UNIVERSITY OF WUPPERTAL
BERGISCHE UNIVERSITÄT WUPPERTAL

EUROPÄISCHE WIRTSCHAFT UND
INTERNATIONALE MAKROÖKONOMIK

Paul J.J. Welfens

Russia's Attack on Ukraine: Economic Challenges, Embargo Issues & a New World Order

EIIW Diskussionsbeitrag 312
EIIW Discussion Paper 312

Europäische Wirtschaft und Internationale Wirtschaftsbeziehungen
European Economy and International Economic Relations

ISSN 1430-5445
EIIW Discussion Papers are registered with RePEc-Econ Papers and in ECONIS

Paul J.J. Welfens

Russia's Attack on Ukraine: Economic Challenges, Embargo Issues & a New World Order

April 27th 2022

Herausgeber/Editor: Prof. Dr. Paul J.J. Welfens, Jean Monnet Chair in European Economic Integration

EUROPÄISCHES INSTITUT FÜR INTERNATIONALE WIRTSCHAFTSBEZIEHUNGEN (EIIW)/
EUROPEAN INSTITUTE FOR INTERNATIONAL ECONOMIC RELATIONS
Bergische Universität Wuppertal, Campus Freudenberg, Rainer-Gruenter-Straße 21,
D-42119 Wuppertal, Germany
Tel.: (0)202 – 439 13 71
Fax: (0)202 – 439 13 77
E-mail: welfens@eiiw.uni-wuppertal.de
www.eiiw.eu

JEL classification: F50, F51, N44, Q48
Key words: Ukraine war, Russia sanctions, economic effects of the war in Ukraine, US, EU, international economic order, aid for Ukraine

Summary:

The launch of Russia's war of aggression against Ukraine on February 24th, 2022, has resulted in great suffering for the people of Ukraine and has created turning point in Europe. Western countries and Japan have imposed very comprehensive sanctions against Russia, the aggressor. The country is largely politically isolated on the international stage, but seemingly has China - still - on its side. Large movements of refugees are to be expected, along with sharp price increases for gas and - somewhat less so - for oil, but also for wheat, with Russia and Ukraine being important exporter countries of that commodity representing together a combined 28% share of the world market. Some economists have suggested Germany impose an energy import boycott against Russia. A realistic analysis, however, arrives at significantly higher losses in real income than the 0.5% to 3% found, for example, by Bachmann et al. (2022), although additional retaliatory measures (e.g., tariff increases) by Russia and other effects must indeed also be considered: -6% in terms of real income and increased unemployment rates are conceivable as an overall effect in Germany; and there will be negative Russian spillover effects to central Asian countries which also have not been considered in the Bachman et al approach. On March 23rd, President Putin declared that Russia's energy exports to "unfriendly countries" would have to be paid for in Rubles in the future, which is a clear strategic move in terms of the international economic conflict between the West and Russia. The latter could itself impose an energy supply boycott on Germany and also other EU countries. Additional supplies from, say, the US - in the form of liquefied natural gas (LNG) - would be limited in relation to the redistribution of supplies within the EU, as the pipeline network is still poorly integrated. Poland, Bulgaria, Austria, Germany and Italy are likely to face particular problems with natural gas supplies in the event of an energy import boycott. As of May 24th, 2022, US citizens will not be allowed to accept interest payments from either private Russian companies or the Russian state; this measure is peculiar and hardly compatible with the idea of a constitutional state, since even companies from Russia that are not actually in danger of bankruptcy will be artificially pushed toward bankruptcy – with the US switching to preventing Dollar bond payments to April 6th (due to the Russian massacre in Bucha, Ukraine), the first Russian bond interest payment missed concerned Russian Railways on April 11th. The very high current and expected numbers of refugees will have positive demand effects in certain countries in 2022 and positive supply effects in overall economic production thereafter. The global economy will be marked by a new economic slowdown and higher inflation rates in 2022/23; it could face a breakup into regional "blocs" and a reduced effectiveness of international economic organizations in the event of international economic conflicts. The weakening of the international legal order should be countered by OECD countries. The figures presented by the Kiel Institute for the World Economy for combined humanitarian, financial and military support to Ukraine are grossly misleading; if one takes into account the important spending on refugees from Ukraine and the corresponding (implied) pledges by OECD countries, EU spending in favour of the Ukrainian people is significantly higher than that of the US, and Germany's spending is also significantly higher than shown in the Kiel study. A new and lasting order for peace in Europe is urgently required. An EU eastern enlargement to include Ukraine will bring about new BREXIT-type risks and could destabilize the EU considerably.

Zusammenfassung:

Mit dem Beginn des Angriffskrieges Russlands gegen die Ukraine am 24. Februar 2022 ergibt sich in Europa eine Zeitenwende und großes Leid für die Menschen in der Ukraine. Gegen den Angreifer Russland haben die westlichen Länder und Japan sehr umfassende Sanktionen verhängt. Das Land ist politisch international weitgehend isoliert, hat allerdings China offenbar – noch – an seiner Seite. Große Flüchtlingsbewegungen sind zu erwarten, zugleich starke Preisanstiege bei Gas und – etwas weniger – bei Öl, zudem auch bei Weizen, wobei Russland plus die Ukraine mit 28% Weltmarktanteil wichtige Exporteure sind. Von Seiten einiger Ökonomen ist ein deutscher Energieimportboykott gegenüber Russland vorgeschlagen worden. Eine realistische Analyse käme allerdings bei den Effekten auf deutlich höhere Einbußen beim Realeinkommen als die beispielsweise von Bachmann et al. (2022) genannten 0,5% bis 3%, wobei in der Tat zusätzlich Vergeltungsmaßnahmen (z.B. Zollerhöhungen) Russlands und weitere Effekte zu beachten sind: -6% beim Realeinkommen und erhöhte Arbeitslosenquoten sind als Gesamteffekt in Deutschland denkbar. Am 23. März erklärte Präsident Putin, dass Russlands Energieexporte an „unfreundliche Länder" künftig in Rubel zu bezahlen sind, was ein Schachzug ist im internationalen Wirtschaftskonflikt Westen gegen Russland. Letzteres könnte einen Energie-Lieferboykott gegenüber Deutschland und auch andere EU-Länder verhängen. Zusätzliche Lieferungen etwa aus den USA – in Form von Flüssiggas – wird man nur begrenzt innerhalb der EU umverteilen können, da das Pipelinenetz noch wenig integriert ist. Polen, Bulgarien, Österreich, Deutschland und Italien dürften bei der Erdgasversorgung bei einem Energieimport-Boykott vor besonderen Problemen stehen. Ab 24. Mai 2022 werden US-Bürger keine Zinszahlungen von Seiten russischer Unternehmen und des russischen Staates annehmen dürfen; diese Maßnahme ist sonderbar und kaum mit der Idee eines Rechtsstaates vereinbar, da auch eigentlich nicht konkursgefährdete Unternehmen aus Russland künstlich Richtung Konkurs gedrückt werden. Die sehr hohen aktuellen und erwarteten Flüchtlingszahlen haben in den Ländern positive Nachfrageeffekte in 2022 und danach auch positive Angebotseffekte bei der gesamtwirtschaftlichen Produktion. Die Weltwirtschaft wird von einem neuen Konjunkturdämpfer und höheren Inflationsraten in 2022/23 geprägt; sie könnte vor einem Zerfall in regionale Blöcke und einer bei internationalen Wirtschaftskonflikten verminderten Wirkkraft der Internationalen Wirtschaftsorganisationen stehen. Der Schwächung der internationalen Rechtsordnung sollte man seitens der OECD-Länder entgegenwirken. Die vom Kieler Institut für Weltwirtschaft vorgelegten Zahlen für die kombinierte Unterstützung in den Bereichen humanitäre, finanzielle und militärische Unterstützung für die Ukraine sind grob irreführend; wenn man die wichtigen Ausgaben für Flüchtlinge aus der Ukraine und die entsprechenden (implizierten) Zusagen von OECD-Ländern mit berücksichtigt, so sind die EU-Ausgaben zugunsten des ukrainischen Volkes deutlich höher als die der USA, und auch die Ausgaben Deutschlands sind deutlich höher, als in der Kieler Studie ausgewiesen wird. Eine neue und dauerhafte Friedensordnung in Europa ist dringend erforderlich. Im Fall einer EU-Osterweiterung um die Ukraine drohen neue BREXIT-Fälle. Eine EU-Osterweiterung um die Ukraine wird neue BREXIT-Risiken mit sich bringen und könnte die EU erheblich destabilisieren.

Acknowledgments: For excellent research assistance, I am very grateful to Julia Bahlmann, EDavid Hanrahan, as well as Kaan Celebi (EIIW). I am also grateful for discussions with Werner Roeger. The usual caveat applies.

Prof. Dr. Paul J.J. Welfens, *Jean Monnet Professor for European Economic Integration; Chair for Macroeconomics; President of the European Institute for International Economic Relations at the University of Wuppertal, (EIIW), Rainer-Gruenter-Str. 21, D-42119 Wuppertal; +49 202 4391371), Alfred Grosser Professorship 2007/08, Sciences Po, Paris; Research Fellow, IZA, Bonn; Non-Resident Senior Fellow at AICGS/Johns Hopkins University, Washington DC.*

welfens@eiiw.uni-wuppertal.de, *www.eiiw.eu*

EIIW 2020 = 25 years of award-winning research (REPeC listed papers)

Russia's Attack on Ukraine: Economic Challenges, Embargo Issues & a New World Order

EIIW Diskussionsbeitrag 312
EIIW Discussion Paper 312

Table of Contents

List of Figures

Figures in the Appendix:

List of Tables

Tables in the Appendix:

1. Introduction – Russo-Ukrainian War

Russia's attack on Ukraine, which was launched on February 24th, 2022, ends the post-war order in Europe through an act aggression for which Russian President Vladimir Putin is ultimately responsible. This crisis marks the end of a phase of covert alienation dynamics between Russia and the West, to which President Putin had already drawn attention in 2007 in a speech at the Munich Security Conference under the chairmanship of Horst Teltschik which was widely considered both alienating and uncooperative in the West. Putin had classified NATO's eastward expansion as a threat to Russia and stressed that Russia would not accept a unipolar world. For his part, US Senator John McCain at the same conference warned that Russia was moving toward an authoritarian system. Fifteen years after that Munich Security Conference, Russia has realized a military invasion of Ukraine from several sides, with Belarus being the staging post for part of the deployment of Russian military forces. Wolfgang Ischinger, long-time head of the Munich Security Conference, said in a German TV interview in late March that he would have classified Putin's 2007 speech as being down to Russia's president simply having had a bad day. This level of misjudgment gives pause for thought.

The West's expectation that international borders in Europe, in place since the collapse of the Soviet Union, would no longer be changed by military force had already proved too optimistic in 2014, when Russia occupied Crimea and sought to annex it to the territory of the Russian Federation following a referendum in favor of such an annexation. The question of the continuation of a Russian lease agreement for Ukrainian Crimean ports on the Black Sea had thus been settled from Russia's point of view. The Budapest Memorandum, adopted in 1994 by the United States, the United Kingdom, Russia and Ukraine - according to which Ukraine would hand over Soviet nuclear weapons stationed on its territory to Russia, while the other countries would guarantee its territorial integrity, i.e. ultimately the existing Ukrainian borders - also proved to be unenforceable.

In the winter of 2013/14, major political unrest erupted in Kyiv when President Yanukovych - relatively Russia-friendly - refused to sign the finalized trade agreement (Association Agreement) with the EU. Large protests erupted in Kyiv's Maidan Square, with the president using force against the demonstrators. Yanukovych then had to flee to Russia, and a more pro-Western government subsequently came to power, which President Putin saw as a political defeat and challenge. Putin probably believed that Russia, Belarus, and Ukraine continued to represent a historical, natural community of states. This view may have been shared by the population in parts of eastern Ukraine, but apparently not in the other regions of Ukraine. Putin's response to the change in the balance of power in Kyiv was the occupation and annexation of Crimea in 2014, and presumably Russia's government gradually moved toward plans for an occupation of Ukraine in subsequent years. With Ukraine, as with other ex-Soviet republics, Russia can exploit political connections to Russian minorities, whose targeted settlement often took place in Soviet times, so that Moscow would have a solid reason to intervene politically in the republics of the former Soviet Union if necessary. With the collapse of the Soviet Union in 1991, this Soviet legacy remained as a potential factor of contention in the former Soviet republics (one can certainly be critical of the fact that in the Baltic states, the governments only issued "foreigners' passports" to Russians who had been living in the country for decades, which certainly made the integration of Russian residents more difficult). The US and Western countries to some extent – and not surprisingly – exploited the economic weakening of the new Russia in the serious economic crisis of 1998; it is a paradox that the IMF with its strange support for Russia's desire to fix the Rubel exchange rate in the years before the crisis in fact contributed to this crisis. One may note that the optimum currency area literature would not give any argument why Russia – with a dominant energy exporting sector – should adopt a fixed exchange rate. After Putin came to power in 1999 as the new Russian president, after Boris Yeltsin, a decade of economic consolidation started, but the rule of law

remained weak and the dominance of the oil and gas sector as major sources for Russia's government facilitated modernization approaches in the energy sector while many other sectors, including education, health and parts of manufacturing industry, witnessed only relatively modest productivity gains. Scientific co-operation of Russian universities with universities in the EU remained rather weak and there was only a limited intellectual debate between Western Europe (and groups of leading intellectuals from eastern European EU countries) and the civil society in Russia.

It is remarkable that forgotten Russian philosophers from the 19th and early 20th century instead became influential in political groups in St. Petersburg and Moscow: with Ivan Ilyin (he was born in 1883; he died 1954 in Switzerland, his final exile) as an important philosopher whose books could be published in Russian only after 1991 and who often was quoted in major speeches of President Putin. Ilyin had been a Russian nationalist who had opposed the October Revolution of 1917 and had advocated in his publications a specific Russian and Slavic nationalism, emphasis on the orthodox religion as a basis of Russian values as well as the idea that the Ukraine was part and parcel of Russia; and that the West sooner or later could push in a future post-Soviet setting for disintegration and a political divorce between Russia and the Ukraine. This ideology of Putin as well as other philosophical influences have been identified early on by Michel Eltchaninoff (2015: French version of his book on Putin, 2016: Dans la tête de Vladimir Poutine; German edition, 2017; 2nd edition 2022; English edition Inside the Mind of Vladimir Putin, 2018). It seems that not many leading Western politicians were aware of the ideological basis of Putin which includes other philosophers as well and whose political aggressiveness vis-à-vis the Ukraine was growing after 2012 – with the Ukraine considered by Putin to be a country which was politically manipulated by the United States and some of its Western political allies.

For the people of Ukraine, the war unleashed in 2022 by Russia is indeed a disaster. The US and EU have little ability to directly oppose Russia's aggression, and EU countries are poorly positioned in terms of energy security. This is especially true for Germany, which buys nearly 60% of its natural gas from Russia, along with 50% of its coal, and which had not even begun to build any liquefied natural gas (LNG) offloading terminals that could provide flexibility in the international sourcing of natural gas by 2022.

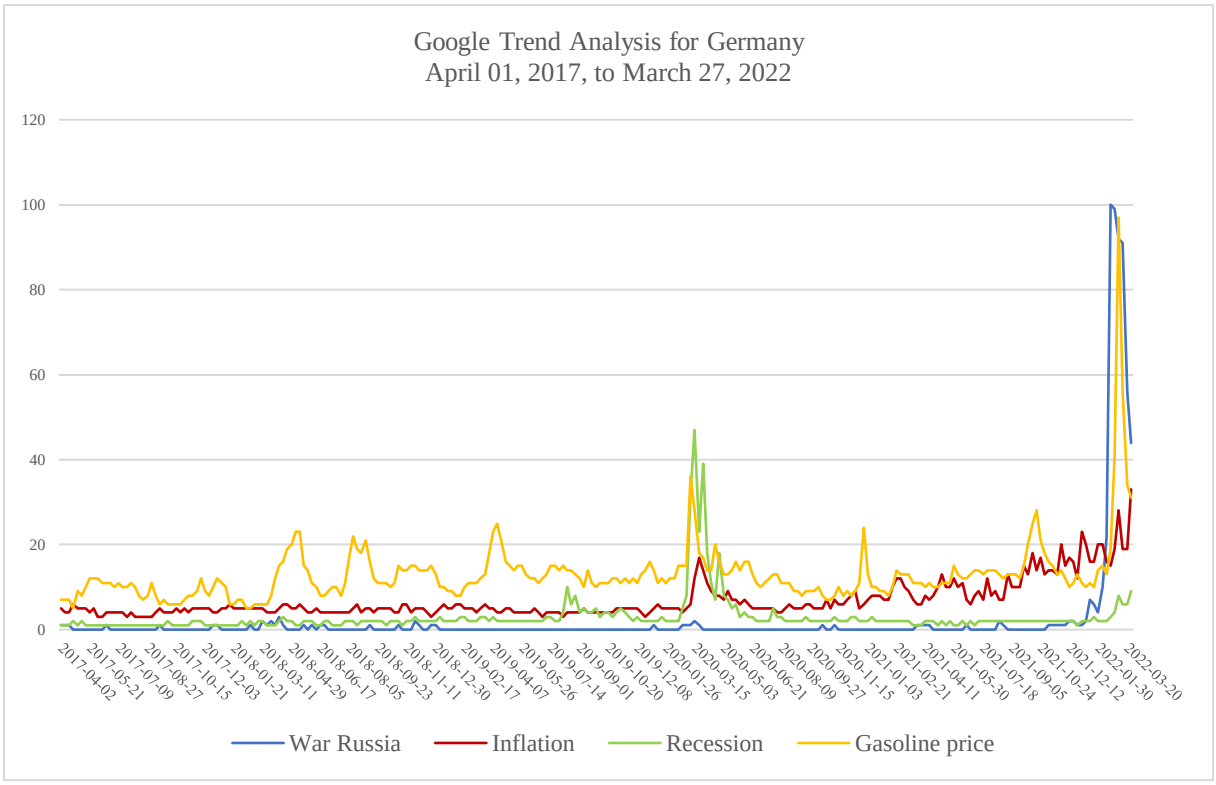
The German government's decision at the end of February - announced in Chancellor Scholz's speech to the Bundestag on February 27th, 2022 - to build two such stations is a step in the right direction. In this speech, Scholz also emphasized for the first time the achievement and even surpassing of the 2% target for defense spending; for 2022, this would amount to around €30 billion in additional spending on the defense budget of €47 billion, which would represent an enormous and hardly efficiently realizable sudden increase in the budget item.

In addition, Chancellor Scholz had also announced defensive arms deliveries to Ukraine - a departure from the long-standing principle of not supplying arms to warzones. This change was attributed to Russia's massive violation of international law with its war of aggression on Ukraine, and because Ukraine was in a defensive situation. Russia's president justified the war by pointing out that he wanted to protect the Russians living in Ukraine from genocide, to "denazify" the government in Kyiv and to prevent NATO from expanding eastward into Ukraine. Moreover, in a publication in 2021, Putin had invoked a historical connection between Russia and Ukraine and even denied Ukrainian statehood (on the history of Ukraine and Russia, see Kappeler, 2022).

As regards the short-term international economic effects of the Ukraine-Russia war, the IMF (2022b) has presented revised forecasts in the spring World Economic Outlook of April 2022: according to the IMF simulations, the growth rates of real output in the Eurozone have declined considerably for 2022 and 2023; e.g., to 2.8%in 2022 and 2.3% in 2023. This then is the baseline which has to be considered for the case of a potential EU energy import embargo vis-à-vis Russia.

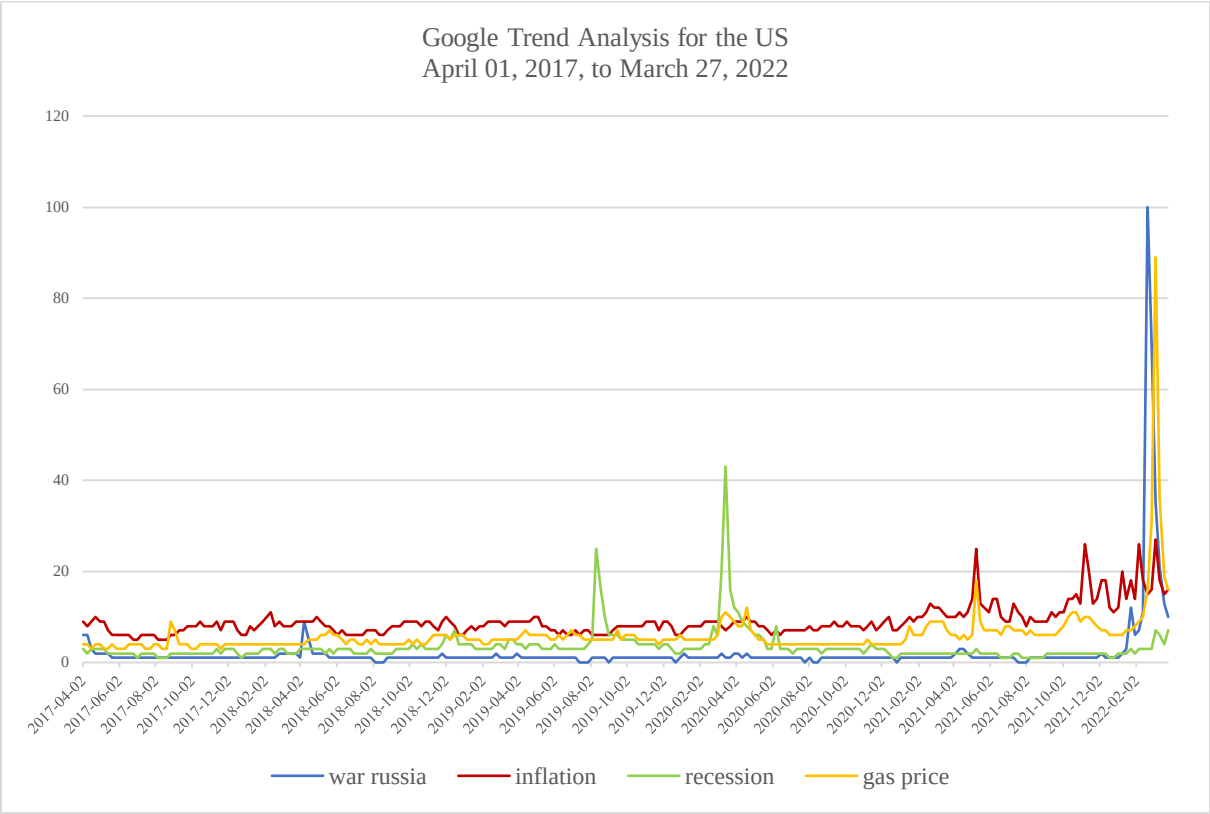
Looking at the frequency of Google searches in the US and Germany for the words war, Russia, inflation, recession, and gasoline price from April 1st, 2017, to early April 2022, it appears that the public in Germany (Fig. 1) quickly became more concerned about the Ukraine-Russia war in March 2022 than Internet users in the US (Fig. 2). At the same time, one can see that no major recessionary fears had yet arisen in either the US or Germany by the end of March; however, more frequent concerns about inflation was apparent in both countries. Search queries about the price of gasoline developed in parallel with concerns about the war itself. With regard to Russia, public interest rose in both countries - one can say in the US and in the Eurozone/Germany. Inflation concerns in the United States were more pronounced in 2021 than in Germany, if you look at the corresponding Google trend development in the two countries.

Fig. 1: Google Trend Analysis for Germany: "War Russia", "Inflation", "Recession", "Gasoline price".



Note: Weekly data are in whole numbers; lowest value "<1".
Source: Own presentation; data from Google Trends (https://www.google.com/trends).

Fig. 2: Google Trend Analysis for the US: "War Russia", "Inflation", "Recession", "Gasoline price".



Note: Weekly data are in whole numbers; lowest value "<1".
Source: Own presentation; data from Google Trends (https://www.google.com/trends).

Insofar as the relative price of gasoline influences demand for cars or car production, a negative impulse can be expected in March 2022 for the automobile industry, which is economically important to Germany and some other EU countries; this, in turn, is likely to dampen the economic upswing in Germany and the Eurozone. Since more gasoline-efficient cars will be in greater demand as gasoline prices rise, the German and EU auto industry can expect advantages in the export business – notably to US sales markets, where relatively large and, in some cases, particularly gasoline-thirsty vehicles are still driven. However, in the US - and the EU - leading electric car producers may have a competitive advantage in a situation with rising relative prices of gasoline and diesel. With Russia's war of aggression against Ukraine, economic developments will become gloomier in the medium term, especially in EU countries.

The sanctions imposed by the West against Russia in March 2022 go far beyond the economic sanctions and measures realized in 2014 in the context of Russia's annexation of Crimea - at that time, Russia had taken visible countermeasure against the EU with import restrictions on agricultural products. Western industrialized countries from the OECD region have varying degrees of dependence on Russia's economy as an export destination when looking at value-added exports to Russia as a share of national income or as a percentage of value-added in 2018: For the majority of European industrialized countries, it was about 1% to 3% of value-added (OECD, 2022), with Germany - a relatively large EU country - recording just under 1%. At first glance, therefore, there is no critically high export dependence on Russia from the perspective of most OECD countries.

However, it is not only from a German perspective that the Russia-Ukraine war poses expropriation risks in Russia and new loss risks for production in Eastern European EU countries. For example, there are steel companies operating plants in Poland and other EU

accession countries from Eastern Europe which source inputs from Russia or Ukraine. The war between the two countries could thus cause major disruptions to supply chains affecting Eastern European EU countries or even Western industrialized countries in some sectors.

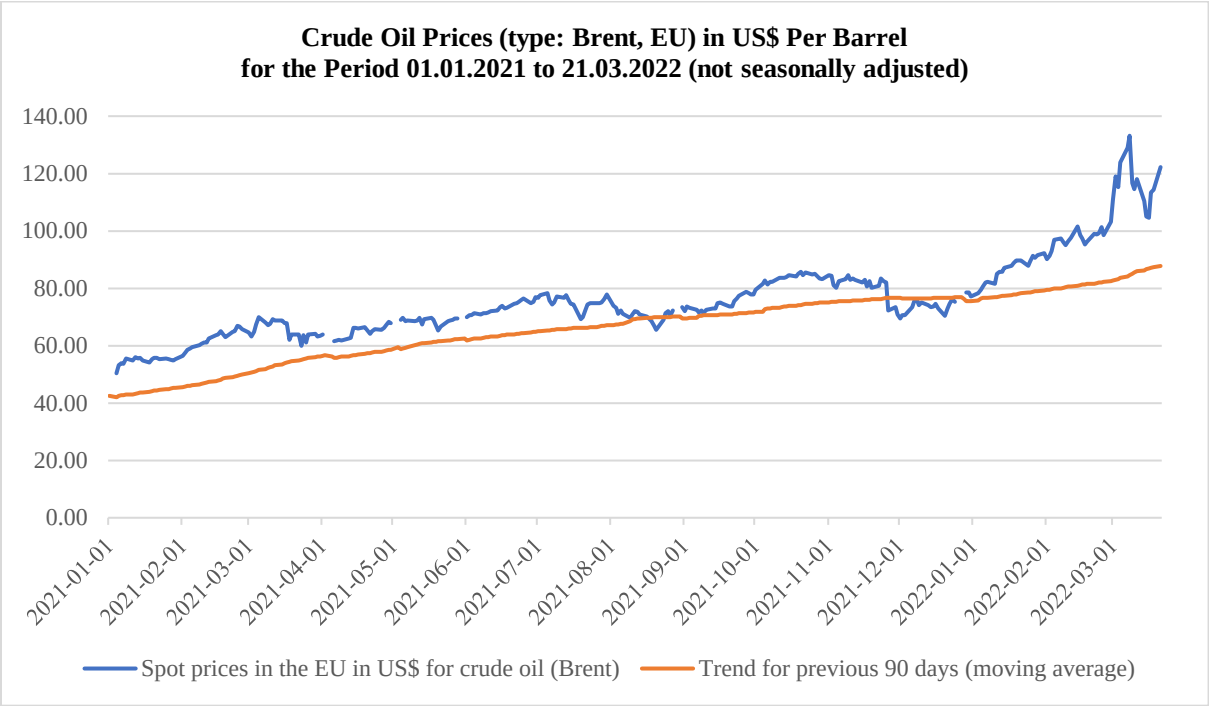
Commodity Exports from Russia and the Ukraine

In the context of the Russia-Ukraine war, strong attention has to be paid to the export side of both Russia and Ukraine, as in some fields, high magnitudes or significant global market shares in commodities can be observed: Critical in many cases in the short term if one thinks of supply disruptions or conceivable Russian steps towards a selective export boycott against Western countries, Japan, Australia and some others. For example, Russia and Ukraine represent a global market share of about 30% for wheat, 20% for corn, fertilizer and natural gas, and 11% for oil. Russia is also a major exporter of palladium (needed for exhaust catalysts in cars) and nickel, which is often used in steel production. Russia and Ukraine are both major suppliers of argon and neon - necessary in chip production - and titanium, which is used in aircraft construction, amongst other things. In addition, both countries are characterized by large (by international standards) uranium deposits. Since the start of the war in Ukraine on February 24th, 2022, the prices of the aforementioned products have risen considerably; in the case of crude oil, however, after a steep rise before mid-March, prices have fallen again slightly (this is shown by data from Refinitiv and the OECD, 2022). In 2022, the oil price could fluctuate around the $100 per barrel mark (Fig. 3).

In the event of a gas embargo on Russian natural gas, however, the oil price could rise even further. Considerable energy price and food price increases have already occurred in the run-up to the Russia-Ukraine war during 2021, but this war is providing further inflationary impetus in the Western industrialized countries. With inflation rates above 5% recorded in many Eurozone countries in March 2022, there is a threat of sharper disputes in wage negotiations in the medium term: Increased wage cost pressures could bring a return to economies of the kind of problems experienced in the 1970s in Western industrialized countries and in Japan in the context of the two OPEC oil price shocks.

As for the collapse in output in the event of a German energy import boycott - or a supply embargo on energy exports against Germany - the expected drop in income is higher than in the case of the OPEC price shocks in the 1970s. At that time, there were recessions with a decline in real national income (and GDP) of just over 2%. Energy price shocks in the context of the Russia-Ukraine war, however, have a smaller economic drag than in the 1970s, since the energy intensity of production in OECD countries in 2020 is less than half that seen in the 1970s. Income fluctuations in the 1970s are shown in Annex 1.

Fig. 3: Development of Crude Oil Prices on a Daily Basis, 01.01.2021 to 21.03.2022



Source: Own presentation and calculations; data from Federal Reserve Economic Data (as of 2022).

On March 23rd, 2022, President Putin declared that Russia's energy exports to what he termed "unfriendly countries" must in the future be paid for in Russian Rubles, which is a strategic move in the international economic conflict between the West, Japan, Australia and others against Russia. If Russia enforces invoicing in Rubles, part of the sanctions against Russia and its central bank will be undermined. Since Russia's supply contracts usually specify Euros and US Dollars as the currency of payment, Western countries plus Japan and the G7, respectively, have rejected a move to Ruble-denominated payments. Russia then declared in late March that it would implement a gas supply boycott if payment for gas supplies was not made in Rubles. The outcome of this conflict over the invoicing of Russian supplies is likely to be decided only after a few months; if Russia wanted to suddenly stop its gas exports to EU countries, this will cause a loss of revenue and also considerable reorganization efforts in the Russian gas production and transport sectors as well as at Russian power plants.

A look at the following table (Table 1) shows that many countries face considerable dependency pressures with regard to fossil energy supplies from Russia. Table 1 shows particular dependencies on the part of Lithuania, Hungary, Slovakia and the Netherlands, where more than 60% of fossil energy comes from Russia. Among the major EU countries, Germany and Italy are relatively dependent: with Russia shares of around 28% in 2019. With a Russian share of just 1.2%, the US has been virtually independent of supplies from Russia for fossil energy, facilitating the US oil, gas, and coal import boycott against Russia in mid-March; the United Kingdom, with a share of 8.7%, has also announced a UK energy import embargo for the end of 2022 at the same time. The overall significant dependency differences evident from country to country on a case-by-case basis are unlikely to facilitate a unified Western front for action in the area of energy trade disputes with Russia.

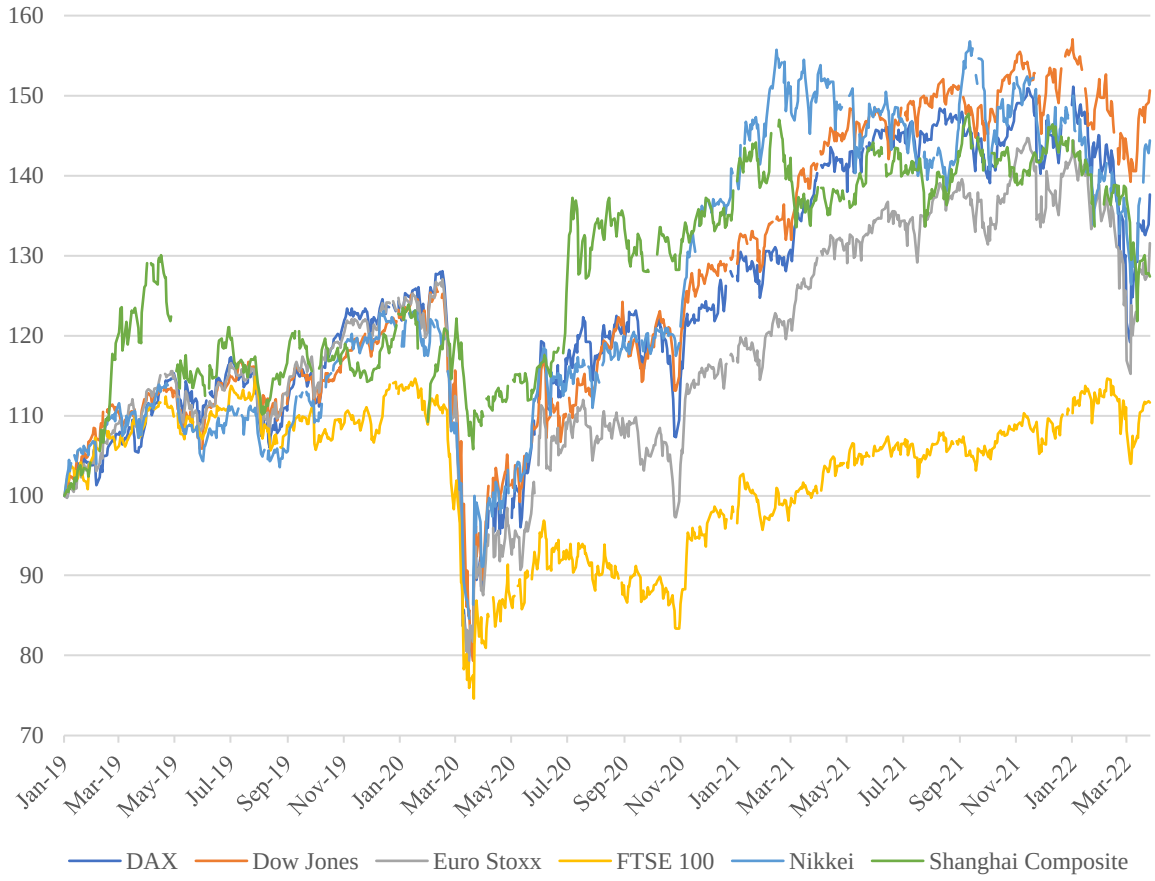
Tab. 1: Share of Fossil Energy Imports from Russia in Domestic Energy Consumption of Selected Countries, 2019

	Country	Dependence on imported fossil energy from Russia
1	Lithuania	121.2%
2	Hungary	76.3%
3	Slovakia	68.5%
4	Netherlands	65.6%
5	Finland	50.4%
6	Bulgaria	40.4%
7	Greece	37.5%
8	Poland	36.7%
9	Latvia	35.5%
10	Belgium	30.5%
11	Germany	28.9%
12	Italy	28.1%
22	France	9.7%
25	United Kingdom	8.7%
26	Spain	7.2%
27	Japan	7.1%
34	US	1.2%

Note: The indicator is composed of the sum of Russian imports of coal, oil and natural gas in relation to domestic energy consumption. The figure can be greater than 100% if more was imported than consumed (transit transactions, if applicable). Since not all figures from 2020 are available, 2019 was chosen as the starting point for the purpose of completeness.
Source: International Energy Agency (IEA), online: https://www.iea.org/reports/reliance-on-russian-fossil-fuels-data-explorer (last accessed March 30th, 2022).

Financial markets - here the share prices of important countries - have reacted to the Russia-Ukraine war. Even before the outbreak of war in 2022, share price developments in the UK were already relatively weak (due to BREXIT). However, in March 2022, the Euro Stoxx index declined significantly and approached the weaker UK short performance. Interestingly, China's leading stock index also recorded a significant decline in the initial months of the Russia-Ukraine conflict (Fig. 4).

Fig. 4: Selected Share Price Developments, 2019-2022 (daily values): Germany, US, Eurozone, UK, Japan, China



Note: This chart shows the performance of the world's major stock indices from January 04, 2019 to March 29, 2022 (1/4/2019=100).
Source: Own calculations; data from investing.com, onvista.de.

On March 30th, 2022, Germany's Council of Economic Experts published an updated economic forecast (SVR, 2022): With expected values for real economic growth in 2022 and 2023 that were significantly lower than the values forecasted in the annual report of Fall 2021; the revision of the growth rate for 2022 is minus 2.8 percentage points, and the growth rate is expected to be just below 2%. The Council of Economic Experts does not assume that there will be an energy import boycott against Russia or a Russian energy export embargo. In such a case, the downward revisions to the growth forecast values for Germany and the Eurozone would be significantly higher than the revision to the forecast values for gross domestic product shown in the chart compared with the forecast values of Fall 2021. The expected international trade disruptions due to the Russia-Ukraine war are only partially included in the Council of Economic Experts' analysis.
The following analysis first addresses the turn-of-the-century perspective in the Russia-Ukraine war context, with cyber-attacks being a relatively new aspect of the conflict; in addition, bilateral perspectives on German-Russia trade and multilateral perspectives are examined. This is followed by a look at fundamental energy issues for Europe and the West, followed by the question of the extent to which a German energy import boycott against Russia - or an EU embargo - makes sense or what effects can be expected here. Then the focus is directed to the possibility of a Russian supply boycott. This is followed by an analysis of Asia and of the global

effects of an EU energy boycott against Russia, as well as a broader analysis of EU-China-Russia perspectives. Finally, refugee and immigration issues are addressed, as well as selected scenario aspects and perspectives for a new global economic order. Overall, the Russia-Ukraine war leads to global position shifts in the longer term; the decline in German real income is incidentally estimated at around -6% in the case of an energy import boycott against Russia, which is higher in percentage terms than the decline in real GDP in Russia as a result of the boycott (a sanction in which one harms oneself more than the addressee of the sanction should be carefully reconsidered).

2. Turning Point in the Russian-Ukrainian War

The following analysis first addresses the 'turning point' perspective in the Russia-Ukraine context, with cyberwar in particular being a relatively new aspect of the current conflict; in addition, bilateral perspectives on German-Russian trade and multilateral perspectives are examined. This is followed by a look at fundamental energy issues for Europe and the West, and by the question of the extent to which a German energy import boycott against Russia - or an EU embargo - makes sense or what effects could be expected here. The focus is subsequently directed to the possibility of a Russian supply boycott. This is followed by an analysis of Asia and of the global effects of an EU energy boycott against Russia, as well as a broader analysis of EU-China-Russia. Finally, refugee and immigration issues are addressed, as well as selected scenario aspects and perspectives for a new global economic order. Overall, the Russia-Ukraine war leads to global position shifts in the longer term; the decline in German real income is incidentally estimated at around -6% in the case of an energy import boycott against Russia, which is higher in percentage terms than the decline in real GDP in Russia as a result of the boycott (a sanction in which one harms oneself more than the intended target of the sanction measures should be carefully reconsidered).

For three decades, most EU countries and the United States assumed that military force would no longer be used to change international borders in Europe, that war was not a means of implementing policy, and that economic and political relations with Russia would develop well in the long term (apart from certain periods of political disruption over time). With the war in Ukraine in 2022, this view has proved unrealistic, and the peace dividend realized by many OECD countries since the end of the Cold War in 1991 in the form of low defense spending relative to national income - often less than 1.5% - is no longer tenable. It appears that most NATO countries, as well as neutral European countries (such as Finland, Sweden, Austria and - de facto - Ireland), will see a significant increase in defense spending after 2021, as conventional military deterrence is now prominent on the political agenda.

The Russia-Ukraine war marked a European and international turning point, and within a few short weeks the West - plus Japan and Australia and others - discussed and, in some cases, quickly decided on a number of common approaches in important policy issues. These included coordinated economic sanctions measures against Russia. However, some issues remain open on the policy agenda for the time being, and this also applies to economic policy countermeasures against economic dampening and inflation boosting impulses in the context of the current war (for example, whether US and ECB monetary policy will opt for further interest rate hikes in quick succession has been considered doubtful since the war began, despite increased inflationary pressures). The quickly decided upon questions in the West concerned:

- An increase in defense spending and the redeployment of NATO troops to Eastern European NATO member countries.
- Decisions on economic sanctions against Russia.
- Policy steps to strengthen the political unity of the West.
- First steps to reduce energy imports from Russia; questions of a short-term total energy import boycott against Russia were discussed in this context as late as March 2022 with regard to Germany and the EU (the boycott study of Bachmann et al. (2022) played a role).
- Policy measures for the reception of Ukrainian refugees.
- Humanitarian aid for Ukraine.
- In the case of some countries, also military indirect support - mainly defensive weapons deliveries and the sharing of military intelligence findings - to Ukraine.

The Russia-Ukraine war, however, raises anew a whole series of further, globally-relevant questions - many also with a crucial economic focus - in a broader view. Precise information on the relevant military, economic and political issues is required, but at times such information

was dangerously scarce. Clear information in the media is obviously important in the context of on-going international crises. Nonetheless, there were a number of significant misinformation stories on German television in March 2022: Anne Gellinek, ZDF's Brussels bureau chief, repeatedly confused millions and billions and wrongly magnified the European Union's aid to Ukraine by a factor of 1,000 with her false billion-dollar claims about concerning military aid. On March 26th, 2020, the ARD broadcast a commercial for the next evening's Anne Will current affairs program - featuring Chancellor Olaf Scholz - and also addressed Germany's military aid, showing the unloading of a tank from an aircraft as a background clip. However, Germany's government had explicitly stated that it would not supply tanks to Ukraine. Such misinformation from public television sources is unacceptable and risks being shown in translation to viewers on Russian television stations: As evidence of egregious interference by Germany or the West in the Russia-Ukraine war. In Germany at least, public television, with its special obligation to inform viewers, is apparently occasionally plagued by serious quality issues in its reporting.

Within weeks of the Russian invasion of Ukraine, the question of an energy import boycott against Russia arose in the West, a question which was then positively decided on the US side in mid-March with a view to the United States. However, American energy imports from Russia are much lower compared to those of Germany and the EU. In fact, for the United States, the move away from Russia as an energy supplier quickly led to other significant changes in US foreign policy. The Biden Administration established contacts with Venezuela, which had previously been economically sanctioned for many years – due to its own statist, authoritarian government - for the purpose of encouraging an increase in oil production and Venezuelan oil exports to the US, and a broader new beginning was also attempted with the old adversary Iran. In March 2022, the Biden Administration attempted to initiate a thaw in relations with Iran - a producer of oil and natural gas - and recommitted to reaching a new multilateral nuclear agreement with that country, which in turn Russia apparently sought to prevent. In a series of steps, the West imposed comprehensive sanctions on Russia, primarily directed against the country's economic strength and its international economic relations. The EU and the US intensified the sanctions imposed since Russia's annexation of Crimea in 2014.

One sanction imposed by the US on Russia that is not easy to understand is that US citizens will be prohibited from accepting interest and dividend payments from Russia as of May 24th, 2022 (after the Bucha massacre in the Ukraine – committed by Russian soldiers - become known, the Biden Administration even switched the critical date to April 6th). In this way, the US is driving those Russian companies that have issued bonds internationally - including in the United States - towards an artificial insolvency; moreover, certain Russian government bonds could then no longer be serviced, which is likely to plunge Russia into bankruptcy. A massive conflict between the United States and Russia is apparently brewing here. In any case, the question arises as to whether the West can credibly present its traditional emphasis on a triad of institutional qualities, namely the combination of democracy, a market economy and the rule of law, if the US imposes sanctions of this kind against Russia. No legal assessment is presented here. However, what the Biden Administration is pursuing as a policy here seems strange, discriminatory and risky.

Germany, for its part, whose federal government suspended the commissioning of the so-called North Stream 2 natural gas pipeline at the end of February 2022 (the contract for North Stream 2 was signed by Germany in 2015, just one year after Russia's annexation of Crimea), was still stepping up its search for alternative energy trading partners in mid-March: Qatar will apparently play a significant role in the medium term, as newly-reached agreements between Qatar and Germany suggest: As a result of the Russia-Ukraine war, Economics and Climate Minister Robert Habeck saw himself faced with the task of securing new gas supplier countries in particular and significantly diversifying gas imports internationally overall. The German government wants to see three floating new LNG terminals in operation as early as 2022/23, so

that liquefied natural gas could be available to Germany in significant quantities within a year; this would require at least two floating LNG terminals to come on stream and the US to provide high levels of LNG supplies to Germany. Despite the war in Ukraine, it is probably safe to assume that Russian natural gas will continue to reach EU countries through Ukraine as a transit country in 2022.
The new long-term cooperation agreement between Germany and Qatar – a country which has been criticized by the EU for many years in terms of weak human rights - is strategically important for Germany: While Qatar's share of the world's gas reserves is estimated at 13%, Russia's share will be 19.9% in 2020 (BP, 2021). With its share of the world's natural gas reserves, Iran is almost as important as Russia (see Table 2).

Tab. 2: Top 15 Leading Countries in Natural Gas Reserves as of end-2020

	Country	Share of world natural gas reserves
1	Russia	19.88%
2	Iran	17.07%
3	Qatar	13.11%
4	Turkmenistan	7.23%
5	USA	6.71%
6	China	4.47%
7	Venezuela	3.33%
8	Saudi Arabia	3.20%
9	United Arab Emirates	3.16%
10	Nigeria	2.91%
11	Iraq	1.88%
12	Azerbaijan	1.33%
13	Australia	1.27%
14	Canada	1.25%
15	Algeria	1.21%
Total		**88.01%**

Source: Own representation; data from BP Statistical Review of World Energy July 2021 (2021).

The top five gas exporting countries (see Table 3 for 2017) were Russia, Qatar, Norway, the US, and Canada, with Russia's market share at 18%, the US standing for 8%, and Canada at 7%. In Europe, the Netherlands represents a major gas exporter with a global market share of 4.4%. However, gas production is actually expected to decline significantly from 2022.

Tab. 3: Top 15 Natural Gas Exporters (in volume), Estimated 2017

	Country	Natural gas exports (in million cubic meters), 2017	Share of world*
	World*	***1,166,342***	***100.00%***
1	Russia	210,200	18.02%
2	Qatar	126,500	10.85%
3	Norway	120,200	10.31%
4	US	89,700	7.69%
5	Canada	83,960	7.20%
6	Australia	67,960	5.83%
7	Algeria	53,880	4.62%
8	Netherlands	51,250	4.39%
9	Malaysia	38,230	3.28%
10	Turkmenistan	38,140	3.27%
11	Germany	34,610	2.97%
12	Indonesia	29,780	2.55%
13	Nigeria	27,210	2.33%
14	Trinidad and Tobago	15,490	1.33%
15	Bolivia	15,460	1.33%
Total		1,002,570	**85.96%**

Note: *World is here calculated as the sum of the 215 countries included in the dataset; 56 countries have natural gas exports greater than zero.
Source: Own calculations (IV); data from The World Factbook (CIA, 2022).

Due to the Russia-Ukraine war, the German government would like to become largely independent of Russia's gas supplies as quickly as possible. In March 2022, the Federal Minister of Economics referred to the target date of mid-2024, which can be seen as diplomatically clumsy insofar as this provides Russia's government with information important relevant for its own policy countermeasures and thus indirectly weakens the West at the international negotiating table.

Russia's invasion of Ukraine is not entirely unexpected. The author Anne Applebaum has pointed to the possibility of war between Russia and Ukraine in her Polish book *Wybór*. US intelligence agencies also apparently largely correctly assessed Russia's war plans - the Biden Administration warned even during the Winter Olympics that Russia was indeed planning an invasion of Ukraine.

Russia's attack on Ukraine may be attributed to the peculiar views of Putin, in particular the idea that Ukraine historically belonged to Russia as a 'brother' nation, a view that would have led to the expectation of a friendly reception for Russian troops in large parts of Ukraine, which, however, was out of the question in March 2022. Putin's view of Russian security interests apparently also played a role in the war against Ukraine; specifically, Russia had vehemently opposed Ukraine's NATO membership diplomatically for over two decades, serious prospects of accession to NATO had first been offered by the United States in 2008. It should be noted here that the enshrinement on the part of the Parliament of Ukraine on February 7th, 2019, of an "orientation of Ukraine towards membership in the EU and NATO" can be seen as strange.

This cannot be a justification for Russia's war against Ukraine. Yet one can only wonder who in the West at a high political level said anything critical of this unusual - and politically frivolous - constitutional clause being adopted in Ukraine at the time (apparently nobody).
Also in 2019, Ukraine's parliament passed new language legislation, with a three-year transition period until March 2022, that effectively restricted Russian as a language in the print media (Russian newspapers would have to print the same circulation in Ukrainian as in Russian, which is a quite odd and economically inefficient condition) and its use in government offices. These were less than friendly political gestures towards some eight million or so people in Ukraine who predominantly use Russian as their everyday language. This not only created new tensions in Ukraine, but also with Russia's government. The OSCE (the Organisation for Security and Co-operation in Europe) and the Council of Europe had already criticized the non-permanent language legislation introduced in Ukraine's parliament in previous years to restrict the use of Russian, amongst other languages. Even according to the EU's own standards, discrimination against a linguistic minority should be viewed critically here; one thinks, for example, of regulations on bilingual populations in South Tyrol, where Italian and German are both considered official languages in the law courts, amongst other examples.
Anchoring the NATO clause in Ukraine's constitution could probably be understood as a provocation in a one-sided view on the part of Russia's government, since a contradiction with earlier promises made by the West seems to be visible here: With the end of the Soviet Union, according to the words of the then German Foreign Minister Genscher, no expansion of NATO in Eastern Europe was planned; the then NATO Secretary General Wörner had also made similar statements in Brussels on May 19th, 1990. However, it is not unknown whether Russia sought any contractual assurances from NATO in the 1990s on the basis of Genscher's or Wörner's comments. The 1997/98 Russian economic crisis, moreover, left Russia's international position looking weak for several years. After all, NATO undertook to maintain military personnel in new Eastern European member states only for a short time - for a maximum of six months - and in limited numbers (in accordance with the NATO-Russia Founding Act).
Under Russian President Yeltsin, the successor of President Gorbachev, privatization in an "oligarch model" was born out of acute need for state financing: About three dozen families came into possession of the largest part of hitherto state-owned companies. In 1997, President Yeltsin agreed to the NATO-Russia Founding Act, according to which Russia would not oppose NATO's eastward expansion - Yeltsin had argued against NATO's eastward expansion for years - while at the same time NATO pledged not to station nuclear weapons in Eastern European NATO member states. The treaty partners wanted to recognize the territorial inviolability of countries. In addition, cooperation was to be intensified within the framework of the OSCE (Organisation for Security and Co-operation in Europe) and a new institution, the NATO-Russia Council, which was to help resolve disagreements between Russia and NATO member states. Poland, Hungary and the Czech Republic subsequently joined NATO in 1997.
Putin, an assertive Moscow official, came to power after Yeltsin's resignation and achieved large majorities in subsequent elections; however, in the context of elections which were rarely fair, as political competition was massively suppressed. Putin's economic model has seen the Russian economy fall behind that of democratic Ukraine in real growth terms after 2016 – thus, Ukraine also appears to be a political-economic challenge for Putin. It should be noted that in polls on Putin's popularity, he suffered significant losses during periods of weak economic growth; after the occupation of Crimea, which Putin hailed as an historic, integral part of Russia, the Russian president recorded particularly high approval ratings in polls.
While the government of Russia claims that the war against Ukraine is necessary because of the need to prevent genocide in the eastern Donbas region - in the context of the "civil war" in Ukraine - because chemical and biological weapons laboratories are operating in Ukraine, and because a government comprised of neo-Nazis should be deposed, the reality is apparently very

different: Even if the state TV media keeps repeating the propaganda to justify the "special military operation" in Ukraine. Contradictions were evident in Russia itself on March 14th from a protest on the 1st TV channel's main news program: There are cracks even in the state media, which are tightly controlled by the president and the government. Journalist Marina Ovsyannikova, who held up an anti-war poster behind the news anchor on that TV channel, also apologized in a video on the Internet for supporting Kremlin propaganda for years. This apparently shows that in Russia, there was no clear majority of the population in favor of the war in Ukraine. The younger generation, which frequently informs itself on the Internet, is probably largely opposed to Russia's war. Since the occupation of Crimea, Russia has recorded an annual emigration of about 300,000 citizens, and in the spring of 2022 the number of Russian emigrants has increased significantly.

In the three decades since the end of the Cold War, Europe has failed to build a stable security partnership. Russia was the eighth country to be admitted to the G7 in 1998- but was then excluded from the G8 after the annexation of Crimea. NATO's admission of numerous Eastern European states after 1991 is seen in the West as an expression of these state's sovereignty. However, as NATO moved closer to Russia, Ukraine's military status became increasingly conflictual. It was known to NATO countries that NATO membership for Ukraine was likely to be politically and militarily provocative for Russia (in 2008, the US had offered the prospect of NATO membership to Ukraine - following the Russia-Georgia war - but Germany and France had opposed it at the time). Between 2008 and 2021, NATO countries, Ukraine, and Russia failed to reach binding agreements on the Ukraine military issue; for many years, the three actors apparently did not sufficiently push this issue diplomatically. Beyond military issues, there are also important economic and political aspects to developments in Ukraine and Russia; and to Russia's war of aggression against Ukraine.

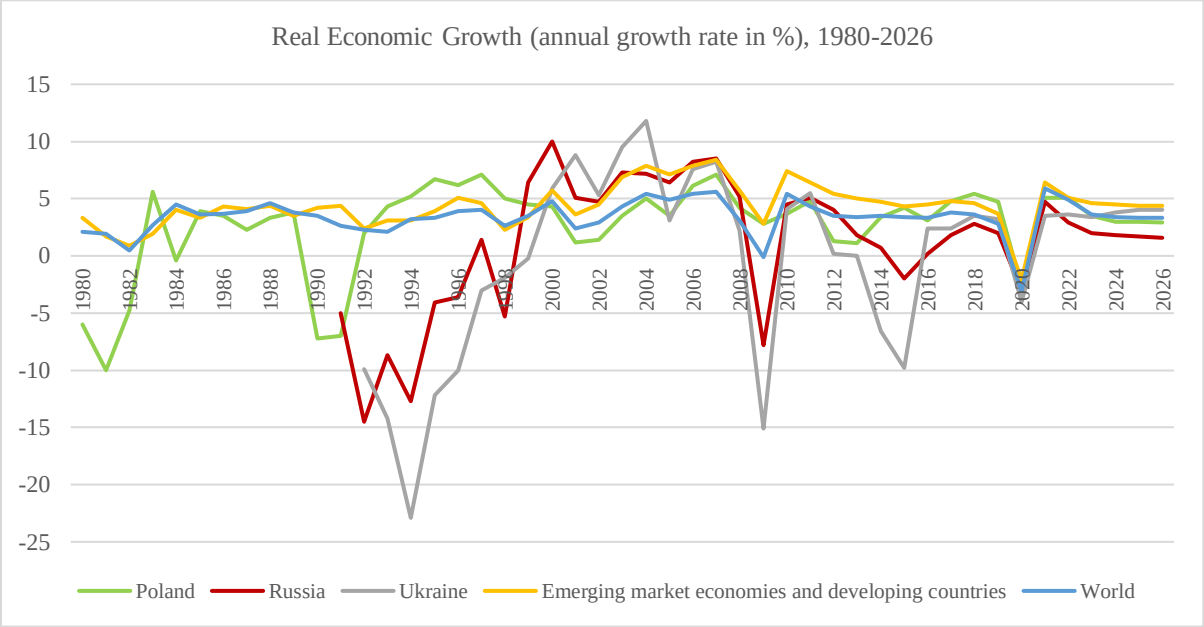
For a long time, Ukraine did not show a better economic development than Russia. However, the support of the IMF (International Monetary Fund) and particularly of the German government - with a long-term project to improve Ukraine's economic development via government consulting, implemented first mainly by the DIW, then by Berlin Economics - certainly led to the expectation that Ukraine could achieve higher growth rates than Russia in the medium term in the course of institutional reforms and the reduction of corruption as well as a pacification of the conflict in eastern Ukraine. In any case, Ukraine presents a challenge to Putin the autocratic leader of Russia: Ukraine as a democracy and a market economy as well as a constitutional state with the rule of law - gradually evolving - tends to challenge the autocratic model in Russia. Whether there would have been a meaningful option prior to 2022 for Ukraine as a neutral country in the middle of Europe is unclear. In principle, neutrality is more likely to be a realistic option for small countries than for larger ones, to which Ukraine could be counted in terms of area and, to some extent, population (44 million in 2021).

The war in Ukraine could become a significant burden on the export dynamics of Eastern European exports of Germany and the EU. The Committee on Eastern European Economic Relations (2022) announced on its website on February 10th with a view to 2021 and the war in Ukraine, respectively:

"With strong growth of almost 20 percent in exports and imports, German trade with Eastern Europe marked a new all-time high in 2021, with total sales exceeding the half-trillion euro mark for the first time. "German companies and their partners in the region are doing a fantastic job in the face of continuing corona restrictions," commented Oliver Hermes, Chairman of the Committee on Eastern European Economic Relations, on the record figures. "We all benefit from a close-meshed network of business connections and supply relationships with our eastern EU neighbors, as well as with important partner countries such as Russia, Ukraine and Kazakhstan. That the fruits of this labor are now once again being put at risk by unresolved political conflicts is completely irresponsible," Hermes said. "We don't need war planning and protectionist measures, but new prospects for intensifying our cooperation."

As far as the economic weights of Russia and Ukraine are concerned, in dollar terms, Russia's national income in 2020 was slightly higher than that of Spain. However, in terms of purchasing power parity - which allows a meaningful international comparison of economic performance – Russia's economic weight is about twice that of Spain. Ukraine's national income in dollar terms is about one-tenth as large as Russia's, the latter having 145 million inhabitants (as opposed to Ukraine's 44 million), so the average per capita income in Russia is higher than in Ukraine (about 2.7 times in 2020;). In purchasing power parity terms, the gap narrows, but the magnitude is similar - Russian national income is about 8 times that of Ukraine, and per capita income is about 2.3 times (World Bank/World Development Indicators, 2022). From 2016, was real growth in Ukraine for a number of years higher than in Russia (see Fig. 5). Due to the Russia-Ukraine war, production will decline significantly in 2022; in Ukraine due to war-related destruction and the flight of refugees and capital, in Russia due to international economic sanctions and the emigration of many, relatively young, professionals – many have taken advantage of opportunities to emigrate to Finland, for example; in some cases, probably also to avoid conscription into the military in Russia. At the end of March, the St. Petersburg-Helsinki rail connection will be discontinued. The emigration of Russian citizens, which have amounted to 300,000 per year since 2014, will thus decrease massively. Under Putin, Russia changed in Spring 2022 into a country whose repressive regime is approaching that of the former Soviet Union. Since the end of March, 2022, there is no independent media left in Russia and the penalties for demonstrating against the war have been made even more draconian.

Fig. 5: Real Economic Growth (annual growth rate in %): Emerging Market Economies and Developing Countries, World, Ukraine, Russia, Poland



Source: International Monetary Fund (World Economic Outlook, as of October 2021).

The West, together with Japan, the Republic of Korea and Singapore, largely blocked Russia's major banks from the international financial markets in February 2022 by excluding them from the SWIFT system. The sanctions were initially chosen on the part of EU countries - including Germany - so that trade in oil and gas from Russia could continue. However, in mid-March, the EU countries and the US also discussed cutting such imports from Russia or suspending them altogether for a certain period of time. Russia, for its part, announced on March 7th that it was also considering plans to stop filling the long-used natural gas pipeline to EU countries with gas, which would have been seen as a Russian gas boycott of EU countries as a countermeasure to Western sanctions. At a special summit in Versailles in March 2022, the EU decided that it would not follow the US, i.e., it would not implement an immediate import boycott of coal, natural gas and oil against Russia. On the part of the European Union, there have been several rounds of sanctions against Russia; on March 14th, a ban on investments in Russia's energy sector was presented by the EU as part of the fourth sanctions package. At the same time, the US is increasing pressure on China not to help circumvent Western sanctions against Russia by supplying Chinese goods to Russia. A fifth package of sanctions were agreed by the EU at the beginning of April. In March – as the US imposed its energy embargo on Russian imports - the UK had also already announced that it intended to end energy imports from Russia by the end of 2022.

The suspension of international transactions for cardholders from Russia by the leading US card-payment service providers Visa and Mastercard at the beginning of March and the announcement by the leading Russian airline on March 6th, 2022 that it would no longer operate international flights (due to the closure of the airspace of many industrialized countries to aircraft from Russia and the risk for Aeroflot that aircraft leased abroad could be confiscated if they land outside Russia as part of Western sanctions) make it clear to many citizens that Russia has become internationally isolated as a result of the war in Ukraine. It remains to be seen to what extent this will be received as important information by the older majority of the population in Russia with regard to Russia's TV-based war propaganda - which gives a different picture of the Russian invasion of Ukraine than independent media (for example in the EU,

Switzerland, Norway, UK, US etc.). The younger segments of the population, many of whom could access digital social media information during the first two weeks of Russia's war of aggression against Ukraine, seem to have a critical view of Russia's invasion of Ukraine.
In the first weeks of the war, Russia's leadership emphasized, amongst other war aims, the goals of achieving the demilitarization and denazification of Ukraine; while there are right-wing neo-Nazi undercurrents in parts of Ukrainian society (see the 2018 REUTERS commentary in Annex 4), they represent only a small minority of Ukrainians. Using them as a justification for a war of aggression against Ukraine comes across as a far-fetched justification.
Russia's invasion of Ukraine and its occupation of the country is likely to mean a new Cold War in Europe. Germany's export industry will face temporary problems in connection with the Western sanctions against Russia, and exports to Russia are likely to fall significantly; especially in the high-tech sector. The value of imports from Russia will rise significantly on a temporary basis as oil and gas prices worldwide will increase in the short term: Oil, gas and metals are Russia's main exports. As far as gas prices for private households in Germany in January 2022 were concerned, the price was 80% above the 2008 price level; this will then be compounded in subsequent months by further price increase effects resulting - in a broader sense - from the Russia-Ukraine war. The inflation rate in Germany and the Eurozone is expected to reach 7% in 2022, which will lower real wages in the short term and therefore increase companies' demand for labor - new jobs could be created here, but only temporarily.
The West will increase its military spending in both the short and medium term, which could help stabilize overall economic demand. The German government's decision to set aside a special fund of €100 billion for the Bundeswehr creates a basis for Germany to finance significantly higher defense spending in the medium term. Whether this will succeed in mitigating the Bundeswehr's weaknesses in terms of procurement efficiency remains to be seen.
If Italy increased its military expenditure ratio from 1.6% to 2% in parallel with the rise in the German and Spanish military expenditure ratios from 1.4% to 2% each, this would result in a fiscal expansion effect of initially around 0.3% of GDP for the EU27. However, imports from the US account for a considerable share of increased military spending, so that the fiscal expenditure multiplier and thus the expansion effect on EU national income remain relatively low.
In addition to production in Ukraine, its exports will also decline in 2022 due to the war. German and Western European companies that procure inputs from Ukraine - for example in the automotive industry - will experience production disruption as a result. However, this is only likely to have a temporary negative impact on production in Western Europe. Russia's massive attack on the important Ukrainian export port city of Mariupol will significantly worsen the export opportunities for Ukraine's economy.
Like the US, the UK and Switzerland, Germany is likely to benefit from falling interest rates on government bonds, as demand for "safe havens" or financial products rises in times of international crisis; this effect should be seen separately from inflation-related impulses to raise interest rates. The reduction in interest rates in Western countries stimulates investment, at least in some sectors. However, it cannot be ruled out that a decline in production in energy-intensive sectors, for example, will ultimately have a dampening effect on the economy as a whole.
Additional spending on the government side could, in the short term, result from refugees from Ukraine; in the medium term, these people will make a positive contribution to production in Germany or the EU (and other countries) once they are integrated into the respective labor markets. In the short term, the refugee flows could lead to an expansion of the shadow economy in the host countries.
Since Ukrainian refugees in Germany, as in many EU countries, receive a quasi-automatic multi-year residence and work permit because of the war situation, many refugees or workers from Ukraine are also likely to come increasingly to Germany in the medium term - in the areas of construction and care workers in the domestic sector, as well as in a few other sectors as far

as numerically significant numbers of workers are concerned. Even before the Russia-Ukraine war, there were significant numbers of workers from Ukraine in the EU: Especially in Poland, where about three-quarters (or 1.4 million people) of the mobile Ukrainian workforce flowed. A large share of the immigrants and refugees from Ukraine is well-educated and highly skilled, whereby especially younger workers possess professional digital competences.

2.1 Cyberwar and Digital Combat via the Internet

Several months before Russia's war of aggression, the United States - or Ukraine – had apparently communicated with well-informed intelligence sources on the policy orientation of Russia's President Putin. According to a March 9th Financial Times report (FT, 2022), the United States sent US experts in cyber warfare with the goal of protecting critical Ukrainian infrastructure from Russian Internet-based attacks. Ukraine had increasingly been the target of Russian cyber-attacks since 2014 - in 2015, a cyber-attack on Ukraine's power grid resulted in the city of Kyiv being without power for several hours. This US assistance likely significantly bolstered defense capabilities in the early weeks of the war in Ukraine, and the FT article reports that unofficial US assistance in the fight against computer viruses in Ukraine were helpful, as was, for example, special support measures that Microsoft took - steps that the US government then recommended be transferred also to NATO partner countries.

A February 28th blog post from Microsoft President Brad Smith (Smith, 2022) said that just hours before Russia's attack on Ukraine, Microsoft's Threat Intelligence Center had detected a new wave of offensive and destructive cyber-attacks against digital infrastructure. Microsoft immediately contacted the government of Ukraine and provided guidance for countering these cyber-attacks - a Microsoft engagement that has also continued. There had also been indications of attempts at data theft from Ukrainian government agencies. The president of Microsoft also stated his concern that recent cyber-attacks had been noted against Ukrainian civilian digital targets, with this affecting the financial sector, the agricultural sector, emergency services, humanitarian aid engagements, and the energy sector, as well as private businesses. Microsoft was cooperating in this field with NATO services and also with US authorities in Washington DC.

Ukrainian President Zelensky repeatedly addressed the people of Russia, as well as Russian soldiers in the Ukrainian war, with speeches in the Russian language during the first weeks of the war. He also delivered speeches, digitally relayed from Kyiv, to the parliaments of Canada, the United States, Germany, France, Italy, Denmark, Israel, and Japan, amongst others. This outreach strengthens international political support for Ukraine in the war against Russia.

Russia's government and President Putin, in turn, have censored radio and TV stations in Russia which are critical of the Kremlin, as well as Internet services from the West (such as Facebook and Twitter). For the younger generation in Russia, such behavior by the state leadership is likely seen as tantamount to a Kremlin admission of guilt in the matter of the Ukraine war, which, in view of Russia's attack, may officially only be referred to in Russian society as a "special military operation" in Ukraine. With this attack against the Ukraine, the prospects for growing Germany-Russia trade are certainly significantly worsened for many years to come.

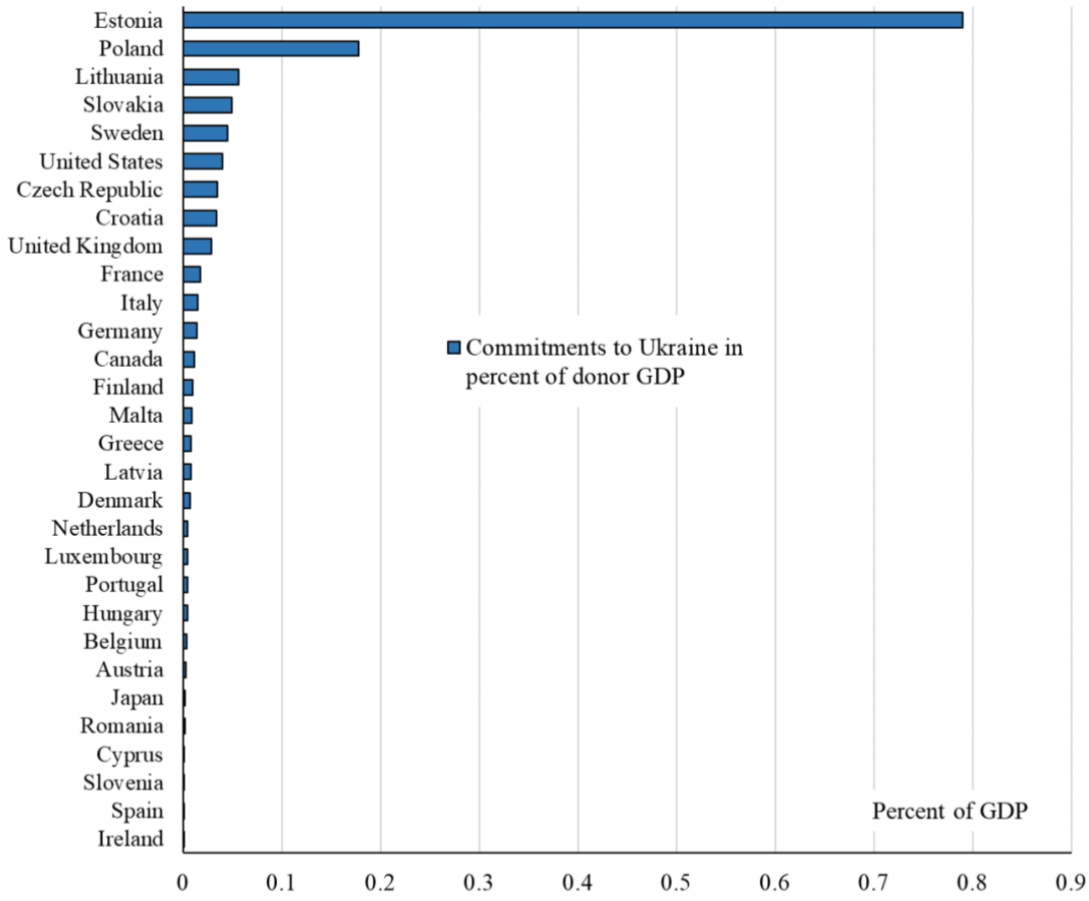
2.2 Leading OECD Donor Countries: A Confusing Debate

How significant is the financial, humanitarian and military support for the Ukrainian people? The study by Antezza et al. (2022) argues – considering these three elements of aid for the Ukraine combined - that the support provided by the EU (i.e., EU27) countries for Ukraine is smaller than that of the United States. This information is not true if one includes the

commitment of EU member countries vis-à-vis refugees from Ukraine (Antezza et al. exclude this position deliberately which makes no sense in economic and political terms). By the end of March 2022, Poland had accepted almost 3 million Ukrainian refugees, which – on the basis of an estimated €500 in expenditures per refugee per month – implies a commitment of €18 billion from Poland on top of the figures covered by Antezza et al; the latter have added other bilateral commitments of €2.9 billion made by EU27 member countries to the commitments of €1.4 billion from the European Commission and the European Council and €2 billion by the European Investment Bank (which sums up to €6.3 billion for the EU/EU27). As regards Germany with about 300,000 Ukrainian refugees – and an estimated €1,000 in expenditures per person per month – this equates to an additional commitment of around €3 billion from Germany for 2022 which should be reflected in a 'gross' EU27 commitment. Italy with an estimated 200,000 refugees would stand for an additional €2 billion expenditures. The combined implicit expenditure commitment of other EU countries roughly adds up to another €2 billion for support for Ukrainian refugees. The coverage gap by Antezza et al. amount to roughly €25 billion for the EU which means that the figures published by the Kiel Institute for the World Economy thus seem to be misleading the public debate. Therefore, it holds that taking into account expenditures of EU member countries, the UK and the US for refugees from the Ukraine as commitments, EU countries have clearly committed a much a higher level of effective aid to the Ukrainian population than the US (or the UK). The respective expenditure figures for refugees by the UK and the US are much smaller than the expenditures of Germany or Italy. In Europe, Germany's support for the Ukrainian people exceeds that of the UK, France and Italy.

Leading OECD donor countries for Ukraine are shown in the following figure from the Kiel Institute for World Economics (Antezza et al., 2022); the figures are based on expenditures for humanitarian, financial and military aid for the Ukraine. The ranking of leading donor countries should, however, also take into consideration the expenditures for Ukrainian refugees – e.g. € 300 million per month in Germany (based on an estimated 300,000 refugees); for 2022, about €3 billion in humanitarian expenditures for refugees from Ukraine will come on top of the figures for Germany covered by the Kiel Institute for the World Economy in an approach which is biased as it does not include the expenditures for refugees in the respective OECD countries.

Fig. 6: Country ranking in percent of donor GDP (bilateral commitments to Ukraine)



Note: This figure ranks countries by the scale of bilateral aid as percentage share of each donor's GDP. We consider total commitments to Ukraine February 24 to March 27, 2022. The data on GDP (current US$) is for 2020 and taken from the World Bank. See the main text for details on data collection and sources.

Source: Antezza et al. (2022), Which countries help Ukraine and how? Introducing the Ukraine Support Tracker, Kiel Working Paper No. 2218 April 2022, Kiel Institute for the World Economy.

2.3 Bilateral Perspectives on Germany-Russia Trade

On the import side, Germany's trade with Russia is dominated by Russian metals - some of which show critically high market shares for Russian suppliers - and the supply of gas, oil and coal. According to a statement made by the German Minister of Economics at the end of March 2022, Germany intends to very significantly reduce energy imports from Russia by the summer of 2024; i.e., apparently through not renew expiring supply contracts. In the case of natural gas, Germany intends to stop importing gas from Russia by mid-2024, with the exception of residual volumes. As far as Germany's dependence on imports from Russia is concerned, Russian

natural gas supplies are critical for Germany; for the EU as a whole, too, Russia's share of gas imports is very substantial at 40%.
Germany's goods exports to Russia grew significantly before the Crimean crisis (in 2014) and at times represented 3.5% of total exports. In the wake of Western sanctions against Russia - and the Crimea region - and Russian counter-sanctions, Russia's share of German exports has fallen to around 2% (Ukraine's share of German goods exports was 0.4% in 2021). With Germany's goods export ratio at one-third, German exports to Russia represent slightly less than 1% of GDP. The mechanical engineering and pharmaceuticals sectors achieved above-average shares of exports to Russia, at 3.1% and 3.6%, respectively, while exports of automobiles had only a below-average share of exports to Russia; medical and pharmaceutical products recorded a significant expansion in exports to Russia in 2021 with an increase of a good 20% compared with 2013 - export value €2.5 billion per year (Schrader/Laaser, 2022).
A massive slump in German-Russia trade in the context of the Ukraine war will have a negative impact on both Russia and Germany, and a corresponding decline in EU-Russia trade would certainly also bring significant economic dampening effects for Eastern European EU countries. On the gas import side, if Germany and the EU turn more towards liquefied natural gas imports (LNG), this will lead to price increases in the energy sector, as liquefied natural gas is about 10% more expensive than gas delivered via pipelines.
In the long term, Russia would probably have to intensify its foreign trade with China and other countries in Asia - as well as Africa. However, Russia would obviously still be a junior partner in this foreign trade as the Chinese economy is much larger than Russia's (a Sino-Russia ratio about 5:1 in the medium term). The breach of trust marked by President Putin's invasion of Ukraine is likely to cloud the prospects for Germany-Russia trade for many years to come.
Moreover, if Germany and the EU actually stopped importing any gas from Russia in a few years, Ukraine would no longer receive any income from pipeline transit fees. Russia will only be able to sell gas surpluses to other countries and regions of the world at a considerable discount. Such price reductions could thus certainly lead to a certain dependence of these countries supplied by Russia on the energy side.

2.4 International Perspectives

War between Ukraine and Russia represents a watershed moment in international relations. In general, trust in the reliability of national borders and international law is being undermined here, at least temporarily, and the propensity for conflict in many parts of the world is likely to increase. On March 12th, 2022, one Russian TV station's program featured experts discussing the possibility of Russian military occupying the Baltic countries and parts of Poland and even Sweden.
A few hours before Russia's attack on Ukraine, Ukraine decoupled its power grid from Russia's, a move which was actually designed - with parallel new connection to the European grid - as a longer-term project until 2023; with test phases due in winter and summer 2022, respectively, and a very first test phase on February 24th. On that day, the day of the launch of Russia's invasion, Ukraine requested an emergency interconnection with the European grid (European Network of Transmission System Operators for Electricity/ENTSO-E). This interconnection did indeed take place and deprived Russia of the ability to control Ukraine's power grid (Sabadus, 2022).
An important international role will be played by China's leadership, which may see the Russian attack on Ukraine as an encouraging signal to step up its own attempts to seize power in Taiwan. This will also create new uncertainty in Asia, the growth engine of the global economy, along with the EU/UK and US. This will weaken investment in the EU and Asia. China could find political support for Russia's war policy extremely costly, as it will certainly

face sanctions from the US and presumably also the EU if Russia receives significant aid; China's trade volume with the US and EU is about 10 times that of Sino-Russian trade. Incidentally, China's stock markets had plummeted significantly in mid-March; a slowdown in growth due to the Ukraine-Russia war will reduce China's exports and thus its national income, and probably also prevent it from achieving the growth targets set by the Chinese Communist Party.

The countries of the EU will want to join forces more strongly than before, both economically and militarily, in order to better protect themselves against further Russian aggression. Germany, France and Italy are likely to play a leading role here. Russia's cyber-attacks on institutions in Ukraine is a warning for EU countries that more attention must be paid to the issue of digital defense. National budgets, like the EU budget, will have to be increased in the medium term, and industry should also be given incentives to invest more in IT security. The question of a significant increase in the EU budget is likely to arise soon: From the current 1% of the EU's national income to around 2%, with joint defense spending becoming part of a higher EU budget.

In Germany, the short- and medium-term losers of the Russia-Ukraine war include the automotive, chemical and mechanical engineering industries, for which Russia was an important sales market for many years. A slump in share prices is to be expected in Russia on the one hand, but also in the Western industrialized countries on the other. A few days after the start of the war, Russia closed its stock exchange - apparently in order to avoid having to report massive price reductions in the context of Western sanctions and the war; a reopening for - only - 30 stocks took place four weeks after the start of the war. The stock market value of the shares halved as a result of Russia's attack on Ukraine.

Falling (real) stock market prices were also seen in Germany, France and other EU countries in March 2022. Economic growth will then be dampened via reduced investment growth. In Germany, the planned 2022 shutdown of the last three nuclear plants should be reviewed. There is too little reserve capacity in the German electricity market, especially as higher gas prices are making some gas-fired power plants uneconomical. The Green Party's federal economy minister will have to make some difficult decisions. A rapid phase-out of coal-fired power generation, which is desirable from a climate policy perspective, will also not be possible if oil and gas prices rise significantly.

The United States announced on March 9th, 2022, that it would stop purchasing gas and oil from Russia. It should be noted that the United States has been a net exporter of gas since 2017. It remains to be seen whether major EU countries will want to do without Russian gas and oil in 2022. Gas storage in Germany was only about 25% full as of mid-March 2022, which is less than in previous years. A new law on the part of the German government for 2022 will bring new requirements for the minimum filling of gas storage facilities in the Fall.

Economic sanctions against Russia can have little effect in the short term; but at least stock trading in Moscow must be suspended in the short term. Russia's occupation of Ukraine will create a kind of GDR 2.0 in Ukraine, because millions of Ukrainians will want to leave the country and Russia will only be able to counter this with a tough border regime. As little as the GDR could exist in the long run, a Russian occupation of Ukraine is also unlikely to be feasible in the long run. Time is not on Russia's side, but rather helping the West. Incidentally, high oil and gas prices are a drag on China's economic growth, as they are on Japan and other countries in Asia. The economic interests of the vast majority of countries in the world ultimately demand stability, peace and prosperity. Putin's Russia, with its military aggression in Ukraine, has not only destroyed peace in Europe and diminished Russia's reputation, it will also face a broad political defensive front internationally.

The alliance between the US and the EU will probably be strengthened, and NATO's role enhanced. It was probably foreseeable that the long-standing NATO expansion in the direction of Eastern Europe would give rise to increased fears or feelings of being threatened in Russia.

However, this cannot seriously justify Russia's invasion of Ukraine. With regard to the Baltic EU countries of Estonia, Latvia and Lithuania - each with Russian minorities - no Russian invasion is to be expected, but Russia will seek to exercise its power more strongly in Europe after the invasion of Ukraine. Russian attempts to destabilize various countries in Eastern Europe can certainly be expected. All of these perspectives present negative prospects for Germany's export expectations and the opportunities to invest profitably in Eastern European countries.

At the UN Security Council, the resolution introduced by the US against Russia's war of aggression against Ukraine on February 25th, 2022, received a clear majority, with one vote against from Russia and abstentions from China, India and the United Arab Emirates. From the abstentions, one can discern some disapproval of Russia's actions, but at the same time narrow economic or military-political interests in terms of the bilateral relationship with Russia. On March 2nd, 2022, the United Nations General Assembly adopted the Ukraine resolution with 141 votes in favor, which contained a condemnation of Russia's invasion of Ukraine. From Russia's side, only four small countries, namely Belarus, Eritrea, Syria and North Korea, voted against, a further 35 abstained, including China, India and Pakistan.

If the OECD countries, i.e. essentially the US, the EU plus Japan and the Republic of Korea, put Russia massively on the defensive by imposing economic sanctions, this will make Russia under Putin a political actor that is no longer calculable and will cause Russia to intensify its relations with China massively in the long term - whereby Russia would be weaker politically if it embraces China. Russia's eastern regions - with low population density - could see increasing numbers of Chinese seep into them over many years until they become an important minority "politically looked after" by China. Then Russia's eastern regions could become a kind of Ukraine 2 with Chinese claims, which could lead to a major international war.

In the longer term, the sanctions regime of the West could also lead to Russia's exclusion from important international organizations. Particularly important in the economic sphere are the International Monetary Fund, where Russia's membership was not yet an issue in March 2022. In addition, the World Trade Organization, the Bank for International Settlements and other organizations with economic, political or legal relevance. On the subject of human rights in Europe, the Council of Europe is particularly important.

On March 11th, US President Biden declared that Russia would lose the benefits of the "most-favored nation" (MFN) clause in the World Trade Organization, with the US, Japan, Canada and the EU taking this step in parallel to make Russian exports more difficult (this is ultimately about tariff increases on Russia's export products). The principles of the most-favored nation clause and equal treatment of foreigners, which are important at the World Trade Organization, have thus been massively weakened with regard to Russia. Russia's government in turn intends to give special national treatment to companies from "unfriendly countries" and thus discriminate against them. In addition, on the same day there was the news report that Russia is to be excluded from the Bank for International Settlements; this institution is important for the cooperation of central banks at the international level and also for agreements on rules in international banking and thus for the stability of the global financial system. The exclusion of Russia from the Bank for International Settlements seems a premature step of Western sanctions tightening against Russia; after all, there will then be hardly any reasonable options left with regard to an ultimately finite sanctions list against Russia. Russia's exclusion is also likely to be considered at the EBRD – the European Bank for Reconstruction and Development (particularly important for Eastern Europe) - in London.

The fact that the US has revoked the most-favored nation clause vis-à-vis Russia can only be justified to some extent. At the World Trade Organization (WTO), the specifications for exceptions to the GATT rules (GATT was the predecessor organization of the WTO) are described as follows in Article 21 for the protection of national security interests (Research Services of the German Bundestag, 2019):

"Nothing in this Agreement shall prevent a Party from,

1. *a) to refuse to provide information the disclosure of which they consider to be contrary to their essential security interests;*
2. *(b) take such measures as it considers necessary to protect its essential security interests*
    1. *(i) with respect to fissile materials or the raw materials from which they are produced;*
    2. *(ii) in trade in arms, munitions and war material and in trade in other goods and materials intended directly or indirectly for the supply of armed forces;*
    3. *(iii) in time of war or other serious crisis in international relations;*
3. *(c) take measures pursuant to its obligations under the Charter of the United Nations for the maintenance of international peace and security."*

The United States - like EU countries or countries in Asia, for example - could point out that the Russia-Ukraine war is a serious crisis in international relations. The United States could also argue that the sanction measure against Russia is ultimately intended to preserve peace and international security.

Russia resigned its membership in the Council of Europe (with 47 states as members) on March 16th, 2022 - after 26 years of membership – after being suspended. The decision of the members, excluding Russia, to suspend Russia was unanimous. Russia's exclusion is, however, not necessarily wise. This is because it means that the country, or rather the jurisprudence there, is no longer subject to review by the European Court of Human Rights. This tends to weaken the protection of defendants in Russia, and the reintroduction of the death penalty in Russia has thus become conceivable. Moreover, Russia had announced on several occasions that it intends to withdraw from the Council of Europe.

On March 16th, 2022, the International Court of Justice in The Hague issued a ruling that Russia must immediately cease hostilities in Ukraine. On February 26th, Ukraine had presented a case before the Court that there was a dispute with Russia over the interpretation, application, and fulfillment of the Convention Against Genocide. Russia had alleged that Ukraine was committing genocide against the population in the breakaway governmental districts of Luhansk and Donetsk, which were under the control of Russian-backed fighters: This was one of the reasons put forward by Russia's government as a justification for the war of aggression against Ukraine.

Russia's war of aggression has apparently largely isolated the country internationally. It is obvious that Russia's invasion of Ukraine must be answered with clear economic sanctions on the part of OECD countries. Wise cooperation and well-thought through approaches on the part of the US, the EU and other countries here are indispensable.

Excluding Russia entirely from the SWIFT agreement, which is important for international payments, should probably be one of the last sanction options, as this threatens to damage international trust in the Brussels-based organization in the long term; SWIFT is a processing system of international payments, which will certainly damage global economic integration - in West and East as well as North and South. The sanction of cutting off large Russian banks - decided at the end of February 2022 - puts these banks under massive pressure when it comes to international business.

Whether freezing Russian currency balances with Western central banks is a sensible policy move is open to doubt. With a view to stable international currency relations, it is not a good idea to actively involve the central banks of the Western world in foreign and sanctions policy, and there are also legal problems relating to the seizure of the currency assets of another country. Russia's reliance on its currency reserves to wage war against Ukraine can only be assumed in the medium and long term.

Russia itself holds foreign exchange reserves at the central bank of its own country, while foreign exchange reserves of around €150 billion are held by the central banks of France and Germany, among others. The foreign currency reserves held abroad by Russia probably account for almost one-fifth of Russia's total reserves. If the West emphasizes democracy, freedom, peace, market economy and the rule of law with good reasons, it should act accordingly when choosing means of sanctions. If Russia is deprived of access to its foreign currency reserves held abroad, the West should not be surprised if Russia no longer services government bonds held abroad in the medium term, or only offers Rubles for interest payments and redemptions.

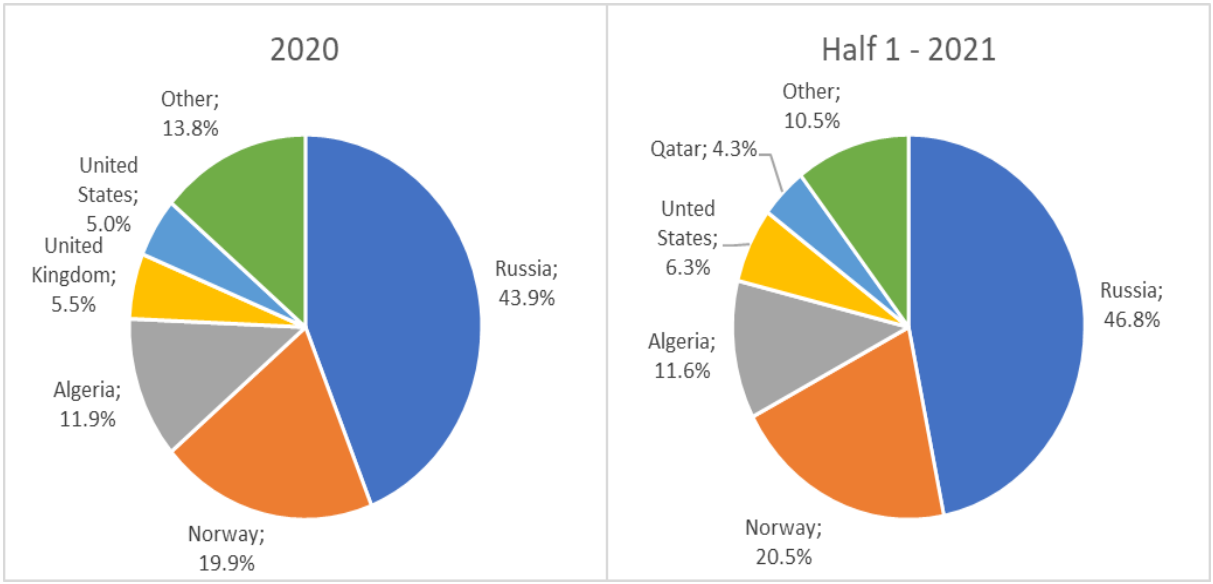
3. Energy Perspectives

3.1 Energy Import Issues

Looking at EU27 gas and oil imports by major supplier country in 2020 and the first half of 2021, respectively, we see that Russia's share of gas in 2021 was still 2.9 percentage points higher than in 2020, at 46.8% (based on third-country gas imports). Norway, Algeria, the US and Qatar followed with shares of 20.5%, 11.6%, 6.3% and 4.3%, respectively, in 2021 (Fig. 7). The commissioning of the North Stream 2 gas pipeline to Russia would likely have increased the EU share in gas to over 50% with Russia. In EU competition policy, a market share of over 50% is considered a problem with regard to market dominance, and it is therefore difficult to understand why Germany, Austria, the Netherlands and other EU countries have pushed politically in support of the North Stream 2 project for many years.
International diversification on the gas side requires, above all, unloading stations for liquefied natural gas in suitably equipped ports, with prices for liquefied natural gas somewhat higher than for gas from deliveries through regional pipelines. The dominance of regional pipeline deliveries for natural gas means that international price differences in individual countries or regions are much greater than for oil, where the price difference between European "North Sea oil" Brent and US oil (West Texas price) is negligible and essentially reflects only transportation costs between the US and the EU.

EU imports of energy products - developments in 2020/2021

Fig. 7: EU Gas Imports from Main Trading Partners (Non-EU), 2020 and H1 2021 (share in % of trade value)

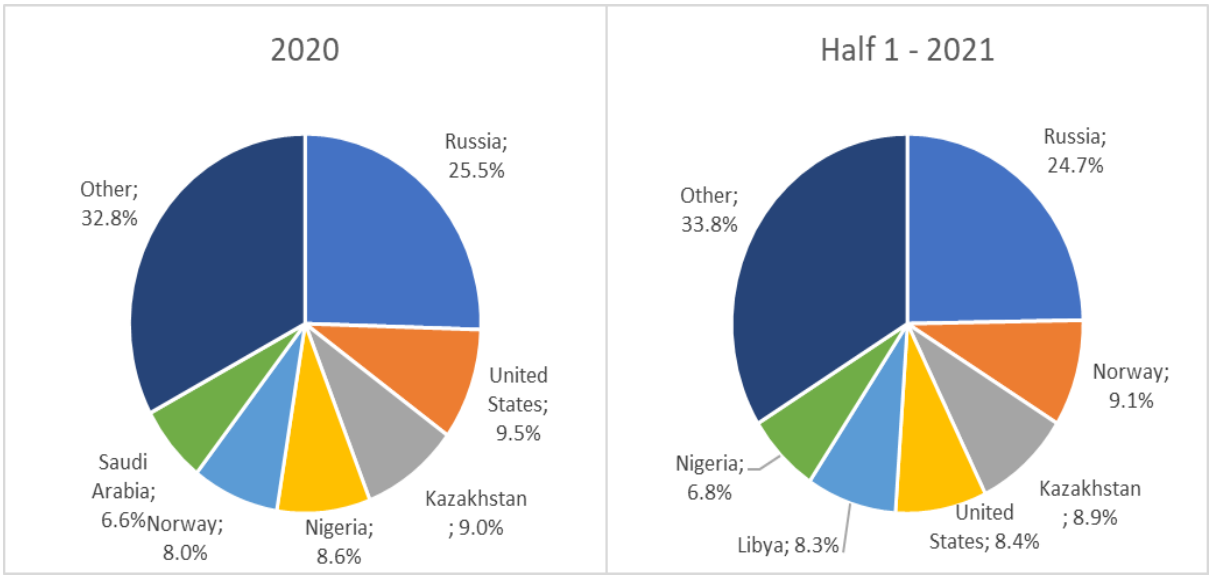


Source: Own representation of data from Eurostat Database (Comext) and Eurostat estimates

In the case of pipeline networks, there is also the potential for political interference with regard to transit countries, as is potentially the case with Ukraine, for example, with the old gas pipeline from Russia to Western and South-eastern Europe traversing the country, and as appears to be the case with the pan-European gas network as a widespread inefficiency problem: The regional pipeline structure is not optimal (Hubert/Cobanli, 2015).

In the EU, Bulgaria has been 100% dependent on Russia for natural gas in 2021. However, the Bulgarian government said in March 2022 that it would not renew order contracts with Gazprom. Instead, Bulgaria plans to make heavy use of gas from Azerbaijan in the future, using the Trans Adriatic Pipeline (TAP), which carries gas from Azerbaijan to Italy via Turkey. The expansion of TAP delivery capacity on a larger scale will certainly take several years.
In terms of EU oil imports from third countries, Russia accounts for 24.7% of oil imports by value in the first half of 2021 - slightly lower than the 25.5% in 2020 - while Norway, Kazakhstan, the US, Libya, and Nigeria recorded EU shares of 9.1%, 8.8%, 8.4%, 8.3%, and 6.8%, respectively (Fig. 8).

Fig. 8: EU Oil Imports from Main Trading Partners (Non-EU), 2020 and H1 2021 (share in % of trade value)



Source: Own representation of data from Eurostat Database (Comext) and Eurostat estimates

EUROSTAT (2021) provided only value ranges on EU import dependence on Russia for gas and oil in the case of individual EU countries in order to comply with the requirement of confidentiality in data publication (see Table 4). In the first half of 2021, for gas and oil from Russia, six countries had a share higher than 5% of total imports from third countries in terms of value for gas and oil; namely, Belgium, Germany, Spain, France, Italy and the Netherlands. In the case of Germany and the Netherlands, Russia accounted for more than 5% of third country supplies by value for both oil and gas.

Tab. 4: Russia's Share in National Non-EU imports of EU Member State, H1 2021; share (%) of trade by value, sorted by gas share and alphabetically

Country	Share (%) of Russia in national non-EU imports	
	Oil	Gas
Bulgaria	75-100	75-100
Finland	75-100	75-100
Slovakia	75-100	75-100
Hungary	75-100	75-100
Romania	25-50	75-100
Czech Republic	25-50	75-100
Estonia	0-25	75-100
Austria	0-25	75-100
Latvia	n.a.	75-100
Slovenia	n.a.	75-100
Poland	50-75	50-75
Germany	25-50	50-75
Sweden	0-25	50-75
Lithuania	50-75	25-50
France	0-25	25-50
Greece	0-25	25-50
Italy	0-25	25-50
Netherlands	25-50	0-25
Belgium	0-25	0-25
Ireland	0-25	0-25
Croatia	0-25	0-25
Malta	0-25	0-25
Portugal	0-25	0-25
Spain	0-25	0-25
Denmark	0-25	n.a.
Cyprus	0-25	n.a.
Luxembourg	n.a.	n.a.

Source: Eurostat database (Comext) and Eurostat estimates, EIIW presentation.

In the first half of 2021, the share of oil imports from Russia was more than 75% of oil imports from third countries for four EU member countries, namely Bulgaria, Slovakia, Hungary and Finland. Ten EU member states imported over 75% of gas imports from third countries from Russia alone, namely Bulgaria, Czechia, Estonia, Latvia, Hungary, Austria, Romania, Slovenia, Slovakia and Finland. In each case, i.e. countries with particularly high shares of Russian imports, these states are those which are relatively close to Russia.

3.2 Policy Options to Reduce Imports of Gas from Russia According to the International Energy Agency and Leopoldina

A recent analysis of natural gas imports by the International Energy Agency with reference to the EU and Russia (IEA, 2022) and a similar study by the Leopoldina Academy (2022) on the question of the option of a significant cut to gas imports from Russia by Germany and the EU, respectively - as a protest against Russia's war of aggression against Ukraine and as a restriction of Russian war financing possibilities - are summarized below, where some inconsistencies also become apparent. Firstly, it should be noted that various EU countries are heavily dependent on imports of natural gas from Russia. Incidentally, a broad energy import boycott against Russia could also be considered from the perspective of EU countries, which would then include oil and coal in addition to gas.
The International Energy Agency (IEA, 2022) published a study on March 3rd, 2022, stating that EU countries could reduce their Russia gas imports by more than a third over the course of a year. Apparently, on March 8th, EU Commission Vice-President Timmermans (2022) referred to important points of this study in his press presentation on EU energy policy options; Timmermans emphasized that the EU could reduce natural gas purchases from Russia by 30% in the short term, and in its text the IEA study also refers to the EU and its energy policy, respectively, due to the European Green Deal. The aforementioned study of the International Energy Agency presents a ten-point program. The EU should

1. Not conclude new gas purchase contracts with Russia, which will increase the European Union's diversification opportunities in gas purchases.
2. Replace Russian supply with alternative supply sources (increases in the non-Russia supply by around 30 billion m^3).
3. Adopt new regulation on the minimum filling of gas storage facilities is to be adopted (this is to ensure the supply of gas next winter).
4. Accelerate the implementation of new wind and solar projects (reduces gas import from Russia by 6 billion m^3).
5. Maximize electricity generation through bioenergy and nuclear energy (Decreases gas import from Russia by 13 billion m^3).
6. Introduce short-term tax measures to tax special profits - on the basis of the additional government revenue, poorer consumer classes could be compensated for the burden of increased energy prices.
7. Accelerate the replacement of gas boilers with heat pumps (import reduction of 2 billion m^3).
8. Accelerate steps to increase energy efficiency in buildings and industry (import reduction of 2 billion m^3 within one year).
9. Encourage lower household heating use by way of a thermostat reduction of 1 degree Celsius (which would decrease gas import by 10 billion m^3).
10. Intensify efforts to diversify and decarbonize more flexible power generation systems (reduce strong links between gas supply and European power security).

It is indeed worth considering in any case an extension to CO2 allowance trading via the EU's Emissions Trading System (ETS) - following the successful Japanese example (Welfens, 2019) - to the office buildings sector; in a phase of economic dampening in the EU, it would indeed be appropriate to achieve politically targeted CO2 reductions at minimal cost: Namely by extending CO2 allowance trading in the EU beyond the existing energy and industry sectors; but not including the private residential rental sector (Welfens, 2022). Moreover, it is clear that the existing EU-wide coverage of industry (essentially only large-scale operations) and the energy sector by CO2 allowance trading means that the arguably necessary mobilization of

coal-fired power plants to secure desired levels of electricity production will not involve an increase in CO2 emissions in the EU, despite a politically-decreed reduction in gas purchases from Russia. If CO2 emissions in the energy sector increase, then CO2 reductions in industry must also increase; this is unavoidable because of the politically-mandated annual CO2 emission reduction targets. This in turn is likely to be accompanied by an increase in CO2 certificate prices and thus tends to dampen overall economic production via reduced profitability at many industrial companies.

The statement of the Leopoldina (2022) "How Russian natural gas can be replaced in the German and European energy supply" concludes that a short-term supply stop of Russian natural gas to Germany's economy can certainly be cushioned. The Leopoldina refers in particular to free landing capacities for liquefied natural gas in several EU countries; however, the problem of how additional liquefied natural gas landed elsewhere can then be transported on to Germany is not properly considered. Here, there is a lack of intra-EU pipeline capacities: especially in the south-north direction.

Various considerations of Western sanctions and a significant cut in EU energy imports as well as US imports plus UK energy imports from Russia yield interesting findings. However, Russia itself can of course work with counter-sanctions against the West in various ways, and President Putin could pre-empt a Western gas boycott with a gas supply boycott. The nationalization of subsidiaries from Western industrialized countries or OECD countries (including Japan, the Republic of Korea, Australia) is one of Russia's ways of harming foreign investors and ultimately citizens in industrialized countries: Namely, there are write-offs on investments in Russia by multinational companies with direct investments in these countries, which means reduced profits and, consequently, lower share prices in OECD countries. Anyone who has invested in the stock market directly or indirectly - for example, via a life insurance policy - will therefore realize losses.

The fact that the nationalization of foreign companies in Russia will significantly harm economic dynamics is another matter. The quality of corporate management and the dynamics of innovation will drop significantly after nationalization, which also means poorer prospects for real wage growth in Russia. Moreover, Western sanctions not only contribute to a weakening of the economy in Russia, but also the five Central Asian countries Kazakhstan, Turkmenistan, Uzbekistan, Tajikistan and Kyrgyzstan - they are closely linked to the economy in Russia - are confronted with new economic problems. These five countries receive large remittance payments from guest workers who work in Russia; moreover, the reduction of real income in Russia means that its imports from almost all countries will decrease. The global flight of investors to safe haven countries (a typical reaction in times of international crisis) increases the devaluation pressures on the currencies of the five aforementioned countries resulting from a reduction in their exports. Currency devaluations mean increased inflation and, in particular, a sharp rise in import prices.

As far as natural gas demand in Germany is concerned, it is expected to decline by only 6 to 17% by 2030 (BCG, 2021; dena, 2021; Prognos et al., 2021). Natural gas could remain an important, even dominant, energy source for heat supply in the medium term and will initially be difficult to replace in industry as well; in steel production, for example, natural gas is used in the direct reduction process for a further transition phase - until green hydrogen generated on the basis of renewable energies can then be used in the long term. Beyond the heat markets, natural gas plays an important role in the electricity market, as power plants running on natural gas can be ramped up quickly; in the long term, these power plants could be operated with biogas or also with green hydrogen. In this context, it appears that at least a doubling of existing capacities will be necessary. The Federal Network Agency in Germany (BNetzA, 2021) assumes that there will be a need for expansion from 32 gigawatts to 59 to 88 gigawatts in 2045.

Thus far, stable gas supplies from Russia have been an important pillar of Germany's energy supply, and a conceivable (politically desired) massive cutback in gas imports from Russia

raises a number of serious economic challenges; by increasingly integrating coal-fired reserve power plants into electricity production, significant quantities of natural gas could be freed up in Germany for industry and for heating purposes in private households (Fischer/Küper, 2022). It goes without saying that this would be problematic in terms of climate policy, but it would probably be acceptable on a temporary basis in the situation of a gas supply crisis.
In the case of Germany, Russia's gas imports accounted for 59% of total gas imports in 2021 (Federal Statistical Office, 2022; see Annex 1). For Russia's export revenues and also for the financing of the state budget, however, gas exports are less decisive than Russia's oil exports.

An Optimal Gas Energy Import Tariff of the EU vis-à-vis Russia

Several economists have suggested imposing import taxes on Russian energy deliveries to the EU and the Western world, respectively (see, e.g., Hausmann (2022) who has advocated a 90% import tariff). Daniel Gros (2022) has considered the problem in a refined theoretical framework where EU countries face a Russian monopoly exporter. What is the welfare-maximizing optimum import tariff from an EU perspective? This question is posed in an implicit three-country perspective with the EU, Russia and Asia - where the latter represents part of world energy demand. The main findings in the analysis of Gros (2022) who uses a linear model to analyze natural gas markets – with Gazprom as Russia's monopolist exporter - are as follows:

- One half of the import tariff will result in higher prices for EU consumers while the tariff revenue would be more than sufficient to compensate consumers for this loss.
- The EU tariff which maximizes welfare for the European Union would be close to 1/3rd of the price at which the EU would stop importing from Russia; and this would reduce Gazprom's net revenues by about half.
- If the import tariff is to be used as a sanctions instrument to reduce revenues for Russia, the tariff should be higher – about 60 percent. This would cut Gazprom's revenues to one fourth of the free trade level.

From this perspective, an EU import tariff on Russian gas would have a considerable effect on Russia's earnings from natural gas exports and would improve the EU's terms of trade. According to this conclusion, it would be adequate for EU countries to impose an import tariff on Russian gas deliveries. There are, however, two counter-arguments against an import tariff:

- Firstly, Gazprom is not really a monopoly supplier and does not maximize profits; instead Gazprom may be understood to act in line with the Russian government's goal, namely to inflict maximum damage on the EU – hence a net price reduction, price net of the tariff – should not really be expected.
- Secondly, the natural market in the EU is not so much a monopoly situation (with Gazprom as the monopoly supplier), but rather it is characterized by an oligopoly. If Gazprom's supply of gas to Germany/the EU would be reduced, the mark-up of other suppliers would increase in the medium term - for additional quantities delivered; and the other large gas suppliers might also try to adjust existing long-term contracts and the respective price in those contracts so that the gas price will indeed increase as will mark-ups which means an economic advantage for Norway, the Netherlands and Algeria plus the US and Qatar as major LNG producers.
- If one was to consider a duopoly model of the EU gas market in which Gazprom is the Stackelberg market leader before 2022 (whereby other firms follow Gazprom's production decision as the leading Russian gas exporter), while after Spring a supplier of liquefied natural gas (LNG), for example from the US, emerges as the new Stackelberg market leader, numerous interesting findings emerge (Roeger/Welfens, 2022b): An EU import tariff on gas from Russia leads to a price increase for gas in the EU that is equivalent to one-quarter of the import tariff and also one-quarter of the cost difference of the new LNG market leader to the old market leader, namely Gazprom.

Under Gros' monopolist approach, the price increase after the imposition of a tariff is half of the tariff amount. Gazprom's sales volume falls relatively sharply (also more sharply than in the case of a gas import tariff and unchanged market leadership of Gazprom), which tends to dampen tariff revenues. Russia's current account position deteriorates due to reduced gas export revenues. This effect is nevertheless relatively small in terms of the revenue side of the Russian state budget; beyond taxes, Russia's state budget is strongly shaped by the oil sector (for details, see Yermakov/Kirova, 2017).

An import tariff on the part of the EU imposed on natural gas from Russia would therefore ultimately be borne entirely as an additional burden by consumers and in part by industry using natural gas; the proposals of Hausmann/Gros for a gas import tariff therefore do not make sense. Also, one may add with respect to the Gros approach that the benefits for the EU could clearly be reduced if the Russian government would adopt countervailing import tariffs on EU exports or would react with, for example, a wave of Cyber-attacks against EU governments, firms and other institutions. Russia would, of course, run the risk of facing digital counter-attacks by the West. There is indeed quite some risk that all this could end up in an escalation spiral which would inflict massive economic losses on both Russia and the West, including a major recession for both Western countries and Russia.

4. Russia Energy Import Boycott by Germany and the EU as a Policy Option?

In a study published in March 2022, several scientists examined how a possible boycott of Russia's energy imports by Germany would affect the German economy (Bachmann et al., 2022) – according to their findings, a decline in real GDP of 0.5 to 3% is expected. Compared with the 4.5% drop in GDP in Germany in the Corona recession of 2020, this initially appears to be a tolerable price to pay for an intended weakening of Russia's economy and its ability to increase military spending and continue the war of aggression against Ukraine. It should be borne in mind, however, that Russia could forestall a boycott of energy imports by Germany, for its part, by a implementing a partial or complete boycott of supplies of oil, gas, coal, and grain, and that Russia, moreover, could sell quantities of oil, gas, and coal that can no longer be sold in Germany at price discounts in the rest of the world economy. Incidentally, the modeling carried out by Bachmann et al. is not really a standard macroeconomic model as it is based on growth decomposition which is an approach which is not really adequate for the problem under consideration. Of particular analytical interest could be a modified DSGE macro model with trade and direct investment (Roeger/Welfens, 2021; 2022a), which consistently covers complex international effects or adjustment paths. In the event of an energy import embargo, the German Bundesbank (2022) simulates a loss of real income of up to 5%; in addition, inflation would be 1.5 percentage points higher in 2022, and in 2023 there would be an additional inflationary push of a similar magnitude.

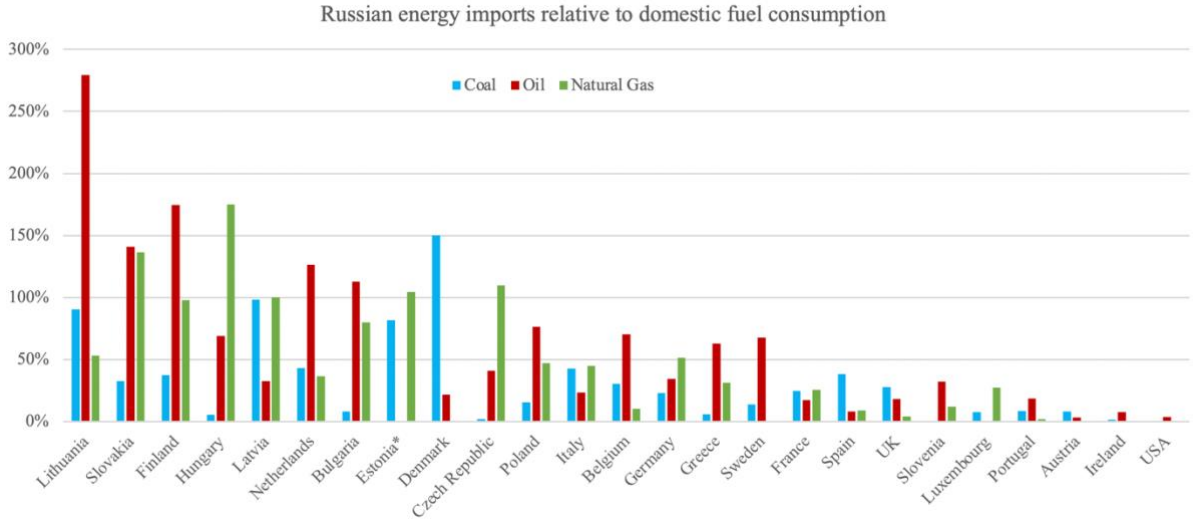
If the EU were to impose an oil import boycott on Russia, Russia would be able to sell its surplus oil at acceptable discounts in Asia, for example.

In the case of oil, Russian price discounts are likely to be low because of the integrated global market, while high price discounts are to be expected in the case of gas, since customer countries are supplied via pipelines - and only in part via LNG ships. Pipelines from Russia to China, for example, are unlikely to have any reserve capacity to cope with surplus Russian supply in the event of an EU energy import embargo against Russia.

The largest dependencies on Russian supplies in the total energy supply in 2019 were in Lithuania, Hungary, Slovakia, and the Netherlands, with Russian shares of over 60% (OECD, 2022; see Fig. 9); these were followed by Finland, Austria, Greece, Poland, Latvia, Belgium,

Germany, Italy - the latter two with a Russia share of about one-third – and Czechia. Denmark and Sweden, amongst others, are less dependent on Russian supplies and did not purchase any natural gas from Russia in 2019.

Fig. 9: The Share of Russia in Total Energy Import Supply for Selected Countries, relative to domestic consumption, 2019.



Note: Figures above 100% may include a) transit volumes, b) stocks and/or c) import of crude oil, its refining and subsequent oil exports. * Estonia shows negative values for oil (-4574%, set to 0% here) due to statistical processing of oil shale liquefaction processes. Due to the structure and definition of energy balances, the TES for crude oil is negative as it picks up exports but not production. This methodology is only applied for these two years, but will be extended to all time series in the forthcoming IEA statistical release.

Source: Own presentation based on OECD (2022), data from IEA: Reliance on Russian Fossil Fuels, online: https://www.iea.org/data-and-statistics/data-product/reliance-on-russian-fossil-fuels-in-oecd-and-eu-countries.

For a realistic assessment of an energy import boycott against Russia, it is important to model the adjustment reactions on the part of Russia and Germany in a meaningful way. This is not the case in the paper by Bachmann et al. as retaliatory measures by Russia and labor market reactions in Germany are not included in the authors' model. The decline in real income in Germany in the event of an energy import boycott will not be around €1,000 per capita, as Bachmann et al. claim, but rather between €1,500 and €2,000, or a good 5% of GDP, which is higher than in the Corona recession year 2020. A severe recession in Germany will have a clearly negative impact on economic development in the Netherlands, France and Belgium - and from there will be corresponding negative repercussion effects on Germany.
The energy shortage occurring in Germany is likely to drive up the price of electricity in the medium term, with increased German replacement demand for gas from Norway, the Netherlands, Algeria, Qatar or the US, for example, also likely to temporarily increase the price of gas and, moreover, the price of electricity throughout the EU. Other main global exporters of gas are Australia, Malaysia and Indonesia, which, however, mainly supply the markets in Asia (Germany's gas exports, in turn, will be close to zero in the event of a Russia energy import boycott, as domestic production is consumed domestically, provided existing international supply contracts can be terminated).

5. Russian Gas Supply Boycott Against European Countries

In 2021, Russia has a world market share of 17% for gas and 13% for oil. Russia threatened a gas supply boycott in late March in response to Western countries' refusal to pay for energy imports from Russia in Rubles as demanded by President Putin. A Goldman Sachs study in early March analyzed such an eventuality - which was deemed unlikely - and produced the following main findings (under three scenarios, one being a halt to gas exports by Ukraine, another being a complete supply boycott in 2022); first, the case of a partial Russian supply boycott:

- Real income in the Eurozone will fall by 0.6% compared with the baseline scenario (excluding the supply boycott), and by 0.1% in the UK.
- In Germany, real income will fall by 0.9% due to the relatively strong dependence on gas supplies from Russia.

In the case of a complete boycott of deliveries to the Eurozone, the real income effects are:

- -2.2% decline for the Eurozone;
- - 3.4% for Germany and -2.6% for Italy.

In addition, the inflation rate in the Eurozone will rise by 1.3% compared with the baseline scenario. A Russian halt in gas supplies to EU countries will initially affect three sectors in particular, and then indirectly at least one other important sector:

- The chemical industry (including fertilizer production)
- the food sector;
- the steel sector;
- indirectly negatively affected: Automotive sector.

If steel production comes to a complete halt due to a lack of natural gas supplies in Germany, for example, then almost all automobile production in Germany will come to a standstill within a few weeks; it is not only production problems that will cause the automotive industry in Germany (or the EU automobile industry in the event of a supply boycott against the entire EU) to shrink, but also the declining demand for consumer durables, including automobiles, as unemployment rates expectedly rise. In Germany, one in six jobs in the automobile industry is linked to the automotive sector. In the event of international supply cuts, the emergency gas plan in place in Germany provides first of all for industrial companies to expect supply shortfalls for natural gas in accordance with rational economic logic; only secondarily do private households come into focus, where supply shortfalls will then lead primarily to heating problems for around one-third of households. On March 30th, 2022, the first stage in the emergency plan gas was declared in Germany for the first time. There is another warning stage - where the markets still secure the supply - and finally a third stage, where government intervention and orders manage the gas shortage politically.
It is easy to imagine that millions of private households and thousands upon thousands of companies, fearing problems with regard to heating with natural gas in winter, will buy and install electric heaters by the millions, which without government regulation in the field of electric heating could then temporarily lead to a collapse of the power grid. Even conceivable record orders for solar panel installations at private households and companies will only be realized to a small extent within a few months and, of course, only at increased prices.

Hecking/John/Meiser (2015) examined a gas supply disruption for Germany and EU countries in three scenarios early on, assuming a Russian supply boycott for three, six, and nine months, respectively. Two key findings of the study were that a three-month boycott could be faced without major problems in Europe, except for Bulgaria, Poland, Turkey, and Finland; in the case of a nine-month supply boycott, however, Germany, Italy, France, and many Eastern European countries would face significant economic problems.

As for the economic impact of a gas supply boycott of OECD countries by Russia, which can be categorized as halving Russia's world market share in gas, this would result in quite substantial price increases - with international regional differences, since gas markets are not globally integrated unlike oil markets. Hamilton (2022) has pointed out that during the OPEC price shocks of the 1970s, the decline in world oil supply was 7% in 1974 and 4% in 1979, both of which were roughly accompanied by a quadrupling of oil prices and a severe recession in the US (and many EU countries as well as Japan); Hamilton blames the recession in the US on a sharp decline in automobile demand in the wake of sharply higher crude oil prices - which significantly worsened consumer sentiment. Of course, increased spending on energy on the part of households in the short-term means that demand in many other markets declines, with an increase in the unemployment rate in the case of nominal market rigidities (inflexibilities hinder very rapid adjustments in terms of structural change). The price elasticity of gas demand in OECD countries will be lower than for oil in the short term, so that substantial price increases can be expected for both companies and consumers. In addition, most gas is supplied internationally via pipelines, so there will also be larger price differentials internationally. A strong gas price increase in the EU will allow EU companies to realize increased import shares for liquefied natural gas; for Germany, this is only a partial relief because LNG terminals are mainly found in Spain, France and Italy and because the intra-EU gas transport infrastructure is largely lacking.

In terms of the EU as a whole, a Russian gas supply boycott could only be sensibly countered through a combination of gas demand reduction measures, on one hand, and supply increases from other countries on the other. Gas price increases in the EU will be part of the market-based adjustment processes (even if Spain and Portugal, for example, want to introduce state price caps, as emerged at the EU summit in Brussels at the end of March 2022). Complete international substitute supplies for gas from Russia, which are conceivable in principle, appear to be unrealistic (McWilliams et al., 2022):

- LNG capacity in many EU countries is limited, as are intra-EU gas export opportunities. LNG shipping capacity is limited in the short term (however, most contracts are such that the port of destination can be changed - here, wealthy EU countries could probably then also prevail in competition in a number of cases).
- In the case of international LNG exports, countries in Asia and the long-term supply contracts concluded there are important; it is hardly likely that larger LNG export volumes from Asia to the EU can be diverted in the short term, especially since the markets in Asia will continue to grow in importance in the long term.
- If rising EU LNG imports continue to drive up gas prices in the European Union, this will weaken the economy via rising energy prices.
- An intra-EU distribution of additional LNG, co-organized by the European Commission, will in many cases lead to political conflicts within the EU; especially since Ukraine is also likely to have to be supplied.

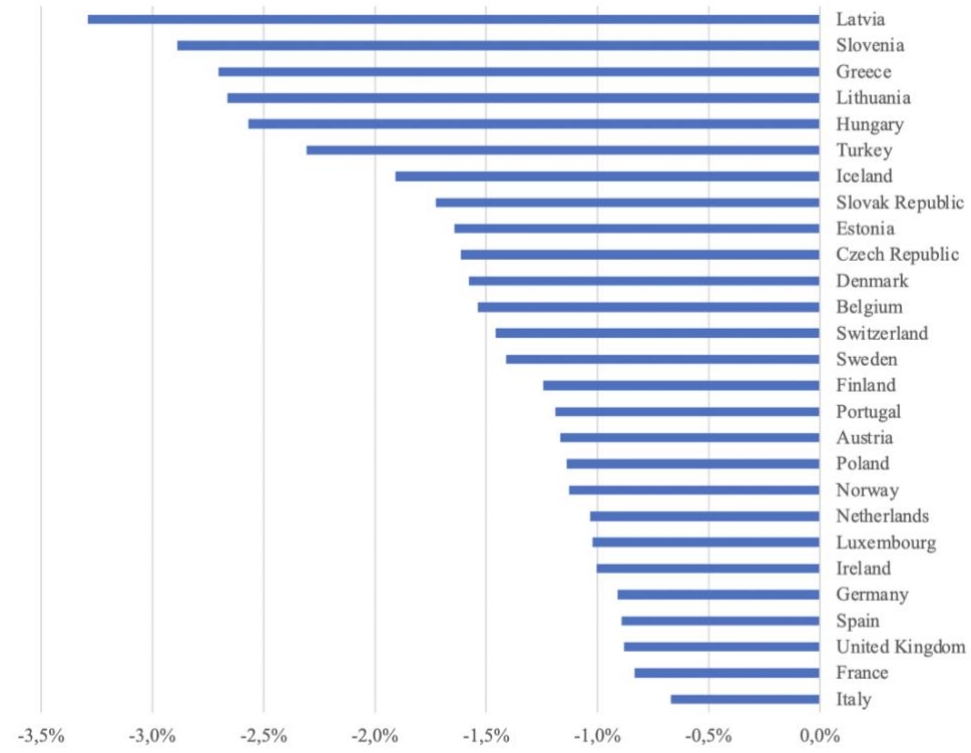
Before turning one's attention to focus on the option of a broader German or EU import embargo vis-à-vis Russia, one should analyze the option of an import tariff on Russia gas.

OECD Modelling of an Energy Import Reduction and Bachmann et al. Study

The OECD (2022) as an international economic organization has simulated the effect of a general 20% energy import reduction for individual industrialized countries on the basis of the NiGEM model (the above effects are not included). For a 40% energy import reduction - which would represent an energy import boycott in several EU countries - the magnitudes shown in the figure are to be doubled if real income declines, which for some countries would amount to real income falling by 2% to 4.5%. For Germany, the decline would be around 1.9%, for Spain, Italy and the Netherlands, the decline would be around 2.5%. The OECD model results depend to a large extent on the assumptions about short- and medium-term elasticities of substitution, which the OECD apparently sets relatively high - namely, in line with standard models, which, however, tend to focus on long-term adjustment processes (in the OECD's 2022 study, this issue is difficult to trace). The OECD simulation results on income declines in the context of a 20% energy import reduction are probably a much too optimistic estimate of income declines in OECD member countries (see Fig. 10, based on a figure from the OECD Economic Outlook, Interim Report March 2022).

Fig. 10: Expected Real Income Loss with a 20% Decline in Energy Imports (based on OECD, 2022)

Percentage change in gross output from a 20 per cent reduction from imported energy inputs



Note: Based on a reduction of 20% of direct and indirect imported energy inputs from fossil fuels, refined fuel products and electricity and gas supply.
Source: Own calculations based on OECD (2022), Fig. 6. Data from OECD IOTs 2021 database.

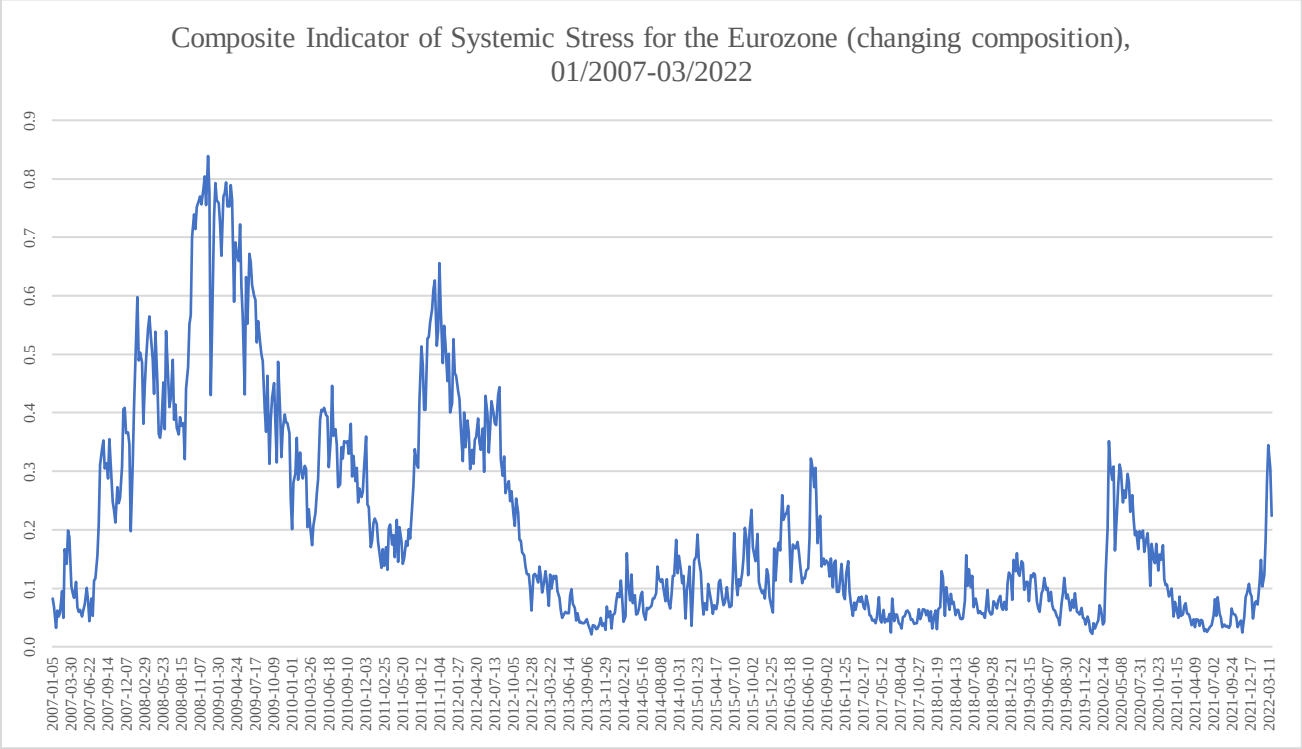
The modeling used in Bachmann et al. (2022) has significant shortcomings and a total of seven weaknesses as a result of an overly narrow view of the problem, the shortcomings in terms of

macroeconomic modeling (little beyond a growth decomposition approach), and a flawed model assumption for employment, can be identified:

1. It ignores the fact that Russia will take economic retaliatory measures against Germany - or the EU as a whole; increased Russian import duties, for example, could significantly depress German exports to Russia. The real drop in income could reach around 0.1% of GDP for Germany.
2. Russia could nationalize the assets of German companies in Russia in response to a German energy import boycott. The stock of German direct investments in Russia amounts to about €20 billion, which corresponds to a good 0.5% of German real income.
3. The economic modeling employed by Bachman et al. is essentially such that domestic demand or the supply of goods is depicted as dependent on the use of energy, capital and labor; an energy boycott is modeled in such a way that energy use decreases. However, the use of capital and labor remains unchanged, which is especially implausible in the case of labor input. If labor input declines by 3% (with real income declining by 3%), this implies an additional real income loss of about 2%. However, it can be assumed that the energy price increase associated with an energy boycott and the related electricity price increases as well as the energy shortage - for instance in the chemical industry - will lead to declining goods production and increased unemployment. IHS (2014) studied the sectoral effects of a relative electricity price increase for Germany and identified significant production declines in the chemical industry as an effect. The IHS (2014) study showed how many additional jobs depended in each of the metal production, chemical/pharmaceutical production, mechanical engineering, and automotive sectors for every 100 direct sector jobs: 190 additional jobs in the automotive sector, 178 indirect jobs in the chemical/pharmaceutical production sector, and an additional 138 and 96 jobs in the metal construction and mechanical engineering sectors, respectively. The IHS study found that Germany's major export sectors are relatively energy-intensive and that increased gas production in Germany could increase international competitiveness; and that electricity price increases in industry would reduce the competitiveness of important sectors and thus result in significant direct and indirect job losses.
4. The decline in real income considered by Bachmann et al. for one year will be accompanied by (reduced) dampening effects on economic development in Germany in subsequent years if real economic adjustment reactions in some sectors are sluggish; in the following year, the decline in real income could amount to another 0.5% to 1% (see Annex 16 on some key modeling aspects of the approach of Bachmann et al.). Incidentally, Russia could stop gas exports to the majority of EU countries in response to a German energy import boycott against Russia and then also plunge Ukraine into serious winter-related problems by refusing to export gas, whereby the government of Ukraine will certainly rely on compensatory gas exports from the EU to Ukraine - a serious economic, logistical and political problem then arises here, which has apparently not been discussed at the European Commission nor the European Council by the end of March 2022. One also has to consider that Russia's output – expected to decline without a German/EU energy embargo by about 11 percent in 2022 (World Bank, 2022) – would further reduce in the case of a Western energy import embargo which will have considerable negative spillover effects on real income in countries in the central Asian countries where two countries had remittances from Russia exceeding fifteen percent of national income in 2021 (ADB, 2022); migrant workers in Russia will lose their job in many cases as a consequence of a major recession in Russia and hence remittances could fall considerably which in turn undermines economic and political stability in central Asian countries. These aspects have also been neglected by Bachmann et al.

5. There will be negative repercussions of the economic slump in Germany on Germany's main trading partners, i.e. the Netherlands, France, US and China - from which there will then be negative repercussions on Germany's export and economic development. These repercussions are likely to amount to a German real income loss of 0.3% of GDP.
6. Germany will be expected to contribute to the stabilization of Ukraine's gas and electricity supply; this means a medium-term cost of 0.1 of Germany's GDP.
7. Volatility on euro financial markets increases - measurable by the CISS indicator (Composite Indicator of Systemic Stress) of the European Central Bank (Hollo/Kremer/Lo Duca, 2012; Kremer, 2016; see Fig. 11) - which can have a negative impact on real economic development. The CISS value in the crisis month of March 2022 was similar to that after the negative result in the UK's EU referendum in June 2016, but it was lower than in the Transatlantic Banking Crisis. If there were a gas supply freeze by Russia in the short term or a German energy import embargo from Russia, the CISS fluctuation indicator for Eurozone financial markets would likely rise significantly: Negative financial market impulses or declines in real income are then to be expected - among other things, due to increased risk premiums in the corporate sector - via reduced investment in the industrial and service sectors or due to an increase in friction on financial markets; these are likely to amount to around 0.5% of national income. A negative correlation between the CISS indicator value and growth risks in the Eurozone was shown by Figueres/Jarocinski (2020). In the context of an updated CISS indicator concept, Corona shock experiences in financial markets are included, which increases the economic relevance of the (modified and thereby daily updated) indicator.

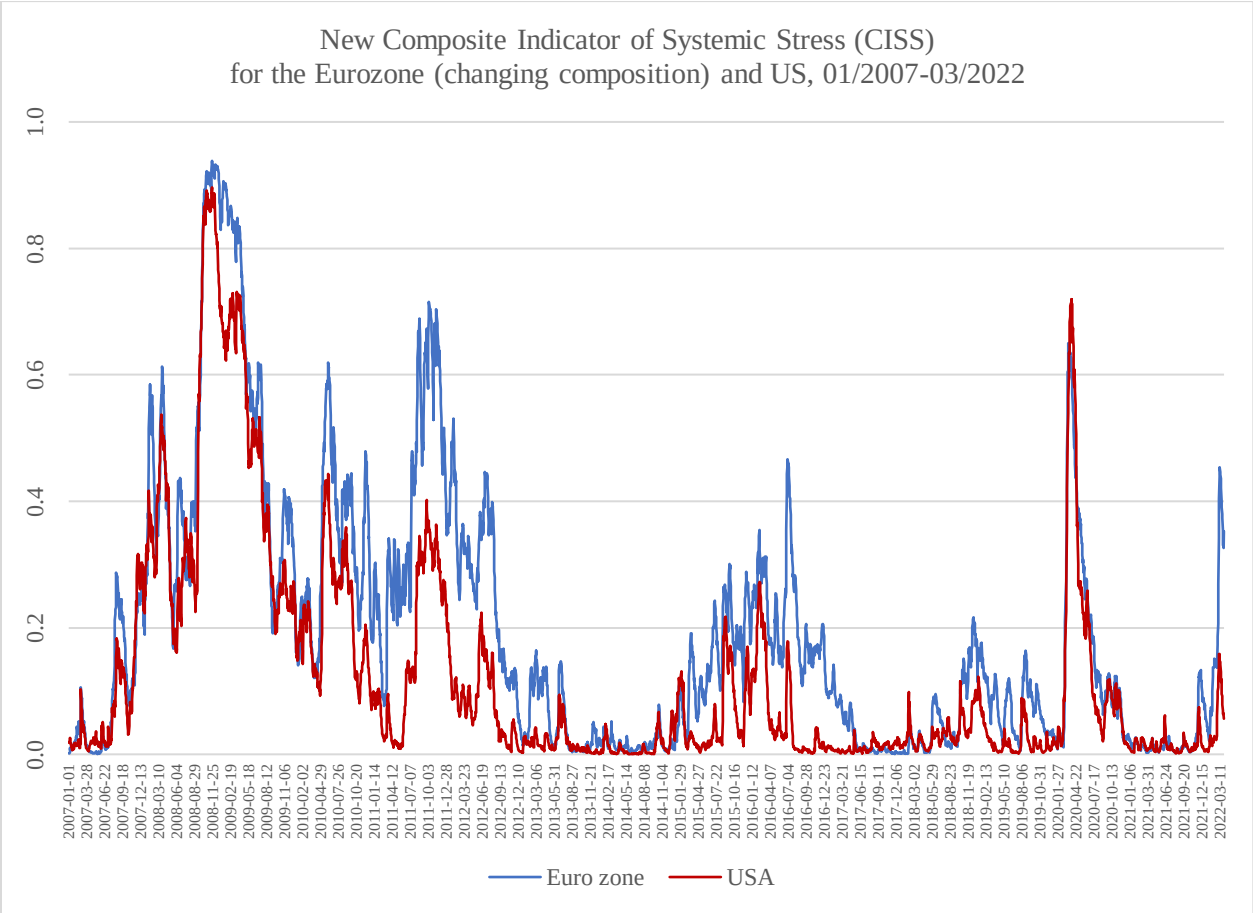
Fig. 11: European Central Bank's CISS Indicator for Financial Market System Stress in the Eurozone, January 2007 to March 25th, 2022.



Note: Weekly index data for Jan 5, 2007, until March 25, 2022.
Source: ECB Statistical Data Warehouse, Composite Indicator of Systemic Stress (2022), EIIW Graph.

In the updated CISS indicator concept, it can be seen from the comparison of the CISS indicators for the Eurozone and the US that the Russia-Ukraine war has led to higher volatility in the system stress indicator for the financial markets in the Eurozone - compared with the US. Accordingly, the growth risks arising from financial market volatility in the spring of 2022 in the context of the Russia-Ukraine war are relatively high in the Eurozone (Fig. 12).

Fig. 12: Development of CISS in the US and the Eurozone (daily values, 2019 to March 30th, 2022)



Note: Daily index data from Jan 1, 2007, until March 31, 2022.
Source: ECB Statistical Data Warehouse, Composite Indicator of Systemic Stress (2022), EIIW Graph

A serious problem for Germany is that the inflation rate rose to 7.3% in March 2022. In the event of an energy import boycott by Germany (or the EU), massive further increases in energy prices could well cause the inflation rate to temporarily reach double digits. In this case, there will be temporary employment gains - in line with the logic of the Phillips curve - as real wage rates will unexpectedly fall in 2022. The state is also likely to be an inflation winner, insofar as the pension increase planned for 2022 is likely to be negative in real terms, both in western and eastern Germany.
IMK simulations (Behringer et al., 2022) with the NiGEM model show that a German import freeze of Russian energy leads to a 6% decline in real income, which is twice the worst-case value in Bachmann et al. (2022). One important question concerns the price elasticity for natural gas, which is estimated to be around -0.2 in Auffhammer/Rubin (2018): A 1% price increase leads to a 0.2% decrease in the amount of gas consumed. The IMK analysis interestingly points out that for private households that transitioned from a favorable gas supply of 6 cents/KWh after the bankruptcy of the previous supplier or provider to the standard supply of the local

provider - at the increased price of about 34 cents/KWh - gas demand should have fallen to zero; this was apparently not the case. The assumption in Bachmann et al. that expansive fiscal policy (i.e., demand policy) can compensate for the shock effects of a supply disruption in the context of an energy import freeze from Russia - as it is primarily the chemical, steel production and food production sectors that are negatively affected in production - in such a way that full employment is maintained is completely implausible. Job losses of 2 to 6% - as a rough calculation is a realistic scenario in the event of an energy import embargo - would mean up to two million more unemployed persons in Germany, which in turn would have a negative impact on overall economic demand and thus also a further decline in real GDP.

After all, Bachman et al. (2022) consider the challenge that relatively poor households may be particularly hard hit by gasoline price increases. In this context, they suggest that the state should compensate these households via higher transfers. However, one certain challenge is known from the US in this problem context: 10% of households have no gasoline expenditures at all, while again another group of households spends more than 10% of income on gasoline (Hamilton, 2022). If one simply compensates poor households, this governmental measure would not be very well targeted.

Effects 2) to 7) in Table 5 below are not considered in the OECD study or in the study of Bachmann et al. (2022). A plausible overall effect here is considered to be a real income loss for Germany of up to -6.5%, which is equivalent to a recession shock as in the case of the Transatlantic Banking Crisis and is higher by order of magnitude than the real income decline experienced during the Corona shock year 2020. Moreover, welfare losses due to the inflation increase that occurred because of the Russia-Ukraine war - order of magnitude 2 percentage point increase in inflation - have to be added, which will increase political discontent in Germany. This assessment is based on fundamental insights of the New Political Economy on the behavior of the electorate, although one has to take into account a certain sympathy bonus for the government as a Ukraine as a special effect here. The Bachmann et al. study is important for the debate on effects of an energy import boycott, but the study is clearly too optimistic with regard to the drop in income for Germany.

Tab. 5: Expected Loss of Real Income in the Event of a German Energy Import Boycott against Russia (DE=Germany)

The main effects of an energy import boycott by Germany - assuming retaliatory measures by Russia	***Impact on real income in Germany (including economic international real repercussions and asset losses as % of German GDP)***
1) Economic base effect of a German energy boycott according to Bachmann et al. (2022)*.	-0.5% to -3% (the size of the effect depends on the elasticities of substitution in goods production); -0.5% and also -1.5% income decline are unrealistic (see OECD, 2022)
2) Tariff increase by Russia	-0.1 %
3) Nationalization of many subsidiaries of German companies in Russia	-0.5 %
4) Rising unemployment, which will lead to a decline in real GDP (and national income). Moreover: in the following year, there will also be an increase in the unemployment rate	-0.3 to -2%
5) In the case of Germany: Retroactive effect of international real negative cyclical effects	-0.3%
6) Stabilization of gas and electricity supply in Ukraine	-0.1%
7) Volatility on the financial markets in the euro zone increases; hence rise in risk premiums for companies	-0.5
8) TOTAL EFFECT (incl. maximum)	**3.3% -6.5% Real income decline**

**For comparison: If one takes the economic base effect according to OECD (2022): 40% decrease in energy imports = Russia boycott, this would mean - 1.9% in real gross domestic product. Deutsche Bundesbank figures (2022) come up with an output decline of 5% under adverse conditions. The Bachmann et al. paper is useful in the overall debate, a deeper analysis would require a special paper.*

It is unclear what the effects will be on the real exchange rate. If one assumes that, in the event of an energy import boycott, Germany's companies will have to buy natural gas and coal on the world market at significantly higher prices, a devaluation of the Euro can be expected, which will stimulate Germany's and the wider Eurozone's exports; in other words, it will also increase real GDP. The Eurozone could also expect increased inflows of direct investment from the US, the UK, Japan and other non-Eurozone countries in the event of a real devaluation, because, according to Froot/Stein (1991), a real devaluation brings an increase in direct investment inflows - in the context of imperfect international capital markets and essentially in the form of more international acquisitions and holdings by multinationals from abroad. However, FDI inflows in EU countries geographically close to Russia are expected to decline: For these countries, the political-military risk is increasing with a view to a possible future attack by Russia.

In favor of an appreciation of the Euro is a possible reaction in imports - excluding energy - which could fall overall as a result of the recession; at the same time, export companies are likely to try to increase their exports in the recession. The real exchange rate effect in the Eurozone could be roughly neutral. The economic costs of an energy import boycott should therefore be estimated to be at least 5%-6% of national income in Germany, i.e. about twice as

high as calculated by Bachmann et al. and thus the expected decline in real income is actually higher than in the Corona recession of 2020.
A 6% drop in real income in Germany in one year via an energy import boycott means that there may still be a significant risk of recession in the following year. In the first year of the boycott, such a massive recession in Germany will also have a significant negative impact on the Netherlands and France, as well as Belgium and other EU countries, resulting in a negative amplification effect on the recession in Germany (via a reduction in exports to these countries). Such dynamics must be considered in a macroeconomic analysis.
A sharp multi-year decline in real incomes and rising unemployment rates regionally are likely to be reflected politically in an increase in the votes of radical parties in Germany; and this even if politicians decide to make higher transfer payments to the poorest households in conjunction with an energy import boycott against Russia. If, on top of this, there is a very strong movement of refugees from Ukraine, the increase in the vote shares of radical parties could increase even further. In any case, the conceivable political destabilization effect in the context of the Russia-Ukraine war and conceivable measures by the German government against Russia should also be considered in the boycott debate.
Germany is not very capable of diversifying its energy imports in the short term, in particular in relation to gas imports. What has been neglected for many years cannot be implemented within a single year. Building an LNG terminal will take three years or more, and expanding the EU gas pipeline network will also take several years of construction. Ultimately, an energy import boycott by Germany against Russia would only marginally help Ukraine in its war against Russia. The claim that Germany is in fact a major financier of Russian warfare in Ukraine through energy imports from Russia sounds good; however, it does little to convince in the short term. Russia's army uses existing armaments, pay and the supplies of provisions to Russia's soldiers do not require the import of goods from the West or Asia - for that, corresponding foreign currency revenues would be needed.
Weapons supplies from the West will be decisive for the outcome of the war. In the medium term, Germany and the European Union can import more natural gas, especially from Norway, Algeria, the US, Qatar and the United Arab Emirates.
For Russia, both boycott cases result in falling oil, gas and coal prices in the rest of the world and domestically, although Russia could temporarily counter the loss of exports, sales and revenues by increasing production rates. In fact, the net effect of international negative price and positive volume developments is likely to be negative in Russia's real income in the medium term, especially as Russia faces further share price declines in the medium term - dampening investment. The price reduction effects in Russia could be significant, as shown for example by the purchase of Russian gas at the beginning of February 2022 at the current market price, which had fallen by around $20/barrel below the world market price in Russia or for export to Shell. However, political pressure in the UK on this deal then prompted Shell to set aside up the special profits realized as an aid fund for Ukraine.
The EU is faced with new tasks, for example in the form of a reduction in oil and gas imports from Russia or the expansion of pipeline networks - including from Spain to northern Europe, where it has not yet been possible to benefit from the large Spanish liquefied natural gas landing capacities. Spain accounts for about one-third of the liquefied natural gas landing capacity, but an unfinished gas pipeline to France could be completed within three to five years, for which Spain requires special EU funding (Louven, 2022).
In Germany, the storage situation in spring 2022 is a cause for concern, as the average fill level was only around 30% - with particularly low fill levels for gas storage facilities owned by Gazprom. Under Chancellor Merkel, the German government allowed Gazprom, the main gas supplier, to acquire substantial storage capacity in Germany. In doing so, the German government failed to enact reasonable regulation in the gas storage business; for example, a minimum fill level of 70% by October 1 of each calendar year.

The global economy will face an increased challenge in the politically desired path towards climate neutrality in the medium and presumably also the long term due to the price reduction in Russia and increases in the production of oil, gas and coal considered here. As a result, the Ukraine war would not only lead to increased international military uncertainty - for example in terms of international border vulnerability - but would also have a negative global climate effect (external effect) and, in addition, world real income could also decline if the negative effects of production in Ukraine, Germany and its main EU trading partners (the Netherlands and France as well as Belgium and Italy) were to lead to an export dampening effect outside the European Union. However, such an effect may be counteracted by the relative cheapening of energy in the rest of the world economy.

A gas boycott would have a significant impact on the German economy, as not only private households would suffer in terms of temporarily increased heating costs and electricity generation from gas-fired power plants, but also the chemical industry, which uses natural gas as a basic material for many production purposes. A German or Western energy import boycott of Russia would therefore certainly also have a negative impact on exports from the chemical industry. Moreover, such a boycott would be historically quite unique and would therefore create a massive international trust problem in international trade agreements (the US effectively imposed an oil supply boycott on Japan in 1941, which Japan responded to by bombing Pearl Harbor, leading to the Americans' entry into World War II).

6. Asia and Global Effects of an EU Energy Import Boycott on Russia

If Germany - or the EU27 - decides to impose an energy import boycott against Russia, it would – historically speaking – be a rather unique case of economic warfare, affecting international oil, gas and coal markets and resulting in increased difficulties for Russia's economy. As for Russia's oil, where the country stood for 13% of the world market share in 2021, the Russian government could sell volumes no longer sold in the EU elsewhere, notably to Asia – e.g., China, ASEAN countries (excluding Singapore, which as the only ASEAN country, fully participated in Western sanctions against Russia as of March 2022). After the US stopped importing oil from Russia in mid-March, Russia was able to sell surplus oil to India, albeit at a good $20 per barrel discount on the world price. If Germany or the EU were to boycott oil imports, Russia would certainly be able to sell surplus oil to Asia at an even higher discount: Probably in the range of $30 to $50 per barrel. However, as long as the world market price is around $100, Russia can absorb such price reductions. A relatively cheaper oil price in Asia then means a stabilizing effect for China and the ASEAN countries as well as other emerging industrial markets in the world economy, counteracting the negative economic effects from the US, the EU, Japan, Republic of Korea and Taiwan.

The sharp rise in oil prices on the world markets in 2022 will on the one hand stimulate oil production in the US - with some time lag – and, on the other hand, the increase in the US inflation rate due to rising energy prices will prompt the US Federal Reserve to gradually step up its policy of braking or raising interest rates. The high world market prices for oil and the increased regional gas prices - especially in Europe - are causing increased inflation rates in North America, the EU, the UK, Switzerland, Japan, Republic of Korea and other countries. There is a risk that the long-standing low inflation rate expectations will break from their anchor values of around 2% in the Western industrialized countries and that a wage-price-wage spiral will develop - with then significantly increased inflation rates over several years and corresponding welfare losses.

The link between higher energy prices and rising inflation rates is not necessarily inevitable, but in industrialized countries in particular, compensatory declines in the prices of other goods

are hardly to be expected, since prices are not very flexible on the downside in many markets and because energy is, of course, a production factor in almost all goods and in most services. The economic significance of an oil price shock in the 2020s is less than in the 1970s - the times of OPEC price shocks (such as the OPEC oil embargo in 1973 and the Khomeni revolution in Iran in 1979, both of which led to large supply shortfalls on the world market, namely by about 7%) - because of long-term declines in energy intensity; but in terms of cost pressure effects, sharp increases in energy prices cannot be ignored in the economy as a whole.

Relatively rising oil prices will also reduce automobile sales in OECD countries and the production of the automotive industry, which was already characterized by problems in its logistics chains even before the Russia-Ukraine war (think of the delivery problems of chips for the automotive industry). Renewable energies and thus also the production of electric cars will be stimulated by oil and gas price increases. High government subsidies for the purchase of electric cars should be reduced significantly and quickly, especially as government budgets in many EU countries and the US and Japan are likely to face increased government deficit ratios in 2022/23. An EU energy import boycott is likely to trigger a recession in several EU countries in the medium term, especially since Russia will probably impose increased import duties or import bans on EU exports.

As the Russia-Ukraine conflict could last for several years, a quick EU energy import boycott, together with the war in Ukraine and Putin's political breach of trust, is likely to weaken global economic expansion for many years to come. Reduced wheat supplies from Ukraine and Russia to the world market will also result in new hunger problems in many developing countries. The Russia-Ukraine war also presents the risk of an internationalization of this war, which would have dramatic consequences for the world economy. In the economic analysis undertaken here, it is clear that, from an overall perspective, the loss of human life and the suffering caused by the war are decisive aspects in the analysis.

Distortions on the international oil and gas markets and the automotive markets, or recessionary effects in many industrialized, emerging and developing countries, could destabilize national and international financial systems. Many oil traders came under liquidity pressures in Spring 2022 because the collateral required from traders on the market for oil purchases rose significantly due to increased volatility in oil prices. Depending on the nature of any financial crisis that may emerge - with potentially strong nonlinear impulses - serious further real economic disruptive effects could emanate from banking and financial systems. This could be compounded by cyber-attacks from Russia to deliberately destabilize Western financial systems and critical infrastructure, which would not go without cyber counter-attacks on the part of Western countries. The risk of Russia and NATO countries becoming directly involved in the war would then increase.

An interesting approach to modeling the economic effects of the Russia-Ukraine war has been presented by a group of WIIW researchers from Vienna - just before Russia's invasion of Ukraine. In the analysis conducted before the start of the Russia-Ukraine war, the authors Astrov et al. (2022a) show the effects a war between Russia against Ukraine could have, namely on Russia, Ukraine and the EU. A distinction is made between a limited attack on Ukraine and a full-scale Russia-Ukraine war, with correspondingly different levels of Western sanctions considered in the study. In addition to a Western energy import boycott of Russia with significant negative effects for Russia and EU countries, the exclusion of Russian banks from the SWIFT system is classified as an effective sanction by the West. Another subsequent analysis by Astrov et al. (2022b) addresses the humanitarian, economic and financial impacts of a Russia-Ukraine war: According to this analysis, the EU will have to deal more with defense issues in the medium term; in addition, an accelerated climate-friendly transformation of energy systems is expected; finally, a weakening of broader European integration is to be expected, and membership prospects for candidate countries from the Balkans are likely to play an increased role in EU enlargement.

In the short term, price changes and higher price volatility have become visible on commodity markets in the Spring of 2022. The first weeks of the actual Russia-Ukraine war have shown that the European gas trade has been affected by the natural gas price increases that have occurred and the increased price volatility: Increased security must be provided by gas traders. Insofar as the natural gas price level - as in Italy and the EU, respectively (criticized by Prime Minister Draghi) - is a kind of lead price level for electricity pricing, reforms are urgent. In the current system, electricity generation from depreciated coal-fired power plants is rewarded with special returns, which is not conducive to efficiency and innovation and which also causes unnecessary price increases for electricity in certain phases.
The high volatility of the gas price in Europe and the increased security deposits of gas traders can lead to serious liquidity problems in gas trading and ultimately to increased risks in gas supply. If natural gas imports from Russia were to be terminated in the short term - for example by Germany or by Russia - this would lead to problems in industry and presumably also in the supply of electricity in Germany. It would be possible to extend the operating lives of the remaining three nuclear power plants for a few years to secure the supply of electricity. In mid-March 2022, Belgium's government decided to set a 10-year lifetime extension for two units of the country's nuclear power plants until 2035.

7. EU-China-Russia

China did not participate directly in sanctions against Russia during the first three months of 2022. However, significant support for Russia from China could fail to materialize in the medium term, as the negative economic effects of the Russia-Ukraine war will have an increasingly negative impact on China. First of all, it should be noted that the Western sanctions are expected to cause Russia's GDP to fall by around 9% in 2022, which initially also means reduced exports from China to Russia; however, it is to be expected that some Chinese companies will also export more to Russia, as they will be able to replace reduced exports from the West and from Japan and the Republic of Korea to Russia. This involves technology-intensive goods on the one hand and luxury goods and automobiles on the other. In March, however, the US government - in talks with China's leadership - highlighted that the country's extensive additional deliveries to Russia will not remain without consequences on the US side; the United States could, for example, impose new tariffs on China's exports to the United States.
A second negative effect for China results from the sharp rise in oil and gas prices in the context of the Russia-Ukraine war. On the one hand, this has a direct economic dampening effect on China, especially on energy-intensive sectors and companies. In the case of natural gas, it is hardly possible for China to increase energy imports from Russia in the short term. Moreover, it can be assumed that Russia will make special price concessions on oil and gas exports to China. In addition, significantly higher oil and gas prices will also have a dampening effect on the economies of the western industrialized countries, Japan, the Republic of Korea and Australia. The cyclical dampening effect that falls away from OECD countries reduces Chinese exports, thus dampening China's real income growth and employment growth.
In a conversation with the then President of the European Commission Barroso, Putin once said that his military could be in Kyiv within two weeks if Russia wanted it to be. As of mid-March 2022, Russia's army had yet to conquer Kyiv, suggesting that Putin and other parts of Russia's political leadership have made a serious military miscalculation regarding the Russian army's Ukraine campaign. The longer the Russia-Ukraine war continues, the higher the cost of economic destabilization in Central Asia and Eastern Europe. Such destabilization effects undermine the prospects of success for China's New Silk Road Initiative: China had indeed intended to be able to significantly increase China's exports or its overall trade volume through

this initiative aimed at modernizing economic actors in Central Asia and Eastern Europe, whereby the rail transport route through Russia, among other things, is of great importance. China's influence in Europe is thus likely to diminish in the long run. Klein (2022) wrote:
"as a Russian vassal state or as a divided state, Ukraine would be a frontline state in a new cold war between Russia and the West. For China, this would be the end of the New Silk Road as a logistics bridge to the EU and also the end of China's geopolitical plans to free itself from the maritime grip of the U.S."
Whether, in an alternative scenario with Ukraine's neutral status guaranteed, China would be able to fully implement its Belt and Road Initiative with great success can be doubted; even if Ukraine were to become an EU member state. The political shock of Russia's war of aggression against Ukraine and Western sanctions against Russia, as well as Russian approaches to nationalizing foreign investors who closed their branches and production facilities in Russia for a period during the war, undermines confidence in expansion projects in Eastern Europe in parts of the rest of Europe - including Russia, of course. Some Western investors will also scale back their involvement in China or allow it to increase only slowly, as one can see in the Russia-Ukraine war a kind of blueprint for a future China-Taiwan war.
If the EU reduces coal, oil and gas imports from Russia, it will create pressure in Russia to export more to Asia. At least in the short term, a reduction in EU gas imports from Russia is unlikely to lead to increased Russian exports of natural gas to China. This is because the gas pipeline from Russia to China was apparently already at its capacity limit in the winter of 2021/22. Building new pipeline capacity from Russia to Asia is likely to take several years.
Presumably, international trade relations will be highly politicized for years by Western countries and Japan, the Republic of Korea, Australia and New Zealand, which amounts to new potential for conflict in the global economy. The influence of international organizations could decline, weakening the rule-based, international trading system.

7.1 Macroeconomic Aspects

EU Macroeconomic Aspects of the Russia-Ukraine War
The Russia-Ukraine war brings about a rise of the oil and gas prices, a decline of trade of EU countries with the Ukraine and Russia as well as disruptions in energy-intensive sectors of certain EU countries (disruptions would strongly affect the chemicals sector, the steel sector and the food sector in the case of a Russian export embargo for gas or an EU import embargo for gas) plus a higher volatility of asset market prices; along with a rise of the unemployment rate in case of major negative sectoral supply shocks – and a rise of the unemployment rate could translate into a recession in major EU countries. Finland as a small country – but with relatively strong trade links to Russia – is also expected to be relatively strongly exposed to the Russia-Ukraine war (see Bank of Finland, 2022).
An expansionary fiscal policy will be a useful intervention only with respect to a demand-driven recession while sectoral supply shocks require accelerated structural change and additional efforts in innovation efforts to create new markets and rising demand. Monetary policy could deal with rising inflation pressure, but a strong rise of ECB interest rates would translate into higher real interest rates in all Eurozone countries and hence weaken economic expansion. A new recession in Italy, France and Germany would bring a broader recession for the whole EU and negative transatlantic spillover effects. Technically, Italy's economy is facing a recession in the first two quarters of 2022. This mild recession in Italy could become much stronger if there should be a German or EU energy import embargo vis-à-vis Russia.
A strong depreciation of non-Eurozone currencies in Eastern EU countries can be expected as a consequence of the Russia-Ukraine war. This will not only bring higher inflation to these countries but also raise foreign indebtedness for the private sector. If this brings liquidity and

solvency problems for firms in key sectors, the stability of the banking sector – already facing problems of low investment and growth dynamics – could be undermined. One should also not ignore the real shock potential of adverse cyber-attacks in EU countries.
Transitorily strong increases of the inflation rate should, in the short term, bring a fall in unemployment along the economic logic of the Phillips curve: Real wages are driven down by unanticipated inflation rate dynamics. However, if there is a negative energy shock to EU countries this supply shock implies a decline of the profit rate and the real wage rate in equilibrium: In the presence of nominal rigidities in labor markets, such a real wage decline should not be expected quickly so that unemployment could rise for some time.
As regards the refugee wave from the Ukraine and the effective rise of immigration numbers from the Ukraine, in many EU countries there should a positive supply-side effect in the medium term as more refugees (workers) from the Ukraine will be integrated into the labor markets of host countries. To the extent that governments in major EU countries are raising military expenditures relative to national income, there will be an expansionary fiscal impulse which, however, to a considerable extent will benefit the US which is expected to sell fighter jets and high-tech military material to many EU countries.
Rising relative prices of wheat and corn – as a consequence of much reduced Ukrainian and Russian exports in 2022 – will be a major challenge for several developing countries. The IMF and the World Bank as well as regional development banks (e.g. the Asian Development Bank and the African Development Bank) will be needed to help cushion these international price shocks. Finally, some newly industrialized countries in Asia are likely to benefit from price discounts on Russian excess oil supplies as many EU countries are cutting oil – and natural gas – imports from Russia. EU countries and the US are likely to face the challenge of helping to rebuild the Ukraine after the end of the Russia-Ukraine war. A kind of Marshall Plan for Ukraine seems to be adequate in the medium term. As long as an authoritarian or dictatorial regime is in power in Russia, Europe and Asia and indeed the whole world economy will face new uncertainties and risks; and more differentiated and higher risk premiums for certain countries and projects can be expected to reflect this in due time.
Among the important drivers of price and volume reactions on international markets are market participants' expectations. For example, if supply problems or cuts are expected for oil and gas from Russia, this leads to sharp price increases for oil (and to a lesser extent for gas - the latter is characterized by long supply contracts), as in March 2022. Wheat also rose sharply on the world market at the beginning of April compared with the previous year - with prices doubling. There were also large price increases in nickel at the end of March, where trading on the London Metal Exchange - in the hands of an investor from Hong Kong - was then temporarily suspended when the price more than doubled within a day.
The British Securities and Exchange Commission allowed trading to resume after an initial failed restart, and the price returned to normal in early April. It is said that a Chinese investor got into serious trouble by taking a large short position in the market (delivery of nickel then in the near future) - made in the expectation of falling nickel prices - and with the attempt to close out his position or to buy large quantities of nickel himself drove the nickel price far up; the market expectation of the Chinese major investor was wrong in that the Russia-Ukraine war caused market prices to shoot up in the short term, especially for nickel. This is because Russia is one of the major producers and exporters of nickel. A fierce Russia-EU economic war, presumably also waged using cyber-attacks, could lead to considerable global economic destabilization overall. Russia's determination to continue the attack on Ukraine is unlikely to be broken in the short term by Western economic sanctions. Western arms deliveries to Ukraine will certainly be more relevant here.
If EU real income falls by 1%, US real income is likely to fall by around 0.2%, and that in Asia by around 0.1%. International economic problems could be exacerbated if there were a boycott of Russian oil, gas and coal exports on the part of the EU as a whole and also on the part of the

US; an exception would be a dampening effect of inflationary pressure in OECD countries, some of which recorded a considerable increase in inflation rates in 2021/22 due to rising energy prices. Russia could also respond militarily to such a massive international boycott, which could include hybrid military actions such as digital disruption actions in Western industrialized countries in a first phase: with quite significant damage to critical infrastructure and production potential in some Western industrialized countries. Incidentally, in the wake of international solidarity with Ukraine since February 24th, 2022, Russia itself has become a favorite target of "protest hackers" from around the world, weakening Russia's economic development, but also potentially causing domestic and international disruption to Russia's critical infrastructure. As for containing inflationary pressures in the West, it is also up to the US to lobby its political allies among OPEC countries to temporarily increase production levels.
The International Monetary Fund addressed the Russia-Ukraine war from the leadership level, the IMF Board, on March 4th and released a statement the next day (IMF, 2022a) which includes for following excerpt:

"The war in Ukraine is resulting in tragic loss of life and human suffering, and is also causing massive damage to Ukraine's physical infrastructure. This has led to a major exodus of more than one million refugees to neighboring countries. Unprecedentedly harsh sanctions against Russia have been announced."

7.2 Multinational Companies with a View to Russia

The development of Russia as a location for foreign companies (direct investments of foreign companies in Russia) and of Russia as a source country of direct investments abroad is characterized by occasionally strong fluctuations and some peculiarities. These include, since February 2022, the fact that numerous companies from Europe, North America and Japan, as well as the Republic of Korea and Australia, have set a course towards the temporary or permanent withdrawal from Russia because of Russia's war of aggression on Ukraine. The 15 largest investors (excluding Cyprus and Bahamas, both of which arguably often stand for "carousel direct investment" - that is, money flowing from Russia, often in the context of tax avoidance or evasion, to these two countries and then from there back to Russia as direct investment) in the list below show for 2020 that there is significant cumulative direct investment from Europe and the United States in Russia. Thus, at the same time, presenting an expropriation potential for Russia's government with regard to investors from European countries and the US.
With the Ukraine war, Russia is facing a tighter sanctions regime from Western countries and Japan etc. In March 2022, many multinational companies from OECD countries have massively restricted or stopped their activities in Russia or even temporarily withdrawn from Russia completely. Russia's government, however, has also threatened to put Western subsidiaries in the country into bankruptcy proceedings if management personnel are withdrawn and activities are temporarily halted, or even to nationalize the assets of foreign investors from certain countries. Such a move is probably to be expected if a Western country or, for example, Japan were to impose an energy import freeze on Russia. If Russia nationalizes the assets of foreign investors, the trust of Western and Japanese investors in Russia's government, built up over thirty years, will be destroyed for many years to come.
The highest direct investment holdings are in the Netherlands, with $97.6 billion (see Table 6), although a significant proportion of this is likely to represent investments from other EU countries and possibly also the US and United Kingdom. This is because the Netherlands is regarded as particularly attractive in view of tax avoidance opportunities with these countries, so foreign investors are active in Russia via intermediate investment in a holding company in

the Netherlands. The Netherlands is followed by Switzerland with $31.6 billion, as well as France and Germany, followed by the United Kingdom, Italy and the United States. A similar caveat to the Netherlands also applies to Luxembourg's direct investment holdings in Russia. Sweden, Finland, Japan, Belgium, Denmark, Turkey and Poland complete the rankings. In the case of France, Germany and Italy, expropriation by Russia's government could still result in asset losses for Western investors of $23.2 billion, $19.6 billion and $14.1 billion, respectively. For the United Kingdom and the US, as source countries of direct investments in Russia, the losses would amount to $15.6 and $12.1 billion, respectively (the respective Euro amounts are about 1/10th less than the dollar figures). For Poland, almost a billion dollars is likely at stake.

Tab. 6: Total Net Outward FDI Stocks of Selected OECD Economies with Russia as a Partner Country in 2020

OECD Rank	Reporting Country	Partner Country	Value in million US$
1	Netherlands	Russia	97,577.62
2	Switzerland	Russia	31,560.26
3	**France**	**Russia**	**23,227.39**
4	**Germany**	**Russia**	**19,613.45**
5	**United Kingdom**	**Russia**	**15,579.89**
6	Italy	Russia	14,125.82
7	**United States**	**Russia**	**12,538.00**
8	Luxembourg	Russia	5,770.03
9	Sweden	Russia	5,677.74
10	Finland	Russia	2,595.41
11	Japan	Russia	2,388.82
12	Belgium	Russia	1,421.03
13	Denmark	Russia	1,330.73
14	Turkey	Russia	914.70
15	Poland	Russia	760.70

Source: Own presentation; data from OECD International Direct Investment Statistics Database.

Table 7 depicts Russia's direct investment holdings abroad showing the Netherlands in first place, recording $33.5 billion in 2020 (indirect direct investment in other countries via tax-efficient holdings is also likely to play a role). Turkey follows with $7.8 billion, followed by Germany, the US and Spain with just over billion dollars each. Then come Finland, Ireland, Latvia, Canada, Czechia, Estonia, Hungary, France, Italy, Lithuania, Japan and Luxembourg. Curiously, the United Kingdom does not provide figures for direct investment stocks from Russia - a plausible order of magnitude is close to the value for the Netherlands.

Tab. 7: Total Net Inward FDI Stocks of Selected OECD Economies with Russia as a Partner Country in 2020

OECD Rank	Reporting Country	Partner Country	Value in million US$
1	Netherlands	Russia	33,526.81
2	Turkey	Russia	7,757.29
3	Germany	Russia	4,429.99
4	United States	Russia	4,326.00
5	Spain	Russia	4,125.66
6	Finland	Russia	1,937.66
7	Ireland	Russia	1,844.40
8	Latvia	Russia	1,838.26
9	Canada	Russia	1,382.23
10	Czech Republic	Russia	993.95
11	Estonia	Russia	904.71
12	Hungary	Russia	849.14
13	France	Russia	817.28
14	Italy	Russia	677.45
15	Lithuania	Russia	351.93
21	Japan	Russia	64.93
[25-30]	United Kingdom*	Russia	0
33	Luxembourg	Russia	-13,313.29

Note: All resident units, immediate investor or immediate host
*Non-publishable and confidential value
Source: Own presentation; data from OECD International Direct Investment Statistics Database.

Presumably, in the context of sanctions imposed by Western countries, Japan and others, Russia's direct investments in Europe and North America will face major new hurdles in the destination countries in the future. China, as a target country for Russian investors, and Chinese multinationals in Russia are likely to play an increased role in the medium term.
It should be borne in mind that Russia's government has long been sceptical of direct investment from China, seeing prospects for heavy dependence on Chinese investors; mainly also due to fears concerning the long-term demographic problems in Russia's Far East - while there are likely to be informal limits on Chinese investors in Russia anyway (Makarov/Morozkina, 2014); the authors of the study on direct investment to and from Russia point out (p. 61) that the population of the Far East is only 6.2 million (spread over 6.2 million km^2, which is approximately 36% of Russia's land area), while China's three most north-eastern provinces - total area 810,000 km^2 - are inhabited by 110 million Chinese. Russia's important resource sector (oil, gas, coal) therefore remained practically closed to investors from China. This is because the investors from China would probably also have brought Chinese workers to Russia in considerable numbers.
Barriers were also erected by Russia in technologically demanding sectors in manufacturing - such as the automotive sector - as it was expected that companies from China could then introduce Chinese technology standards, which would be different to domestic companies with Russian standards and possibly also weaken Russian sectors complementary to such companies; or the supplier or suppliers from China could seek a market monopoly. In 2012,

therefore, multinationals from the Asia-Pacific region represented only 1% of direct investment inflows into Russia. That year, however, informal restrictions on direct investment from Asia were lifted, and in 2013 the share of such direct investment increased significantly as the Russian state agreed investment projects primarily with multinationals from Japan and China. In 2014, however, direct investment from Japan decreased significantly as Japan participated in the sanctions imposed by Western countries on Russia, which annexed Crimea from Ukraine that year.

7.3 Effects of Reduced Russian Oil and Gas Exports in Russia

The systemic transformation in Russia after 1991 established elements of a market economy in many areas, but there were also considerable market power problems in many sectors, as the privatizations of large state-owned enterprises under President Yeltsin took place with little regard to efficiency and competition policy (Welfens et al., 1999). In the energy sector, Russia also has a large state-owned energy company, Gazprom, which, amongst other things, also operates important international pipeline networks on its own or in cooperation with others. The energy sector has been modernized since the 1990s, amongst other things through the participation of Western multinational energy companies in some Russian energy companies, and has remained an essential production and export sector of the Russian economy even after the transformation.

Both embargo measures on the EU's energy imports from Russia and a conceivable Russian supply boycott of gas (or gas and oil) will have effects on Russia's economy and state budget. Questions of a conceivable energy import boycott by Germany and other EU countries can therefore be raised. However, one can hardly argue - as was often heard in the public discussion in EU countries in March 2022 with a moralistic undertone - that the EU is partly responsible for the Ukraine war: Since, after all, one provides Russia with high foreign exchange earnings through EU energy imports from Russia. This view is grossly flawed, as Russia's oil and gas exporters to Eastern and Western Europe will no longer be able to export oil and gas sold to Europe to other regions of the world. International financial market sanctions are more likely to affect Russia economically and lead to a decline in real income in Russia.

Assuming a combined Russian oil and gas export of 12% of Russia's national income (export revenues/gross national income), at first glance an EU energy import boycott - plus boycotts by the US and the UK - could lead to a decline in real national income in Russia of about 6%. However, this would be a double misjudgement:

- The ratio of Russia's energy exports to GDP in purchasing power parities is only about one-third as high as the above ratio based on nominal values. Nominal value-added shares, moreover, only play a role in the significance of the sectoral technical progress rate.
- If Russia could no longer sell oil and gas to Western countries, the relevant Russian companies will try to sell the initially surplus oil and gas volumes to countries in Asia and Africa at a possibly high discount compared to the - in 2022 relatively high - world market price.
- If Germany or the EU were to decide on an oil import boycott against Russia, the economic dampening effects for Russia's economy would be manageable, since surplus quantities could be sold on the world market - the oil market is globally integrated - at a relatively small price discount. Incidentally, Russia's government could respond with a gas export boycott against the EU, which would see countries such as Germany, Italy, Austria, Bulgaria, Poland and Hungary facing short- and medium-term economic difficulties.

Accordingly, a Western energy import boycott against Russia will cause its real income to fall by around 3-4% in the short term and by 1-2% in the medium term. Instead of the recession of -9% expected in March 2022, Russia would then experience a more severe recession of a circa -12% decline in real income. This would be countered by Russian fiscal policy through an increased government spending program and, in addition, by the Central Bank of Russia through an expansionary monetary policy, so that one can expect a real income decline in the order of about 7-10% for 2022. The vast majority of the Russian population is likely to accept such a drop in income without protest, especially since TV coverage on Russia's main TV channels holds the West responsible for a deteriorating economic situation in Russia. More precise orders of magnitude for the loss of real income in Russia can only be determined with the help of a macroeconomic Russia model or in a three-country Russia-EU*-Asia model (whereby EU* would have to include the United Kingdom in addition to the 27 EU countries). Instead of a complete energy import boycott against Russia, Western countries could also realize the increase of import duties on energy products from Russia. It is not plausible that an energy import boycott could significantly affect the financing of the state budget and thus indirectly weaken Russia's financial ability to wage war in the long term; even if, of course, adjustment problems will arise in Russia's state financing. However, the starting point for the 2021 state budget has been a budget surplus, and Russia's government could also use a special fund, co-funded by energy revenues, for defense financing for some years.
The real income decline in Ukraine could be -30% in 2022 due to the war. However, the main burden on Ukraine will be the human suffering and death and destruction caused by Russia's invasion of the country. It should be noted that in 2014 - when Russia annexed Crimea – Ukraine's real income fell by 10.1% and then again by 9.8% the following year.

8. Ukrainian Refugees and Ukrainian Guest Workers in EU Countries and Effects for Ukraine and the EU

By the end of March 2022, one can assume that there are about three million Ukrainian refugees in Poland and about 500,000 Ukrainian refugees in Germany. The number of Ukrainians in Poland thus reached circa 10% of the population. At the same time, there was a great private willingness to help refugees from Ukraine in Poland, Germany and many other countries. The UN Refugee Agency (UNHCR, 2022) calculated in the first half of March that already about five million people were fleeing their homes in Ukraine in 2022, which underestimates the actual number - because by March 18th the number of Ukrainian refugees had already reached about four million. The main countries of refuge were Poland (No. 1 with 2 million), Romania, Moldova and Hungary, which corresponded to Ukraine's western neighbors (see Fig. 13); then came the Slovak Republic, Russia and Belarus. The 185,000 refugees from Ukraine listed for Russia probably originated from the Donbas region of Ukraine. In Germany, there were estimates of 250,000 Ukraine refugees at the end of March. Germany had initially not implemented official refugee registration, so there is little accurate data for February and March 2022.

Fig. 13: Refugee Movements from Ukraine, as of 30.03.2022

Total Refugee influx from Ukraine in neighboring countries**

JSON

Location name	Source	Data date	Population
Poland	*Government*	29 Mar 2022	2,336,799
Romania	*Government*	29 Mar 2022	608,936
Republic of Moldova	*Government*	29 Mar 2022	387,151
Hungary	*Government*	29 Mar 2022	364,804
Russian Federation	*Government*	29 Mar 2022	350,632
Slovakia	*Government*	29 Mar 2022	281,172
Belarus	*Government*	29 Mar 2022	10,902

**The accumulated data in this table is higher than the total number of refugees fleeing Ukraine presented above since it also takes into account people crossing the border between Romania and Moldova.

Source: UNHCR (2022).

As far as the situation of Ukrainian refugees in the EU is concerned, they do not need to go through an individual asylum procedure in order to obtain a humanitarian residence permit, as for the first time, EU Interior Ministers on March 4th, 2022, decided to approve the application of the so-called Temporary Protection Directive. Ukrainian refugees are thus granted temporary EU-wide access to medical services, work, education and social benefits. By the end of March, the EU failed to reach agreement on national registration procedures in EU countries, citing, among other things, incompatible IT systems in those countries.

Due to the Russian war of aggression on Ukraine, there will be a large movement of people, which should then also strengthen the labor market on the supply side in the destination countries in the medium term. Since men of military age are being held back at Ukraine's borders, the international flight movement from Ukraine will initially be primarily women and children seeking to reach the EU or Western Europe - and also the US and Canada. The UNHCR projected up to 10 million Ukrainian refugees at the end of March 2022. This would be a 50% increase in global refugee numbers compared to 2017: At that time, 0.26% of the world's population were recorded as refugees, a relative decrease from 0.33% in 1990 (EBRD).

The special aspects of refugee movements can only be very briefly highlighted here, although reference can be made to some extent to the movement of people fleeing from Syria, amongst others countries, to the EU and especially to Germany in 2015/16 - at that time, however, the proportion of men among the refugees was initially relatively high. A small subset of refugees also came to Germany via so-called resettlement programs; authorities from Germany select refugees with high vulnerability and good integration prerequisites in a special procedure abroad (Welfens, 2022). During a visit to Moldova in March 2022, Germany's foreign minister, Annalena Baerbock, pledged that Germany would take over some of the 80,000 refugees from Ukraine in Moldova. Presumably, this will be done in a similar way to the usual resettlement procedure. Since Moldova had 2.6 million inhabitants in 2021 and will probably have 260,000 Ukrainian refugees in the country at the end of March 2022, in terms of refugees per inhabitant, this is like having 8.3 million Ukrainian refugees in Germany.

In the following, it is assumed that a significant share of Ukrainian refugees in EU countries will find their way onto the labor markets of the respective Western host countries in the longer term. A US study comparing the labor market integration of immigrants and refugees found that in the short term, the labor volume and also hourly wages of working refugees were lower than those of immigrants, but that in the long term, labor force participation and also hourly wages were higher than those of immigrants (Cortes, 2004).

As far as the effects of immigration and refugees on source and destination countries are concerned, economic migration analysis offers important insights. There is permanent

emigration and circular emigration. The latter means that the guest workers return to the sending countries after some time; however, circular immigration is not a main focus in the following analysis. From the perspective of migration analysis, remittances from guest workers (or emigrants) in many sending countries represent substantial foreign exchange inflows from abroad. According to World Bank data, remittances to sending countries represented over 10% relative to GDP in 29 countries around the world in 2019; this included seven EU Neighborhood Countries (broadly defined): Armenia, Georgia, Jordan, Lebanon, Palestine, and Ukraine. Such remittances are positive for recipient households in sending countries, as disposable income is increased; there is also a kind of insurance protection, provided that these remittances are relatively high during periods of recession and crisis in sending countries. The economic importance of these remittances in relatively poor countries is further enhanced by the fact that the prices of non-tradable goods are relatively low by international standards; thus, a positive purchasing power effect in the recipient country of the remittances may need to be considered (Kapur/McHale, 2012).

Whether remittances have a positive impact on economic growth depends largely on the extent to which receiving households use them to finance consumption or investment. There are some findings suggesting that consumption and real estate financing play an important role (Chami et al., 2008). However, an econometric analysis by the International Monetary Fund (IMF, 2016) shows that, especially in countries with financing constraints for enterprises, remittances led to increased private sector investment.

By strengthening the disposable incomes of family members in the home country, remittances from migrant workers increase aggregate demand, which is allocated to non-tradable goods or many services on the one hand, but also to imported goods on the other. The latter leads to a deterioration of the balance of payments and therefore, with flexible exchange rates, to a depreciation; however, the execution of the initial international remittance leads to a real currency appreciation. This leads to a "Dutch disease" effect associated with increased demand for imports and reduced domestic exports, and further, slower technical progress. As a rule, the increase in aggregate demand on goods markets caused by international remittances also raises the domestic price level; the appreciation of the currency, however, makes the import of goods cheaper.

When there are substantial international remittances, they can contribute to dampening business cycles (Temprano Arroyo, 2019): Namely, when these remittances are higher in recessionary years than in economic boom years; sustained international remittances can also support better financial system development in the recipient country. Educational improvement and improved population health in recipient countries are also observable.

Moreover, remittances lead to real currency appreciation, which dampens the recipient country's net exports and thus its economic development in the medium term. Moreover, moral hazard problems arise, as the behavior of people in recipient countries may change adversely. According to the IMF (2016), a one percentage point increase in the international remittance ratio - the ratio of remittances received to the gross domestic product of the recipient country - led to a 4% real currency appreciation. This, in turn, dampens export sector growth. According to the IMF study, remittances increase the financial mobility of recipient households, which lowers the labor force participation rate and raises the "reservation wage" - the lower bound on the wage level above which an individual will offer work. In addition, there is also a moral hazard problem in that risky investment projects are more often selected in the recipient country and less is invested in existing investment projects, leading to increased differences in investment returns on the one hand, but also to increased variability in economic development on the other (Chami et al., 2008).

Finally, it should also be borne in mind that emigration - including refugee flows - leads to a shortage of labor supply, which causes real wages to rise. A particular problem, however, is the

emigration of skilled workers, which leads to a dampening effect on growth in the sending country, namely for low-skilled workers.
Emigration and flight abroad (internal refugees are a conceivable special problem) have a negative impact on state finances, since previous tax payments and social contributions are eliminated. Insofar as emigrant or refugee groups tend to relate to the younger strata of the population, the average age of the working population also deteriorates. This can lead to a slowdown in growth. To the extent that skilled workers leave the country, the growth rate of technological progress is also likely to decrease (Docquier, 2014). An analysis by the IMF (2016) showed that the growth rate of progress in Eastern European countries would have been about 2.5 percentage points higher had it not been for the outflow of skilled workers in 1995-2012. It is conceivable, moreover, that emigration provides incentives to gain better skills in sending countries (Docquier/Rapoport, 2014). The sending country can gain economically if the share of well-educated people increases and at the same time the probability of emigration is below 15-20% - then there is no critical brain drain, i.e. a loss of knowledge in society or the economy.
In the face of falling information and transportation costs, temporary or permanent emigration can cause unemployment rates to fall in sending countries, while at the same time labor shortages fall and output rises in countries with surplus demand in the labor market - demand from firms is greater than supply from domestic households (Zimmermann, 2014). Temporary migration is accompanied by problems concerning low-skilled immigrant groups who can exercise fewer rights and face worse working conditions than migrant groups who settle permanently in their host countries (European Commission, 2011; Zimmermann, 2014). The literature cited in the study by Kone/Özden (2017), moreover, shows a positive correlation between immigration and US direct investment abroad, provided that the immigrant groups represent the well-skilled: US companies will then invest more in the corresponding sending countries.
As for emigration from Ukraine before 2014, Russia was the most important destination country in the period before that, with a 43% share in Ukrainian emigration, which was estimated at about 2.5 million before the Russia-Ukraine war. In 2017, Poland became the most popular destination country, with a share value of 39%, while Russia still stood for 26%; in addition to Poland and Russia, the countries Italy, Czechia, Spain, Portugal, Hungary and Germany can be considered as destination countries in 2017 (Pienkowski, 2020, 11-12); in this regard, emigration towards the United States is predominantly characterized by qualified people, while migration towards EU countries is characterized by workers with low and medium qualifications. As a rule, men predominate in emigration (70%); only in the case of Italy do women represent the numerically dominant group (71%).
With large refugee movements from Ukraine expected in Spring 2022 in the wake of Russia's war of aggression, EU countries, as well as arguably the UK and the US, are key destination countries. By mid-March, Poland was the No. 1 destination country, with the population originating from Ukraine increasing to three million, more than doubling. Moldova, the Slovak Republic, Hungary, as well as the Czechia and Germany, were important destination countries, far behind Poland. A refugee movement is not the same as immigration, but in the medium term - over the course of a few years - refugee groups will behave partly, and probably mostly, like immigrants.
As for the economic effects in the immigrant countries, it is interesting to look at the effects of Ukrainian immigration before 2022. Here, a study by the National Bank of Poland is of particular interest. Ukrainian guest workers in Poland represent just over 10% of economic growth in 2013-18 - with 1.4 million Ukrainians in Poland; this is a lower bound estimate, as the National Bank of Poland study (Strzelecki/Growiec/Wyszynski, 2020) actually did not include a portion of working Ukrainians in the study: namely, firstly, those who worked in Poland under short-term 6-to-9-month visas and, secondly, those working in the shadow

economy. Immigration from Ukraine in isolation had an annual growth effect of 0.5% in 2013-18.

The main target countries of war refugees from Ukraine will benefit in the medium and long term from positive growth effects in the course of the integration of refugees into the respective national labor markets. Eastern European EU countries will therefore benefit disproportionately economically-speaking, and to a certain extent also Germany and Italy. Whether these refugees can actually contribute to economic convergence within the European Union remains to be seen. For the countries receiving the refugees, costs will arise initially, in the first year, although a positive macroeconomic demand effect can also be expected here. It is up to the EU and the EU countries to sensibly try to influence the large refugee movements in accordance with the absorption capacity of countries and to temporarily help the main target countries financially.

If we assume three million refugees in Poland and one million refugees each in Germany, France and Italy, then - assuming €1,000 per person per week in necessary maintenance and accommodation costs - total economic demand in these three countries increases by €52 billion each within one year. For Germany, this amounts to 1.3% of national income, and for France and Italy, a good 1.5% of national income each. In Poland, maintenance and accommodation costs can be set at about half the amount as in the three largest Western European EU countries, so that in Poland national income increases by €78 billion within one year. This additional demand will strengthen aggregate demand in EU countries, whose post-Corona recovery forces will thus be consolidated. In the process, the government budget deficit ratio will increase significantly on a one-off basis: In the EU as a whole by around 1% of national income.

In the second year of residence, some of the refugees will return to Ukraine, provided that peace and good reconstruction conditions prevail there. However, a significant proportion of Ukrainian refugees are likely to remain in the EU, with married women usually pushing for family reunification with their husbands. It could therefore amount to about six million refugees in the EU in the medium term after the Ukraine war, of whom just under half are likely to be able and willing to work. The labor force potential in the EU is rising; relatively quickly in Poland, where Ukrainian refugees are not expected to pose a major language comprehension problem - the same applies to the Czechia as a target country. In Germany, France and Italy, the potential labor force is likely to rise rather slowly over time, since in many sectors refugees must first acquire sufficient language skills by attending language courses before taking up employment.

It cannot be ruled out that very strong refugee flows toward EU countries in some member states of the European Union will lead to a strengthening of radical right-wing parties in particular. Here, a destabilization of Western democracies may occur as a consequence of the Russia-Ukraine war. The economic costs of the war for Europe, including Russia, and the world economy as a whole depend on the outcome of the war in Ukraine and the duration of the armed conflict. From the perspective of the Western countries, it looks as if Russia under Putin has ultimately destroyed much of the world order that was in place after 1991. What Russia has built up over thirty years in terms of trust in many Western countries, Japan and elsewhere has largely been lost with the war of aggression against Ukraine. It is obvious that the economic costs of the war are also quite considerable for Russia in the short term. The country is likely to fall into its worst recession since 1991. The official figures on Russia's gross domestic product will be sought to be corroborated by looking at supplementary statistics and analyses.

The West and its allies will have to discuss many important economic and political issues with China again in the future. One of the unacceptable points from the Western point of view is China's censorship of the speech at the opening ceremony of the Beijing Paralympics in March 2022: On Chinese television, some sentences were simply not translated - especially those that referred to the importance of peace.

It may be difficult for the West to quickly persuade Russia under President Putin to reach a diplomatic resolution to the Ukraine war. If China's support for Russia's political position on

the Ukraine war can be significantly weakened, however, Russia's president could come under significant pressure to adapt. It seems unlikely that the West will be able to restore good economic and political relations with Putin in the longer term. If Western investors perceive China's behavior in the Ukraine conflict as being clearly pro-Russia, economic relations between the West and China will weaken considerably, as quite a few investors will view China from a political perspective in a similar way to Russia (and its war against Ukraine): In the long term, it will probably not be possible to expect more direct investment in Russia. The world economy could move toward a new Cold War, with China included. The international economic order could disintegrate as important organizations - such as the World Trade Organization - weaken.

The global economy faces an economic slowdown and higher inflation rates in 2022 and 2023 and could face a disintegration into regional blocs and a reduced effectiveness of key international economic organizations in international economic conflicts, which would dampen growth. The weakening of the international legal order should be counteracted on the part of the OECD countries, and the role of international organizations to safeguard free trade and globalization should rather be strengthened. The US, the EU, UK and other countries will probably also face special challenges in helping poor developing countries, which are likely to face serious new hunger-related problems in the medium term with massively increased grain prices.

Incidentally, one result of the weakened global legal order and Russia's war of aggression against Ukraine is that the EU countries and Norway will significantly increase their respective defense spending in the medium term. As far as the purchase of military jets is concerned, the US is likely to be the main supplier country and thus experience an improvement in its trade balance as well as a medium-term appreciation of the dollar. It cannot be ruled out that the world economy will slide into a new Cold War, with the Western countries and Japan plus the Republic of South Korea pitted against an autocratic Russia. China's positioning in this regard is not clear for the time being. From the German side, sales in China are 16 times higher than those of German companies in Russia, and conversely, China's exports to the US and the EU are much higher than its exports to Russia. Economic interests could encourage China to give greater weight to its relations with the EU, at least in the medium and long term.

EU countries will probably become more united politically and militarily in the medium term - without significant military contributions from the neutral member countries Ireland, Sweden and Austria. There is no doubt that the EU, the UK and the US, as well as other countries, will help in the reconstruction of Ukraine after the end of the war and the withdrawal of the Russian troops. A strengthening of the role of renewable energies, which is necessary from a climate policy point of view in any case, will arise in the context of the Russia-Ukraine war in many EU countries, as well as a broader diversification in international energy purchasing. Germany can play a leading role in Europe in this respect. If the political situation in Russia improves sufficiently, the restoration of intensive trade relations with Russia can also be envisaged - an option for Western policy that will probably only emerge in the long term.

9. Important Ukraine-related Emigration Aspects and EU Enlargement Risks with Ukraine

Even before the Russo-Ukrainian war, there was a significant level of emigration of Ukrainian male and female workers; migrating workers primarily went to Russia, Poland and some other countries. Among the important findings is the analysis by Commander/Nikolaychuk/Vikrov (2013), based on a survey in Ukraine: Amongst emigrants, the well-educated and younger workers are over-represented. However, this is only partially reflected in the jobs they take up abroad; half of the emigrant group find themselves in jobs for which they are overqualified. This down-skilling problem is due, amongst other reasons, to the fact that in Ukraine there is little correlation between qualification and job quality. Workers who experience down-skilling in Ukraine will typically also experience it when emigrating in the destination countries. Such problems are comparatively strong in the EU when comparing the EU and other emigration destination countries.

One particularly important focus for analysis are potential emigration flows from Ukraine in the event that it indeed becomes an EU member country (see, e.g., Fertig/Kahance, 2015). The two authors determine the migration potential towards the EU from their Eastern European neighbors plus Croatia: They conduct an analysis - an out-of-sample forecast - to estimate emigration potentials after the first EU enlargement round in Eastern Europe. The analysis illustrates that emigration numbers are determined by both migration costs and economic circumstances; the largest effects result from policy variables. After an initial increase in emigration - which is slightly higher with migration liberalization than without - emigration figures in the EU's Eastern European neighboring countries develop towards a long-term equilibrium. Ukraine is expected to have the highest emigration figures in absolute terms, while the highest immigration figures from the neighboring Eastern European EU countries are found in the simulation analysis for Germany, Italy and Austria. Relative to the population, the immigration intensities are highest in Ireland, Denmark, Finland and Austria.

Even if one has to modify the Fertig-Kahance analysis due to later the implementation of BREXIT - on 1 January 2021 – valuable insights from the analysis remain:

- The integration of Ukrainian refugees or guest workers into EU societies and labor markets will not be an easy process – with the possible exceptions of Poland and some other Eastern European EU countries.
- There is a risk that large numbers of immigrants from Ukraine could focus on relatively few EU destination countries, which could politically destabilize some of these countries: The specter of another BREXIT case then looms.
- The EU's inclination to learn from previous mistakes and important political failures - such as the BREXIT - is noticeably low; it therefore seems implausible that a sensible political reform package will be adopted or implemented in the EU before Ukraine's accession.

Of course, the refugee flows from 2022 only partly follow normal emigration preferences; potential emigrants under normal circumstances are a random subset of the refugees. This does not exclude that in the medium term a share of the refugees may decide to work as guest workers in certain EU countries. Due to the close affinity between the Ukrainians and Polish, Poland is likely to be a preferred destination for many refugees. The economic logic of the so-called gravity equation suggests that refugees and emigrant groups from Ukraine will initially have a certain preference for countries a relatively short distance from Ukraine; in a second adjustment step, however, refugees and emigrants from Ukraine will - to a certain extent - select economically preferred destination countries.

The UK is likely an almost inaccessible destination for many of these people, and political resistance to refugees and worker immigration from Ukraine to the UK is high in that country. The issue of immigration has been the subject of much political criticism in the UK since around

2010. Before the BREXIT referendum in June 2016, the UK became home to almost half of all emigrants from Eastern European EU countries – which is one of the reasons why the issue of immigration became so politically prominent in the UK in the decade after 2004. The UK, Ireland and Sweden were the only EU countries not to avail of the opportunity to implement a transitional period limiting the free movement of persons for Eastern European accession countries from 2004; unlike France and Germany – with a seven year transition period -, for example. Although ideological struggles in the UK were the main cause of the BREXIT majority, the overall uncoordinated EU immigration policy obviously played a role in the UK's EU exit; moreover, survey results in EU countries – with surveys regularly commissioned by the European Commission - were apparently not consistent in the run-up to the referendum (the European Commission did not change survey methodologies, and there was a lack of critical debate in Brussels (see Welfens, 2017a, 2017b).

An enlargement of the EU to include Ukraine would leave the then enlarged European Union in a new situation of having a much longer (and probably still contentious) eastern border with Russia. For Russia, depending on the political tensions between Russia and the EU, an EU enlargement to the east to include Ukraine - with over 40 million inhabitants including a significant Russian-speaking minority population - could provide an incentive to destabilize Ukraine politically and economically in various ways. Within the framework of EU regional policy and EU cohesion policy, the European Union would then probably face considerable additional financial burdens. Moreover, a relatively unstable Ukraine would possibly also be a bone of contention within the EU itself, which could destabilize the European Union. Unreflective political enthusiasm in Brussels, and numerous EU member countries, for an expedited enlargement to include Ukraine is therefore neither appropriate nor responsible. In the event of an EU enlargement to include Ukraine, the EU would have to adopt a comprehensively altered policy towards Russia, which would bring its own political risks for the stability of EU integration.

EU enlargement to include Ukraine would bring a considerable potential immigration problem for a number of EU countries - and this would then also threaten the EU with the next 'BREXIT case'; at least that is what can be assumed unless the political management in Brussels improves significantly or continues not to draw sensible conclusions from previous policy mistakes made in the matter of prior EU enlargements to the east (and indeed BREXIT itself). In particular, it should be ruled out for any EU country not to realize a transitional period for the free movement of persons. Otherwise, there is a risk that large emigration movements from Ukraine will be geographically concentrated in just a few EU countries thus destabilizing the political system in at least some EU countries with high relative immigration or encourage radicalization and anti-EU attitudes there: This could bring about the next BREXIT.

Ukraine, as a relatively large country in terms of population and with a low per capita income, can expect to experience considerable levels of emigration to other EU countries for many years to come; with full freedom of movement for Ukraine, as an EU member state, there are considerable risks that high immigration figures in destination countries will destabilize those EU countries or the European Union as a whole in the medium term. The question of a sensible temporary restriction of immigration in the event of an EU enlargement should be reconsidered. There is also a danger that the topic of EU enlargement to include Ukraine will be discussed primarily on an emotional level in the public sphere and that an analytically reflective political debate will be largely absent with the result that the necessary risk-reducing flanking measures for a stable EU enlargement to the east not being initiated. Thus, in the end, the Russia-Ukraine war could initiate the further disintegration of the European Union by creating more "BREXIT cases"; dynamics possibly supported in the political run-up to referendums by Russia's government and the Russian president. There is little doubt that President Putin and his government have supported BREXIT from the beginning in a variety of ways in the British political process - without any major public critical debate in the UK. In any case, further

enlargement in Eastern Europe, in this case to include Ukraine, will be a complex challenge for the EU and its member states.
The process of EU enlargement could take about a decade in the case of Ukraine if one considers the accession process of Croatia as a benchmark for the timeline. However, Ukraine and the EU could argue that the existing Association Agreement and the Deep and Comprehensive Free Trade Area (DCFTA) agreement which had been signed in 2014 means that considerable progress in key fields relevant for an EU accession have already been achieved. As regards Western support for trade integration between the EU and Ukraine, one should recall that on April 6th, 2016, there was a non-binding referendum on the Ukraine-European Union Association Agreement in the Netherlands. The required minimum turnout of 30 percent was achieved (32.28 percent) and the result was that 61 percent of Dutch voters voted against the Approval Act. In the Dutch Press it was argued that Russia's government had influenced the campaign in favor of a refusal of an association agreement (one may also recall that on June 23rd 2016 there was the BREXIT referendum in the United Kingdom). The Dutch referendum shows that political support for an EU enlargement allow Ukrainian accession could be rather modest in some countries of the European Union; one may, however, assume that the Russo-Ukrainian war has reinforced political support for such an enlargement in many EU countries. The official request on the part of Ukraine for EU membership was submitted on February 28th, 2022. As regards the position of Ukraine, President Zelensky argued in favor of a very fast membership procedure for Ukraine. However, at the Versailles summit in March 2022, EU countries dampened hopes that such an expedited procedure would be applied in the case of Ukraine.
As regards the fundamental requirements for EU membership, the "Copenhagen Criteria" of 1993 have to be fulfilled which means the ability of the country's economy to live with the competitive pressures of being part of the single market (including the four freedoms), firm state support for democracy and the protection of minority rights as well as the institutional and administrative capacity to effectively implement the Acquis Communautaire – the set of laws and rules relevant in the European Union; moreover the requirement that existing member countries must be able to absorb the new member countries. As the European Commission has stated in 2000, the critical criteria for membership are as follows (European Commission, 2022):

"The accession criteria, or Copenhagen criteria (after the European Council in Copenhagen in 1993 which defined them), are the essential conditions all candidate countries must satisfy to become a member state. These are:

- *political criteria: stability of institutions guaranteeing democracy, the rule of law, human rights and respect for and protection of minorities;*
- *economic criteria: a functioning market economy and the capacity to cope with competition and market forces;*
- *administrative and institutional capacity to effectively implement the acquis (Communitaire – <u>added by PJJW</u>) and ability to take on the obligations of membership.*

The Union's capacity to absorb new members, while maintaining the momentum of European integration, is also an important consideration."

The topics and chapters, respectively, which should be addressed in a timely manner for an EU accession are summarized in the following table which indicates the new clustering enlargement negotiation approach of the European Union: Since 2021, several chapters are grouped in certain clusters and negotiations for EU accession should follow the clusters emphasized in the EU's approach (see the subsequent Table 8 which consists of the topics under

the headings of Fundamentals, Internal Markets, Competitiveness and inclusive growth, Green agenda and sustainability connectivity, Resources, agriculture and cohesion, External relations):

Tab. 8: Technical EU Pillars: Clusters of Negotiating Chapters for EU Enlargement (EU, 2020)

1. Fundamentals	23 - Judiciary and fundamental rights 24 - Justice, Freedom and Security Economic criteria Functioning of democratic institutions, Public administration reform 5 - Public procurement 18 - Statistics 32 - Financial control
2. Internal Market	1 - Free movement of goods 2 - Freedom of movement for workers 3 - Right of establishment and freedom to provide services 4 - Free movement of capital 6 - Company law 7 - Intellectual property law 8 - Competition policy 9 - Financial services 28 - Consumer and health protection
3. Competitiveness and inclusive growth	10 - Information society and media 16 - Taxation 17 - Economic and monetary policy 19 - Social policy and employment 20 - Enterprise and industrial policy 25 - Science and research 26 - Education and culture 29 - Customs union
4. Green agenda and sustainable connectivity	14 - Transport policy 15 - Energy 21 - Trans-European networks 27 - Environment and climate change
5. Resources, agriculture and cohesion	11 - Agriculture and rural development 12 - Food safety, veterinary and phytosanitary policy 13 - Fisheries 22 - Regional policy & coordination of structural instruments 33 - Financial & budgetary provisions
6. External relations	30 - External relations 31 - Foreign, security & defence policy

Source: European Commission (2020), COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS Enhancing the accession process - A credible EU perspective for the Western Balkans, COM(2020) 57 final, Brussels.

If one follows the CEPS analysis for early 2022 (Emerson et al., 2022), with the exception of anti-corruption policy and transport, none of the 26 chapters relevant for an EU accession have been rated by the authors with the weak rating of 1 ("some preparation") in 2021; 1.5 has been achieved in the field of intellectual property rights, macroeconomic policy, consumer protection and company law. The only field where the EU's rating of Ukraine is 3 (a good rating in preparedness in relation to EU standards) concerns civil society, the other fields had been rated with 2 or 2.5 (see Table 9). Emerson et al. (2022) express clear support for a fast EU membership procedure; or more precisely: A quick start of the EU procedure for the Ukraine. Incidentally, the authors suggest that Ukraine should use frozen Russian assets abroad – read: Foreign exchange reserves of the Russian central bank – to pay for the Ukraine's external debt of roughly $57 billion. This view is strange as this means that the authors are in favor of a kind of international bank robbery where the Ukraine would take $57 billion of Russian state property.

Tab. 9: Ukraine's Implementation Ratings of the Main Provisions of the Association Agreements and DCFTAs (early 2022)

Political principles, rule of law		
Electoral democracy	2.5	Recent elections correct: President, Parliament, local
Human rights	2	Fundamental freedoms OK (except occupied Donbas and Crimea)
Rule of law	1.5	Judicial reform badly needed, not advancing consistently
Anti-corruption	1	Poor, only marginal improvement, inconsistent stance of leadership
DCFTA		
Market access	2	Shift in trade structure from Russia to EU and China
Customs services	2	Long resistance to reform; advances now being made
Technical product standards (TBT)	2	Good progress in implementing strategy
Food safety (SPS)	2	Strategy adopted; progress in implementation
Services	2.5	Ukraine more liberal than the EU for establishment
Public procurement	2.5	E-procurement system acclaimed; risks of backtracking
Intellectual property rights (IPR)	1.5	Limited progress in IPR protection and enforcement
Competition policy	2	Laws OK, but authority of government agency at risk
Statistics	2	Significant progress in adopting EU methodologies
Economic cooperation		
Macroeconomic policy	1.5	Improved but still vulnerable; IMF/EU aid-dependent
Financial services	2	Proceeding with comprehensive alignment on EU laws
Transport	1	Road transport needs action by Ukraine (and EU)
Energy	2	Major challenges being addressed; joining Green Deal
Environment	2	Comprehensive, costly, long-term action engaged
Digital and cyber	2.5	Dynamic digital and cybersecurity sectors
Consumer protection	1.5	Progress in product safety, but much more outstanding
Company law	1.5	Legislative action, but uncertain enforcement
Employment and social policy	2	ILO conventions OK, but new Labour Code outstanding
Visa regime, movement of people	2.5	Successful implementation of visa-free travel
Education and culture	2.5	High educational standards, comparable to EU neighbours
Gender equality	2.5	Comparable to EU neighbours
Civil society	3	Competent, independent civil society, forceful advocates of reform

Source: Emerson et al. (2022, Opinion on Ukraine's Application for Membership in the European Union, Brussels: CEPS, Table 2, p. 6

Note: Ukraine's average rating 1.81 is rather average compared to the candidate states; the average ratings in the interpretation of the CEPS study are: Montenegro with 2.21, Serbia 2.11, North Macedonia 2.07, Albania 1.73, Bosnia and Herzegovina 1.55 and Kosovo 1.35.

As regards the option of an expedited enlargement by the EU in relation to Ukraine, the authors do not consider the challenges of the four freedoms of the EU single market in general and of the free movement of labor in particular. One would witness considerable destabilization of the EU if the lessons from previous EU eastern enlargements – and of BREXIT – would not be carefully taken into account by the European Union. One can understand that many Western politicians, struck by strong emotions in the context of the tragic war between Ukraine and Russia, would be in favor of a faster than usual EU membership process for Ukraine; without taking into account the problems encountered in reality in an adequate way. Considering the experience of the EU eastern enlargement of 2004, which brought immediate freedom of labor mobility for the smaller states of Malta and Cyprus, but a general immediate freedom of

movement for all accession countries was implemented only in the case of the UK, Sweden and Ireland, it was remarkable that Germany, for example, opted for the maximum of a seven year transition period and many other EU countries also opted to impose several years of a special transition regime without free labor mobility for the accession countries.

The resultant delays to the free migration of labor from Eastern European EU accession countries to older member states implied that a very strong immigration pressure would be faced by the United Kingdom where policymakers welcomed additional immigrants as those were assumed to help overcoming existing labor shortages; the situation in British labor markets, however, changed strongly following the Transatlantic Banking Crisis and the massive UK recession of 2008. The issue of excessive immigration to the United Kingdom became a prominent topic on the British political agenda. Prime Minister David Cameron in turn had no idea how to really cope with the emergent problem or how to create a sufficient number of new jobs so that political populists (e.g., Nigel Farage) could exploit the new situation. Cameron's massive cuts to central government transfers to local communities – reaching 5 percent of national income within a few years - contributed to the perception of an under-provision of local public services which in the perception of the public then became largely associated with the problem of excessive immigration from Eastern Europe; anti-EU sentiments thus started growing especially after 2009. As regards Russian interference in the BREXIT campaign, it is unclear whether or not the Russian government supported in various ways the pro-BREXIT groups which in the end won the BREXIT referendum of 2016; little evidence of coordinated Russian interference via Twitter was found, e.g., by Narayanan et al. (2017). However, Russian expatriates and oligarchs – with double nationality - living in London, have apparently been influential donators to the Conservative Party for many years (e.g., Parker, 2021).

If Russia's political leadership would follow Putin's aggressive policy attitude vis-à-vis the West in the long run, the EU should expect that Russia will invest significantly in the political and economic destabilization of Ukraine and the European Union, respectively. If the EU in the end would disintegrate, Putinism would have achieved success in Europe (this would possibly include new reinforced links between Russia and Serbia as well as other countries in the Balkans). As regards the cost of reconstruction of Ukraine, its government will most likely want to use Russia's foreign exchange reserves which have effectively been seized by the Western countries, Japan and Australia within the sanction packages of March 2022. At the same time, it is clear that Russia would hardly accept such a procedure: With about $300 billion at stake – in the accounts of Western central banks - for Russia's central bank. The EU in turn might have to come up with considerable financial support for the reconstruction of Ukraine; at its summit of March 24th/25th, 2022, the European Council agreed to create a Ukrainian Solidarity Fund which is open for non-EU countries; if the EU were to follow the US Marshall Plan funding for Germany in 1948-50, the European Union would have to put up about €16 billion.

If Russia should change its international policy course under Putin or Putin's successor in a way which is decisively more cooperative vis-à-vis the West, EU membership of the Ukraine would still be a formidable challenge. Geography cannot be changed and the EU cannot really have political stability in the long run if relations with both Ukraine and Russia are not based on clear principles, rules and membership of functional international organizations such as the World Trade Organization, the Bank for International Settlements and the International Monetary Fund. Getting Russia back into the G8 could be considered in the long run. However, western countries plus Japan should consider more seriously the political psychology of international cooperation in the future. For example, a repeat of the situation at the G8 Heiligendamm Summit of 2007 during Germany's G8 presidency – when Putin was visibly isolated among the other leaders and found himself alone at a table (while Chancellor Merkel, as the host, made no effort to avoid this situation which certainly was humiliating for President Putin) - should be avoided.

The idea of an energy import embargo vis-à-vis Russia is interesting, but a temporary special import tariff on Russian gas is more adequate from an economic perspective. In any case, there should be a clear signaling to Russia that a change in its military and foreign policy – towards peaceful cooperation in Europe – will make growing trade between the EU and Russia possible again. The regulatory and bureaucratic adjustment barriers for structural change towards a much higher share of renewable energy in many EU countries is still considerable. It often takes many years to start a new construction project or to get to begin construction on a new LNG terminal. Systemic reforms and deregulation would, to some extent, thus be adequate in many Western countries. As regards the expansion of solar electricity and heat production, one may point out that few EU countries could really push for a strong policy in favor of renewables in the household sector: There is a structural shortage of adequately skilled craftsmen in the renewable energy sector. Shifting from fossil fuels to CO2-friendly renewable energy sources will therefore cost many years of adjustment time. The overall picture of challenges in the context of the Russia-Ukraine war suggests that careful analysis is needed and a pragmatic medium-term adjustment approach should be useful.

10. Scenario Perspectives

It is difficult to foresee a clear development of the further course of the war in Ukraine. Russia's war aims are relatively unclear; it cannot be ruled out that Russia wants to completely cut off Ukraine's access to the Black Sea, which would require the capture of Odesa, a city of over a million inhabitants, and further territorial gains by Russian forces. However, the Ukrainian military's successful counterattack over more than four weeks and Russia's overall modest territorial gains through the end of March 2022 show that Ukrainian national defenses have been quite successful to some extent. In any case, the Russian government will not be able to claim that Russia's invasion forces outside the Donbas were greeted by cheering Ukrainians. It cannot be ruled out that Russia's invasion of Ukraine will be followed by further attempts to invade Moldova or the Central Asian republics plus Georgia. With its war of aggression against Ukraine, Russia has become an international politico-economic destabilizing factor; normal economic and policy cooperative measures to improve relations between Russia and the West and between Russia and Ukraine have been setback many years. The fact that President Putin has chosen military force to enforce policy against Ukraine is completely unacceptable and ultimately probably not a reasonable course of action for Russia at all. Europe is likely to be marked by a new Cold War for a number of years, possibly with a militarily neutral Ukraine that loses part of its eastern territory to Russia.

It is possible that the war in Ukraine will drag on for many months as a war of attrition - with further destruction and many additional deaths. Under favorable circumstances, a peace agreement and a withdrawal of Russian troops as well as a phase of reconstruction of Ukraine would be conceivable, with the latter possibly choosing a neutral status; with political guarantees for Ukraine that are binding under international law.

The longer the war continues, the greater the media and political pressure in Germany and the EU will become to impose an energy import boycott on Russia in the short term. For Russia, this would be a high level of escalation in an international economic war, which will certainly lead to considerable countermeasures on the part of Russia. An energy boycott by Germany would be economically problematic, as the drop in real income is likely to be almost 6% - in year 1 of the boycott; the Bachmann et al. study has significant methodological problems, so the economic impact on Germany is certainly underestimated. Strong negative economic impulses on the Netherlands, France, and Belgium will emanate from Germany in the event of a German energy import boycott and a resulting severe recession; with negative repercussions

from EU partner countries on Germany. Economic and digital retaliation (i.e., cyber-attacks from Russia) can be expected in the event of an energy import boycott.
Ukraine is certainly not served by an economic weakening of important EU countries. In addition, there are risks on the international financial markets that may arise in the context of instability impulses in the context of the Ukraine war and the economic war of the OECD countries against Russia.
The sanctions of the West, Japan and Australia etc. against Russia probably result in a kind of encirclement fear in the Russian government, because economically more than half of the world economy is positioned against Russia its war of aggression in Ukraine. Russia with its war of aggression against Ukraine is, however, responsible for Russia's own widespread international isolation. Instead of turning Russia's membership in the World Trade Organization - since 2012 - into the starting point for Russia's long-term internationalization and modernization, the Russian economy has developed dynamically in only a few sectors; the share of Russia's high-tech exports has remained very low, even though Russia would have good chances to strengthen its export position in industrial goods, digital services and also high-tech products if it had an innovation-friendly and internationally-oriented economic policy. Putin's war in Ukraine threatens to damage three decades of Russian economic modernization, massively diminish Russia's international reputation and reverse the modernization that has been successful in some sectors - including by foreign direct investors.
At the same time, it can be argued that the leading democracies across the world are acting together against Russia's war and that the Russia-Ukraine war is a kind of political struggle of the democracy against authoritarianism as a political system; thus, in addition to Russia, China also indirectly comes into critical focus in some areas of the political system. However, based on the population figures of the countries that abstained from voting on the Ukraine resolution condemning Russia in the UN, it can be noted that around half of the world's population is not in favor of condemning and sanctioning Russia.
The risks of escalation in the Ukraine war are significant. President Putin's covert threat to use Russia's nuclear weapons against countries that interfere in the Russia-Ukraine war has startled many Western countries. France, a nuclear power which usually has one of four nuclear-armed submarines operating in the world's oceans, decided in March 2022 to send three submarines on patrol; the vulnerability of the submarines appears too great if they are in port at the same time (Blegala, 2022). The risks of a military expansion of the Russia-Ukraine war should be carefully considered in politics.
If the West rightly emphasizes the meaningful connections between democracy, market economies and the rule of law, which secures freedom and prosperity, then it would be appropriate for the leading Western powers - including the US, UK, France, Germany, Spain and others - not to implement arbitrary political elements within the framework of the sanctions policy. The US ban on American citizens from accepting dividend and interest payments from Russia and Russian companies as of May 24th is a rather dubious measure if one takes the rule of law seriously. At the same time, it should be emphasized that the West should attach great importance to unity in a common, reasonable, effective sanctions policy toward Russia.
Even in the run-up to the Russia-Ukraine war, the EU's international cooperation prospects were rather complicated and characterized by many areas of conflict with Russia. Within the framework of the EU's neighborhood policy, the European Union has a special commitment to cooperation in foreign and external economic policy. This involves sixteen countries, namely eight to the east of the EU and ten to the south. The Eastern EU Neighborhood Partner countries are Armenia, Azerbaijan, Belarus, Georgia, Moldova and Ukraine. These are all former Soviet republics, and conflicts with Russia could arise with each country. For example, while Ukraine has been a politically disputed area of influence between the EU and Russia for many years, Russia is also active in an arbitration role between Armenia-Azerbaijan; with Belarus, Russia is a dominant partner, helping to use the country as a staging area for the Ukraine invasion.

Meanwhile, Georgia was the target of a Russian military intervention in 2008, while Moldova has a serious challenge in Transnistria (or 'Pridnestrovian Moldavian Republic'), a strongly pro-Russia breakaway territory where the Russian military is stationed. Prior to the outbreak of war in 2022, the Russian list of demands (dated December 17, 2021) vis-à-vis NATO countries argued that Russia expects that the US and NATO would decide against integrating Ukraine and other former Soviet republics into NATO and that the West should withdraw weapons from, and end military exercises in, the region (ARD, 2021). The US and NATO swiftly refuted these Russian demands and pointed out that each country was free to determine its own future. Russia also demanded that NATO troops be withdrawn from eastern Europe which would amount to an effective cancellation of the previous accession of certain Eastern European states to NATO. On April 25th, 2022, the Russian government declared that its war goals now included the establishment of a land-bridge between occupied regions in southern Ukraine and the break-away Transnistria in Moldova which would indicate a Russian willingness to further escalate the war and indeed cause a spill over into another country (while a self-declared republic, Transnistria is not fully recognized as independent of Moldova). This, in turn, suggests that the EU/NATO member countries should undertake everything possible to support the Ukrainian government in driving out Russian forces from the southern parts of Ukraine and at least part of the Donbas region. If Putin should get a message that he can conquer neighboring countries on the basis of very strange arguments – bringing Europe back into the 19th century and creating a new form of expansionism, imperialism and a form of international state-based terrorism – the Russian inclination to move militarily against yet more countries would grow over time. As a peaceful country, Russia could have a brilliant economic and political future as an internationally respected country, but as a war-prone system it is likely to face a decade of economic stagnation and decline (not the 5% real output growth as announced in a speech by President Putin) plus its possible disintegration sooner or later as the political consensus in the long run in Russia will decline very strongly. Russia as a war-prone regime is also likely to undermine economic stability in Asia/China and the world economy.

The EU seems to have chosen difficult countries for its neighborhood policy - the European Union can see this as a political goal, but the policy results so far are not encouraging. The EU's southern neighboring partners are Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Palestine, Syria and Tunisia. In the case of Syria and Libya, this list of countries has a particular potential for conflict with Russia, and obviously Russia, as the successor to the Soviet Union, is a politically weighty actor in the Middle East; in Syria, Russia has militarily stabilized the Assad regime for years and, in return, has a port base and military airport in its hands, which results in political influence for the Middle East and the Mediterranean. Relations with Israel are less problematic, but it is located in a region of tension and faces an unresolved peace problem with Palestine.

Spain has particular areas of conflict with Morocco because of the exclaves of Ceuta and Melilla in Morocco. The remaining countries on the southern list also face considerable economic and political challenges. Algeria, Lebanon, Morocco and Tunisia are a particular focus of France's foreign policy, with EU-Maghreb country cooperation prospects including European gas use and the conceivable import of green hydrogen. Egypt is the most populous country in the Arab region, with the US, EU, and UK rivals for influence. In African countries further south, the EU encounters economic and political influence from rivals China and Russia. The latter tends to offer particularly cheap weapons - compared with the US or EU countries - which ultimately brings political influence; China, on the other hand, has engaged in numerous infrastructure projects in African countries, with the EU appearing to be a relatively weak rival to China with more market-based approaches to infrastructure financing.

With regard to opportunities for shaping a new world order, the EU therefore has weak prospects. This makes closer cooperation with the United States all the more important for the EU. The United States, however, has been internally divided since at least the Trump presidency

and can hardly be considered a reliable EU partner in the long term, especially since the EU countries will not automatically be active on the side of the US in conceivable US-China conflicts. In the area of defense policy, the US will demand greater commitment from the EU countries in the longer term - NATO is unlikely to be stable without increased defense spending by these countries.

One of the losers of the Russia-Ukraine war seems to be, at least temporarily, climate protection policy. The readiness for international cooperation in the global economy has certainly been damaged with regard to important emitting countries of CO2 in the context of this war. However, at least in the EU countries, a relevant problem has become clear, namely if one is heavily dependent on the import of fossil fuels on the energy production side. Incidentally, the sharp relative price increase for oil, gas and coal is providing an impetus in many countries to invest more in renewable energies, at least in the medium term. The new geopolitical uncertainties and risks are likely to affect the financing of long-term climate protection projects worldwide. Special efforts will have to be made in the G20 countries - including Russia - to ensure successful international cooperation on climate protection policy.

As far as the prospects for a peace agreement are concerned, Ukraine will certainly want to emphasize the role of guarantor powers in the event that a neutral status is accepted, including Germany, France, the UK and the US as well as Russia itself. One can only warn against Germany suddenly assuming a European leadership role here - in a new phase of hubris. First of all, the German government must ensure that Germany itself becomes defensible in the first place, i.e., that years of underfunding and efficiency problems in the procurement area are sustainably overcome in the Bundeswehr. Solving this task in a meaningful way will take several years.

Ukraine's geographical situation is what it is, and the Ukrainian government itself should draw the right conclusions from this, including in negotiations with Russia. Years of Russia-Ukraine negotiations, which could keep the entire world economy in suspense for years, do not seem very desirable. It is certainly desirable that the EU countries support democracy, a market economy and the rule of law in Ukraine. For the rest, it would make sense to try to keep Russia from going down a path of political autocracy or even dictatorship and to prevent, if possible, military interventions by Russia in other countries.

From the point of view of the global economy and, above all, the people in developing countries, a speedy conclusion to the Russia-Ukraine war in the form of peace could help prevent the threat of a sharp rise in the price of wheat. If possible, both countries should be able to realize their usually relatively high grain exports. In principle, it would be desirable for both Russia and Ukraine to remain anchored in important international organizations so that conceivable conflicts of interest can be resolved within the framework of a rules-based legal system. The question remains why politicians and intelligence services in Western countries apparently fundamentally misjudged Putin's policy course on Ukraine for many years. The *Stiftung Wissenschaft und Politik* in Berlin, which is endowed with €15 million of state support per year, could have been expected to provide critical and competent analyses of Ukraine and Russia in the area of foreign policy earlier on.

As far as the twin challenges of the Corona shock and the Russia-Ukraine war shock in 2022 are concerned, innovative medium-sized and larger companies are likely to have an advantage in adapting. As always with shocks, efficient adaptation and sensible innovation dynamics are required for companies, for which a good positioning in the field of information and communication technology is important. In Germany, KfW surveys of SMEs have shown (KfW Research, 2022a, 2022b) that medium-sized and large companies are relatively advantageously positioned in ICT use and modernization: Larger SMEs have once again increasingly recognized the Corona shock as an impetus for digital corporate modernization and the development of new procurement and sales channels.

For companies using gas in industrial processes, a gas supply embargo would be a major problem unless the embargo situation can be overcome within a few weeks. Sectors whose electricity intensity in production is relatively high will also be significantly negatively affected: Rising gas and coal prices will drive up electricity costs for private households and companies alike in the medium term. This is likely to apply to almost all EU countries, with the exception of France, whose high share of nuclear power generation should be an advantage in 2022. Sharply rising gasoline prices - which are an important market signal in terms of economic psychology - are likely to dampen household spending in all EU countries, which will act as a brake on the EU economy. The EU should be helped economically by the fact that the economic slowdown in the US is likely to be less severe than in Europe. In the United States in particular, gas prices are likely to rise much less than in the EU.
There will be need for broad EU support for the reconstruction of the Ukraine after the war. Such a reconstruction will take many years and should go along with institutional reforms which reinforce credibility of government and economic policy actors. One may doubt that it will be possible to rather quickly achieve the per capita income of Poland – as suggested by Eichengreen et al. (2022) - which had better institutional modernization after the end of the socialist system and also a largely different privatization policy; to a considerable extent with a focus on enhancing economic competition. EU membership perspectives also helped Poland in the first 15 years of transition. The Ukraine of 2020 had a much larger corruption problem as Poland had around 2005 (see Annex 18) and the Ukraine's privatization brought about a powerful group of oligarchs and big business with often rather modest competition in some sectors. Reconstruction of the Ukraine probably would take place in a rather destabilized global economic order.

11. New World Economic Order

A rapid military victory by a highly armed Russia against Ukraine has proved impossible in the Spring of 2022. Russia's military advisers within President Putin's entourage have apparently not developed a realistic view on the question of the scale and determination of Ukraine's defense effort. Russia's war of aggression - without any real discernible reasoning - in February 2022 has destabilized the world's political and economic order:

- Western confidence and political trust in the promises made by President Putin and the Russian leadership will be significantly weakened for many years to come. Cooperation with Russia will become more difficult.
- Russia's economic modernization will suffer from reduced direct investment inflows from multinational companies from industrialized countries.
- Russia's political leadership - active as an autocracy (with Putin at times displaying dictatorial characteristics) - is seeking to close ranks with China, but this means assuming junior position for Russia in the long term; it will weaken over time due to China's increasing economic and military weight. A strong economic-political orientation of Russia toward China contradicts the historical orientation of Russia from before 1917 - the year of the October Revolution - toward Western Europe. This then represents new contradictions in Russian society and its political system.
- Russia's economic growth is likely to be weakened in the medium term by new developments, especially since imports of high-tech products from the West will decline significantly for several years (even after an end to the war).
- After Spring 2022, Eastern European EU countries will permanently experience an increased risk premium due to their geographical proximity to Russia as well as

increased capital outflows - also because wealthy citizens buy real estate in Spain, France and Italy. The conditions for economic convergence in the EU will thus deteriorate, and the EU will have to make more transfers (relative to national income) to Eastern European EU countries in the long term.

- Germany could benefit economically from increased emigration from Eastern European EU countries, but its growth prospects will be temporarily weakened by the dampening of German-Russian trade and the reduced attractiveness of Eastern European EU countries as suppliers of intermediate products for industry in Germany.
- By motivating Germany to significantly increase defense spending as a result of the Russia-Ukraine war, Germany's military role within the EU will increase. However, Germany is likely to continue its efforts to realize a political-military anchoring in NATO.
- The EU's role in defense policy will increase in the medium term, although an efficient military industry in the European Union will only be visible in rudimentary form for years to come. Where Airbus, for example, encounters major international competition in civil aviation, the company generally develops excellent products; Airbus' defense division, on the other hand, has attracted attention, for example, due to enormous quality problems with military transport aircraft. Behind this are apparently serious efficiency problems in government procurement in Germany and other EU countries.
- Germany's strong export- and direct investment-driven economic model is at risk of coming under massive pressure in the event of a disintegration of the world economy into an OECD-led bloc and a China-Russia bloc (Rürup, 2022). A rules-based world economic order without politically hostile blocs is also in the interest of global prosperity. How this order can be restored - after a peace agreement between Russia and Ukraine - is difficult to foresee for the time being. At least there is a chance, if the US and the EU are willing to invest in such a world economic order.

The Russia-Ukraine war has weakened the rules-based international economic system that has existed since the end of World War II. Russia's participation in key international organizations was suspended in the spring of 2022, and the country will likely need several years to resume an active and credible role in these organizations. Presumably, there will also be new problems at the UN and G20 levels in reliably engaging with Russia as a player in the global climate change policy arena. To the extent that China's political leadership permanently sides with Russia, a new Cold War could emerge, placing China-Russia in political-economic conflict with the West plus Japan, the Republic of Korea, Australia, and some other countries; an important issue in Asia will concern the positioning of India, which has visible political ties with Russia through long-standing arms sales; but there is also latent India-China tension, especially as there are also border conflicts in the border regions - especially in Kashmir. In terms of security policy, as ASEAN countries see China's continued rise - and its growing military budget - as a long-term threat, these Asian countries may find themselves cooperating more politically with OECD countries in the early 21st century; even as the respective importance of China as a trading partner is likely to also increase over decades.

It cannot be ruled out that after decades of sustained globalization, a de-globalization phase will set in, with liberal principles losing influence in the global economic order. For the West, it appears to be a formidable challenge to promote Western values in a meaningful way in the dialogue of cultures and to develop starting points or policy areas for a new dialogue about important values. The influence of digital social media is likely to play a significant role in this context. Whether the US will present itself as a reliable partner for EU countries in security matters in the medium term remains to be seen. The radicalization of the political fringes in the US - but also in Europe - is a serious challenge, which in turn is likely to be further encouraged by expansion of digital media. These are rather poor conditions for the West to successfully

shape the new world order in the long term. Authoritarian regimes around the world will probably try to split what is actually a global Internet into regionally controlled Internet spheres. A new lasting peace order in Europe is urgent. Realizing it will require special political and economic efforts. It is a question of a new safeguarding of life, security, prosperity and trust. Without international institutions - in which a peaceful Russia plays a lasting role - it will hardly be possible to achieve success here. In a transitional period, arms spending in Europe is likely to increase significantly; arms control will want to be meaningfully put back on the agenda. The EU should intensify its integration efforts and also cooperate more closely with other integration areas in the global economy. Within the European Union itself, it would be well advised to pay attention to innovation and competitive structures. An EU purchasing monopoly for gas, as proposed by the European Commission in 2022, is contradictory in view of this and, moreover, does not bode well after the experience with Covid-19 vaccine procurement. Procurement diversification in the energy sector will, however, be able to be strategically emphasized on the part of the EU.

Trade and direct investment networks must continue to be strengthened from a European perspective; and one should not allow a long-term weakening of International Organizations in the context of the Russia-Ukraine war. It will, however, take many years (following an assumed ultimate peace treaty between the Ukraine and Russia) to restore Russia's role in certain International Organizations. As regards the EU, following a potential enlargement for the accession of Ukraine, there will be a change in the internal balance of power to the extent that one would want to analyze power dynamics via the Banzhaf power index; there would be an increase in terms of the power of smaller EU countries in decisions based on qualified majority voting in European Council meetings (Kirsch, 2022); it is not clear to what extent this could reduce political stability vis-à-vis EU integration – a potential remedy would be an adjustment in the EU's required critical percentages for qualified majority voting, namely a minimum of 55% of member countries and 65% of the EU population. There is some risk that accelerated EU enlargements also in the Western Balkans could undermine the economic and political stability in the European Union for some time as structural economic divergence would be raised.

It is in the interest of the West to reduce, in the short term, trade and investment relations with Russia under Putin. In a more long-term perspective, it is in the interest of the US, the EU and Japan to reinforce trade and two-way international investment with a new Russia (i.e., under a new president or a new government). Trade and international investment links are not a guarantee against war, but both trade and international investment create mutual interdependency; it gives the West and Japan an opportunity to influence Russia – and Russia has an opportunity to peacefully influence the Western world and Japan. As regards EU-China economic and political relations, the European Union and its member states should help to avoid a lasting impression that China is internationally isolated. International isolation could be a goal in an extreme situation, but if one is in favor of some trade and cooperation between the EU and China (or the US and China), one should indeed maintain mutually beneficial economic and political relations between the European Union and China. At the same time, the EU should point out to China that an active role in circumventing Western sanctions against Russia on its part is unacceptable in this critical situation of a war between the Ukraine and Russia. It would be wise if the US and the EU could encourage China to push Russia towards agreeing a lasting peace settlement with the Ukraine quickly.

Following Kant's ideas on perpetual peace, the rule of law must be anchored in a sustainable manner both nationally and internationally. Global climate policy as a major international cooperation project should continue to be given high priority.

Literature

ADB (2022), Asian Development Outlook 2022, April, Manila.

Antezza et al. (2022), Which countries help Ukraine and how? Introducing the Ukraine Support Tracker, Kiel Working Paper No. 2218 April 2022, Kiel Institute for the World Economy.

ARD (2021), Osterweiterung; Russland veröffentlicht Forderungen an NATO (PJJW transl: 'Eastern Enlargment; Russia publishes NATO demands'), version 17.12.2021 23:50 Uhr, https://www.tagesschau.de/ausland/europa/ukraine-konflikt-russland-ende-nato-osterweiterung-101.html (last accessed on 26.04.2022)

Astrov, V. et al. (2022a), Possible Russian Invasion of Ukraine, Scenarios for Sanctions, and Likely Economic Impact on Russia, Ukraine and the EU, WIIW Policy Notes and Reports 55, Vienna.

Astrov, V. et al (2022b), Russia's Invasion of Ukraine: Assessment of the Humanitarian, Economic and Financial Impact in the Short and Medium Term, forthcoming in International Economics and Economic Policy, Special Issue (No. 2).

Auffhammer, M.; Rubin, E. (2018), Natural gas price elasticities and optimal cost recovery under consumer heterogeneity: Evidence from 300 million natural gas bills, NBER Working Paper No. w24295, National Bureau of Economic Research.

Bachmann, R. et al. (2022), What if? The Economic Effects for Germany of a Stop of Energy Imports from Russia (study in German), ECONtribute Policy Brief No. 028, online: https://www.econtribute.de/RePEc/ajk/ajkpbs/ECONtribute_PB_028_2022.pdf (last accessed 30.03.2022).

Bank of Finland (2022), War in Ukraine will slow Finland's GDP growth and increase inflation, Helsinki, online: https://www.bofbulletin.fi/en/war-in-ukraine-will-slow-finland-s-gdp-growth-and-increase-inflation/ (last accessed on 06.04.2022).

BCG - Boston Consulting Group (2021), Klimapfade 2.0, Ein Wirtschaftsprogramm für Klima und Zukunft, Gutachten für Bundesverband der deutschen Industrie e.V. (BDI), online: https://www.bcg.com/de-de/klimapfade (last accessed 30.03.2022).

Behringer, J., et al. (2022), Ukraine war hampers recovery after pandemic. Prognose der wirtschaftlichen Entwicklung 2022/23, IMK Report No. 174, March 2022, Düsseldorf: IMK, online: https://www.imk-boeckler.de/fpdf/HBS-008284/p_imk_report_174_2022.pdf (last 04.04.2022).

Blegala, E. (2022). La France renforce son niveau d'alerte et déploie trois sous-marins nucléaires en mer, online: https://www.franceinter.fr/monde/la-france-renforce-son-niveau-d-alerte-et-deploie-trois-sous-marins-nucleaires-en-mer (last accessed 30.03.2022).

BP (2021), Statistical Review of World Energy, London.

Chami, R.; Barajas, A.; Cosimano, T.; Fullenkamp, C.; Gapen, M.; Montiel, P. (2008), Macroeconomic Consequences of Remittances, International Monetary Fund, Occasional Paper 259, Washington, D.C.

Commander, S.; Nikolaychuk, O.; Vikhrov, D. (2013), Migration from Ukraine: Brawn or Brain? New Survey Evidence, IZA Discussion Paper No. 7348, Bonn

Committee on Eastern European Economic Relations (2022), New Record in Eastern Trade - Half a Trillion Cracked, online: https://www.ost-ausschuss.de/de/neuer-rekord-im-osthandel-halbe-billion-geknackt (last accessed 30.3.2022).

Cortes, K. E. (2004), Are Refugees Different from Economic Immigrants? Some Empirical Evidence on the Heterogeneity of Immigrant Groups in the United States?, *The Review of Economics and Statistics*, 86, 465-480 https://doi.org/10.1162/003465304323031058

Dena - Deutsche Energie-Agentur (2021), dena-Leitstudie Aufbruch Klimaneutralität, online: https://www.dena.de/fileadmin/dena/Publikationen/PDFs/2021/Abschlussbericht_dena-Leitstudie_Aufbruch_Klimaneutralitaet.pdf (last updated 30.03.2022).

Docquier, F. (2014), The brain drain from developing countries, IZA World of Labor 2014: 31, online https://wol.iza.org/articles/brain-drain-from-developing-countries/long (last accessed 30/03/2022) http://dx.doi.org/10.15185/izawol.31

Docquier, F.; Rapoport, H. (2012), Globalization, brain drain, and development. Journal of economic literature, 50(3), 681-730 http://dx.doi.org/10.1257/jel.50.3.681

EBRD (2018), Transition Report 2018-19, London, online: https://www.ebrd.com/news/publications/transition-report/transition-report-201819.html (last accessed 30.3.2022).

Eichengreen, B. et al. (2022), A Blueprint for the Reconstruction of Ukraine, London: CEPR

Emerson, M. et al. (2022), Opinion on Ukraine's Application for Membership of the European Union, CEPS Policy Insights, No. 2022-16.

European Commission (2011), Temporary and circular migration : empirical evidence, current policy practice and future options in EU Member States, Publications Office, Directorate-General for Migration and Home Affairs, online: https://op.europa.eu/en/publication-detail/-/publication/f20ccc9d-44c5-4bf2-8072-51b8c8409b39/language-en/format-PDF/source-117503538 (last accessed 30.03.2022). DOI: http://dx.doi.org/10.2837/67921.

European Commission (2020), Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Enhancing the accession process - A credible EU perspective for the Western Balkans, COM(2020) 57 final, Brussels.

European Commission (2022), European Commission – Enlargement – Accession Criteria, https://ec.europa.eu/neighbourhood-enlargement/enlargement-policy/glossary/accession-criteria_en (last accessed 18.04.22).

Federal Statistical Office (2022), Facts on Foreign Trade with Russia, Press Release No. N 010, February 24, 2022, online: https://www.destatis.de/DE/Presse/Pressemitteilungen/2022/02/PD22_N010_51.html (last accessed March 30, 2022).

Fertig, M.; Kahanec, M. (2015), Projections of potential flows to the enlarging EU from Ukraine, Croatia and other Eastern neighbors, IZA Journal of Migration (2015) 4:6 https://doi.org/10.1186/s40176-015-0029-8

Figueres, J.M.; Jarociński, M. (2020), Vulnerable growth in the euro area: Measuring the financial conditions, *Economics Letters*, Elsevier, vol. 191(C). https://doi.org/10.1016/j.econlet.2020.109126

Fischer, A.; Küper, M. (2022), Die Bedeutung russischer Gaslieferungen für die deutsche Energieversorgung. Untersuchung bestehender Lieferbeziehungen und Ausblick auf die weitere Entwicklung, Gutachten im Auftrag der Atlantik Brücke e.V., Cologne.

Fraunhofer ISI; ECOFYS; et al. (2015), Electricity costs of energy-intensive industry. An international comparison. Summary of results, online: https://www.bmwi.de/Redaktion/DE/Publikationen/Studien/stromkosten-der-energieintensiven-industrie.pdf?__blob=publicationFile&v=5 (last accessed 04.04.2022).

Froot, K.; Stein, J. (1991), Exchange Rates and Foreign Direct Investments, *Quarterly Journal of Economics*, 1191-1217

Gros, D. (2002), Optimal Tariff Versus Optimal Sanction, The case of European gas imports from Russia, CEPS Policy Insights, No. 2022-12, Brussels https://www.ceps.eu/ceps-publications/optimal-tariff-versus-optimal-sanction/

Hamilton, J. (2022), On Sanctions, Energy Prices and the Global Economy, Princeton Economics Webinar Presentation, March 17, 2022, online: https://bcf.princeton.edu/events/james-hamilton-on-sanctions-energy-prices-and-the-global-economy/ (last accessed 04.04.2022).

Hausmann, R. (2002), The Case for a Punitive Tax on Russian Oil, Project Syndicate, dated Feb. 26th, 2022 https://www.project-syndicate.org/commentary/case-for-punitive-tax-on-russian-oil-by-ricardo-hausmann-2022-02 (last accessed 13.04.22)

Hecking, H.; John, C.; Weiser, F. (2015), An embargo of Russian gas and security of supply in Europe, *Journal of Energy Economics*, 39(1), 63-73 https://doi.org/10.1007/s12398-014-0145-9.

Hollo, D.; Kremer, M.; Lo Duca, M. (2012), CISS – A Composite Indicator of Systemic Stress in the Financial System, ECB Working Paper Series, No. 1426 March 2012 https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp1426.pdf

Hubert, F.; Cobanli, O. (2015), Pipeline power: A case study of strategic network investments, Review of Network Economics, 14(2), 75-110.

IEA (International Energy Agency, 2022), How Europe Can Cut Natural Gas Imports from Russia Significantly within a Year, Press Release, Paris, online: https://www.iea.org/news/how-europe-can-cut-natural-gas-imports-from-russia-significantly-within-a-year (last accessed Mar. 30, 2022).

IHS (2014), A More Competitive Energiewende: Securing Germany's Global Competitiveness in a New Energy World. Main Report, IHS Report March 2014.

IMF (2016), Emigration and Its Economic Impact on Eastern Europe, IMF Staff Discussion Note 16/07.

IMF (2022a), IMF Staff Statement on the Economic Impact of War in Ukraine, online: https://www.imf.org/en/News/Articles/2022/03/05/pr2261-imf-staff-statement-on-the-economic-impact-of-war-in-ukraine (last accessed 30.3.2022).

IMF (2022b), World Economic Outlook. War Sets Back Global Recovery, April 2022.

KfW Research (2022a), KfW Digitization Report for SMEs 2021, online: https://www.kfw.de/PDF/Download-Center/Konzernthemen/Research/PDF-Dokumente-Digitalisierungsbericht-Mittelstand/KfW-Digitalisierungsbericht-2021.pdf (last accessed 04.04.2022).

KfW Research (2022b), Expected shift in demand toward digital offerings accelerates digitization in SMEs, No. 372, 23.03.2022, online: https://www.kfw.de/PDF/Download-Center/Konzernthemen/Research/PDF-Dokumente-Fokus-Volkswirtschaft/Fokus-2022/Fokus-Nr.-372-Maerz-2022-Digi-Nachfrage.pdf (last 04.04.2022).

Kappeler, A. (2022), Unequal Brothers. Russians and Ukrainians from the Middle Ages to the present, 2nd ed, Munich: Beck.

Kapur, D.; McHale, J. (2012), Economic effects of emigration on sending countries, in Rosenblum, M.; Tichenor, D.J. (eds.), Oxford Handbook of the Politics of International Migration, Oxford, 131-147 http://dx.doi.org/10.1093/oxfordhb/9780195337228.013.0006.

Kirsch, W. (2022), The Distribution of Power within the EU: Perspectives on an Ukrainian Accession and a Turkish Accession, *forthcoming in International Economics and Economic Policy*, Issue 2.

Klein, M. (2022), The end of the New Silk Road?, *Economic Service* 103(3), 157 http://dx.doi.org/10.1007/s10273-022-3142-3 .

Kone, Z.L.; Özden, Ç. (2017), Brain drain, gain and circulation, KNOMAD Working Paper 19, online: https://www.knomad.org/sites/default/files/2017-04/KNOMAD%20WP19_Brain%20Drain%20gain%20and%20circulation.pdf (last accessed 30.3.2022).

Kremer, M. (2016), Macroeconomic effects of financial stress and the role of monetary policy: a VAR analysis for the euro area, International Economics and Economic Policy, 13(1), 105-138.

Leopoldina/National Academy of Sciences (2022), How Russian natural gas can be replaced in German and European energy supply, Ad Hoc Statement, 08.03.2022, Halle, online: https://www.leopoldina.org/publikationen/detailansicht/publication/wie-sich-russisches-erdgas-in-der-deutschen-und-europaeischen-energieversorgung-ersetzen-laesst-2022/ (last accessed 30.03.2022).

Louven, S. (2022), Gas from Spain to help Northern Europe, Handelsblatt, 18.3.2022.

Makarov, I; Morozkina, A. (2014), Regional Dimension of Foreign Direct Investment in Russia, Discussion Paper No. 3, Higher School of Economics, Moscow/Economic Policy Forum (EPF), Berlin.

Malakhovskaya, O.; Minabutdinov, A. (2014), Are commodity price shocks important? A Bayesian estimation of a DSGE model for Russia, *Int. J. Computational Economics and Econometrics*, Vol. 4, Nos. 1/2, 2014, 148-180 https://doi.org/10.1504/ijcee.2014.060294.

McWilliams, B., Sgaravatti, G., Tagliapietra, S., & Zachmann, G. (2022). Can Europe survive painlessly without Russian gas?. *Bruegel blogs*, online: https://www.bruegel.org/2022/01/can-europe-survive-painlessly-without-russian-gas/ (last accessed 30.03.2022).

Narayanan, V. et al. (2017), Russian Involvement and Junk News during Brexit, Oxford Internet Institute, COMPROP DATA MEMO 2017.10, dated 19 December 2017, https://blogs.oii.ox.ac.uk/wp-content/uploads/sites/93/2017/12/Russia-and-Brexit-v27.pdf (last accessed 20.04.22)

OECD (2022), OECD Economic Outlook, Interim Report. Economic and Social Impacts and Policy Implications of the War in Ukraine, Paris. https://doi.org/10.1787/4181d61b-en.

Parker, S. (2021), Did donations to the Conservatives buy a Kremlin Brexit, West Country Voices, dated 12 April 2021, https://westcountryvoices.co.uk/did-donations-to-the-conservatives-buy-a-kremlin-brexit/ (last accessed 20.04.22)

Pienkowski, J. (2020), The Impact of Labor Migration on the Ukrainian Economy, DG EFIN Discussion Paper 123, EU, Brussels. https://doi.org/10.2765/450169.

Prognos; Öko-Institut e.V.; Wuppertal-Institut (2021), Klimaneutrales Deutschland 2045 (Climate-neutral Germany by 2045), Wie Deutschland seine Klimaziele schon vor 2050 erreichen kann. Commissioned by Stiftung Klimaneutralität, Agora Energiewende und Agora Verkehrswende, online: https://www.agora-verkehrswende.de/veroeffentlichungen/klimaneutrales-deutschland-2045-langfassung/ (last accessed 30.03.2022).

Research Services of the German Bundestag (Wissenschaftliche Dienste, 2019), Zur Geltendmachung nationaler Sicherheitsinteressen beim Aufbau des 5G-Netzes, Berlin, online: https://www.bundestag.de/resource/blob/657800/a839ff5d440a7fa626c9c165ca6b636b/WD-2-079-19-pdf-data.pdf (last accessed 30.3.2022).

Roeger, W.; Welfens, P.J.J. (2021), Foreign Direct Investment and Innovations: Transmission Dynamics of Persistent Demand and Technology Shocks in a Macro Model, EIIW Discussion Paper No. 300 https://eiiw.wiwi.uni-wuppertal.de/fileadmin/eiiw/Daten/Publikationen/Gelbe_Reihe/disbei300.pdf

Roeger, W.; Welfens, P.J.J. (2022a), The Macroeconomic Effects of Import Tariffs in a Model with Multinational Firms and Foreign Direct Investment, *International Economics and Economic Policy*, forthcoming.

Roeger, W.; Welfens, P.J.J. (2022b), EU Gas Import Tariff Under Duopoly: A Contribution to the Energy Sanctions Debate on Russia, EIIW Discussion Paper No. 314, forthcoming.

Rürup, B. (2022), Warum das Geschäftsmodell der deutschen Wirtschaft am Ende ist (Why the German Business Model Might Face a Sudden End), Düsseldorf, Handelsblatt, 1.4.2022

Sabadus, A. (2022), Bold Ukrainians Defy Putin's Invasion and Join European Electricity Grid, Atlantic Council, online: https://www.atlanticcouncil.org/blogs/ukrainealert/bold-ukrainans-defy-putins-invasion-and-join-european-electricity-grid/ (last accessed 30.03.2022).

Schrader, K.; Laaser, C.-F. (2022), Germany's trade with Russia and the war in Ukraine: What is at stake?, Kiel Policy Brief 163, Kiel Institute for the World Economy.

Smith, B. (2022), Digital Technology and the War in Ukraine, online: https://blogs.microsoft.com/on-the-issues/2022/02/28/ukraine-russia-digital-war-cyberattacks/ (last accessed 30/03/2022).

Srivastava, M.; Murgia, M.; Murphy, H. (2022), The Secret U.S. Mission to Bolster Ukraine's Cyber Defences Ahead of Russia's Invasion, online: https://www.ft.com/content/1fb2f592-4806-42fd-a6d5-735578651471 (last visited March 30, 2022).

Strzelecki, P., Growiec, J., Wyszynski, R. (2020), The Contribution of Immigration from Ukraine to Economic Growth in Poland, NBP Working Paper No 322, Warsaw.

Temprano Arroyo, H. (2019). Using EU aid to address the root causes of migration and refugee flows, European University Institute, online: https://cadmus.eui.eu/bitstream/handle/1814/61108/EUaidMIgration_2019.pdf (last accessed 30.03.2022).

Timmermans, F. (2022), Opening remarks by Executive Vice-President Timmermans and Commissioner Simson at the press conference on the REPowerEU Communication, March 8/Press Statement, Brussels.

UNHCR (2022), Operational Data Portal. Ukraine Refugee Situation, online: https://data2.unhcr.org/en/situations/ukraine (last accessed 30.03.2022).

Welfens, N. (2021), Categories on the Move. Governing Refugees in Transnational Admission Programs to Germany, Amsterdam, Ipskamp Printing.

Welfens, P.J.J. (2017a), BREXIT aus Versehen, 1. Auflage, Heidelberg: Springer https://doi.org/10.1007/978-3-658-15875-0

Welfens, P.J.J. (2017b), An Accidental BREXIT, London: Palgrave https://doi.org/10.1007/978-3-319-58271-9

Welfens, P.J.J. (2019), Klimaschutzpolitik – Das Ende der Komfortzone, Heidelberg: Springer. DOI: https://doi.org/10.1007/978-3-658-27884-7.

Welfens, P.J.J. (2022), Global Climate Change Policy, London: Palgrave. DOI: https://doi.org/10.1007/978-3-030-94594-7.

Welfens, P.J.J.; Gloede, K.; Strohe, H.G.; Wagner, D. (1999), System Transformation in Germany and Russia. Experiences, economic perspectives and policy options, Berlin/Heidelberg: Springer. DOI: https://doi.org/10.1007/978-3-662-13075-9.

World Bank (2022), Russian Invasion to Shrink Ukraine Economy by 45 Percent this Year, Presse Release, April 10, Washington DC.

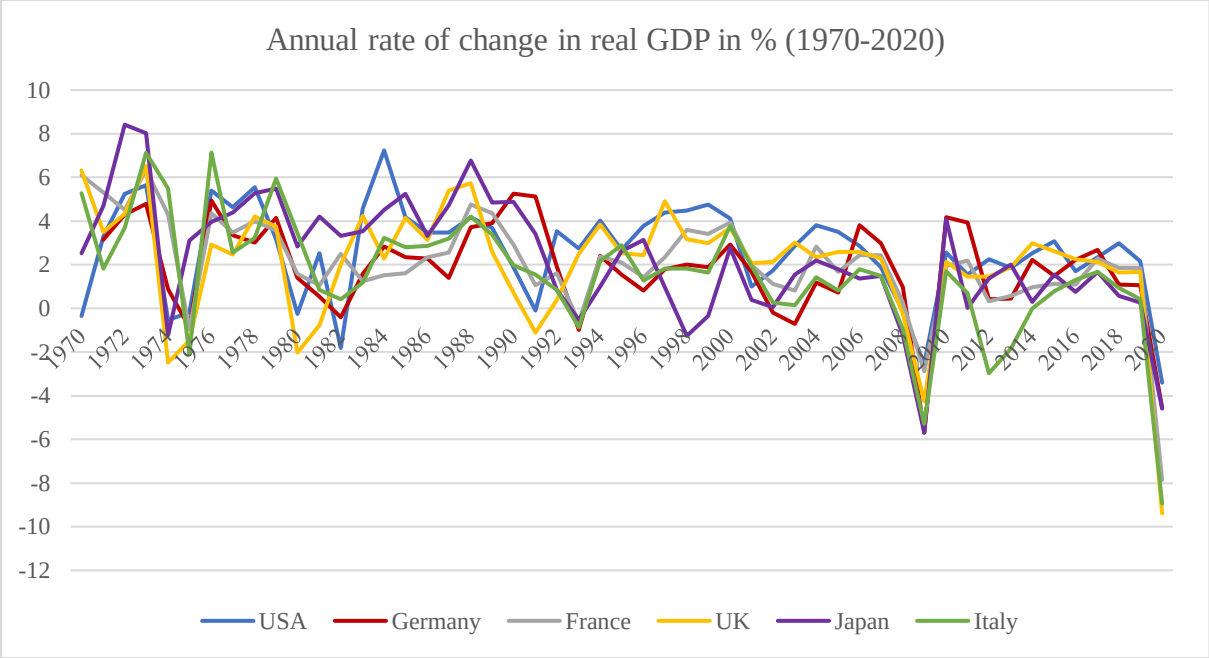
Yermakov, V.; Kirova, D. (2017), Gas and Taxes: The Impact of Russia's Tinkering with Upstream Gas Taxes on State Revenues and Decline Rates of Legacy Gas Fields, Energy Insight 20, The Oxford Institute for Energy Studies, October 2017, https://www.jstor.org/stable/resrep33915

Zimmermann, K. (2014), Circular migration. IZA World of Labor, online: https://wol.iza.org/articles/circular-migration/long (last accessed Mar. 30, 2022). DOI: https://doi.org/10.15185/izawol.1.

Appendix

Annex 1: Business Cycles 1970-2020 in the US, Germany, France, Italy, the UK and Japan

Fig. A1: Annual Rate of Change in Real Gross Domestic Product in % (1970-2020), Selected Industrialized Countries



Source: EIIW presentation; data from the World Bank (World Development Indicators, as of 2022).

Annex 2: German-Russian Economic Relations in 2021 (Federal Statistical Office, 2/24/2022)

Reproduced here (in an English translation) is Press Release No. N 010, dated February 24, 2022:

"Foreign trade with Russia up 34% year-on-year in 2021

Due to higher energy prices, imports in particular increase significantly (+54%)

Crude oil and natural gas account for around 59% of all imports from Russia

WIESBADEN - Despite growing political tensions, trade between Germany and Russia increased significantly again in 2021 compared with the first pandemic year 2020. As reported by the Federal Statistical Office (Destatis), goods worth around 59.8 billion euros were traded between the two countries in 2021 - 34.1% more than in the previous year. Goods worth 33.1 billion euros were imported from the Russian Federation, while exports worth a good 26.6 billion euros went there. Foreign trade turnover between Germany and Russia was thus 3.4% higher than the pre-crisis level in 2019.

Imports exceed exports again in 2021 - in contrast to 2020

Imports from Russia in particular grew strongly in 2021, rising by +54.2% compared with 2020. The value of goods exported to Russia also increased in the same period - but at a much more moderate rate of +15.4%. Thus, in contrast to the previous year, the value of German imports from Russia in 2021 again exceeded the value of exports to Russia. In 2020, Germany had achieved an export surplus for the first time since 1993. One reason for this: In the first Corona year, the value of crude oil and natural gas imports in particular had fallen significantly.

Crude oil and natural gas account for 59% of all imports from Russia

The primary commodities traded between Russia and Germany are raw materials, vehicles and machinery. Germany imported mainly crude oil and natural gas worth €19.4 billion in 2021 - this was an increase of 49.5% and accounted for 59% of all imports from Russia. Russia also supplied metals in particular (€4.5 billion,

+72.1% compared to 2020), petroleum and coke products (2.8 billion euros, +23.0%), and coal (2.2 billion euros, +153.0%) to Germany.

By contrast, Germany's exports to Russia in 2021 were mainly machinery (5.8 billion euros, +5.7%), motor vehicles and parts (4.4 billion euros, +31.8%) and chemical products (3.0 billion euros, +19.7%).

With a share of 2.3% of Germany's total foreign trade, Russia was one of the country's 15 most important trading partners in 2021. Outside the European Union, Russia was Germany's fourth most important import partner and fifth most important buyer of German goods in 2021. By way of comparison, the Federal Republic of Germany conducts most of its trade outside the EU with the People's Republic of China (9.5%) followed by the USA (7.5%). However, Russia's importance for German foreign trade has declined over the past decade: In the record year 2012,

which was also characterized by high energy prices, goods traded to and from Russia still accounted for 4.1% of German foreign trade.

Russian-managed companies in Germany generated almost 32 billion euros

The linkages between German and Russian companies are at a similar level to foreign trade. 1.9% of the sales of all foreign-controlled companies in Germany in 2019 were generated by those headquartered in Russia. By comparison, companies headquartered in the United States accounted for 17.9% of sales. There were 164 Russian-headquartered companies in Germany in 2019. They employed a good 8,100 people and generated sales of €31.6 billion in the process.

Conversely, according to the Deutsche Bundesbank, 472 companies in Russia were controlled by German investors in 2019. These employed just under 129,000 people and generated annual sales of a good 38.1 billion euros. This corresponds to a share of 1.5% of global annual sales generated abroad by companies of German investors in 2019. By way of comparison, 21.1 % of this global turnover by companies of German investors was generated in the USA (545.4 billion euros).

Methodological Notes:

The statistics on companies under foreign control include companies domiciled in Germany that are controlled by a parent company based abroad. Control exists when a company directly or indirectly owns more than 50% of the shares of another company. "

Annex 3: NATO Aircraft for Ukraine?

Russia has apparently achieved clear air superiority in the first two weeks of the war against Ukraine - mainly by destroying airports in Ukraine. Ukraine's government has called for the delivery of weapons from Western countries. A critical issue in mid-March included the possible delivery of 29 Soviet-made aircraft in service with the Air Force in Poland. News reports in Germany on March 8th said that Poland's government, initially reluctant, was willing to deliver the said aircraft to the US (to be flown to Ramstein US Air Force Base in Germany); Poland's government was said to have demanded that other NATO countries also cooperate here, with the air forces in Bulgaria and Slovakia also still using Soviet-made aircraft. Poland's government did not want to deliver the requested aircraft to Ukraine from Polish airports under any circumstances, as it feared that otherwise it would be classified as a warring party in the Ukraine war from the point of view of Russia's political leadership. Incidentally, the US is said to have promised that Poland would receive modern aircraft from the US to fill the emerging defense gap. Such a promise, however, can only be kept after several months, even if the US Air Force were willing to supply Poland with used US aircraft - F16s, for example. After all, Polish military pilots would first have to be trained on the new US aircraft. Incidentally, Poland's government has demanded that its aircraft could only be transferred to Ukraine with a unanimous NATO decision.

In principle, a transfer of aircraft from NATO countries to Ukraine could result in little countering of the then "new Ukrainian air force" against Russian air superiority. With some 40 aircraft that would be hard to ship to Ukraine under Russian radar and space-based satellite reconnaissance, little is likely to be accomplished in terms of strengthening Ukrainian defenses in the Ukraine war, while Russia is likely to point out that such Ukrainian aircraft could also attack targets in Russia: NATO countries could quickly become an active part of the Russia-Ukraine war against this backdrop, something NATO had said in the early days of the war should be avoided at all costs. Finally, there would then be the danger of a nuclear war between Russia and the US as well as the UK plus France as soon as an escalation within the framework of conventional warfare should have exceeded a critical threshold.

It is therefore not surprising that Germany did not agree to the transfer of the 29 Polish military jets to Ramstein. In the end, the US also rejected Poland's proposal. The problem is too obvious: Bringing Ukrainian pilots to Ramstein so that they can take off from there for military action in Ukraine's airspace would draw Germany and NATO into the crosshairs of the Russian military. Ukraine, Poland and the US could have raised questions about strengthening Ukraine's air force as early as Spring 2021, when Russia's armed forces launched their maneuvers on Ukraine's borders.

Annex 4: Ukraine's Neo-Nazi Problem - Text Published via REUTERS on March 19th, 2018 https://www.reuters.com/article/us-cohen-ukraine-commentary-idUSKBN1GV2TY

"Commentary: Ukraine's Neo-Nazi Problem

By Josh Cohen, Comment...

As Ukraine's struggle against Russia and its proxies continues, Kiev must also contend with a growing problem behind the front lines: far-right vigilantes who are willing to use intimidation and even violence to advance their agendas, and who often do so with the tacit approval of law enforcement agencies.

A January 28 demonstration, in Kiev, by 600 members of the so-called "National Militia," a newly-formed ultranationalist group that vows "to use force to establish order," illustrates this threat. While the group's Kiev launch was peaceful, National Militia members in balaclavas stormed a city council meeting in the central Ukrainian town of Cherkasy the following day, skirmishing with deputies and forcing them to pass a new budget.

Many of the National Militia's members come from the Azov movement, one of the 30-odd privately-funded "volunteer battalions" that, in the early days of the war, helped the regular army to defend Ukrainian territory against Russia's separatist proxies. Although Azov uses Nazi-era symbolism and recruits neo-Nazis into its ranks, a recent article in Foreign Affairs downplayed any risks the group might pose, pointing out that, like other volunteer militias, Azov has been "reined in" through its integration into Ukraine's armed forces. While it's true that private militias no longer rule the battlefront, it's the home front that Kiev needs to worry about now.

When Russian President Vladimir Putin's seizure of Crimea four years ago first exposed the decrepit condition of Ukraine's armed forces, right-wing militias such as Azov and Right Sector stepped into the breach, fending off the Russian-backed separatists while Ukraine's regular military regrouped. Though, as a result, many Ukrainians continue to regard the militias with gratitude and admiration, the more extreme among these groups promote an intolerant and illiberal ideology that will endanger Ukraine in the long term. Since the Crimean crisis, the militias have been formally integrated into Ukraine's armed forces, but some have resisted full integration: Azov, for example, runs its own children's training camp, and the careers section instructs recruits who wish to transfer to Azov from a regular military unit.
According to Freedom House's Ukraine project director Matthew Schaaf, "numerous organized radical right-wing groups exist in Ukraine, and while the volunteer battalions may have been officially integrated into state structures, some of them have since spun off political and non-profit structures to implement their vision." Schaaf noted that "an increase in patriotic discourse supporting Ukraine in its conflict with Russia has coincided with an apparent increase in both public hate speech, sometimes by public officials and magnified by the media, as well as violence towards vulnerable groups such as the LGBT community," an observation that is supported by a recent Council of Europe study.

In recent months, Ukraine has experienced a wave of unchecked vigilantism. Institute Respublica, a local pro-democracy NGO, reported that activists are frequently harassed by vigilantes when holding legal meetings or rallies related to politically-controversial positions, such as the promotion of LGBT rights or opposition to the war. Azov and other militias have attacked anti-fascist demonstrations, city council meetings, media outlets, art exhibitions,

foreign students and Roma. Progressive activists describe a new climate of fear that they say has been intensifying ever since last year's near-fatal stabbing of anti-war activist Stas Serhiyenko, which is believed to have been perpetrated by an extremist group named C14 (the name refers to a 14-word slogan popular among white supremacists). Brutal attacks this month on International Women's Day marches in several Ukrainian cities prompted an unusually forceful statement from Amnesty International, which warned that "the Ukrainian state is rapidly losing its monopoly on violence."

Ukraine is not the only country that must contend with a resurgent far right. But Kiev's recent efforts to incorporate independent armed groups into its regular armed forces, as well as a continuing national sense of indebtedness to the militias for their defense of the homeland, make addressing the ultranationalist threat considerably more complicated than it is elsewhere. According to Schaaf and the Institute Respublica, Ukrainian extremists are rarely punished for acts of violence. In some cases — such as C14's January attack on a remembrance gathering for two murdered journalists — police actually detain peaceful demonstrators instead.

To be clear, the Kremlin's claims that Ukraine is a hornets' nest of fascists are false: far-right parties performed poorly in Ukraine's last parliamentary elections, and Ukrainians reacted with alarm to the National Militia's demonstration in Kiev. But connections between law enforcement agencies and extremists give Ukraine's Western allies ample reason for concern. C14 and Kiev's city government recently signed an agreement allowing C14 to establish a "municipal guard" to patrol the streets; three such militia-run guard forces are already registered in Kiev, and at least 21 operate in other cities.

In an ideal world, President Petro Poroshenko would purge the police and the interior ministry of far-right sympathizers, including Interior Minister Arsen Avakov, who has close ties to Azov leader Andriy Biletsky, as well as Sergei Korotkykh, an Azov veteran who is now a high-ranking police official. But Poroshenko would risk major repercussions if he did so; Avakov is his chief political rival, and the ministry he runs controls the police, the National Guard and several former militias.

As one Ukrainian analyst noted in December, control of these forces make Avakov extremely powerful and Poroshenko's presidency might not be strong enough to withstand the kind of direct confrontation with Avakov that an attempt to oust him or to strike at his power base could well produce. Poroshenko has endured frequent verbal threats, including calls for revolution, from ultranationalist groups, so he may believe that he needs Avakov to keep them in check.

Avakov's Peoples' Party status as the main partner in Ukraine's parliamentary coalition increases Avakov's leverage over Poroshenko's Bloc. An attempt to fire Avakov could imperil Poroshenko's slim legislative majority, and lead to early parliamentary elections. Given Poroshenko's current unpopularity, this is a scenario he will likely try to avoid.

Despite his weak position, Poroshenko still has some options for reducing the threat from the far right. Though Avakov controls the Ukraine's police and National Guard, Poroshenko still commands Ukraine's security and intelligence services, the SBU, and could instruct the agency to cut its ties with C14 and other extremist groups. Poroshenko should also express public support for marginalized groups like the Roma and LGBT communities, and affirm his commitment to protecting their rights.

Western diplomats and human rights organizations must urge Ukraine's government to uphold the rule of law and to stop allowing the far right to act with impunity. International donors can

help by funding more initiatives like the United States Agency for International Development's projects supporting training for Ukrainian lawyers and human rights defenders, and improving equitable access to the judicial system for marginalized communities.

There's no easy way to eradicate the virulent far-right extremism that has been poisoning Ukrainian politics and public life, but without vigorous and immediate efforts to counteract it, it may soon endanger the state itself.

About the Author

Josh Cohen is a former USAID project officer involved in managing economic reform projects in the former Soviet Union.

Annex 5: EU sanctions against Russia (from EU Ukraine support website, March 2022)

"The sanctions include:

- financial sanctions that make it more difficult for Russia to access EU capital markets, freeze assets and prevent transactions with three Russian banks, and disconnect key banks from the SWIFT system
- Sanctions in the energy sector to make it harder and more expensive for Russia to expand its oil refineries
- Prohibition of export, sale and supply of aircraft and related equipment to Russian air carriers, as well as of all related repair, maintenance or financial services
- Closure of EU airspace to all Russian-owned, Russian-registered or Russian-controlled aircraft. These aircraft will no longer be able to land on the territory of the EU, take off from the territory of the Union or fly over the territory of the Union.
- Expand export controls on dual-use items to limit Russia's access to key technologies such as semiconductors or cutting-edge software
- EU entry restrictions for Russian diplomats and similar groups and for business people
- EU-wide suspension of broadcasting rights for state media Russia Today and Sputnik and their affiliates. "

Source: European Commission (2022), online: https://ec.europa.eu/info/strategy/priorities-2019-2024/stronger-europe-world/eu-solidarity-ukraine_de

Annex 6: OECD Interim Economic Outlook, March 2022 (Economic Model Analysis on the Russia-Ukraine War/Main Assumptions and Selected Results).

"The main text incorporates simulations of the potential economic impact of the Russia-Ukraine conflict using the NiGEM global macroeconomic model. The simulations consider the impact of the shocks to commodity and financial markets seen in the first two weeks since the invasion by Russia, and large up-front declines in domestic demand in Russia and Ukraine.

The commodity price shocks are the percentage difference in the average price of selected commodities over February 24 to March 9 from the average price in January 2022. Translating these into the global commodity price aggregates included in NiGEM:

- World oil prices are increased by 33% and coal prices by 80%.
- Gas prices are raised by 85% in Europe, 10% in North America and 20% in the rest of the world.
- World metals prices are increased by 11%, based on a weighted average of changes in prices for copper, gold, zinc, iron ore, nickel, aluminum, palladium and platinum.
- World food prices are raised by a weighted average of 6%, with wheat prices up by 90%, corn prices by 40% and all other index components assumed to remain unchanged.
- Fertiliser prices are assumed to be 30% higher.

The financial market shocks are also calibrated on the average changes seen since the start of the war relative to January 2022. They include:

- A 50% depreciation of the rouble against the US dollar, and an initial increase of 10.5 percentage points in Russian policy interest rates, with smaller bilateral US dollar currency depreciations of 5% in the Czech Republic, Hungary, Poland, Romania and Turkey. These shocks imply small effective exchange rate appreciations in the major advanced economies.
- Greater financial market uncertainty and diminished risk appetite has pushed up investment risk premia by around 1000 basis points in Russia, 500 basis points in Ukraine, 100 basis points in Turkey, 50 basis points in Bulgaria, Czech Republic, Hungary, Poland and Romania, and 25 basis points in all other emerging-market economies.

The potential scale of the likely hit to domestic demand in Russia and Ukraine is extremely uncertain, but is likely to be large. Past episodes in Russia, such as the financial crisis in 1998 and the aftermath of the annexation of Crimea in 2014 were accompanied by sizeable domestic demand declines of between 10-15 per cent. The stronger sanctions applied following the invasion of Ukraine suggest that the downturn in Russia could be even larger than these past episodes. Sharp downturns have also occurred in other countries subject to international sanctions, including Iran. In Ukraine, the scale of the damage caused by the war is likely to be greater still. Other conflicts have resulted in annual GDP declines of between 25-40% in some countries, including Iraq, Syria and Yemen.

The simulations incorporate ex-ante domestic demand declines of 15% in Russia and 40% in Ukraine. Domestic demand is left endogenous to reflect other factors that are adjusting in the simulation.

All shocks are assumed to last for at least one year. The simulations are undertaken on the NiGEM model in backward-looking mode. This means that consumers and companies do not make their current spending choices with certainty about the future evolution of the conflict. Policy interest rates are endogenous and adjust according to the balance of the shocks to growth and inflation.

The fiscal scenario considers the impact of an increase in final government spending of 0.5% of GDP in all OECD economies. In practice, the measures taken could vary across countries, reflecting a combination of stronger investment and defense spending and cash transfers targeted on lower income households or refugees with a high marginal propensity to consume. In countries less directly affected by the conflict, the additional spending could also reflect temporary delays in some previously-planned discretionary consolidation. "

Source: OECD Economic Outlook, Interim Report March 2022, p. 13.

Annex 7: Joint Statement by the Leaders of International Financial Organizations with Programs for Ukraine and Neighboring Countries (March 17, 2022).

An unusual joint statement of the leaderships of international financial organizations expresses a special cooperation of these organizations in the assistance to Ukraine in the Spring of 2022.

STATEMENT MARCH 17, 2022

Joint Statement of Heads of International Financial Institutions with programs in Ukraine and neighboring countries

Statement from Odile Renaud-Basso, President of the European Bank for Reconstruction and Development (EBRD), Werner Hoyer, President of the European Investment Bank (EIB), Carlo Monticelli, Governor of the Council of Europe Development Bank (CEB), Kristalina Georgieva, Managing Director of the International Monetary Fund (IMF), and David Malpass, President of the World Bank Group (WBG).

We, the heads of the EBRD, EIB, CEB, IMF, and WBG, met today to discuss impacts on the global economy of the ongoing war in Ukraine and our respective and collective response to this crisis. We are horrified and deeply concerned about the Russian invasion of Ukraine and the ensuing crisis. The attacks on civilians and civilian infrastructure are causing tremendous suffering, creating massive population displacements, threatening international peace and security, and endangering basic social and economic needs for people around the world.

In addition to the devastating human catastrophe unfolding in Ukraine, the war is disrupting livelihoods throughout the region and beyond. The impacts will be extensive-from reduced energy and food supplies, to increases in prices and poverty and a massive undertaking of Ukraine's reconstruction, all of which will hamper the post-pandemic recovery around the world.

The entire global economy will feel the effects of the crisis through slower growth, trade disruptions, and steeper inflation, harming especially the poorest and most vulnerable. Higher prices for commodities like food and energy will push inflation up further. Countries, particularly those neighboring Ukraine will suffer disruptions in trade, supply chains and remittances as well as surges in refugee flows. Reduced confidence and higher investor uncertainty will impact asset prices, tighten financial conditions, and could even generate capital outflows from emerging markets.

Our institutions have responded with emergency support to Ukraine and its neighbors.

The **EBRD** has approved a "War on Ukraine - EBRD Resilience Package", initially sized at EUR 2 billion, to respond to the immediate needs of the people affected by the war and - when conditions permit - support the substantial reconstruction of Ukraine. The EBRD's package comprises an immediate Resilience and Livelihoods program covering the areas of energy security, nuclear safety, municipal services, trade finance support and liquidity for SMEs in Ukraine and in neighboring affected countries. Once conditions permit, the EBRD will also be prepared to take part in a reconstruction program for Ukraine, to rebuild livelihoods and businesses; restore vital infrastructure; support good governance; and enable access to services. It envisages working with international partners including the EU and U.S., as well as bilateral donors and other international financial institutions.

The **EIB** has prepared an emergency solidarity package for Ukraine of EUR 2 billion, including the provision of EUR 668 million in immediate liquidity assistance to the Ukrainian authorities. This has been developed in close collaboration with the European Commission. As part of this package, the Bank is also accelerating the delivery of an additional EUR 1.3 billion of

commitments made for infrastructure projects. Of the emergency liquidity assistance, EUR 329 million has been disbursed in the past week. An additional EUR 329 million will be disbursed over the coming days. In parallel, the Bank is developing a multi-billion euro package for the EU Eastern and Southern Neighborhood, the EU Enlargement Region and Central Asia to mitigate the consequences of the refugee crisis, and help address the social and economic fallout caused by the war. Within the EU, EIB will work closely with Member States, National Promotional Banks and the European Commission to prepare an action plan to help alleviate the impact of the refugee crisis on EU countries hosting refugees.

The **CEB**, according to its membership and special social mandate, has provided emergency grants to Ukraine's neighboring countries to cover immediate needs of refugees, including transportation and orientation. The CEB stands ready to also provide flexible, fast-disbursing loans to address the significant financial needs of neighboring and other countries hosting large inflow of refugees, while remaining focused on the social sector.

The **IMF** disbursed emergency assistance of US$1.4 billion to Ukraine on March 9 under the Rapid Financing Instrument (RFI) to help meet urgent financing needs including to mitigate the economic impact of the war. IMF staff remains closely engaged with the authorities to provide policy support as they continue to design and implement effective crisis mitigation measures. The IMF is also currently working with Moldova, which has requested an augmentation of its existing IMF-supported program. The Fund stands ready to support neighboring and other countries affected by the spillovers of the war through all its relevant instruments.

The **World Bank Group** has already mobilized more than US$925 million for Ukraine, including fast-disbursing budget support to help the government provide critical services to Ukrainian people, of which US$350 million has been disbursed. This financing is part of a US$3 billion package of support planned for Ukraine in the coming months. The World Bank also set up a multi-donor trust fund (MDTF) that is among the most rapid, targeted, and secure mechanisms to facilitate channeling grant resources from donors to Ukraine, with contributions of US$145 million thus far. The World Bank Group is also working on options to assist neighboring countries, including to support refugee populations, and will continue to provide trade finance to support the private sector.

We acknowledge the importance of working together to coordinate our respective responses to support Ukraine and neighbors on the financing and policy fronts and maximize impact on the ground. We are committed to strengthening international cooperation and solidarity in the face of this enormous challenge.

Annex 8: Intra-EU Solidarity Requirements of Member Countries under the EU Gas Supply Emergency Directive (excerpts; 2017).

The directive refers directly, amongst other things, to supply problems from Russia in 2009; it is probably unclear what solidarity requirements apply in a case where EU member states - individually or collectively - implement a gas import boycott. Nevertheless, Germany, for example, is likely to have a special obligation to help within the EU if the EU decides to impose a gas import boycott on Russia.

The following are excerpts from the EU Directive:

"([1]) Commission Regulation (EU) No 312/2014 of 26 March 2014 establishing a network code for gas balancing in transmission systems (OJ L 91, 27.3.2014, p. 15).

28.10.2017

Official Journal of the European Union L 280/7 (Official Journal of the European Union 28.10.2017)

This Regulation establishes sufficiently harmonized standards for security of supply to deal with at least a situation such as that which occurred in January 2009, when gas supplies from Russia were interrupted. These standards take into account the differences between Member States as well as public service obligations and customer protection as set out in Article 3 of Directive 2009/73/EC. The security of supply standards should be stable to ensure the necessary legal certainty, they should be clearly defined and they should not impose an unreasonable and disproportionate burden on natural gas undertakings. They should also ensure equal access of Union natural gas undertakings to national customers. Member States should establish measures to ensure in an effective and proportionate manner that natural gas undertakings comply with those standards, including the possibility of imposing financial penalties on suppliers where they deem it appropriate.

The roles and responsibilities of all natural gas undertakings and Competent Authorities should be clearly defined in order to maintain a properly functioning internal gas market, in particular in the event of supply disruptions and crises. The definition of roles and responsibilities should be such as to ensure that a three-level approach is followed, with action being taken in a first step by the natural gas undertakings and industry concerned, in a second step by the Member States at national or regional level and in a third step by the Union. This Regulation should enable natural gas undertakings and customers to rely on market mechanisms for as long as possible in the event of supply disruptions. However, it should also provide for mechanisms to be resorted to in the event that markets alone can no longer adequately deal with a gas supply disruption.

In the event of a gas supply disruption, market participants should be given sufficient opportunity to respond to the situation with market-based measures. Where market measures have been exhausted and are still not sufficient, Member States and their competent authorities should take measures to remedy or mitigate the effects of the gas supply disruption.

Where Member States intend to adopt non-market based measures, the introduction of the measures should be accompanied by a description of the economic consequences. This will ensure that customers receive the information they need on the costs of such measures and that the measures are transparent, in particular as regards their impact on the gas price.

The Commission should be empowered to ensure that new non-market-based preventive measures do not jeopardize the security of gas supply of other Member States or of the Union. Since such measures may be highly detrimental to the security of gas supply, it is appropriate that they enter into force only if they have been approved by the Commission or amended in accordance with a Commission decision.

Demand-side measures such as fuel switching or reducing gas supplies to large industrial customers in an economically efficient sequence can make a valuable contribution to securing gas supplies, provided they can be implemented quickly in response to a gas supply disruption and reduce demand appreciably. More should be done to encourage efficient energy use, especially when demand-side measures are necessary. The environmental impacts of proposed demand-side and supply-side measures should be adequately considered, and preference should be given as much as possible to those measures that have the least impact on the environment. At the same time, the considerations of security of gas supply and preservation of competition should be taken into account.

It is necessary to ensure the predictability of the actions to be taken in an emergency so that all market participants have sufficient opportunity to respond and prepare for such circumstances. In principle, therefore, the competent authorities should act in accordance with their emergency plans. However, in duly justified special circumstances, they should be allowed to take measures that deviate from those plans. It is also important to make the way in which emergencies are announced more transparent and predictable. In this respect, information on the network balancing status (the overall status of the transmission network) - the relevant framework is set out in Commission Regulation (EU) No 312/2014 ([1]) - can play an important role. This information should be available in real time to the competent authorities and to the national regulatory authorities where they are not the competent authorities.

As was made clear in the context of the October 2014 stress test on the short-term resilience of the European gas system, solidarity is needed to ensure security of gas supply in the Union. This will spread the impact more evenly and mitigate the overall impact of a severe disruption. The solidarity mechanism is designed to deal with extreme situations where the supply of customers protected by solidarity is at stake as an essential necessity and indispensable priority in a Member State. Solidarity ensures cooperation with the more vulnerable Member States. Solidarity is also a last resort, used only in an emergency and under limited conditions. Therefore, when an emergency is declared in a Member State, a graduated and proportionate approach should be taken to ensure security of gas supply. In particular, the Member State which has declared the emergency should first take all the emergency measures provided for in its emergency plan in order to ensure gas supply to its customers protected by solidarity. At the same time, all Member States that have implemented an increased supply standard should temporarily lower it to the normal supply standard in order to increase the liquidity of the gas market if the Member State declaring the emergency declares that cross-border measures are necessary. If these two sets of measures do not result in the necessary supply, solidarity measures should be taken by the directly connected Member States to ensure gas supply to customers protected by solidarity in the Member State where the emergency has occurred, upon its request. Such solidarity measures should ensure that gas supplies to customers not protected by solidarity are reduced or withdrawn in the territory of the Member State providing solidarity in order to make gas quantities available to the extent needed and for the period during which the gas needs of customers protected by solidarity are not met in the Member State requesting solidarity. Under no circumstances should this Regulation be understood as requiring or allowing a Member State to exercise sovereign authority in another Member State.

39. Solidarity measures should also apply as a last resort where a Member State is connected to another Member State through a third country, provided that the flow through that third country is not restricted and subject to the agreement of the Member States concerned, which should include, where appropriate, the third country through which they are connected.
40. Where solidarity measures are applied as a last resort, the curtailment or withdrawal of gas supply in the Member State providing solidarity should affect all customers not protected by solidarity where this is necessary to meet its solidarity obligations and to avoid discriminatory treatment, irrespective of whether the customers receive gas in the form of heat directly or through district heating facilities protected by solidarity. The same should be ensured in reverse for customers who are not solidarity-protected customers in the Member State purchasing gas through the solidarity mechanism.
41. Where solidarity measures are taken as a last resort, preference should first be given to reducing gas consumption in the Member State providing solidarity on a voluntary basis, through market-based measures such as voluntary demand-side measures or reverse auctions where certain consumers, such as industrial consumers, notify the transmission system operator or other competent authority of the price at which they would reduce or stop their gas consumption. If market-based measures prove insufficient to remove the congestion in the necessary gas supply, and given the importance of solidarity as a last resort, the Member State providing solidarity should be able to apply non-market-based measures, including supply cuts for certain groups of consumers, as a second step to meet its solidarity obligations.
42. Compensation should be provided for solidarity measures as a last resort. The Member State providing solidarity should receive adequate compensation without delay from the Member State benefiting from solidarity, including for gas delivered to its territory and for any other relevant reasonable costs incurred in providing solidarity. Solidarity measures as a last resort should be conditional on the commitment of the Member State requesting solidarity to provide adequate and prompt compensation. This Regulation does not harmonize all aspects of adequate compensation. The Member States concerned should take the necessary measures - in particular technical, legal and financial arrangements - to implement the provisions on prompt and adequate compensation between them.
43. Member States, when taking measures under the provisions of this Regulation on solidarity, implement Union law and are therefore required to respect fundamental rights guaranteed by Union law. Such measures may therefore lead to an obligation for a Member State to provide compensation to those affected by its measures. Member States should therefore ensure that there are national provisions on compensation that are compatible with Union law and in particular with fundamental rights. In addition, it should be ensured that the Member State benefiting from solidarity ultimately bears any reasonable costs incurred by the Member State providing solidarity as a result of the aforementioned obligation to provide compensation, as well as any further reasonable costs incurred as a result of providing compensation under the aforementioned national compensation schemes.

Since more than one Member State may provide solidarity support to a requesting Member State, there should be a burden-sharing mechanism. Under this mechanism, the Member State requesting solidarity should, after consulting all Member States concerned, select the most advantageous offer in terms of cost, speed of delivery, reliability and diversification of gas supply from different Member States. Member States should, as far and as long as possible, make such offers on the basis of voluntary demand-side measures before resorting to non-market-based measures.

This Regulation introduces for the first time such a solidarity mechanism between Member States as a tool to mitigate the effects of a severe emergency within the Union - including a burden-sharing mechanism. The Commission should therefore review the burden-sharing mechanism and the solidarity mechanism in general in the light of future experience with their functioning and propose amendments to them as appropriate.

Member States should adopt the necessary measures to implement the provisions on the solidarity mechanism, including that the Member States concerned agree on technical, legal and financial arrangements. Member States should describe the details of these arrangements in their contingency plans. The Commission should provide non-legally binding guidance on the main elements to be included in these arrangements.

As long as a Member State is able to cover the gas consumption of customers protected by solidarity from its own production and therefore does not need to request solidarity, it should be exempted from the obligation to establish technical, legal and financial arrangements with other Member States to obtain a solidarity payment. This should not affect the obligation of the Member State concerned to provide a solidarity benefit to other Member States.

There should be a safeguard clause for cases where the Union bears the costs of measures which Member States are required to take under the solidarity mechanism provisions of this Regulation, on the basis of liability other than for unlawful acts or conduct within the meaning of Article 340(2) TFEU. In such cases, it is appropriate that the Member State benefiting from solidarity should reimburse the costs incurred by the Union.

Where necessary, solidarity should also be exercised through assistance provided by the Union and its Member States in the framework of civil protection. Such assistance should be facilitated and coordinated through the Union Civil Protection Mechanism established by Decision No 1313/2013/EU, which aims to strengthen cooperation between the Union and the Member States and facilitate coordination in the field of civil protection in order to improve the effectiveness of systems for preventing, preparing for and responding to natural and man-made disasters.

Access to relevant information is essential for assessing the security of gas supply of a Member State, part of the Union or the Union as a whole. In particular, Member States and the Commission need regular access to information from natural gas undertakings on the main parameters of gas supply, including precise measurements of available storage reserves, as a basic starting point for designing strategies to safeguard gas supply. Independent of the declaration of an emergency, access to additional information needed to assess the overall gas supply situation should also be possible in justified cases. Such additional information would typically be non-price gas supply information, e.g., on minimum and maximum gas volumes, delivery points, or gas supply suspension conditions.

An efficient and targeted mechanism for Member States' and the Commission's access to key gas supply contracts should ensure a comprehensive assessment of the relevant risks that may lead to a disruption of gas supply or affect the necessary mitigation measures in case a crisis nevertheless occurs. Under this mechanism, certain major gas supply contracts should be - automatically notified to the competent authorities of the Member States most affected, whether the gas originates in the Union or in third countries. New contracts or modifications should be notified immediately after their conclusion. In order to ensure transparency and reliability, existing contracts should also be notified. The notification obligation should also apply to all commercial agreements relevant to the performance of the gas supply contract, including

relevant agreements which may be related to infrastructure, storage and other aspects important for the security of gas supply.

Any obligation to automatically notify a contract to the competent authority must be proportionate. Applying this obligation to contracts between a supplier and a buyer representing at least 28% of the national market is balanced in terms of administrative efficiency and transparency and imposes clear obligations on market participants. The Competent Authority should assess the contract from the point of view of ensuring the security of gas supply and send the results of the assessment to the Commission. If the Competent Authority has doubts as to whether a particular contract is a risk to the security of gas supply in a Member State or region, it should notify that contract to the Commission for assessment. This does not mean that other gas supply contracts are not relevant for the security of gas supply. Where the competent authority of the Member State most concerned or the Commission considers that a gas supply contract which is not subject to the automatic notification requirement under this Regulation could, due to its specificities, the group of customers supplied or its importance for security of gas supply, pose a risk to security of gas supply in a Member State, in a region of the Union or in the Union, the competent authority or the Commission should be able to request the contract in order to assess its impact on security of gas supply. This information could be requested, for example, if there is a change in the pattern of past gas supplies to one or more customers in a Member State which would not be expected under normal market conditions and which could have an impact on the gas supply to the Union or parts of the Union. This mechanism will ensure that access to other important gas supply contracts relevant to security of supply is guaranteed. Such a requirement should be duly justified and should take into account the need to minimize the administrative burden of this measure. "

Annex 9: Fossil Energy Imports of Selected Countries from Russia and Main Suppliers of Oil, Gas and Coal

Tab. A1: Share of Fossil Energy Imports from Russia in Domestic Energy Consumption of Selected Countries, 2019.

	Country	Dependence on imported fossil energy from Russia
1	Lithuania	121.2%
2	Hungary	76.3%
3	Slovakia	68.5%
4	Netherlands	65.6%
5	Finland	50.4%
6	Bulgaria	40.4%
7	Greece	37.5%
8	Poland	36.7%
9	Latvia	35.5%
10	Belgium	30.5%
11	Germany	28.9%
12	Italy	28.1%
22	France	9.7%
25	United Kingdom	8.7%
26	Spain	7.2%
27	Japan	7.1%
34	US	1.2%

Note: The indicator is composed of the sum of Russian imports of coal, oil and natural gas in relation to domestic energy consumption. The figure can be greater than 100% if more was imported than consumed (transit transactions, if applicable). Since not all figures from 2020 are available, 2019 was chosen as the starting point for the purpose of completeness.
Source: International Energy Agency (IEA), online: https://www.iea.org/reports/reliance-on-russian-fossil-fuels-data-explorer (last accessed March 30, 2022).

Annex 10: Largest Exporters of Crude Oil, Natural Gas and Coal

Tab. A2: Top 15 Exporting Countries of Crude Petroleum Oil in 2020, Exported Value in Thousand US$

	Country	Exported value in 2020 (thousand US$)	Share of World
	World	***607,279,930***	***100.00%***
1	United Arab Emirates	105,123,365	17.31%
2	Russian Federation	72,564,294	11.95%
3	Iraq	50,907,809	8.38%
4	United States of America	49,507,575	8.15%
5	Canada	47,605,672	7.84%
6	Kuwait	28,629,492	4.71%
7	Nigeria	25,161,351	4.14%
8	Kazakhstan	23,703,746	3.90%
9	Norway	22,671,605	3.73%
10	Angola	20,227,206	3.33%
11	Brazil	19,613,858	3.23%
12	United Kingdom	16,096,917	2.65%
13	Oman	15,023,520	2.47%
14	Mexico	14,683,691	2.42%
15	Iran	10,034,998	1.65%
Total			**85.88%**

Note: Product Code 2709 - Petroleum oils and oils obtained from bituminous minerals, crude.
Source: Own calculations (IV); data are ITC calculations based on UN Comtrade and ITC statistics (2022).

Tab. A3: Top 15 Exporting Countries of Liquified Natural Gas in 2020, Exported Value in Thousand US$

	Country	Exported value in 2020 (thousand US$)	Share of World
	World	***77,923,928***	***100.00%***
1	Australia	26,312,442	33.77%
2	United States of America	13,045,788	16.74%
3	Malaysia	6,865,068	8.81%
4	Russian Federation	6,745,828	8.66%
5	Nigeria	3,748,842	4.81%
6	Oman	3,677,245	4.72%
7	Indonesia	3,609,514	4.63%
8	Papua New Guinea	3,310,233	4.25%
9	Trinidad and Tobago	2,341,485	3.00%
10	Brunei Darussalam	2,161,184	2.77%
11	Algeria	2,099,697	2.69%
12	Angola	1,016,229	1.30%
13	Peru	520,027	0.67%
14	Equatorial Guinea	505,253	0.65%
15	Norway	466,569	0.60%
Total			**98.08%**

Note: Product Code 271111 - Natural gas, liquefied.
Source: Own calculations (IV); data are ITC calculations based on UN Comtrade and ITC statistics (2022).

Tab. A4: Top 15 Exporting Countries of Coal in 2020, Exported Value in Thousand US$

	Country	Exported value in 2020 (thousand US$)	Share of World
	World	***82,636,102***	***100.00%***
1	Australia	32,725,103	39.60%
2	Indonesia	14,547,621	17.60%
3	Russian Federation	12,388,244	14.99%
4	United States of America	6,072,849	7.35%
5	South Africa	3,910,237	4.73%
6	Colombia	3,542,690	4.29%
7	Canada	3,396,095	4.11%
8	Mongolia	2,123,670	2.57%
9	Mozambique	590,789	0.71%
10	Poland	507,316	0.61%
11	Netherlands	437,116	0.53%
12	China	435,278	0.53%
13	Kazakhstan	339,784	0.41%
14	Philippines	231,103	0.28%
15	United Kingdom	180,464	0.22%
Total			**98.54%**

Note: Product Code 2701 - Coal; briquettes, ovoids and similar solid fuels manufactured from coal.
Source: Own calculations (IV); data are ITC calculations based on UN Comtrade and ITC statistics (2022).

Tab. A5: Top 15 Exporters of Natural Gas (in volume), Estimated 2017

Rank	Country	Natural gas exports (in million cubic meters), 2017	Share of World*
	World*	***1,166,342***	***100.00%***
1	Russia	210,200	18.02%
2	Qatar	126,500	10.85%
3	Norway	120,200	10.31%
4	United States	89,700	7.69%
5	Canada	83,960	7.20%
6	Australia	67,960	5.83%
7	Algeria	53,880	4.62%
8	Netherlands	51,250	4.39%
9	Malaysia	38,230	3.28%
10	Turkmenistan	38,140	3.27%
11	Germany	34,610	2.97%
12	Indonesia	29,780	2.55%
13	Nigeria	27,210	2.33%
14	Trinidad and Tobago	15,490	1.33%
15	Bolivia	15,460	1.33%
Total		1,002,570	**85.96%**

Note: *World calculated as sum of the 215 countries included in the data set, 56 of which have natural gas import volumes greater than zero.
Source: Own calculations (IV); data are from The World Factbook (CIA, 2022).

Annex 11: On the Important Sectors with High Electricity Intensity of Production (Expert Opinion for the German Federal Ministry of Economics, 2015).

The use of gas - and also coal - from Russia is important for power generation in Germany, but also in Poland (where coal imports from Russia are particularly significant) and other countries. Power generation from gas-fired power plants is relatively flexible and increased output can be realized at short notice, while the ramp-up of coal-fired power plants takes more than a day and is less favorable than power generation from gas-fired power plants in terms of climate policy because of the relatively high CO2 emissions. In the event of an energy import embargo on gas and coal supplies from Russia, sharply rising gas and coal prices in the EU are to be expected - and therefore electricity prices for private households and industry will also rise. Electricity price increases will only affect companies and private households with a time lag of several months or quarters. The Fraunhofer Institute ISI, together with partner institutes (ISI et al, 2015), has presented an analysis of what role rising energy or electricity prices would have for the economy in Germany; and how the policy in Germany should be classified in comparison to other industrialized countries. In Germany, relatively electricity-intensive companies have special (regulated) electricity price concessions - from an economic perspective, this is relatively problematic.

"Brief summary

Energy prices are a key factor for the competitiveness of many German companies. In order to finance the energy turnaround, the costs of promoting renewable energies in Germany are mainly passed on to end consumers via energy prices, especially electricity prices. A large number of levies as well as the electricity tax increase the electricity price and thus the electricity costs for industry. In order to limit the burdens on energy-intensive industry in particular, the German government has created various exemptions.

For the same economic considerations of competitiveness, competing economies have also introduced special regimes for industrial electricity consumers. This study examines in detail the composition of electricity prices in Germany and ten other countries: the Netherlands, the United Kingdom, France, Italy, Denmark, Canada, the United States, China, Korea and Japan. At four levels of analysis, it shows the effects of the exemptions on the competitiveness of industrial companies in Germany.

The analysis divides electricity price components into three categories:

Electricity procurement prices include the purchase costs of electricity on the wholesale market and the margins of the suppliers. Their level is determined by the composition and technical characteristics of the power plant fleet, the costs of the fuels used, the development of demand, and the framework conditions of electricity market regulation.

Network charges are used to allocate the costs of transmission system operators and distribution system operators for their services.

Other, state-regulated components finance the costs of energy policy instruments or add revenue to the state budget. These include taxes and levies, but also costs for meeting specified quotas.

The analysis of the national electricity markets reveals the different regulatory approaches in the countries studied. While the European regulators in Germany, the Netherlands, France, Italy and Denmark distribute costs of energy policy measures via levies and taxes with defined privilege criteria for individual customers, the British and North American governments rely on quota systems to distribute costs. They thus leave the question of cost allocation largely to market actors. In all three Asian countries studied, the costs of political interventions in the electricity system are accounted for in a non-transparent manner via government-set full-cost prices.

The electricity procurement prices, network charges and privilege criteria for taxes and levies determined in the study are applied to sample cases in six energy-intensive industries: Chemicals, Paper, Steel, Aluminum, Copper, and Textiles. The electricity consumption of these industries comprises about 70% of the electricity consumption of the manufacturing sector in Germany and about 27% of the total...

Aluminum and copper producers, steel production in electric steel furnaces, and chemical reduction processes fall under nearly all of the privilege criteria analyzed, which are intended to relieve competitively vulnerable companies from state-regulated electricity price components. These criteria include:

Absolute consumption: The tariffs of many state-regulated electricity price components are tiered or contain fixed base amounts. Companies with higher consumption thus pay less per unit of energy on average. For example, in Germany, all companies in the Special Equalization Scheme (BesAR) pay the full Renewable Energy Sources Act (EEG) levy for the first gigawatt-hour of consumption.

Energy intensity: The level of electricity costs compared to sales or gross value added shows which companies' competitiveness suffers particularly from high electricity prices. Under various regulations, companies are privileged above a certain energy intensity threshold. Under the German special equalization scheme, this threshold is 16% of gross value added in 2015.

Sector affiliation: Some sectors of the economy are more exposed to international competition than others, which is why exemptions are often linked to sector affiliation. The new regulation of the special equalization scheme is also an example of this. Depending on the sector to which they belong, companies must reach different threshold values for energy intensity in order to be privileged.

Processes used: Individual industrial processes are inherently electricity-intensive. The electricity consumption of defined processes is therefore often exempt from taxes and levies. One example is electricity consumption in metallurgical processes, for which no electricity tax has to be paid in Germany.

Energy efficiency measures: Some regulators reward efficient companies with lower electricity prices through reduced taxes and surcharges. The special equalization scheme also makes it a condition that companies install energy management systems.

Cost cap: Some regulators limit the absolute costs of a policy measure for consumption with an absolute or a relative value. The newly regulated Special Equalization Scheme also limits payments for the EEG levy to a maximum of 4%, or 0.5% of a company's gross value added.

Self-generation: Energy-intensive companies occasionally generate their own electricity to save costs. This in-house generation is often exempt from taxes and levies. The special equalization scheme in the EEG 2014, for example, stipulates that companies pay 15% of the EEG surcharge for their own consumption.

As the example of the Special Equalization Scheme shows, in many cases the above criteria are combined to limit the number of privileged end users.

Compared to the other countries surveyed, Germany levies a particularly large number of taxes and surcharges. Without the German privileges, electricity prices for individual companies would have been almost 8 ct/kWh higher in 2014.

The privilege granted by the special equalization scheme in the Renewable Energy Act alone accounted for up to 6.2 ct/kWh for individual companies in 2014. Electricity prices for household and commercial customers and less energy-intensive industrial companies would have been around 1.6 ct/kWh lower in 2014 if the Special Equalization Scheme had been abolished completely.

In order to examine the impact of the German exemptions on the competitiveness of industrial companies, the share of electricity costs in the production costs of different products is first calculated and the significance of the exemptions for competitiveness at product level is determined. This shows that aluminum producers and manufacturers of basic chemical products in particular react sensitively to rising electricity costs. Without the special equalization scheme, production of these goods in Germany would not be worthwhile and would cease sooner or later. This also applies to many paper manufacturers and steel producers.

The second stage examines the significance of electricity costs for competitiveness at the company level. The analysis of profit and loss accounts of sample companies shows what effects can be expected if rising electricity costs cannot be passed on to customers. Here, too, the significance of the exemptions for metal producers and paper manufacturers, which produce comparatively electricity-intensive products, becomes apparent. Diversified companies, such as integrated chemical companies, generate most of their profits in non-electricity-intensive areas. Increased electricity costs do have an impact on the divisional earnings (division) of the sample companies studied, but a smaller impact on corporate earnings.

Additional interviews conducted underline the great importance of proximity to customers and the qualification of the workforce for the competitiveness of companies in Germany. However, these location factors can only compensate for the increase in electricity costs up to a certain threshold. The case analysis shows that companies with a limited, electricity-intensive product range in particular would probably not be able to compensate for the cost increase.

The analysis of the importance of electricity costs for competitiveness at the sector level calculates the short-term effects on product prices, demand and production in the case that increased electricity costs are fully passed through the value chain. It shows how current prices and production would change if individual sectors were excluded from the BesAR. The average product prices in the paper industry and in the non-ferrous metals industry increase particularly sharply. This increase would average about 5%. Due to the increased prices, the demand for exports in the metal and paper industries would decrease between 16%- 18%. According to the calculations, the production of these industries would collapse by 11-18% in the short term. The analysis is based on statistical data on electricity cost shares and estimated price elasticities of demand. The effects of closures of individual companies or production sites in the value

chain cannot be mapped at sector level. This analysis therefore tends to underestimate the impact of electricity cost increases, especially in industries with long and interconnected value chains such as the chemical industry.

Finally, the fourth stage examines the long-term macroeconomic effects of the exemptions in Germany using a macroeconometric model. It is estimated how the overall economic situation would change if exemptions were abolished for all sectors. In ex-ante and ex-post scenarios for the period from 2007 to 2020, it is shown how changes in the exemptions in Germany would affect production, value added, employment, investment and foreign trade. Electricity prices in the other countries are not changed in the scenario calculations.

In the ex-ante scenario (2020) of the complete abolition of the BesAR, average production prices increase by up to 3.5%. For individual companies, the production cost increases are significantly higher. Compared to the reference, maintaining the current regulation, German exports in 2020 would be up to almost 0.3% or 4.7 billion euros lower according to the study's approach. In the calculations, the overall negative impact on gross domestic product amounts to 4 billion euros or 0.15% in 2020. In the labor market, up to 45,000 employees could lose their jobs if the BesAR is abolished. If all electricity tax and surcharge privileges are abolished, the model calculations show that as many as 104,000 employees could lose their jobs by 2020, over 70,000 of them in the manufacturing sector.

Abolishing the exemptions would reduce the levies for non-privileged sectors and thus reduce costs. This could amount to more than 2 billion euros per year for households. A part of the remaining industry (approx. 0.5 billion euros) as well as GHD (approx. 2 billion euros) would also be relieved by lower levies. This is reflected in higher private consumption. Over time, however, consumption growth weakens as real wage income becomes lower. The negative effects triggered in the model in the privileged companies when applicable regulations are abolished outweigh the positive effects in the slightly relieved, non-privileged consumers. The main reason for this is lower international price competitiveness.

The modeling approaches have limitations: Decisions on production relocations are made at the company level and depend on company-specific factors, intra-industry linkages and product-related aspects. These cannot be comprehensively mapped statistically. Additional qualitative research suggests that the effects reported here tend to be underestimated at the industry and macroeconomic level.

Even with this restriction, all analyses at the various levels lead to the same result: Existing exemptions for electricity-intensive companies support the competitiveness of industry and have a positive effect on the (overall) economy.”

Annex 12: Sanctions against Russia (according to Tony Blair Institute)

Figure 1 - An overview of sanctions against Russia (as of 22 March, non-comprehensive list)

Restrictions on the Central Bank of Russia and the Russian government

- Freezing of the foreign reserves of the Central Bank of Russia (UK, US, EU and Canada)
- Ban on transactions with the Central Bank of Russia (UK, US, EU and Canada), and with the National Wealth Fund and Ministry of Finance (UK and US)

Financial sanctions

- Exclusion from SWIFT, the global financial messaging system, for several large Russian financial institutions (UK, US, EU and Canada), including SberBank and VTB (US and UK), and several Belarusian banks, including Bank Dabrabyt, Development Bank and Belagroprombank (EU)
- Freezing of the assets of leading Russian banks and other financial institutions, and blocking sanctions, including on: VTB Bank (US and UK); SberBank (US); Alfa-Bank, Otkritie (EU and US); Bank Rossiya (EU, UK, US and Japan); Promsvyazbank (EU, UK, Switzerland, Japan and Canada); Sovcombank, Novikombank, Russian Agricultural Bank, Central Bank of Moscow, Gazprombank (US); Is Bank, GenBank, Black Sea Bank for Development and Reconstruction (UK); VEB.RF (EU, UK, US, Switzerland, Japan and Canada); and others.
- Freezing of assets of state-owned Belarusian banks, including Belinvestbank and Bank Dabrabyt (US)
- A ban on Russian deposits above €100,000 in EU banks, on Russian accounts held by EU central-securities depositories and on selling euro-denominated securities to Russian clients (EU)
- A ban on listing the shares of Russian state-owned entities (EU); on the issuance of new Russian sovereign bonds (Japan); on sterling clearing through UK and Russian companies from the issuing of transferable securities and money-market instruments (UK); and on the dollar clearing for Russian financial institutions (US)

Economic and trade restrictions

- A ban on commercial activities with selected Russian companies, particularly in the aerospace, defense and energy sectors, and with most publicly owned and controlled Russian companies (UK, US, EU, Switzerland, Canada and Australia)

- Export ban on an array of goods and technologies aimed at the transport, telecoms, energy and commodities sectors, and wider sectors (UK, US, EU, Switzerland and Australia)
- Ban on dual-use items and high-end technologies, covering key sectors such as defense, aerospace and maritime (US, EU, UK and Japan). Limited exemptions for international organizations, pandemic-related supplies, overflight and emergency landings, and energy
- Restrictions on providing certain services that relate to some sanctioned goods and activities, including technical assistance and engineering services related to selected sectors and the supply of tourism services (UK, US, EU, Switzerland and Australia)
- A wide range of import restrictions, including a ban on Russian crude oil imports (US, Canada and Australia); the phasing out of gas by the end of 2022 (UK); and a ban on natural gas and coal, and other raw materials (US)
- A ban on the import of targeted goods from Russia, such as agri-food products and raw materials including steel (EU, US and Canada); plus all goods originating from Russia (Australia)
- Withdrawal of the "most favored nation" status for Russia and Belarus from the World Trade Organization (UK, US, EU, South Korea, Canada, Australia, Japan and eight other WTO members)

Restrictions on persons

- Restrictions on providing assets to designated persons and on dealing with the assets of designated persons (asset freezes), covering the Russian elite and including members of the government, the State Duma and businesspeople (UK, US, EU, Switzerland, Australia and Canada); plus lists of designated persons that varies country by country
- Travel bans on designated persons (UK, US, EU, Switzerland, Australia and Canada)

Other

Source: TBI

- Territorial sanctions already imposed on Crimea extended to Donetsk and Luhansk (UK and EU)
- Ban on Russian planes using airspace (UK, US, EU and Switzerland)
- Ban on Russian ships using ports (UK, EU and Canada)

Source: Spisak, Anton (2020), Sanctioning Russia: Where Does the West Go Next?, Tony Blair Institute for Global Change, London

Annex 13: Extract from the Gas Emergency Plan for the Federal Republic of Germany (2019); (translation PJJW)

"Residential" is considered a priority over industrial firms when it comes to gas supply. Gas supply issues with industry are considered in parallel with gas use issues in the electric power industry, where appropriate. A three-stage scheme of crisis is used in the emergency plan: Early Warning Stage (declared in Germany on March 30, 2022), Alert Stage, Emergency Stage. As important points, the gas emergency plan states:

"Contents of the emergency plan

3.1 Requirements according to Art. 10 of the SoS Regulation

The requirements for the content of the national emergency plans are defined in Art. 10 SoS-VO. Accordingly, the emergency plans must meet the following criteria:

a) They are based on three main crisis levels:

Early warning level (Early Warning) Alarm level (Alarm) Emergency level (Emergency)

(b) define the roles and responsibilities of natural gas undertakings and commercial gas customers, including relevant electricity producers, taking into account the extent to which each is affected by an interruption of gas supply, and regulate their cooperation with the competent authorities and, where appropriate, with national regulatory authorities at each of the defined crisis levels.

(c) define tasks and responsibilities of competent authorities and other bodies to which tasks (...) have been delegated at each of the defined crisis levels.

(d) ensure that natural gas undertakings and commercial gas customers have ample opportunity to respond at each crisis level.

(e) They shall specify, where appropriate, the measures to be taken to mitigate the potential impact of a natural gas supply disruption on district heating and on the supply of gas-generated electricity, including, where appropriate, an overall consideration of the interdependencies of electricity and gas in the operation of the power system.

(f) they shall set out in detail the procedures and measures applicable to each stage of the crisis, as well as the corresponding plans for the flow of information.

(g) designate a crisis manager or crisis team and define its responsibilities.

(h) demonstrate how market-based measures can help manage the situation in the case of an alert level and contain the situation in the case of an emergency level.

9. *(i) identify the contribution that non-market-based measures envisaged or implemented for the emergency stage can make and assess the extent to which recourse to such measures is necessary for crisis management; assess their impact and define the*

procedures for their implementation. In doing so, it shall be taken into account that non-market-based measures shall only be applied when supplies, in particular to the protected customers, can no longer be ensured by market-based mechanisms alone or when Article 13 applies.

10. *j) include a statement of the mechanisms that apply to cooperation with other Member States, depending on the level of crisis.*

(k) detail the reporting requirements to which natural gas undertakings are subject at the alert and emergency levels.

(l) describe the technical or legal arrangements in force to prevent unjustified consumption by customers who are connected to a gas distribution system or gas transmission system but who are not protected customers.

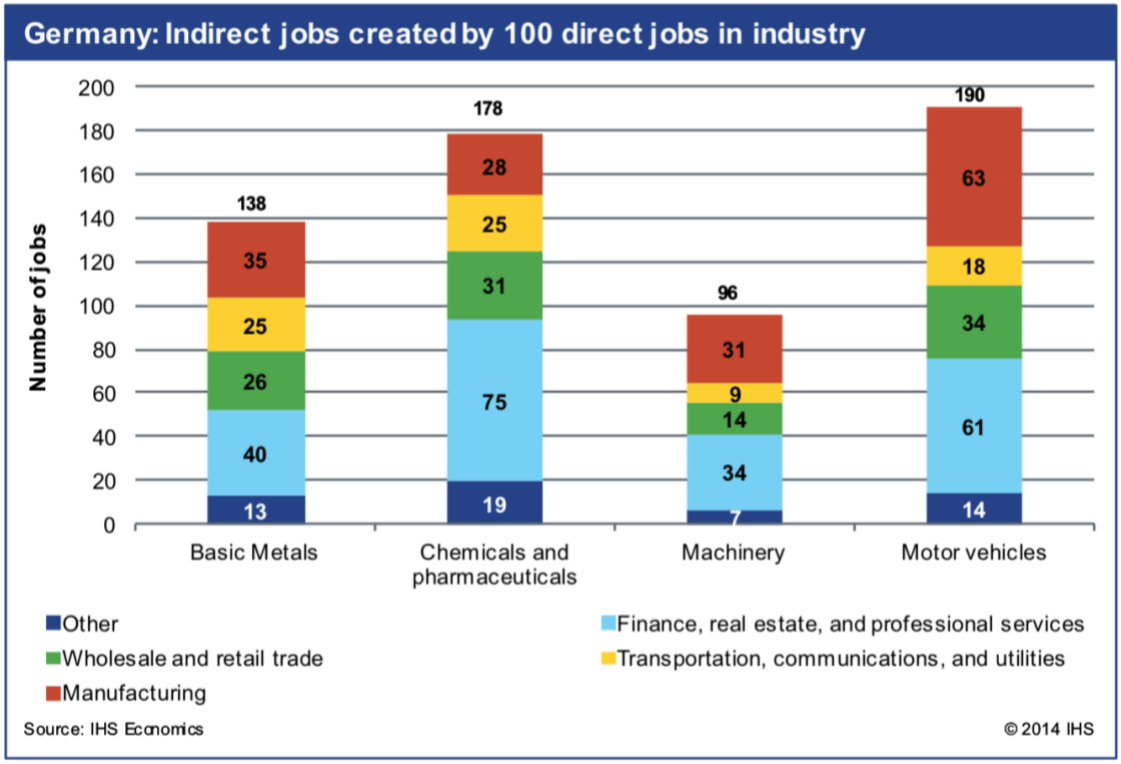
(m) describe the applicable technical, legal and financial arrangements for the fulfillment of the solidarity obligations set forth in Article 13.

(n) include an estimate of the quantities of gas that could be consumed by customers protected by solidarity, including at least the cases described in Article 6(1).

(o) they shall include a list of predefined measures to be taken in order to ensure the availability of gas in the event of an Emergency, this shall include commercial agreements between the parties involved in such measures and, where appropriate, compensation mechanisms for natural gas undertakings, with due regard to the confidentiality of sensitive data. Such measures shall include, as appropriate, cross-border arrangements between Member States and/or natural gas undertakings. "

Annex 14: Indirect Job Effects of Major Sectors in Germany (per 100 Direct Job Effects in the Respective Sector; based on input output analysis)

Fig. A2: Indirect Job Effects of Major Sectors in Germany (per 100 Direct Job Effects in the Respective Sector)



Annex 15: EU Emissions Trading System (ETS) Carbon Price Dynamics, March 2008 – December 2021

Fig. A3: CO2 Price on the EU ETS, March 2008-December 2021

Source: Own representation of data available from https://icapcarbonaction.com/en/ets-prices

Some Conceptual Key Elements in the Bachman et al. (2022) Analysis:

Annex 16: Conceptual framework – key quantities in the Bachmann et al. model

Note: The subsequent equations come from the presentation by David Baqaee and Ben Moll on April 7, 2022 in the Princeton Webinar of Markus Brunnermeier

Subsequently C denotes consumption in real terms, p denotes price, w nominal wage rate, m import quantity of energy (e.g., gas), x is export quantity, L is labor input: The subsequent equation is a second-order Taylor approximation for the consumption effects where relevant terms concern in the first line expenditures shares and changes in import quantity, export quantity and sectoral labor input, respectively (and other inputs); the second term refers to the impact of changes in the expenditure shares of imports, exports and labor input (and also other inputs) as well as the changes in import quantity, export quantity and sectoral labor input, respectively (and other inputs):

$$\Delta \log C \approx \sum_{j \in \text{imports}} \frac{p_j m_j}{GNE} \Delta \log m_j - \sum_{i \in \text{exports}} \frac{p_i x_i^X}{GNE} \Delta \log x_i^X + \sum_{f \in \text{factor}} \frac{w_f L_f}{GNE} \Delta \log L_f$$
$$+ \frac{1}{2} \left[\sum_{j \notin D} \Delta \frac{p_j m_j}{GNE} \Delta \log m_j - \sum_{i \in D} \Delta \frac{p_i x_i^X}{GNE} \Delta \log x_i^X + \sum_{f \in F} \Delta \frac{p_f L_f}{GNE} \Delta \log L_f \right]$$

Key uncertainty:

- $\Delta \log m$: size of the shock - reduction in energy imports.

How big will the volume of short-term energy import reduction be? This refers to the decision of the German government on whether it decides to impose a boycott on Russian energy imports – and the associated short-term reallocation of the use of various energy forms plus changes in overall imports (e.g., Germany's additional gas and oil imports from other countries).

Order of magnitudes: Basic calculation in the Bachmann et al. paper

Assumption is a reduction in gas availability: $\Delta \log m$ is -30 percent;

The share of gas in GNE/GDP is 1.2 percent;

It is assumed that the expenditure share quadruples (roughly comparable to the oil crisis in the 1970s); then

$$\Delta \log C \approx \frac{p_j m_j}{GNE} \Delta \log m_j + \frac{1}{2} \Delta \frac{p_j m_j}{GNE} \Delta \log m_j$$
$$= 1.2\% \times \log(0.7) + \frac{1}{2} \times 3.6\% \times \log(0.7) \approx -1\%$$

going further, the authors use a series of structural models (basically 40 countries with 30 industrial sectors for each country)

$\Delta \frac{p_j m_j}{GNE}$: change in expenditures - complementarities / essentialness.

Annex 17: On International Citations of the Eltchaninoff book on Putin (English edition: Inside the Mind of Putin)

One would have expected that the excellent book of Michel Eltchaninoff could find many readers in the English version in the Western world and India/Australia/New Zealand etc. This, however, does not seem to be the case if one considers the number of citations – according to Google Scholar – in the period 2018-2021; and this, in turn, could point to some crucial and actually dangerous inefficiencies of the strong Anglo-Saxon emphasis on journal publications – and a lack of appreciation of scientific books.
Subsequently, the list of works in English citing the 2018 translated version of the book of Michel Eltchaninoff (a number of which are Master Theses). Only one contribution has a clear direct military/policy background - a 2019 technical note by US Army Major Francesca Graham titled "Putin's Political Philosophy: Implications for Future Russian Military Activity" published by the US Army School of Advanced Military Studies - who came to the conclusion Putin would *not* seek further military escalation against Ukraine.
There were two more contributions in either Russian/Ukrainian and a paper in Portuguese which cited the English edition of the book.

2021

Cronin, G. (2021), Disenchanted Wanderer: The Apocalyptic Vision of Konstantin Leontiev, Cornell University Press, https://muse.jhu.edu/book/94427

Oskanian, K. (2021), Hybrid Exceptionalism in Contemporary Russia, in: Russian Exceptionalism between East and West. Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-030-69713-6_5

Pynnöniemi, K., (2021), Ivan Il′in and the Kremlin's strategic communication of threats: Evil, worthy and hidden enemies, in: Pynnöniemi, K. (Ed.), Nexus of patriotism and militarism in Russia: A quest for internal cohesion. Helsinki University Press, Helsinki. https://doi.org/10.33134/HUP-9-4

van der Zweerde, E. (2021), Russian Political Philosophy: Between Autocracy and Revolution. In: Bykova, M.F., Forster, M.N., Steiner, L. (eds) The Palgrave Handbook of Russian Thought. Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-030-62982-3_4

2020

Beck, C. (2020), The rise of Strongmen leaders: a threat to global security, submitted as Master Thesis for a Degree in Political Science at Stellenbosch University, 2020, https://scholar.sun.ac.za/handle/10019.1/108215

Langdon, K.C., Tismaneanu, V. (2020), The Intellectual Origins of Putinism. In: Putin's Totalitarian Democracy. Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-030-20579-9_4

Löhlein, A. (2020), Biopolitical Conservatism: Identity-Making Projects in Poland and Russia vis-à-vis gender and sexuality, Master Thesis submitted for Degree in Development and International Relations at Aalborg University, https://projekter.aau.dk/projekter/files/334968282/Master_Thesis_Alena_Lohlein.pdf

Sakwa, R. (2020), Russian Politics and Society, 5th Edition, Routledge, London https://doi.org/10.4324/9781003053569

Sakwa, R. (2020), The Putin Paradox, IB Taurus/Bloomsbury Publishing, London https://kar.kent.ac.uk/80013/1/9781788318303_Final_Revised_Proofs.pdf

2019

Berezovenko, A. (2019). CULT OF PERSONALITY OF VLADIMIR PUTIN IN POST-MODERN CONTEXT. *Strategic Priorities*, *49*(1), 117-132 https://niss-priority.com/index.php/journal/article/view/245 (paper in Ukrainian, abstract in English)

Graham, F.A. (2019), Putins Political Philosophy: Implications for Future Russian Military Activity, US Army School of Advanced Military Studies, https://apps.dtic.mil/sti/pdfs/AD1083386.pdf

O'Meara, P. (2019), The Russian Nobility in the Age of Alexander I, Bloomsbury Publishing, London (paperback edition 2021)

Pilkington, M. (2015-2019), The Political Economy of the Russian Religious Renaissance - The Place of Putinism Between Spirituality and Modernity (*last revised 17 December 2019*) http://dx.doi.org/10.2139/ssrn.2659422

Syrovátka, J. (2019), Taylor, Brian D.: The Code of Putinism, *Czech Journal of Political Science*, Issue 3, 217-219 https://www.politologickycasopis.cz/userfiles/file/2019/3/Polcas_2019_3_pp_217-219.pdf **(a review of Taylor's 2018 book The Code of Putinism – see below)**

Worth, O. (2019), Morbid Symptoms: The Global Rise of the Far-Right, Zed Books Ltd., London

2018

Taylor, Brian D. (2018), The Code of Putinism, Oxford University Press, Oxford

Annex 18: Corruption Perceptions Index

Tab. A6: Corruption Perceptions Index, 1995-2020

Country / Territory	Rank 2020	Rank 2015	Rank 2010	Rank 2005	Rank 2000	Rank 1995
Germany	9	11	15	16	17	13
Japan	19	18	17	21	23	20
France	23	23	25	18	21	18
United States of America	25	16	22	17	14	15
Poland	**45**	**29**	**45**	**70**	**43**	**N/A**
Italy	52	61	69	40	39	33
South Africa	69	61	56	46	34	21
China	78	83	78	78	63	40
India	86	76	91	88	69	35
Indonesia	102	88	116	137	85	41
Ukraine	**117**	**130**	**146**	**107**	**87**	**N/A**
Russia	129	119	154	126	82	N/A
No. of countries surveyed	180	168	178	159	90	41

Source: Transparency International Corruption Perceptions Index, 1995-2020
https://www.transparency.org/en/cpi/2021

Annex 19: IMF World Economic Outlook Projections 2022

Tab. A7: Overview of the World Economic Outlook Projections

(Percent change, unless noted otherwise)

		Projections		Difference from January 2022 WEO *Update*[1]		Difference from October 2021 WEO[1]	
	2021	2022	2023	2022	2023	2022	2023
World Output	**6.1**	**3.6**	**3.6**	**–0.8**	**–0.2**	**–1.3**	**0.0**
Advanced Economies	**5.2**	**3.3**	**2.4**	**–0.6**	**–0.2**	**–1.2**	**0.2**
United States	5.7	3.7	2.3	–0.3	–0.3	–1.5	0.1
Euro Area	5.3	2.8	2.3	–1.1	–0.2	–1.5	0.3
Germany	2.8	2.1	2.7	–1.7	0.2	–2.5	1.1
France	7.0	2.9	1.4	–0.6	–0.4	–1.0	–0.4
Italy	6.6	2.3	1.7	–1.5	–0.5	–1.9	0.1
Spain	5.1	4.8	3.3	–1.0	–0.5	–1.6	0.7
Japan	1.6	2.4	2.3	–0.9	0.5	–0.8	0.9
United Kingdom	7.4	3.7	1.2	–1.0	–1.1	–1.3	–0.7
Canada	4.6	3.9	2.8	–0.2	0.0	–1.0	0.2
Other Advanced Economies[2]	5.0	3.1	3.0	–0.5	0.1	–0.6	0.1
Emerging Market and Developing Economies	**6.8**	**3.8**	**4.4**	**–1.0**	**–0.3**	**–1.3**	**–0.2**
Emerging and Developing Asia	7.3	5.4	5.6	–0.5	–0.2	–0.9	–0.1
China	8.1	4.4	5.1	–0.4	–0.1	–1.2	–0.2
India[3]	8.9	8.2	6.9	–0.8	–0.2	–0.3	0.3
ASEAN-5[4]	3.4	5.3	5.9	–0.3	–0.1	–0.5	–0.1
Emerging and Developing Europe	6.7	–2.9	1.3	–6.4	–1.6	–6.5	–1.6
Russia	4.7	–8.5	–2.3	–11.3	–4.4	–11.4	–4.3
Latin America and the Caribbean	6.8	2.5	2.5	0.1	–0.1	–0.5	0.0
Brazil	4.6	0.8	1.4	0.5	–0.2	–0.7	–0.6
Mexico	4.8	2.0	2.5	–0.8	–0.2	–2.0	0.3
Middle East and Central Asia	5.7	4.6	3.7	0.3	0.1	0.5	–0.1
Saudi Arabia	3.2	7.6	3.6	2.8	0.8	2.8	0.8
Sub-Saharan Africa	4.5	3.8	4.0	0.1	0.0	0.0	–0.1
Nigeria	3.6	3.4	3.1	0.7	0.4	0.7	0.5
South Africa	4.9	1.9	1.4	0.0	0.0	–0.3	0.0
Memorandum							
World Growth Based on Market Exchange Rates	5.8	3.5	3.1	–0.7	–0.3	–1.2	0.0
European Union	5.4	2.9	2.5	–1.1	–0.3	–1.5	0.2
Middle East and North Africa	5.8	5.0	3.6	0.6	0.2	0.9	0.1
Emerging Market and Middle-Income Economies	7.0	3.8	4.3	–1.0	–0.3	–1.3	–0.3
Low-Income Developing Countries	4.0	4.6	5.4	–0.7	–0.1	–0.7	–0.1
World Trade Volume (goods and services)	**10.1**	**5.0**	**4.4**	**–1.0**	**–0.5**	**–1.7**	**–0.1**
Imports							
Advanced Economies	9.5	6.1	4.5	–0.2	0.0	–1.2	0.4
Emerging Market and Developing Economies	11.8	3.9	4.8	–1.7	–0.9	–3.2	–0.9
Exports							
Advanced Economies	8.6	5.0	4.7	–1.1	0.0	–1.6	0.7
Emerging Market and Developing Economies	12.3	4.1	3.6	–1.7	–1.5	–1.7	–1.4
Commodity Prices (US dollars)							
Oil[5]	67.3	54.7	–13.3	42.8	–5.5	56.5	–8.3
Nonfuel (average based on world commodity import weights)	26.8	11.4	–2.5	8.3	–0.6	12.3	–1.0
Consumer Prices							
Advanced Economies	3.1	5.7	2.5	1.8	0.4	3.4	0.6
Emerging Market and Developing Economies[6]	5.9	8.7	6.5	2.8	1.8	3.8	2.2

Source: IMF staff estimates.

Note: Real effective exchange rates are assumed to remain constant at the levels prevailing during February 7, 2022–March 7, 2022. Economies are listed on the basis of economic size. The aggregated quarterly data are seasonally adjusted. WEO = *World Economic Outlook*.

[1]Difference based on rounded figures for the current, January 2022 WEO *Update*, and October 2021 WEO forecasts.

[2]Excludes the Group of Seven (Canada, France, Germany, Italy, Japan, United Kingdom, United States) and euro area countries.

[3]For India, data and forecasts are presented on a fiscal year basis, and GDP from 2011 onward is based on GDP at market prices with fiscal year 2011/12 as a base year.

(Percent change, unless noted otherwise)

	Year over Year				Q4 over Q4[8]			
			Projections				Projections	
	2020	2021	2022	2023	2020	2021	2022	2023
World Output	**–3.1**	**6.1**	**3.6**	**3.6**	**–0.3**	**4.6**	**2.5**	**3.5**
Advanced Economies	**–4.5**	**5.2**	**3.3**	**2.4**	**–2.7**	**4.7**	**2.5**	**2.0**
United States	–3.4	5.7	3.7	2.3	–2.3	5.6	2.8	1.7
Euro Area	–6.4	5.3	2.8	2.3	–4.3	4.6	1.8	2.3
Germany	–4.6	2.8	2.1	2.7	–2.9	1.8	2.4	2.5
France	–8.0	7.0	2.9	1.4	–4.3	5.4	0.9	1.5
Italy	–9.0	6.6	2.3	1.7	–6.1	6.2	0.5	2.2
Spain	–10.8	5.1	4.8	3.3	–8.8	5.5	2.3	4.0
Japan	–4.5	1.6	2.4	2.3	–0.8	0.4	3.5	0.8
United Kingdom	–9.3	7.4	3.7	1.2	–6.3	6.6	1.1	1.5
Canada	–5.2	4.6	3.9	2.8	–3.1	3.3	3.5	2.2
Other Advanced Economies[2]	–1.8	5.0	3.1	3.0	–0.4	4.5	2.5	2.8
Emerging Market and Developing Economies	**–2.0**	**6.8**	**3.8**	**4.4**	**1.7**	**4.4**	**2.5**	**4.9**
Emerging and Developing Asia	–0.8	7.3	5.4	5.6	3.7	4.2	4.4	5.8
China	2.2	8.1	4.4	5.1	6.4	3.5	4.8	4.7
India[3]	–6.6	8.9	8.2	6.9	1.5	5.6	2.7	9.0
ASEAN-5[4]	–3.4	3.4	5.3	5.9	–2.5	4.5	5.1	5.3
Emerging and Developing Europe	–1.8	6.7	–2.9	1.3	0.0	6.3	–6.0	3.3
Russia	–2.7	4.7	–8.5	–2.3	–1.7	5.0	–14.1	3.3
Latin America and the Caribbean	–7.0	6.8	2.5	2.5	–3.2	3.8	1.6	2.5
Brazil	–3.9	4.6	0.8	1.4	–1.0	1.6	0.8	1.9
Mexico	–8.2	4.8	2.0	2.5	–4.4	1.1	3.3	1.9
Middle East and Central Asia	–2.9	5.7	4.6	3.7	. . .	. . .	. . .	. . .
Saudi Arabia	–4.1	3.2	7.6	3.6	–3.8	6.7	6.9	3.6
Sub-Saharan Africa	–1.7	4.5	3.8	4.0	. . .	. . .	. . .	. . .
Nigeria	–1.8	3.6	3.4	3.1	–0.2	2.4	2.1	2.3
South Africa	–6.4	4.9	1.9	1.4	–3.4	1.8	2.3	1.1
Memorandum								
World Growth Based on Market Exchange Rates	–3.5	5.8	3.5	3.1	–0.9	4.5	2.6	2.9
European Union	–5.9	5.4	2.9	2.5	–4.1	5.0	1.8	2.7
Middle East and North Africa	–3.3	5.8	5.0	3.6	. . .	. . .	. . .	. . .
Emerging Market and Middle-Income Economies	–2.2	7.0	3.8	4.3	1.8	4.5	2.4	4.9
Low-Income Developing Countries	0.2	4.0	4.6	5.4	. . .	. . .	. . .	. . .
World Trade Volume (goods and services)	**–7.9**	**10.1**	**5.0**	**4.4**	**. . .**	**. . .**	**. . .**	**. . .**
Imports								
Advanced Economies	–8.7	9.5	6.1	4.5	. . .	. . .	. . .	. . .
Emerging Market and Developing Economies	–7.9	11.8	3.9	4.8	. . .	. . .	. . .	. . .
Exports								
Advanced Economies	–9.1	8.6	5.0	4.7	. . .	. . .	. . .	. . .
Emerging Market and Developing Economies	–4.8	12.3	4.1	3.6	. . .	. . .	. . .	. . .
Commodity Prices (US dollars)								
Oil[5]	–32.7	67.3	54.7	–13.3	–27.6	79.2	28.6	–11.6
Nonfuel (average based on world commodity import weights)	6.8	26.8	11.4	–2.5	15.4	17.3	9.4	–2.5
Consumer Prices								
Advanced Economies[6]	0.7	3.1	5.7	2.5	0.4	4.9	4.8	2.2
Emerging Market and Developing Economies[7]	5.2	5.9	8.7	6.5	3.3	6.0	8.8	5.3

[4]Indonesia, Malaysia, Philippines, Thailand, Vietnam.

[5]Simple average of prices of UK Brent, Dubai Fateh, and West Texas Intermediate crude oil. The average price of oil in US dollars a barrel was $69.07 in 2021; the assumed price, based on futures markets, is $106.83 in 2022 and $92.63 in 2023.

[6]The inflation rates for 2022 and 2023, respectively, are as follows: 5.3 percent and 2.3 percent for the euro area, 1.0 percent and 0.8 percent for Japan, and 7.7 percent and 2.9 percent for the United States.

[7]Excludes Venezuela. See the country-specific note for Venezuela in the "Country Notes" section of the Statistical Appendix.

[8]For world output, the quarterly estimates and projections account for approximately 90 percent of annual world output at purchasing-power-parity weights. For Emerging Market and Developing Economies, the quarterly estimates and projections account for approximately 80 percent of annual emerging market and developing economies' output at purchasing-power-parity weights.

Source: IMF World Economic Outlook 2022, p. 6f.

Tab. A8: Overview of the World Economic Outlook Projections at Market Exchange Rate Weights

(Percent change)

		Projections		Difference from January 2022 WEO *Update*[1]		Difference from October 2021 WEO[1]	
	2021	2022	2023	2022	2023	2022	2023
World Output	**5.8**	**3.5**	**3.1**	**–0.7**	**–0.3**	**–1.2**	**0.0**
Advanced Economies	**5.1**	**3.3**	**2.3**	**–0.6**	**–0.2**	**–1.2**	**0.2**
Emerging Market and Developing Economies	**6.8**	**3.8**	**4.2**	**–0.8**	**–0.3**	**–1.2**	**–0.3**
Emerging and Developing Asia	7.4	5.0	5.4	–0.5	–0.2	–1.0	–0.1
Emerging and Developing Europe	6.4	–2.1	0.8	–5.6	–2.1	–5.8	–2.1
Latin America and the Caribbean	6.6	2.4	2.4	0.2	–0.1	–0.6	–0.1
Middle East and Central Asia	5.1	4.6	3.4	0.5	0.2	0.7	0.0
Sub-Saharan Africa	4.5	3.8	3.9	0.2	0.1	0.1	0.0
Memorandum							
European Union	5.3	2.8	2.4	–1.1	–0.2	–1.5	0.2
Middle East and North Africa	5.0	4.8	3.2	0.7	0.2	0.9	0.1
Emerging Market and Middle-Income Economies	7.0	3.7	4.2	–0.8	–0.3	–1.3	–0.3
Low-Income Developing Countries	4.0	4.6	5.3	–0.6	–0.1	–0.6	–0.1

Source: IMF staff estimates.

Note: The aggregate growth rates are calculated as a weighted average, in which a moving average of nominal GDP in US dollars for the preceding three years is used as the weight. WEO = *World Economic Outlook*.

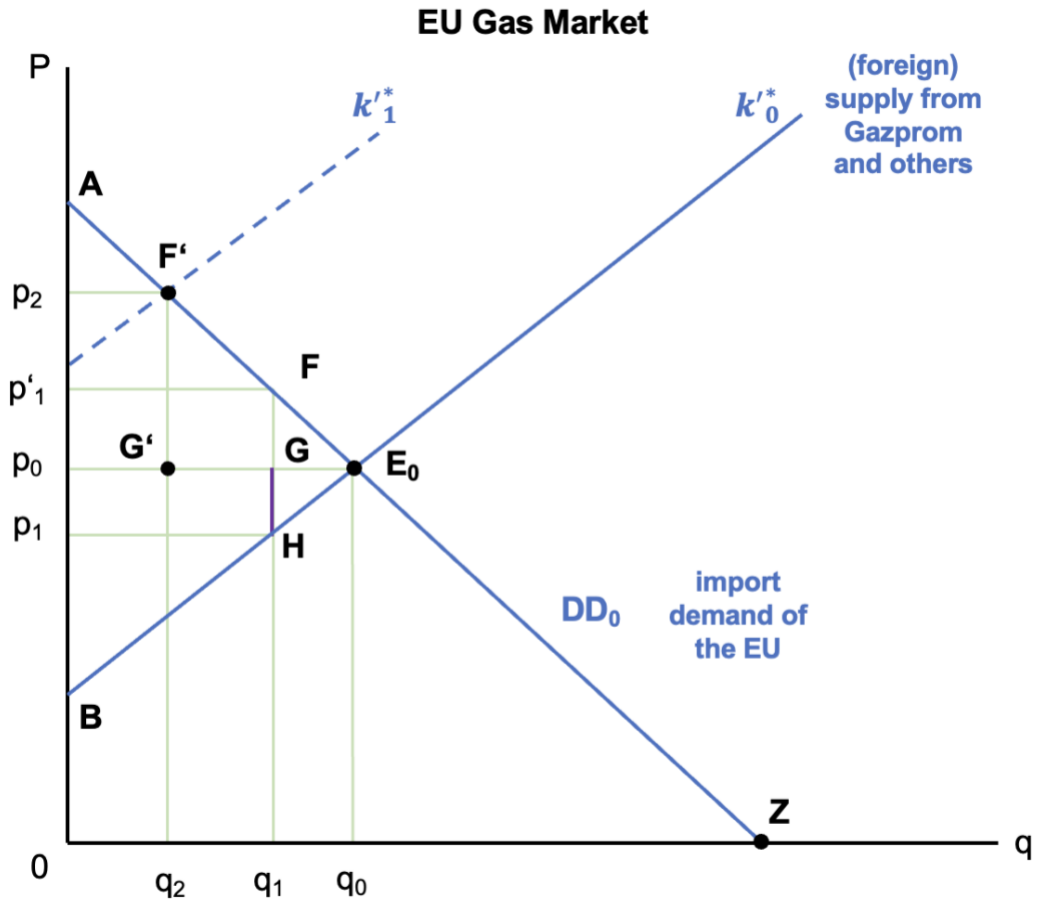
[1]Difference based on rounded figures for the current, January 2022 WEO *Update*, and October 2021 WEO forecasts.

Source: IMF World Economic Outlook 2022, p. 8.

Annex 21: Traditional Gas Market Perspective in the EU and New Approach

The following graph shows the standard economic perspective on the EU Gas Market (with DD denoting the EU demand for gas; k'* is the supply curve of Gazprom and other firms). If the EU would impose an import tariff on Russian gas, the standard result is that the net price – the offer price without the tariff – will fall, while the gross price p' will rise ($p_1 > p_0$). The assumption here is that firms are profit maximizing. However, in the situation with the Russo-Ukrainian war, Gazprom is not maximizing profits, but rather acting as an instrument of the Kremlin trying to create high economic damage in the EU. Gazprom might decide to raise the offer price of gas by as much as the import tariff of the EU is (see the reduce quantity q_2).

Fig. A4: EU Gas Market and EU Import Tariff



Source: Own representation.

As regards inflation pressure in the context of rising expected oil and gas prices in 2022, one may point out the paradoxical possibility that rising central bank interest rates in the course of 2022 (e.g., in the Eurozone and the US plus the UK) could stimulate oil production which in turn could dampen the inflation dynamics in the context of a modified Hotelling pricing rule of natural resources.

A Modified Hotelling Approach

Let i, P" and $P"^{E}$ denote the nominal interest rate, the oil price and the expected oil price, respectively; H is the unit cost of resource extraction (t is the time index). The Hotelling rule says that the marginal profit for taking an extra resource unit from the ground in time t should be equal to the expected marginal profit for an extra unit of production in the next period. The marginal profit from an extra unit produced in period t is the cash flow (P" minus unit costs H) times the nominal interest rate. Subsequently r is the real interest rate and the inflation rate is denoted by π where π" is the oil price inflation rate and π' is the inflation rate for non-oil goods (v is the share of non-oil goods in the consumption basket); q^{s} is the quantity of oil offered, π^{E} is the expected inflation rate.

(1) $i(P"-H) = dP"^{E}/dt$ (t is time index); divide by P"

(2) $i(1 - H/P") = \pi"^{E}$; if H=H'q (H'>0), q quantity

Taking logs on both sides gives (assuming that H/P" is close to zero)

(3) $\ln i - H'q/P" = \ln\pi"^{E}$; H' is a cost parameter

(4) Hence quantity supplied $q^{s} = \ln(i/\pi"^{E})P"/H'$ and with $i = r + \pi^{E}$ and $\pi := v\pi' + (1-v)\pi"$ $(0<v<1)$ for case $\pi'=\pi"$ (constant relative price) and with $\ln(1+x)\approx x$ (small $r/\pi"^{E}$)

(5) $q = (r/\pi"^{E})P"/H'$

Hence we get:

(6) $P" = H'(\pi"^{E}/r)q$

Assuming that global oil demand depends on the real income and – negatively – on P"/P (P is the general price level; V' and V" are positive parameters):

(7) $q^{d} = V'Y - V"P"/P$

Considering the supply side and the demand side we get the equilibrium price P":

(8) Equilibrium $P" = V'Y/((r/\pi"^{E})/H' + V"/P)$; $V'>0$; $V">0$

(9) $\ln P" = \ln V' + \ln Y - \ln((r/\pi"^{E})/H' + V"/P)$

The equilibrium price is a positive function of real income and a negative function of $r/\pi"^{E}$ and a negative function of the price level P. For an expected inflation rate, the equilibrium oil price is a negative function of the real interest rate. If the real interest rate is falling in the US, the Eurozone and the UK – in 2019-2021 – the equilibrium price of oil is rising. If, however, the real interest rate is rising (possibly in 2022-2024) in the world economy, then the equilibrium price of oil will fall. In a second stage this could bring about a fall of the expected inflation rate.

EIIW Diskussionsbeiträge

EIIW Discussion Papers

ISSN 1430-5445:

Die Zusammenfassungen der Beiträge finden Sie im Internet unter:
The abstracts of the publications can be found in the internet under:

https://eiiw.wiwi.uni-wuppertal.de/

No. 173 **Welfens P.J.J; Perret K.J.:** Structural Change, Specialization and Growth in EU 25, January 2010

No. 174 **Welfens P.J.J.; Perret K.J.; Erdem D.:** Global Economic Sustainability Indicator: Analysis and Policy Options for the Copenhagen Process, February 2010

No. 175 **Welfens, P.J.J.:** Rating, Kapitalmarktsignale und Risikomanagement: Reformansätze nach der Transatlantischen Bankenkrise, Februar 2010

No. 176 **Mahmutovic, Z.:** Patendatenbank: Implementierung und Nutzung, Juli 2010

No. 177 **Welfens, P.J.J.:** Toward a New Concept of Universal Services: The Role of Digital Mobile Services and Network Neutrality, November 2010

No. 178 **Perret J.K.:** A Core-Periphery Pattern in Russia – Twin Peaks or a Rat´s Tail, December 2010

No. 179 **Welfens P.J.J.:** New Open Economy Policy Perspectives: Modified Golden Rule and Hybrid Welfare, December 2010

No. 180 **Welfens P.J.J.:** European and Global Reform Requirements for Overcoming the Banking Crisis, December 2010

No. 181 **Szanyi, M.:** Industrial Clusters: Concepts and Empirical Evidence from East-Central Europe, December 2010

No. 182 **Szalavetz, A.:** The Hungarian automotive sector – a comparative CEE perspective with special emphasis on structural change, December 2010

No. 183 **Welfens, P.J.J.; Perret, K.J.; Erdem, D.:** The Hungarian ICT sector – a comparative CEE perspective with special emphasis on structural change, December 2010

No. 184 **Lengyel, B.:** Regional clustering tendencies of the Hungarian automotive and ICT industries in the first half of the 2000's, December 2010

No. 185 **Schröder, C.:** Regionale und unternehmensspezifische Faktoren einer hohen Wachstumsdynamik von IKT Unternehmen in Deutschland; Dezember 2010

No. 186 **Emons, O.:** Innovation and Specialization Dynamics in the European Automotive Sector: Comparative Analysis of Cooperation & Application Network, October 2010

No. 187 **Welfens, P.J.J.:** The Twin Crisis: From the Transatlantic Banking Crisis to the Euro Crisis? January 2011

No. 188 **Welfens, P.J.J.:** Green ICT Dynamics: Key Issues and Findings for Germany, March 2012

No. 189 **Erdem, D.:** Foreign Direct Investments, Energy Efficiency and Innovation Dynamics, July 2011

No. 190 **Welfens, P.J.J.:** Atomstromkosten und -risiken: Haftpflichtfragen und Optionen rationaler Wirtschaftspolitik, Mai 2011

No. 191 **Welfens, P.J.J.:** Towards a Euro Fiscal Union: Reinforced Fiscal and Macroeconomic Coordination and Surveillance is Not Enough, January 2012

No. 192 **Irawan, T.:** ICT and economic development: Conclusion from IO Analysis for Selected ASEAN Member States, November 2013

No. 193 **Welfens, P.J.J.; Perret, J.:** Information & Communication Technology and True Real GDP: Economic Analysis and Findings for Selected Countries, February 2014

No. 194 **Schröder, C.:** Dynamics of ICT Cooperation Networks in Selected German ICT Clusters, August 2013

No. 195 **Welfens, P.J.J.; Jungmittag, A.:** Telecommunications Dynamics, Output and Employment, September 2013

No. 196 **Feiguine, G.; Solojova, J.:** ICT Investment and Internationalization of the Russian Economy, September 2013

No. 197 **Kubielas, S.; Olender-Skorek, M.:** ICT Modernization in Central and Eastern Europe, May 2014 Trade and Foreign Direct Investment New Theoretical Approach and Empirical Findings for US Exports & European Exports

No. 198 **Feiguine, G.; Solovjova, J.:** Significance of Foreign Direct Investment for the Development of Russian ICT sector, May 2014

No. 199 **Feiguine, G.; Solovjova, J.:** ICT Modernization and Globalization: Russian Perspectives, February 2012

No. 200 **Syraya, O.:** Mobile Telecommunications and Digital Innovations, May 2014

No. 201 **Tan, A.:** Harnessing the Power if ICT and Innovation Case Study Singapore, March 2014

No. 202 **Udalov, V.:** Political-Economic Aspects of Renewable Energy: Voting on the Level of Renewable Energy Support, November 2014

No. 203 **Welfens, P.J.J.:** Overcoming the EU Crisis and Prospects for a Political Union, March 2014

No. 204 **Welfens, P.J.J.; Irawan, T.:** Trade and Foreign Direct Investment: New Theoretical Approach and Empirical Findings for US Exports and European Exports, November 2014

No. 205 **Welfens, P.J.J.:** Competition in Telecommunications and Internet Services: Problems with Asymmetric Regulations, December 2014

No. 206 **Welfens, P.J.J.:** Innovation, Inequality and a Golden Rule for Growth in an Economy with Cobb-Douglas Function and an R&D Sector

No. 207 **Jens K. Perret.:** Comments on the Impact of Knowledge on Economic Growth across the Regions of the Russian Federation

No. 208 **Welfens, P.J.J.; Irawan T.:** European Innovations Dynamics and US Economic Impact: Theory and Empirical Analysis, June 2015

No. 209 **Welfens, P.J.J.:** Transatlantisches Freihandelsabkommen EU-USA: Befunde zu den TTIP-Vorteilen und Anmerkungen zur TTIP-Debatte, Juni 2015

No. 210 **Welfens, P.J.J.:** Overcoming the Euro Crisis and Prospects for a Political Union, July 2015

No. 211 **Welfens, P.J.J.:** Schumpeterian Macroeconomic Production Function for Open Economies: A New Endogenous Knowledge and Output Analysis, January 2016

No. 212 **Jungmittag, A.; Welfens, P.J.J.:** Beyond EU-US Trade Dynamics: TTIP Effects Related to Foreign Direct Investment and Innovation, February 2016

No. 213 **Welfens, P.J.J.:** Misleading TTIP analysis in the 6th/7th May 2016 issue of DER SPIEGEL, May 2016

No. 214 **Welfens, P.J.J.:** TTIP-Fehlanalyse im SPIEGEL Heft 6. Mai 2016, Mai 2016

No. 215 **Welfens, P.J.J.; Irawan, T.; Perret, J.K.:** True Investment-GDP Ratio in a World Economy with Investment in Information & Communication Technology, June 2016

No. 216 **Welfens, P.J.J.:** EU-Osterweiterung: Anpassungsprozesse, Binnenmarktdynamik und Euro-Perspektiven, August 2016

No. 217 **Perret, J.K.:** A Spatial Knowledge Production Function Approach for the Regions of the Russian Federation, June 2016

No. 218 **Korus, A.:** Currency Overvaluation and R&D Spending, September 2016

No. 219 **Welfens, P.J.J.:** Cameron's Information Disaster in the Referendum of 2016: An Exit from Brexit? September 2016

No. 220 **Welfens, P.J.J.:** Qualitätswettbewerb, Produktinnovationen und Schumpetersche Prozesse in internationalen Märkten, October 2016

No. 221 **Jungmittag, A.:** Techno-Globalisierung, October 2016

No. 222 **Dachs, B.:** Techno-Globalisierung als Motor des Aufholprozesses im österreichischen Innovationssystem, October 2016

No. 223 **Perret, J.K.:** Strukturwandel in der Europäischen Union am Beispiel ausgewählter Leitmärkte mit besonderem Bezug auf die Innovationstätigkeit der Mitgliedsländer, October 2016

No. 224 **Irawan, T.; Welfens, P.J.J.:** ICT Dynamics and Regional Trade Bias in Asia: Theory and Empirical Aspects, October 2016

No. 225 **Korus, A.:** Erneuerbare Energien und Leitmärkte in der EU und Deutschland, October 2016

No. 226 **Dachs, B.; Budde, B.:** Fallstudie Nachhaltiges Bauen und Lead Markets in Österreich, October 2016

No. 227 **Welfens, P.J.J.:** eHealth: Grundlagen der Digitalen Gesundheitswirtschaft und Leitmarktperspektiven, October 2016

No. 228 **Korus, A.:** Innovationsorientierte öffentliche Beschaffung und Leitmärkte: Politische Initiativen in der EU, October 2016

No. 230 **Nan, Yu:** Innovation of renewable energy generation technologies at a regional level in China: A study based on patent data analysis, December 2016

No. 231 **Welfens, P.J.J; Debes, C.:** Globale Nachhaltigkeit 2017: Ergebnisse zum EIIW-vita Nachhaltigkeitsindikator, März 2018

No. 232 **Welfens, P.J.J.:** Negative Welfare Effects from Enhanced International M&As in the Post-BREXIT-Referendum UK, April 2017

No. 233 **Udalov, V.; Welfens, P.J.J.:** Digital and Competing Information Sources: Impact on Environmental Concern und Prospects for Cooperation, April 2017

No. 234 **Welfens, P.J.J.:** The True Cost of BREXIT for the UK: A Research Note, October 2017

No. 235 **Welfens, P.J.J.; Hanrahan, D.:** BREXIT: Key Analytical Issues and Insights from Revised Economic Forecasts, January 2018

No. 236 **Welfens, P.J.J.:** Techno-Globalisierung, Leitmärkte und Strukturwandel in wirtschaftspolitischer Sicht, August 2017

No. 238 **Welfens, P.J.J.:** Foreign Financial Deregulation under Flexible and Fixed Exchange Rates, June 2017

No. 239 **Welfens, P.J.J.; Kadiric, S.:** Neuere Finanzmarktaspekte von Bankenkrise, QE-Politik und EU-Bankenaufsicht, July 2017

No. 240 **Welfens, P.J.J.; Hanrahan, D.:** The BREXIT Dynamics: British and EU27 Challenges after the EU Referendum, May 2017

No. 241 **Welfens, P.J.J.; Baier, F.:** BREXIT and FDI: Key Issues and New Empirical Findings, January 2018

No. 242 **Welfens, P.J.J.:** International Risk Management in BREXIT and Policy Options, March 2018

No. 243 **Korus, A.; Celebi, K.:** The Impact of Brexit on the British Pound/Euro Exchange rate The Impact of Brexit on the British Pound/Euro Exchange rate, April 2018

No. 244 **Welfens, P.J.J.; Yushkova, E.:** IKT-Sektor in China und Wirtschaftsbeziehungen zu Deutschland, April 2018

No. 245 **Udalov, V.:** Analysis of Individual Renewable Energy Support: An Enhanced Model, June 2018

No. 246 **Welfens, P.J.J.:** Lack of International Risk Management in BREXIT? July 18 2018

No. 247 **Xiong, T.; Welfens, P.J.J.:** The Effects of Foreign Direct Investment on Regional Innovation Capacity in China, June 2018

No. 248 **Welfens, P.J.J.:** New Marshall-Lerner Conditions for an Economy with Outward and Two-Way Foreign Direct Investment, July 2018, Updated February 2019

No. 249 **Welfens, P.J.J.; Xiong, T.:** BREXIT Perspectives: Financial Market Dynamics, Welfare Aspects and Problems from Slower Growth, September 2018

No. 250 **Welfens, P.J.J.; Udalov, V.:** International Inequality Dynamics: Issues and Evidence of a Redistribution Kuznets Curve, September 2018

No. 251 **Kadiric, S.; Korus, A.:** The Effects of Brexit on Corporate Yield Spreads: Evidence from UK and Eurozone Corporate Bond Markets, September 2018

No. 252 **Welfens, P.J.J.:** Import Tariffs, Foreign Direct Investment and Innovation: A New View on Growth and Protectionism, December 2018

No. 253 **Welfens, P.J.J.:** Explaining Trumpism as a Structural US Problem: New Insights and Transatlantic Plus Global Economic Perspectives, October 2018

No. 254 **Baier, F.J.; Welfens, P.J.J.:** The UK's Banking FDI Flows and Total British FDI: A Dynamic BREXIT Analysis, November 2018

No. 255 **Welfens, P.J.J.; Yu, N.; Hanrahan, D.; Schmuelling, B; Fechtner, H.:** Electrical Bus Mobility in the EU and China: Technological, Ecological and Economic Policy Perspectives, December 2018

No. 256 **Welfens, P.J.J.; Baier, F.; Kadiric, S.; Korus, A.; Xiong, T.:** EU28 Capital Market Perspectives of a Hard BREXIT: Theory, Empirical Findings and Policy Options, March 2019

No. 257 **Welfens, P.J.J.:** Council of Economic Advisers: Biased Per Capita Consumption Comparison of the US with Europe, March 2019 (forthcoming)

No. 258 **Welfens, P.J.J.:** Wirtschaftspolitik-Fehlorientierung des Westens nach 1989: Bankenkrise, Globalisierungs-Ordnungsdefizit und Desintegrationsdruck, April 2019

No. 259 **Welfens, P.J.J.:** CO2-Steuer, Zertifikate-Handel und Innovationsförderung als Klimapolitik-Instrumente, June 2019

No. 260 **Welfens, P.J.J.:** BREXIT- Wirtschaftsperspektiven für Deutschland und NRW: Mittel- und langfristige Effekte & Politikoptionen, June 2019

No. 261 **Baier, F.J.:** Foreign Direct Investment and Tax: OECD Gravity Modelling in a World with International Financial Institutions, August 2019

No. 262 **Welfens, P.J.J.:** Rationale Klimapolitik für das Erreichen des Ziels Klimaneutralität: NRW-Deutschland-EU-G20Plus, Oktober 2019

No. 263 **Welfens, P.J.J.:** After Eastern German State Elections 2019: Germany Facing Serious Politico-Economic Problems, September 2019

No. 264 **Jungmittag, A.; Welfens, Paul J.J.:** EU-US Trade Post-Trump Perspectives: TTIP Aspects Related to Foreign Direct Investment and Innovation, November 2019

No. 265 **Welfens, P.J.J.:** Financial Markets and Oil Prices in a Schumpeterian Context of CO2-Allowance Markets, December 2019

No. 266 **Welfens, P.J.J.; Xiong, T.:** US MNCs' Reinvested Earnings and Investment in EU Countries: New Thoughts on Feldstein-Horioka, December 2019, *forthcoming*

No. 267 **Welfens, P.J.J.; Celebi, K.:** CO2 Allowance Price Dynamics and Stock Markets in EU Countries: Empirical Findings and Global CO2-Perspectives, January 2020

No. 268 **Celebi, K.:** Quo Vadis, Britain? – Implications of the Brexit Process on the UK's Real Economy, January 2020

No. 269 **Welfens, P.J.J.:** The Optimum Import Tariff in the Presence of Outward Foreign Direct Investment, January 2020

No. 270 **Welfens, P.J.J.:** Macroeconomic Aspects of the Coronavirus Epidemic: Eurozone, EU, US and Chinese Perspectives, March 2020

No. 271 **Kadiric, S.:** The Determinants of Sovereign Risk Premiums in the UK and the European Government Bond Market: The Impact of Brexit, March 2020

No. 272 **Welfens, P.J.J.:** Macroeconomic and Health Care Aspects of the Coronavirus Epidemic: EU, US and Global Perspectives, April 2020

No. 273 **Welfens, P.J.J.:** Corona World Recession and Health System Crisis: Shocks Not Understood So Far, May 2020

No. 274 **Bretschger, L.; Grieg, E.; Welfens, P.J.J.; Xiong, T.:** Corona Fatality Development, Medical Indicators and the Environment: Empirical Evidence for OECD Countries, June 2020

No. 275 **Welfens, P.J.J.:** Doubts on the Role of Disturbance Variance in New Keynesian Models and Suggested Refinements, October 2020

No. 277 **Bretschger, L.; Grieg, E.; Welfens, P.J.J.; Xiong, T.:** COVID-19 Infections and Fatalities Developments: Empirical Evidence for OECD Countries and Newly Industrialized Economies, September 2020

No. 279 **Welfens, P.J.J.:** Product Innovations, Process Innovations and Foreign Direct Investment: New Theoretical Aspects and Empirical Findings, December 2020

No. 280 **Zander, T.:** Does corruption matter for FDI flows in the OECD? A gravity analysis, October 2020

No. 281 **Celebi, K.; Welfens, P.J.J:** The Economic Impact of Trump: Conclusions from an Impact Evaluation Analysis, October 2020

No. 283 **Welfens, P.J.J:** Optimal Inward Foreign Direct Investment Share within an International M&A Setting, November 2020

No. 285 **Hanrahan, D.:** Tax Challenges of the Digitalized Economy, December 14th 2020

No. 286 **Welfens, P.J.J:** Corona-Impfpolitik-Perspektiven: Grundlagen, Probleme und Strategieoptionen, December 19th 2020 (Vorabversion)

No. 287 **Welfens, P.J.J.; Wilke, A.:** Urban Wind Energy Production Potential: New Opportunities, December 21st 2020

No. 288 **Welfens, P.J.J.:** The Background of Trumpism and its Main Economic Effects, December 30th 2020

No. 289 **Gries, T.; Welfens, P.J.J.:** Testing as an Approach to Control the Corona Epidemic Dynamics and Avoid Lockdowns, January 11th 2021

No. 290 **Gries, T.; Welfens, P.J.J.:** Testen als Ansatz zur Kontrolle der Corona-Epidemie und zur Vermeidung von Lockdowns, January 11th 2021

No. 291 **Celebi, K.; Welfens, P.J.J.:** The Stock Market, Labor-Income Risk and Unemployment in the US: Empirical Findings and Policy Implications, January 27th 2021

No. 295 **Welfens, P.J.J.:** Nationale und globale Impfstoffbeschaffung in einer Pandemie-Situation: Rationale Patent-Ersatzoption, February 18th 2021

No. 296 **Welfens, P.J.J.:** National and Global Vaccine Procurement in a Pandemic Situation: Rational Patent Replacement Option, April 7th 2021

No. 297 **Welfens, P.J.J.:** Gesundheitsförderung und Klimapolitik: Neue Krankenversicherungs-Perspektiven zu Marktdynamik und Klimafortschritt, March 24th 2021

No. 299 **Dauenhauer, C.; Perret J.K.:** Determinants of Purchasing Behavior – On the Interaction of Price Anchors and the Framing of Price Changes, April 9th 2021

No. 300 **Roeger, W.; Welfens, P.J.J.:** Foreign Direct Investment and Innovations: Transmission Dynamics of Persistent Demand and Technology Shocks in a Macro Model, April 20th 2021

No. 301 **Welfens, P.J.J.; Celebi, K.:** FDI Globalization and the New Phillips Curve: Role of Multinational Companies and Institutional Changes, April 12th 2021

No. 302 **Welfens, P.J.J.:** Neue Ungleichheits- und Modernitätsanalyse: Ökonomische Perspektiven und Soziologie-Fehlsicht, July 9th 2021

No. 303 **Welfens, P.J.J.:** New Inequality and Late Modernity Analysis: Economic Perspectives and Sociological Misperceptions, July 27th 2021

No. 304 **Welfens, P.J.J.:** Nouvelle analyse de l'inégalité et de la modernité tardive : Perspectives économiques et perceptions sociologiques erronées, July 28th 2021

No. 306 **Mueller, M.:** French Presidency of the Council of the European Union in 2022: What to Expect?, September 1st 2021

No. 307 **Soliman, K.:** Are Industrial Robots a new GPT? A Panel Study of Nine European Countries with Capital and Quality-adjusted Industrial Robots as Drivers of Labour Productivity Growth, September 15th 2021

No. 308 **Baier, F.; Welfens, P.J.J.; Zander, T.:** Employment and Job Perspectives for Female Refugees in Germany: Analysis and Policy Implications from a Local Survey Study, December 6th 2021

No. 309 **Xiong, T.; Celebi, K.; Welfens, P.J.J.:** OECD Countries' Twin Long-run Challenge: The Impact of Ageing Dynamics and Increasing Natural Disasters on Savings Ratios, December 16th 2021

No. 310 **Xiong, T.:** Mergers and Acquisitions by Chinese Multinationals in Europe: The Effect on the Innovation Performance of Acquiring Firms, January 31st 2022

No. 312 **Welfens, P.J.J.:** Russia's Attack on Ukraine: Economic Challenges, Embargo Issues & a New World Order, April 27th 2022

Weitere Beiträge von Interesse:

Titels of related interest:

Paul J.J. Welfens (2019), Klimaschutzpolitik - Das Ende der Komfortzone: Neue wirtschaftliche und internationale Perspektiven zur Klimadebatte, Springer Heidelberg

Paul J.J. Welfens (2019), The Global Trump - Structural US Populism and Economic Conflicts with Europe and Asia, Palgrave Macmillan London

Paul J.J. Welfens (2018), Brexit aus Versehen: Europäische Union zwischen Desintegration und neuer EU, 2.A, Springer Heidelberg

Paul J.J. Welfens; Samir Kadiric (2018), Bankenaufsicht, Unkonventionelle Geldpolitik und Bankenregulierung, DeGruyter Oldenbourg

Paul J.J. Welfens (2017), An Accidental BREXIT: New EU and Transatlantic Economic Perspectives, Palgrave Macmillan London

Paul J.J. Welfens (2017), Macro Innovation Dynamics and the Golden Age, New Insights into Schumpeterian Dynamics, Inequality and Economic Growth, Springer Heidelberg

Paul J.J. Welfens (Nov. 2016), Brexit aus Versehen: Europäische Union zwischen Desintegration und neuer EU, Springer Heidelberg

Paul J.J. Welfens; Jens K. Perret; Tony Irawan; Evgeniya Yushkova (2015), Towards Global Sustainability, Springer Berlin Heidelberg

Paul J.J. Welfens; A. Korus; T. Irawan (2014), Transatlantisches Handels- und Investitionsabkommen: Handels-, Wachstums- und industrielle Beschäftigungsdynamik in Deutschland, den USA und Europa**,** Lucius & Lucius Stuttgart

Paul J.J. Welfens (2013), Grundlagen der Wirtschaftspolitik, 5. Auflage, Springer Berlin Heidelberg

Paul J.J. Welfens (2013), Social Security and Economic Globalization, Springer Berlin Heidelberg

Paul J.J. Welfens (2012), Clusters in Automotive and Information & Communication Technology, Springer Berlin Heidelberg

Paul J.J. Welfens (2011), Innovations in Macroeconomics, 3rd revised and enlarged edition, Springer Berlin Heidelberg

Paul J.J. Welfens (2011), Zukunftsfähige Wirtschaftspolitik für Deutschland und Europa, Springer Berlin Heidelberg

Paul J.J. Welfens; Cillian Ryan, eds. (2011), Financial Market Integration and Growth, Springer Berlin Heidelberg

Raimund Bleischwitz; Paul J.J. Welfens; Zhong Xiang Zhang (2011), International Economics of Resource Efficiency, Physica-Verlag Heidelberg

Paul J.J. Welfens; John T. Addison (2009), Innovation, Employment and Growth Policy Issues in the EU and the US, Springer Berlin Heidelberg

Paul J.J. Welfens; Suthiphand Chirathivat; Franz Knipping (2009), EU – ASEAN, Springer Berlin Heidelberg

Paul J.J. Welfens; Ellen Walther-Klaus (2008), Digital Excellence, Springer Berlin Heidelberg

Huub Meijers; Bernhard Dachs; Paul J.J. Welfens (2008), Internationalisation of European ICT Activities, Springer Berlin Heidelberg

Richard Tilly; Paul J.J. Welfens; Michael Heise (2007), 50 Years of EU Economic Dynamics, Springer Berlin Heidelberg

Paul J.J. Welfens; Mathias Weske (2007), Digital Economic Dynamics, Springer Berlin Heidelberg

Paul J.J. Welfens; Franz Knipping; Suthiphand Chirathivat (2006), Integration in Asia and Europe, Springer Berlin Heidelberg

Edward M. Graham; Nina Oding; Paul J.J. Welfens (2005), Internationalization and Economic Policy Reforms in Transition Countries, Springer Berlin Heidelberg

Paul J.J. Welfens; Anna Wziatek-Kubiak (2005), Structural Change and Exchange Rate Dynamics, Springer Berlin Heidelberg

Paul J.J. Welfens; Peter Zoche; Andre Jungmittag; Bernd Beckert; Martina Joisten (2005), Internetwirtschaft 2010, Physica-Verlag Heidelberg

Evgeny Gavrilenkov; Paul J.J. Welfens; Ralf Wiegert (2004), Economic Opening Up and Growth in Russia, Springer Berlin Heidelberg

John T. Addison; Paul J.J. Welfens (2003), Labor Markets and Social Security, Springer Berlin Heidelberg

Timothy Lane; Nina Oding; Paul J.J. Welfens (2003), Real and Financial Economic Dynamics in Russia and Eastern Europe, Springer Berlin Heidelberg

Claude E. Barfield; Günter S. Heiduk; Paul J.J. Welfens (2003), Internet, Economic Growth and Globalization, Springer Berlin Heidelberg

Thomas Gries; Andre Jungmittag; Paul J.J. Welfens (2003), Neue Wachstums- und Innovationspolitik in Deutschland und Europa, Physica-Verlag Heidelberg

Hermann-Josef Bunte; Paul J.J. Welfens (2002), Wettbewerbsdynamik und Marktabgrenzung auf Telekommunikationsmärkten, Springer Berlin Heidelberg

Paul J.J. Welfens; Ralf Wiegert (2002), Transformationskrise und neue Wirtschaftsreformen in Russland, Physica-Verlag Heidelberg

Paul J.J. Welfens; Andre Jungmittag (2002), Internet, Telekomliberalisierung und Wirtschaftswachstum, Springer Berlin Heidelberg

Paul J.J. Welfens (2002), Interneteconomics.net, Springer Berlin Heidelberg

David B. Audretsch; Paul J.J. Welfens (2002), The New Economy and Economic Growth in Europe and the US, Springer Berlin Heidelberg

Paul J.J. Welfens (2001), European Monetary Union and Exchange Rate Dynamics, Springer Berlin Heidelberg

Paul J.J. Welfens (2001), Internationalization of the Economy and Environmental Policy Options, Springer Berlin Heidelberg

Paul J.J. Welfens (2001), Stabilizing and Integrating the Balkans, Springer Berlin Heidelberg

Richard Tilly; Paul J.J. Welfens (2000), Economic Globalization, International Organizations and Crisis Management, Springer Berlin Heidelberg

Paul J.J. Welfens; Evgeny Gavrilenkov (2000), Restructuring, Stabilizing and Modernizing the New Russia, Springer Berlin Heidelberg

Paul J.J. Welfens; Klaus Gloede; Hans Gerhard Strohe; Dieter Wagner (1999), Systemtransformation in Deutschland und Rußland, Physica-Verlag Heidelberg

Paul J.J. Welfens; Cornelius Graack (1999), Technologieorientierte Unternehmensgründungen und Mittelstandspolitik in Europa, Physica-Verlag Heidelberg

Paul J.J. Welfens; George Yarrow; Ruslan Grinberg; Cornelius Graack (1999), Towards Competition in Network Industries, Springer Berlin Heidelberg

Paul J.J. Welfens (1999), Globalization of the Economy, Unemployment and Innovation, Springer Berlin Heidelberg

Paul J.J. Welfens (1999), EU Eastern Enlargement and the Russian Transformation Crisis, Springer Berlin Heidelberg

Paul J.J. Welfens; S. Jungbluth; H. Meyer; John T. Addison; David B. Audretsch; Thomas Gries; Hariolf Grupp (1999), Globalization, Economic Growth and Innovation Dynamics, Springer Berlin Heidelberg

Paul J.J. Welfens; David B. Audretsch; John T. Addison; Hariolf Grupp (1998), Technological Competition, Employment and Innovation Policies in OECD Countries, Springer Berlin Heidelberg

John T. Addison; Paul J.J. Welfens (1998), Labor Markets and Social Security, Springer Berlin Heidelberg

Axel Börsch-Supan; Jürgen von Hagen; Paul J.J. Welfens (1997), Wirtschaftspolitik und Weltwirtschaft, Springer Berlin Heidelberg

Paul J.J. Welfens; George Yarrow (1997), Telecommunications and Energy in Systemic Transformation, Springer Berlin Heidelberg

Jürgen v. Hagen; Paul J.J. Welfens; Axel Börsch-Supan (1997), Springers Handbuch der Volkswirtschaftslehre 2, Springer Berlin Heidelberg

Paul J.J. Welfens; Holger C. Wolf (1997), Banking, International Capital Flows and Growth in Europe, Springer Berlin Heidelberg

Paul J.J. Welfens (1997), European Monetary Union, Springer Berlin Heidelberg

Richard Tilly; Paul J.J. Welfens (1996), European Economic Integration as a Challenge to Industry and Government, Springer Berlin Heidelberg

Jürgen v. Hagen; Axel Börsch-Supan; Paul J.J. Welfens (1996), Springers Handbuch der Volkswirtschaftslehre 1, Springer Berlin Heidelberg

Paul J.J. Welfens (1996), Economic Aspects of German Unification, Springer Berlin Heidelberg

Paul J.J. Welfens; Cornelius Graack (1996), Telekommunikationswirtschaft, Springer Berlin Heidelberg

Paul J.J. Welfens (1996), European Monetary Integration, Springer Berlin Heidelberg

Michael W. Klein; Paul J.J. Welfens (1992), Multinationals in the New Europe and Global Trade, Springer Berlin Heidelberg

Paul J.J. Welfens (1992), Economic Aspects of German Unification, Springer Berlin Heidelberg

Paul J.J. Welfens (1992), Market-oriented Systemic Transformations in Eastern Europe, Springer Berlin Heidelberg

Paul J.J. Welfens (1990), Internationalisierung von Wirtschaft und Wirtschaftspolitik, Springer Berlin Heidelberg

Paul J.J. Welfens; Leszek Balcerowicz (1988), Innovationsdynamik im Systemvergleich, Physica-Verlag Heidelberg