



International
Trade
Centre

TRADE EFFECTS OF THE UKRAINE
CONFLICT ON COUNTRIES OF THE
ORGANIZATION OF ISLAMIC COOPERATION

2022



About the report

The Organisation of Islamic Cooperation can expect mixed effects of the conflict in Ukraine, as many of its members are net food importers, while several are also net energy exporters. This report assesses the potential effects in the short and medium term.

Preliminary data for 2022 show a strong immediate negative impact on the food imports of countries of the Organisation of Islamic Cooperation, in particular for cereals, but consistent signs of recovery in later months. Energy exports from countries of the Organisation of Islamic Cooperation performed strongly, as some important markets shift away from Russian supplies.

In the medium term (2025), results show modest impacts on the GDP of countries of the Organisation of Islamic Cooperation, between -0.2% for net energy importers and 0.9% for net energy exporters, who will continue to benefit from additional exports to sanctioning countries. Total food imports are expected to recover in the medium term, however, import volumes of cereals, oil seeds and wheat will decline.

Measures to enhance access to food and diversify trade can improve the current situation and build resiliency against external shocks.

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Foreword by ICDT

The conflict in Ukraine and subsequent sanctions and trade measures have prompted effects on prices, value chains and food and energy markets around the globe.

Against this backdrop, the Organisation of Islamic Cooperation stands at a peculiar juncture. Most of its members, as net food importers, are experiencing first hand disruptions in their food value chains and challenges in accessing food at increasing prices. At the same time, many of them, as net energy exporters, can expect gains from higher energy prices and some markets switching suppliers.

In order to design adequate strategies in response, the government agencies of countries in the Organisation of Islamic Cooperation need to be able to disentangle and gauge the impacts of the conflict on their economies.

For that reason, the Islamic Centre for Development of Trade has commissioned the International Trade Centre to assess the trade consequences of the conflict and ensuing trade measures on countries of the Organisation of Islamic Cooperation, in the short and medium term, and discusses possible risks and paths forward.

The report shows a strong negative shock on the trade of members of the Organisation of Islamic Cooperation in March 2022, incipient recovery in some sectors in later months, and moderate projected effects on their GDP in the coming years. It also highlights three crucial concerns: the diverging experiences of individual members, the continued diminished access to essential food products in many countries of the Organisation of Islamic Cooperation in coming years, and the reinforced dependence on energy exports for some members, increasing their vulnerability to external shocks.

In this context, we invite efforts to reduce remaining food tariffs, facilitate food imports, and address frictions that hinder export growth and value chain development beyond energy products.

The International Trade Centre and the Islamic Centre for Development of Trade stand ready to continue to support the countries of the Organisation of Islamic Cooperation in their path to greater resilience and sustainable development.

Latifa El Bouabdellaoui
Director General
Islamic Centre for Development of Trade

Foreword by ITC

In the past few years, cascading and intersecting crises have hit lives and livelihoods around the world. The widespread effects of the COVID-19 pandemic, climate change and, most lately, the war in Ukraine threaten global progress towards sustainable development.

The war has, of course, been first and foremost a humanitarian, social and economic disaster for the Ukrainian people. A disaster that can scarcely be captured in terms of lives cut short, infrastructure destroyed, refugees flowing into neighbouring countries and years of lost productivity. However, the war has also had far-reaching effects and arguably unprecedented impacts around the world.

For some members of the Organisation of Islamic Cooperation (OIC), the disruptions in food value chains and soaring prices have highlighted their heavy dependence on imported cereals, many of which were traditionally sourced from Ukraine. At the same time, the OIC comprises leading energy exporters that are now facing greater demand in some markets and additional competition in others.

Our analysis in this report presents three potential responses for OIC countries:

First, diversification of trade. For countries dependent on food imports, diversifying suppliers and regional sourcing will increase resilience to shocks and moderate the impact of the crisis on the OIC's poorest. For countries dependent on energy exports, diversifying markets helps to maintain revenue levels. The OIC Trade and Market Intelligence project that the International Trade Centre (ITC) has developed with the Islamic Centre for Development of Trade (ICDT) will help navigate alternatives and find new partners.

Second, value chain development. Increasing income from the energy sector risks undermining many countries' efforts to broaden their export baskets. Developing new, value-added industries will on the one hand shield countries from volatile prices and on the other, generate additional income to cope with rising costs of living. A value chain diagnostic developed jointly by ITC, the African Union Commission and the European Commission shows that this is possible if investments are channelled into growth sectors and bottlenecks are removed.

Third, facilitation of trade. Liberalizing remaining tariffs and facilitating imports would make food more affordable. From our work on tariffs and the business surveys on non-tariff measures, we know that individual OIC countries still have customs duties, regulatory import measures and procedures in place that sometimes unintentionally counteract food security.

Based on the findings of this report, ITC, in partnership with ICDT, will dive deeper into each of these pillars with a study that explores the potential for more trade between OIC member states and the African continent as a whole. This forthcoming study will complement these findings and add an assessment of the impact of the war on these countries, helping to define the areas where trade development partners – including ITC on a global level and ICDT on a regional level – can assist.

Pamela Coke-Hamilton
Executive Director
International Trade Centre

Acknowledgements

Upon request from the Islamic Centre for Development of Trade (ICDT), the International Trade Centre (ITC) developed this report on the trade implications of the conflict in Ukraine on countries of the Organisation of Islamic Cooperation (OIC). The report is meant as a resource for ICDT to better assess the current trade environment and provide recommendations to its members, in particular government agencies.

Cecilia Heuser and Julia Spies are the main authors of the report. Houssein Guimbard implemented the general equilibrium model used in this report and produced tables and descriptions of its results. Yvan Decreux provided guidance and comments. The authors thank Sylvain Périllat, Arushi Vaishnav and Xiaoyu Yan for their valuable research assistance and ICDT experts for their inputs and valuable contribution they have made to enrich this study. The team worked under the leadership and supervision of Mrs Latifa El Bouabdellaoui , Director General of ICDT and Mr. Mondher Mimouni (Chief, Trade and Market Intelligence, ITC).

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Acronyms

Unless otherwise specified, all references to dollars (\$) are to United States dollars, and all references to tons are to metric tons.

CEPII	Centre d'Etudes Prospectives et d'Informations Internationales
GTAP	Global Trade Analysis Project
ICDT	Islamic Centre for Development of Trade
ITC	International Trade Centre
IMF	International Monetary Fund
MFN	Most-favoured-nation
OIC	Organisation of Islamic Cooperation

Executive summary

The conflict in Ukraine and subsequent sanctions and retaliation measures triggered multiple economic effects around the globe. In April 2022, the International Monetary Fund (IMF) revised its global GDP forecast downwards by 1.3 percentage points compared to pre-conflict estimates. While the economies of Ukraine, the Russian Federation and Belarus are expected to contract the most, in other countries fears of rampant price increases, value chain disruptions and shortages in energy and food markets emerged quickly.

The effects of the conflict on the Organisation of Islamic Cooperation (OIC) Countries are mixed as the region depends on food imports while also comprising some of the world's largest energy exporters.

This report assesses the potential trade consequences of the conflict and subsequent trade measures on OIC countries in the short and medium term and discusses possibilities for greater resilience.

OIC countries experienced negative short-term effects on food supplies

With the Russian Federation and Ukraine jointly accounting for 15% of global cereal exports and Russia and Belarus for one fifth of global fertilizer exports, the conflict immediately raised concerns about access to food for the world's poorest. North Africa has the highest level of import dependence for wheat globally —41% of its wheat came from the Russian Federation and Ukraine between 2017 and 2021. Other OIC countries, like Sudan and Yemen also rely heavily on cereal imports and have traditionally sourced a significant share from the two suppliers.

Foregone harvests, destroyed infrastructure, blockage of trade routes through the Black Sea and temporary export bans caused the Russian Federation's and Ukraine's cereal exports to plummet in March relative to pre-Covid levels. In response, cereal prices surged, with wheat prices rising from \$390.5/ton in February to \$522.29.3/ton in May. Data from ten OIC countries indicates that their cereal imports from the Russian Federation were 62% lower in March 2022 than in March 2021. Total OIC imports of food fell by 25% in real terms over the same period.

Following the UN-led Black Sea Grain Deal, as well the lifting of food export restrictions by several countries and other tempering factors, food prices began to decline, and OIC imports of food, including cereals, recovered to levels similar to those of the previous year.

The OIC has shown a strong export performance in energy products since March

Energy prices rose in Europe in response to attempts to reduce oil and gas imports from the Russian Federation. As a leading energy exporter, the OIC competes with the Russian Federation in world markets. The OIC's global energy exports showed a strong performance between March and November with a growth rate of 69% year-on-year, surpassing the 64% increase in prices in the sector. While preliminary data indicates that their share in European markets has increased since March, market share losses can be expected in India and China, which were able to procure Russian oil and gas at discounted prices.

Trade indicators calculated from the monthly data that is currently available hint at a temporary shortage of food and potentially longer-term gains for the OIC's energy exports. However, disentangling and quantifying the potential positive and negative effects requires a comprehensive analysis based on a general equilibrium model.

The OIC's gas exports will trigger moderate GDP and trade gains in the medium term

The general equilibrium model considers both Ukraine's productivity losses and the trade measures adopted in connection to the conflict. The model assumes that factor markets will adjust to the shock and compares the impact of the conflict and subsequent measures to a baseline for the year 2025.

Overall, the impact on OIC economies in 2025 is small. As a group, the OIC could see a modest increase of 0.2% in GDP with small reductions of 0.2% for net energy importers like Tunisia and Albania and increases of up to 0.9% for net energy exporters like Brunei Darussalam.

Export volumes will also show a minor net increase of 0.1%. However, sector-level differences are large, with energy exports expected to increase by 1.4% in volume and 3.2% in value, as additional demand leads to higher prices in global markets, especially for gas. Non-energy sectors will likely see a decline in export volumes. The real appreciation of most OIC currencies and the real depreciation of the Euro will weigh on the competitiveness of the OIC's services sector, which is expected to decline by 1.7%.

Significant negative impacts are expected for food imports

While imports of food, energy, manufacturing and services are set to increase both in volume and value, marked differences exist within each industry. For food products, increases in import volumes are highest for the dairy (2.3%), fishing (2%) and meat (1.5%) sectors. However, import volumes are likely to decline for those products where OIC countries are most reliant on imports and where Ukraine and the Russian Federation have a significant global market share. This is the case for oil seeds (-1.6%), cereals (-1.3%), and wheat (-0.7%). Despite these declines in import volumes, import values will increase as suppliers only partially compensate for the shortfall in Ukrainian production, pushing up prices. As a consequence, essential food items could become less affordable for vulnerable segments of the OIC's populations.

Additional exports to the European Union and Japan will drive gains for the OIC's net energy exporters

Country-level analysis shows changes in exports ranging from -1% for Albania to 3.4% for Tajikistan and Kyrgyzstan, and changes in imports ranging from -0.6% for Pakistan to 7% for Kazakhstan. As with GDP, OIC countries confronted with trade losses tend to be reliant on imported food while those experiencing net gains are generally net energy exporters. They benefit in particular from additional exports to some of the countries, like the European Union and Japan, while energy exports to China, the Republic of Korea, the rest of ASEAN, Türkiye, India and others will decrease as result of price competition from the Russian Federation.

Counterbalancing negative trade effects requires the removal of frictions and diversification of markets

Measures to enhance access to food and diversify exports can help build resiliency against external shocks. OIC countries have options to cushion the effects:

First, price increases for food items risk to cause a humanitarian crisis among the world's poorest. They could be offset by removing remaining tariffs or by facilitating imports of these products. Gabon, for example, which has one of the region's largest trade deficits for food, still levies a 5% most-favoured nation (MFN) tariff on wheat imports. Furthermore, ITC business surveys on non-tariff measures reveal that import measures and procedures sometimes counteract food security, such as Sudan's import bans on food products which were imposed without prior notice and Pakistan's additional 10% regulatory duty on vegetable imports.

Second, the OIC's efforts to diversify its export basket are threatened by the strengthening of the energy sector and the weakening of non-energy sectors. ITC's export potential methodology points to opportunities for export growth and market diversification. According to this methodology, 49% of OIC's export potential in manufacturing remains unused, in part due to trade frictions. Identifying and overcoming such frictions for specific products and markets will help to boost the diversification of OIC exports.

SECTION 1 OVERVIEW OF OIC TRADE

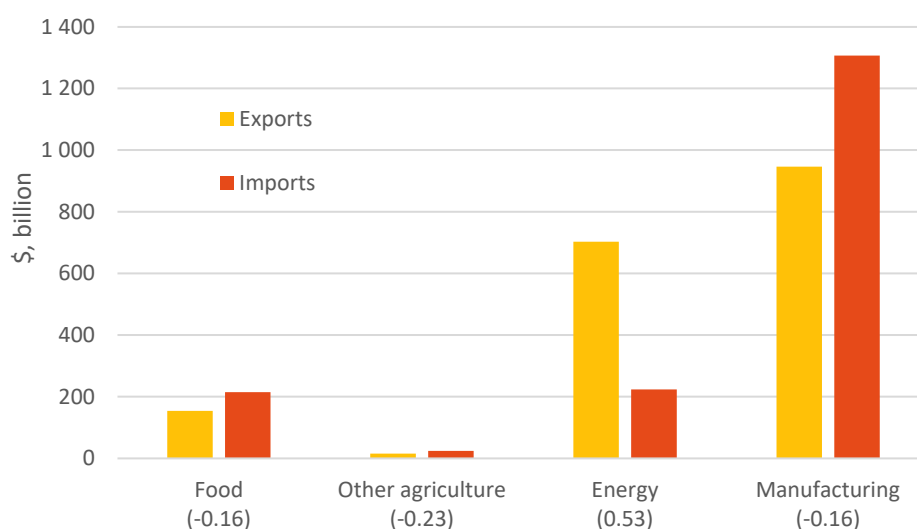
In late February 2022, the start of the conflict in Ukraine unleashed a ripple effect of global scale. The initial impact on the Ukrainian economy was swiftly compounded by sanctions imposed on Belarus and the Russian Federation, followed by the retaliation measures these countries themselves adopted against sanctioning states. The leading position of Belarus, the Russian Federation, Ukraine, and many of the sanctioning countries in several global markets fostered a rapid amplification of effects around the world. Since then, discussions over rampant price increases, value chain disruptions and possible shortages in energy and food markets, among other economic implications of the conflict, have taken centre stage.

In this context, the Organisation of Islamic Cooperation (OIC) Countries, comprising net energy exporters and net food importers, could face positive and negative economic outcomes. Some of the elements that determine whether the overall impact for the OIC is negative or positive are the significance of Belarus, Ukraine, the Russian Federation and sanctioning countries in international markets for certain products, the dependence of OIC countries on exports or imports of these products, and whether OIC's trade partners are directly involved in the conflict, are imposing sanctions or not. The objective of this report is to explore these elements and to quantify the potential gains and losses of OIC countries.

OIC's trade profile: relative dependence on energy exports and food imports

The export and import basket of OIC countries as a group shows some unique characteristics. Most noteworthy is the 40% share of energy products in total exports, compared to 11% globally.¹ Also salient, particularly in the current context, is the 12% share of food in the imports of OIC Countries, while the world's is 7%. In line with these characteristics, OIC countries as a group are net food importers and net energy exporters (Figure 1).²

Figure 1: Exports and imports of OIC countries, by industry



Note: based on average trade flows between 2017 and 2021. For each industry, the net position is shown in parenthesis. The net position is the ratio $(\text{exports} - \text{imports}) / (\text{exports} + \text{imports})$.

Source: Authors' calculations based on the ITC Trade Map (2022) data.

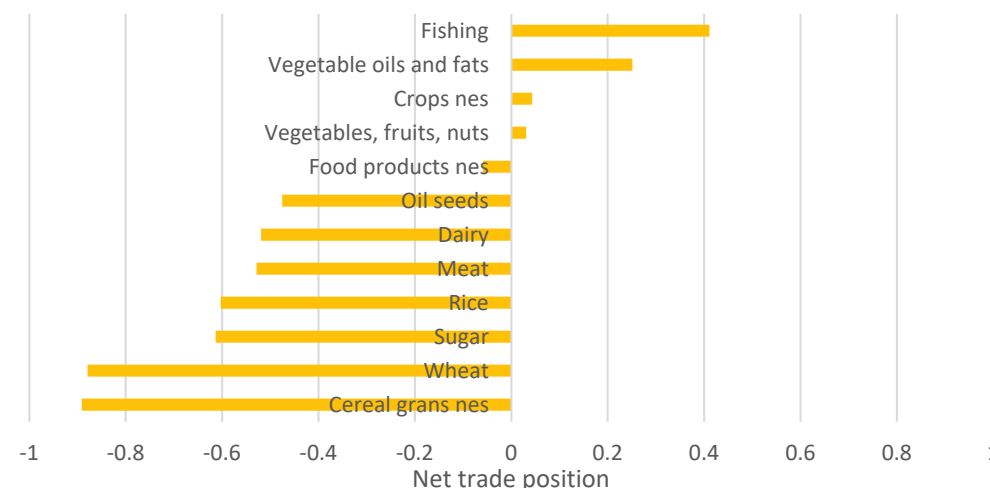
¹ For a definition of food, energy, manufacturing and other agricultural products, see Table A. 2. Note that energy refers to energy, energy products, ore mining and other mineral products.

² The net position is the ratio $(\text{exports} - \text{imports}) / (\text{exports} + \text{imports})$. It ranges between -1 and 1. Negative values indicate that imports are larger than exports (net importer position), and positive values indicate that exports are larger than imports (net exporter position).

High dependence on cereal imports from the Russian Federation and Ukraine

Figure 2 examines the OIC's net position with respect to food in more detail. OIC Countries exports of fish, vegetable oils and fats, some crops, and vegetables fruits and nuts exceed imports.³ However, the OIC Group is also clearly net importer for other food sectors, especially for wheat and other cereal grains.

Figure 2: Net trade position of OIC countries, by food sector

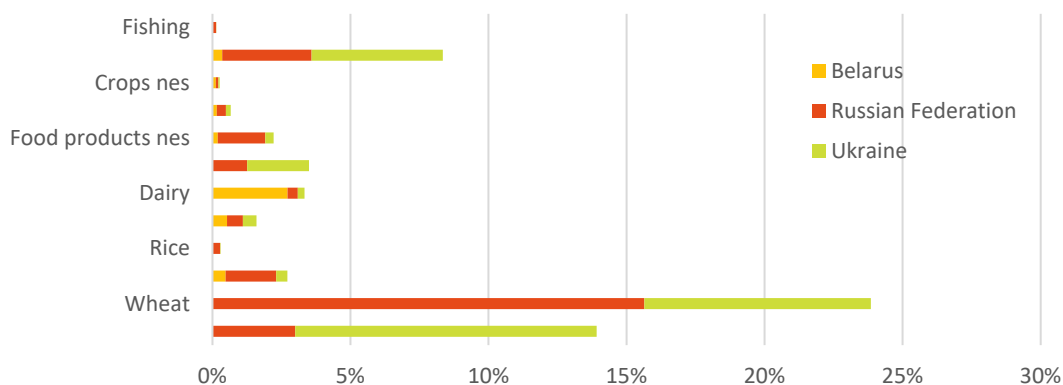


Note: based on average trade flows between 2017 and 2021. For each industry, the net position is shown in parenthesis. The net position is the ratio $(\text{exports} - \text{imports}) / (\text{exports} + \text{imports})$.

Source: Authors' calculations based on the ITC Trade Map (2022) data.

The exposure of the OIC Countries to volatile energy and food supplies is especially relevant in the context of the conflict in Ukraine, given the weight Belarus, the Russian Federation and Ukraine have in global markets for those industries. The Russian Federation holds over 8% of world markets of energy products, while the Russian Federation and Ukraine jointly represent close to 4% of world markets of food. In particular, they jointly make up 24% of world trade of wheat, and 14% of other cereals (Figure 3). In addition, Belarus and the Russian Federation account for 20% of global exports of fertilizers, an essential input for most food products.

Figure 3: Share in world exports, Belarus, the Russian Federation and Ukrainian, by food sector



Note: based on average trade flows between 2017 and 2021.

Source: Authors' calculations based on the ITC Trade Map (2022) data.

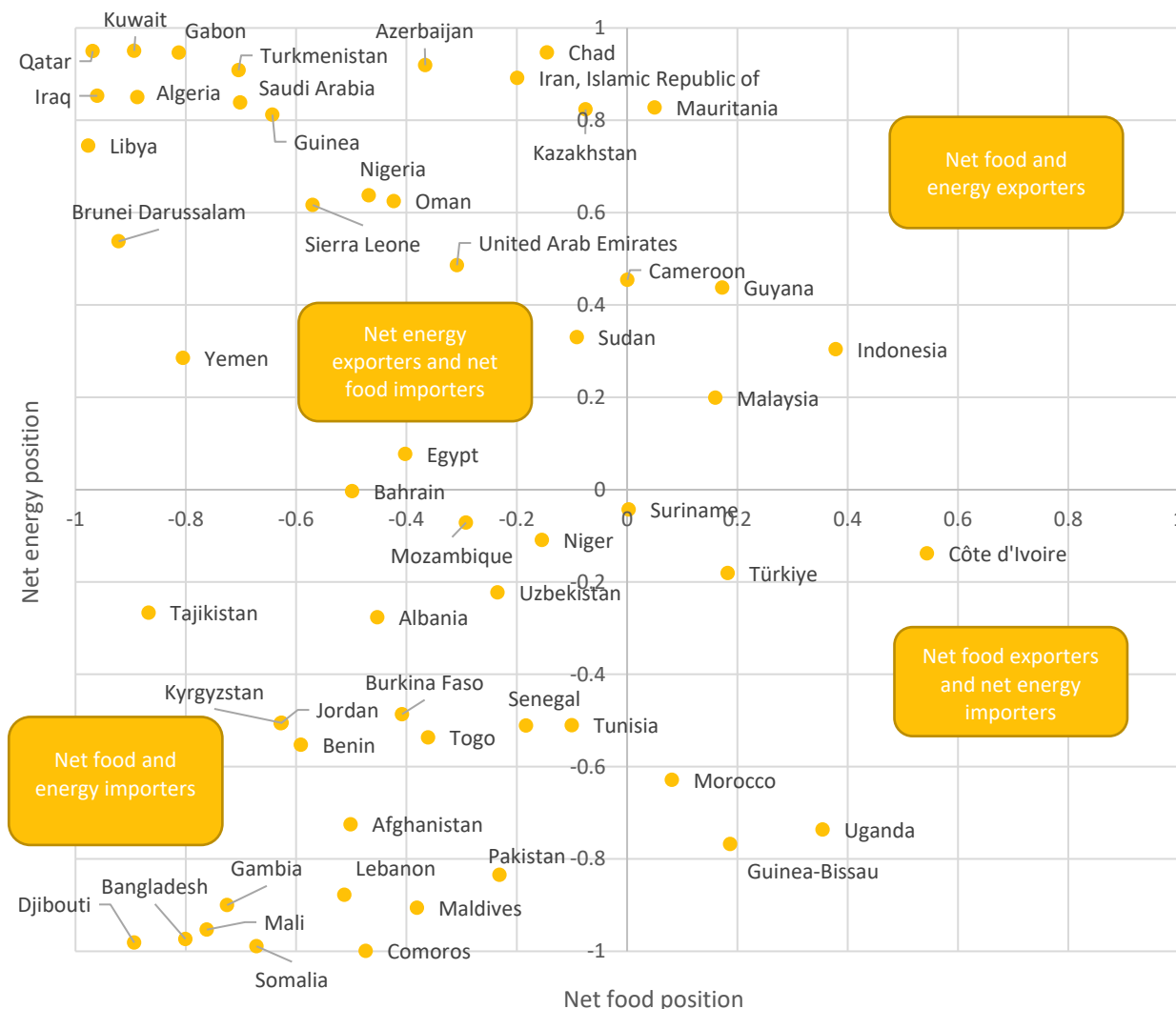
³ The export surplus of the OIC Countries in Vegetable oils and fats corresponds mostly to the trade of Indonesia and Malaysia, the two largest exporters of Vegetable oils and fats (mostly palm oil) in the world, and to a lesser extent to Tunisia (olive oil).

Most OIC countries are net food importers

In general, a country’s net trade of food and energy is closely related to its resource endowments, which are of course not uniform across OIC countries. Consequently, neither are their net trade positions in food and energy products, as illustrated in Figure 4 (for a detailed view per country, see Figure A. 1).

Very few OIC countries, namely Cameroon, Guyana, Indonesia, Malaysia and Mauritania, are both food and energy products net exporters (upper right quadrant of Figure 4). A few others are net food exporters, but net energy products importers: Côte d’Ivoire, Guinea-Bissau, Morocco, Türkiye, and Uganda (lower right quadrant of Figure 4). All remaining OIC countries are net food importers, half of them are net energy products importers (lower left quadrant of Figure 4), and half of them are net energy products exporters (upper left quadrant of Figure 4).

Figure 4: Net trade position of OIC countries for food and energy products



Note: based on average trade flows between 2017 and 2021. For each industry, the net position is shown in parenthesis. The net position is the ratio (exports - imports) / (exports + imports).

Source: Authors’ calculations based on the ITC Trade Map (2022) data.

The trade deficit in food, particularly wheat and other cereals, and the trade surplus in energy products observed in Figure 1 and Figure 2, together with the importance of Belarus, the Russian Federation and Ukraine in international markets for these products, observed in Figure 3, suggest that the OIC Group is likely to experience mixed impacts from the conflict. The heterogeneity between OIC countries in terms of their food and energy products net positions, observed in Figure 4, in addition suggests that impacts within the group will be mixed.

To better understand how its net food and energy positions expose the OIC Group to the economic impact of conflict, the next points investigate the OIC's import and export dependence at the product level.

Nearly all OIC countries depend on imports of wheat and meslin

Figure 1 and Figure 4 illustrated that, to various extents, most OIC countries are net importers of food. To understand in more detail if that position exposes OIC countries to the effects of the conflict and associated trade measures, we analyse product-level information to identify:

- precisely for which products OIC countries are net importers,
- whether Belarus, the Russian Federation or Ukraine play an important role as suppliers in global markets for those products, and
- how important these imports are for the economy of the importing OIC countries.

The first point implies simply listing all products for which the imports of at least one OIC country are larger than its exports. In the second point, that list is narrowed by focusing on products for which Belarus, the Russian Federation or Ukraine represent 5% or more of world exports. This step shortens the product list significantly, to 290 products, out of which 60 are food products.

To understand whether the imports of these food products can channel the effect of the conflict into OIC economies, we assess how important they are for OIC countries. For this, we rely on the concept of *dependence*. To identify dependence on imports of a product, we divide a country's net imports of a given product by that country's GDP. Import dependence on a specific good is higher if a country's trade balance is more negative (imports > exports), or if the trade balance for that good makes up a larger share of the country's GDP, i.e., plays a larger role in the economy.

Figure 5 indicates the extent of import dependence of each OIC country for each of the 60 food products identified. Blank cells show no import dependence, coloured cells show import dependence, ranging from yellow (low dependence) to red (high dependence). The food products, listed on the left, are ordered according to the average import dependence for all OIC countries.

At the top of the list, we find wheat and meslin, sunflower-seed oil, maize, frozen fish, frozen fowls, durum wheat, barley, crude sunflower-seed oil, margarine and peas. Almost all OIC countries are import dependent for these goods, albeit with different intensities. For example, Yemen, Tajikistan, Djibouti, Mauritania and Mozambique highly depend on wheat and meslin imports, while Chad and Brunei Darussalam show moderate levels of import dependence. Kazakhstan, Maldives and Guinea-Bissau are OIC's only net exporters of this product. Note also that Qatar is import dependent for 58 out of the 60 food products identified, while Comoros only relies on imports for 21 of them.

In addition to the general relevance of Belarus, the Russian Federation and Ukraine in the global markets for these goods, OIC members source substantial shares of their imports directly from these countries for 38 out of the 60 food products identified (listed with an asterisk in Figure 5, and detailed in Table A. 5). Most significantly, close to 82% of imports of crude sunflower seed oil into OIC countries originate in the Russian Federation or Ukraine. Similarly, OIC countries source approximately 40% of their wheat and barley imports from these countries.

More generally, for 58 out of the 60 food products identified, at least 10% of imports originate in countries directly involved in the conflict or in countries that are imposing sanctions: Australia, Belarus, Canada, the European Union, the European Free Trade Area (EFTA), Japan, the Republic of Korea, New Zealand, the Russian Federation, Ukraine, and the United States of America.

This overall dependence makes it likely that the effects on global food markets will trickle down to OIC's net importers.

- how important these exports are for the economy of the exporting OIC countries.

Selecting all products for which the exports of at least one OIC country are larger than the imports and narrowing down that list to products for which Belarus, the Russian Federation or Ukraine represent 5% or more of world exports, we identify 273 products, out of which 38 are energy products (and minerals).⁴

The reliance of OIC countries on the exports of these energy (and mineral) products is assessed using the *dependence indicator* described earlier. In this case, the export dependence on a specific good is higher if a country's trade balance is more positive (exports > imports), or if the trade balance for that good makes up a larger share of the country's GDP, i.e., plays a larger role in the economy. Results are shown in Figure 6.

As expected, OIC countries are most export dependent on crude petroleum oil, natural gas (both gaseous and liquified), and petroleum oil preparations. Countries such as Iraq, Kuwait, Libya, Azerbaijan, and Gabon show a strong dependence on exports of crude petroleum oil. Many countries across the group also depend on exports of ores (lead, precious metal, iron and others). While the Islamic Republic of Iran, Kazakhstan, Indonesia, Malaysia, and the United Arab Emirates are dependent on exports of numerous energy products, Bangladesh, Benin, or Djibouti rely on exports of only one energy or mineral product.

In general, export dependence on energy products (Figure 6) is sparser across OIC countries than import dependence on food is (Figure 5). In other words, chances of gains through energy exports are concentrated in fewer countries and fewer products, while chances of losses through food imports are dispersed in more countries and more products. The balance between these forces is explored in section 2.

Sanctioning countries may demand more oil and gas from OIC

It is also important to assess the destination of OIC energy exports, given Russian Federation's global market share, and its potential as a competitor to OIC exports of energy. In markets that have imposed sanctions on the Russian Federation, OIC exporters are now expected to face less competition. Conversely, in third markets, OIC exporters may face additional competition from Russian exports funnelled to new destinations by various sanctions or trade restrictions.

Figure 7 shows the partner composition of OIC Countries' exports for the 38 energy products identified above, focusing particularly on Belarus, the Russian Federation and Ukraine, and on the main partners that have adopted sanctions against the Russian Federation.⁵ The Russian Federation is one of the main partners for some of the products, but not for those on which OIC countries are most dependent.

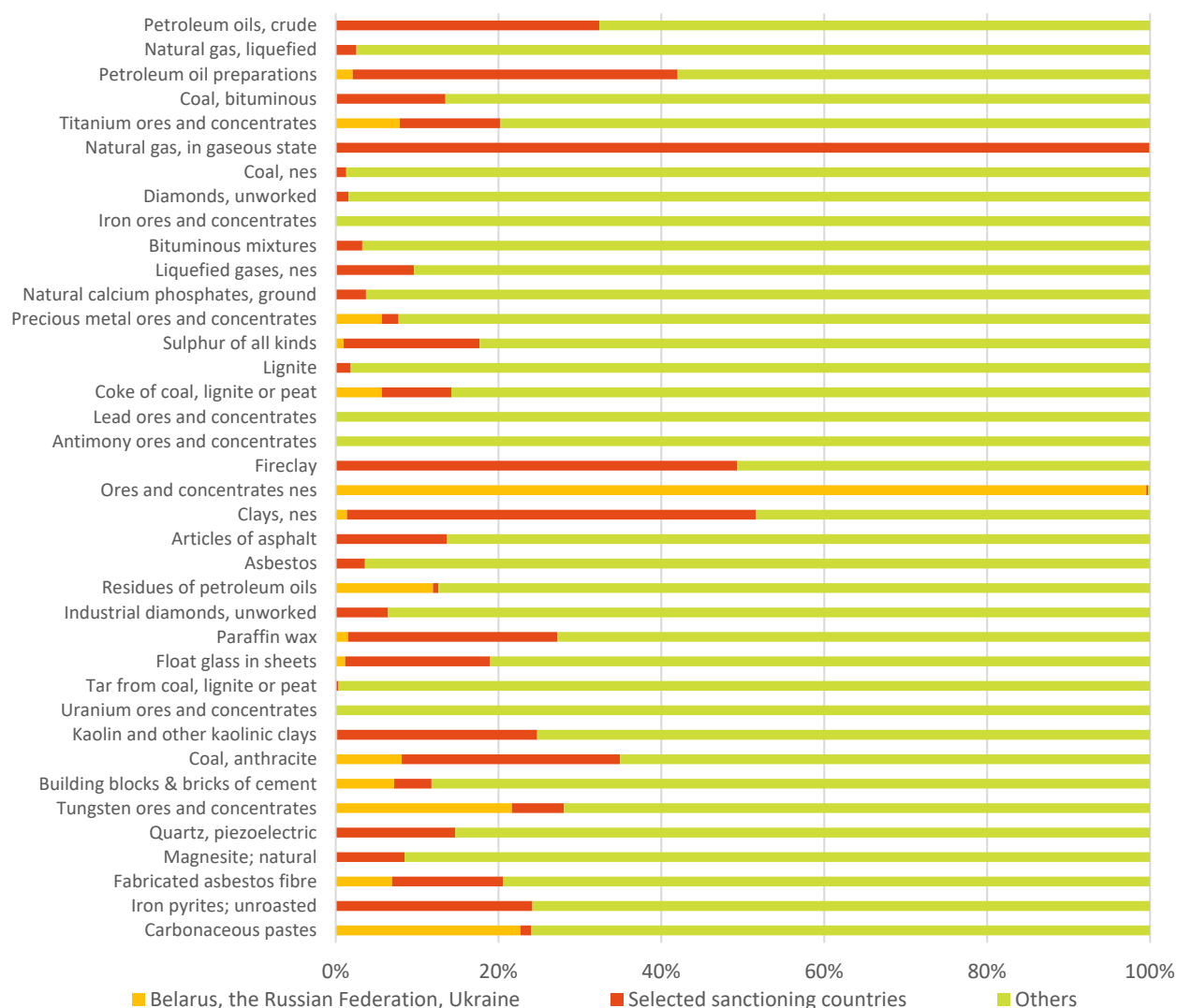
Importantly, for gas, petroleum oil preparations and clays, a substantial share of exports is destined to sanctioning countries, in particular gas to the European Union. As the OIC is most dependent on oil and gas exports, positive economic impacts of the conflict on OIC countries are likely when these partners seek to reallocate their demand away from the Russian Federation.

However, Figure 7 also shows that the OIC Countries' exports many energy products to countries not involved in the conflict or sanctions. Such countries may find offers from cheaper sources, in particular the Russian Federation, affecting OIC countries negatively.

⁴ Seven are other agricultural products, 61 are food products, and 167 are manufacturing products.

⁵ The sanctioning countries considered are Australia, Canada, the European Union, EFTA, Japan, Republic of Korea, New Zealand, and the United States of America.

Figure 7: Destination of OIC exports of selected energy and mineral products



Note: based on average trade flows between 2017 and 2021. The selected sanctioning countries include Australia, Canada, the European Union, EFTA, Japan, Republic of Korea, New Zealand, and the United States of America.

Source: Authors' calculations based on the ITC Trade Map (2022) data.

OIC's trade trends in 2022: initial shock to food and energy sectors, followed by signs of recovery

At the time of writing, data on trade flows since the outbreak of the conflict are still scarce. Trade data are usually reported with some delay, a challenge compounded in this case by the fact that Belarus and the Russian Federation are currently not reporting their trade data.

In the case of the OIC, ten members have reported 2022 trade data, to varying extents.⁶ Consequently, we use mirror data, which does not include trade with Belarus or the Russian Federation, to observe preliminary emerging trends for the OIC in 2022. The direct data available from reporting OIC countries is used to

⁶ OIC members that have reported monthly trade data after February 2022 are as follows (in parenthesis, latest month available): Bahrain (November), Guyana (March), Indonesia (November), Malaysia (November), Morocco (June), Mozambique (March), Nigeria (June), Pakistan (September), Türkiye (November) and Uganda (October). Data available for all other OIC countries precedes the outbreak of the conflict.

complement the mirror data and to comment on bilateral trade with Belarus or the Russian Federation, where needed.

With energy and food supplies contracting, prices surged temporarily

Ukrainian exports of cereals only started surpassing pre-pandemic quantities in August 2021. The outbreak of the conflict in February 2022 interrupted their recovery. Ukrainian exports of cereals collapsed to 1.4 million tons in March and 0.9 million tons in April, compared to 6 and 5 million tons in January and February 2022.⁷ Cereal exports from the Russian Federation were already low in January 2022, and are believed to have been significantly restricted during the initial months of the conflict, although data on this regard are scattered. Many countries also restricted their exports of cereals at that time with the intention of safeguarding domestic markets (see Box 1).

As a result of the limited supply, and of the increased uncertainty, starting in March, cereal prices surged until May.⁸ For example, the price of wheat soared from \$390.5/ton in February to \$522.29.3/ton in May. Food prices in general increased 13% from February to May (Figure 8, dashed green line).

With the implementation of the Black Sea Grain Initiative in August, Ukrainian exports of cereals recovered partially, more than doubling between July and September to reach 4.4 million tons.⁹ This, together with other tempering forces, such as the lifting of export restrictions by some countries, eased the pressure on global food prices, which finished 2022 only 1% above their January levels.

Meanwhile, as the conflict unfolded, energy prices reinforced the positive trend they had already been exhibiting during the pandemic. They started descending after August 2022, to reach pre-conflict levels only in the initial months of 2023.¹⁰

Initial shock to OIC food imports and energy exports

Based on mirror data, Figure 8 presents the monthly evolution of OIC exports of energy and imports of food since early 2019 until November 2022 (solid lines). This figure does not include trade with Belarus or the Russian Federation, that have not reported data since the beginning of the conflict. Global indices for energy and food prices are included in the chart for comparison (dashed lines).

For this subset of OIC trade partners, food import values increased 2% in March 2022 when compared to the previous year, but food prices were 36% higher, implying a 25% fall in real imports of food year-on-year. As prices stopped their ascent in May, the situation improved. Between March and November 2022 food import values increased 18% when compared to the same period in 2021. With food prices on average 19% higher than the previous year during that period, OIC food imports remained stable in real terms.

Exports of energy were 82% higher in March 2022 than in the previous year, while prices were 106% higher, for a real decrease in exports of 12%. The performance of exports in the months that followed was strong, increasing more than prices. For the period of March to November exports of energy products increased 69% with respect to 2021, surpassing the 64% average increase in prices for the period, for a real growth of 3%.

Direct trade data of six OIC countries available up to September 2022 provides preliminary evidence of the evolution of trade with all partners that confirms the trends observed in Figure 8. For the six reporting countries, food import values increased by 9% in March 2022 with respect to the previous year, while prices increased 36%, meaning that food imports actually suffered a 20% fall in real terms. The fall is in large part due to the dip in trade with the Russian Federation: wheat and other cereal imports from the Russian Federation were 62% lower in March 2022 than in March 2021, even without accounting for price changes.

⁷ In March and April 2021 Ukrainian exports of cereals were 3.5 and 3.4 billion tons respectively, but even these quantities were low compared to previous years.

⁸ The energy, cereals and food prices are sourced from the FAO Food Price Index of March 2023 and the World Bank Commodity Prices Pink Sheet Data of March 2023.

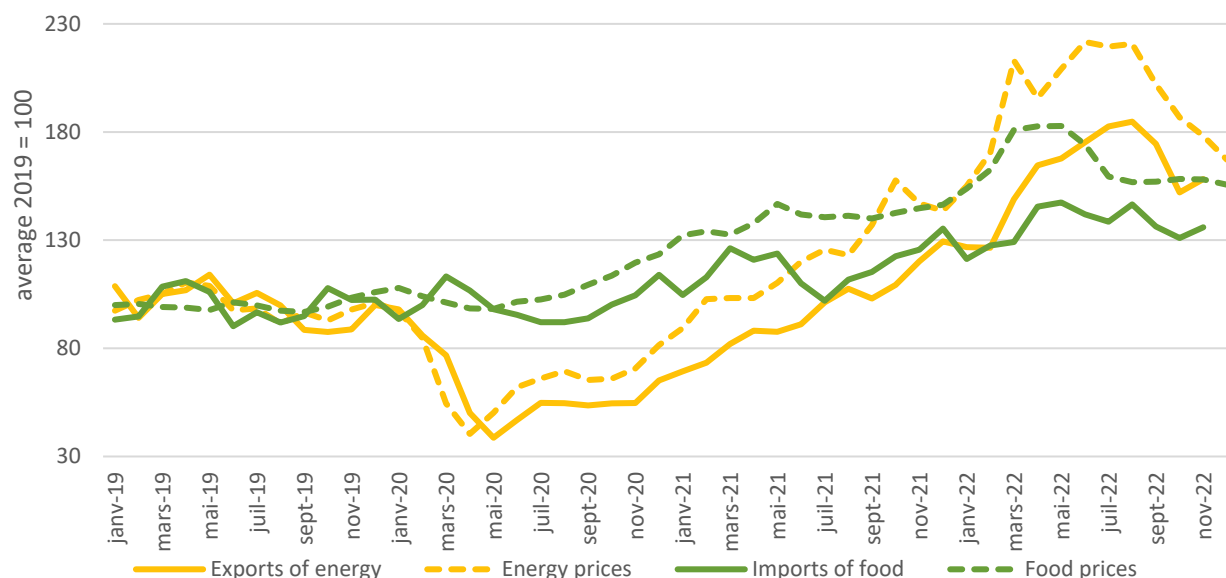
⁹ The Black Sea Grain Initiative, signed in July 2022, allowed for the resumption of exports of grain, other foodstuffs, and fertilizer from Ukraine through three ports (Chornomorsk, Odesa, and Yuzhny/Pivdennyi).

¹⁰ The prices of oil and gas have mostly returned to their pre-conflict level, but the price of coal is still above that level.

In the months that followed, the imports of food of the six reporting countries recovered partially, so that, in real terms, for the period March-September they were -2% below their level for 2021. Even imports of wheat and other cereals from the Russian Federation accumulated a 50% real increase in March-September.

In total, both OIC Countries' energy exports and food imports experienced a large shock in March, but have shown consistent signs of recovery since then, more clearly so in the case of exports of energy products.

Figure 8: OIC Countries' exports of energy, imports of food and international prices of energy and food, monthly



Source: OIC exports and imports are authors' calculations based on the ITC Trade Map (2023) data. Prices are from the World Bank Commodity Prices Pink Sheet data, March 2023.

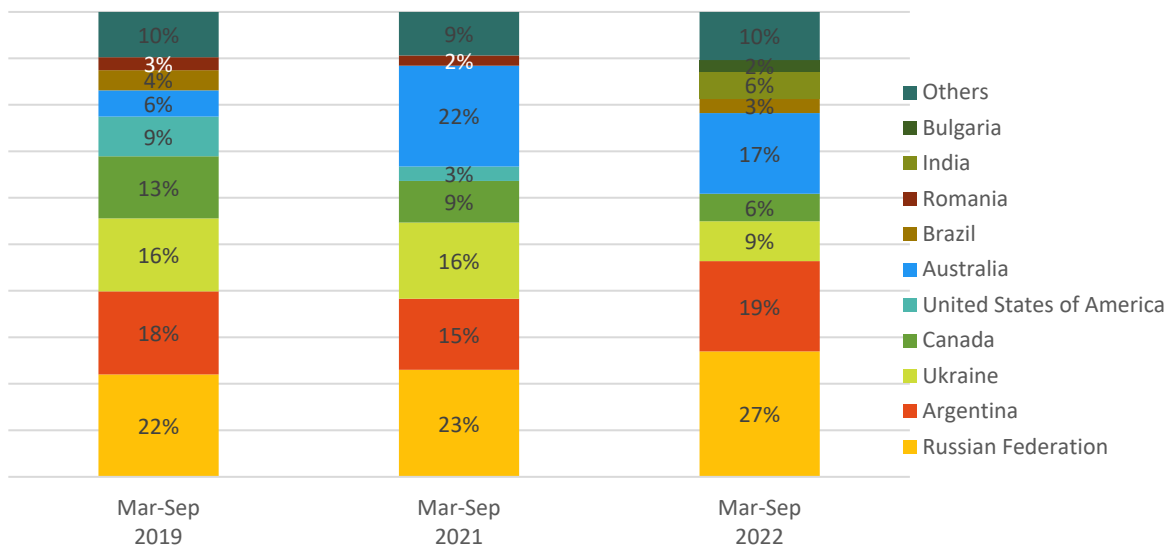
OIC countries reallocate trade partners in response to the conflict and sanctions

Besides changes in the aggregate levels of food imports and energy exports, we expect some restructuring of exports and imports in terms of partners, as OIC countries and their counterparts search for alternative sources for their imports.

Based on the bilateral product-level data reported by Bahrain, Indonesia, Malaysia, Pakistan, Türkiye and Uganda up to September 2022, **Erreur ! Argument de commutateur inconnu.** shows the composition of partners for the OIC Countries' imports of wheat and other cereals, the food sectors in which OIC Group is most import dependent. When compared to pre-pandemic trade, imports of wheat and cereals from Australia, India and the Russian Federation gained larger shares in the total. As a counterpart, the share of imports from Canada, Ukraine and the United States decreased. While some of these changes are directly linked to the conflict, others continue trends started before the conflict began.

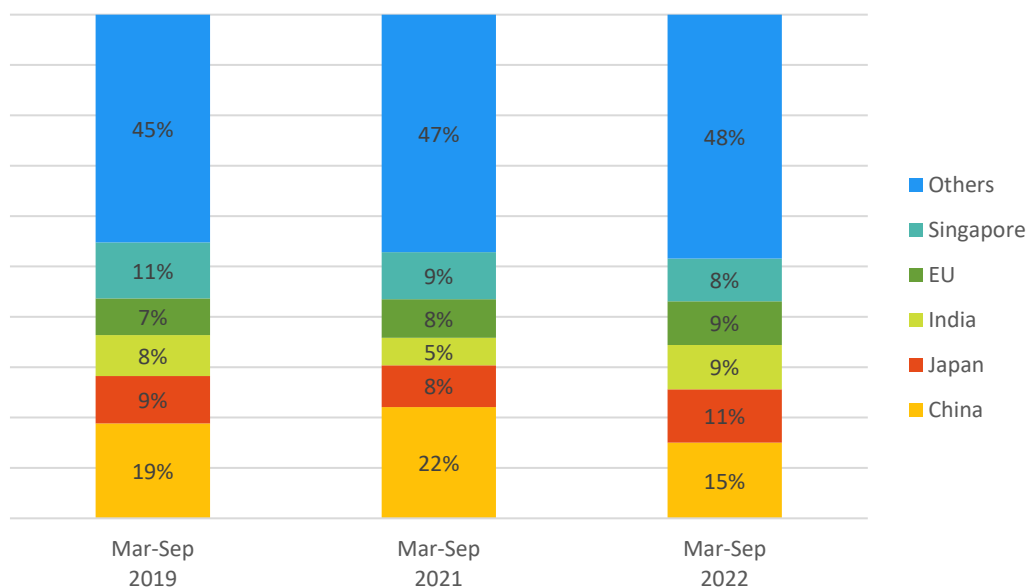
A similar comparison is conducted in Figure 10 for exports of energy products. While no reallocation is observed towards the European Union, the share of exports destined to China is smaller for the period Mar-Sep 2022. This is consistent with China sourcing increasing shares of their imports of energy products from the Russian Federation.

Figure 9: Imports of wheat and other cereals from selected OIC countries, by origin



Note: OIC countries included are Bahrain, Indonesia, Malaysia, Türkiye and Uganda, due to data availability.
 Source: Authors' calculations based on the ITC Trade Map (2023) data.

Figure 10: Exports of energy products from selected OIC countries, by destination



Note: OIC countries included are Bahrain, Indonesia, Malaysia, Pakistan, Türkiye and Uganda, due to data availability.
 Source: Authors' calculations based on the ITC Trade Map (2023) data.

Box 1. 145 temporary trade measures related to the conflict are currently active, many of which affect the food or energy sectors

After the conflict broke out, several countries decided to adopt temporary trade measures against Belarus and the Russian Federation as part of their sanction packages. In response, the Russian Federation adopted counter-sanction packages that also included temporary trade measures. In turn, other countries also implemented temporary trade measures in hopes of safeguarding their domestic markets from international fluctuations.

Since the outbreak of the conflict, ITC has been publishing a catalogue of these temporary trade measures, with the objective of improving transparency in international trade.

As of February 2023, 33 countries had imposed export restrictions and 1 had also adopted export liberalising measures. At the same time, 18 countries had adopted import restrictions and 13 import liberalising measures.

Among them, Ukraine implemented export bans on gas, fertilizers and cereals, meat and livestock, which were partially lifted from April onwards.

Several countries¹ imposed temporary trade restrictions on imports from Belarus and the Russian Federation, covering oil, petroleum, gas, coal and other energy products, iron and steel, wood, cement, seafood, liquor, firearms and explosives, machinery, potassium, and rubber, among other products. Restrictions on exports to Belarus and the Russian Federation include luxury goods, computers and semiconductors, military goods, specific technologies, jet fuel, and others.

Additionally, Canada, the European Union, the United Kingdom and the United States enacted a wide suspension of levies on imports from Ukraine.

In response, the Russian Federation adopted restrictions on, among others, exports of telecoms, medical, vehicle, agricultural, and electrical equipment, as well as some forestry products.² The Russian supply of gas to Bulgaria and Poland was halted. On the imports side, an embargo was established for imports of foodstuffs originated in countries that supported sanctions. At the same time, it liberalised parallel imports for a large set of goods.

Belarus did not impose limits on imports, but 6-month restrictions on exports of cereals, animal feed, rice, pasta, and other food products, irrespective of their destination. Many of these restrictions were lifted by October, but some limits to exports of certain food products remain.

As mentioned earlier, other countries not directly involved in the conflict or sanctions also adopted temporary trade measures, generally aimed at stabilizing local food markets. For example, Brazil, Dominican Republic, El Salvador, Philippines, and others liberalised imports of basic food products.

In an attempt to guarantee supplies for the domestic market and control its prices, Algeria, Azerbaijan, Egypt, Hungary, India, Kyrgyzstan, Lebanon, Malaysia, Serbia, and Türkiye, restricted their exports of food and agricultural products, in particular wheat, soy, pasta, rye, flour, lentils, oats, maize, meat, barley, animal feed, oil seeds, cooking oil and others.³

The updated catalogue of all measures adopted is available through ITC Market Access Map, at <https://m.macmap.org/ukraine>.

¹ Albania, Andorra, Australia, Canada, the European Union, Iceland, Japan, the Republic of Korea, Lithuania, Montenegro, New Zealand, North Macedonia, Norway, Singapore, Switzerland and Liechtenstein, Ukraine, United Kingdom and United States of America.

² Initial export bans on cereal exports were lifted by the end of March.

³ Argentina adopted a mix of liberalising (increasing quotas) and restrictive (increasing duties) measures on wheat and soy exports.

SECTION 2 EFFECTS OF THE CONFLICT AND TRADE-RELATED MEASURES ON OIC COUNTRIES

The conflict and the temporary trade measures associated with it have an effect on the productivity of the countries directly involved, but also on demand, prices, and economic welfare around the globe. In order to measure these far-reaching and interconnected effects for OIC countries, we use a global model of the world economy.¹¹

In this model, the conflict and temporary trade measures are simulated as two types of changes:

- The productivity of Ukraine is reduced by 35%.¹²
- International trade is restricted to reflect the temporary trade measures captured in ITC's database, described in Box 1.

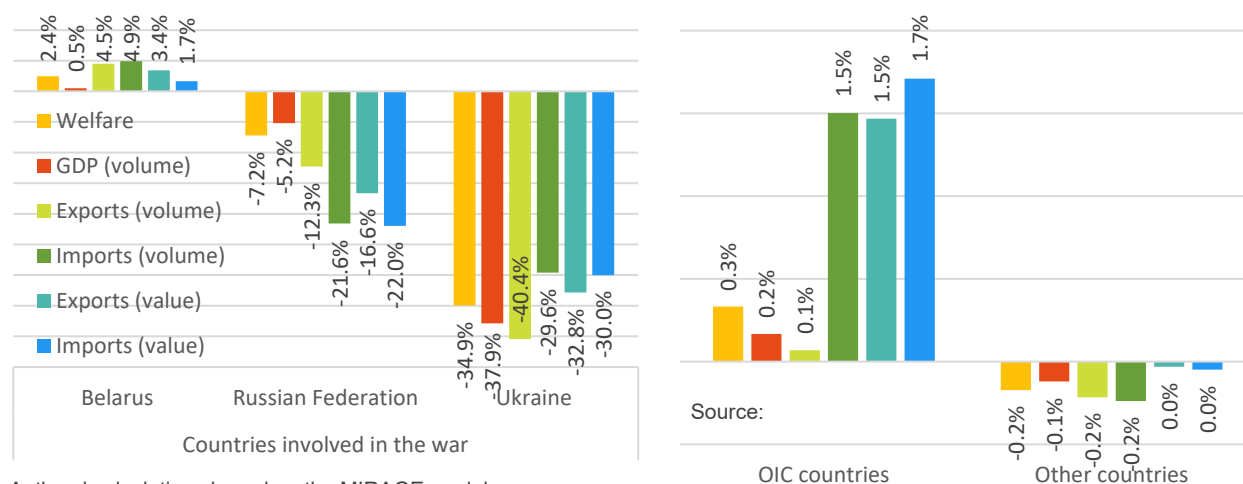
It is important to note that the model does not contemplate other measures, such as the ban from the SWIFT system, that can also impact all economies.

The model produces results that show how GDP, exports and imports are expected to change in the medium term because of the conflict and temporary trade measures, i.e., how the projections of the model for 2025 change once the conflict and sanctions are considered.¹³

Small losses of global welfare and GDP expected

The conflict and the related trade measures imply a 0.3% loss of global welfare and real GDP, respectively and a 0.6% reduction in the volume of world exports (0.4% in their value). Naturally, these effects are distributed unevenly across the globe, depending on countries' involvement in the conflict, their imposition of sanctions, and their trade profiles, among other factors.

Figure 11: Effects of the conflict and related trade measures, selected country groups



¹¹ We implement the MIRAGE Computable General Equilibrium (CGE) model, which relies on the Global Trade Analysis Project (GTAP) database. The MIRAGE model is documented in Bchir et al. (2002), Decreux and Valin (2007) and Fontagné et al. (2013). Details on the GTAP database can be found here: <https://www.gtap.agecon.purdue.edu/about/project.asp>

¹² This change is based on projections by the International Monetary Fund (IMF) published in the April 2022 edition of the World Economic Outlook (WEO).

¹³ Appendices I-IV detail how the model is specified, how the countries or regions and sectors considered are defined, how the temporary trade measures are modelled, and the possible channels for impact of these measures on OIC countries.

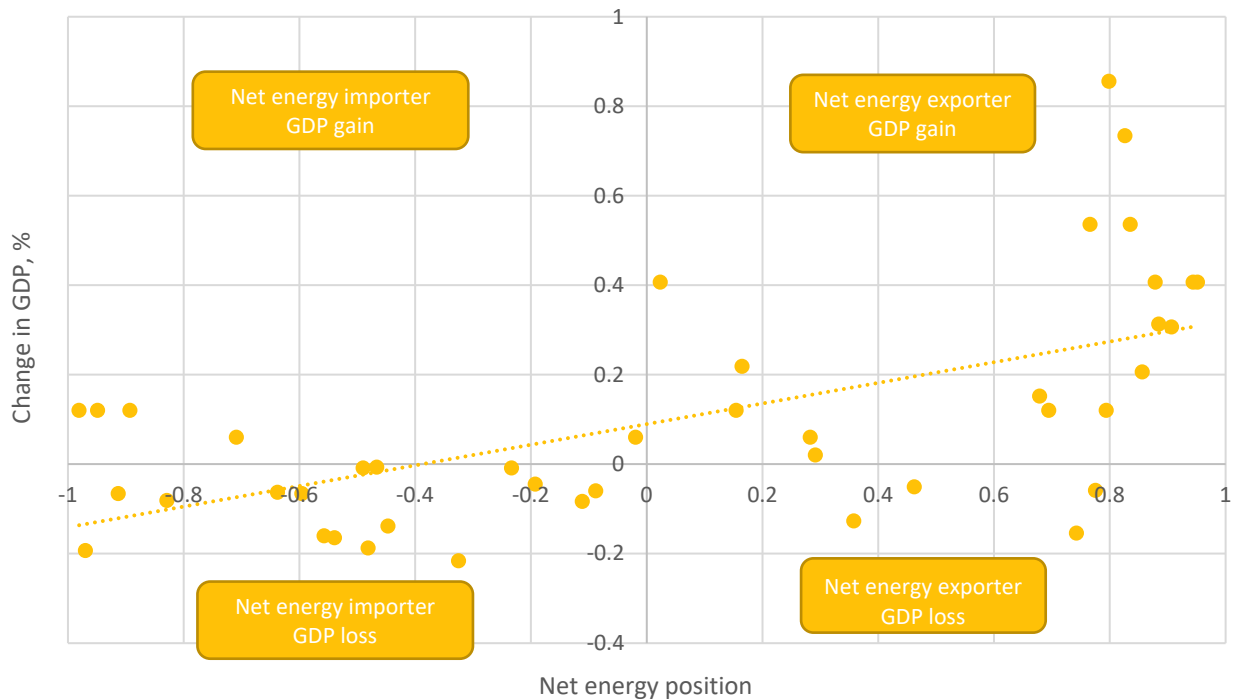
The brunt of the negative impact is concentrated in the countries directly involved in the conflict, in particular the Russian Federation and Ukraine, as can be seen in Figure 11 (left). Most affected is Ukraine, with a sharp drop in GDP, of 37.9%, and declines in the volume of exports and imports of 40.4% and 29.6%, respectively. The Russian Federation is expected to experience a more moderate impact, with a fall in GDP of 5.2%, and 12.3% and 21.6% in the volume of exports and imports. Belarus on the other hand, will experience a 0.5% growth in GDP, as well as a 4.5% and 4.9% increase in exports and imports, respectively.

OIC countries face small gains in the medium term, unevenly distributed across the group

As for countries not directly involved in the conflict, we can see in Figure 11 (right) that OIC countries are expected to fare better, on average, than other countries. While other countries are estimated to experience decreases of 0.1%, 0.2% and 0.2% in GDP, export and import volumes, respectively, OIC countries will see modest increases of 0.2%, 0.1% and 1.5% in the same indicators. Note as well that OIC exports and imports are also expected to increase by 1.5% and 1.7% in value.

Earlier sections discussed the possibility of OIC countries facing a mix of positive and negative effects from the conflict context, most likely through energy exports and food imports. The aggregate results shown in Figure 11 suggest that, for OIC countries as a group, the gains from the former outweigh the possible losses from the latter. However, the results for the group are likely to be driven by the experience of net energy exporters, as illustrated in Figure 12. The figure shows that most OIC countries that are net exporters of energy products are expected to experience a positive total change of GDP as a result of the conflict and sanctions, while conversely, most OIC countries that are net importers of energy products are expected to experience a decrease in GDP.¹⁴ Given the diverse patterns of export specialization and import dependencies among OIC countries discussed in Section I, it is important to also explore the heterogeneity in results by country and sector within the OIC group.

Figure 12: Net energy position and change in GDP for OIC countries



Note: The net energy position is the ratio $(\text{exports} - \text{imports}) / (\text{exports} + \text{imports})$ only considering trade of energy products.

Source: Authors' calculations based on ITC Trade Map (2022) data and the MIRAGE model.

¹⁴ A regression of the expected change in GDP on the net position of OIC countries for food, energy, manufacturing, and other agricultural products, shows that the net energy position is positively correlated with the change in GDP, while the net position in food or other industries is not significantly correlated with it.

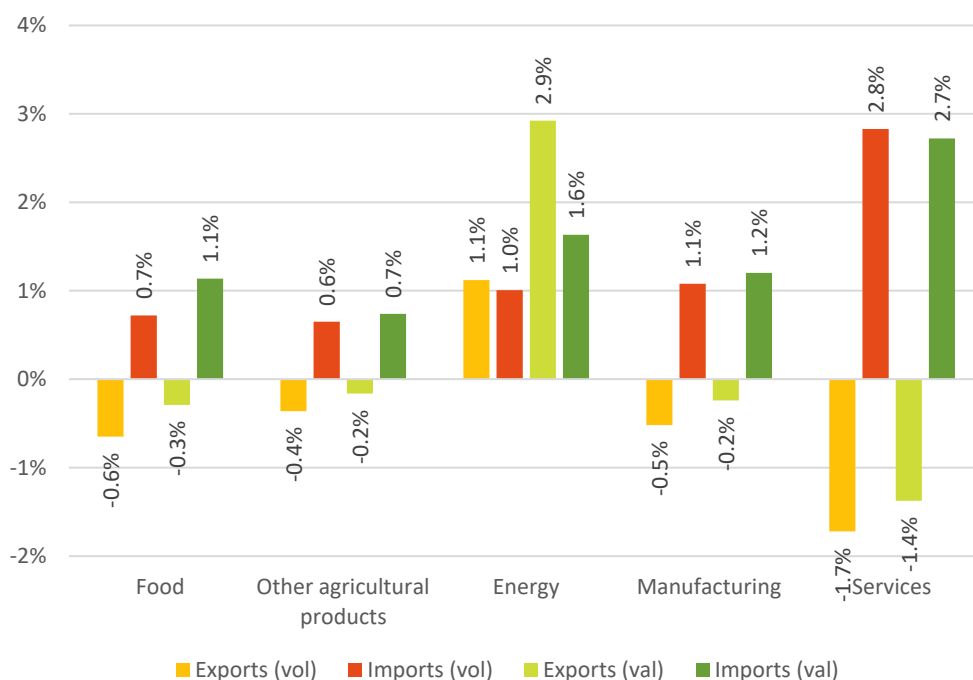
Non-energy sectors lose, affecting the diversification of OIC economies

Exploring the outcomes for OIC countries at the industry level (Figure 13) confirms that the positive results observed for the exports of OIC countries in Figure 11, both in volumes (0.1%) and values (1.5%), are entirely driven by increases in the exports of energy, of 1.1% and 2.9% in volumes and values, respectively. Conversely, declines of 0.6%, 0.4%, 0.5% and 1.7% are expected in the export volumes of food, other agricultural products, manufacturing, and services (-0.3%, -0.2%, -0.2% and -1.4% in values). This reduction in exports is due to the real appreciation of the currencies of most OIC countries as a result of higher oil prices, which makes exports of other sectors less competitive. In the case of services, this phenomenon is reinforced because the higher oil prices also lead to a depreciation of the Euro, and subsequently to increased exports of services from the European Union, one of the largest international players in the sector.

Figure 13 also shows that imports of food products are set to increase both in volume and value, as are imports of Manufacturing and Services.

Sector-level results, listed in Table A. 8, complement the industry view presented in Figure 13. While in Figure 13 aggregate results for Food show increases in imports, both in volume and value, this is not the case for all food sectors. In line with the import dependencies observed in Section I, and the importance of Ukrainian and Russian providers in these markets, imports of oil seeds (-1.6%), cereals (-1.3%), and wheat (-0.7%) experience reductions in volumes, even when in most cases their value increases due to higher international prices. The positive results observed in Figure 13 for exports of energy products are largely driven by gas exports (5.6% in volume, 7.7% in value).

Figure 13: Effect of the conflict and related trade measures on the trade of OIC countries, by industry



Source: Authors' calculations based on the MIRAGE model.

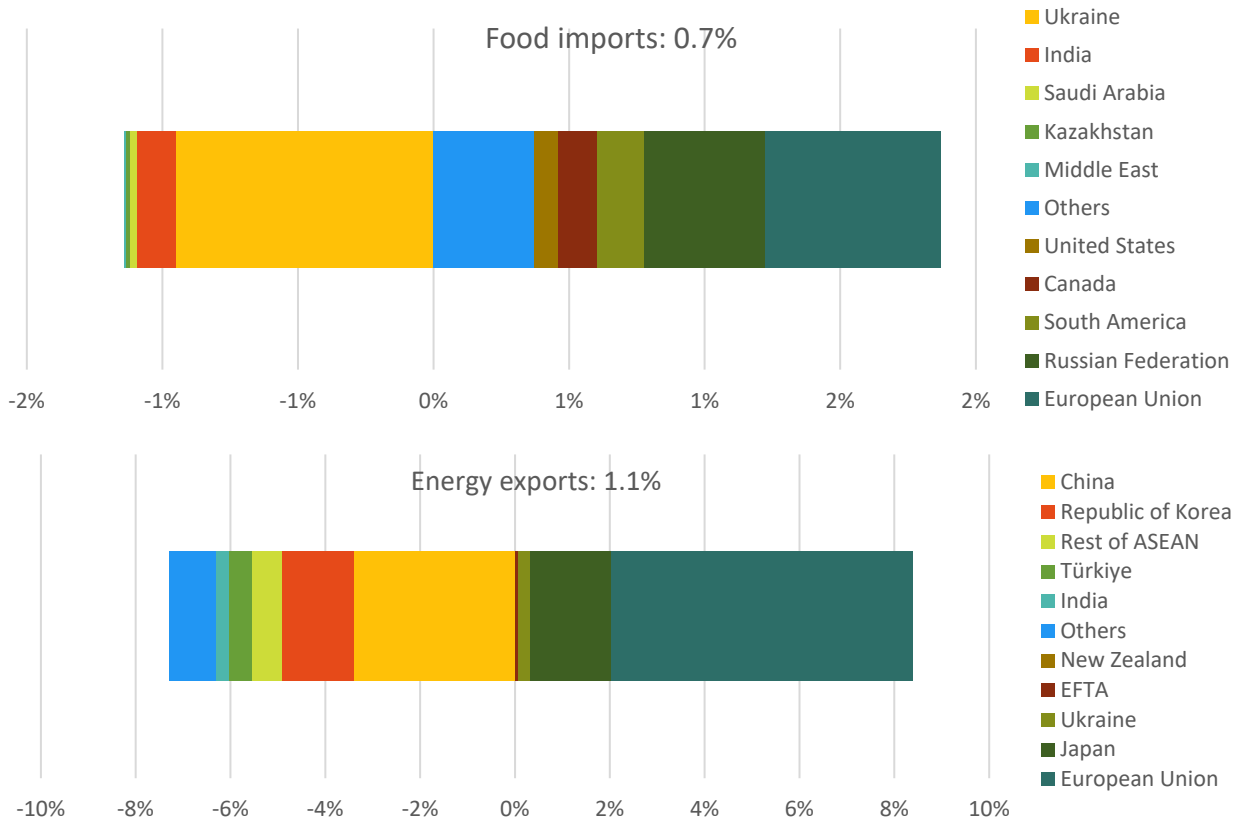
Energy exports to the European Union, Japan increase but drop to many Asian markets

Underlying the aggregate results observed in Figure 13, there are also changes in the partners involved in trade with OIC countries. Figure 14 shows how the 0.7% change in imports of food is actually composed of a significant drop in imports of food from Ukraine that is compensated by larger imports of food from the European Union, the Russian Federation, South America, Canada, the United States and others.

The total change by 1.1% in exports of energy comprises increases in exports to the European Union and Japan that are partially counterbalanced by decreases in exports of energy products to China, the Republic of Korea, the rest of ASEAN, Türkiye, India and others. This is consistent with the discussion in the previous

section: for energy products exported by the Russian Federation, OIC countries are likely to benefit in their exports to sanctioning countries, but to experience increased competition in other “third countries”.

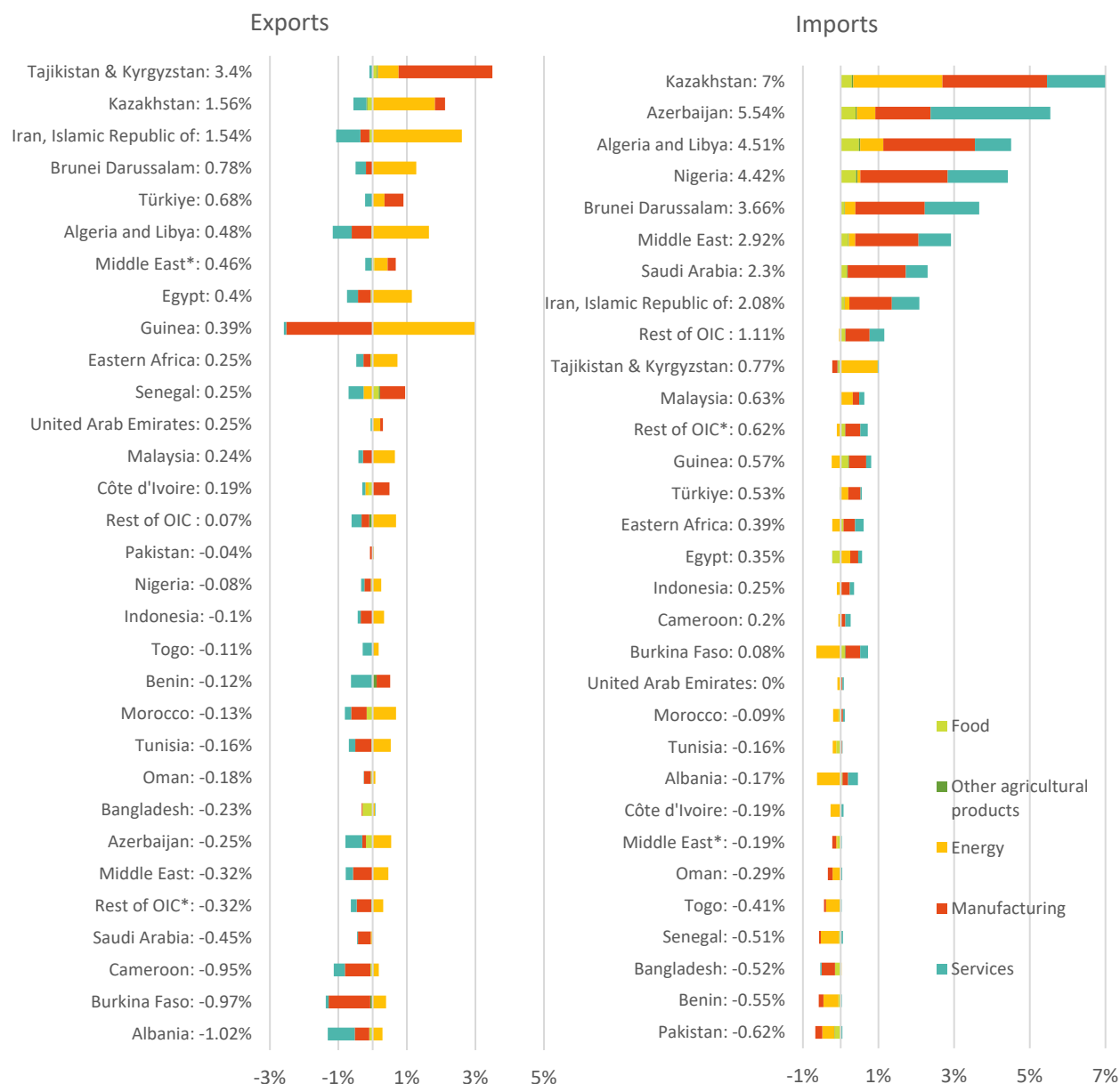
Figure 14: Change in OIC volume of imports of food and exports of energy, by partner



Source: Authors' calculations based on the MIRAGE model.

As discussed in the first section, OIC countries are a heterogeneous group in terms of their net food and energy positions and are therefore likely to be affected differently by the conflict and sanctions. Figure 15 explores the changes in exports and imports by OIC country and industry, which are wide-ranging. For exports, on one end we find Tajikistan and Kyrgyzstan, Kazakhstan and the Islamic Republic of Iran with increases of 1%, while on the other end Cameroon, Burkina Faso and Albania experience decreases of close to 1%. Note that, with a few exceptions, increases in exports are almost entirely linked to expansions in exports of energy products.

Figure 15: Effect of the conflict and trade measures on trade volumes, by OIC country and industry

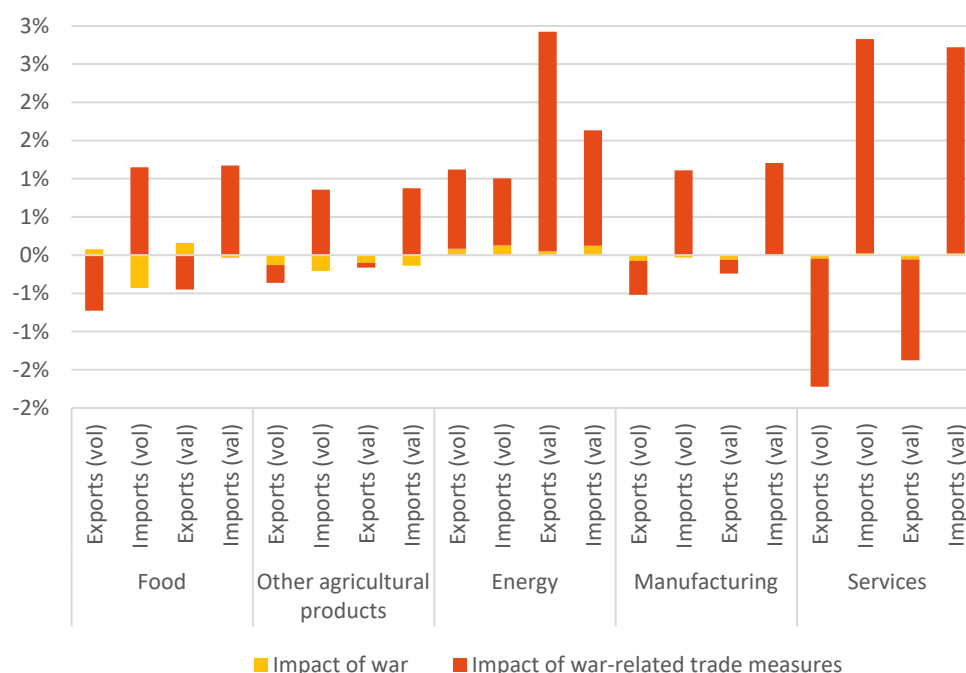


Note: * refers the part of the group that includes net energy and cereals importers.

Source: Authors' calculations based on the MIRAGE model.

As a concluding point, Figure 16 repeats the exercise presented in Figure 13, but separates the effects of the conflict itself from those of sanctions. The effects whether positive or negative, are overwhelmingly connected to sanctions rather than to the conflict. The reducing effect of the conflict on OIC's food import volumes, triggered by the loss of Ukraine's productivity, is overcompensated by benefits arising from sanctions.

Figure 16: Distinguishing effects of conflict and trade measures on the trade of OIC countries



Source: Authors' calculations based on the MIRAGE model.

In total, the general equilibrium exercise shows that in the medium term the effect of the conflict and sanctions on trade is expected to be modestly positive for OIC countries. The positive effect on the GDP of individual OIC countries is significantly connected to their positive energy net position.

When focusing on trade, results show that gains in exports are entirely driven by the increase in energy exports. Additionally, while the OIC's food dependence may generate expectations of negative effects through food imports, the general equilibrium results show that the negative impact of the conflict itself on the imports of food is more than counterbalanced by the reallocation of trade prompted by sanctions.

The restructuring of the OIC trade basket in face of this shock implies increased exports of energy products to the European Union, Japan and other sanctioning countries, and diminished ones to China, the Republic of Korea or Türkiye, that increasingly source energy from the Russian Federation. With respect to food imports, losses in imports from Ukraine are more than compensated by imports from the European Union and the Russian Federation among others.

Aggregate results are however not valid for all sectors and all OIC countries. The impact on essential food imports of oil seeds, cereals and wheat, among others, are still expected to be negative, despite the increased imports from some partners. OIC countries that are heavily dependent on imports in these sectors and/or whose energy exports are not as large, can still expect to experience negative effects in total.

As highlighted at the beginning of the section, the results refer to the medium term, when production and trade adjustments and reallocations that are time consuming can be expected to have occurred. Additionally, the results capture the effects of the conflict on Ukrainian production and the sanctions on trade, but not others, for example the increased difficulty in trading with the Russian Federation in the context of generic sanctions.

SECTION 3 DISCUSSION

This report analysed the exposure of OIC countries to the effects of the conflict in Ukraine and its associated trade sanctions, focusing on the dependence of OIC economies on energy exports and food imports.

The exercise confirmed the importance for most OIC countries of imports of multiple food products for which the Russian Federation or Ukraine are relevant global suppliers. At the same time, the exercise showed the significance for a few OIC countries of their exports of a small number of energy or mineral products for which the Russian Federation is a competitor in global markets.

Although exhaustive trade data for OIC countries in 2022 is not yet available, the report also discussed preliminary evidence of the *short-term effects* of the conflict and sanctions on OIC trade from March until June.

A sizable negative shock on imports of food and exports of energy products is observed in March, together with rapidly increasing international prices for both. While the price of food started descending after May, the price of energy products remains high and with a positive trend. Recently, OIC exports of energy appear to be back on track and OIC food imports show signs of partial recovery as well.

In terms of changes in partners, the Russian Federation represented a larger part of food imports between March and June than in previous years. An increasing share of European Union imports of energy products was sourced from OIC countries during these months. It is also expected that other partners, particularly China and India, will have reallocated parts of their imports away from OIC and towards Russian energy products in the last few months.

The report also calculated the *medium-term effects* of the conflict on OIC economies using a general equilibrium model computed for 2025.

The results show modest gains in GDP for the OIC, driven by gains in the exports of energy products, in particular gas. While imports of food are expected to increase in general as well, imports of oil seeds, wheat and other cereals will be lower.

Food import losses from Ukraine will likely be compensated by higher imports from the European Union and the Russian Federation. Energy exports to the European Union, Japan, Ukraine will increase at the expense of decreases in China and other Asian markets that have turned to cheaper Russian supplies.

In total, the results observed for the OIC speak of an immediate negative shock in March, incipient recovery in later months, and modestly positive effects over the coming years. However, this aggregate interpretation glosses over several important risks OIC countries face in this context.

First, as was highlighted throughout the report, the potential gains through energy exports are concentrated in a few OIC countries, while the vulnerabilities in food imports are spread across the group, with some countries experiencing a negative impact on GDP. Since gains are concentrated in energy exporters, the effects can exacerbate existing gaps among OIC members.

Second, even though total food imports are going to increase, the reduction in imports of oil seeds, wheat and other cereals, can have a strong detrimental effect on local food value chains and local prices of food. Along the same line, although international commodity prices started decreasing after May, the prices of food faced by consumers can remain high for some time. Both issues raise concerns about the access to food for the poorest parts of the population of OIC countries, and food affordability in general.

Third, the positive effects channelled through energy exports are likely to induce further dependence on exports of a few energy products. This means that even countries experiencing modest gains in this instance, are at the same time becoming more vulnerable to all the downsides linked to export concentration, such as susceptibility to fluctuations in the international prices of energy products and other external shocks.

In order to address these three areas of concern, actions should be targeted to:

- Securing access to food and enhancing food affordability

There are multiple initiatives in support of local food production, markets and value chains that countries can consider in order to improve the access of their population to food. In fact, many OIC countries have extensive experience implementing such measures, for example food subsidy systems in Egypt and cereal

banks in Mali, among others. In this sense, much may be gained from intra-OIC exchanges on best practices and experiences.

In terms of international trade, there are also multiple options OIC countries can consider in order to facilitate or secure imports of food.

Remaining tariffs on food imports can be suspended. For example, Algeria still imposes a 5% tariff on maize imports from Argentina, one of its main suppliers. Similarly, Morocco levies a small import tariff on wheat and meslin from Canada, also one of its main suppliers. Gabon, with one of the region's largest trade deficits for food, still levies a 5% most-favoured nation (MFN) tariff on wheat imports.¹⁵

Beyond any remaining tariffs, OIC countries can also facilitate food imports by addressing burdensome non-tariff measures (NTMs) in the importing process. For example, an ITC NTM Business Survey conducted in Sudan in 2019 revealed that importers faced mainly non-technical challenges when importing, such as unexpected import bans on food products, as well as finance measures, quantity-control measures, and charges, taxes, and price-control measures.¹⁶

- Diversifying exports

The benefits of export diversification cannot be overstated, from diversification of risk to economic growth and more. While diversifying exports to completely new products can prove extremely challenging, ITC's export potential methodology identifies several opportunities for OIC countries to increase their existing non-energy exports either to new or to existing partners.¹⁷

The export potential methodology estimates that 49% of OIC's export potential in manufacturing remains unused. A large part of that untapped export potential (27%) is linked to expectations of growth in the next five years for the export supply of OIC countries and the import demand of all possible partners. But a similarly significant part (22%) is connected to existing trade frictions.¹⁸

Increased efforts to identify and overcome the frictions that prevent the realization of untapped export potential for specific markets and products can be instrumental in diversifying exports. Additionally, to be able to materialize the portion of untapped potential connected to growth, it is important to guarantee adequate investment.

The actions discussed above to enhance access to food and diversify exports can help OIC countries weather the current context of conflict and trade sanctions. Importantly, these actions can also help build resiliency against external shocks in general. This is of particular importance considering that the deeply interconnected nature of global economies and the impending impacts of climate change suggest that cascading crises may become recurrent.

¹⁵ Sourced from ITC Market Access Map (2022) data.

¹⁶ The analysis of the NTM Business Survey conducted for Sudan is available here: <https://ntmsurvey.intracen.org/ntm-survey-data/country-analysis/sudan/>

¹⁷ ITC's export potential methodology combines information on current and projected supply, demand and ease of trade, to determine the export potential in the year 2026 for existing exports for each exporter, potential importer and product. For more information on the methodology, see Decreux and Spies (2016). The export potential results are available at <https://exportpotential.intracen.org/en/>

¹⁸ To name a specific example, Cameroon has an untapped export potential of \$6.3 million in beauty, make-up and skincare preparations (330499) - \$2.7 million because of trade frictions, and \$3.6 million associated to expectations of growth until 2026. A large part of this untapped potential is directed to Nigeria (\$1.1 million), one of the main markets for current exports of this product from Cameroon. However, there is untapped potential for it in new markets as well, for example in the United Arab Emirates (\$132,000).

REFERENCES

Bchir, M. H., Decreux, Y., Guérin, J. L., & Jean, S. (2003). MIRAGE, a computable general equilibrium model for trade policy analysis. CEPII Working Paper, n°2002-17.

Decreux, Y. and H. Valin (2007) 'MIRAGE, Updated Version of the Model for Trade Policy Analysis: Focus on Agriculture and Dynamics', CEPII Working Paper, n°2007-15.

Decreux, Y., & Spies, J. (2016). Export Potential Assessments: A methodology to identify export opportunities for developing countries. Mimeo.

Fontagné, L., J. Fouré and M.P. Ramos (2013) 'MIRAGE-e: A General Equilibrium Long-term Path of the World Economy', CEPII Working Paper, n°2013-39.

Fouré, J., A. Bénassy-Quéré and L. Fontagné (2013) 'Modelling the world economy at the 2050 horizon', *Economics of Transition*, 21(4):617–654.

Hausmann, R., & Klinger, B. (2007). The structure of the product space and the evolution of comparative advantage. CID Working Paper Series.

Hidalgo, C. A., Klinger, B., Barabási, A. L., & Hausmann, R. (2007). The product space conditions the development of nations. *Science*, 317(5837), 482-487.

APPENDICES

Appendix I The general equilibrium model

The computable general equilibrium model used in this report is the MIRAGE model.¹⁹ MIRAGE is a computable general equilibrium model based on a reference situation, called the baseline, that can range from 2014 to 2050/2100. In this report the baseline starts in 2014 and stops in 2025. The dynamics of the model are determined by the evolution of exogenous variables (population, labour supply, growth of total factor productivity, natural resources) and by endogenous capital accumulation. The model calculates a medium-term trajectory for the world economy, based on explicitly described microeconomic behaviour of consumers, producers and investors.

A. 1 The model

The basic structure of the MIRAGE model confronts a "supply" block and a "demand" block, mediated by a vector of relative prices. The global consistency of the model is ensured by a macroeconomic closure.

A.1.1 The demand side

In MIRAGE, there is a representative agent for all consumers and the government in each geographical area that formulates the final demand.²⁰ The sources of income for the representative agent are:

- the remuneration of factors in the area: labour (skilled and unskilled), land, natural resources,
- the capital income of domestic firms, whether located in the country or abroad,
- the net transfers received by the geographical area under consideration, and
- revenues from various taxes and trade levies collected by the geographical area; this figure may include some revenues from non-tariff barriers (in particular, quota licenses).

The income is allocated to two main categories: final consumption and savings. The savings rate sourced from CEPII's MAGE model (see A. 2).

The nested structure of the final demand function is described in Decreux and Valin (2007). In the first stage, the agent solves a classical LES-CES utility optimization problem (taking into account the evolution of the representative consumption basket with wealth under budgetary constraints, by integrating a minimum consumption) to determine his consumption of the different goods. A nesting of CES functions, integrating the Armington hypothesis (differentiation between the good produced domestically and the same good produced abroad) constitutes the lower levels. The elasticities of substitution corresponding to these different functions rise as one moves down the demand tree.

A.1.2 The supply side

In parallel, the supply side of MIRAGE distinguishes between intermediate consumption and value added, combined in fixed proportions via a Leontief-type formulation (strict complementarity). Intermediate inputs are substitutable between them, according to different degrees of substitutability (CES-type formulation). The value added remunerates five factors of production: capital, two forms of labour differing in their qualification (skilled and unskilled), land and natural resources. The last two factors are used only in certain sectors, while the first three are generic.

Resources are assumed to be fully employed, but the imperfect mobility of some factors allows for the problems induced by massive reallocations. In MIRAGE, wages are flexible and workers mobile across

¹⁹ The MIRAGE model is documented in Bchir et al. (2002), Decreux and Valin (2007) and Fontagné et al. (2013).

²⁰ Geographical areas can be individual countries or composite regions.

sectors. Despite the absence of explicit unemployment, this modelling allows to account for the difficulties encountered in the labour market, particularly when the wage in a sector falls sharply.

A. 2 The dynamic baseline

In order to calculate the evolution of the world economy during the period chosen for the simulation (in our case, until 2025), the MIRAGE model relies on forecasts from external sources.

In particular, the GDP growth rate projections of the baseline scenario come from the ECONMAP dataset, and the energy price path (oil, coal, gas) comes from the International Energy Agency (IEA). The ECONMAP dataset is the output generated by the Macroeconometrics of the Global Economy (MAGE) model from CEPII, documented in Fouré et al (2013).

Considering technical progress in agriculture appears to be lower than national TFP growth, agriculture is considered separately from other sectors for the calculation of the TFP, distinguishing as well between animal and crop production. The calculation of TFP in the industry and services sectors is therefore conditional on the GDP trajectory from MAGE, on the estimated TFP in the agricultural sectors, and on a productivity differential between industry and services. This means that the behaviour of TFP growth in agriculture thus strongly conditions the dynamic path of MIRAGE (see Fontagné et al., 2013, for a full description of the method and its implications).

Lastly, note that in simulations TFPs are fixed while GDPs can deviate from the value they take in the baseline scenario.

A. 3 Interpreting the results of the simulation

The general equilibrium model predicts all variables to a baseline level in 2025 that would be reached in the absence of the conflict. The simulation results are expressed as changes relative to this baseline, either in percentages or in 2014 US dollars. Results for changes in *volume* show the changes observed when comparing the simulation to the predictions for 2025 at *unchanged prices*, i.e., changes in volume refer to changes at constant prices.

The model produces results for a range of economic outcomes including economic welfare, GDP volume, and trade flows, both in terms of value and volume. The economic welfare indicator measures consumption capacity, and it can be interpreted as a measure of real income.²¹ GDP in volume terms, in turn, measures production. The indicators of changes in trade flows, both in volumes and values, are of particular interest, and account for the *direct* impact of changes in trade costs (e.g. tariffs), and the *indirect* impact through trade *diversion* or *creation*.

The CGE model assumes that factor markets are frictionless and that production factors are mobile. While in reality, finding new partners and signing new contracts can be costly and time consuming, the model assumes that countries realize new export opportunities immediately following a shock.

²¹ Technically, the change in welfare corresponds to the equivalent change in utility: in a context where the level of utility but also the relative prices change, welfare measures the income that would be necessary at unchanged prices to reach the representative agent's new level of utility. In this sense, economic welfare can be seen as the real income of the representative agent.

Appendix II Geographical and sectoral breakdown

In addition to the external sources mentioned as basis for the dynamic baseline, the MIRAGE model relies on the GTAP database for information. The GTAP 10.1 database contains the social accounting matrices of 147 regions (individual countries or groups of countries) covering the entire world economy, and 65 sectors, for the year 2014. A social accounting matrix, the heart of CGE models, is an extension of the input-output tables of national accounts. A trade matrix links countries together.²²

In order to make calculations feasible, the GTAP database is aggregated on its two dimensions (country and sector). The aggregation criteria are guided by computational constraints, the objectives of each study, and the sort of shock considered.²³ In this study, the MIRAGE simulation contains 49 countries or regions and 32 sectors.

Geographical aggregation

The aim of the CGE model used in this report is to produce a quantitative evaluation of the impact of the conflict in Ukraine and associated trade measures on OIC countries. In line with this, countries were aggregated according to the following four criteria:

- OIC countries

There are 57 OIC countries, 24 out of which are represented as individual countries in the model. Additionally, 19 OIC countries are contained in 7 composite regions that only include OIC countries. Whenever possible, the regions were grouped to include only net exporters or net importers of cereals and energy. The remaining 14 OIC countries belong to composite regions in GTAP that also include non-OIC countries. In such cases, it is not possible for us to disentangle the countries of interest out of the pre-defined region, so these countries are not included in the OIC results.²⁴

- Countries directly involved in the conflict

Countries directly involved in the conflict are considered individually (Belarus, the Russian Federation and Ukraine). This is necessary to properly apply the “economic shock” due to the conflict and the associated trade measures in the simulation.

- Countries that have adopted trade restrictive measures against the Russian Federation and/or trade liberalising measures towards Ukraine

In the same spirit, it is necessary to consider individually, or in dedicated groups, all countries that have adopted trade measures associated to the conflict, so as to adequately capture the shock of the adoption of such measures. Among them, Australia, Canada, the European Union, EFTA, Japan, the Republic of Korea, New Zealand, and the United States of America.

In addition, India and China²⁵ are also considered individually, since including such large economies in aggregated groups may affect the results. India has implemented a trade policy in connection to the conflict that is included in the simulation, while China has not.

- Other countries

Lastly, the remaining countries are those that have not adopted trade measures associated to the conflict, and that more generally are not needed individually to adequately capture the impact of the conflict and trade measures on OIC countries. These remaining countries are split into five regions: Central America and South America), non-OIC ASEAN countries, rest of Europe, rest of Africa, and the rest of the world.

²² The full GTAP dataset is documented here: <https://www.gtap.agecon.purdue.edu/about/project.asp>

²³ Some shocks can lead to difficulties in finding a new equilibrium.

²⁴ OIC countries not included in OIC results are Afghanistan, Chad, Comoros, Djibouti, Gabon, Guyana, Maldives, Somalia, Suriname, Turkmenistan, Uzbekistan and Yemen.

²⁵ In this case, China includes Hong Kong and Chinese Taipei.

The complete list of countries and country groups included in the simulation is detailed in Table A. 1

Table A. 1: List of countries or country groups

Individual OIC Countries	
Albania	Kazakhstan
Azerbaijan	Malaysia
Bangladesh	Morocco
Benin	Nigeria
Brunei Darussalam	Oman
Burkina Faso	Pakistan
Cameroon	Saudi Arabia
Côte d'Ivoire	Senegal
Egypt	Togo
Guinea	Tunisia
Indonesia	Türkiye
Iran, Islamic Republic of	United Arab Emirates
Regions of OIC Countries	
East Africa	Rest of OIC
Rest of North Africa	Rest of OIC*
Middle East	Kyrgyzstan & Tajikistan
Middle East*	
Countries involved in the conflict	
Belarus	Ukraine
Russian Federation	
Countries that adopted trade measures	
Australia	India
Canada	Japan
China	Korea, Republic of
EFTA	New Zealand
EU28	United States of America
Other Countries	
Rest of Africa	Rest of the World
Rest of ASEAN (not OIC)	South America
Rest of Europe	

Note: * refers the part of the group that includes net energy and cereals importers.

Source: Authors' groupings based on the GTAP database.

Sectoral aggregation

As mentioned earlier, the model is solved for 16 agricultural sectors, 8 industrial sectors, 4 energy sectors and 4 service sectors. In choosing this aggregation, retaining detailed agricultural and energy sectors was prioritized, considering the expected impact of the conflict and the trade measures on food and energy markets. Conversely, industrial and service sectors, that are not the main focus of the report, are then considered at more aggregate levels.

The complete list of sectors included in the simulation is detailed in Table A. 2.

Table A. 2: List of sectors considered in the CGE model

Industry	Sector	Sectors in GTAP
Food	Cereal grains nes	Cereal grains nes
	Crops nes	Crops nes
	Dairy	Raw milk; dairy products
	Fishing	Fishing
	Meat	Bovine cattle, sheep, goats, horses; animal products nes; bovine meat products; meat products nes
	Oil seeds	Oil seeds
	Food products nes	Food products nes
	Rice	Paddy rice; processed rice
	Sugar	sugar cane, sugar beet; sugar
	Vegetables, fruits, nuts	Vegetables, fruits, nuts
	Vegetable oils and fats	Vegetable oils and fats
	Wheat	Wheat
Other agricultural products	Beverages and tobacco products	Beverages and tobacco products
	Forestry	Forestry
	Plant-based fibres	Plant-based fibres
	Wool, silk-worm cocoons	Wool, silk-worm cocoons
Energy	Coal	Coal
	Gas	Gas; gas manufacture
	Oil	Oil
	Other energy products	Other extraction, petroleum and coal products, mineral products nes, electricity
Manufacturing	Chemical	Chemical products
	Machinery	Machinery and equipment nes, motor vehicles and parts, transport equipment nes, manufactures nes
	Manufacturing	Wood products, paper products and publishing, rubber and plastic products, computer electronic and optical products, electrical equipment
	Ferrous metals	Ferrous metals
	Metals nes	Metals nes
	Metal products	Metal products
	Pharmaceutical products	Pharmaceutical products
	Apparel and textile products	Apparel and textile products
Services	Finance	Finance
	Insurance	Insurance
	Other services	Water; construction; trade; accommodation, food and service activities; warehousing and support activities; communication; real estate activities; business services nes; recreation and other services; public administration and defence; education; human health and social work activities; dwellings
	Transportation	Transportation nes, water transport, air transport

Note: the acronym “nes” refers to “not elsewhere specified”.

Source: Authors' groupings based on the GTAP database.

Appendix III Modelling changes in trade policy

Since the beginning of the conflict, ITC has been collecting a database on trade measures adopted around the globe in connection to the conflict. The database is available as part of the Market Access Map platform. Based on the measures listed in that database, four distinct types of trade policy change associated to the conflict are included in our simulation:

Trade liberalisation with Ukraine

The liberalisation vis-à-vis Ukraine is modelled as a change in the *ad valorem* equivalent of the applied tariff available in the GTAP 10.1 dataset, setting the bilateral tariff in each sector to zero. The removal of tariffs occurs in 2022 in the simulation and the assumption made is that it will persist until the end of the simulation (2025).

The countries that implement such policies are Canada, EFTA, EU28, Japan, and New Zealand. In the case of EFTA (Iceland, Liechtenstein, Norway, Switzerland), the agricultural sector was excluded from the temporary removal of tariffs. The simulation also accounts for the suspension of 232 tariffs on Ukrainian steel by the United States of America.

Trade sanctions against the Russian Federation and Belarus

Several countries implemented trade sanctions against the Russian Federation and Belarus. However, not all countries that implemented such measures are individualised in our dataset, as detailed in Appendix II. When a country implementing a trade sanction is part of an aggregated region in our dataset, that sanction is not considered in our simulation. For example, Brazil and Argentina implemented trade policies in response to the conflict in Ukraine, but as they are aggregated into a region (South America), their sanctions are not reflected in this study.

The countries implementing restrictions of trade flows from the Russia Federation and Belarus that are included in this study are: Australia, Canada, EFTA, EU28, Japan, New Zealand, the Republic of Korea and the United States of America.

The restrictions in exports and imports to and from the Russian Federation and Belarus is modelled as an increase in the *ad valorem* equivalent of a sectoral iceberg trade cost, set to an initial value of 0% in the model. Increasing this trade cost to 200% makes it almost impossible for trade to occur in that sector.

The trade-restricting measures adopted by countries are defined at the HS6 product level, but the restriction in the simulation is defined at the sectoral level. To define whether a sector is subject to the 200% increase in the iceberg trade cost, we compute the share of the exports of Russia (or Belarus) to the importing country (e.g., EU28) for all the HS6 products defined in the sanction. If the market share is higher than 50% then the sanction is applied to the full sector. If it is lower, the sanction is not applied (i.e., the trade cost remains null).

The measures adopted by Canada and New Zealand are modelled differently. Both countries changed their tariffs on Russian imports to their general tariff, which is an *ad valorem* tariff equal to 35%.²⁶ In these cases, the restriction is modelled as a change in in the *ad valorem* equivalent of the applied tariff available in the GTAP 10.1 dataset to 35% or the country's MFN tariff, whichever is highest.

Trade sanctions by the Russian Federation and Belarus

Similarly, the sanctions imposed by the Russian Federation or Belarus are modelled using a 200% increase in the bilateral trade cost between these two countries and a list of “unfriendly countries” (see Table A. 3).

Moreover, the trade cost between Ukraine and Russia and Ukraine and Belarus is set to 200% (in both ways), aiming at modelling the absence of bilateral trade between Ukraine and these two countries.

²⁶ Canada extended this measure to Belarus as well.

Trade policies by the rest of the world

Most of the sanctions or restrictive policies applied by other countries are not taken into account in the simulation scenario. For example, they might only concern an embargo on a product for a few months, or a small part of a sector, etc.

The only policy by a country from the rest of the world that is integrated is the restriction on Indian exports of wheat to the rest of the world. It is kept constant from 2022 to 2025.

Table A. 3: Countries and territories considered unfriendly by the Russian Federation

Albania	Monaco
Andorra	Montenegro
Anguilla	New Zealand
Australia	North Macedonia
Bahamas	Norway
Canada	San Marino
Croatia	Singapore
Denmark	Slovakia
European Union	Slovenia
Greece	Republic of Korea
Guernsey	Switzerland
Iceland	Chinese Taipei
Isle of Man	Ukraine
Japan	United Kingdom
Liechtenstein	United States of America
Micronesia	

Note: In bold, countries that are explicitly modelled in MIRAGE. EFTA and EU28 individual countries are integrated in their region).
Source: https://en.wikipedia.org/wiki/Unfriendly_Countries_List (2022-07-24)

Appendix IV Channels of impact on OIC countries in the model

Given the simulation scenario considered, the trade flows and entire economies of OIC countries can be affected through several channels, as follows:

- the “conflict itself”

The conflict has a stark detrimental effect on the Ukrainian economy, strongly affecting its exports to and imports from international markets. Countries that source a large part of their imports from Ukraine are pushed to find new suppliers. For products for which Ukraine has an important global market share, this triggers upward pressure on international prices.²⁷ Higher international prices promptly affect all countries importing the products in question, regardless of the origin of their imports.²⁸

- changes in competition for imports and exports:

The sanctions imposed on Belarus and the Russian Federation, as well as the retaliatory measures they adopted against sanctioning countries, trigger their own chain of effects.

“Third countries”, i.e., countries not imposing sanctions or retaliatory measures, that rely on imports from sanctioned or sanctioning countries may find that their supplier is now willing to part with their product at a lower price in order to circumvent sanctions. They could thus indirectly benefit from sanctions. This can be the case for OIC countries that import wheat from the Russian Federation, for example.

Conversely, third countries may be harmed by sanctions if they import a sanctioned product from other third countries, as they may face higher prices as a result of additional demand coming from sanctioned and sanctioning countries.

A similar argument can be made for exports. If a third country’s exports are destined to sanctioning countries, it will be able to obtain a better price from them, benefitting from sanctions. For example, this can be the case of OIC countries exporting energy products to the European Union.

However, if a third country exports primarily to other third countries, it may now face increased competition from sanctioned countries that will lower the price. That could be the case of OIC countries that export energy products to, for example, China.

In a nutshell, taking into account the significance Ukraine and the Russian Federation have in world markets for wheat and other cereals and energy products, we would expect OIC countries that import cereals from Russia and export energy products to the European Union to benefit, and those that import cereals from other third countries and export energy products to other third countries to suffer.²⁹

- erosion of preferences

Some markets reduced their tariffs vis-à-vis Ukraine, making it more difficult for OIC countries to compete in those markets.³⁰

These three channels highlight some of the elements that determine whether that impact on OIC countries is negative or positive: the significance of Belarus, Ukraine, the Russian Federation and sanctioning countries in international markets for certain products, the dependence of OIC countries on exports or imports of these products, and whether their trade partners are involved in the conflict and sanctions or not.

²⁷ Conversely, even if less often observed, countries that previously destined a significant part of their exports to Ukraine, are pushed to find new partners in global markets. For products for which Ukraine is a large buyer, this can entail downward pressure on international prices.

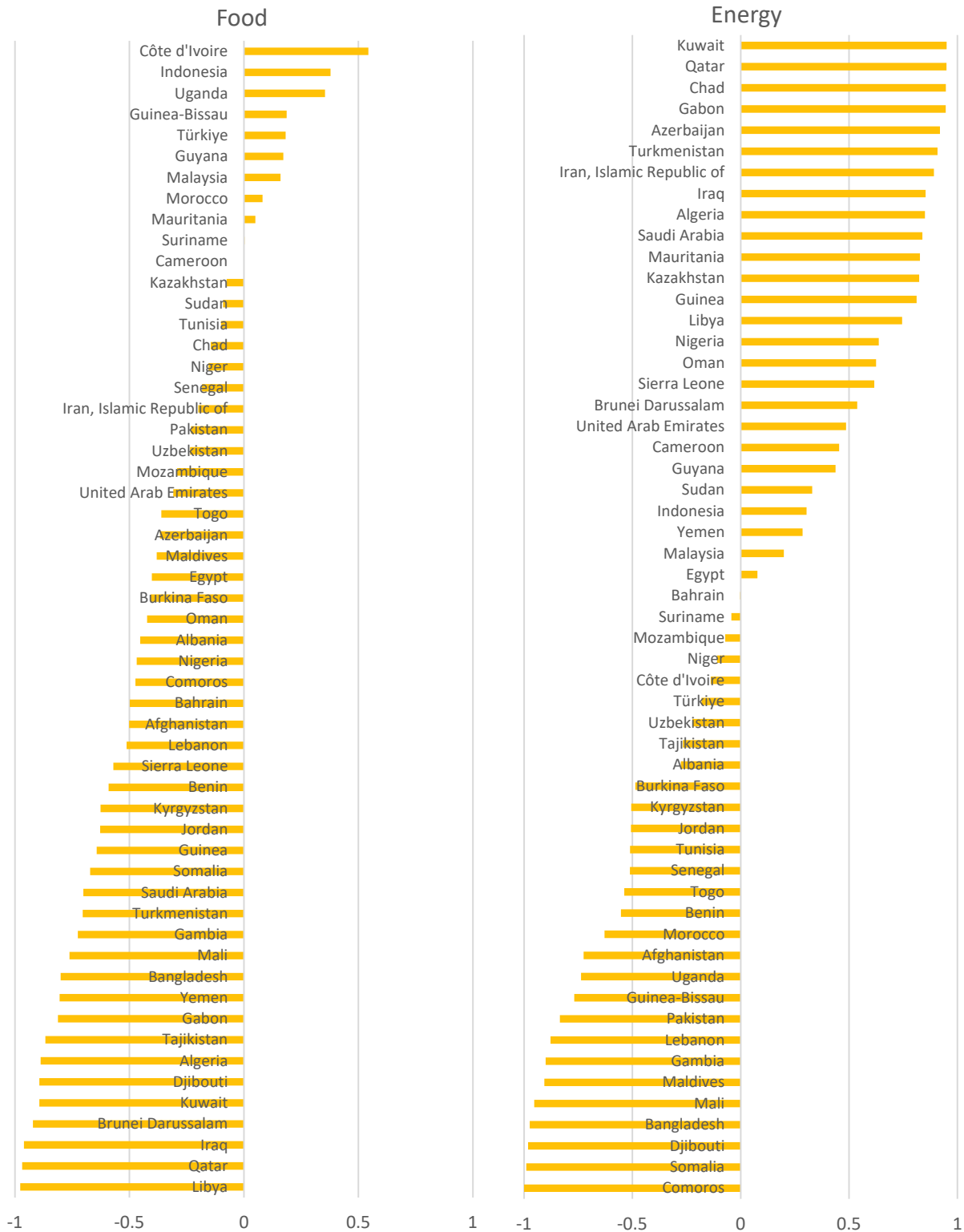
²⁸ Countries that export these products are also affected, since the upward pressure on international prices also pushes up the domestic prices of these products.

²⁹ Reality is more complex, since in addition lower or higher prices for some goods have indirect impacts on other prices. However, the direct effects described tend to be dominant. Additionally, the conflict may generate difficulties for the Russian Federation to exports its cereals along specific routes.

³⁰ In the model, Ukraine can still export despite the conflict. In markets that reduce their tariffs towards Ukraine, Ukraine gains competitiveness vis-à-vis other exporters, including OIC countries.

Appendix V Additional results

Figure A. 1: Net trade position of OIC countries for food and energy products, detailed



Note: based on average trade flows between 2017 and 2021. The net position corresponds to the ratio $(\text{exports} - \text{imports}) / (\text{exports} + \text{imports})$. It ranges between -1 and 1. Negative values indicate that imports are larger than exports (net importer position), and positive values indicate that exports are larger than imports (net exporter position).

Source: Authors' calculations based on the ITC Trade Map (2022) data.

Table A. 4: Food products for which at least one OIC country is a net importer, and Belarus, the Russian Federation or Ukraine are important global suppliers

Sector	Product	Belarus	Russian Federation	Ukraine
Cereal grains nes	Barley	0%	10%	11%
	Maize	0%	2%	13%
	Buckwheat	1%	29%	1%
	Millet	0%	7%	17%
	Worked cereals nes	0%	18%	5%
	Germ of cereals	0%	8%	0%
	Maize residues	0%	6%	5%
	Wheat residues	0%	12%	7%
	Cereals nes residues	0%	6%	0%
Crops nes	Coriander seeds	0%	12%	3%
Dairy	Sweetened milk & cream	7%	1%	1%
	Buttermilk	7%	3%	0%
	Butter	5%	0%	1%
	Dairy spreads	17%	1%	3%
Fishing	Crabs, fresh	0%	44%	0%
Food products nes	Sockeye salmon, frozen	0%	36%	0%
	Halibut, frozen	0%	7%	0%
	Plaice, frozen	0%	37%	0%
	Herrings, frozen	0%	16%	0%
	Sardines, frozen	0%	9%	0%
	Cod, frozen	0%	42%	0%
	Haddock, frozen	0%	30%	0%
	Fish livers, roes & milt, frozen	0%	39%	0%
	Fish nes, whole, frozen	0%	12%	0%
	Flatfish, whole, frozen	0%	12%	0%
	Fish fillets, cured	16%	1%	0%
	Crabs, frozen	0%	35%	0%
	Birds' eggs, shelled, dried	0%	0%	5%
	Mushrooms & truffles	9%	4%	2%
	Raspberries, frozen	1%	0%	5%
	Prepared herrings	14%	1%	0%
	Caviar & fish egg substitutes	15%	3%	0%
	Crustaceans	6%	0%	1%
	Peas	1%	6%	0%
	Tomato juice, unfermented	2%	6%	3%
Honey	0%	0%	6%	
Meat	Bovine carcasses, frozen	16%	3%	5%
	Fowls, whole, fresh	8%	1%	0%
	Fowls, whole, frozen	1%	1%	6%
	Animal secretions	1%	7%	0%
Oil seeds	Linseed	0%	27%	1%

	Colza seeds (low)	0%	1%	12%
	Colza seeds (high)	0%	9%	2%
	Sunflower seeds	0%	5%	1%
	Mustard seeds	0%	16%	6%
Sugar	Raw beet sugar	0%	11%	0%
	Beet molasses	3%	21%	1%
	Beet-pulp	1%	33%	3%
Vegetables, fruits, nuts	Peas, dried & shelled	0%	12%	5%
	Chickpeas, dried & shelled	0%	8%	1%
	Walnuts, shelled	0%	0%	6%
Vegetable oils and fats	Crude sunflower-seed oil	0%	20%	52%
	Sunflower-seed oil	0%	13%	14%
	Colza oil, crude (low)	7%	14%	3%
	Crude linseed oil	1%	17%	1%
	Margarine	0%	5%	1%
	Oilcake of linseed	1%	9%	1%
	Oilcake of sunflower seeds	0%	16%	48%
Wheat	Durum wheat	0%	15%	8%
	Wheat (excl durum) & meslin	0%	15%	9%

Note: based on average trade flows between 2017 and 2021. The food products listed are those for which: a) at least one OIC country is a net importer, b) either Belarus, the Russian Federation or Ukraine hold more than 5% of world exports. The shares shown represent the participation of each country in world trade of each product. The acronym nes stands for not elsewhere specified.

Source: Authors' calculations based on the ITC Trade Map (2022) data.

Table A. 5: Food products sourced to a significant extent from either Belarus, the Russian Federation or Ukraine

Product	Belarus	Russian Federation	Ukraine
Crude sunflower-seed oil	0%	51%	30%
Oilcake of sunflower seeds	0%	31%	46%
Buckwheat	0%	42%	18%
Mustard seeds	0%	56%	3%
Tomato juice, unfermented	1%	53%	1%
Cereals nes residues	0%	53%	0%
Linseed	0%	49%	4%
Beet molasses	0%	52%	0%
Cod, frozen	0%	51%	0%
Beet-pulp	1%	41%	9%
Sunflower-seed oil	0%	32%	16%
Prepared herrings	15%	32%	0%
Durum wheat	0%	28%	17%
Wheat residues	0%	28%	16%
Worked cereals nes	0%	40%	1%
Wheat (excl durum) & meslin	0%	26%	15%
Barley	0%	24%	15%
Maize residues	0%	23%	15%
Bovine carcasses, frozen	20%	6%	9%
Peas, dried & shelled	0%	26%	9%
Germ of cereals	0%	29%	1%
Raw beet sugar	0%	30%	1%
Birds' eggs, shelled, dried	0%	1%	29%
Millet	0%	11%	13%
Peas	1%	21%	0%
Margarine	0%	20%	1%
Maize	0%	4%	17%
Colza seeds (high)	0%	0%	16%
Buttermilk	2%	13%	1%
Fish fillets, cured	3%	12%	0%
Caviar & fish egg substitutes	4%	10%	0%
Sunflower seeds	0%	11%	2%
Coriander seeds	0%	11%	2%
Colza seeds (low)	0%	0%	11%
Halibut, frozen	0%	11%	0%

Note: based on average trade flows between 2017 and 2021. The food products listed are those for which: a) at least one OIC country is a net importer, b) either Belarus, the Russian Federation or Ukraine hold more than 5% of world exports, and c) OIC countries as a group source over 10% of their imports from either Belarus, the Russian Federation or Ukraine. The acronym nes stands for not elsewhere specified. The share shown represents the participation of each country in OIC imports of that product.

Source: Authors' calculations based on the ITC Trade Map (2022) data.

Table A. 6: Energy products for which at least one OIC country is a net exporter, and Belarus, the Russian Federation or Ukraine are important global suppliers

Sector	Product	Belarus	Russian Federation	Ukraine
Coal	Coal, anthracite	0%	59%	1%
	Coal, bituminous	0%	16%	0%
	Coal, nes	0%	5%	0%
	Lignite	0%	8%	0%
Gas	Natural gas, liquefied	0%	7%	0%
	Natural gas, in gaseous state	0%	11%	0%
Oil	Petroleum oils, crude	0%	13%	0%
Other energy and mineral products	Iron pyrites; unroasted	0%	9%	0%
	Sulphur of all kinds	0%	9%	0%
	Kaolin and other kaolinic clays	0%	0%	6%
	Fireclay	0%	0%	46%
	Clays, nes	0%	0%	8%
	Natural calcium phosphates, ground	0%	22%	0%
	Magnesite; natural	0%	6%	0%
	Asbestos	0%	65%	0%
	Iron ores and concentrates	0%	8%	10%
	Lead ores and concentrates	0%	9%	0%
	Tungsten ores and concentrates	0%	12%	0%
	Uranium ores and concentrates	0%	8%	0%
	Titanium ores and concentrates	0%	0%	6%
	Precious metal ores and concentrates	0%	12%	0%
	Antimony ores and concentrates	0%	30%	0%
	Ores and concentrates nes	0%	8%	1%
	Coke of coal, lignite or peat	0%	10%	0%
	Tar from coal, lignite or peat	0%	7%	6%
	Petroleum oil preparations	0%	10%	0%
	Liquefied gases, nes	0%	8%	0%
	Paraffin wax	1%	6%	0%
	Residues of petroleum oils	0%	6%	0%
	Bituminous mixtures	1%	8%	0%
	Carbonaceous pastes	0%	0%	6%
	Articles of asphalt	2%	12%	0%
	Building blocks & bricks of cement	7%	1%	0%
	Fabricated asbestos fibre	0%	8%	0%
	Float glass in sheets	1%	5%	0%
	Industrial diamonds, unworked	0%	22%	0%
	Diamonds, unworked	0%	12%	0%
Quartz, piezoelectric	0%	8%	0%	

Note: based on average trade flows between 2017 and 2021. The energy products listed are those for which: a) at least one OIC country is a net exporter, b) either Belarus, the Russian Federation or Ukraine hold more than 5% of world exports. The acronym nes stands for not elsewhere specified.

Source: Authors' calculations based on the ITC Trade Map (2022) data.

Table A. 7: Macroeconomic impacts for OIC countries

OIC country or region	Welfare	GDP (vol)	Terms of trade	Exports (vol)	Imports (vol)
Albania	0.0%	-0.2%	1.0%	-1.0%	-0.2%
Azerbaijan	2.2%	0.3%	4.9%	-0.3%	5.5%
Bangladesh	-0.3%	-0.2%	-1.3%	-0.2%	-0.5%
Benin	-0.4%	-0.1%	-0.2%	-0.1%	-0.5%
Brunei Darussalam	1.3%	0.9%	1.5%	0.8%	3.7%
Burkina Faso	0.3%	0.0%	0.9%	-1.0%	0.1%
Cameroon	0.1%	-0.1%	1.2%	-1.0%	0.2%
Côte d'Ivoire	-0.2%	-0.1%	-0.4%	0.2%	-0.2%
Egypt	0.0%	-0.1%	0.3%	0.4%	0.3%
Guinea	0.2%	-0.1%	0.4%	0.4%	0.6%
Indonesia	0.1%	0.0%	0.2%	-0.1%	0.3%
Iran, Islamic Republic of	0.4%	0.3%	0.6%	1.5%	2.1%
Kazakhstan	2.0%	0.7%	4.5%	1.6%	7.0%
Malaysia	0.4%	0.2%	0.2%	0.2%	0.6%
Morocco	0.0%	-0.1%	-0.1%	-0.1%	-0.1%
Nigeria	0.7%	0.2%	3.6%	-0.1%	4.4%
Oman	-0.2%	-0.2%	-0.2%	-0.2%	-0.3%
Pakistan	-0.2%	-0.1%	-0.5%	0.0%	-0.6%
Saudi Arabia	0.8%	0.2%	1.4%	-0.5%	2.3%
Senegal	-0.4%	-0.2%	-0.4%	0.3%	-0.5%
Togo	-0.3%	-0.2%	-0.2%	-0.1%	-0.4%
Tunisia	-0.2%	-0.2%	0.1%	-0.2%	-0.2%
Türkiye	0.0%	0.0%	-0.1%	0.7%	0.5%
United Arab Emirates	-0.2%	-0.1%	-0.2%	0.2%	0.0%
Eastern Africa	0.1%	0.1%	0.1%	0.3%	0.4%
Algeria and Libya	1.8%	0.5%	4.5%	0.5%	4.5%
Middle East	0.9%	0.4%	1.3%	-0.3%	2.9%
Middle East (Deficit in cereals and energy)	-0.2%	-0.1%	-0.3%	0.5%	-0.2%
Rest of OIC	0.3%	0.0%	0.8%	0.1%	1.1%
Rest of OIC (Deficit in cereals and energy)	0.6%	0.1%	1.2%	-0.3%	0.6%
Tajikistan and Kyrgyzstan	0.0%	0.0%	0.1%	3.4%	0.8%

Source: Authors' calculations based on the MIRAGE model.

Table A. 8: Impact on OIC trade flows, by sector

		Volume		Value	
Sector		Exports	Imports	Exports	Imports
Food	Cereal grains nes	0.42%	-1.28%	1.33%	0.50%
	Crops nes	-0.48%	0.46%	-0.35%	0.51%
	Dairy	-0.80%	2.29%	-0.43%	2.27%
	Fishing	-0.32%	1.98%	-0.20%	1.99%
	Food products nes	-1.32%	1.74%	-0.86%	1.86%
	Meat	0.20%	1.54%	0.48%	1.64%
	Oil seeds	-0.35%	-1.56%	0.23%	0.04%
	Rice	-0.15%	1.14%	-0.09%	1.10%
	Sugar	-0.73%	0.58%	-0.32%	0.73%
	Vegetable oils and fats	0.20%	0.00%	0.46%	0.53%
	Vegetables, fruit, nuts	-1.41%	0.90%	-1.14%	1.03%
	Wheat	-0.76%	-0.72%	0.89%	0.57%
Other ag. prod.	Beverages and tobacco products	0.34%	1.10%	0.60%	1.17%
	Forestry	0.09%	-1.17%	0.21%	-0.32%
	Plant-based fibres	-1.43%	-0.22%	-1.09%	0.01%
	Wool, silk-worm cocoons	-2.16%	0.12%	-1.84%	0.24%
Energy	Coal	0.10%	-0.29%	0.67%	1.03%
	Gas	5.64%	0.43%	7.66%	2.20%
	Oil	0.43%	2.48%	2.61%	1.65%
	Other energy products	-0.41%	0.84%	0.74%	1.53%
Manufacturing	Apparel and textile products	-0.44%	0.78%	-0.37%	0.90%
	Chemical	-1.36%	0.57%	-0.77%	0.91%
	Ferrous Metals	0.95%	0.12%	1.56%	0.55%
	Machinery	0.87%	1.67%	1.08%	1.65%
	Manufacturing	-0.42%	1.07%	-0.22%	1.16%
	Metal products	0.78%	1.32%	1.11%	1.43%
	Metals nes	-1.74%	0.32%	-1.42%	0.60%
	Pharmaceutical products	-1.46%	2.05%	-1.29%	1.98%
Services	Finance	-2.03%	2.27%	-1.75%	2.07%
	Insurance	-1.75%	1.90%	-1.48%	1.63%
	Other services	-2.28%	3.32%	-1.96%	3.11%
	Transportation	-0.77%	1.29%	-0.36%	1.62%

Source: Authors' calculations based on the MIRAGE model.