THE RUSSIAN INVASION OF UKRAINE: AGRICULTURAL BACKGROUND, DEVELOPMENT AND IMPLICATIONS

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From an agricultural perspective, both Ukraine and Russia have an interesting economic and agricultural development: First of all the breadbasket of Europe, later stagnation due to planned market economy, then new growth and large exports after the collapse of the Soviet Union, playing an important role in previous food crises - and now participants in a major political and military conflict with major potential consequences.

Russia and Ukraine are both major agricultural countries, and the war between the two countries has greatly affected the international markets for agriculture and food illustrated by rising prices and price volatility.

Both countries have again become very important exporters of cereals, and they have both previously had a significant impact on global food crises - in particular in 2010-11. Ukraine having favorable conditions for crop production has an important position in both the short and long term when it comes to supply of agricultural commodities on the international markets.

Keywords: Ukraine, Invasion, Agriculture, Development, Food crisis, Breadbasket.

Purpose

The Russian invasion of Ukraine in February 2022 was of great importance from both geopolitical, military and agricultural perspectives. Ukraine - and for that matter also Russia - are important exporters of cereals in particular, and the crisis between the two countries can to have a major impact on international agricultural markets.

The purpose is thus to identify the significance of agriculture and recent development of agriculture in Ukraine as a basis for assessing the potential impact of the invasion in the short and long term. The purpose is also to shed light on developments in Russian agriculture in relation to the possible effects of the war and of the sanctions.

Introduction

Russia and Ukraine are both major agricultural countries, and for that reason the invasion and war have already had a major impact on the international agricultural and food markets. The mere risk or fear of a decline in world grain supply due to Russia's invasion have caused prices to rise. The war has already led to price increases, but the political developments and the long-term effects on the markets are inherently very difficult to predict. However, less trade, additional sanctions, more economic uncertainty and instability in the international agricultural markets are likely consequences - also in the slightly longer term. However, the fact that Russia is an important exporter of both grain and energy gives the country a special position in a time of more expensive energy and more expensive food. More expensive energy will also push up agricultural and food prices.

The present significance of agriculture in Russia and Ukraine

Today, Russia is the world's largest exporter of wheat, and Russia and Ukraine together account for 28 per cent of the total wheat exports in the world, and 15 per cent of the total wheat production. Also when we look at all cereals in total - including for example maize and rice - the two countries have an important position, cf. Table 1.

Table 1. Russia's and Ukraine's shares (per cent) of total world exports and production (2020)

	World export of			World production of		
	wheat	cereals	sunflower cake	wheat	cereals	sunflower oil
Russia	**18,8**	**8,8**	**17,9**	**11,3**	**4,3**	**27,0**
Ukraine	**9,1**	**10,1**	**50,8**	**3,3**	**2,2**	**29,1**
Russia+Ukraine	**27,9**	**19,0**	**68,7**	**14,4**	**6,5**	**56,1**

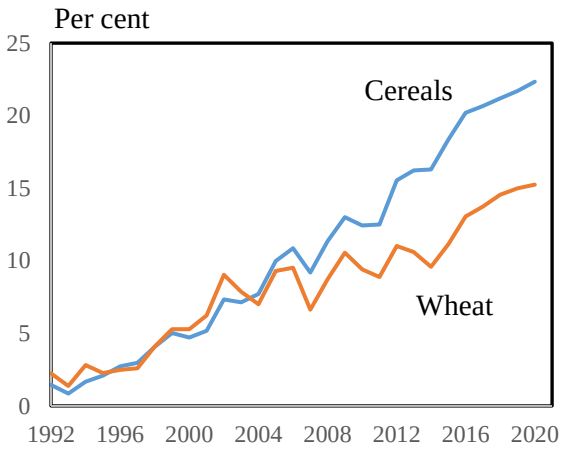
Source: Own calculations based on FAO (2022a)

As the table shows, Russia and Ukraine together have 19 per cent of the total exports of cereals in the world, and 6,5 per cent of total production of cereals. The countries are especially important when it comes to protein crops like sunflower. According to IFPRI (2022) their exports represent 12 percent of all the food calories traded in the world.

Ukraine: 25 per cent of Europe's exports

Not least from a European perspective, Ukraine's export of wheat and cereals play a large and increasing role. Ukraine has an increasing share of Europe's total exports, and in recent years the share has risen to almost 25 per cent, cf. Figure 1.

Figure 1. Ukraine's share of Europe's total export of wheat and cereals



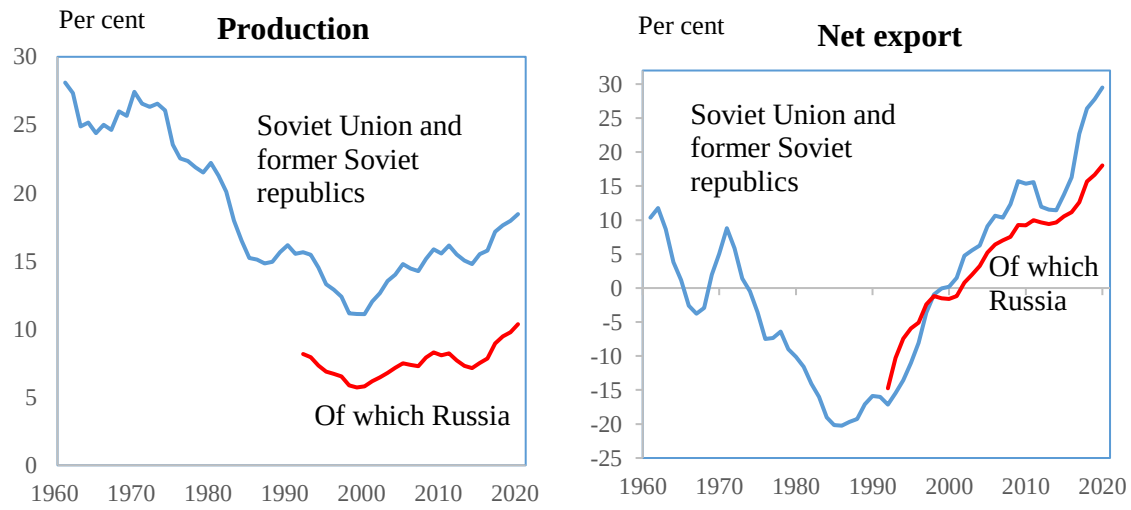
Note: 5 years moving average
Source: Own calculations based on FAO (2022a)

In 2021, Ukraine exported cereals worth 11,8 billion USD. The largest export market was China, which accounted for more than 20 per cent of Ukraine's export of cereals. Ukraine and the United States together account for approx. half of China's import of cereals, and China is the world's largest importer of cereals with approx. 9 pct. of the world market. China therefore also has significant interests in the conflict between Russia and Ukraine - especially if the result is a long-term shortage of cereals and high prices.

Decline leading up to the collapse of the Soviet Union

In the 1960s, the Soviet Union was a very important producer and exporter of wheat - among the most important in the world: The Soviet Union was definitely the world's largest producer and at the same time the world's third largest exporter. Subsequently and until the collapse of the Soviet Union, however, wheat production fell. It was not until the mid-1990s that developments began to reverse in the former Soviet republics. It took time to reverse the development because large agricultural areas in Ukraine and other former Soviet republics were uncultivated due to unresolved ownership, and due to limited access to fertilizers, plant protection, infrastructure, markets and capital, cf. figure 2.

Figure 2. Soviet Union's and Russia's wheat production and net exports: Total share of the world



Note: 5 years moving average
Source: Own calculations based on FAO (2022a)

The figure shows the development back from the beginning of the 1960s until today. A 5-year moving average has been calculated to eliminate annual random fluctuations and instead focus on the longer-term trends.

As can be seen from the figure, in the early 1960s, the Soviet Union had 25-30 percent of the world's wheat production. The share fell to just over ten percent around the year 2000, after which it has risen again when looking at the former Soviet republics in total.

Similarly, the trend in wheat exports. In the 1960s, the Soviet Union was a major exporter of wheat, but the importance declined, and around 1990, exports were almost negligible, and instead imports were significant.

The Soviet Union changed from being a major net exporter of wheat to an even larger net importer. In the 1980s, the Soviet Union was the world's largest importer of wheat.

Grain Agreements between the United States and the Soviet Union in the 1970s

The consequence of this development was that in the early 1970s the Soviet Union was not sufficiently supplied with cereals. Two factors in particular were important: first, the country wanted an increase in domestic production of animal products (meat and dairy products), thereby increasing the demand for grain for feed. Secondly, the country's own grain supply stagnated, as the harvest was very poor in both 1971 and 1972 due to unfavorable growth conditions. Therefore, the country had to import significant quantities of cereals.

In 1972 the United States and the Soviet Union entered into the first agreements on large supplies of cereals - the so-called Grain Agreements - in which the United States over a three-year period sent large quantities of grain to the Soviet Union with state aid (Ford 1975; Brada, 1985). Significant political interests were at stake during the negotiations on these agreements. However, a side effect of the agreements came in the form of a significant reduction in world grain stocks, which resulted in a subsequent food crisis.

The United States is losing market share to Russia, Ukraine and Kazakhstan

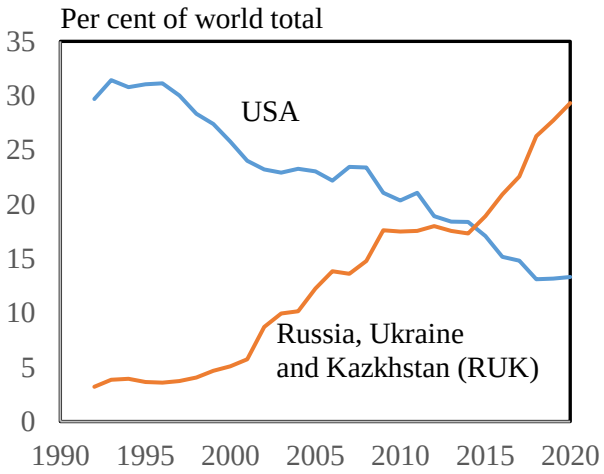
In recent decades, world trade in wheat has shifted: The United States, which for a long time had been the dominant exporter, has now been surpassed by three former Soviet republics together: Russia, Ukraine and Kazakhstan - also known as the RUK countries.

For several reasons the RUK countries are interesting:

- They have great potential in grain production (climate, soil, infrastructure, etc.). Ukraine has long been perceived as Europe's breadbasket due to extremely favorable conditions for crop production (FAO, 2014; 2018)
- They have a rapidly increasing share of world grain production and exports
- They are a major source of uncertainty in the international grain markets due to large variations in the size of production from year to year and due to trade policy interventions.

The development and changes are shown in Figure 3.

Figure 3. Exports of wheat from the RUK countries and the USA, 1992-2020



Note: 5 years moving average
Source: Own calculations based on FAO (2022a)

From major importer to major exporter

After the end of the Cold War and communism, both Russia and the former Soviet republics as a whole have once again become major net exporting countries when it comes to wheat. In recent years, exports have risen again - even significantly - as Figure 2 also showed.

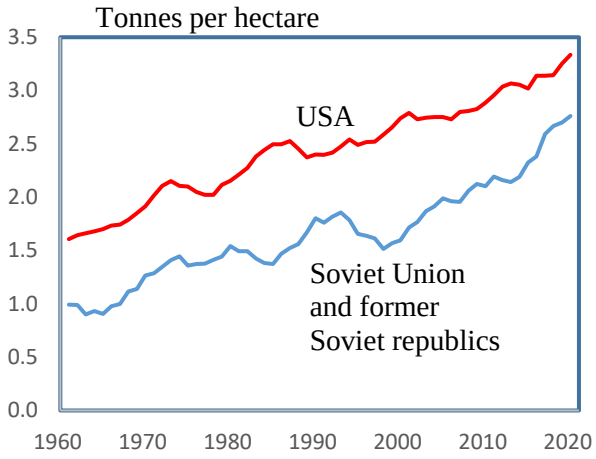
The interesting question is, why could Russia and other former Soviet republics reverse the trend and become major grain exporters after the collapse of the Soviet Union? Several explanations can be identified:

First, the abolition of the communist planned economy and the introduction of a more market economy had a positive effect. Prices were then set based on supply and demand, which stimulated both production and trade.

Second, grain production and yields began to rise again. The market economy and better access to fertilizers in particular led to significant increases in yields.

As can be seen from Figure 4, in the 1990s, the yields of wheat production fell in the former Soviet republics, including Russia as well, while after 2000 there has again been a significant increase.

Figure 4. Wheat yields in the Soviet Union, former Soviet republics and the United States

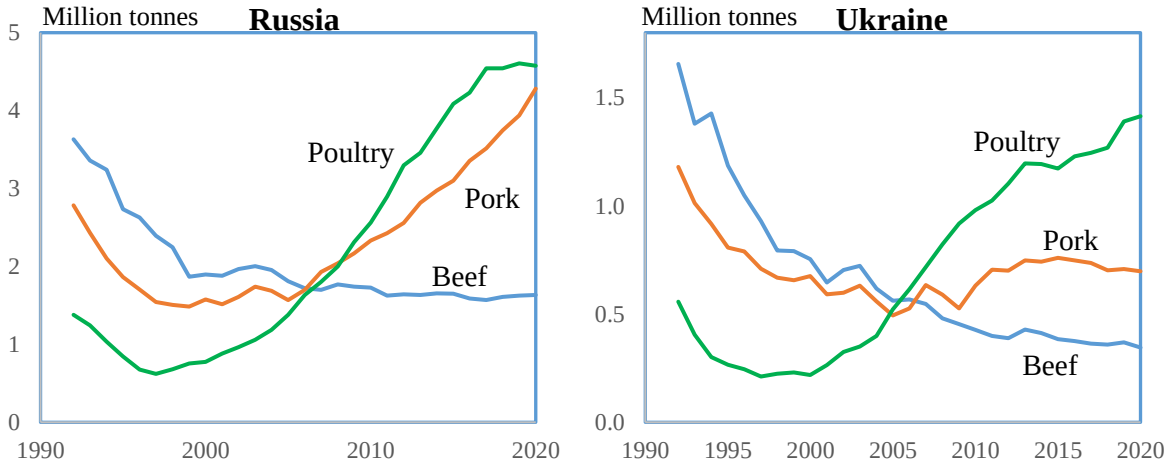


Note: 5 years moving average. Similar developments in the United States are shown in order to compare with an alternative country
Source: Own calculations based on FAO (2022a)

As also shown in Figure 4, the yield gap relative to the United States has decreased since the year 2000. This has also contributed to an increase in production and exports during this period.

Third, livestock production fell sharply after the collapse of the Soviet Union. Thus, the demand for grain and other feed also fell, and at the same time more land was left for e.g. grain production. The livestock and meat the population decreased by almost 50 percent during this period, cf. figure 5.

Figure 5. Developments in meat production in Russia and Ukraine, 1992-2020



Note: 5 years moving average
Source: Own calculations based on FAO (2022a)

With the declining livestock production and also declining demand for feed, grain was released for other uses, and this helped to increase grain exports.

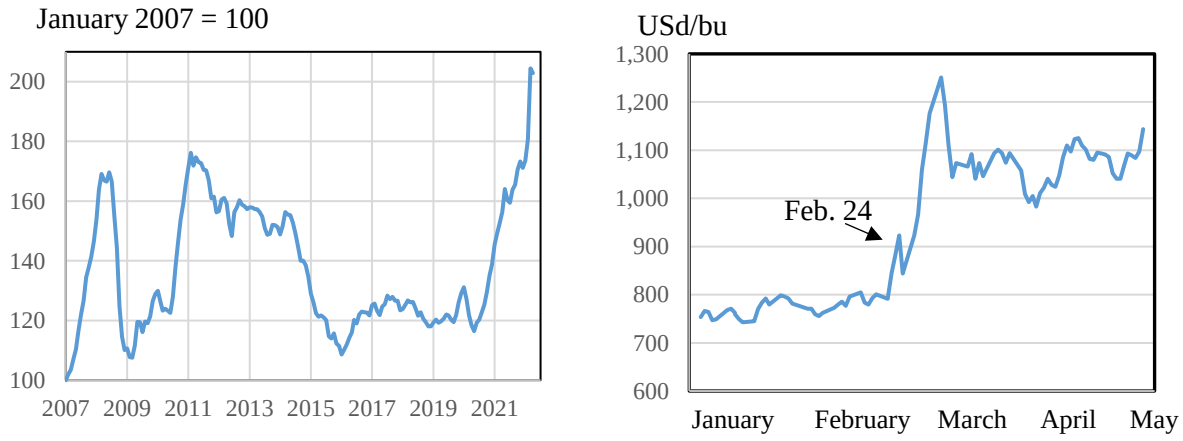
Since 2005, the production of poultry and pork has increased again, and it has further increased due to the Russian sanctions against food exports from among others EU and the United States in 2014. Ukraine has had an almost similar development, but especially the Ukrainian poultry production has increased.

The Ukraine crisis and the food crisis

The Ukraine crisis and the impact on international agriculture is complicated to analyze because the world was already in a so-called global food crisis before the Ukraine crisis began. In this context, a food crisis is defined as a period of sharply rising and uncontrollable prices for agriculture and food. Food crises are often global, affecting large parts of the world. Farmers - specifically crop producers - are experiencing short-term benefits from rising prices, while consumers, especially in poor parts of big cities, are suffering from more expensive food. For that reason, food crises can lead to unrest and riots in these areas.

Since 2007, two major "price bubbles" or food crises have been observed, and with the latest developments, we are entering the third food crisis. To illustrate this, Figure 6 shows the development of a weighted price index for a number of agricultural products since 2007, as well as the daily wheat price on Chicago Board of Trade in 2022.

Figure 6. Price index of agricultural commodities, January 2007 to April 2022, as well as wheat price on the Chicago Board of Trade in 2022.



Note: The price index for all agricultural products is calculated as a weighted average of international prices of cereals, vegetable oils, sugar, meat and milk. In total approx. 90 price series are included in the price index.

Source: Own presentations based on FAO (2022b) and Trading Economics (2022)

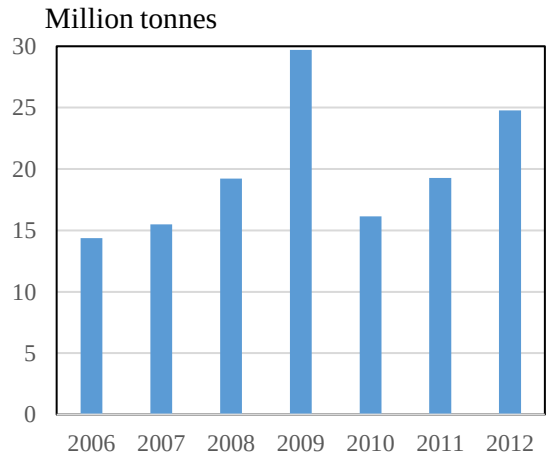
The figure shows a sharp increase in international prices of agricultural products since July 2020. From August 2020 to January 2022 (before the Russian invasion) the prices of agricultural commodities had increased by 45 per cent. It illustrates that several factors contributed to creating the high prices of agricultural commodities in 2022.

The food crisis of 2010: Russia and Ukraine

The recent global food crisis of 2010-11 arose to a certain extent due to Ukraine and Russia in particular - and in part also the other former Soviet republic, Kazakhstan. This food crisis was not due to political problems, but rather to an extensive drought in the three countries. The drought in Russia was the worst in the country for 130 years, and together with subsequent fires, it led to major reductions in the wheat production and exports. As the countries were already relatively large exporters, this also affected world market prices significantly.

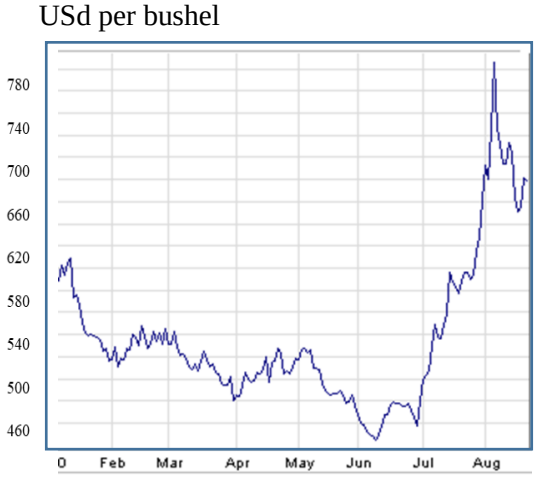
Figure 7 shows Russia's and Ukraine's total wheat exports 2006-12. Exports almost halved in 2010. Figure 8 shows international wheat prices in the first 8 months of 2010. Prices rose sharply in July and August - at the same time as the negative outlook for the two countries' wheat production and exports were confirmed.

Figure 7. Russia's and Ukraine's wheat exports



Source: Own presentations based on FAO (2022a)

Figure 8. Development in international wheat price in 2010



Source: Own presentations based on CME Group (2022)

In the past, both Russia and Ukraine have been willing to use drastic trade policy instruments to secure domestic grain supplies. During the food crisis of 2007-08, both countries tried to restrict or even ban grain exports in order to ensure sufficient and cheap domestic grain. In early August 2010, Russia imposed a de facto export ban on cereals.

Conclusion

From an agricultural perspective, both Ukraine and Russia have an interesting history: first Europe's breadbasket, later stagnation due to planned economy, then new growth and large exports after the collapse of the Soviet Union, in the meanwhile an important role in previous food crises - and now participants in a political and military conflict with major potential consequences. The transition from a planned market economy to a market economy has had a major impact on the development and importance of Ukrainian agriculture. The future consequences of the war in Ukraine for international agriculture are very difficult to predict, as they depend on a number of major political decisions and because experience from comparable historical cases is very sparse.

Regardless of geopolitical developments, both Ukraine and Russia are very important players in the international markets for cereals in particular. International grain prices rose significantly immediately after the invasion, and the rise came in a period of already high prices and an incipient food crisis. Ukraine has been - and is currently - a major player in food crises and international price volatility.

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