Economic and Agricultural Impacts of the Russian Invasion of Ukraine

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Purdue Farm Policy Study Group
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Outline

• The importance of Black Sea region and mounting price pressure
• The War in Ukraine is disrupting commodity markets
  • There are winners and losers
• The impact of war is exacerbated in many other ways
  • Adverse weather events
  • Energy sanctions on Russia
• Conclusion
The Black Sea region is an important commodity supplier

Ukraine’s and Russia’s share of global trade, 2018-2020

<table>
<thead>
<tr>
<th>Product</th>
<th>Russian Federation</th>
<th>Ukraine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barley</td>
<td>14.2</td>
<td>12.6</td>
</tr>
<tr>
<td>Maize</td>
<td>15.3</td>
<td></td>
</tr>
<tr>
<td>Sunflower</td>
<td>19.6</td>
<td>4.3</td>
</tr>
<tr>
<td>Sunflower Oil</td>
<td>23.1</td>
<td>49.6</td>
</tr>
<tr>
<td>Wheat</td>
<td>24.1</td>
<td>10</td>
</tr>
</tbody>
</table>

Source: Glauber and Laborde (2022)

Top potash fertilizer producers in 2021

<table>
<thead>
<tr>
<th>Country</th>
<th>Metric tons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>14.0M</td>
</tr>
<tr>
<td>Russia</td>
<td>9.0M</td>
</tr>
<tr>
<td>Belarus</td>
<td>8.0M</td>
</tr>
<tr>
<td>China</td>
<td>6.0M</td>
</tr>
<tr>
<td>Germany</td>
<td>2.3M</td>
</tr>
<tr>
<td>Israel</td>
<td>2.3M</td>
</tr>
<tr>
<td>Jordan</td>
<td>1.6M</td>
</tr>
<tr>
<td>Chile</td>
<td>900.0K</td>
</tr>
<tr>
<td>U.S.</td>
<td>460.0K</td>
</tr>
<tr>
<td>Spain</td>
<td>400.0K</td>
</tr>
<tr>
<td>Laos</td>
<td>300.0K</td>
</tr>
<tr>
<td>Brazil</td>
<td>210.0K</td>
</tr>
</tbody>
</table>

Source: Bloomberg (2022)

Russia’s share in global fuel production (2017)

<table>
<thead>
<tr>
<th>Fuel Type</th>
<th>Russia's Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural gas</td>
<td>18%</td>
</tr>
<tr>
<td>Crude oil</td>
<td>13%</td>
</tr>
<tr>
<td>Refined oil</td>
<td>6%</td>
</tr>
<tr>
<td>Coal and lignite</td>
<td>5%</td>
</tr>
</tbody>
</table>

Source: based on https://energydata.info/
Price pressure has been mounting long before the war.

Source: Kammer et al. (2022)
Russia’s invasion of Ukraine has adversely impacted global agricultural, energy and fertilizer markets:

- Immediate supply disruptions (corn and wheat shipping in Ukraine are blocked).
- Limited opportunities to export grain from Ukraine via rail and road transportation routes.
- Drastic short/mid-term price increases with a potential to sustain in the long-run.

Severe sanctions imposed on Russia and Belarus -> reputational risks for businesses:

- EU has blocked imports of potash from Belarus
- Import energy bans (US, UK, EU). Expected to further strengthened within the next package of sanctions.
- Russia is implementing restrictions on exports of selected commodities, including grains and sugar.
- Other countries are restricting food exports to ensure domestic food security.
Implications for agricultural supply in the Black Sea region

Expected vs Actual exports of wheat and corn from Ukraine in 2021/2022

Source: Patterson (2022)

Expected vs Actual exports of wheat from Russia in 2021/2022

Source: Patterson (2022)
Why grain can’t get out of Ukraine?

• About 20m tons of grain are in storage, as the new harvest begins
  • Ukraine has exported most of its 2020/2021 crop before Russian invasion.
  • Ukrainian ports on the Black Sea are under blockade (the area is heavily mined).
  • Limited storage for the new harvest.

• Infrastructural challenges to export
  • Road and rail routes limit export opportunities (20% of capacity).
  • Railway gauge in Ukraine is 4 inches wider than in the EU.
  • Ukrainian infrastructure is partially damaged.
  • Negotiations on deblocking Black Sea routes for grain export are stalled (+ demining challenge).
The Impact of the War in Ukraine on Global Trade and Investment

Edited by Michele Ruta

The Russian invasion of Ukraine is disrupting global supplies of essential commodities, pushing prices higher, driving trade, and driving down incomes. Russia and Ukraine together account for about a quarter of global wheat exports and 14% of corn exports. Figure 1. Russia produces half of the world’s sunflower oil, while Ukraine is one of the world’s largest food energy suppliers. As the Black Sea region is also a large exporter of fertilizers, the resulting shortages and price increases could translate into negative impacts on crop yields in many regions (FAO 2022).

Figure 1 Russia and Ukraine’s global share of key commodity exports in 2019 (%)
Net agricultural and energy importers are impacted the most

Change in real income in selected countries and regions, percent

Large energy and agricultural exporters could gain

Net energy and agricultural importers are the most vulnerable

Source: authors estimates.
Can the U.S. step up?

Change in U.S. exports, percent

- Wheat: Moderate = 10%, Severe = 16%
- Other grains (incl. corn): Moderate = 8%, Severe = 14%
- Oil seeds: Moderate = 2%, Severe = 4%
- Other crops: Moderate = 1%, Severe = 2%

Change in U.S. output, percent

- Wheat: Moderate = 12%, Severe = 18%
- Other grains (incl. corn): Moderate = 8%, Severe = 14%
- Oil seeds: Moderate = 2%, Severe = 4%
- Other crops: Moderate = 1%, Severe = 2%

Source: authors’ estimates.
The impact of war is exacerbated in many other ways

- Increasing demand following recovery from the Covid pandemic
  - Growing demand for energy, transportation services

- Adverse weather events are impacting yields worldwide:
  - Devastating floods in South Sudan
  - Heat waves in India
  - Droughts in North America and Europe (e.g. France)
  - Drought stress and heat waves in Brazil (heavy crop losses in the Southern region and part of the Brazilian Midwest)

**Food export restrictions put pressure on global food security:**
For instance, India announced in May that it is shutting down all grain exports as a domestic food security measure
U.S. Drought Monitor shows mounting pressure

Data valid: July 5, 2022

Source:
https://droughtmonitor.unl.edu/

Intensity and Impacts

- None
- D0 (Abnormally Dry)
- D1 (Moderate Drought)
- D2 (Severe Drought)
- D3 (Extreme Drought)
- D4 (Exceptional Drought)
- No Data

〜 - Delineates dominant impacts
S - Short-term impacts, typically less than 6 months (agriculture, grasslands)
L - Long-term impacts, typically greater than 6 months (hydrology, ecology)
SL - Short- and long-term impacts
Global drier conditions are observed

Rainfall (percent of average) in the 6 months ending 31 May 2022

Adverse weather impacts crop production perspectives

Energy sanctions are further mounting pressure on economies around the World

Cutting Russia’s fossil fuel exports: Short-term pain for long-term gain

Maksym Chepeliiev, Thomas Hertel, Dominique van der Mensbrugge 09 March 2022

In opposition to the invasion of Ukraine, most OECD countries have announced punshing sanctions against Russia. But the sanctions have not been targeted at Russia’s primary source of foreign exchange – exports of fossil fuels. This column argues that while the short-term impact of restricting Russia’s fossil fuel exports on EU household’s real income would be non-negligible, the long-term cost could be more modest and would be offset by considerable environmental co-benefits. Meanwhile, the extreme impact on the Russian economy would be overwhelming.

On 24 February, Russia launched an unannounced attack on Ukraine, sending its forces on multiple fronts, including minning Ukrainian cities. As the entire Ukrainian nation has entered a period of disruption and the country’s dependence on oil and gas, the situation of the country’s economy is uncertain. Most of the countries of the OECD, including the US, Australia, Canada, South Korea, Japan, the UK and the EU, have announced punishing sanctions against Russia. These include restrictions on financial transactions, freezing assets of Russia’s major banks and selected individuals, banning exports of high-tech equipment to Russia, as well as closing the airspace for Russian flights. Finally, at the time of writing this column is one of the most pivotal events for the Russian economy – sanctions on the export of fossil fuels. This is the country’s primary source of foreign exchange.

This exception is hardly surprising. During 2018, the EU and UK imported over US$171 billion worth of fossil fuels from Russia, with Germany, Netherlands (largely re-exports), Italy, Poland and France among the top ten buyers (at 13%). During earlier periods with higher energy prices, the corresponding import flow was even larger. Indeed, the value of this import flow exceeded US$181 billion in 2019.

Can the EU afford a ban on Russian oil and gas imports?

A panel of expert economists who have studied the impact of a ban on Russian oil and gas on the EU economies will explain their findings on 31/3/2022 from 12:00 to 13:30 at the European Parliament (ASP 122).

Maksym Chepeliiev Purdue University
Ben Moll London School of Economics
Karen Pittel University of Munich
Georg Zachmann Bruegel
Hosted by Luis Garicano MEP and Professor of Economics.
With the participation of Oleg Ustenko, Economic Adviser to President Zelensky

MEPs demand full embargo on Russian imports of oil, coal, nuclear fuel and gas

Press Releases 07-04-2022 - 12:39

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There are winners and losers across the World

**Change in real income by regions, percent**

- Rest of ECA: 6.5%
- Rest of MENA: 1.7%
- Rest of SSA: 2.5%
- Egypt: 0.9%
- Rest of high-income: 1.4%
- United States: 0.7%
- High-income Asia: 0.9%
- European Union: 0.6%
- Russia: 0.0%
- Change in real income, percent: 10.4%

**Change in EU energy imports by source, percent**

- Gas: -12%
- Coal: -10%
- Oil & petrol: -8%

**Scenarios:** Substantial (-80% energy imports from Russia), High (-90%), Severe (-99%).
Reality check: Energy markets are distorted in many other ways

Energy prices have soared since invasion:

- 45% increase in oil prices (w.r.t. 2021) and >60% in natural gas prices (Dutch TTF in Apr w.r.t. Nov 2021).
- *Price pressure has been mounting prior to the War.*
- *(Near) flat supply curve from OPEC.*

- Combined price increases are much higher than from energy import bans only.
- Russian budget is estimated to earn 30% more from energy exports in 2022 than in 2021.
- Price caps on energy exports from Russia are being considered by Western Allies to make sanctions more efficient.

- **Should not expect energy price to decrease substantially in the nearest future.**

Further stress the importance of energy security and decarbonization efforts
Conclusion

• Russia’s invasion of Ukraine has adversely impacted global agricultural, energy and fertilizer markets:
  • Immediate supply disruptions (corn and wheat shipping).
  • Drastic short-term price increases, including energy and fertilizer (would this become a new normal?).
  • Longer-term impacts on planting and harvesting (projected 20%-30% decline in 2021/2022 yields in Ukraine).
  • Infrastructural constraints on exporting grains from Ukraine (sea ports are blocked).

• Opportunities for other countries to step up:
  • War is having devastating impacts on food security (up to 47 million more people could face food insecurity and starvation).
  • Increasing global demand could be expected for wheat and corn, in particular.
  • Situation is complicated by adverse weather conditions around the World.
  • U.S. is one of the countries that could step up by filling the gap in global agricultural supply.
Thank you!

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