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Assessment of the Humanitarian, Economic and Financial Impact in the Short and Medium Term

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Executive summary

The Russian invasion of Ukraine has triggered a humanitarian crisis. Urban warfare is causing massive damage to critical civilian infrastructure, and there is a high risk of starvation, infection, and a rapid deterioration in people's physical and mental health. Pre-war, almost 19m people lived in those regions that are currently directly affected. Refugee inflows to the rest of Europe are likely to be at least three times greater than in 2015/2016.

The economic costs of the invasion will be profound. Available estimates put the damage and destruction of physical infrastructure so far at USD 62.6bn. However, the cost of making good those losses is likely to be much higher. The regions of Ukraine that are currently directly affected by the conflict account for 53% of GDP. About one third of industrial and agricultural production, and about a quarter of exports originate in the conflict regions (excluding Kyiv city). Economic activity has practically ceased in the affected regions. As Black Sea ports come under Russian assault, Ukraine has lost its ability to sell more than half of its exports, primarily agricultural commodities and metals. Merchandise exports accounted for more than a third of the country's GDP in 2021.

The economy so far has shown remarkable macro-financial resilience. However, this may change as many companies stop functioning and as unemployment rises. Banks will face substantial losses, due to the damage caused to their physical assets and the high probability of defaults on many loans. Western financial support will become ever more important as the war continues.

Turning to Russia, sanctions will have a very serious impact on that country's economy and financial sector. We estimate that Russian GDP will contract by at least 7-8% this year (and feasibly up to 15%), and inflation will accelerate to close to 30% by the end of 2022. During the first week of the crisis, Russia faced capital flight, FX depreciation and deposit outflows. Despite being partly hamstrung by the fact that a large proportion of Russian reserve assets are frozen in the EU and G7, the central bank managed to stabilise financial markets by a combination of confidence-building and hard-steering measures: capital controls, FX controls, regulatory easing for financial institutions, and a doubling of the key policy rate. Although these measures were effective in curtailing financial panic, they further undermined investor confidence and increased the costs of borrowing for business. The fiscal stimulus so far announced is very limited, especially considering the likely scale of the contraction, and is not going to offset a sharp decline in real household incomes in 2022.

As a result of the war and the sanctions, the rest of Europe faces a surge in already high inflation; this will weigh on real incomes and could depress economic growth. In Germany, we estimate that each doubling of the gas price causes GDP to decline by over 1 percentage point. Many European countries rely heavily on Russia for oil and gas imports: import shares are over 75% in Czechia, Latvia, Hungary, Slovakia and Bulgaria with respect to natural gas; Slovakia, Lithuania, Poland and Finland with respect to oil and petroleum; and Cyprus, Estonia, Latvia, Denmark, Lithuania, Greece and Bulgaria with respect to solid fuels.

Aside from energy, the fallout via trade for the rest of Europe is likely to be small. Non-energy trade and investment links between Russia and many European countries have declined in importance since 2013, with partial decoupling as a result of the exchange of sanctions following the annexation of Crimea. The most significant links are in CESEE; but even there, with a couple of exceptions, non-energy reliance on Russia is very limited. Even in a scenario where Russian demand falls by 10%, imports by 30% and exports by 13%, the negative hit to GDP growth in the rest of Europe via the trade channel (excluding energy) would be at most -0.25%, with the worst-affected countries mostly in CESEE. Using the 'partial global extraction method' to get a perhaps more realistic scenario, with adjustment via substitution, the impact on GDP in the rest of Europe would be even smaller.

If the EU were to ban imports of energy from Russia, or if Russia itself limits or stops gas exports to the EU, the trade impacts would be much more significant. More far-reaching moves to restrict or halt imports of Russian oil and gas by the EU are no longer inconceivable. As the Russian armed forces turn increasingly to indiscriminate shelling of civilian areas, and with allegations of war crimes by Russian forces starting to emerge, public anger in the rest of Europe will only grow, and there will be increased political space for EU leaders to take the undoubtedly economically painful step of cutting off Russian energy revenues.

The 'temporary protection' scheme introduced by the European Commission is an unambiguously positive step to foster Ukrainian refugees' integration into EU labour markets. However, there are several major challenges. First, those fleeing the war are mostly women, children and the elderly. Second, some EU labour markets are still recovering from the COVID-19 crisis. Third, although the average education level of Ukrainians is above the EU average, there are some doubts about the transferability of refugees' skills, knowledge and work experience, at least in the short-run.

Financial contagion is already visible in CESEE: currencies have weakened in countries near to Russia and Ukraine due to higher risk aversion, and interest rates on government debt have increased in some cases. Investor sentiment – both domestic and foreign – in the Baltic states is likely to suffer amid fears that Russia has designs on more than Ukraine. Nevertheless, most of the region has strong macroeconomic fundamentals, and policymakers have some space to use fiscal and monetary tools to ensure macro-financial stability.

The medium- and long-term outlook for Ukraine, Russia and the rest of Europe has been changed radically by the events of the last few weeks. For Ukraine, if one part of the country is occupied and the other part remains independent, economic outcomes will be very divergent. An independent part of Ukraine would see many refugees return, would receive massive Western financial support and could look forward to greater integration with the EU. Western investment would drive technological upgrading and productivity improvements. The IT sector – already advanced – would develop further. And the agricultural sector, where land reform was implemented recently, has great potential for increases in efficiency, which could be brought about by increased post-war investment. By contrast, a Russian-occupied East Ukraine would be rebuilt much more slowly, would continue to suffer from outward migration and would form part of a Russia-dominated world that has become relatively isolated from the global economy (except for its links with China – links that are unlikely to be very important for these regions of Ukraine).

For Russia, the medium-term outlook is largely negative. The sanctions mean that the economy will lose its access to Western technological transfer, which will increase its economic backwardness relative to the rest of the world. This will be partly – but far from completely – offset by rising integration with the major Asian economies, especially China. Real incomes are likely to stagnate. The Russian invasion also looks set to presage a fundamental unwinding of 30 years of economic integration between Russia and the West. On top of the harsh financial sanctions imposed on Russia, Western firms are leaving Russia *en masse*. That creates the likelihood that, even if at some point sanctions are eased, February 2022 may well prove to have been the swansong for European economic integration in its broadest sense.

There are four main areas of structural change and lasting impact for the EU (and Europe more broadly) as a result of Russia's invasion of Ukraine. First, the EU will get more serious about defence. Second, the green transition will gather pace. Third, broader Eurasian economic integration will be unwound. And fourth, the EU accession prospects for countries in Southeast Europe could (and should) improve.

Western policymakers have a lengthy to-do list in the short term. The immediate priority must be to address the humanitarian crisis, including supporting and integrating refugees, providing assistance where possible for internally displaced people within Ukraine, and helping those countries where most refugees are arriving (such as Poland and Moldova). The next step is to address integration, including language training and active labour market policies to ease job access. Once the war ends, the US and EU should be ready with a plan for reconstruction, including identifying the most urgent areas where support will be needed (transport, housing, administration, etc.). They should also determine the scale and sequencing of this support, and encourage a significant return flow of refugees, once this becomes feasible. Technical assistance to the government will be crucial in rebuilding the economy from its war mode and advancing with reforms. The EU should make specific efforts to integrate post-war Ukraine much more strongly. This should include participation in all major EU programmes, just as if the country were an EU member: the cohesion funds, exchange programmes, research and scientific cooperation, trans-European transport and other infrastructure projects, common energy policy and programmes linked to the New Green Deal.

Keywords: Ukraine, Russia, EU, US, sanctions, energy, CEE

JEL classification: F51, E31

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1. Introduction: The end of an illusion

Like 11 September 2001, 24 February 2022 may well be a day when the world changed irrevocably. Although Russia (and before it the Soviet Union) has launched many military incursions into its so-called near abroad, the invasion of Ukraine marks a paradigm shift in European security, from which it seems likely there will be no going back.

It is probably fair to say that much of the media and analytical coverage still underestimates how long this crisis could last, and how much of a structural change it will bring about – militarily, but also geo-politically, economically and financially. This is a potential watershed moment in European defence. Never before has the EU given money to a country at war for it to use to buy weapons. And Germany seems, after several generations, ready to again become a 'normal' country in military terms, having already announced plans to significantly ramp up its defence spending.

Russia's attack on Ukraine marked the start of warfare in Europe on a scale not seen since the Balkan wars of the 1990s. Many people have already died, and as Russia launches apparently increasingly indiscriminate artillery and missile attacks on major cities, the death toll is likely to rise dramatically. What was unimaginable a few weeks ago is now happening. TV pictures show an already high level of human suffering in Ukraine. Although it is impossible to calculate the odds properly, the risks of a major nuclear incident in Europe seem as high as they have been for several decades.

In this context, wiiw has produced a second policy note on the invasion. In this paper we do two main things. First, we attempt to quantify and analyse the immediate macroeconomic and financial impact of the invasion, and the ensuing sanctions, on Ukraine, Russia and the rest of Europe. And second, we look ahead to the medium term, and make an initial attempt to understand the structural changes that the invasion will bring about.

2. Short-term measurable impact and projections

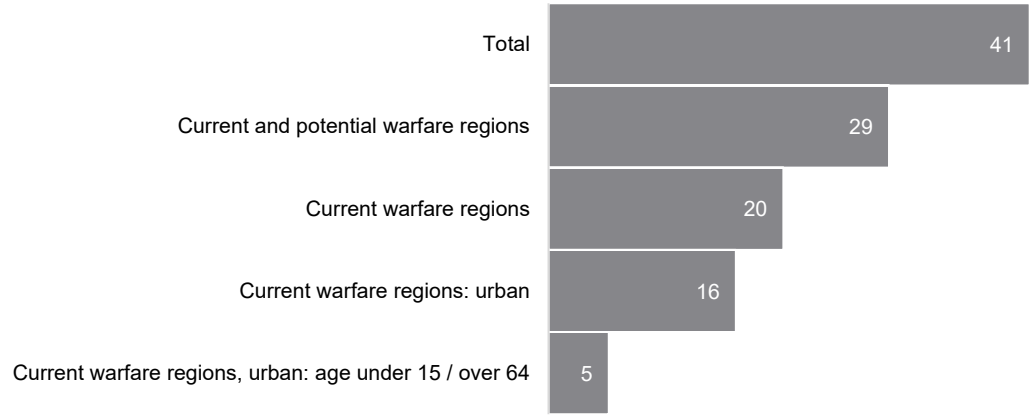
2.1. UKRAINE

2.1.1. Humanitarian impact

The decision by the Kremlin to launch a full-scale military campaign caused a massive deterioration in the humanitarian situation in Ukraine. Historically, the greatest detrimental impact of wars has not been the direct destruction of capital goods, but the collateral damage arising from them: disruption of public services, interruption of production chains, and market disintegration amid uncertainty. And, in the event of massive refugee flows, significant loss of human capital. In the modern era, this damage can be significantly reduced if one manages to avoid armed warfare in urban areas. Unfortunately, this is rarely the case.

After three weeks of fighting, the Russian armed forces had not managed to cut the Ukraine armed forces off from the major Ukrainian cities, except Kherson. With defending positions being set up inside the cities, the Russian armed forces started to engage in urban warfare, which will cause massive collateral damage to critical civilian infrastructure: water and heat supply systems, electricity grids and sewerage. With this damage to the infrastructure, the urban population faces a high risk of starvation, the spread of disease and a rapid deterioration in its physical and mental health. Prior to the war, 70% of the Ukrainian population lived in urban areas in the government-controlled zone.

Figure 1 / Exposed population groups, million



Note: Potential warfare regions are defined as regions that contain part of the river Dnipro on their territory, plus Odesa, but that so far have not witnessed a mass Russian armed forces presence. See the precise list in Table 8.
Source: Ukrstat, UNOCHA, own calculations.

Assuming that the Russian armed forces does not try to occupy the most westerly regions of Ukraine,[1] we put the upper bound of persons at risk of hostilities at 29m, with 20m located in the regions where the Russian armed forces have at some point had partial or full territorial control.

About 10% of the population belong to the high-risk group: young children and the elderly are less mobile, which reduces the odds of their survival in a besieged city. The evacuation of this social group to safe regions should be the top priority for the authorities and non-governmental organisations (NGOs). The scale and severity of the humanitarian crisis will depend largely on the duration of the urban combat and the scope of application of heavy arms: artillery, multiple rocket launchers and air strikes.

Modern conflicts provide little quantitative guidance on this score, due to the high level of variation. As Table 6 in the Annex shows, the duration of the most recent large-scale urban battles has varied enormously – from 6 days during the US takeover of Baghdad up to 1,425 days during the siege of Sarajevo. The duration does not correlate with easily observable characteristics of cities, such as size or population density. Qualitative evidence suggests that a swift frontal assault could be successful, if the defending forces are poorly prepared and if the attacker manages to neutralise the leadership quickly, as happened in the Battle of Baghdad (Fiore, 2019). Yet it is a risky strategy;[2] and except for around Kherson, the Russian armed forces is currently facing stiff resistance in the major urban areas. Evidence from the Balkan wars suggests that superiority in infantry and arms does not guarantee a quick and decisive victory over a besieged city (see Box 1). The organisation and existence of routes to supply the defenders appear to be of great importance, yet this is hard to evaluate ex ante: it depends on developments on the battlefield.

The battle around Mariupol provides a classic example of what happens when the bulk of the population is trapped in a city, the defenders display stiff resistance and the attackers lack high-precision weapons to knock out the defenders' strongholds. At the time of writing, about a quarter of the population of that city of 400,000 are awaiting evacuation while living with limited access to electricity, water, sewerage and heating for over three weeks (UNOCHA, 2022b). This implies a high probability of death from starvation, frostbite and disease.

[1] We assume low likelihood of Russian armed forces incursion into the following regions: Vinnytsia, Volyn, Zakarpattia, Ivano-Frankivsk, Lviv, Rivne, Ternopil, Khmelnytskyi and Chernivtsi oblasts. We assume high likelihood of armed assaults for the following regions where the Russian armed forces is currently not present: Dnipropetrovsk, Kirovohrad, Odesa, Poltava and Cherkasy oblasts.

[2] As the First Battle of Grozny demonstrated, however, this approach carries high risks and is unlikely to succeed against motivated defence forces (Thomas, 1999).

BOX 1 / THE EXAMPLES OF THE WARS IN CROATIA IN 1991 AND BOSNIA AND HERZEGOVINA IN 1992

When analysing the current situation surrounding the Russian invasion of Ukraine, certain analogies with the series of independence wars in former Yugoslavia between 1991 and 2001 spring to mind. Clearly, the political developments then were influenced by a number of different idiosyncratic factors, which are not necessarily comparable to current events. Nevertheless, we believe that their analysis can yield insights into the question of the sustainability of military resistance by inferior, but highly motivated, defence forces against a technically and numerically superior invader.

At the end of communist rule in 1990, the Socialist Federal Republic of Yugoslavia was divided more or less according to the readiness of the communist parties in the various federal units[3] to develop a democratic system involving free elections. For the Serbian party, under the leadership of Slobodan Milošević and his allies, democracy was of far less interest than control over a 'Serbian World'; and as far as they were concerned, the Yugoslav federation was the most functional form. At the 14th Extraordinary Congress of the League of Communists of Yugoslavia, in January 1990, all proposals from the Croatian and Slovene reform-minded communist party delegates were voted down. That led to the break-up of the overall party – and ultimately of the federal state, after free elections were held in Slovenia and Croatia.

While Slovenia was allowed to leave the federation after a 10-day war in the summer of 1991, Croatia faced a full-blown invasion by the Serb-controlled Yugoslav People's Army, primarily because a large Serbian minority lived in Croatia (unlike the monoethnic Slovenia). Serbian propaganda justified the intervention under the pretext of the 'denazification' of Croatia and in defence of the Serbian minority, which was supposedly under attack by the newly elected Croatian government.

Croatia, at the outbreak of war in March 1991, had no proper army to defend itself. The nucleus of the newly established military was the (special) police force, as well as deserters and reservists of the Yugoslav People's Army, militias from the republic's Territorial Defence home guard, and volunteer units. Overall, it is estimated that in 1991 Croatia had around 70,000 men with light weapons, out of a population of about 4.7m. The Serbian forces had about double the number of men, and they were armed with weapons of all sorts, including hundreds of aircRussian armed forcest and helicopters, warships, tanks, armoured personnel carriers, heavy artillery pieces, rocket launchers and ground-to-ground-missiles. The Serbian side was composed of recruits and reservists from the Yugoslav People's Army (with a mixed level of fighting morale) and the Serbian Territorial Defence, as well as volunteer units from Serbia and the Serb-populated regions of Croatia. The Croatian army was able to improve its arsenal only stepwise, by seizing some of the arms found in Yugoslav People's Army barracks and the Territorial Defence depots; it also got its hands on some weapons imported illegally (given that there was a general embargo on military equipment).

After a series of small armed incidents and more significant clashes, a referendum, the declaration of independence in May 1991 and the brief war in Slovenia, the conflict in Croatia started to escalate in July 1991. The Serbian battle plan envisaged several operations to chop the country into pieces along the coastline and in the central hinterland. In the campaign's main effort, armoured and mechanised forces were tasked with following the 'highway of brotherhood and unity' along the Sava river northwest, in order to capture Croatia's capital Zagreb and to overthrow the country's newly elected government. A number of operations were successful, with about a third of the country occupied early on and large sections of the non-Serb population expelled. However, the main goal of the campaign was not achieved. The Croatian army focused on defending the capital, as well as the city of Vukovar on the Danube, close to the Serbian border.

[3] The six republics and the two autonomous provinces of Kosovo and Vojvodina within the republic of Serbia that had the de facto status of republic in the collective presidency of Yugoslavia.

That city commanded the full attention of the occupying forces, and the Battle of Vukovar lasted from 25 August to 18 November 1991. In the end, the fall of the city was a pyrrhic victory for the Serbian side: while almost all of the 1,800 defenders were either killed or wounded in the battle, the invaders lost several aircraft and more than 100 tanks and armoured personnel carriers, and suffered 3,600 casualties (about 10% of the besieging force). Vukovar was the first major European town to be entirely destroyed since the Second World War. The related atrocities against the civilian population led indirectly to international recognition of Croatian statehood and subsequently to a UN-sponsored ceasefire in January 1992. From then on, Croatia was able to build a well-organised army and prepare for the reconquest of its lost territories, which happened in August 1995. Overall, it is estimated that the war in Croatia caused about 20,000 deaths and resulted in around 500,000 refugees and displaced persons.

By contrast, the war in Bosnia and Herzegovina developed very differently. Following its declaration of independence in March 1992, sporadic fighting broke out across the whole territory and included a series of massacres. The democratically elected government missed its chance to seize a large quantity of weapons from the barracks and depots of the Yugoslav People's Army and the republic's Territorial Defence. Moreover, the importation of weapons was hampered by the embargo mentioned above, but circumventing it was much more complicated than in the case of Croatia, given that Croatia and local Croatian militias also started to attack the government forces, mainly consisting of Muslim Bosniaks, cutting off their access to the coast. Thus, the government-controlled territory rapidly shrank to a fairly small part of central Bosnia. Moreover, several enclaves were surrounded by Serbian forces. And most importantly, the capital city of Sarajevo was encircled early on.

The siege of Sarajevo lasted from April 1992 to February 1996. It is deemed to be the longest siege of a capital city in the history of modern warfare. The defenders outnumbered the besiegers, who, however, had large quantities of tanks and artillery pieces provided by the Yugoslav People's Army. The defenders had only a small quantity of light weaponry at their disposal. On 5 February 1994, the Serbian artillery shelled the Markale market in the heart of Sarajevo's old town, killing 68 and wounding 144. Following this episode (known as the first Markale massacre), the UN formally asked NATO to consider air strikes against the aggressors. In the following months, NATO performed occasional and targeted air strikes against the Serbian forces. After the Serbian massacre of more than 8,000 men and boys in the Bosniak enclave of Srebrenica in July 1995 and the second Markale massacre in August 1995, a large-scale NATO air campaign against the Serb military commenced. This, together with a shift in the balance of power on the ground when the Croatian army's campaign to recapture occupied territories in Croatia was bolstered by joint operations in the western parts of Bosnia by the Army of the Republic of Bosnia and Herzegovina, cleared the way for the subsequent peace negotiations in Dayton. It is estimated that during the whole Bosnian war, about 100,000 persons were killed and more than 2m were rendered refugees or displaced persons, out of a total population of 4.4m.

The above examples show that military resistance is possible, even if the defending side is initially weak in terms of armaments, but is strongly motivated to defend the country. However, the examples also show that the ultimate ability to retake occupied territories depends inter alia on the possibility of engaging the invader in bloody urban warfare, which leads to international support. That, however, can only be utilised if supply routes are kept open and the capital city is not besieged. The latter two issues are crucial for the reinforcement of the defender's army. Also, air superiority is an important element in the potential reconquest of lost territories. Finally, the mobilisation of international support in the Balkan wars of the 1990s was probably made considerably easier by the fact that the aggressor was not a nuclear power.

2.1.2. Economic impact

The indiscriminate bombardment of residential areas by the Russian armed forces has led to the destruction of large parts of the infrastructure and buildings in those regions of the Ukraine that have come under attack (see Figure 2). According to estimates by the Kyiv School of Economics' KSE Institute, at least 411 educational institutions, 36 healthcare facilities, 1,600 residential buildings, 26 factories, 6 thermal power plants/hydroelectric power plants were damaged during the first three weeks of the war. In addition, there was damage to more than 15,000 km of roads, 5,000 km of railways, 15 airports, and 350 bridges and overpasses. The total value of damaged/destroyed objects is estimated to be about USD 62.6bn.[4] However, the cost of repairs is likely to be much higher, as it will be necessary to knock down the destroyed buildings/structures and rebuild a significant number of them from scratch.

Economic activity has practically ceased in these regions, apart from the maintenance of public utilities, basic retail trade and medical services, where possible. Finance Minister Serhiy Marchenko estimates that by mid-March 2022, the Russian invasion had forced 30% of the economy to stop working. According to a survey conducted by the European Business Association in Ukraine on 14 March 2022, 42% of small and medium-sized enterprises (SMEs) had completely ceased operations and 31% had suspended their operations, but intended to resume them as soon as possible.[5] Only 14% of those enterprises surveyed had enough financial resources to survive for more than three months; and about half of the SMEs had already applied for monthly state aid of UAH 6,500 (USD 222) per person/SME. According to the Ministry of Economy, the losses from the war so far could amount to between a third and a half of the country's GDP.[6]

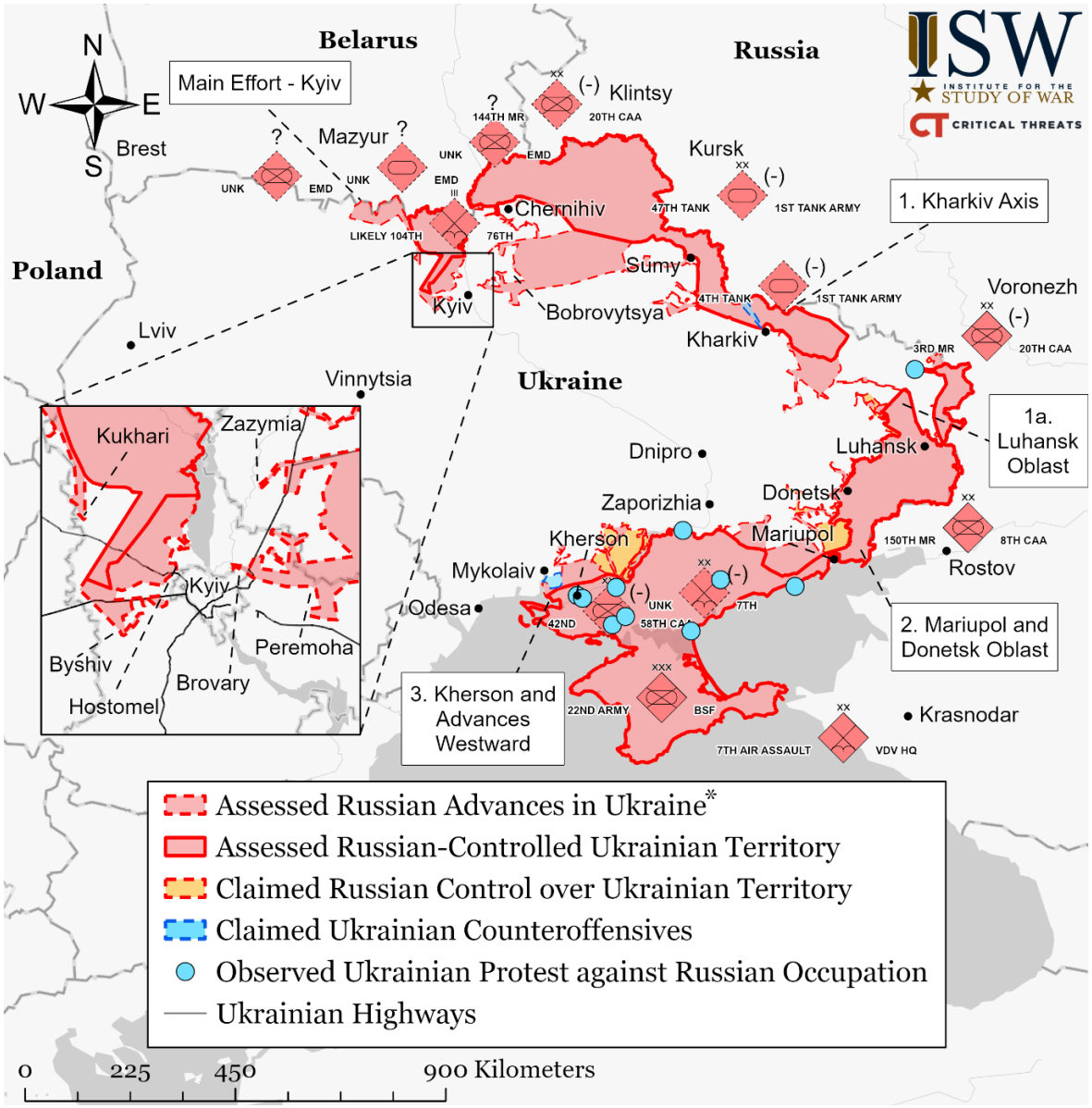
Since the Black Sea ports in the south of the country have been brought to a virtual standstill by the Russian assault, Ukraine has lost the ability to sell more than half of its exports – primarily agricultural commodities and metals. Merchandise exports accounted for more than a third of the country's GDP in 2021.

4 https://interfax.com.ua/news/general/814999.html

5 https://eba.com.ua/en/finansovi-rezervy-chverti-predstavnykiv-malogo-biznesu-vzhe-vycherpani/

6 https://archive.ph/wip/OKkOT and https://archive.ph/wip/U0iS3

Figure 2 / Map of the assessed Russian advances in Ukraine



Note: Situation as of 20 March 2022. Assessed Russian advances are areas where ISW assesses Russian forces have operated in or launched attacks against but do not control.
Source: Institute for the Study of War.

Table 1 shows the importance for the economy of the country of those regions that are on the front line. Almost 19m people reside in these regions (about 46% of the total population), which means that the displaced population (a significant share of whom are likely to become refugees) could still increase dramatically.

Table 1 / Main characteristics of the regions on the front line

Regions	Population 2021	GDP 2019	Industrial production 2020	Goods exports 2020	Services exports* 2019	Agricultural production 2020	FDI stock* 2020
	million people	shares in the total for the country, %					
Kyiv city	2.95	23.9	11.8	25.3	48.5	-	46.4
Chernihiv	0.96	2.0	1.4	1.8	0.4	6.9	1.1
Kharkiv	2.60	6.2	7.1	3.0	4.6	6.4	2.2
Kherson	1.00	1.6	1.3	0.6	0.4	3.9	0.9
Kyiv	1.80	5.5	5.1	4.0	4.2	5.9	4.4
Mykolayiv	1.09	2.3	2.5	4.6	5.9	3.1	1.5
Donetsk	4.06	5.2	10.3	8.0	1.1	3.3	5.0
Luhansk	2.10	1.0	0.8	0.3	0.4	2.2	0.8
Total for the selected regions	**18.91**	**52.7**	**43.1**	**50.3**	**75.4**	**34.0**	**66.0**
Total for the selected regions without Kyiv city	***15.96***	***28.8***	***31.3***	***25.0***	***26.9***	***34.0***	***19.6***

* Excluding unallocated value.
Source: State Statistics Service of Ukraine, National Bank of Ukraine.

Excluding Kyiv city from the total makes sense for some indicators, as the capital is used as a place of registration for many companies that have their real production facilities elsewhere. Another thing to keep in mind is that a large share of services is produced and traded online; thus not all the services production will be lost with the destruction of the cities. In 2020, digitally provided services exports (IT and other business services) accounted for at least 5% of GDP. Another important services export item is pipeline transport, export of which accounted for 1.6% of GDP. So long as the pipeline transport infrastructure remains operational, these services will continue to be provided.

Together, the regions in the active war zones account for at least 29% of GDP (53% if Kyiv city is included). About a third of industrial and agricultural production, and about a quarter of exports originate in the regions (excluding Kyiv city). The International Monetary Fund (IMF) estimates that Ukraine's economic output could shrink by at least 10% in 2022 (assuming a prompt resolution of the war and substantial donor support).[7] If the war is more protracted, GDP could fall by up to 35% in 2022.

Probably the most significant losses in the short run will be in human capital, with the rising death toll, the deterioration in people's health and their displacement. The mass displacement of the population has already started, but is unlikely to have reached its peak. Displacement may take two forms: internal (when citizens flee their homes, but stay in the country of origin) and external (when people leave the country). At the time of writing, UNOCHA puts the total number of displaced persons in Ukraine at about 10m. Experience of previous conflicts suggests, however, that this assessment could be on the conservative side.

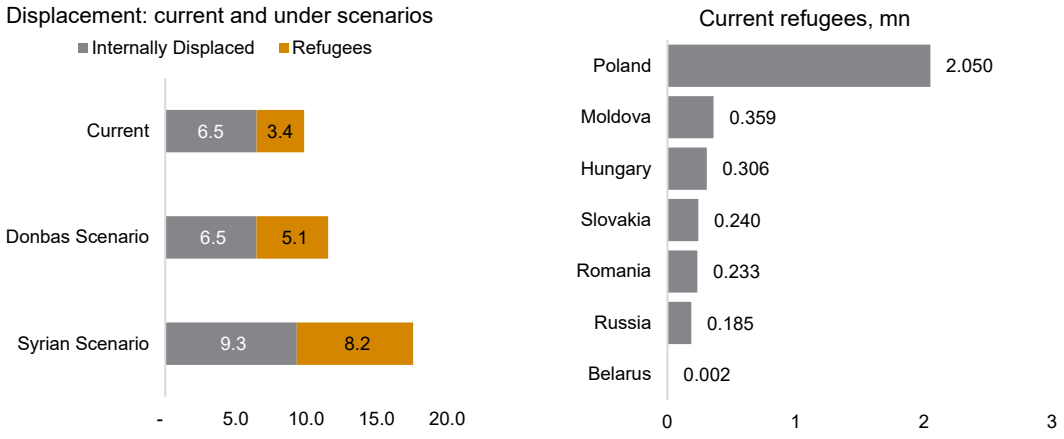
Assuming people will flee from both current and potential warfare regions and assuming the displacement ratios observed in Donbas in 2014/2015, we can expect 11.6 mn displaced persons with 5.1 of them becoming refugees (Figure 3). If one posits, however, a displacement rate similar to that witnessed in Syria (61%), then the number of displaced persons may reach almost 20m. Such a

[7] https://www.reuters.com/world/europe/ukraine-economy-could-shrink-by-third-due-russia-invasion-imf-report-says-2022-03-14/

scenario is plausible if the Russian armed forces manage to advance to the central Ukrainian regions, but fail to achieve a major victory, so that the war becomes protracted, as in Syria.

The longer a conflict lasts, the greater are the chances that internally displaced persons (IDPs) will flee to another country. In contrast to the Donbas crisis, this time it is almost all large population centres that are affected by warfare. This means that those regions that are unaffected by the fighting may simply lack the capacity to host enough of the population from other cities. For example, the population of Lviv – the largest city in western Ukraine – is only about a quarter of the size of Kyiv, which is directly under siege. It is a logistical nightmare to find accommodation for half of Kyiv's population (or about 1.5m people).[8] The chances are that the longer the conflict lasts, the more people will flee to other countries in Europe. Regardless of the actual figures, one conclusion is inescapable: Europe is facing an influx of refugees that is at least three times greater than it witnessed in 2015/2016.

Figure 3 / Displacement scenarios and first-country destinations of Ukrainian refugees, as of 18 March 2022



Note: Figures reported as "current" (left panel) include survey-based estimates for IDPs, while the refugee data are administrative. The Donbas scenario assumes the displaced-to-total ratio, the IDP-to-displaced ratio and the refugee-to-displaced ratio to be as during the Donbas conflict at the peak of the crisis, in January 2015. The Syrian scenario assumes the same ratios as were reported for Syria as of 15 March 2022. The ratios are then multiplied by the estimated registered population of both current warfare and potential warfare regions. See Table 7 and Table 8 in the Annex for the parameter ratios and definitions of current and potential warfare regions.
Source: UNOCHA, own calculations.

There are two major problems facing refugees at the moment. The first involves the logistics of travel and border control. The early days of the conflict highlighted the lack of capacity at the Polish, Slovak and Moldovan border checkpoints with Ukraine.[9] This resulted in crossing times that exceeded two days in the most extreme cases.[10] It should be among the EU's key policy priorities to support border-control capacities and to offer humanitarian assistance at the checkpoints of neighbouring countries – Poland and Moldova, first and foremost. The second problem is the limited capacity of the neighbouring

8 This the number of people leaving Kyiv, as reported by Kyiv's mayor to the media. https://www.aljazeera.com/news/2022/3/10/half-of-kyiv-population-has-fled-says-ukrainian-capitals-mayor

9 https://www.impact-initiatives.org/what-we-do/news/ukraine-crisis-supporting-humanitarian-response-in-and-outside-ukraine-with-the-the-right-data-and-information-products/

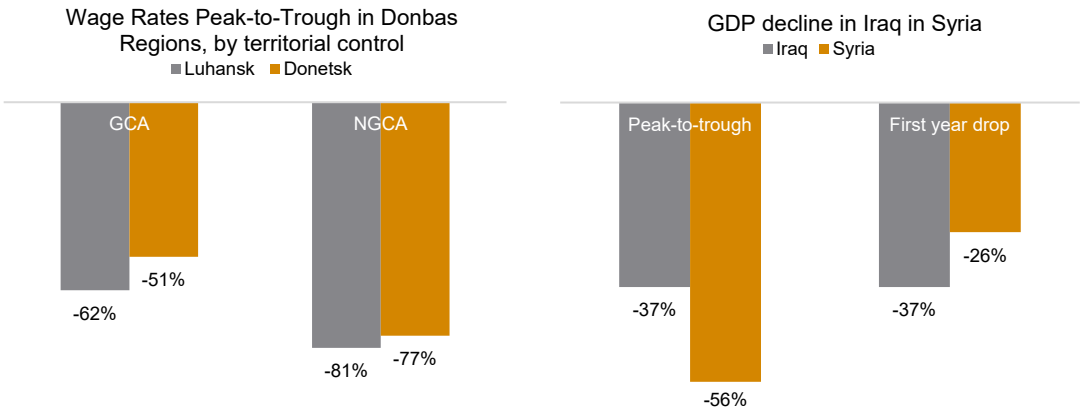
10 https://www.euro.who.int/en/countries/ukraine/news/news/2022/3/who-in-the-republic-of-moldova-delivers-much-needed-health-supplies-to-aid-refugees-from-ukraine

countries to host such a vast number of refugees. For a relatively populous country like Poland, the ratio of refugees to resident population has already reached 5%. And the situation is still more worrying in Moldova – a much less populous and poorer country – where the ratio stands at 13.5%. Given that the refugee flow is going to continue, Moldova is likely to have reached the limits of its hosting capacity. To avoid further worsening the crisis, we recommend that policymakers should provide financial support to the host countries – especially the Moldovan authorities – and introduce a burden-sharing scheme across the EU, in order to avoid an excess concentration of refugees in a few of the closest countries.

BOX 2 / SHORT-TERM IMPACT OF WAR ON ECONOMIC ACTIVITY

Historical accounts suggest that the speed and depth of economic damage in a war situation vary greatly in cases of large-scale conflict. Although comparable GDP figures for Donetsk and Luhansk regions before and after the 2014 war are not available, mean wage rates – the closest proxy of GDP per capita – suggest that Luhansk region's economy contracted by 80% in two years. The war in Donbas is, however, an example of a protracted conflict with options for the population to leave for peaceful regions. The wars in Iraq and Syria provide examples of the impact of conflict that encompasses the whole territory of a country. There the peak-to-trough values are smaller than in the case of Donbas, yet the magnitudes are still much greater than even the most severe episodes of conventional economic crisis. For example, the first-year GDP contraction in Syria was almost as great as the estimated cumulative decline in US GDP over the whole period of the Great Depression between 1929 and 1933.

Figure 4 / GDP decline in selected conflict regions



Note: GCA = government-controlled areas; NGCA = non-government-controlled areas.
Source: Havlik et al. (2020); World Bank.

It is worth noting that the war was not the only contributing factor of the economic decline. In many cases, the opposing sides have imposed economic sanctions on each other. In the case of the war in Donbas, the economies of the non-government-controlled regions were sanctioned when the central government of Ukraine withdrew its public services, prohibited banking and imposed a trade ban. In the case of the war in Syria, the Assad government has operated under trade embargoes and financial sanctions – similar in size and scope to those currently being imposed on Russia – since 2011. The war in Iraq is probably the most comparable to the case in hand. That said, the war in Iraq is an example of a very short campaign in an oil-rich country. Ukraine is different, mainly because of the absence of petroleum revenues and the strength of the military resistance it is demonstrating.

The longer a war lasts, the greater the cost of it. As Havlik et al. (2020) show, the costs of the protracted Donbas conflict amounted to the equivalent of the total 2013 annual GDP of the region – and to at least 16% of total Ukrainian GDP as of 2019. As the scale of the damage and the displacement of people arising from the current Russian invasion both exceed many times over what was seen during the Donbas conflict, it is reasonable to assume that the costs of economic recovery will be dramatic. It is too early to provide any proper estimates, since the war is still going on and the scale of the damage will mount up further; but it is obvious that in order to rebuild its economy, Ukraine will have to receive substantial assistance in the form of grants from the West – and possibly also reparations from Russia (although that would require a rather dramatic domestic political change in Russia to become realistic).

The Ukrainian economy is so far showing remarkable resilience when it comes to macro-financial stability. The international reserves of the National Bank of Ukraine (NBU) amounted to USD 27.5bn in the middle of March 2022, which allows the government to meet its external debt repayment obligations quite easily: scheduled general government debt repayment in 2022 is about USD 7bn. The government has reassured foreign investors that it does not plan to default on its debt.

The banking system remains stable and liquid: retail deposits increased between the start of the war and 15 March by 16%, as individuals received their salaries and social payments, while spending and cash withdrawals by households declined significantly. Corporate deposits decreased during the same period by 5%. Deposit outflows are constrained by the accessibility of cashless transactions and by the limited operation of banks in some regions. Non-cash payments are the only practical means of payment in those regions where cash delivery is impossible, due to safety concerns. Nearly all banks have offered their customers credit repayment holidays. The exchange rate of the national currency was fixed in accordance with martial law at UAH 29.25 to the US dollar.

On 24 February, the NBU allowed banks to purchase foreign currency and make transfers from Ukraine, so that residents can make transactions to buy critical imports. The government has introduced price controls on key food categories for the duration of the war. For people who lose their jobs because of the war, a monthly allowance of UAH 6,500 (about USD 220) will be provided.

In future, however, the inflow of money into accounts is likely to decline, as many companies stop functioning and unemployment increases. Further on, banks will face substantial losses due to the damage to their physical assets and likely defaults on many loans, which will erase a lot of the banks' capital.

Other measures introduced by the government to support the economy include a tax reform: VAT and income tax have been replaced during the war by a 2% turnover tax, and SMEs are allowed to decide for themselves whether to pay taxes (a simplified flat tax). The self-employed, individual entrepreneurs and farmers are exempt from social contributions. Excise tax on fuel has been set at 0% until martial law is lifted. Tax inspections for all businesses have been suspended for the duration.

As of 14 March 2022, the equivalent of more than UAH 12bn (USD 440m) has been transferred to a special account opened by the NBU to support the Ukraine Armed Forces. Money has been flooding in from people and businesses in Ukraine and from the international community, with over UAH 2.9m received from abroad in foreign currencies. Additionally, Ukraine has successfully issued USD 691m worth of war bonds (around 0.5% of 2020 GDP) at three auctions since the invasion. The war bonds have a one-year maturity and offer interest of 11%.

In order to help Ukraine maintain macro-financial stability during the war, many Western countries and international financial organisations were prompt to offer financial aid packages. The biggest contribution was announced by the US: on 15 March 2022, President Biden signed a bill that includes USD 13.6bn in assistance to Ukraine. The European Commission has approved a new EUR 1.2bn emergency macro-financial assistance programme. On 10 March 2022, the IMF board approved emergency financing of USD 1.4bn under the Rapid Financing Instrument – money that was disbursed immediately to help with urgent spending needs. The IMF is also working to set up a trust fund instrument, through which bilateral donors can channel resources to Ukraine. The World Bank has approved USD 923m funding for Ukraine; this is a part of an announced USD 3bn package of support to be provided in the coming months. A summary on the financial support that Ukraine has been receiving are shown in Table 2.

Table 2 / Major financial support to Ukraine since 24 February 2022

National Bank of Ukraine war bond	USD 691m
US	USD 13.6bn
International Monetary Fund	USD 1.4bn
World Bank	USD 923m
European Union	EUR 1.2bn
European Investment Bank	EUR 668m

Source: Bloomberg, National Bank of Ukraine, European Commission, World Bank.

2.2. RUSSIA

2.2.1. Sanctions' inventory

Russia has been hit by a barrage of sanctions since its invasion of Ukraine. There has been a high degree of coordination between the US, the EU and other Western countries, but many non-Western countries have also joined. Although the extent of sanctions is not unprecedented, it is hard to think of such measures being imposed against a country of Russia's size and importance, at least since the Second World War. The sanctions are notable for their scale, their breadth and the speed with which they were introduced. They include the following elements:

› Media: A ban on Russian state-owned media channels and agencies (RT, Sputnik)

› Individuals: President Putin, some Russian ministers, Lower house MPs, Upper house MPs, oligarchs and influential media figures

› Financial: Freezing of the Central Bank of Russia's (CBR) assets held in Western jurisdictions (roughly half of the total); a ban on transactions with the CBR, the Ministry of Finance and a number of state-owned enterprises; cutting off seven Russian banks from the SWIFT payment system; withdrawal of access to primary/secondary markets for government bonds; no assignment of ratings by the three main rating agencies

› Export bans: Arms, dual-purpose goods, oil/gas exploration and extraction machinery, parts and components for the aviation industry, luxury goods, and selected goods called "advanced technology

items", largely composed of semiconductor products, telecom and IT security devices, sensors, laser equipment, and jet and marine engines.[11]

› Import restrictions and bans: Metals, luxury goods and energy embargo in non-EU countries; most-favoured-nation status revoked by a few Western countries

In contrast to the sanctions imposed prior to 2022, these will have a very serious impact on the Russian economy and will certainly lead to a recession this year. There are two key mechanisms at play.

First, the sanctions affect macro-financial stability. The synchronised and rapid adoption of sanctions within the regulatory frameworks of major economies rendered virtually all Russian assets toxic on the balance sheets of foreign investors. As a result, foreign investors started to sell Russian assets, leading to capital flight and rouble depreciation, which in turn triggered excess deposit outflows on the retail market. With the Russian government accounts in EU and G7 jurisdictions frozen, the CBR resorted to administrative measures – capital and FX controls – to curtail financial panic. There will be severe shortages of foreign currency, and the central bank will be hamstrung in its attempts to stabilise the economy and financial sector, as a large part of its reserve assets are frozen abroad. Since the assets of the National Welfare Fund were on central bank accounts, part of this money (around a third of the total, or 3% of GDP) is frozen as well, limiting fiscal space.

Second, sanctions affect the real economy. While the trade sanctions are so far relatively narrow in scope, the sheer number of the new regulations and the speed with which they have been rolled out have created great uncertainty regarding new restrictions. To avoid compliance issues, financial companies have stopped providing insurance to cargos delivered to Russia; traders across the world have put a stop to deliveries from sensitive Russian businesses; and some major international brands have begun withdrawing from Russian markets.[12] All that has already resulted in supply-chain disruptions, severe delivery delays, shortages of goods and inflation. As Figure 5 shows, the number of Google Trends queries related to delays in Russia has exceeded the peak reported during the COVID-19 crisis. The combined effect of the shortage of goods and rouble depreciation has led to an exogenous-like inflation shock for households. With household incomes deteriorating amid negative macroeconomic expectations, this supply-side shock result will result in higher unemployment and a decline in consumption.

While acknowledging the breadth and severity of the sanctions, it is also important to keep in mind several important caveats. First, quantity is not quality. Most of the sanctions related to individuals have a limited impact on the aggregate economy. The EU has still not imposed an energy embargo, which would have the biggest impact on the Russian fiscal position. Second, it is impossible to effectively impose sanctions exclusively against elites, without harming the general population. Sector-wide sanctions will cause hardship for ordinary Russians, but even individual-related sanctions do not avoid collateral damage. There is rich evidence both from Russia and international experience that the government is also likely to compensate the elites for their losses, at the expense of taxpayers (Ahn and Ludema, 2020; Astrov et al., 2022; Dreger et al., 2016; Lee, 2018). Finally, the sanctions can backfire in terms of shaping public opinion and limiting the opportunities to support pacifist movements inside

[11] https://ec.europa.eu/info/sites/default/files/business_economy_euro/banking_and_finance/documents/220316-faqs-export-related-restrictions-russia_en.pdf

[12] https://www.kommersant.ru/doc/5240137?from=spot

Russia – as indeed happened with the sanctions imposed after Russia's annexation of Crimea and its support for the separatists in Donbas. There is a high chance that campaigns to boycott all Russian public institutions, together with the exodus of Western franchises from the Russian market, will affect mainly well-educated Russians living in big cities – those very people who value individuality over grand political achievements, who deliver and consume diverse media content, and who are most critical of the Putin regime. With their income opportunities and information flows constrained, they will become more dependent on state-provided revenues. This, in turn, will increase the likelihood that they are co-opted and that the anti-Western sentiment in Russia will harden.

Figure 5 / Joint Google Trends searches of logistics-related keywords, normalised to the highest request value

Note: Search engine queried as follows: 'поставки+просрочка+перекредитование+отсрочка+дефицит' equivalent to 'deliveries+delays+refinancing+extension+deficit'.
Source: Google Trends.

It is important to note that – apart from the frozen government accounts and the restrictions on exports – sanctions will have only limited power to constrain the Kremlin's ability to continue the war in the short term. Even with a significant part of its assets frozen, the Russian government possesses enough fiscal reserves to continue the war. The Ukrainian Ministry of Defence as of February 28th assessed that the direct costs of the war for Russia – measured in terms of arms, vehicles and aircraft destroyed and personnel lost – were USD 7bn, equivalent to 0.4% of its annual GDP, or 5.5% of its fiscal reserves.[13] Assuming Russia spends about USD 1.5bn per day to replace the arms and personnel (assuming the country can do both instantaneously), Russia would deplete its fiscal reserves within around 80 days. For that, however, the Russian armed forces would need to proceed with the same intensity and suffer the same losses. This is not what experts have observed over the past two weeks of the campaign (Kagan et al., 2022). Realistically, it is more likely that the Russian armed forces will simply run out of men and materiel (rather than funds), since neither qualified military nor heavy arms can be replaced overnight.

[13] Estimations by Centre for Economic Recovery (2022). The share of fiscal reserves after excluding 30% of the assets of the National Welfare Fund. The size of the National Welfare Fund was estimated at USD 180m at the end of 2021. Around 30% of that was likely placed on accounts in G7 and EU countries, and consequently frozen.

The importance of sanctions on the intensity of military operations will grow over time. With the Russian offensive becoming effectively stalled, and with the conflict developing into trench warfare, the effects will become increasingly important in the medium to long term, since the economic contraction will have a tangible effect on fiscal revenues and on production chains for the manufacture of heavy arms.

2.2.2. Macro-financial stability

The Russian financial market was the first to experience the economic sanctions. Although the fears of conflict as Russia massed its armed forces on Ukraine's borders during the winter had already put the rouble and Russian bonds under pressure, the full-scale invasion caused a market crash in Russia. The CBR had to address two major problems: capital flight and strong demand for major foreign currencies in the retail and corporate sectors.

The early response of the CBR was predictable: suspension of FX purchases according to the budget rule[14] and FX interventions on the market. Yet the agreement of Western countries to freeze the CBR accounts in their jurisdictions forced the CBR to establish hard steering of financial market operations. The key stabilisation actions of the CBR were as follows:

› Interest rate increase: the key rate rose by 10.5 percentage points (pp) to 20%

› Capital controls: setting limits on daily FX transfers outside Russia for entities and individuals (USD 5,000 per month)

› Limits on cash withdrawal from FX accounts (USD 10,000 until 9 September) unless converted into national currency

› Blocking asset sales by non-residents: the CBR prohibited brokers from accepting orders from non-residents to sell securities on the market

› Foreign exchange controls: enforcement of the rule that 80% of the FX revenues of exporting companies must be converted into the national currency

› Trading suspended on the Moscow Exchange (MICEX)

› Temporary suspension of capital and liquidity requirements for regulated financial institutions

› Permission for financial institutions to reflect the credit quality of assets as of 18 February[15]

Unable to transfer assets from European and US accounts, the CBR based its stabilisation policy largely on methods of administrative control. Considering that the policy options were narrow – either setting limits on market operations or uncontrolled financial panic with the potential to place the whole banking system under stress – this was a sensible approach. The Russian financial market is anyway likely to

[14] The budget rule is a fiscal rule that prescribed the process of accumulating fiscal reserves in Russia generated from exports of energy commodities. To avoid appreciation of the FX rate caused by the conversion of foreign currency revenues into roubles, the rule prescribed the Central Bank to accumulate fiscal reserves in foreign currency to offset demand for the rouble. These amounts were subsequently invested in low-risk assets.

[15] Say a bond issued by Sberbank had credit quality BBB as of 24.2.2022. Assume that recent sanctions led to a downgrading of the asset credit quality to CCC on 25.2.2022. Usually, a bank would need to cut the value of the asset as reported to the central bank in its reporting, to reflect risks in the asset price. Under the recent central bank provision, however, Russian banks may continue to reflect the asset price of the Sberbank bond on its books as if there had been no ratings downgrade.

remain isolated from global investors for the foreseeable future, and therefore sacrificing investor confidence was the lesser of two evils.

More controversial, however, was the decision by the CBR to increase the key rate. Most likely this sought to achieve two goals: a) prevent deposit outflows, and b) weaken demand for foreign currency. The approach seems to have helped reduce deposit outflows: while the Russian banking sector began to report excess deposit outflows in the last week of February, that trend was reversed once the central bank introduced the full package of stabilisation measures (CBR, 2022). However, it is debatable whether this measure had any sizeable impact on demand for foreign currency, in particular. For the majority of non-residents, the main reason for selling rouble-denominated assets was concern over compliance, meaning that the level of interest rates had little influence on their behaviour. And it was this fire sale of rouble-denominated assets by non-residents that led in turn to panic in the domestic retail banking market. In these circumstances, the interest rate level was anyway of secondary importance for foreign currency purchasers.

This point is further supported by the fact that the rouble continued its freefall after the hike in interest rates and the currency only stabilised once the CBR opted for foreign exchange controls. The central bank potentially had the option to offset emerging liquidity gaps in the banking sector exclusively via direct liquidity provision. This approach would probably have been more risky. In the absence of clear signals, the stabilisation of deposit withdrawals would likely have been less rapid. It could, however, have avoided the indiscriminate decline in profitability of the banking sector and increased credit costs for businesses.

The CBR started to gradually reopen trading on Russian securities and FX markets on March 20th, 2022. The key constraints – a ban on short-selling of the most liquid stocks by all market players and a ban on short-selling of assets by foreign investors – remain in place. Most likely, the constraints on foreign investors will become permanent. EU and G7 sanctions are likely to stay in place, together with all the related compliance issues for foreign investors. Although keeping constraints on operations by foreign investors limits liquidity in the market, maintaining this policy is probably the only way to avoid very heavy further selling of securities.

Compared to monetary policy, the scope for fiscal intervention remained limited. In short, the government is largely using support mechanisms similar to those introduced during the COVID-19 pandemic: regulatory easing, SME subsidies, financial support for low-income families and pensioners, and credit lines to regional budgets (see Table 3).[16]

The fiscal support schemes announced are exceptionally modest, even considering both hard and soft measures together. The fiscal stimulus announced so far is around half that enacted during the COVID-19 crisis, which was already much smaller than the European average.[17] Considering that there is a sizeable risk of a double-digit economic contraction by the end of the year, fiscal stimulus of a mere 2.4% of GDP will be far from sufficient to offset falling incomes – even for the most socially supported social strata, like low-income households. Most benefits are indexed against the previous year's inflation rate, which stood at about 8% at the end of 2021. With inflation expected to be in double digits this year,

[16] https://www.interfax.ru/russia/826228

[17] That is, 3.5% of GDP of hard measures and 4.5% of hard and soft measures combined (IMF, 2022).

real household incomes will decline, leading to a contraction of consumption. This, in turn, will deepen the economic contraction and reduce the prospects for economic growth in 2023.

Table 3 / Components of fiscal support packages in Russia

		Amount, RUB billion		% GDP	
Type	**Support**	**Lower bound**	**Upper bound**	**Lower bound**	**Upper bound**
Hard	Asset purchase programme	1,000	1,000	0.8%	0.8%
Hard	Subsidies for low-income families	455	455	0.3%	0.3%
Hard	Increase in pensions	34	34	0.0%	0.0%
Hard	0% profit tax rate for IT companies	14	113	0.0%	0.1%
Hard	Credit subsidies for SMEs	14	14	0.0%	0.0%
Hard	Income tax suspension for deposit incomes	225	260	0.2%	0.2%
Soft	Credit line worth 10% of income of regional budgets	1,387	1,755	1.1%	1.3%
N/A	Of that amount redistributed from other planned expenditure	486	486	0.4%	0.4%
Hard	Total, net of redistributed amounts	1,256	1,390	1.0%	1.1%
Hard & Soft	Total, net of redistributed amounts	2,643	3,145	2.0%	2.4%

Note: Russian GDP in 2021 at current prices: RUB 130,795bn
Source: Rbc.ru, Cnews.ru, CBR, Gazeta.ru, Minfin.gov.ru, Mintrud.gov.ru, Kremlin.ru, Rosstat, own calculations.

2.2.3. Short-run economic impact

Although asset prices in Russia have shown a consistently negative trend since the outbreak of war, they provide only a superficial account of the state of the real economy. Apart from the decline in asset prices, the sanctions imposed have had two main effects. Export restrictions and the toxicity of Russian assets have generated a supply-side shock, which has spread through disruptions to supply chains. The result is shortages of goods and adverse market expectations on the part of businesses, leading to a reduction in working hours and investment cuts. This is a short-term impact, and the key question is what the extent of the contraction in investment and consumption will be. It may be possible to assess these effects with some degree of confidence once the latest official statistics are released. But for the time being, we provide a preliminary assessment, based on historical cases and modelling results.

The second major effect is of a long-term nature. On the assumption that the current leadership of Russia remains in power, there is little or no chance that the sanctions will be lifted. For Russia, which has been an importer of technology on the global market, this presents a long-term challenge. Although there is a chance that Russia may manage to find certain substitutes for goods for existing value chains, it is most likely that the prices will be higher, the quality lower and the suppliers' contractual conditions worse. With capital provision limited largely to internal institutions and minor foreign players who are not active on international markets, this is likely to limit long-term economic growth to substantially below the world average.

Although the direct impact of sanctions has affected the financial markets, the measures have had major implications for the real economy. First, the rouble devaluation essentially came as an external shock to the real purchasing power of consumers, through the rising cost of imports. Second, the disruption to supply chains has put many enterprises on hold, as they scramble to find alternative suppliers. Third, the

cost of finance has increased for local enterprises, due to the key rate hike. And finally, the suspension of activities by major brands and franchises in Russia could send out a powerful signal to consumers and producers to cut spending and suspend investment activities.

Estimating those effects on the real economy presents a challenge, since some of them are hard to quantify. For this paper, we estimated the potential impact of currency devaluation and interest rate changes on the Russian GDP and inflation. We applied a stylised vector autoregression model with exogenous variables (VARX), which features GDP and the consumer price index (CPI) as endogenous variables and controls for exogenous factors: oil and gas prices, US GDP growth, Fed interest rate, US inflation, time trend, and intercept dummies for the periods after 2008 and after 2014 (see Annex for details).[18]

Considering the lower-bound estimates, the pre-war expectations for Russian GDP growth (2.4%) and inflation (5.4%),[19] and the anticipated hard fiscal stimulus (1.1%), the model would predict a 7.4% contraction of Russian GDP this year, with inflation accelerating to 27% on an annual basis by the end of the year.

It is important to note, however, that the selected methodology – despite being common in macroeconomic forecasting – is merely exploiting conditional correlations present in the selected time series. Market players and the CBR take action in response to expected market and policy developments. That is, applied methodology does not truly disentangle unanticipated shocks from anticipated ones, and the estimations above reflect historical associations between time series, not causal mechanisms.[20]

Nonetheless, these estimations are helpful. First, what is crucial at this point is the ability to make projections, not to infer a causal effect. From this perspective, if some variables appear to be good predictors of economic activity – whether the FX or the interest rate – then there is a chance that they could provide reasonable guidance. Second, the estimates also show extremes of the distributions, which allow us to account for the uncertainty of the estimates and are more appropriate in providing guidance for a stress scenario under extreme conditions.

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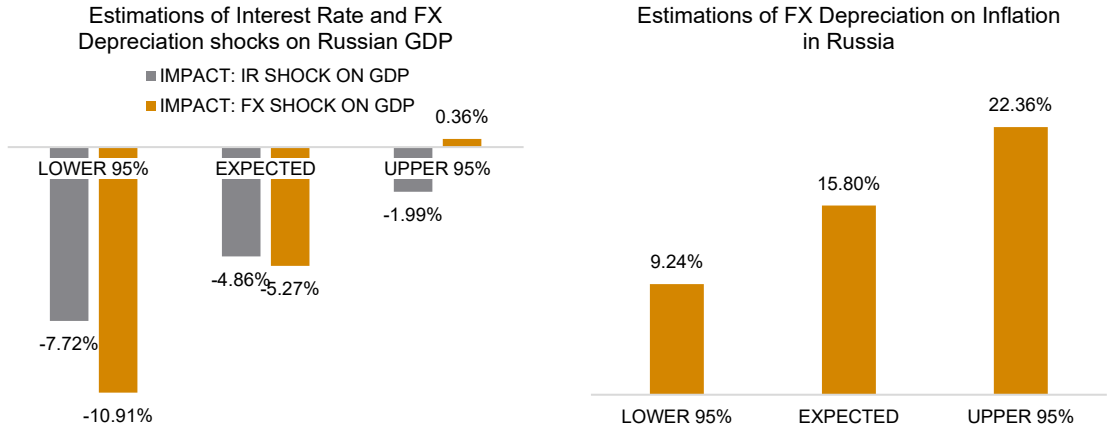
[18] A VARX model is a system of simultaneous equations. The modeler defines variables determined inside the system (endogenous variables) and the ones determined outside of it (exogenous). The number of equations in a system depends on the number of endogenous variables and describes the evolution of each endogenous variable over time subject to its own previous values and the previous values of other endogenous and exogenous variables at once. The intertemporal nature of the model and ability to connect variables to each other allows for the modelling of dynamic feedback loops (e.g. if inflation impacts GDP, which in turn affects inflation). The major tool of analysis of VARX outcomes are the so-called impulse response and multiplier functions. They show how an increase of a variable of interest in 1 unit is affecting an endogenous variable over time. In this paper we focus on cumulative dynamic multipliers, which show the cumulative size shock by the end of a period (1 year in our the core text, up to 3 years in the Annex).

[19] Central Bank of Russia (2022). Macroeconomic Survey of Bank of Russia: February 2022. Link: http://www.cbr.ru/Collection/Collection/File/39743/full_022022.xlsx

[20] For example, episodes of FX depreciation usually follow on from episodes of interest rate increases as a response policy by the central bank. As a result, the estimated FX and interest rate shocks to GDP are not isolated random events, but typically embed components of one another.

Figure 6 / Predicted impact of FX rate and key rate changes on the Russian economy by the year end

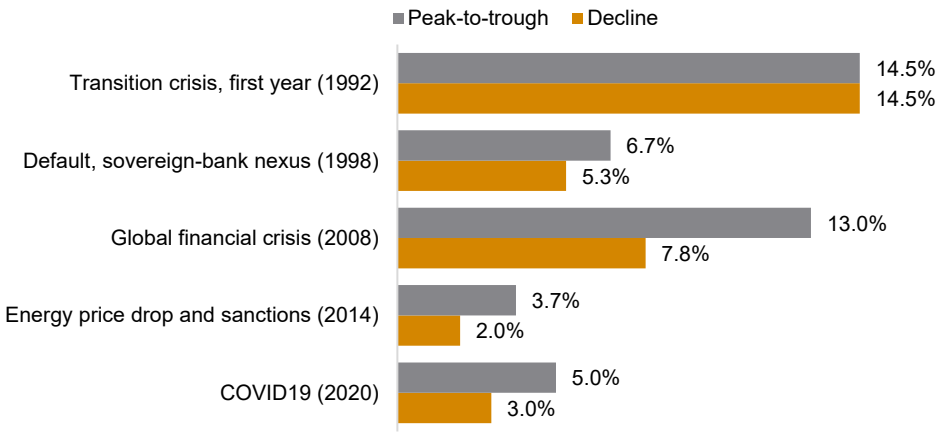


Notes: Shock scenarios assume a 10.5% increase in the key rate and depreciation of the national currency to half of its original value. Values show cumulative dynamic multipliers of doubling gas and oil prices, estimated using a 2-lag VARX model. Estimated with quarterly data. See Annex for more details on model specification and sensitivity of results to the model specification.
Sources: IMF International Financial Statistics (IFS), Yahoo Finance, own calculations.

It is worth bearing in mind that the above estimations largely include time-series variation during 'business as usual', with crisis-time variation constituting only a small fraction of the sample. From this point of view, it is also helpful to look at the performance of the Russian economy specifically during times of crisis (Box 3).

BOX 3 / EXPERIENCE OF PREVIOUS ECONOMIC CRISES IN RUSSIA

Figure 7 / GDP decline in Russia in the post-communist era



Note: Peak-to-trough value for 1992 calculated as a simple growth rate due to no negative growth rates in 1990 and 1991. Transition crisis 1992 reflects only the strongest episode of GDP decline in a single year. Value for 2014 compares with 2013 growth rate due to macroeconomic turbulence of Russia in Q4 2014.
Source: World Bank.

Prior to the current crisis, the Russian economy had come through five economic crises in recent history. The transition crisis of the early 1990s was by far the deepest and longest crisis in Russian history. Not only did it involve the steepest GDP decline, but it was also a multi-year crisis: it effectively started with monetary and fiscal deterioration in 1989, and ended only in 1997, when Russia reported its first ever economic growth. The next two crises (1998) and (2008) shared certain common features: external shock, capital flight, FX depreciation, and the banking sector as the weakest link. Nonetheless, they differed in two important respects. Despite the capital flight from emerging markets in 1998, the global real economy performed generally quite well. The crisis unfolded primarily due to unsustainable government debt, poor macroprudential supervision of the banking sector and the sovereign-bank nexus (Owen and Robinson, 2003). By contrast, the 2008 crisis was a global financial crisis, which featured both capital flight and trade collapse at the same time. That episode shared certain similarities with the COVID-19 crisis, which showed that even shutting down mobility and global trade for just a few weeks can generate sizeable macroeconomic losses for the whole year.

It might be tempting to compare the ongoing crisis in Russia with the crisis of 2014, which followed the annexation of Crimea. However, despite a similar narrative surrounding the events, that would be misleading. A series of studies has suggested that economic contraction during the 2014 crisis was largely caused by declining prices for major export commodities and fiscal consolidation.

In its short-term impact, the current crisis more closely resembles the effects that the 2008 crisis had on the Russian economy: capital flight, FX depreciation and trade collapse. However, the similarities end with the most immediate impact: unlike the present crisis, in 2014 the Russian economy remained open, did not face long-term trade restrictions and continued its integration with global markets.

In terms of the scale of potential long-term changes, the current crisis is closer to the transition crisis. The key similarity is the disintegration of established value chains. As in 1992, enterprises will face the partial disintegration of long-established supply processes and will have to start searching for alternative suppliers. It is worth noting, however, that the environment is different this time: enterprises in the early Russian economy operated in an environment with comparatively high costs of information search, but declining barriers to trade; this time, while the information costs are moderate, the barriers to trade are rising.

The key takeaway here is that none of the historical crises provides a truly comparable case for the current crisis. They do provide us, however, with guidance on what is likely in terms of contraction of the Russian economy, and what is not.

All in all, the recession in the Russian economy this year is likely to be between 7.5% (which is predicted by the model in Figure 6, which does not include factors such as trade sanctions or Western firms leaving Russia) and 15%. Past experience suggests that GDP decline of more than 15% is unlikely. Back in 1992, the Russian transition crisis featured – among other nasties – hyperinflation, state bankruptcy and the collapse of all public institutions. The present crisis is unlikely to reach that point. Inflation will be in the double-digit zone this year; however, given the relatively limited extent of rouble depreciation so far, we do not expect it to come anywhere close to 100% per annum, as was the case during the sovereign default crisis of 1998, when the rouble crashed four times in nominal terms. Fiscal space is becoming more constrained, but it should be adequate to cover the immediate needs – at least by the end of the year.[21] Finally, public institutions will continue to operate, despite their usual sins of corruption and inefficiency.

[21] The selective default on the Russian state obligations so far, which took the form of, for example, foreign debt holders being repaid in roubles, is not classified as a full-fledged sovereign default.

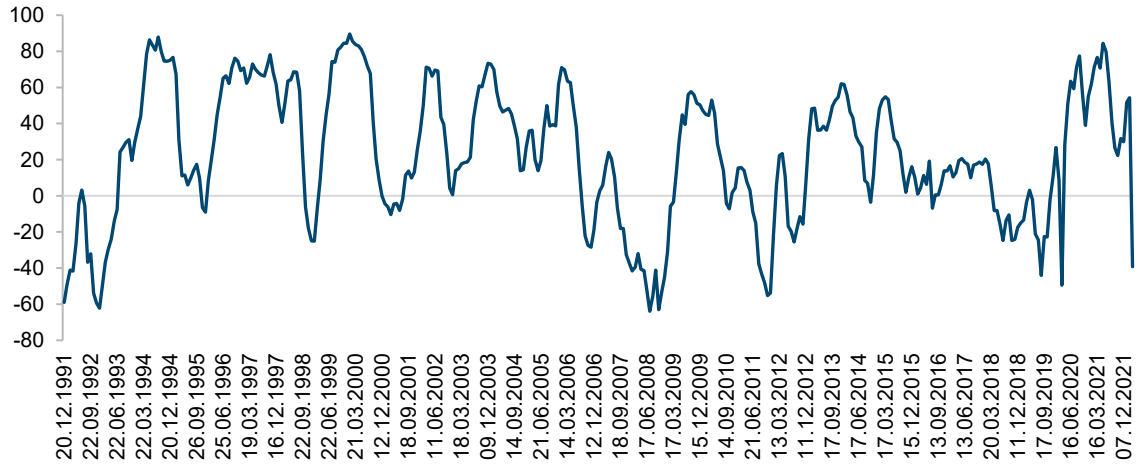
2.3. THE REST OF EUROPE

For the rest of Europe,[22] there are four main possible macro-financial channels of impact from Russia's invasion of Ukraine. First, the sanctions response and broader impact on commodity markets will create a surge in already high inflation, which will weigh on real incomes and could depress economic growth. Second, the trade channel. Third, the labour market. Fourth, there is potential financial market contagion and a negative impact on confidence, particularly in parts of CESEE close to Ukraine, which has already caused a sharp sell-off in FX and bond markets (Astrov et al., 2022).

2.3.1. Inflation and macroeconomic fallout

It seems quite clear that inflation across Europe will be considerably higher than consensus projections pre-invasion – and therefore that growth could be lower. The wave of sanctions imposed by the EU and G7 countries against Russia has so far largely left the gas sector untouched, although the US and UK have announced bans on imports of Russian oil. We already outlined in the previous policy note the EU's dependence on Russian energy (Astrov et.al, 2022). This applies to oil and gas, but oil is less important, because there are alternatives. Gas is much harder to replace, due to pipeline infrastructure. Some 40% of gas consumed in the EU comes from Russia. Moreover, 66% of German gas imports come from there, but Germany has so far resisted any moves to ban oil and gas exports from Russia.[23]

Figure 8 / ZEW Economic Sentiment Index for Germany



Source: ZEW.

Even with these limited sanctions on the energy sector, energy and other commodity prices have already moved sharply higher. Aside from energy, the cost of food, fertilisers, methanol, nickel and palladium has also risen – in part as a direct result of the war, but also because of other obstacles to trade, such as uncertainty surrounding insurance, the mechanics of payment, and logistics. Media reports already indicate that some parts of European industry are shutting down as energy prices reach

[22] Here we mean Europe in a geographic sense, rather than just the EU. We will cover the impact on non-EU CESEE, plus – where relevant – other non-EU European countries, such as the UK and Switzerland.

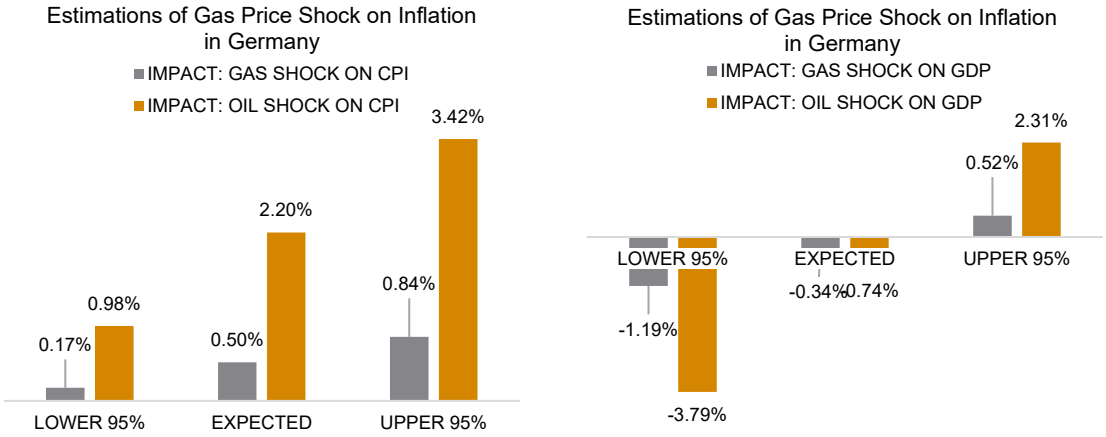
[23] https://www.bloomberg.com/news/articles/2022-03-09/germany-is-stalling-eu-efforts-to-broaden-russia-s-swift-ban

unsustainable levels.[24] Meanwhile, France and other countries are drawing up plans to potentially ration the supply of energy to certain industries, if Russia follows through on its threat to cut off the gas.[25] Short-term sentiment indicators already suggest that the hit to the economy is likely to be quite severe. Germany's ZEW Economic Sentiment Index in March recorded its sharpest monthly decline since the series began in 1991 (Figure 8).

wiiw has estimated the potential impact of the gas price increase on German GDP and CPI, following the same methodology used to project Russian GDP.[26] We applied a stylised VARX model, which features GDP and CPI as endogenous variables and controls for a number of factors, which are treated as exogenous in the specification: price of oil futures, price of gas futures, European Central Bank (ECB) interest rates, US GDP growth and CPI, time trend, distinct dummy intercepts for 2008 and 2014, and interaction terms between the time trend and the intercepts (see Annex for details).

The results of the estimation suggest that the spike in the cost of mineral fuels may have an adverse impact on German GDP and contribute to rising prices. The model suggests that the German economy is more sensitive to oil prices: for instance, a doubling of the oil price is likely to increase inflation by 2.2 pp by year end, which is four times greater than the impact expected from a doubling of the gas price. In general, the adverse effect of gas price hikes on German GDP is much more uncertain than the impact on inflation. Taking the impact of gas prices as a benchmark – since the effects of oil price fluctuations are very uncertain – a doubling of the price of those commodities will at worst lead to a 1.19 pp decline in GDP and a 0.84 pp acceleration of inflation.

Figure 9 / Predicted impact on CPI in Germany of a doubling of the gas/oil price



Note. Shock scenarios assume a doubling of oil and gas prices. Values show cumulative dynamic multipliers for a doubling of gas and oil prices, estimated using a 2-lag VARX model. Estimated with quarterly data. See Annex for more details on model specification and sensitivity of results to the model specification.
Source: IMF IFS, own calculations.

[24] https://www.bloomberg.com/news/articles/2022-03-09/european-industry-starts-shutting-down-as-energy-prices-soar?sref=tvUbUFbg

[25] https://www.bloomberg.com/news/articles/2022-03-07/russia-threatens-to-cut-gas-flows-to-europe-via-nord-stream-1

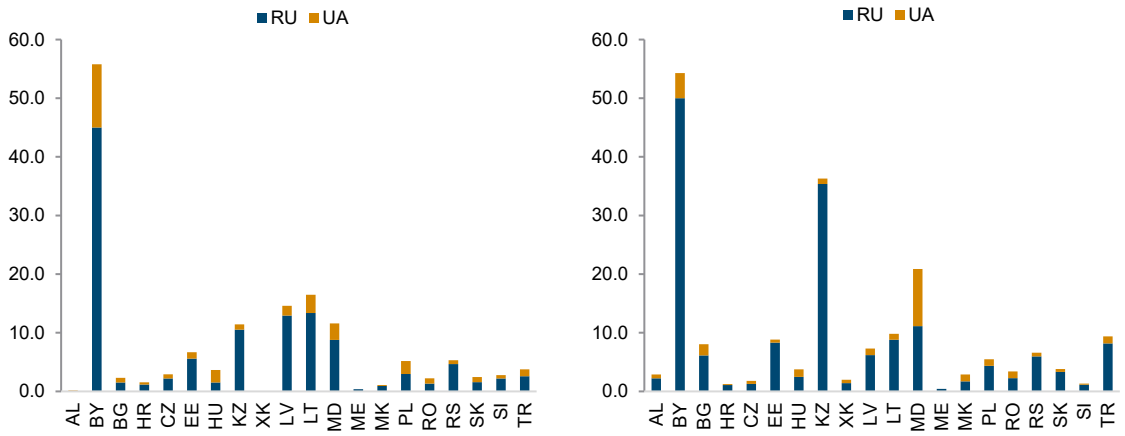
[26] We focus on Germany, as the largest European economy, which also acts as a hub for relocating Russian energy supplies in Europe.

It is important to note two things. First, our estimations do not take into account physical restrictions on deliveries of oil and energy supplies, and do not account for degree of substitution between different energy types. For Germany, Bachmann et al. (2022) used a structural trade model with internal production linkages to evaluate welfare losses. Assuming a 30% cut in supplies and a low degree of substitution between oil/gas and other sources (0.1), they put the long-term upper bound of GDP losses at 2.2%. This would be equivalent to almost a fourfold increase in the price of gas, according to our results. Considering the original growth forecasts for the German economy of 3.6% in 2022,[27] the available results generally support the view that cutting energy imports from Russia by 30% will not result in a major recession in Germany.

Second, the model assumes that interest rates stay fixed and do not react endogenously to inflation shocks. That is, the estimations assume inaction by the monetary policy authorities in the face of a rise in inflation. We do this for the sake of simplicity, although it is unlikely to be the case in 2022, given the high inflation rates since Q3 2021. Should the ECB respond to the price increases by tightening monetary policy, we are likely to observe an additional negative effect on GDP growth.

Beyond Germany, the short-term macroeconomic fallout will vary, depending on a country's links to Russia. As we highlighted in Astrov et al. (2022), non-energy trade and investment links between Russia and many European countries have declined in importance since 2013, with a partial decoupling as a result of the exchange of sanctions following the annexation of Crimea. The most significant links are in CESEE; but even there (with a couple of exceptions), non-energy reliance on Russia is very limited. Belarus, Kazakhstan, Moldova and, to some extent, the Baltic states are the only countries with trade links to Russia of any note (Figure 10). On the import side, for most countries it is fair to assume that energy accounts for the vast majority of imports. Meanwhile, trade and investment links with Ukraine are also generally quite minor. Across most of CESEE, the main channel of economic contagion from the crisis is likely to involve sharply higher prices for energy and food, which will eat into real incomes and weigh on economic growth.

Figure 10 / Exports to (left) and imports from (right) Russia and Ukraine, 2020, % of total



Source: National sources, wiiw.

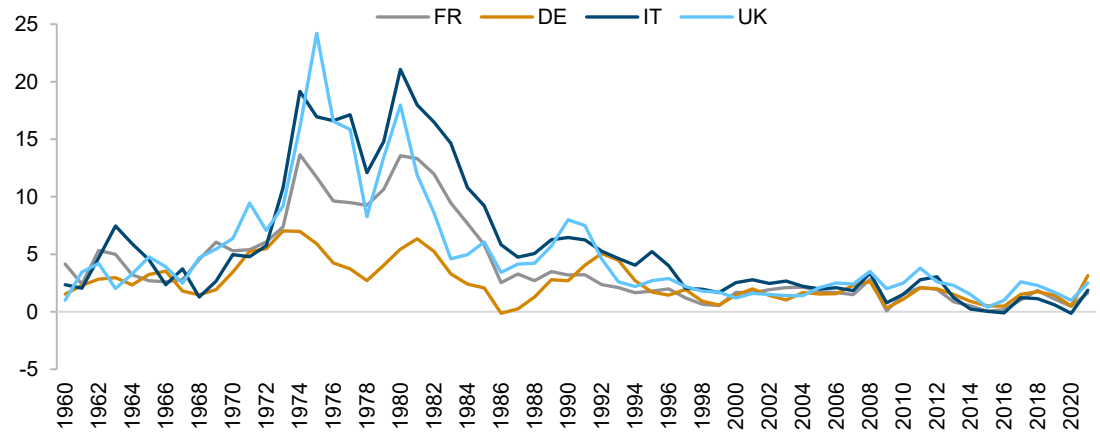
[27] https://archive.ph/wip/QvvQG

BOX 4 / BACK TO THE 1970S?

The current situation has prompted many comparisons with the 1970s – a decade of double-digit inflation and the end of *Les Trente Glorieuses,* three decades of strong, sustained economic growth in Western Europe after the Second World War. Inflation had been rising in the developed world since the late 1960s, influenced by expansionary US monetary policy to finance the Vietnam War. Then, in August 1971, US President Richard Nixon went on national television to announce that foreign governments could no longer exchange their dollars for gold. This would come to be known as the 'Nixon shock', and ended the Bretton Woods system of managed exchange rates. As the 1972 presidential election approached, the US embarked on another bout of monetary easing to boost short-term economic momentum, with further inflationary impacts around the world.

Then, in October 1973, came the Yom Kippur war between Israel and several neighbouring states. Western support for Israel led to Arab oil producers significantly increasing the selling price of oil, and cutting off some Western countries altogether. This sparked a decade of extremely high inflation, including in Western Europe (Figure 11), that was only ended by aggressive monetary tightening at the start of the 1980s. The 1970s also saw significant structural changes in global energy markets, with far-reaching implications that continue to the present day. US energy self-sufficiency ended in the 1970s, and that was also the decade when Germany became heavily dependent on Soviet energy.[28]

Figure 11 / Consumer price inflation, % per year



Source: OECD.

The parallels with the situation today are in some ways clear, with the possibility of sustained higher inflation as a result of higher energy prices. Both the 1973 and the 2022 episodes started from a point where inflation was already high. During the Arab oil embargo of 1973-1974, the cost of oil rose roughly fourfold. Since the pandemic low of 2020, oil prices have risen by a similar magnitude. While oil itself is less important to the global economy than it was in 1973, the role of gas is crucial in Europe. The pipeline infrastructure connecting Russia and Germany means that quick substitution will be much more difficult than for oil.

However, there are also important differences, which could mean that the impact of an energy shock on inflation this time will not be as bad as in the 1970s. Labour bargaining power remains fairly weak, particularly compared to the oft-cited episode of the truly high inflation of the 1970s, limiting the likelihood today of a wage-price spiral. The power of technology to increase competition and keep down prices in online retail has,

[28] https://bigthink.com/the-present/disorder-helen-thompson/.

if anything, been strengthened by the pandemic. Meanwhile, the prevalence of within-country income inequality, which has been shown to be a key driver of weak price growth, is unlikely to have been fundamentally altered by the pandemic. Finally, the 1970s oil shock also arose from a situation where oil prices had been low and stable for many years, whereas the current market is used to volatility and spikes in the price of oil.

While a decade of double-digit inflation may be unlikely, there are nevertheless reasons to think that the current spike in energy prices will lead to changes in both the rate and the composition of growth. As was established by Martin Baily in the early 1980s, the oil price surges of the 1970s had important structural implications for the economy (Baily et al., 1981). Capital that was less energy efficient was employed to a lesser degree or even abandoned, while part of capital spending was devoted to improving energy efficiency, rather than to capital deepening. In addition, the higher cost of energy led to shifts in demand that could not be immediately adjusted for – parts of the capital stock came to be underutilised, while other parts of the economy saw capital shortages. This process led to a partial decoupling of energy use and economic growth. Baily showed that in the US between 1973 and 1979, gross national product (GNP) growth (+2.8% per year on average) significantly outstripped energy use (+0.9% per year), reversing the trend of previous years (where energy use had been roughly equal to, or sometimes higher than, GNP growth). This indicates much less energy-intensive growth as a result of changes in economic behaviour due to high energy prices.

Should the EU decide to ban imports of Russian oil and gas, the short-term increase in energy prices would be far more severe than even the current levels. One of the most in-depth analyses done so far on the impact on German GDP growth of stopping imports of Russian energy has been performed by Bachmann et al. (2022). Using several approaches, the authors come up with a range of impact on German gross national expenditure (GNE) of between -0.2% and -3%. They emphasise that the 3% drop is an extreme, worst-case scenario, and is very unlikely. Yet even that would be less than the decline in German GNE caused by the COVID-19 pandemic. The authors believe that a decline in German GNE of 0.2-0.3% is more likely. Only in the case of little or no substitution (which is an unrealistic assumption, given alternative sources of oil and gas, as well as green alternatives) would the decline get anywhere near the authors' worst-case projections. The authors do, however, point out that those on lower incomes would suffer a much bigger relative hit; but offsetting that with support measures should be well within the capabilities of a country with Germany's fiscal resources. This projection, however, is disputed, with other experts in Germany suggesting that a decline in German output of 5% is more likely and emphasising the heavy costs to industry.

2.3.2. Potential impact via the trade channel

Table 4 provides information on the mutual trade structures between the EU, Russia and Ukraine. As far as the EU is concerned, Russia accounted in 2019 for about 2% of total goods exports and 3% of imports, and thus ranks as the EU's 6th and the 5th most important trading partner, respectively; meanwhile Ukraine accounted for about 0.5% for both exports and imports, with rankings of 21st for exports and 23rd for imports.

Trade relations in the opposite direction are quite different. The EU accounts for about 40% of Russian and Ukrainian exports, and around 35% of Russian and almost 40% of Ukrainian imports. The EU is therefore by far the most important trading partner for those countries. Furthermore, Ukraine accounts for 1.6% of Russian exports (ranking 11th) and 2% of Russian imports (ranking 9th), while Russia accounts for 6.5% of Ukrainian exports (ranking 3rd) and 11.5% of Ukrainian imports (again ranking 3rd).

Table 4 / Mutual relations in goods trade: EU27, Russia and Ukraine

		Exports		Imports	
		Share in %	Rank	Share in %	Rank
EU27	RU	1.8	6	2.9	5
EU27	UA	0.5	21	0.4	23
RU	EU27	41.5	1	34.5	1
RU	UA	1.6	11	2.0	9
UA	EU27	40.3	1	39.9	1
UA	RU	6.5	3	11.5	3

Note: including intra-EU trade.
Source: UN COMTRADE, own calculations.

A similar picture is found if we use data that include trade in services. Table 5 shows the geographic trade patterns for the EU and Russia, based on the OECD TiVA database (Release 2021).[29]

Table 5 / Geographic trade structures for EU27 and Russia in 2018

EU27 exports			EU27 imports			Russia exports			Russia imports		
Importer	Share in %	Rank	Exporter	Share in %	Rank	Importer	Share in %	Rank	Exporter	Share in %	Rank
US	8.3	1	US	7.2	1	EU27	37.8	1	EU27	38.3	1
UK	6.4	2	CN	5.7	2	CN	15.0	2	CN	16.6	2
CN	5.3	3	UK	5.2	3	US	5.2	3	US	6.4	3
CH	2.7	4	RU	3.1	4	KR	3.6	4	JP	2.8	4
RU	2.0	5	CH	2.6	5	JP	3.4	5	TR	2.7	5
JP	1.8	6	JP	1.6	6	KZ	3.3	6	UK	2.7	6
IN	1.3	7	TR	1.4	7	TR	3.1	7	KR	2.4	7
TR	1.2	8	NO	1.3	8	UK	2.5	8	CH	1.6	8
NO	1.2	9	IN	1.3	9	IL	2.2	9	IN	1.5	9
KR	1.1	10	SG	0.9	10	IN	1.3	10	TH	1.5	10

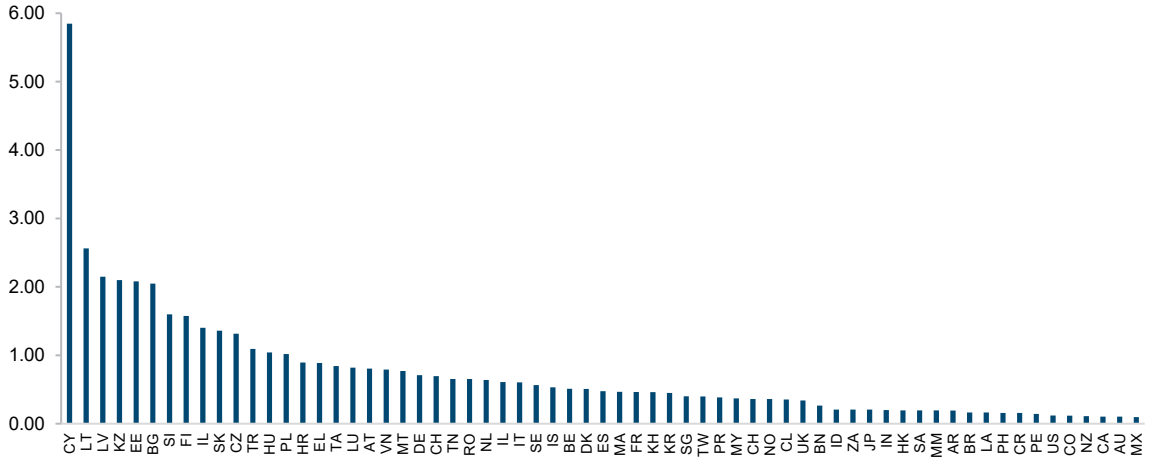
Source: OECD TiVA database, Release 2021, own calculations.

The EU is by far the most important trading partner for Russia, with almost 37.8% of services exports going to the EU and 38.3% of services imports coming from it; the second most important partner is China, with 15% of exports and 16.6% of imports. Similar to the picture for trade in goods, Russia accounts for 2% of EU exports (ranking 5th) and 3.1% of EU imports (ranking 4th).

The effects of the war and the sanctions against Russia will likely lead to a sharp decline in Russian GDP (see Section 2.1.2) depending – among other things – on the mutual trade relations and interlinkages. Figure 12 shows the relative importance of Russia in terms of each country's value-added embodied in exports to Russia (i.e. value added directly and indirectly involved in exports linked to Russian final domestic and imported demand), as a percentage of GDP. Apart from Cyprus (with almost 6%) and the Baltic states, Kazakhstan and Bulgaria (all with slightly above 2%), value-added exports to Russia account for less than 1.5% of GDP – and for the majority of countries, for less than 1%.

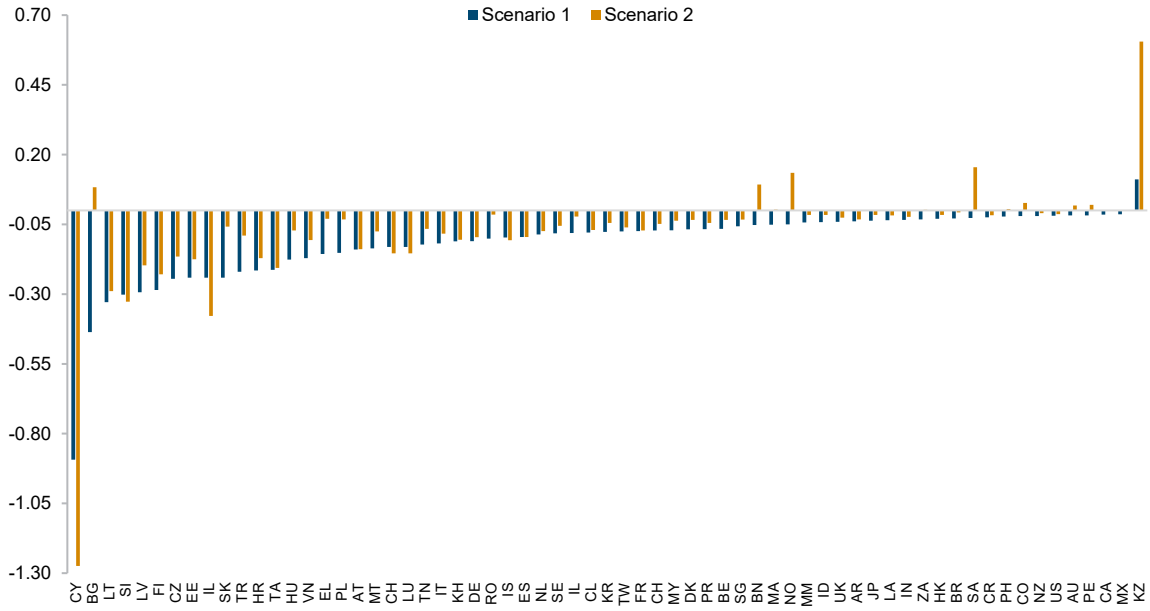
[29] The last year available is 2018; Ukraine is not included in these data separately.

Figure 12 / Value-added in exports to Russia, 2018



Source: OECD TiVA database, Release 2021, own calculations.

Figure 13 / GDP effects (model results)



Source: OECD TiVA database, Release 2021, own calculations.

Accordingly, the impact on trading partners of a decline in Russian GDP and of the sanctions against Russia might be relatively small. In Figure 13, we model the implications of a decline in Russian demand of 10% (akin to the adverse prediction of a GDP decline of 10% in Section 2.1.2), a decline in Russian imports of 30% (also due to sanctions on exports) and a decline in Russian final goods exports of 13%. As a first scenario, we assume that the decline in Russian final goods exports can be substituted by

importing countries with domestic production or imports from other countries[30] (however, there is no change in the sourcing structures for intermediary inputs). In this scenario, the impact on GDP is around -0.25% (or a bit larger) in a few countries (Cyprus, the other countries of Central and Eastern Europe); but otherwise the impact is between -0.1% and -0.15%, and is much smaller for non-European countries. Kazakhstan would even experience a small positive effect, due to the assumption concerning import-substitution effects (Figure 13).

In a second scenario, we allow for changes in the sourcing structures by applying the 'partial global extraction method' (Reiter and Stehrer, 2021), and allow for a decline in Russian intermediary exports of 13% and in intermediary imports of 30%. In addition, we assume that the decline in Russian exports of intermediates can be countered by the partner countries using substitutes from other countries (proportionally according to current sourcing structures of intermediate inputs), and that Russia is able to substitute its decline in intermediary imports domestically. Such a scenario might be interpreted as implementing longer-term structural changes in sourcing structures in the global economy [31]response to this shock. For most countries, the impact on GDP of the war and the sanctions is reduced by their adjustment to changes in sourcing structures (with a few exceptions, particularly Cyprus and Israel). A few resource-rich countries would gain strongly from such a restructuring, notably Bulgaria, Colombia, Brunei, Norway, Saudi Arabia and Kazakhstan.

These scenarios indicate the magnitude of the direct effects of the war and the sanctions against Russia via trade and production linkages. However, they do not take into account potential adverse effects on growth and demand in other countries (e.g. due to the rising cost of energy and raw materials, supply chain disruptions, or dependence on critical inputs like gas or oil, or specific commodities like palladium, nickel, or inputs like neon).[32]

One particular aspect is Europe's import of energy from Russia (in particular, oil and gas), in terms of which some countries are badly exposed. Figure 14 shows energy use by source in the EU member states. Some of them are heavily dependent on oil and gas in general; and some of them also have a high level of imports of these energy sources from Russia. For example, import shares are over 75% in Czechia, Latvia, Hungary, Slovakia and Bulgaria with respect to natural gas; Slovakia, Lithuania, Poland and Finland with respect to oil and petroleum; and Cyprus, Estonia, Latvia, Denmark, Lithuania, Greece and Bulgaria with respect to solid fuels.[33] Consequently, the scenarios implicitly assume that either energy imports are not stopped, or – at least in the medium and longer term – such imports are substituted from other sources or supplying countries.[34]

[30] Technically, we assume a proportional change in sourcing structures of final goods as a first approximation without further detailed modelling.

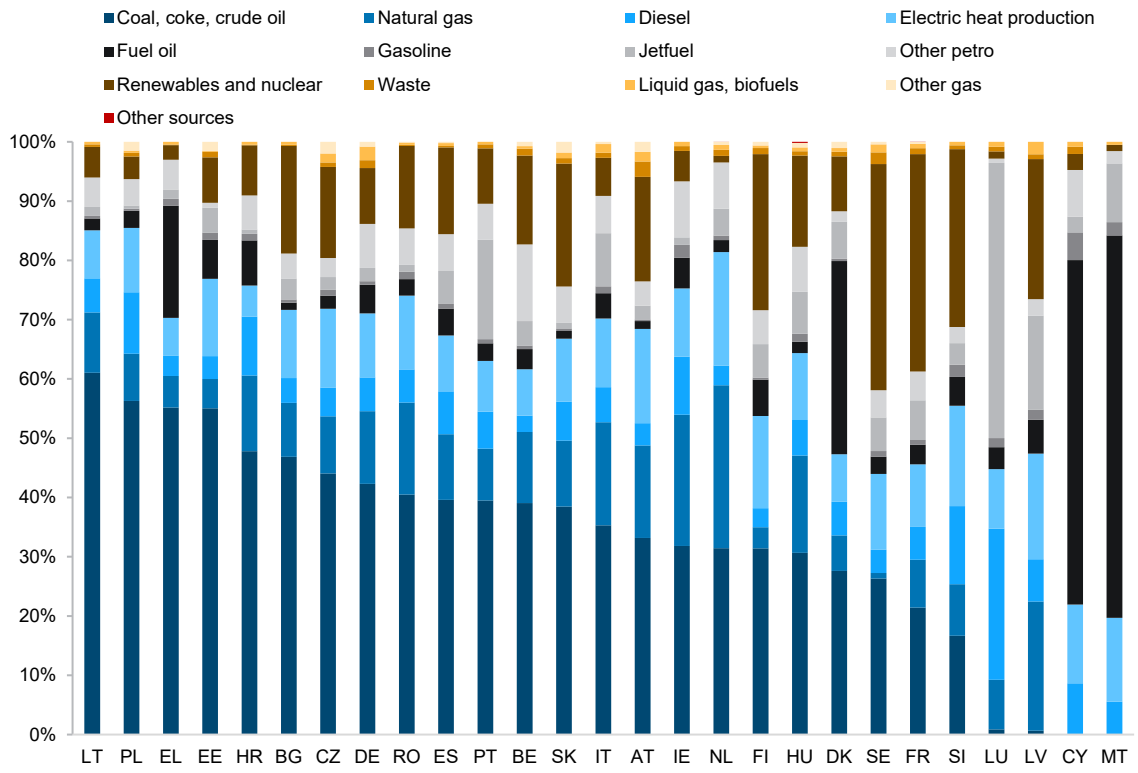
[31] We apply a proportionality assumption for the sake of simplicity and to outline some broad magnitudes. Details of changes in sourcing structures also depend on technical issues and relative price or exchange rate movements, which go beyond the scope of this exercise.

[32] For EU member states' exposure, see Redeker (2021).

[33] See Redeker (2021). Note also that for some countries (e.g. Austria) such assessments are difficult, as official data do not provide information on sourcing countries.

[34] For an assessment of import stops on the German economy, see Bachmann et al. (2022).

Figure 14 / Energy mix by source, 2016



Source: JRC World Input-Output Database Environmental Accounts, own calculations.

If the EU bans imports of energy from Russia, the impact on trade will be much more significant. More far-reaching efforts to limit or halt imports of Russian oil and gas by the EU are no longer inconceivable. As the Russian armed forces turns increasingly to the indiscriminate shelling of civilian areas, public anger in the rest of Europe will only grow, and there will be increased political space for EU leaders to take the undoubtedly economically painful step of cutting off Russian energy revenues.

On 8 March, the European Commission set out a plan to cut Russian gas imports by two thirds this year,[35] and to stop importing Russian gas well before 2030. This was part of the updated 'REPowerEU: Joint European action for more affordable, secure and sustainable energy' initiative.[36] The key points of the plan are to diversify gas supplies, speed up the development of renewable gases and replace gas in heating and power generation. In the short term, the Commission is proposing measures such as exemptions from state aid rules to support firms struggling with the sharp increase in energy prices. By the end of April, it plans to finalise its proposal that all member states should have their gas storage facilities 90% full by October of each year. It is also looking at temporary price limits on electricity prices.

The EU can significantly cut gas imports from Russia this year, according to the International Energy Agency (IEA), which proposes a list of measures that could be implemented now to reduce gas imports from Russia by a third.[37] The Brussels-based Bruegel think tank has found that Europe could survive

35 https://www.euractiv.com/section/energy/news/eu-rolls-out-plan-to-slash-russian-gas-imports-by-two-thirds-before-year-end/

36 https://ec.europa.eu/commission/presscorner/detail/en/IP_22_1511

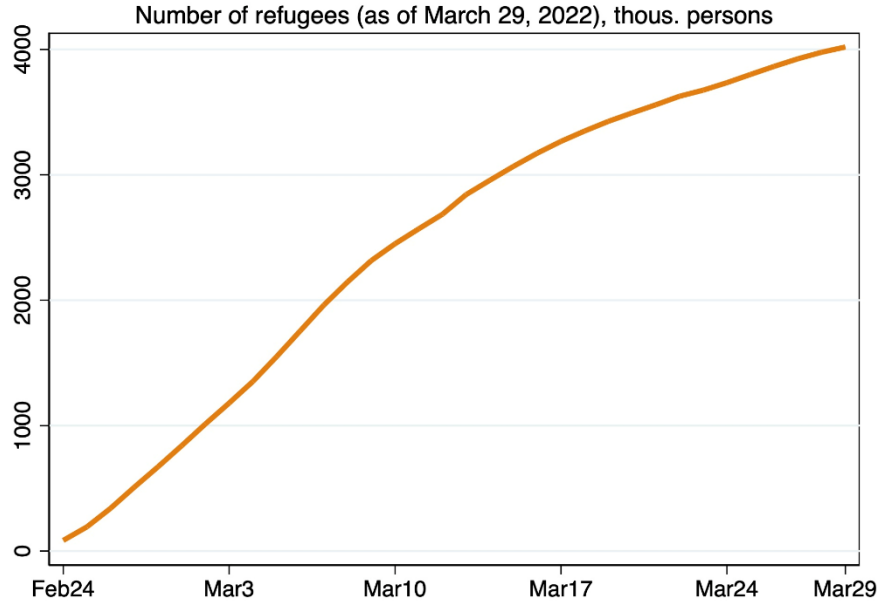
37 https://www.iea.org/reports/a-10-point-plan-to-reduce-the-european-unions-reliance-on-russian-natural-gas

even next winter without Russian gas, albeit at a hefty price.[38] In the short term, this involves doing whatever it takes, including temporarily relegating the green transition to secondary importance, by using coal as a partial substitute for Russian gas. There are some other significant low-hanging fruit, like solar panels.[39] Here a lot could be done on the bureaucratic front to make the development of solar energy easier and to speed it up. The role of individual citizens is also important: EU officials have already suggested that people turn their central heating down by 1 degree. It is not inconceivable that other measures used during the oil shocks of the 1970s could also be resurrected. This will all require sacrifice on the part of EU citizens. However, against the backdrop of bombed-out maternity hospitals, it hardly qualifies as a great effort.

2.3.3. Labour market impact in the EU

With over 3m people fleeing the war in the first three weeks, the EU faces another major refugee crisis (see Figure 15; see also Figure 3 in section 2.1.2). Uncertainty over the duration of the war and the extent of the damage caused by the Russian invasion means that a well-calibrated EU response to the looming refugee crisis is required; and a core aspect of this response is proactive support for the labour market integration of refugees and help to enable them to stand on their own two feet in the medium and long term.

Figure 15 / Total number of Ukrainian refugees as of end-March



Source: UNOCHA (2022a).

The ‘temporary protection’ scheme[40] introduced by the European Commission is an unambiguously positive step to foster Ukrainians’ integration, as full access to labour markets lies at the core of the policy.

38 https://www.bruegel.org/2022/02/preparing-for-the-first-winter-without-russian-gas/

39 https://www.bloomberg.com/news/articles/2022-03-08/energy-crunch-spurs-insane-rush-for-industrial-rooftop-solar?sref=tvUbUFbg

40 https://www.consilium.europa.eu/en/press/press-releases/2022/03/04/ukraine-council-introduces-temporary-protection-for-persons-fleeing-the-war/

With the refugees' right to move across EU member states, reduced bureaucratic procedures surrounding the hiring of refugees and active job-search support from member states are two measures that are deemed to be of great benefit to refugees seeking to stay in the EU for the medium or long term.[41]

BOX 5 / COSTS OF INTEGRATION

The integration of any migrants, and particularly refugees, is typically associated with cost. In contrast to regular migrants, refugees did not plan to end up in a host country, and as newcomers they are likely to experience severe financial pressure. Only highly skilled individuals can integrate quickly into a labour market: the others typically require time and money to learn a new language, adjust their skills set to the local standards and sort out all the legalities. The earlier the process starts, the better the chances of successful integration. That is why financial support for refugees is essential in the early years.

Experience of the Syrian refugee crisis can serve as a guide in assessing the potential costs of integration in European Union, assuming the current refugees stay in the host countries permanently. According to OECD (2017), the cost of processing and accommodating a single asylum seeker is EUR 10,000 in the first year, though this figure declines linearly by about 10% every year thereafter. Assuming that the number of refugees reaches 5.1m (as in the 'Donbas' scenario shown in Figure 3, Section 2.1.2), then the total integration costs over the whole integration period would amount to EUR 255bn. That is the equivalent of 1.5% of annual EU GDP, or about 31.6% of the COVID-19 recovery fund (NextGenerationEU). Given that most of the Ukrainian refugees arrive to Eastern European countries, this figure is likely to be smaller due to difference in costs of living. Taking the ratio of average GNI per capita of Eastern European countries (Poland, Czechia, Hungary, Romania, and Slovakia) to German GNI per capita, the costs of accommodation in Eastern Europe should be only 33% of the German level. Therefore, should Ukrainian refugees stay in the first recipient country, the lifetime accommodation support should be around EUR 84bn.

It is worth pointing out, however, the differences between Syrian and Ukrainian refugees that will affect their integration prospects: cultural proximity and the gender-age composition. Unlike the Syrian refugee wave, which had a sizeable share of men, the Ukrainian refugees consist primarily of females with children and elderly people. This likely initially places them in a more difficult financial position, since the children will probably require almost a decade to start participating in the EU labour market, while the elderly will probably remain inactive. On the other hand, the higher share of children and the cultural proximity of Ukrainians to people in other European countries should make their cultural integration easier and generate less of a political backlash from European right-wing parties. Existing social networks of Ukrainians living in the EU will be an additional factor facilitating integration of the refugees[42].

As the situation now stands, it is hard to predict how the EU labour market will respond to the refugee crisis and how Ukrainians fleeing the war will meet the demands of EU labour markets. Yet, a number of factors are crucial.

First, those fleeing the war are mostly women, children and the elderly. As men aged 18-60 are prohibited from leaving the country, Ukrainian refugees are very different from previous refugee waves,

41 https://www.ft.com/content/4f0322a4-da99-41d1-9abd-491009155ecd

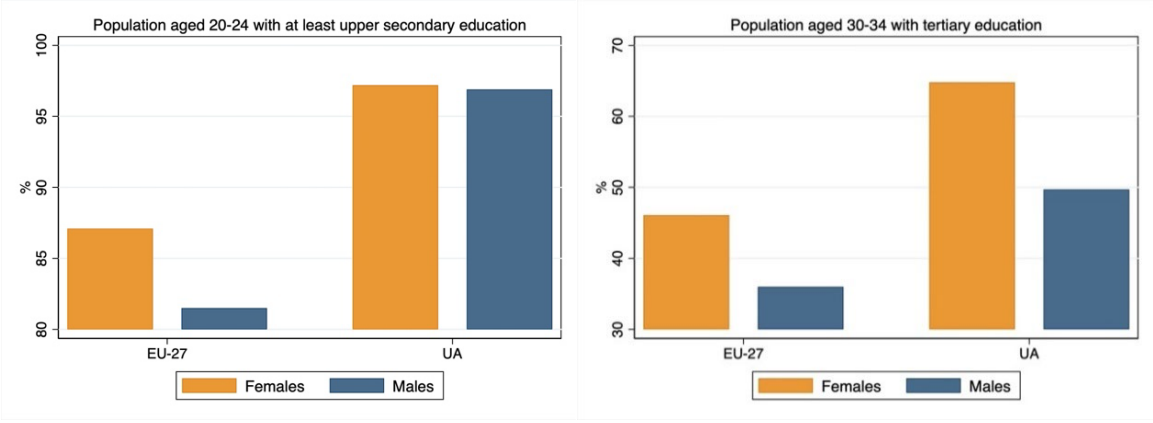
42 According to Eurostat data, in 2020 there were more than 500,000 Ukrainian citizens with long-term residence permits in the EU. In 2021, Ukrainians were granted an additional 757,000 residence permits. The biggest Ukrainian diaspora is in Poland, were more than 2 million Ukrainians resided in 2018 (https://www.eurointegration.com.ua/news/2018/04/17/7080564/). Additionally, a substantial number of Ukrainians by origin have obtained EU citizenship.

with their preponderance of males.[43] Thus, a large proportion of the Ukrainian refugees were inactive on the Ukrainian labour market and may opt to stay so in the EU (e.g. retired), while some (e.g. mothers with young children) may need access to childcare facilities in order to work. Furthermore, the employability of refugees will vary across sectors: e.g. the male-dominated construction industry will have relatively little to offer the refugees, unlike the care or the service sector.

Second, the ability of labour markets to absorb Ukrainian refugees differs across EU countries, and the recent COVID-19 crisis, together with the uneven economic recovery from it, could widen those gaps still further. At the end of 2021, unemployment varied from 14.1% in Spain to 2.2% in Czechia;[44] Ukraine's neighbour Poland had unemployment of 3%. Low unemployment sends out a positive signal about a country's capacity to offer refugees work; yet the specific sectoral labour demands are critical. Tourism, accommodation and the food service sector used to rely very heavily on immigrant workers (mainly women); but those sectors were badly hit by the pandemic and are experiencing a very slow recovery, so employment opportunities may be limited.[45] Hence, local authorities will bear the brunt of matching Ukrainian refugees to existing job vacancies and, if that is not possible, of providing further training.

Third, although the average educational level of Ukrainians exceeds the EU27 average among both men and women (Figure 16), there is a question mark over the transferability of the refugees' skills, knowledge and work experience to EU labour markets. While low-skilled workers may find it relatively easy to find a position (since such jobs often require a minimum command of the host country's language and no extensive training), highly educated refugees could struggle to obtain a post that matches their qualifications.[46] Hence, they may find themselves overqualified for the jobs available, at least in the short to medium term, since it will probably take some time for their formal and informal qualifications to be recognised and for them to acquire a sufficient command of the language.

Figure 16 / Educational attainment in Ukrainian population and EU27 average, 2020



Source: National Statistical Office of Ukraine.

[43] https://www.ft.com/content/4f0322a4-da99-41d1-9abd-491009155ecd

[44] https://ec.europa.eu/eurostat/documents/2995521/14084165/3-10012022-AP-EN.pdf/53ac483e-71d9-3093-5bd8-12f1ea89683a

[45] https://www.consilium.europa.eu/media/48767/eg-note-sectoral-impact_fin.pdf

[46] https://www.icmpd.org/blog/2022/integration-of-ukrainian-refugees-the-road-ahead

Fourth, language training and active labour market policies will be required to ease access to jobs: the provision of additional education and retraining will foster rapid labour market integration. While the temporary protection scheme assumes the provision, among other things, of various integration and language courses, actual implementation will depend largely on state funding, capacity and the number of refugees who arrive in any given country. For successful integration into society and the labour market, Ukrainians need to be given access to language courses as soon as possible.[47] Furthermore, to match the needs of local labour markets, people may need additional training and re-education, in order to acquire a new qualification or achieve recognition of their existing degree.

The inflow of refugees is not the sole factor changing the EU labour market landscape as a result of the conflict. As overall mobilisation was announced on 24 February 2022, tens of thousands of Ukrainians working in the EU and beyond returned to protect their homeland. As of 7 March, more than 140,000 Ukrainians, mostly men, had returned home.[48] They had mainly been working in construction, transportation, agriculture and repair services – the most common sectors for male immigrants from Ukraine.[49] An exodus of workers will inevitably spur labour shortages in those sectors – indeed a crisis in Estonia's construction sector is already emerging.[50] Given the gender and age composition of the refugees, one cannot any compensating effect in those sectors that have experienced an outflow of workers. Whether these labour shortages prove persistent will depend on the progress of the war, people's willingness to return to the host countries after the war, and the identification of replacement workers among EU residents.

2.3.4. Financial contagion

Financial contagion is already visible in CESEE. Currencies have weakened in countries near to Russia and Ukraine, due to higher risk aversion (Figure 17), and interest rates on government debt have increased in some cases. Investor sentiment – both domestic and foreign – in the Baltic states is likely to suffer amid fears that Russia has designs on more than Ukraine. Poland, Slovakia, Hungary and others are already seeing a massive influx of refugees. Meanwhile, the countries of the region were already facing significant inflationary pressures, and these will no doubt increase as a result of the further rise in energy costs caused by the invasion.

In this context, there are no good options open to the region's central banks. With inflation so far above target, they cannot stand back and do nothing; and yet they know that monetary policy is not very useful against inflation driven by supply bottlenecks, and that higher rates will weaken the recovery. This dilemma is reflected in the current policy stance. Nominal rates are rising – quite rapidly in some cases – but real rates adjusted for inflation are negative. In real terms, monetary policy is as loose as it has been at any point since 2007 in most countries of the region. Current real rates are particularly low in the Baltic states and Czechia: the latest Eurostat data for February show annual inflation at 14% in Lithuania, 11.6% in Estonia, 10% in Czechia and 8.8% in Latvia.

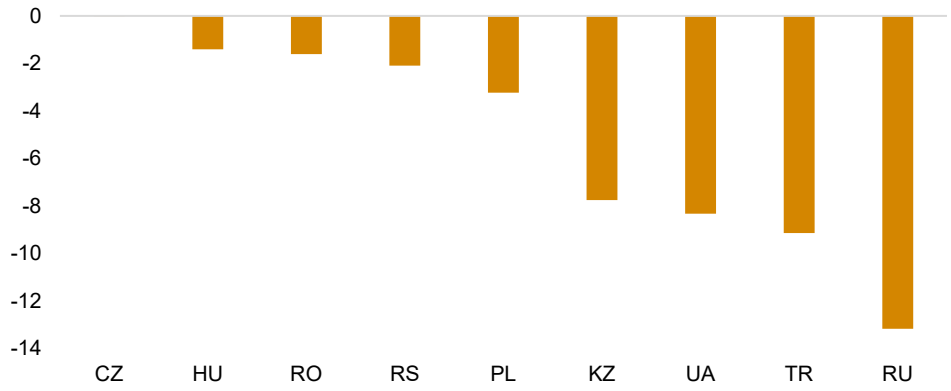
47 https://www.icmpd.org/blog/2022/integration-of-ukrainian-refugees-the-road-ahead

48 https://www.kmu.gov.ua/en/news/vid-pochatku-napadu-rosiyi-na-ukrayinu-bilshe-140-tisyach-ukrayinciv-povernulisya-dodomu

49 https://ec.europa.eu/info/sites/default/files/economy-finance/dp123_en.pdf

50 https://news.err.ee/1608532684/tallinn-deputy-mayor-majority-of-construction-projects-to-be-delayed

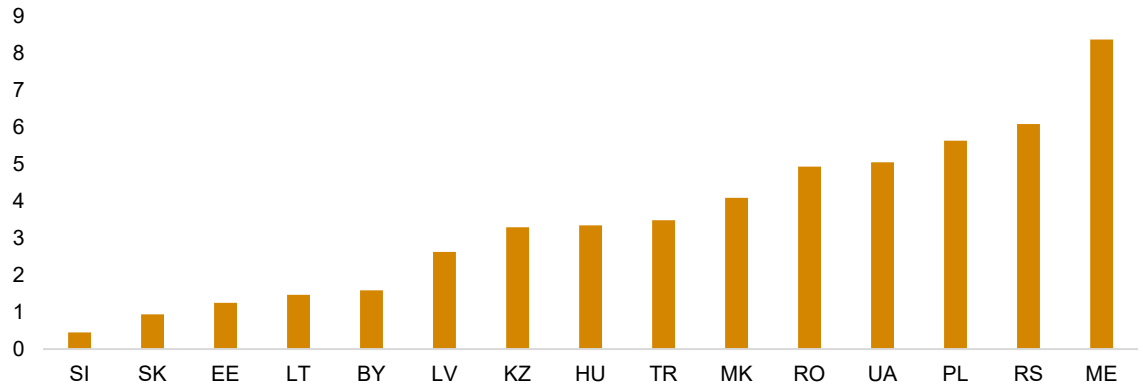
Figure 17 / Percentage change in the value of the national currency versus US dollar, end 2021 to 30 March 2022



Source: National sources, wiiw.

While not wanting to play down the clear challenges faced by the region's economies, it is worth noting that in general the region has strong macroeconomic fundamentals and that policymakers have plenty of options to manage volatility. Central bank foreign reserves cover a healthy level of imports in most places (Figure 18). The lowest levels of reserves relative to imports are in Belarus and Kazakhstan, two of the countries that are most integrated with Russia and that therefore face contagion via various channels. Otherwise, Hungary and Turkey have fairly limited reserves relative to imports.

Figure 18 / Months of import cover: gross central bank reserves, excluding gold, divided by average monthly value of imports, end 2021



Source: National sources, wiiw.

There is a possibility of hefty financial contagion in the EU more broadly, as asset managers and banks in Europe write down Russian assets (in some cases to zero), with as yet unknowable impacts on the financial sector. History suggests that there is unlikely to be no impact. As of 16 March, global investors and firms had revealed around USD 131bn in exposure to Russia, while data from the Bank for International Settlements (BIS) show foreign banks with around USD 20bn of exposure.[51]

[51] https://www.reuters.com/markets/europe/stranded-assets-how-many-billions-are-stuck-russia-2022-03-03/

3. Structural changes in the medium term

Projecting developments from here requires a level of military expertise that we do not possess at wiiw. Taking our cue from those who know better, in the early days of the invasion we had envisaged five possible broad scenarios.

- **Scenario 1:** Russia takes all of Ukraine after heavy and indiscriminate bombing of cities. It appoints a puppet government in Kyiv and settles into occupation mode. Sanctions remain in place for the long term, and Russia suffers heavy casualties due to a continued Ukrainian insurgency.
- **Scenario 2:** After taking Odesa and Kyiv, Russia halts its advance, leaving the Western part of Ukraine unoccupied, with Lviv as the capital. Putin decides that further advances would be too costly and negotiates on this basis. The outcome would be a partitioning of Ukraine and agreements on demilitarisation and neutrality. Again, stiff sanctions would remain in place.
- **Scenario 3:** Due to mounting losses and lack of progress on the battlefield, Russia is forced to negotiate, without having taken Kyiv. Russia's negotiating position would be much weaker than in scenarios 1 or 2, and it would end up controlling Crimea, Donbas and possibly a 'land bridge' in between. There would be an attempt to sell this to the Russian public as a victory, but it would be a long way short of the Kremlin's pre-invasion goals.
- **Scenario 4:** A lack of 'success' and opposition to the war among the elites and/or the general population in Russia leads to regime change.
- **Scenario 5:** A Russia-NATO war.

At the time of writing, something like scenario 3 seems to be the most likely. However, any projection about the future path of the war must be couched in huge uncertainty. Any combination of the first three scenarios would lead us in the direction of a new Cold War, and a fundamental break with the economic integration of the last 30 years between Russia and the West. Countries 'in between' would struggle to maintain full economic relations with both: Belarus would move even more fully into Russia's orbit, whereas the Western Balkans would end up mostly in the Western camp. Unless China fundamentally breaks with Russia, which seems very unlikely, this would also intensify the bigger geo-economic shift at the global level, with a harder economic and financial conflict between US- and China-led blocs.

We find it very difficult to put a probability on scenario 4, but if it happens, we would expect a gradual unwinding of sanctions and possibly even a return to something like the pre-invasion economic and financial integration. A full return to the pre-invasion status quo would only be very gradual, and we would possibly never get back to that point. Everything would depend on what kind of regime replaces that of President Putin. Scenario 5 would be a disaster scenario from all angles, including economic and financial. The costs would be so catastrophic that it is impossible to project.

3.1. UKRAINE

The war will have caused severe destruction: of basic infrastructure (transport, electricity, water, etc.) and civilian housing. Most importantly, there will have been a major loss of population through the dramatic flow of refugees (estimated currently at anything between 5m and 10m). The outcome of the military conflict will determine the extent to which external support can contribute to the rebuilding of this infrastructure, how massive the inflow of (Marshall Plan-type) aid will be, and whether the current refugee population (or a significant proportion of it) sees fit to return. The outcome of the military confrontation will also determine which regions of Ukraine will continue to be occupied by Russian troops (where confrontation through resistance of various types will likely persist). These regions will be deprived of any large-scale Western support, and will have to rely on support from Russia – fairly meagre, if the experiences of the occupied Donbas region post-2014 are anything to go by.

Hence, in a scenario in which one part of Ukraine remains occupied and another remains independent, we can expect very uneven economic development. One part will receive very significant support; there will be some degree of demographic stabilisation; and there will be very close economic cooperation with the European Union, although most likely falling short of full membership (which would be the best-case option as far as Ukraine is concerned). The other part, occupied by Russian forces, will have difficulty in rebuilding after the destruction caused by the military conflict (which was specifically concentrated in those regions); will continue to suffer from outward migration, implying a very long-lasting demographic shock; and will form part of a Russia-dominated world, which has become relatively isolated from the global economy, except for its links with China (which for those regions of Ukraine would be rather distant links).

Hence, the most urgent tasks for the Western side are to set up a plan for the reconstruction of post-war Ukraine; to identify the most urgent areas (critical infrastructure, transport, housing, administration and public services) that require support; to determine the scale and time sequencing of this support; and to encourage – through support measures – a significant return of those migrants currently flooding out of the country. Technical assistance to the government will be crucial in rebuilding the economy from its war mode and advancing with reforms. In addition to the Marshall Plan-type Western support, it has been suggested that those assets of Russian oligarchs and the Russian central bank that have been frozen by Western countries could be used to help rebuild the country (although this would be legally very complicated). Maintaining close contact with the growing Ukrainian diaspora would also be an important support for Ukraine's future development.

Although a significant part of the capital infrastructure will have been destroyed, there could be a silver lining to this, as post-war investment could flow into a modernised infrastructure, new technologies and support the development of more efficient and technologically advanced sectors. Ukraine already has a successful and booming IT sector, and its relatively highly skilled labour force could allow for the further, accelerated digitalisation of the economy and its integration into European and global production chains. The agricultural sector, where land reform was recently implemented, has lots of potential for increased efficiency, which could come through increased post-war investment in the sector. For cooperation/integration with the EU, we suggest the following: participation in all major EU programmes, just as if the country were an EU member – the cohesion funds, exchange programmes, research and scientific cooperation, trans-European transport and other infrastructure projects, common energy policy and transition programmes linked to the New Green Deal.

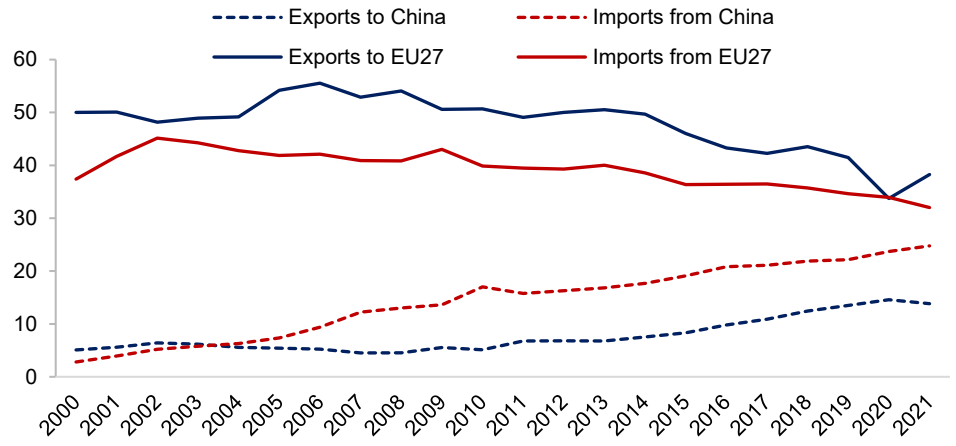
3.2. RUSSIA

The deep recession facing the Russian economy this year (and potentially next) analysed above is only one consequence of the war in Ukraine and of the Western sanctions. Most of the costs that Russia will have to bear are, arguably, of a longer-term nature and will stem from (i) less-competitive markets due to reduced imports, (ii) missed opportunities of technology transfer from abroad, and (iii) the exodus of scientists, entrepreneurs and other professionals, which will result in (further) losses of valuable human capital.[52]

At present, the Russian invasion looks set to presage a fundamental unwinding of 30 years of economic integration between Russia and the West. In addition to the harsh financial sanctions imposed on the country, Western firms are leaving Russia *en masse*, opening up the possibility that their assets will be nationalised.[53] Thus, it seems likely that, even if sanctions are eased at some point, February 2022 may well prove to have been the high-water mark for European economic integration in its broadest sense. The much-heralded 'integration of integrations' between the EU and the Eurasian Economic Union (EAEU) always did seem to require a great deal of creative thinking, given the political reality; today it seems to be from another world.

The current rupture in economic and financial links between Russia and the West marks an intensification (rather a severe one) of a process that began with the annexation of Crimea and the exchange of sanctions in 2014. The EU's share of total Russian trade has been falling since the global financial crisis, but the decline generally accelerated after 2014 (Figure 19). This decline has been almost fully matched by an increase in trade with China, which has become Russia's biggest single trading partner. The gap between the EU and China has particularly narrowed on the import side: 32% versus 25%, respectively, as of 2021.

Figure 19 / Russia's merchandise trade with the EU and China, % of total



Source: Russian Federal State Statistics Service.

[52] Here, the assumption is that Russian borders will remain largely open (in the Soviet Union, the 'brain drain' hardly existed, because it was almost impossible to leave the country).

[53] At the time of writing, the possibility of nationalisation is only on the government agenda for those Western companies that have announced their withdrawal from Russia. However, it cannot be ruled out that nationalisation may be extended to other foreign companies from 'unfriendly jurisdictions' as well.

There is little doubt that these trends will be greatly amplified in the years to come: unlike some other East Asian countries,[54] China has not joined the Western sanctions (and has not even officially condemned Russian aggression in Ukraine), and it will be eager to take advantage of the openings left behind by the withdrawal of Western companies. It is highly likely that, at least on the imports side, China will very soon overtake the EU as Russia's biggest trading partner.[55] Cooperation with other non-Western partners, such as India, Vietnam, Indonesia and countries of the Middle East and Latin America, will likely gain momentum as well.

The Russia-China relationship, already important, is now central from Russia's perspective. While this will clearly help Russia to cushion the blow from Western sanctions and the continued decoupling from the West, there are also sound reasons for believing that it will not be an especially comfortable relationship for the Russians. China's GDP is already 3-4 times that of Russia, and the gap – given the growth scenarios envisaged – will expand further, creating a serious power imbalance in the relationship. Even now, China seems to use market power in this relationship to buy commodities from Russia at a discount. Russia's role in the relationship is likely to become ever more similar to that of many Latin American countries with China (a cementation of a Heckscher-Ohlin type of trade specialisation: Russia exporting mostly energy and raw materials in exchange for manufactured goods); the economy will be even more vulnerable to commodity price fluctuations, and will struggle even more with structural diversification. Moreover, while interaction with European economies left open at least the possibility of integration into international production/value chains, with the potential for upgrading, this is very unlikely to be the case with China – not least because the physical distance to Russia's industrial heartland (where most of its human capital is also located) is enormous.

There is little doubt that with Western sanctions likely to remain in place for years to come, firms will find substitutes for consumer goods. However, the more limited choice of suppliers and the increased market power of those that remain will result in lower supply volumes and higher prices, which will lead to deadweight welfare costs. Potentially even more importantly, Russia will be largely cut off from the opportunity to import technology and high-tech goods from top producers and leaders in the advanced industries: from oil refineries to MRI scanners, from gas turbines to graphic cards, from jet engines to mobile telephony. This is not because there are no technical means of circumventing sanctions – after all, North Korea has done it for decades. Rather, it is because advanced industries are dominated by international companies, which are deeply rooted in the global financial system – and that implies compliance with the regulations of G7/EU economies. Therefore, there are good reasons for believing that increased imports from China and other non-Western countries will only partly offset reduced imports from the West, and the eastward reorientation of Russian foreign trade will proceed against a background of overall declining trade volumes.

The potential effects of sanctions on investments in Russia may not be as obvious as the effects of those on trade. One reason is that Russia consistently runs current account surpluses and is thus a net lender to the rest of the world; as such, it does not need to borrow from abroad to finance domestic

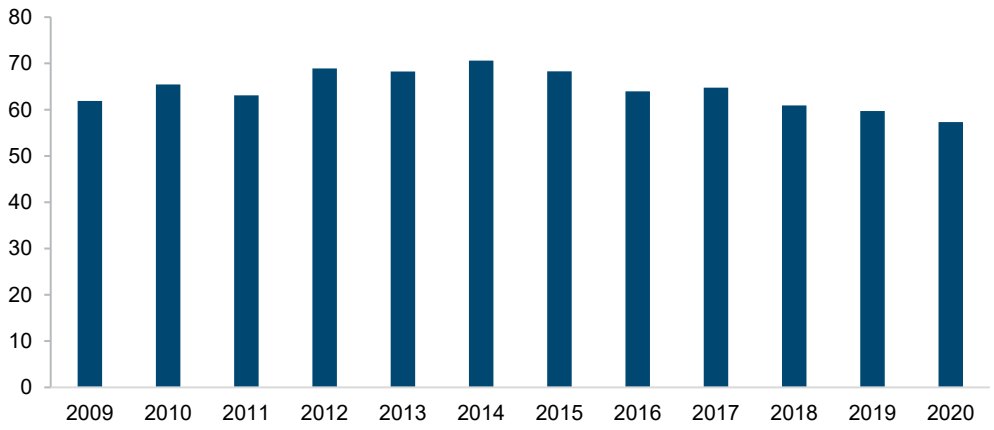
[54] Japan and Singapore formally joined many of the Western sanctions, while leading companies from South Korea (Samsung, LG) and Taiwan (TSMC) have halted their exports to Russia.

[55] On the export side, reorientation of Russian trade from the EU towards China will probably be less pronounced – and will, in any case, take longer. Russian energy exports to the EU have not been sanctioned (unlike those to the US and the UK), at least so far, while a diversion of particularly gas exports by Russia from Europe towards China would be complicated by the existing infrastructural links (the bulk of Russian gas export pipelines run westwards).

investments. With the rouble depreciation and Western sanctions likely to affect Russian imports more than exports, it will probably maintain its external surplus in years to come.

The real issue here is not so much the influx of foreign capital per se, but of the advanced technologies that often come with it. Such technologies have the potential to raise total factor productivity, and thus to lay the foundations for long-term economic growth and for the country to catch up with the advanced economies. On a positive note, it has to be said that Western foreign direct investment (FDI) has never played a particularly prominent role in Russia anyway, so that limits the potential for divestment (all the recent announcements of Western companies leaving Russia notwithstanding). Although the EU still accounts for 57% of Russian FDI stocks, its share has been declining over time (Figure 20). Besides, a large part of it comes from Cyprus and other 'offshore' jurisdictions (such as The Netherlands), essentially represents the reinvestment of Russian capital that had earlier fled the country, and brings hardly any of the benefits usually associated with FDI (such as new technologies, integration into regional and global value chains or access to foreign markets). With the geopolitical climate likely poisoned for years to come, it is safe to assume that genuine Western FDI will continue to avoid Russia.

Figure 20 / Russia's inward FDI stock from the EU, % of total



Source: Central Bank of Russia.

All in all, Russia is likely to remain stuck with the parameters that have constrained its economic growth over the past decade: low levels of investment,[56] together with low rates of return (given the near absence of foreign multinationals). This time, however, this unfortunate constellation may be aggravated by the erosion of human capital because of the brain drain. As has been the case over the past decade, Russia's economic growth is likely to continue at substantially below the world average. This means increasing backwardness of the Russian economy, compared to the rest of the world, and most likely the stagnation of real incomes. The case of Iran shows that, although an economy can maintain a semblance of stability under severe sanctions, these may lead to long-term decline in the level of economic development (Box 6). Having said that, there are several important differences between

[56] The share of gross fixed capital formation (GFCF) in Russian GDP in 2010-2020 averaged a mere 21.4%. This is too low to ensure sustainable catching-up. In successful catching-up countries, the share of GFCF was generally much higher, exceeding 25% of GDP in Japan and 30% in South Korea. In China it was frequently above 40%.

Russia and Iran, which might suggest that the Russian economy could weather the sanctions relatively better in the longer term:

› Russia has arguably been better prepared than Iran for at least some Western sanctions. For instance, Iran did not have its own payment system when its economy was cut off from SWIFT transactions by the West. By contrast, in Russia a domestic alternative to SWIFT (called SPFS) has been under development since 2014, when Western governments first started considering the imposition of SWIFT sanctions. As of now, the system is reportedly operational – at least for payments within Russia, as well as with the EAEU, China and a few other countries. To an extent, this should offset the impact of Western financial sanctions, unless the G7/EU explicitly prohibits foreign companies from joining SPFS. Yet even then, tracking compliance among minor financial institutions outside the G7/EU jurisdictions may not be feasible.

› The Russian economy is more diversified and has a larger share of sectors with higher value added. While it is true that the structure of Russian *exports* is heavily skewed towards raw materials, with oil and natural gas accounting for some 60% of the total, there is a wide range of manufacturing industries that produce mostly for the domestic market. In the short run, this may be seen as a source of vulnerability: many of these industries are crucially dependent on imported parts and components.[57] However, in the longer run the existence of Russia's own production capacities may facilitate import substitution.[58]

BOX 6 / IMPACT OF THE SANCTIONS REGIME ON THE IRANIAN ECONOMY

The sanctions regime against Iran was intensified by the international community (US, Canada, Australia and the EU) and the UN Security Council during the period 2010-2012. The general sanctions were aimed at preventing or disrupting Iran's trade, its oil exports, the financial sector, SWIFT transactions and the Central Bank of Iran, in order to coerce the country into limiting its nuclear programme. In addition, smart sanctions targeting individuals and officials were implemented in response to human rights violations, affiliation to Iran's nuclear and aerospace sectors and linkages to military proxies in the region. The general sanctions significantly affected trade between Iran and the sanctioning countries. However, humanitarian trade in food, medicine and medical devices was not affected significantly (Ghodsi and Karamelikli, 2022). The general sanctions were lifted in 2016, following implementation of the Joint Comprehensive Plan of Action (JCPOA), though numerous smart sanctions that targeted individuals and that were not related to nuclear activities remained in force.

After Donald Trump withdrew the United States from the JCPOA in 2018, the US imposed new secondary sanctions on Iran. These unilateral sanctions have been working more aggressively than the sanctions imposed earlier by the international community. In the beginning, sanction waivers were offered for a few months to some major importers of Iranian oil (such as China, Japan, South Korea and India) to enable them to find other sources. Afterwards, Iran's oil exports dropped from about 2.4 million barrels per day (mbp/d) to under 0.5 mbp/d. These reduced exports crept under the US government's radar by following secondary routes, such as through Malaysia. In a previous round of international sanctions, in 2014, Iran had managed to export about 1.4 mbp/d, routed through countries such as the United Arab Emirates.[59] Thus US secondary

[57] A case in point is the aviation industry, which will likely suffer from the ban on the exports of Western parts and components to Russia.

[58] This may be the case, for instance, in the automotive sector. After most Western car manufacturers producing in Russia announced their withdrawal, negotiations reportedly got under way with Chinese companies, which may take over.

[59] https://www.eia.gov/todayinenergy/detail.php?id=21792#:~:text=Iran's%20crude%20oil%20and%20condensate,(250%2C000%20b%2Fd)

sanctions had clearly become much tighter, as the technology and the experience of tracking Iran's oil tankers improved. The significant reduction in oil revenues limited Iran's fiscal space. Therefore, borrowing from the central bank increased the monetary base significantly. This led to a large surge in annual inflation, to around 40-50% in 2019-2021.

Furthermore, the US secondary sanctions on the Iranian banking system targeted any international transaction that originated in or that was destined for Iran.[60] The country no longer had access to its foreign reserves – or even to the payments it received for its oil. This led to a significant depreciation of the Iranian rial: against the US dollar, it fell by 450% between January 2018 and October 2020.[61] Furthermore, in order to bypass the sanctions, Iran suspended legislation that related to the regulations of the Financial Action Task Force (FATF). This led to Iran being placed on the FATF blacklist, alongside North Korea. Both the US sanctions and the internal self-isolation that led to this blacklisting prevented foreign banks from opening letters of credit for any kind of trade with Iran, although humanitarian trade was not part of the US sanctions. In the meantime, other signatories to the JCPOA attempted to establish a barter trading system with Iran to facilitate humanitarian trade. Efforts were made by the EU to establish the Instrument in Support of Trade Exchanges (INSTEX) in 2019; this has not registered any trade between Iran and the EU, because the US has not given its blessing. This has forced Iran to initiate its own barter trading system, which has connected Iran's exporters with Iran's importers abroad, using unofficial networks to bypass the sanctions. It is worth noting that the existence of cryptocurrencies has enabled this network to survive. However, transaction costs and trade costs have increased, which has exerted considerable pressure on the prices of imported goods, such as livestock feed, which is an upstream good in the agricultural sector. There has consequently been an overall rise in prices.

Inflation and limited fiscal space have both reduced real wages (as the population is mostly employed in the public sector), which has contributed to a reduction in private consumption in recent years. This has triggered protests and a nationwide uprising, which have been violently crushed by the security forces.[62] Iran's policies and retaliatory sanctions over the past decade have brought misery to Iranians. Iran's real GDP now stands at below its 2017 level, and real GDP per capita at below its 1976 level.

3.3. THE REST OF EUROPE

There are four main areas of structural change and lasting impact for the EU and Europe more broadly following Russia's invasion of Ukraine:

› the EU will get more serious about defence,

› the green transition will gather pace,

› broader Eurasian economic integration will be unwound,

› the EU accession prospects of some countries (although probably not Ukraine) could improve.

The key to how deep and how lasting these changes are will be Germany, where a major change in thinking with regard to Russia is under way. Above all, naturally, this is due to disgust at the unprovoked invasion and the devastation to human lives it has brought. Yet the German reaction goes far beyond

60 https://home.treasury.gov/news/press-releases/sm1147

61 https://carnegieendowment.org/sada/83350

62 https://wiiw.ac.at/iran-s-new-president-ebrahim-raisi-takes-over-a-ruined-country-n-521.html

simply military matters, and looks set to deliver sweeping changes to German and EU energy and defence policies, in particular.

Many have been frustrated by Germany, which has allowed itself to be so strongly dependent on Russian energy for so long.[63] The fact that Germany ended up in this position seems to reflect the fact that the country has not had to think about hard defence questions for several generations. For many in Germany – and perhaps especially among the generation now coming into power – a mindset had formed that the hard realities of international relations did not apply to it.[64] The fact that Germany got into such an embrace with Russia over energy shows a serious lack of strategy. Now that illusion is over.

Germany is not somehow uniquely guilty of mass collusion with the Putin regime over the past two decades: one could make the same withering assessments of other Western countries' moral-free engagement with Russian money – for example, the buying of political influence by oligarchs in London, or the now very uncomfortable-looking financial embrace between Russia and large parts of the Austrian elite. Much of this is now being unwound publicly, to the great embarrassment of politicians and business leaders across Europe. Yet in terms of lasting structural policy changes, the unwinding in Germany looks set to be of greatest significance.

Defence: EU countries will also now ramp up military spending, with Germany's announcement that it will massively increase funds for defence in the wake of the Russian invasion being particularly notable. Although truly EU standalone military capabilities are still hard to imagine anytime soon, the EU countries will play a much more prominent role in NATO than has been the case until now. This is likely to include a much bigger permanent presence of NATO troops in the Baltic states and Poland.

The Baltics are in for a more difficult future (they have already been termed the 'new' West Berlin).[65] It is impossible to know whether or not Volodymyr Zelensky will be right that Ukraine is not the limit of Russia's territorial ambitions; but clearly, an invasion of the Baltic states is less unthinkable than it was even a few weeks ago. Those countries themselves have never been under any illusions. Long regarded as hardliners over Russia, the views of the Baltic states and Poland on their eastern neighbour are now part of the EU mainstream.

Energy: The EU has more or less always been a leader on the response to climate change. Yet the last few years have seen three crucial developments that have very clearly speeded up the agenda and will collectively bring about a revolution in EU energy politics. The Russian invasion of Ukraine, and its implications for energy politics in the EU, will deliver a further big push in that direction.

First, over the past few years there has been increasing evidence (in terms of both scientific research and extreme weather events) that the world is facing a climate crisis that will significantly harm current and future generations, unless decisive action is taken now. The EU is, as a result, even more focused on tackling the climate crisis, reflecting growing public pressure and the presence of Green parties in government, most importantly in Germany. Green politics has become a 'mainstream' issue in most big

63 https://www.newstatesman.com/world/europe/ukraine/2022/03/profits-from-fossil-fuel-energy-power-russias-war-machine-and-ukraine-suffers

64 https://warontherocks.com/2021/05/a-millennial-considers-the-new-german-problem-after-30-years-of-peace/

65 https://www.ft.com/content/d711c884-653d-4336-a490-b9075e5ce82f

EU member states, with policies that were previously the preserve of green parties now forming part of the platforms of most non-far-right political groups.

Second, the pandemic itself was a reminder of man's unbalanced relationship with nature, and of the drastic consequences this can have. It also showed how many resources can be mobilised quickly in time of crisis, with obvious implications for the climate crisis as well. Especially in the EU, there has been a conscious linking of the pandemic and the environment: a cornerstone of the EU's ground-breaking Next Generation EU pandemic recovery plan is the financing of green projects.

The third factor is Russia's invasion of Ukraine, and the pressure to immediately transition away from a reliance on Russian energy. As already outlined, in the short term this involves doing whatever it takes, including utilising dirty energies, such as coal. But beyond fire-fighting measures, the clear direction of travel will be to replace Russian energy with green sources of power.

Taking these three factors together provides an extremely powerful fillip for the green transition in the EU. A key stumbling block to more rapid transition, even in the EU, has always been the high cost. But the combination of factors outlined above creates a possibly unique window of opportunity, where EU leaders will have the political space they need to force through this expensive transition.

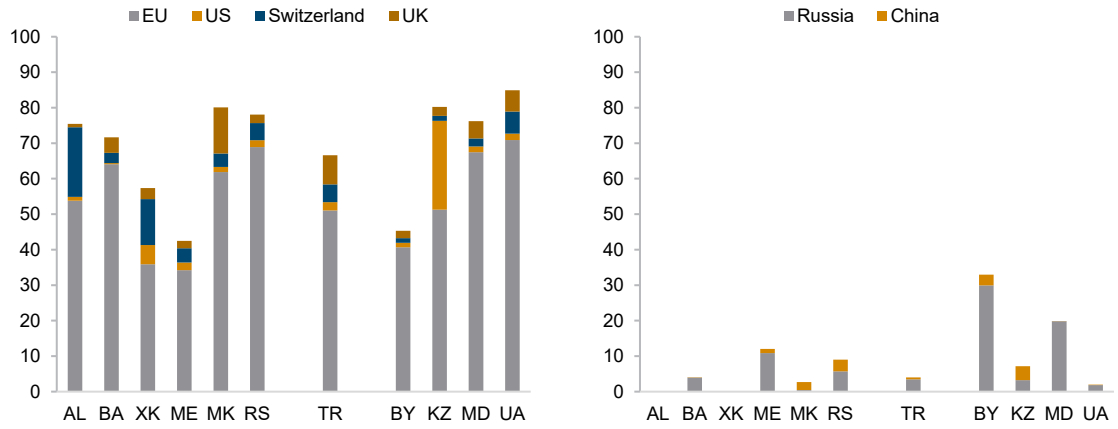
In response to the invasion, the European Commission has updated its REPowerEU plan, which now seeks to fully eliminate dependence on Russian gas before 2030. As well as diversifying gas imports with liquefied natural gas and pipeline gas from other sources, the cornerstone of this accelerated plan is to increase further the use of renewables, improve energy efficiency, introduce more electrification and address infrastructure bottlenecks.

Eurasian economic integration: If the direction of travel in terms of Russia-EU economic disintegration is clear (see above), the picture is potentially more complicated for those countries in the 'contested zone' in between. This applies, in particular, to countries of the Former Soviet Union, but also to Turkey and at least some parts of the Western Balkans, which have sought until now to maintain economic and political relationships with both Russia and the EU. It looks highly likely that maintaining a neutral stance politically, and therefore finding a middle ground economically and financially, is going to be increasingly difficult.

Data on economic integration as of 2020 show that, for most parts of this 'contested zone', the relationship with the West is much more important than that with Russia (and China). The West accounts for a much greater share of total inward FDI in all countries than do Russia and China combined. Only in Belarus and Moldova is Russia a key investor, accounting for around a fifth or more of the total FDI stock. Meanwhile, the West[66] is a key investor in all countries.

[66] By 'the West' we mean primarily the EU, although other Western countries have a particular importance in one or more partner countries (e.g. Switzerland in Albania and Kosovo; the UK in North Macedonia; the US in Kazakhstan).

Figure 21 / Share of inward FDI stock in selected countries, % of total, by origin



Source: National sources, wiiw.

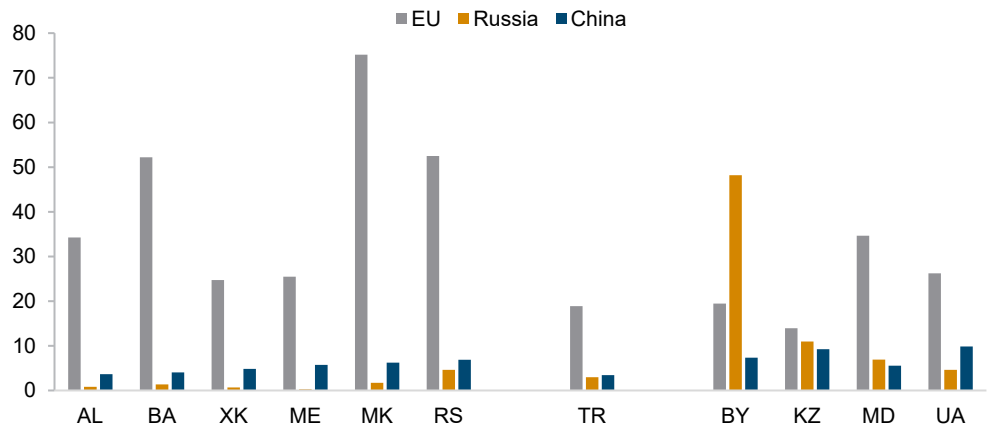
The impression gained from external trade relations is broadly similar, with the EU the most important trading partner of the countries considered.[67] For the Western Balkans, Turkey, Moldova and Ukraine, the trade relationship with the EU is much more important than with Russia and China (and even with Russia and China *combined* in the case of the Western Balkans and Turkey). In Kazakhstan, the importance of external trade with the EU, Russia and China is more even. Only in Belarus is Russia clearly more important than any other trading partner.

The general impression created by these data is that, as the Russia-West divide continues to harden, and as the middle ground becomes more and more difficult to sustain, the overwhelming logic in economic and financial terms is for the Western Balkan countries and Turkey to side with the West. That is naturally the case for Ukraine, but based on these data, it is also true for Moldova. Kazakhstan faces a much more difficult reality, and may well try to follow China in maintaining economic relations with all sides; but that will be increasingly difficult. For Belarus, further alienation from the EU is likely.

This economic and financial logic in part matches the current political moves. However, two major exceptions are Turkey and Serbia. For now, both seem determined to stick to the middle ground, and both have notably so far kept transport connections with Russia open (or even increased them). Yet for both, this path does not look sustainable. The clear economic and financial importance of the West for both countries creates clear incentives to prioritise this relationship, but it also gives the West leverage over them to join in the sanctions against Russia.

[67] Here we exclude the UK, US and Switzerland, as they are not especially important trading partners for any of the countries considered, owing to gravity effects.

Figure 22 / Merchandise trade (exports + imports), % of GDP, 2020



Source: National sources, wiiw.

EU enlargement in Southeast Europe: Via initiatives such as its Deep and Comprehensive Free Trade Agreement (DCFTA) with the EU, and its participation in NATO's enhanced opportunities partnership interoperability programme, Ukraine had embarked on a process of euro-Atlantic integration. However, one of the lessons of the Russian invasion is that until such time as the Western integration is complete, with full NATO and EU membership, that integration can be undone. The lesson of this, particularly for the EU, should be that Western Balkan EU accession should be speeded up. Until the six countries of Southeast Europe are fully integrated into euro-Atlantic institutional structures, they remain vulnerable to Russian interference. Russia's invasion of Ukraine shows that the EU strategy towards the Western Balkans must be rethought, and should act as a catalyst for much more concrete integration steps in the coming years. Now, more than ever, more of the same in the EU approach to the Western Balkans should not be an option (Weiss, 2020).

4. Conclusion

Russia's invasion of Ukraine has sparked the worst conflict in Europe since the Balkan wars of the 1990s. It will cause untold human suffering, destruction of infrastructure, and economic and financial damage. Many people will die, but the lives of millions more will be changed forever.

As we show in this report, there are various things that the current situation can be compared to, as a guide to how bad the fallout will be. In military terms, the Balkan wars provide some baseline. In terms of sanctions, Iran can serve as a guide. Yet the current crisis is fundamentally worse than either of those examples. In military terms, the fact that Russia is a nuclear power raises the stakes and renders the worst-case scenario categorically worse than anything since at least 1989. Meanwhile, the severity of the sanctions on an economy as big and important as Russia's means that the impact on European and global economies will be much greater than in the case of Iran.

There is so much uncertainty and so many contingencies that forecasting is extremely difficult. But the fact that Russian President Vladimir Putin has committed himself to this war of aggression, and seems unable to back down, indicates that in practice there are only really two ways this can go: either something like a New Cold War, or regime change in Russia. Today, the first seems more likely than the second.

In this report, we have shown that the economic and financial consequences for Europe will be profound. The economies of Russia and Ukraine will suffer by far the most. Ukraine's economy will shrink badly, a large part of its infrastructure will be destroyed and millions of people will leave the country. Russia will suffer a major recession and a sharp increase in inflation, and there will be a severe drop in living standards.

The rest of Europe, and especially the countries of CESEE, will be buffeted by much higher inflation and some financial contagion. Across the EU, inflation will also be higher, but much will depend on the willingness (or otherwise) to cut off oil and gas imports from Russia. If that happens, EU growth would suffer significantly; but as the indiscriminate bombing of civilian areas in Ukraine continues, we think that is a price that EU residents will increasingly be willing to pay.

The medium- and long-term outlook for Ukraine, Russia and the rest of Europe has been changed radically by the events of the last few weeks. For Ukraine, in a scenario where part of the country remains occupied and the other part is independent, the economic outcomes will be very divergent. An independent part of Ukraine would see many refugees return, would receive massive Western financial support and could look forward to greater integration with the EU. By contrast, a Russian-occupied part of East/South Ukraine would be rebuilt much more slowly, would continue to suffer from outward migration and would form part of a Russia-dominated world that has become relatively isolated from the global economy (except for its links with China – links that are unlikely to be very important for these regions of Ukraine).

For Russia, the medium-term outlook is mostly negative. Due to the sanctions, the Russian economy will lose its access to a large part of foreign capital and Western technological transfer, increasing its economic backwardness relative to the rest of the world. This will be partly – but by no means fully – offset by rising integration with the major Asian economies, especially China. Real incomes are likely to stagnate. The Russian invasion also looks set to presage a fundamental unwinding of 30 years of economic integration between Russia and the West. On top of the harsh financial sanctions imposed on Russia, Western firms are leaving Russia en masse. Thus, it seems likely that, even if sanctions are eased at some point, February 2022 may well prove to have been the high-water mark for European economic integration in its broadest sense.

There are four main areas of structural change and lasting impact for the EU and Europe more broadly following Russia's invasion of Ukraine. First, the EU will get more serious about defence. Second, the green transition will gather pace. Third, broader Eurasian economic integration will be unwound. Fourth, the EU accession prospects of some countries (although probably not Ukraine) could improve.

Western policymakers have a lengthy to-do list in the near term. The immediate priority must be to address the humanitarian crisis, including supporting and integrating refugees, providing assistance where possible for internally displaced people within Ukraine, and helping those countries where most refugees are arriving (such as Poland and Moldova). The next step is to address integration, including language training and active labour market policies to ease job access. Once the war ends, the US and EU should be ready with a plan for reconstruction, including identifying the most urgent areas where support will be needed (transport, housing, administration, etc.). They should also determine the scale and sequencing of this support, and encourage a significant return flow of refugees, once this becomes feasible. Technical assistance to the government will be crucial in rebuilding the economy from its war mode and advancing with reforms. The EU should make specific efforts to integrate post-war Ukraine much more strongly. This should include participation in all major EU programmes, just as if the country were an EU member – the cohesion funds, exchange programmes, research and scientific cooperation, trans-European transport and other infrastructure projects, common energy policy and programmes linked to the New Green Deal.

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Annex

Table 6 / Duration of some of the largest urban battles in modern history

	Length, days	City area, sq. km	Pre-war population, thousands	Population density, people/sq. km
Vukovar (1991)	87	100	45	446
Sarajevo (1992)	1425	142	341	2401
Grozny (1994)	39	324	364	1123
Grozny (1999)	43	324	186	574
Baghdad (2003)	6	204	5615	27525
Baghdad (2006)	809	204	5327	26113
Tripoli (2011)	8	1507	1095	727
Aleppo (2012)	1217	190	3078	16200
Donetsk (2014)*	46	358	948	2648
Mosul (2016)	277	180	1430	7944
Raqqa (2017)	133	1962	492	251

* End as of Minsk I ceasefire agreement: 5 September 2014.
Sources: Macrotrends, Thomas (1999), Kochnev (2020), Živić and Degmečić (2016), Godfroy et.al (2019).

Table 7 / Scenario parameters for displacement flows

	Donbas Scenario	Syrian Scenario
Displaced-to-total	40%	61%
Internally displaced to total	22%	23%
Refugees to total	18%	38%

Sources: UNOCHA (2022c), Kochnev and Valente (2021).

Table 8 / List of current and potential warfare regions

Region	Current warfare regions	Potential warfare regions
Vinnytsia Oblast	-	-
Volyn Oblast	-	-
Dnipropetrovsk Oblast	-	1
Donetsk Oblast	1	-
Zhytomyr Oblast	1	-
Zakarpattia Oblast	-	-
Zaporizhzhia Oblast	1	-
Ivano-Frankivsk Oblast	-	-
Kyiv (Municipality)	1	-
Kirovohrad Oblast	-	1
Luhansk Oblast	1	-
Lviv Oblast	-	-
Mykolaiv Oblast	1	-
Odesa Oblast	-	1
Poltava Oblast	-	1
Rivne Oblast	-	-
Sumy Oblast	1	-
Ternopil Oblast	-	-
Kharkiv Oblast	1	-
Kherson Oblast	1	-
Khmelnytskyi Oblast	-	-
Cherkasy Oblast	-	1
Chernivtsi Oblast	-	-
Chernihiv Oblast	1	-
Kyiv Oblast	1	-

Note: Current warfare regions as of March 20th, 2022 according to maps produced by the Institute for the Study of War. Potentially warfare regions consist of Odesa Oblast all regions located to the East of or in proximity to Dnipro. We include Odesa since this is the third-biggest Ukrainian city and is a hub for Ukrainian maritime trade.

VARX model description

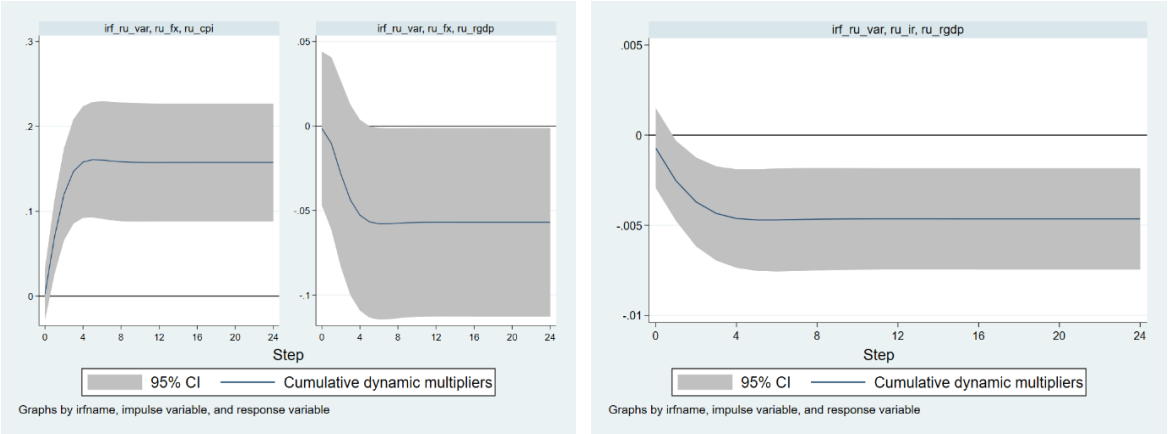
Model specification, Russian economy[68]

$$\begin{cases} \text{GDP} = \alpha_{11} L.\text{GDP} + \alpha_{12} L2.\text{GDP} + \beta_{11} L.\text{CPI} + \beta_{12} L2.\text{CPI} + \sum_i^n (\gamma_{1i} x_i + \gamma_{2i} L.x_i) + \varepsilon \\ \text{CPI} = \alpha_{21} L.\text{GDP} + \alpha_{22} L2.\text{GDP} + \beta_{21} L.\text{CPI} + \beta_{22} L2.\text{CPI} + \sum_i^n (\gamma_{2i} x_i + \gamma_{2i} L.x_i) + \zeta \end{cases}$$

Such that $x_i \in$
{Domestic key rate, FX rate, Oil price, Dutch TTF price, US GDP, US Key rate, US CPI, time trend}

Base specification (2 lags):

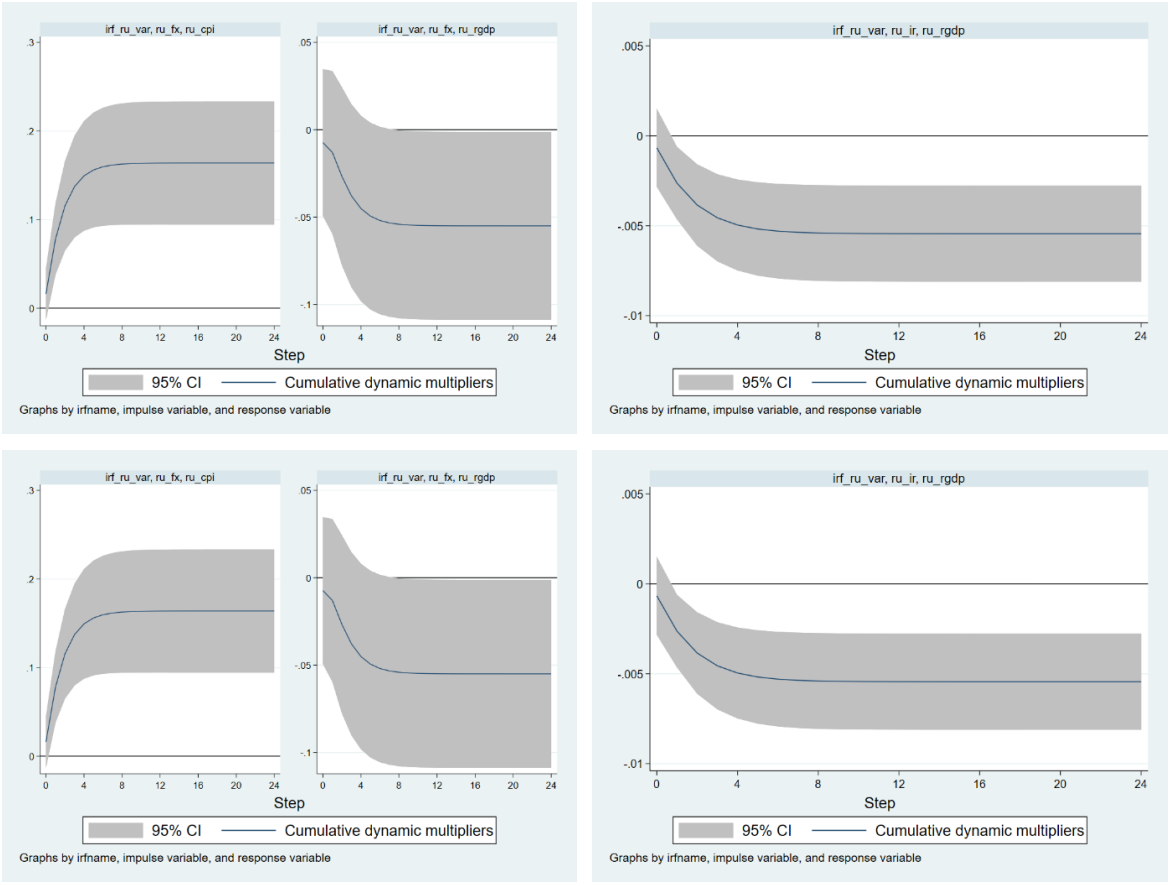
Figure 23 / Cumulative dynamic multiplier, VARX model of Russian economy, 2 lags (baseline result)



Note: Left panel: impact of FX shock (depreciation by half) on CPI and GDP growth rate. Right panel: impact of interest rate shock (1 pp increase) on GDP growth. Estimated on quarterly data in first differences. One step means one quarter. Shaded areas indicate 95% confidence bounds.
Source: IMF IFS, Yahoo Finance, own calculations.

[68] All equations omit time subscripts for notational convenience. That is, GDP ≡ $(\text{GDP})_t$. L stands for a lag operator. Thus, L.GDP ≡ $(\text{GDP})_{t-1}$

Figure 24 / Cumulative dynamic multiplier, VARX model of Russian economy, 1 lag and 3 lags (alternate specifications)



Note: Upper row: 1 lag; Bottom row: 3 lags. Left panels: impact of FX shock (depreciation by half) on CPI and GDP growth rate. Right panels: impact of interest rate shock (1 pp increase) on GDP growth. Estimated on quarterly data in first differences. One step means one quarter. Shaded areas indicate 95% confidence bounds.
Source: IMF IFS, Yahoo Finance, own calculations.

Model specification, German economy[69]

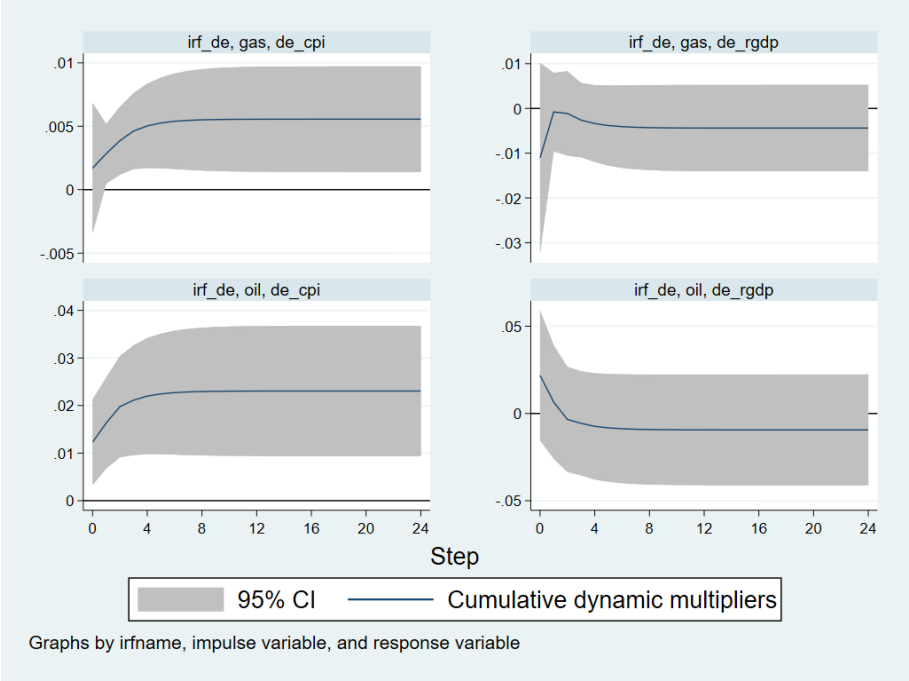
$$\begin{cases} \text{GDP} = \alpha_{11} L.\text{GDP} + \alpha_{12} L2.\text{GDP} + \beta_{11} L.\text{CPI} + \beta_{12} L2.\text{CPI} + \sum_{i}^{n} (\gamma_{1i} x_i + \gamma_{2i} L.x_i) + \varepsilon \\ \text{CPI} = \alpha_{21} L.\text{GDP} + \alpha_{22} L2.\text{GDP} + \beta_{21} L.\text{CPI} + \beta_{22} L2.\text{CPI} + \sum_{i}^{n} (\gamma_{2i} x_i + \gamma_{2i} L.x_i) + \zeta \end{cases}$$

Such that $x_i \in \{\text{Domestic key rate, FX rate, Oil price, Dutch TTF price, US GDP, US Key rate, time trend}\}$.

Note that compared to the model of the Russian economy, this model excludes US CPI from the equation: its inclusion produces high standard errors and an implausibly high impact of an oil price increase on the real economy, especially with 3 lags included.

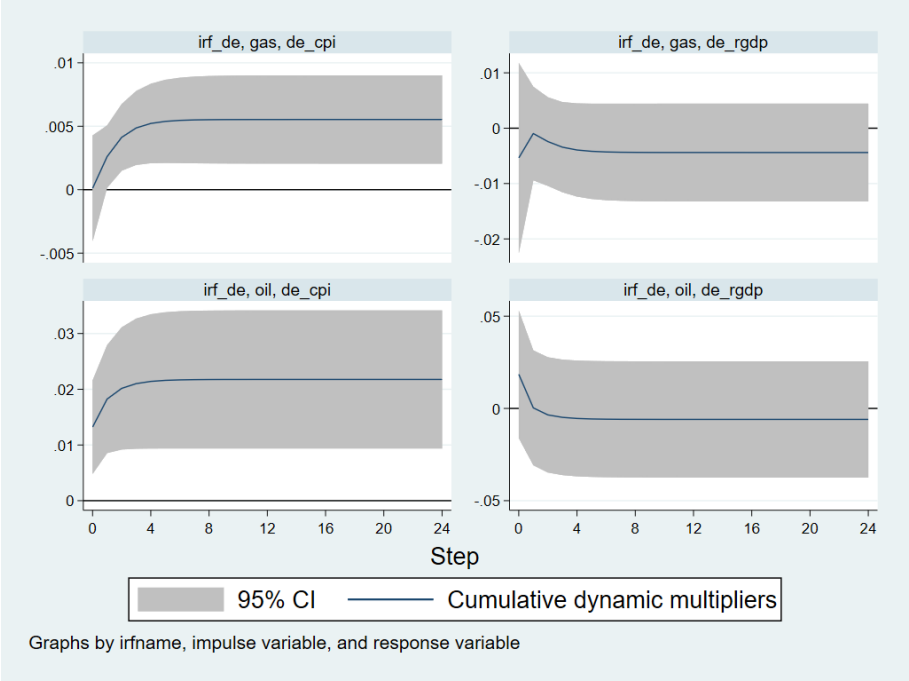
[69] All equations omit time subscripts for notational convenience. That is, GDP ≡ $(\text{GDP})_t$. L stands for a lag operator. Thus, L.GDP ≡ $(\text{GDP})_{t-1}$

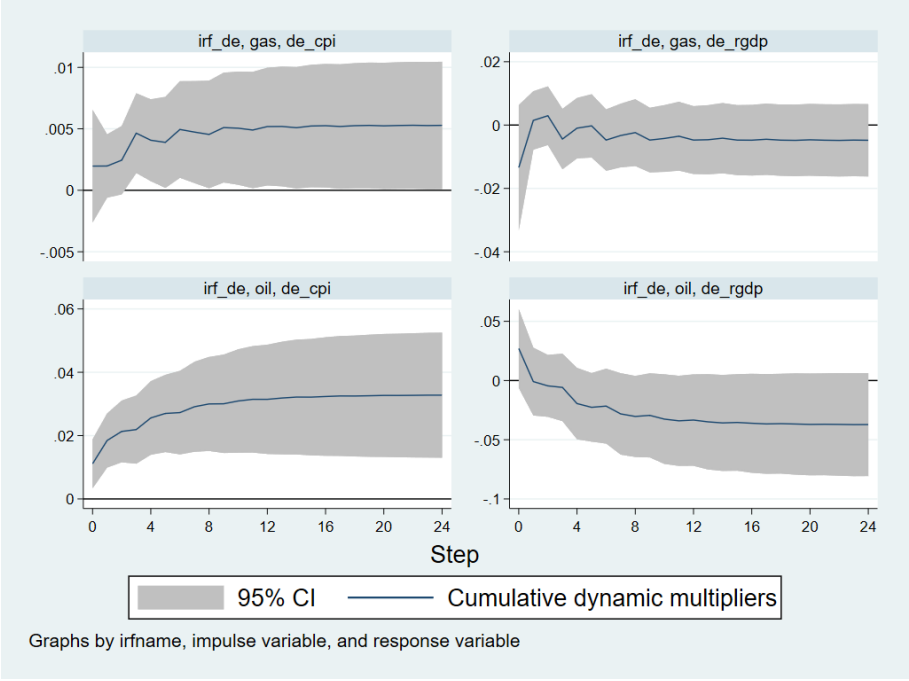
Figure 25 / Cumulative dynamic multiplier, VARX model of German economy, 2 lags (baseline result)



Note: Upper row: impact of gas price increase of 100%; Bottom row: impact of oil price increase of 100%; Left panel: impact on CPI; Right panel: impact on GDP growth. Estimated on quarterly data in first differences. One step means one quarter. Shaded areas indicate 95% confidence bounds.
Source: IMF IFS, Yahoo Finance, own calculations.

Figure 26 / Cumulative dynamic multiplier, VARX model of German economy, 1 lag and 3 lags (alternate specifications)





Note: Upper panel: 1 lag; Bottom panel: 3 lags. Upper row of each panel: impact of gas price increase of 100%; Bottom row of each panel: impact of oil price increase of 100%; Left column of each panel: impact on CPI; Right column of each panel: impact on GDP growth. Estimated on quarterly data in first differences. One step means one quarter. Shaded areas indicate 95% confidence bounds.
Source: IMF IFS, Yahoo Finance, own calculations.

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