fears of recession follow one by another and people from poor countries will suffer the most. The world should unite like the joint efforts of G-20 during and after the previous crisis in the period 2007-2009. Nowadays, in one strongly divided world the measures will have little positive effect.

7. Conclusion

In 2023 a recession or low economic growth will emerge for most of the developed countries. The Organization for Economic Cooperation and Development points out that only the UK and the Russian Federation will suffer negative GDP growth rate, but the data and the signs show that the USA and other countries can witness a decline in the economic activity. Nevertheless, the demand for agricultural products (including wheat) will remain stable and can even increase.

In the short-term an oversupply will be formed at the international market of wheat, if there are not some extreme weather conditions. The latter means that the prices of wheat will remain at the current level or may decrease a little. In a long run there will be a steady trend of increase in the prices of wheat which will be influenced not only by the inflation, but also by the high demand. The import dependency will start to increase, while the export orientation will start to decrease.

The food security in the short-term can be achieved only by joint efforts of the whole world in order to reduce inflation, to support farmers, to increase the financial help for purchase of wheat by poorest countries, and to return to the model of free international trade. The wheat is traded at Commodity Exchanges, which means that the volatility and sensitivity is very high. In order to be prevented from an unexpected sharp increases a mechanism for a pause in the trade should be introduced. The latter should be applied to all commodities which are of great importance for the food of the ordinary people.

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Notes

Note 1. Export orientation=Export/Production

Note 2. Import dependency=Import/Consumption