Volume 57 | Number 3 **May/June 2022**

Intereconomics

Review of European Economic Policy

FORUM

The Ripple Effects of the War in Ukraine

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A 58369 ISSN 0020-5346

Springer

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ZBW Leibniz-Informationszentrum Wirtschaft
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Intereconomics

Review of European Economic Policy

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Abstracted/Indexed in: SCOPUS, EconLit, Google Scholar, EBSCO, CSA, ProQuest, CAB International, ABS Academic Journal Quality Guide, Academic OneFile, Bibliography of Asian Studies, CAB Abstracts, CSA Environmental Sciences, ECONIS, European Sources Online (ESO), Gale, GeoRef, International Bibliography of Book Reviews (IBR), International Bibliography of Periodical Literature (IBZ), OCLC, Research Papers in Economics (RePEc), SCImago, Summon by ProQuest, World Affairs Online

DOI: 10.1007/s10272-022-1043-0

Intereconomics, 2022, 57(3), 138-139

JEL: F51, F53, F55

The EU's Ukraine Watershed: Fast Forward to European Defence Union

Beyond the implications of the war in Ukraine for energy resources, migration, food security and value chains, it has led to major shifts in the EU's security and defence orientation. These have been accompanied by developments at the member state level that suggest a gradual converging of strategic cultures, with industrial, institutional and operational implications for EU security.

The ideological debate on how to respond, first to troop build-up and then full-blown invasion, boiled down to a clash between realists and liberals. The former have argued that it is inevitable that great power blocs be accorded spheres of influence in which grey zone buffer areas help safeguard the national security and economic interests of great powers (e.g. Russia) and the expansion into those areas (e.g. NATO enlargement) is just cause for an array of responses including armed aggression. This position, however, downgrades the opinion and actions of Ukrainians to secondary importance, arguing that war in Ukraine is first and foremost about pan-European security. Diplomatic channels were thoroughly explored in the run-up to Putin's senseless aggression, especially by those member states with strong economic ties to Russia, a high degree of energy dependence and/or large pro-Russian constituencies; these failed, however, to prevent a full-blown invasion. Unable to justify active intervention by the West for fear of nuclear escalation, realists recommended a policy of restraint, backtracking suggestions that Ukraine join NATO and negotiating limited agreements on issues such as arms control.

Since Russia's decision to up the ante with its so-called special military operation, realists have framed (re)actions by the EU and its member states beyond diplomatic efforts to change Russia's calculus as active engagement in a proxy war and strategically short-sighted. As their argument goes, the EU continues to face threats from Russia such as nuclear proliferation, disinformation and weaponised migration, and should not poke the proverbial bear. The EU will also have to manage relations with Russia long after the (literal) dust settles in Ukraine. As a result, their policy prescription is a negotiated settlement between Ukraine and Russia that might include armed neutrality and a return to pre-24 February frontlines along with EU/NATO/US negotiations that may explore new formats of pan-European security. In short, realists believe that the West should offer (conditional) off-ramps to Russia.

On the other hand, liberals ascribe Putin's motives to a fear that Ukrainians will continue along their path towards being a full-fledged liberal democracy and will deepen their political, security, and socioeconomic integration with the like-minded EU and US. The consolidation of freedom, the rule of law, and democracy on Russia's borders challenges the stability of Putin's regime. Indeed, Putin's declarations prior to invasion regarding the de-militarisation and "de-Nazification" of Ukraine and subsequent full-blown invasion confirm a much broader values-based motive: laying authoritarian and imperialistic claim once more to what he considers to be an integral part of Russian territory. Contrary to realists, liberals hold a strong conviction that Ukraine, and indeed EU member states along the eastern flank, maintain a degree of agency independent of powers such as Russia, the US, France and Germany. However, besides a concerted diplomatic effort led by the US to rally allies and signal to Putin that the West would be united in its response, liberals had few policy recommendations in the run-up to war. Troop numbers of NATO countries bordering Russia were bolstered, but this did not enhance Ukraine's bargaining power to avoid large-scale loss of life. While Putin paid diplomatic lip service to the West, this only served to buy time and continue military build-up on Ukraine's borders. Russia's course of action had already been set:

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Putin could only react to such a values-based threat through the so-called de-Nazifying use of force to (partially) occupy Ukraine or install a puppet government.

Believing that internal pressures – both grassroots and elite – generated by economic depravity and the internal spread of counter-narratives may force Russia to halt its senseless war, the West has agreed upon economic sanctions on Russia. Agreeing with realists that actively intervening – in defence of common values – would significantly raise the possibility of nuclear conflict, most liberals have nonetheless been vocal about supporting Ukraine by any other means necessary.

War in Ukraine has led to widespread strategic reorientation in defence of common values and interests within the EU – and a largely liberal framing and response to Russia's full-blown invasion. In terms of military assistance, EU member states have provided lethal equipment to the tune of €2 billion via the EU's European Peace Facility for the very first time. In line with a flourishing "Team Europe" logic, EU member states have also sold, leased and/or provided arms on a bilateral basis with the purpose of strengthening Ukraine's relative positioning vis-à-vis Russia in the current war. Most EU member states have contributed in some way to the delivery of anti-aircraft systems, grenade-launchers, machine guns and ammunition.

Beyond this immediate assistance to Ukraine, Putin's war has also had significant institutional effects. Denmark will hold a referendum on 1 June 2022 on its opt-out from the EU's Common Security and Defence Policy. Although latest polls tell the story of an undecided Denmark, the change in strategic orientation is significant. Furthermore, Finland and Sweden applied for NATO accession with the aim of reinforcing Europe's immediate deterrence posture. Despite Turkish objections, they will be welcomed into the Alliance – positive both in terms of EU-NATO integration as well as enhancing Europe's ability to reinforce the Baltics and project into the Arctic.

On the industrial and capabilities development side, EU member states have committed to significant increases in their military expenditures in order to replenish and enhance their capabilities, reduce their vulnerabilities and better protect their soldiers. Germany, Denmark and Sweden have decided to meet their EU-NATO Wales Summit-enshrined goal of spending 2% of GDP on defence in the medium to long term, with Romania, Lithuania and Poland set to exceed the 2% benchmark in the coming years. Parallel to this, EU member states have committed to spend better together with a view towards improving interoperability. Further European Defence Technological and Industrial Base integration would also be essential to leverage civilian-defence industrial synergies, create economies of scale, foster strategic culture convergence and build resilience.

The latest sign from EU institutions and member states that they are serious about greater security and defence integration is the EU's Strategic Compass for Security and Defence, a roadmap for greater cooperation and coordination in crisis management, resilience building, capabilities development and partnership consolidation. The threat assessment underpinning it highlights the *Zeitenwende* (watershed) represented by war in Ukraine for the EU, and lays out a series of proposals to better place the EU as a security and defence actor. In a first push to implement the Compass after its February 2020 duo of defence-related communications, the EU has broken taboos with a proposal to coordinate joint arms procurement and investment. The proposal stretches Treaty boundaries that prevent the EU from using its common budget for military expenditures. To get around this legal obstacle, the new programme will focus on investment with industrial ambition and could finance joint purchases using innovative financial instruments.

The EU's united liberal response is grounded in the values it shares with Ukraine and opposed to the realist premise that the world be divvied up into spheres of influence. Rather than cause divisions, Putin's war has inspired even greater understanding within the EU that Europe is better together, especially in security and defence. It remains to be seen, however, how the flurry of announcements, initiatives and actions will concretely translate into tangible industrial, institutional and operational progress in what has historically been the remit of national sovereignty.

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DOI: 10.1007/s10272-022-1048-3

The Ripple Effects of the War in Ukraine

Although the world watched for months as Russian troops amassed on the Ukrainian border, there was still a collective disbelief at Russia's audacious invasion of its sovereign neighbour. On 24 February, as Russian tanks went in, Ukrainian refugees flowed out. In response, the European Union united in a way never seen before to implement sanctions against Russia, send weapons to Ukraine and accommodate the displaced. As the war continues with no feasible solution in sight, economists and policymakers are considering the ripple effects of the conflict in numerous sectors: energy, food and agriculture, raw materials and technology, security and defence, migration, and the global world order. This Forum examines the impact of the war on the European economy and society, how to address the fall out in the hardest hit sectors and the deep-seated ramifications that will play out in the years and decades to come.

The Asymmetric Impact of War: Resilience, Vulnerability and Implications for EU Policy

Giuseppe Celi, University of Foggia, Italy.
Dario Guarascio, Sapienza University of Rome, Italy.
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The Fog of War: Russia's War on Ukraine, European Defence Spending and Military Capabilities

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The War in Ukraine and Migration to Poland: Outlook and Challenges

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Who Will Shape the New World Order?

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DOI: 10.1007/s10272-022-1049-2

Intereconomics, 2022, 57(3), 141-147

JEL: F51, O52

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The Asymmetric Impact of War: Resilience, Vulnerability and Implications for EU Policy

Contrary to what Jean Monnet imagined, the European Union does not seem to become stronger and more integrated "crisis after crisis". Recent history attests to how symmetric shocks systematically translate into divergence and polarisation, both between and within member states (Celi et al., 2018; Gräbner et al., 2020). This was the case of the financial crisis of 2008, which highlighted the contradictions of the fiscal and monetary policy setting of the eurozone while the structural gap between the centre and the periphery continued to widen (Celi et al., 2019). The same goes for the COVID-19 pandemic (Ceron and Palermo, 2022). Where deflationary policies and spending cuts have been more prevalent, such as in the southern periphery (Storm, 2019), death rates and socio-economic costs have skyrocketed (Prante et al., 2020). Likewise, the renunciation of industrial policy in the name of export-driven competitiveness has contributed to undermining the EU's production capacity for a number of essential products, starting with vaccines (Celi et al., 2020). This is evident in a growing dependence on the United States, China and, more generally, on multinationals leading key technology domains (e.g. big pharma, big tech).

The Russia-Ukraine war is no exception. The channels through which it will influence the economy are many

Open Access funding provided by ZBW – Leibniz Information Centre for Economics.

* This essay is part of the activities funded by the Dezernat Zukunft Foundation in the context of the European Macro Policy Network project. All the usual disclaimers apply.

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(Pisani-Ferry, 2022; Astrov et al., 2022). First, there is an exponential growth of uncertainty, which negatively affects consumption and investment, with depressive effects on GDP and employment: the longer the war lasts, the greater and more persistent its effects will be. Second, sanctions against Russia are fueling tensions over energy and commodity prices. Rising energy costs will cause companies to reduce production, postpone investment and reduce employment. Likewise, inflation can diminish the purchasing power of households, particularly those at the bottom of income distribution, further depressing aggregate demand and GDP. Adding to the bottlenecks caused by COVID-19 (Baldwin and Freeman, 2021), the war is further destabilising global value chains (GVCs), with the shortage of key intermediate inputs that increase production costs and put entire industries at risk. In the medium term, this could accelerate a process of deglobalisation (Dadush, 2022) – reshoring or "friendshoring" – which could lead to a "decoupling of the global trading system into two blocs – a US-centric and a China-centric bloc" (Bekkers and Góes, 2022). If this is the plausible scenario, sustaining incomes, strengthening internal markets, and recovering technological and productive sovereignty are considered the foremost political priorities.

What are the expected consequences for the European economy?

European countries are affected differently by the war but in ways that transcend the traditional core-periphery division. So far, the German manufacturing core (GMC, made up of Germany and the Visegrád countries) stands out as the most resilient part of the EU economy in the face of a crisis (Celi et al., 2018). This time, the degree of economic vulnerability associated with the weight of energy-intensive manufacturing in the economy, dependence on energy production and diversification of supply determine the costs in terms of inflation and growth. In this respect, the GMC and Italy – the southern periphery's major economy – share a significant degree of vulnerability: A large share of energy-intensive manufacturing and a strong import dependency on Russian energy reduce the room for adjustment and make the risk of a prolonged recession greater. Diversification of energy sources and composition, in particular renewables, will only work in the medium term. Equally serious is dependence on Russian and Ukrainian key raw materials and intermediate goods (e.g.

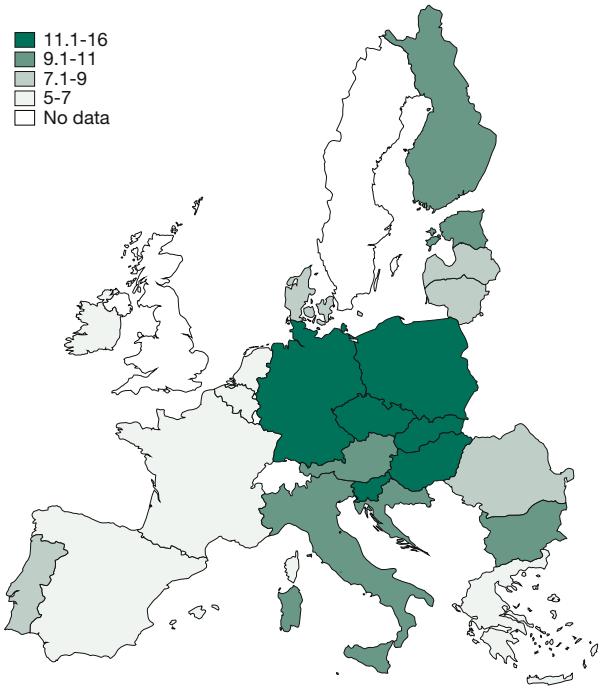
iron, cereals, fertilisers): The risks of bottlenecks and supply restrictions feed sector-specific inflationary shocks, which are easily transmitted to the whole economy. Key German industries, such as the automotive industry, are particularly vulnerable to the disruption of specific supply chains.[1]

But why did the GMC and Italy develop such a strong dependence on fossil fuels and, in particular, on Russian gas? A possible explanation can be found in the model of growth and the long-term evolution of these economies. First, Germany's mercantilist strategy, which aimed at promoting exports to the detriment of domestic demand (both consumption and investment), required minimising costs in order to maximise export competitiveness. Cheap Russian gas was an important element of this strategy, as was the relocation of German industry to the East. For the GMC, strengthening its links with the Russian economy, both in terms of energy supply and in terms of creating a market for its exports, represented an obvious strategic development. Economic interests, as well as the illusion behind the *doux commerce* doctrine, may explain the lack of diversification efforts as ties to the Russian energy sector grew stronger. Similar arguments hold true for Italy: its historical ties with the Russian energy sector (e.g. relations between the Italian state-owned oil company Eni and its Russian counterpart Gazprom have strengthened since the 1990s)[2] and the importance of Russia as an exporting market for Italian products, both capital and final goods.

Are we therefore overcoming the core-periphery division? Not exactly. The relative initial vulnerability of member states matters as much as their position within European (and global) production and trade networks. As Landesmann (2020) noted, periphery countries are more vulnerable in many ways, and the war may increase the structural divide. Their higher share of low-wage precarious workers (for a detailed analysis, see Eurofound, 2021), their weaker welfare systems and their smaller fiscal space[3] are bound to increase the social costs of the crisis. Furthermore, the periphery has a higher share of micro and small enterprises (in Italy, firms with less than ten employees account for about 95% of the total). These enterprises, characterised by low capitalisation and limited organisational capabilities, have poor resilience to crises. Their fragility calls for more extensive government support. A perspective that becomes even more gloomy in the case of a return to fiscal austerity, monetary restraint and a "wartime industrial policy", that is, more weapons and less welfare.

In what follows, we assess the economic implications of the Russia-Ukraine war focusing on member states' relative vulnerability. Relying on a heterogeneous set of data sources, key channels are considered: employment share of energy-intensive industries; import dependency with respect to energy goods (oil, coal and gas), key raw materials and intermediate goods; and production link-

Figure 1
Employment in high and medium-high energy-intensive sectors in Europe, 2019
% of total employment



Notes: To define energy-intensive industries, we rely on the Eurostat energy balances ranking sectors according to the ratio between the amount of energy used in that sector and total final energy consumption. We classified industries with an above-the-median ratio as energy-intensive. Once we identified the set of energy-intensive industries (chemical and petrochemical; iron, steel and non-ferrous metals; non-metallic minerals; paper, pulp and printing; food, beverages and tobacco; machinery), we computed their relative employment share for each EU member state. The taxonomy fits all EU member states with the exception of the Baltic countries, where the "wood and wood products" sector has the highest energy intensity.

Source: Authors' elaboration on Eurostat data.

1 Interruption of cable production in Ukraine has prompted Volkswagen and other car producers to stop production at some plants (Campbell and Miller, 2022).
2 The collaborations between the Italian energy giant and its Russian counterpart have never stopped. Among the most important is the 1,200-kilometre Blue Stream pipeline, which connects Russia and Turkey, crossing the Black Sea. Since 1999, Eni and Gazprom have shared ownership of the offshore section of the pipe, through the Blue Stream Pipeline Company B.V., registered in the Netherlands.
3 This is particularly true for Greece and Italy, where the public debt grew exponentially as a consequence of austerity first, and then the COVID-19 crisis. According to Eurostat data, in 2020 the debt-to-GDP ratio in the southern periphery – Greece, Italy, Spain and Portugal – reached an average of 150% against 90% in the EU27.

ages. After mapping the (asymmetric) vulnerability of the European economies, we conclude by discussing the potential risks of adopting a wartime agenda for the EU economic policy.

Assessing the asymmetric impact of the Russia-Ukraine war

Two distinct but related aspects matter for the assessment of vulnerability to war: the EU's dependence on imports from Russia and Ukraine and the differential impact on individual countries. The latter refers to the relative importance of the most energy-intensive sectors in terms of employment and value added.

Employment in energy-intensive industries

To assess the relative vulnerability of EU economies to energy shocks, we computed the relative weight of energy-intensive industries for each EU country and the share of workers employed in them (Figure 1). Member states that, other things being equal, show a relatively high share of employment in energy-intensive industries tend to be more exposed to the risk of unemployment and recession. While the highest shares are found in Czechia and Slovenia, at 15.7% and 13.7% respectively, employment in energy-intensive industries also represents over 11.5% of total employment in Germany (equal to 5.3 million workers) and 9.5% in Italy (2.3 million workers). A similar picture emerges if we look at the share of value added generated by such an industry cluster. As anticipated, a strong (and new, compared to previous crises) industry-related divide seems to emerge in Europe, partly reflecting the different importance of the manufacturing industry in the economy: Germany, Austria, Italy and a large part of the eastern periphery on the one side; and Belgium, France, Spain, and the Netherlands on the other.

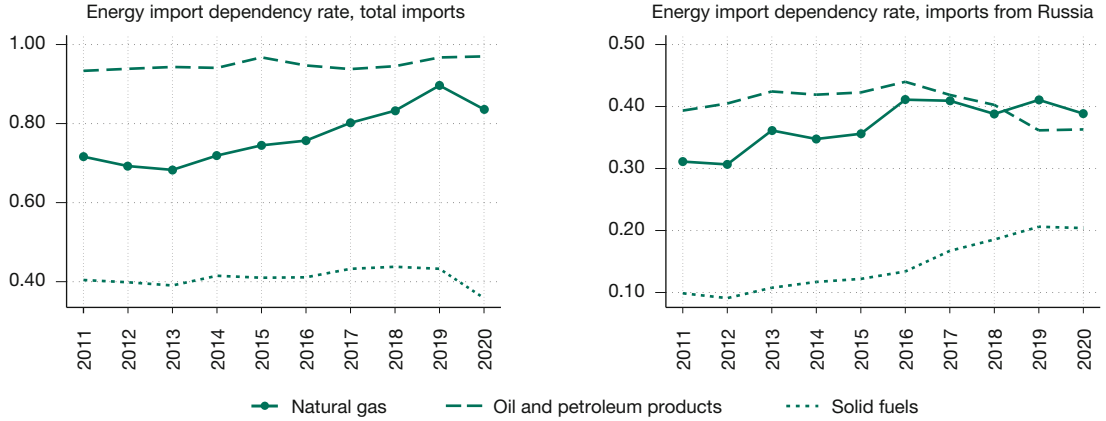
Europe's dependence on Russian fossil fuels

The share of energy-intensive industries is only one of the factors that can potentially affect the relative vulnerability of member states. Equally important is the dependence on the import of energy goods. Under current conditions, this is especially true if imports come from Russia. Over the past decade (except in 2020, when COVID-19 hit demand and imports), the dependence of the EU27 has grown across the spectrum of fossil fuels: natural gas, oil and petroleum products and solid fuels (see Figure 2, left-hand panel). The same goes for dependence on Russia (Figure 2, right-hand panel). In 2019, over 96% of EU27 oil needs, nearly 90% of natural gas and over 43% of solid fuels were met by net imports, with the largest share coming from Russia (35% of oil, 40% of natural gas and 20% of solid fuels consumed in EU27).[4] The decline in the share of oil since 2016 was more than offset by the increase in gas and solid fuels.

However, the aggregate figures conceal important heterogeneities between countries. Figure 3 delves into this heterogeneity based on Eurostat's import dependency

4 The highest share of natural gas imports (in total EU imports) comes from Russia (38%), followed by Norway (15%) and Algeria (7%). Russia is also the largest exporter of solid fossil fuels to the EU27, with 41% of total imports, followed by the US with 16% and Australia with 12%. Russia is equally important in oil, with a share of 23% of the EU's imports, followed by Saudi Arabia (6%) and the US (5%).

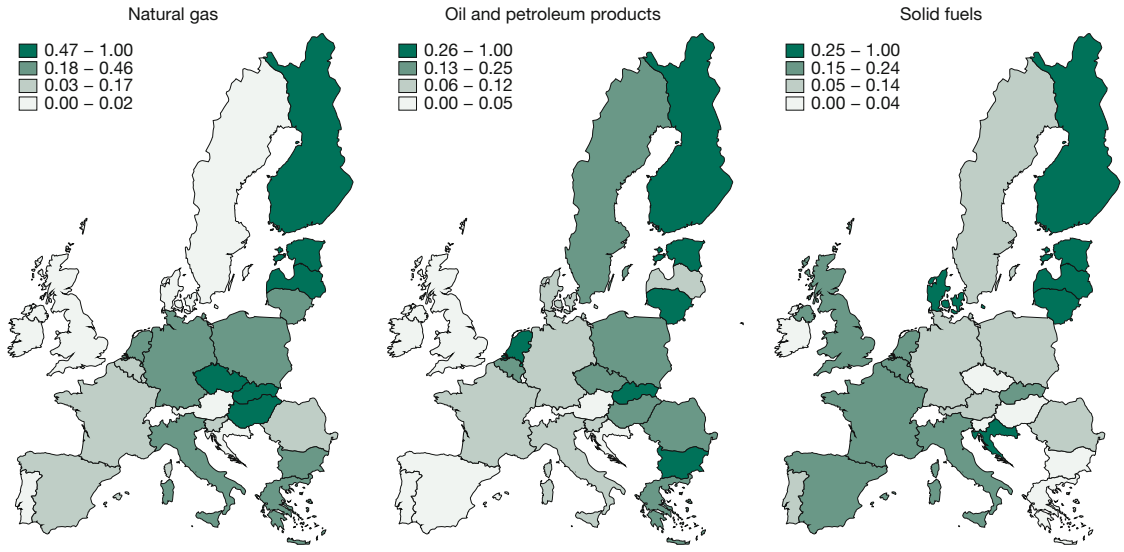
Figure 2
EU27 dependency on energy imports



Note: The left-hand panel shows the share of the EU27's energy net imports in gross available energy, while the right-hand panel exhibits the share of EU27 net imports from Russia in gross available energy.

Source: Authors' elaboration on Eurostat Energy data.

Figure 3
EU member states' dependency on energy imports from Russia, 2019
Index



Notes: The energy import dependency rate for each country is defined as the share of net energy imports (imports minus exports) in total available energy – separately for natural gas, oil and petroleum products, and solid fossil fuels. We standardise indicators on a scale of 0 to 1, where zero stands for the lowest position in the ranking and 1 for the highest. The distribution of the indicator is then divided into quartiles to compare the relative position of member states.

Source: Authors' elaboration on Eurostat data.

indicator. A clear East-West divide appears to be emerging. Particularly strong when it comes to gas and oil: Hungary, Czechia and Slovakia obtain virtually all of their natural gas imports from Russia, followed by Finland, Estonia and Latvia, accounting for more than 80% of their natural gas needs. Germany and Italy rely heavily on natural gas and, though belonging to the second quartile of the dependency indicator, they are the biggest importers of Russian gas in volume terms. As for solid fuels, Poland and Germany emerge as more autonomous, partly due to their domestic production.

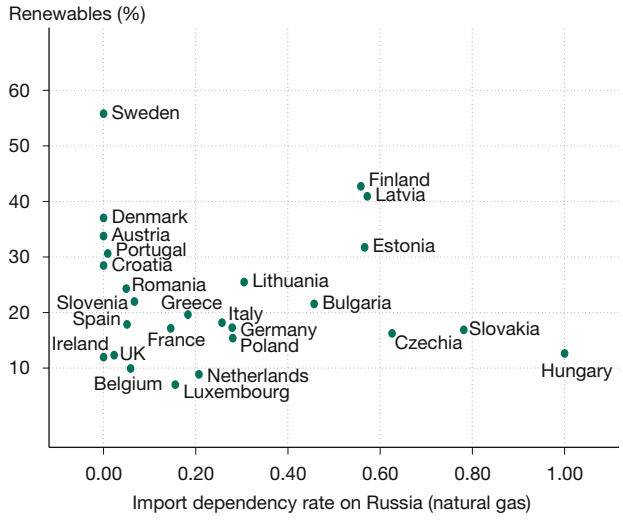
This preliminary evidence gives an idea of the significant, albeit asymmetrical, costs that EU economies will have to bear if the crisis lasts or worsens (e.g. a full Russian gas embargo). These costs would be much higher, as many scholars have pointed out (see, among others, Pisani-Ferry, 2022), for countries that are more dependent on Russian natural gas, such as Germany and Italy.[5] It also shows how the "new divide" emerging in Europe appears to be strongly associated with a country's industrial specialisation (i.e. relative size of manufacturing, heavy and energy-intensive industries) as well as the extent of its ties to Russia. The only way to reduce vulnerability is to diminish dependence on fossil fuels and diversify sources. Here too, however, a relevant asymmetry can be observed. Although dependence can be reduced by increasing the use of renewable energy, we observe that the most dependent and therefore most vulnerable countries also tend to rank low in terms of the share of energy consumption from renewable sources in gross final energy (see Figure 4).

Industrial specialisation, geographical proximity and historical ties with a gas-rich country such as Russia may explain the poor performance of Eastern European countries in terms of renewables. For countries such as Germany and Italy, in turn, the need to promote an export-oriented, energy-intensive manufacturing sector could have played a significant role. In the short run, the energy crisis could put the brakes on environment-friendly policies; however, a positive and unintended consequence of these tragic events could be the acceleration of the green transition, with an EU-wide industrial policy more focused on addressing current energy vulnerabilities.

5 In fact, although diversification is somewhat more feasible in the case of oil and solid fuels, it will undoubtedly be far more challenging in the case of gas.

Figure 4

Natural gas import dependency and share of renewables in EU member states, 2019



Notes: The indicator of the import dependency rate on Russian natural gas has been standardised to a common scale within the range from 0 to 1. Instead, the renewables share stands for the share of energy consumption from renewable sources in gross final energy.

Source: Authors' elaboration on Eurostat data.

Exposure to disruptions in GVCs

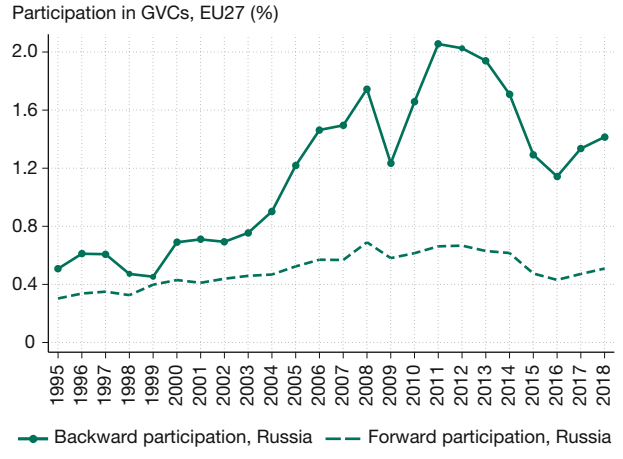
The war is going to further disrupt value chains. To assess the vulnerability of Europe (and individual member states), we look at the interdependence between Russia and the EU as measured by OECD's GVC backward and forward participation indicators (Figure 5a).[6] While forward participation remains fairly stable over the observed period (averaging around 0.5%), the level of backward participation has nearly tripled: from 0.5% in 1995 to 1.4% in 2018 (though declining after 2011). In other words, 1.4% of the EU27 gross exports in 2018 relied on value added produced in Russia.

Once again, European countries differ in their degree of interaction with the Russian economy (Figure 5b). Bulgaria, Greece, Finland, Slovakia, Latvia and Lithuania stand out with the highest level of backward participation, with values exceeding 4% of exports. Over the period 1995-2018, most countries are above or near the pink line (zero rate of change), suggesting that backward linkages with Russia increased or remained stable, with only the Baltic countries and Slovakia recording a decrease, albeit from a high value. Thus, the costs of a permanent disruption of Russian-related supply chains would spread rather unevenly.

6 The backward participation indicator is defined as the percentage share of value added produced in country j (Russia, in our case) embodied in gross exports of country i (the EU and its member states, in our case) over total gross exports of country i. Basically, the backward participation indicator measures the relative importance of country j's productions for country i's exports. In turn, the forward participation indicator is the share of country i's (the EU and its member states) domestic value added embodied in j's (Russia) gross exports over its total gross exports. This measures the importance of i's productions for j's final exports.

Figure 5a

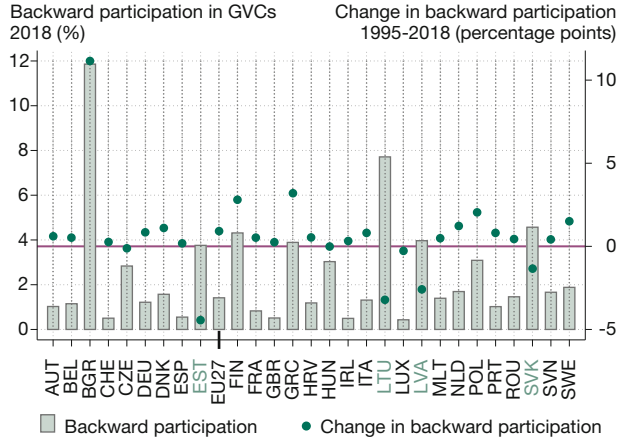
Interdependence between Russia and the EU, 1995-2018



Source: Authors' elaboration on OECD-TIVA.

Figure 5b

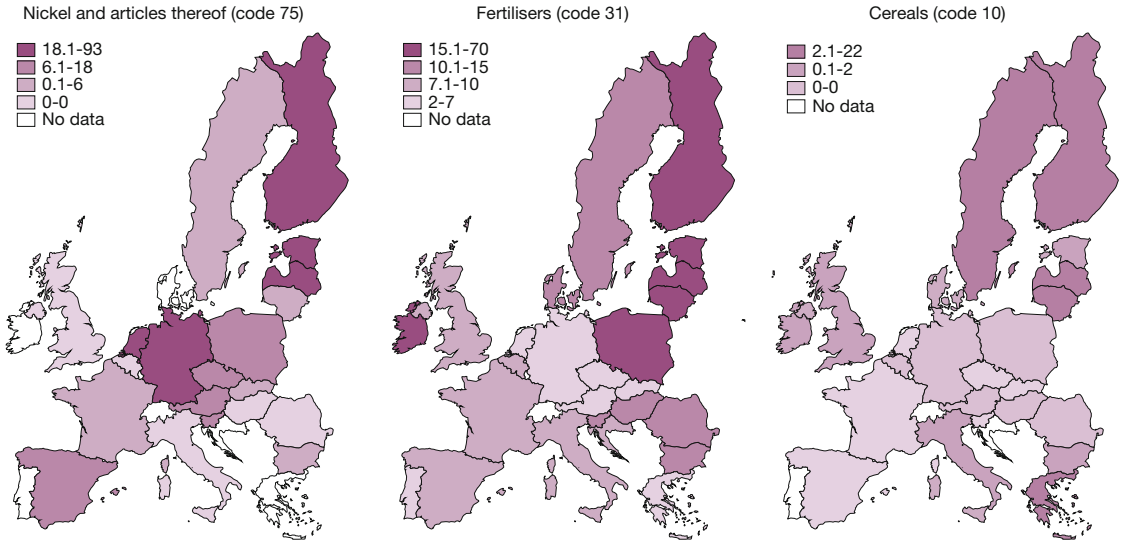
Interdependence between Russia and the EU member states



Note: The left-hand side axis refers to the level of backward participation in 2018, while the right-hand side axis refers to long-term changes over the period 1995-2018. The highlighted countries recorded a decrease.

Source: Authors' elaboration on OECD-TIVA.

Figure 6
The share of imports from Russia in total imports, 2019 (top three products)
in %



Note: In the case of cereals, half of the countries do not import from Russia.

Source: Authors' elaboration on Comtrade data.

Aggregate figures can hide sector-specific bottlenecks. Even a low aggregate degree of interdependence will not shield from major disruption if there is a strong dependence on imports of specific (strategic) goods. For example, despite Germany's relatively low backward participation indicator with Russia (Figure 5b), the German automotive sector is particularly vulnerable to the disruption of specific goods, such as palladium (used in catalytic converters) and nickel ore (used in lithium-ion car batteries).[7]

Although in 2019 Russian exports accounted for only 2.3% of total world exports, figures were much higher for some specific non-energy, key commodities: fertilisers accounted for 14.3% of global exports, nickel and articles thereof 11.3%, and cereals 7.2%. These three commodities, which play an important role for agricultural and industrial production, weigh differently in EU countries' imports (Figure 6), and their shortage could cause domino effects. In the case of nickel, for example, an input crucial for the production of batteries for electric vehicles, the highest share is recorded in Germany and its manufacturing core, as well as in Spain and the Baltics – countries where the car industry plays a significant role. Enduring shortages may cause interruptions in car production in the short run, and slow down the green transition in the medium term. Fertilisers and cereals are crucial for agriculture, with fallout effects in other sectors, such as cattle breeding and the food industry.

Cross-country interdependence should also not be underestimated, as disruptions taking place in a specific country may be rapidly transmitted to other economies, especially if some countries operate as brokers (i.e. play the role of intermediaries in the trade of specific goods) or process and export strategic intermediate goods. Similar to the increase in energy prices, higher prices of cereals and fertilisers passed on to food can affect people at the bottom of the income distribution (Mitchell et al., 2022), in addition to being deleterious for lower-income countries, which depend on these products for survival. These negative outcomes may be reinforced if the impact of war and sanctions cause a long stagflation.

What impact on the EU's economic policy?

Russia's invasion of Ukraine, and the consequent sanctions, have unleashed supply and demand shocks, slashing growth, fueling inflation and raising new challenges for the EU's fiscal and monetary policy. The member countries more dependent on fossil fuels are going to suffer more – which explains their opposition to including oil and gas in sanctions. These economies are the EUs' "manufacturing heart", therefore their hardships will be inevitably passed on, in varying degrees, to the whole Union. The first to be hit is likely to be the eastern periphery – which is closely

7 Similar problems concern imports of cables produced in Ukraine (Simchi-Levi and Haren, 2022).

integrated with German industry (Stehrer and Stöllinger, 2015) but has also established ties with Russia – and a portion of the southern periphery that is part of German value chains (Simonazzi et al., 2013).

With COVID-19 still progressing, the need to assist households and businesses in this new crisis will weigh on public budgets and feed on debt. If preventing business bankruptcy is necessary in order to restart the economy, once the recovery sets in, the highly heterogeneous fiscal stance of the member states is likely to affect their capacity to support their economies. The debtor countries could face a more severe challenge, depending on the macroeconomic policy that the EU governing bodies will decide to implement. Although fiscal rules have been frozen for the current year, the growth of public debt – made worse by the commitment to increase military spending – may alarm creditor countries and convince them to resume austerity measures for the whole Union. The definition of the fiscal rules for the future is as important as the policy mix (fiscal, monetary and industrial policies) implemented in the current environment for the survival of the Union.

The war has undoubtedly made the definition of policies more difficult. Rising inflation presents the ECB with a conundrum. While there is a consensus that interest-rate hikes are not appropriate to address price rises due to supply shocks, the need for ECB's credibility to moderate inflationary expectations earns consideration. A central bank that is perceived as being committed to protecting its mandate, it is argued, can contain inflation at a lower economic cost, since the expectation that adequate policy action will be taken is itself stabilising. Such credibility is vital for the conduct of monetary policy. If continuing the path of policy normalisation is therefore the appropriate course of action, its speed will depend on the economic fallout from the war, and the severity and persistence of the inflation shock.

This leaves the issue of the debt management unresolved. It is true that real interest rates are still negative. However, without a firm commitment by the ECB, interest rates on government bonds in debtor countries (namely, the southern periphery) could rise abruptly and steeply, and a contagious panic could set in, forcing the ECB to rashly reverse its policy on bond purchases (Heimberger, 2022). The monetary stance will affect fiscal policy: Euro area governments face a trade-off between business cycle stabilisation and debt sustainability.

The war marks a turning point for the global geopolitical order. Globalisation, already affected by the US-China trade conflict and the disruption following the pandemic, could be in retreat. Deglobalisation may not mean a new age of autarky like in the 1920s and 1930s. Rather, as mentioned above, we could see the formation of international economic blocs (Dadush, 2022). European countries, traditionally dependent on (global) exports, might have to readjust their growth model by giving greater weight to the domestic market. In this context, the need for a "Fortress Europe" can in fact change their macroeconomic stance. A result that is not necessarily a happy ending, and that could have certainly been achieved in less dramatic circumstances.

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DOI: 10.1007/s10272-022-1050-9

Intereconomics, 2022, 57(3), 148-151

JEL: F51, F31, F41

Oleg Itskhoki and Dmitry Mukhin

Sanctions and the Exchange Rate

A record number of economic sanctions have been imposed on the Russian economy since the invasion of Ukraine in February 2022. Given that it might take months and even years for these restrictions to take a toll on the economy, many commentators and policymakers attempt to infer the effects of sanctions from the short-term dynamics of the rouble exchange rate. In the immediate aftermath of the invasion and the imposition of sanctions, the Russian rouble quickly lost nearly half of its value (Figure 1). However, a few weeks later, the value of the rouble started to appreciate and, at the beginning of May, was higher than before the war.

These puzzling dynamics lead to several contradictory and misleading interpretations. Some commentators conclude that the imposed sanctions are not working. Similarly, state media in Russia uses the reversion of the exchange rate as an indicator of the resilience of the economy and the short-lived effects of sanctions. Other commentators went to a different extreme suggesting that given all the policy measures and restrictions imposed to stabilise the exchange rate, it has lost its relevance as an allocative price and has become inconsequential from the perspective of welfare.

Swings in the exchange rate

What explains the puzzling swings in the exchange rate over the last months? To answer this question, we first note that the value of the rouble is determined on the Moscow Exchange, which has become largely disconnected from international financial markets since the beginning of the war. Western sanctions constrain foreign banks from trading roubles, and Russian capital controls limit access of Russian residents to foreign markets. As a result, the local supply of foreign currency comes from export revenues and government reserves, while local demand is shaped by import expenditure, foreign liabilities of Russian firms (to the limited extent they exist despite the 2014 sanctions) and the use of foreign currency as a store of value. The equilibrium exchange rate equilibrates the local supply and demand of currency and also shifts together with monetary inflation.

In Itskhoki and Mukhin (2022b), we show that a simple equilibrium model of exchange rate determination explains well the rouble dynamics from Figure 1. The overnight freeze of a significant fraction of government foreign reserves, the exclusion of major banks and corporations from international borrowing markets, and a threat of blocking commodity exports led to a sharp depreciation of the rouble on impact. Foreign investors exited the Russian market selling assets and expatriating proceeds, which resulted in capital outflows and an associated steep demand for currency. These factors were exacerbated by a sharp increase in the home precautionary demand for foreign currency driven by a collapse in the supply of alternative vehicles for savings. Indeed, demand for home-currency deposits went down due to rising inflationary expectations and the risks in the banking system. Similarly, the increased uncertainty and the risk of sanctions made local stocks and bonds highly unattractive, resulting in a prolonged closure of the Russian financial market.

The exchange rate appreciation

The exchange rate reversed in mid-March and appreciated gradually over the next month to the pre-war level.

First, tougher sanctions on Russia's imports than on its exports over this period led to a sizable current account surplus and an inflow of foreign currency into the economy. This created a force for the rouble appreciation to bring the currency market in equilibrium. Similarly, from the perspective of the goods market equilibrium, this appreciation force allowed for expenditure reallocation towards varieties of imported goods that were not sanctioned but were not demanded unless home currency appreciation brought down their relative prices (see also Lorenzoni and Werning, 2022).

Although no official data on country's trade balance in this period is available yet, the anecdotal evidence suggests that the fall in imports was dramatic, with some estimates exceeding 50%. The direct restrictions on imports were amplified by difficulties with cross-border payments and

Open Access funding provided by ZBW – Leibniz Information Centre for Economics.

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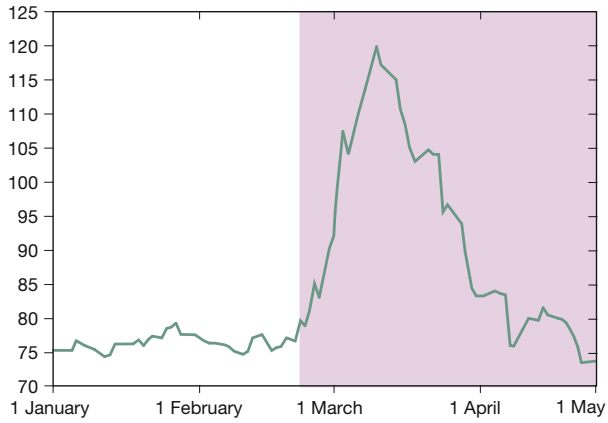
Figure 1
Daily rouble exchange rate (per US dollar) in 2022



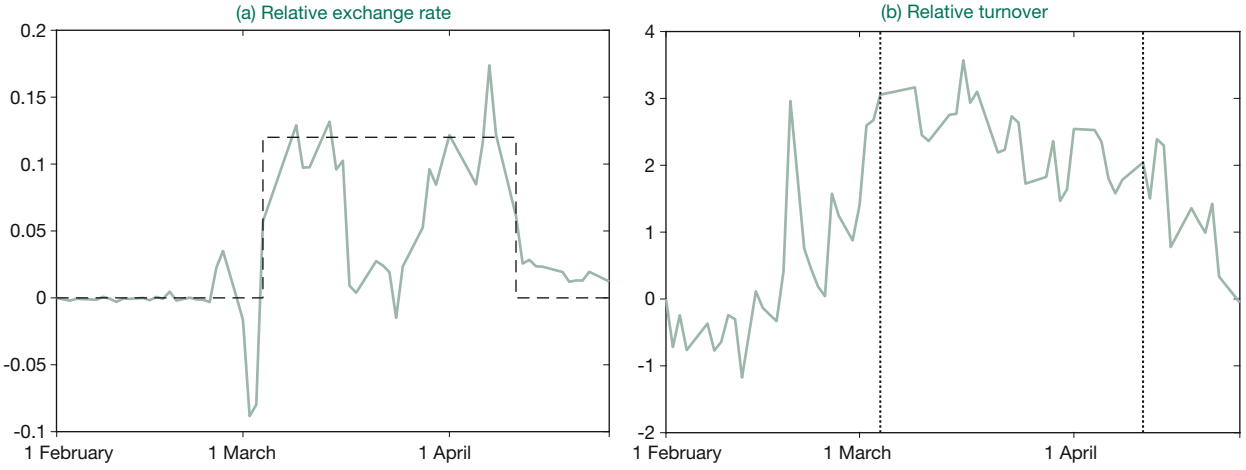
Source: Authors' calculations based on the data from the Moscow Exchange.

shipments of foreign goods. At the same time, the inventories of foreign durables used in production and sold to final consumers allowed for a gradual adjustment in the Russian market. With the benefit of hindsight, it is clear that the fall in imports is a large enough force for the rouble appreciation even after other factors described below fade away, as Russia is likely to "enjoy" a persistent trade surplus as the result of the current mix of sanctions.

Second, with limited access to foreign reserves, the central bank used extensive financial repression, which included strict limits on foreign currency deposit withdrawals, capital outflows, and a tax on local currency conversion to dollars and euros. This severely constrained the domestic demand for foreign currency deposits as well as eliminated the effective ability to access existing currency deposits and send the stock of foreign currency savings abroad. This largely offset the initial shock of the freeze of Russian foreign reserves, which constituted the main instrument used by the Central Bank of Russia to smooth exchange rate fluctuations before the war. The aggressive use of financial repression, along with a steep increase in the home currency interest rate, proved to be an effective substitute under sanctions from the point of view of exchange rate stabilisation.

The relevance of the financial repression policy can be clearly seen in Figure 2, which exploits the heterogeneous treatment of different currencies. Specifically, on 4 March, a 12% tax was introduced on purchases of US dollars, euros and UK pounds, but not other currencies. This tax was eliminated on 11 April. For concreteness, we compare the behaviour of the US dollar exchange rate with that of the Swiss frank, which was not subject to the tax, yet is presumably as safe and therefore offers a close substitute to the dollar. In the left panel of Figure 2, we plot the US dollar exchange rate against the Swiss frank at the Moscow Exchange relative to its international value, which was identically zero before the war, and comoved closely with the tax thereafter. Indeed, the Swiss frank appreciated sharply on the Moscow Exchange (and not

Figure 2
Swiss franc vs US dollar: Exchange rate and turnover, 2022
in logs



Notes: Panel (a) plots the tax on purchasing dollars as dashed line and the (log) dollar exchange rate against the Swiss franc at the Moscow Exchange relative to its international value. Panel (b) shows the (log) turnover of the Swiss franc relative to the dollar turnover at the Moscow Exchange. The values on 1 February are normalised to zero.

Source: Authors' calculations based on the data from the Moscow Exchange.

internationally) after the 12% tax was imposed on the dollar on 4 March and then depreciated back after the tax was eliminated on 11 April, resulting again in the convergence of the Moscow Exchange's rate to its international value. The right panel of Figure 2 additionally shows that the turnover of Swiss francs on the Moscow Exchange increased dramatically relative to that of the dollar during the same period.

Third, the record-high commodity export revenues in the first half of 2022 allowed the Russian government to enjoy a considerable fiscal surplus, thus far avoiding the need to monetise its fiscal obligations and to induce a monetary-driven depreciation. In contrast, the steep appreciation of the rouble since mid-March now puts pressure on the government fiscal balance, as revenues are tied to foreign currency exports, while liabilities are in roubles. As a result, in late April and May, the Russian government has relaxed a number of financial repression measures on foreign currency savings and transfers to avoid excessive appreciation of the rouble.

The three factors outlined above are arguably more important in stabilising the exchange rate than conventional monetary tools such as the hike in the policy rate to 20%, which was mostly aimed at stopping a bank run on the rouble deposits and at preventing monetary inflation. Nonetheless, going forward, the prospect of export sanctions and fiscal problems driven by a domestic recession can result in both inflation and devaluation, but these prospects appear to be pushed forward at least towards the end of 2022.

Paying for exports in roubles

Another policy that attracted much attention was Putin's decree that "unfriendly nations" pay for Russian energy exports in roubles rather than in euros or dollars. This demand faced a backlash in Europe with some countries eventually switching to the rouble and others refusing to change the settlement currency. In response, Russia halted gas exports to Poland, Bulgaria and Finland.

While the motivation for this request has never been publicly laid out, it is unlikely to be directly related to the exchange rate. Of course, as a monopolist, the Russian government could potentially sell roubles to other nations at any exchange rate. However, because oil and gas contracts specify prices in euros or dollars, the rouble exchange rate would not change the total inflows of foreign currency. Given that most import prices are also invoiced in euros and dollars (Amiti et al., 2022), the volume of imports would not change either. Thus, a change in the settlement currency would have no real effects. Instead, it is more likely that the request to use the rouble in international transactions is aimed at loosening the stance of the financial sanctions on the economy.

Sanctions did bite

The appreciation of the rouble to the pre-war level has been widely interpreted as a sign that so far sanctions have had a limited effect on the Russian economy. As mentioned above, this argument misses the fact that most restrictions were imposed on Russia's imports, which lowered demand for foreign currency, thus creating a force for the rouble appreciation. This appreciation, however, cannot offset the increase in the effective costs of imports, particularly in view of their limited availability, or compensate the associated welfare losses and increased real costs of living.

More generally, there is no one-to-one relationship between the exchange rate and welfare, and hence the effectiveness of sanctions cannot be inferred from the exchange rate. On the one hand, sanctions on imports and exports are equivalent in terms of their effect on the consumption of foreign goods – the former increase their relative prices, while the latter lower the amount of resources available to purchase foreign goods – and thus have the same welfare implications. On the other hand, the effect on the exchange rate goes in opposite directions in the two cases – import sanctions decrease the *demand* for dollars and appreciate the rouble, while export sanctions lower the *supply* of dollars and depreciate the rouble.

Importantly, the equivalence extends to fiscal revenues: Although import restrictions have no direct effect on government income, the associated change in the exchange rate lowers nominal and real fiscal revenues in the same way as export restrictions (see Amiti et al., 2017). The fact that exports constitute an important source of government revenues does not change the result and thus cannot be used as an argument in favour of export over import sanctions. Instead, the use of export restrictions can be justified if import sanctions are considered insufficient, are limited by the trade share of sanctioning countries or minimise the costs to sanctioning countries (see Sturm, 2022).

The exchange rate still matters

Equally misleading is the common view that the policy restrictions make the exchange rate irrelevant for the economy. Despite the large interventions of the government in the foreign exchange market, including multiple restrictions on purchasing and managing foreign currency, the value of the rouble affects the economy via two channels. First, the appreciation of the exchange rate increases the

purchasing power of households and boosts consumption of foreign goods mitigating the negative effects of import sanctions. Importantly, this comes at the expense of the households that want to hold foreign currency as a safe asset and thus are subject to the measures of financial repression that are used to strengthen the rouble. In other words, the policy of financial repression creates redistributive effects from savers (who tend to be richer households) to consumers of foreign goods (many of whom are poorer "hand-to-mouth" households).

Second, the nominal exchange rate is a signal about monetary policy, which is especially valuable in an environment with high uncertainty and low trust in policymakers. Budget deficit pushes the government to monetise its nominal liabilities. Even before this happens, uncertainty about the monetary policy can lower demand for local currency deposits, leading to higher inflation and a run on the banks. To regain credibility, anchor inflation expectations and stabilise the financial system, the central bank can adopt a nominal peg to communicate its policy priorities (Athey et al., 2005; Itskhoki and Mukhin, 2022a).

Future dynamics

Although exchange rates are notoriously difficult to forecast – even more so given the current extreme levels of uncertainty – there are good reasons to believe that the rouble will most likely depreciate in 2022-23. First, the fiscal considerations put a floor on how much the exchange rate can appreciate without causing significant tightening of the budget, as discussed above.

Second, given that there remain few restrictions on Russian imports that could be further imposed by Western countries, it is likely that further rounds of sanctions would be imposed on export. European countries are now planning to gradually move away from Russian gas and oil, which will eventually bring down the inflow of foreign currency into the Russian economy even if exports are partially rerouted to other destinations. Furthermore, as soon as European countries do not need to purchase Russian commodities, they are able to impose even stricter financial sanctions completely freezing foreign assets of Russian banks and firms. This, in turn, lowers the supply of dollars and euros, depreciating the rouble exchange rate and putting the banking system at risk of a bank run on foreign currency deposits.

Third, as the inventories of foreign intermediate and final goods are running low, the Russian economy would seek alternative foreign suppliers and switch to parallel imports. This increases the demand for foreign currency and depreciates the rouble. Finally, there is an increasing risk of "monetary depreciation" driven by loose monetary policy. Although as mentioned above, the central bank has put much effort into maintaining its credibility, a fall in export revenues and increasing expenses to support the economy can push the government to monetise its liabilities, which ultimately leads to inflation and depreciation of the nominal exchange rate.

Paradoxically, even a ceasefire resulting in a remote possibility of certain sanctions being lifted will likely depreciate the rouble. While lowering the probability of monetary inflation, this will increase imports and will make it easier to transfer money abroad, putting pressure on the rouble exchange rate.

To conclude, a strong appreciation of the rouble over the past two months was driven by import sanctions and financial repression, both of which lowered demand for foreign currency. This does not mean that the sanctions are not working – in fact, there is an important equivalence between import and export restrictions in terms of welfare effects and government fiscal losses. Stabilising the exchange rate allows the Russian government to anchor inflation expectations and support consumption but comes at the cost of the financial repression of domestic savers. In the medium run, the rouble is likely to depreciate due to falling demand for Russian exports, increasing demand for foreign goods and loosening of monetary policy to finance government expenditures.

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DOI: 10.1007/s10272-022-1051-8

Intereconomics, 2022, 57(3), 152-156

JEL: O33, F50, N44

Daniel Fiott

The Fog of War: Russia's War on Ukraine, European Defence Spending and Military Capabilities

When war hits, some degree of analytical humility is required. No one knows how – or when - Russia's war on Ukraine will end and the effects on European security over the medium to longer term (i.e. the next five to ten years) are unknown. Despite the analytical fog that shrouds Russia's war, discussions increasingly focus on how European countries should support Ukraine, how Europe and the United States should view and engage with Russia during and after the conflict and to what extent Europe should bolster its own defences. Such questions have already found material form. Think of the wide-scale provision of weapons and lethal equipment to Ukraine, the enhanced military presence on the European Union's and NATO's eastern flank, the announcements of increased defence spending in Europe, the sanctions designed to disable the Kremlin's war machine or the calls for Ukraine to be speedily brought into the EU. Finland and Sweden have also formally announced their intention to join NATO in response to Russia's actions.

So far, Europeans have shown a high degree of unity in the face of Russia's war – forces have been deployed to the eastern flank and, despite the difficulties on agreeing to an oil and gas embargo on Russia, political unity has ensured that heavy sanctions are in place. However, this unity is likely to be challenged over the coming months and years by a fundamental question that has so far not received sustained and serious attention: How should Europe view and interact with Russia after its invasion of Ukraine? Some elites may desire a détente with Putin, especially with economic interests at stake. Others, however, reject any notion of a diplomatic settlement with Russia and instead call for preparations for a long-term political standoff with the Kremlin. How Europe politically adapts itself to the Russian threat in the coming months and years will be a test of its credibility, unity and autonomy.

Open Access funding provided by ZBW – Leibniz Information Centre for Economics.

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Indeed, Russia's war on Ukraine is already giving rise to questions that will have long-term implications for European security, including: To what extent should European countries increase their defence expenditure? How should Europeans invest any additional financial resources for defence? To address such questions, this article looks at some of the implications of Russia's war on Ukraine for European security, and it focuses on some of the direct policy choices that European countries presently face and those that may appear on the horizon. To this end, the paper explores how defence expenditure in Europe may evolve after Russia's invasion and how defence investments may be shaped in the coming years. More specifically, the article looks at the interplay between geostrategic and investment choices.

Money for nothing?

One of the obvious effects of Russia's February 2022 invasion of Ukraine has been several announcements that European countries will increase their defence expenditures. To be sure, the need to increase military budgets was already a recognised political ambition in Europe; and ever since Russia's initial invasion of Ukraine in 2014, EU and NATO states have been working – however slowly – to increase defence spending. Indeed, the European Defence Agency (2020b) estimates that EU members invested €198 billion in defence in 2020, but only after they collectively cut spending from 2008 to 2014 by €24 billion in the wake of the 2007 financial crash. An important moment in the history of European defence spending occurred in 2014, as the NATO Defence Investment Pledge endorsed in that year called for Allies to meet the 2% of GDP spending guideline. Russia's actions – rather than the divisive rhetoric of former US President Trump – have led a handful of European countries to expand defence spending since 2014.

Russia's further military invasion of Ukraine in 2022 is only likely to lead to more announcements about defence spending hikes in Europe. For example, Germany recently announced that it would substantially increase defence spending and Chancellor Scholz has promised an injection of €100 billion through a "special fund" that will be invested from 2022. Additionally, Berlin has announced that it will ensure that it meets NATO's 2% pledge sooner rather than later. Indeed, this about-face on spending has been viewed as part of a wider paradigm shift in German

strategic thinking – what is being called a *Zeitenwende*. Whether this will really occur remains to be seen, but other European states have also pledged to boost their military expenditures. Countries such as France, Italy, the Netherlands, Portugal, Spain and Sweden have proclaimed their intention to spend more in line with NATO and EU targets, and countries that already meet the 2% target – such as several Baltic states and eastern NATO allies – will spend more in future (Arteaga et al., 2022).

Of course, declarations of increased defence spending should be questioned, and it is unclear how fast and to what extent European governments will increase their spending levels in real terms. For example, some analysts have already questioned whether Germany's injection of €100 billion will be enough to close the gap on its 2% of GDP commitment. Such analyses point to how quickly this €100 billion will be swallowed up by the need to replenish depleted munitions stocks, procure heavy transport helicopters, invest in air defence systems and develop future European capability programmes such as the Future Combat Air System (FCAS) and Main Ground Combat System (MCGS) (Giegerich and Schreer, 2022). Other European defence budget increases should also be scrutinised for how far they realistically add new money for defence (rather than simply topping budgets to redress post-2008 budgetary cuts) or whether they will outpace inflation.

Keep in mind that inflation is high today, not least because of inflated energy prices and the COVID-19 recovery. Yet even in 2021, higher inflation conspired to cut global defence spending in real terms by 1.8% (McGerty, 2022). Even if the war in Ukraine has justified announcements of defence spending hikes, the ramifications of the war may create financial pressures that European governments will not find sustainable. As the war drags on, and the economic effects hit the global economy, governments will have to address the effects of the "cost of living" crisis across Europe. Some governments may hold to the idea that increased defence spending is necessary regardless of the economic context, but others may be tempted to invest only incrementally in defence if other public services require enhanced spending. Some may look at the depleted nature of Russia's military after its invasion of Ukraine and incorrectly surmise that defence spending increases are not that necessary after all.

Even in times of major economic upheaval, there is every reason to believe that European governments will enhance their defence spending. Not only do Europe's armed forces drastically need modernisation, but Europe's strategic interests include and go beyond the war in Ukraine. If, as governments have acknowledged, Europe is entering an era of strategic competition where the continent may have to act without the United States, then investment in military capabilities is of paramount importance. As part of this rationale for meeting the challenge of strategic competition vis-à-vis Russia, China and others, Europe will need to invest in its technological, scientific and industrial base in order to ensure that it has the military equipment needed to defend its interests. Such investments may come at the expense of higher debt, so this is really a test of whether Europe acts according to a strategic rather than an economic rationale.

Assuming that there is a higher investment in defence in Europe, the next point to address is how this additional money will be spent. As the German case indicates, some of the investment will be needed to cover essential capability gaps. In this respect, we should not expect these national funds to be exclusively invested in European collaborative solutions (e.g. Germany's insistence on purchasing the US-made F-35 fighter aircraft is conditioned by its nuclear commitments in NATO and the lack of a credible alternative European nuclear delivery air system). What is more, it is unrealistic to expect governments to increase national defence spending without wanting a large proportion of this money to benefit national producers. In this respect, it is worth questioning whether the war in Ukraine will incentivise European governments to develop or procure capabilities together rather than nationally.

Collaborative defence procurement in the EU

While military capability collaboration does not always reduce project costs overall, there is evidence that the individual contributions to multinational projects can be better managed from a cost perspective. Pushing for European capability solutions, if managed properly, can also lead to greater cross-border cooperation and the enlargement of supply chains (which, in turn, can help increase security of supply). In some cases, major capability projects cannot be handled at a purely national level because of the technologies involved and labour skills required, among other things. In this respect, the direct and quick return on national investment is less obvious but still fruitful if it leads to broader European defence innovation and trustworthy supply chains that cannot be compromised by Europe's strategic rivals. Indeed, we can already observe evidence of this impulse in the work on the FCAS and MCGS projects and EU-level initiatives such as Permanent Structured Cooperation and the European Defence Fund are geared towards further incentivising European cooperation.

The truth is that it is not the norm for European countries to invest national defence budgets into collaborative pro-

jects. Indeed, recent data shows that the level of investment in European collaborative equipment procurement is on the decline – one study shows that in 2019 collaborative spending decreased by 13% to low levels not seen since 2005 (European Defence Agency, 2020b, 10). Despite this fact, there has been growing interest in collaborative investment bodies like the EU and NATO. In 2021, 17 out of 30 NATO members signed on to a declaration of intent to create the NATO Innovation Fund. The Fund will be endowed with €1 billion for at least the next 15 years and it will, through the Defence Innovation Accelerator for the North Atlantic, seek to promote and accelerate early-stage defence innovation. The 2022 NATO Madrid Summit will initiate these allied endeavours and the hope is that investments can begin in 2023 (NATO, 2022).

More substantially, the EU has already developed the European Defence Fund (EDF) for collaborative investments in defence innovation and capability prototyping. The EDF is endowed with €8 billion up to 2027, and discussions will begin in 2024 for an additional financial envelop for the period 2028-2035. The EDF is already investing in defence research and capability projects, and all 27 EU member states have the potential to access the Fund for collaborative programmes. It should be noted that one of the precursor programmes to the EDF – the European Defence Industrial Development Programme (EDIDP) – has already invested €500 million in 2020 for space, precision strike, naval, air, cyber and drone systems as well as disruptive technologies such as artificial intelligence (European Commission, 2020). The fact that the EDIDP has benefited 420 industrial entities from 26 EU member states in a single year provides evidence that European countries are increasingly looking to cooperate in the industrial sphere.

Yet the story for the EU does not end here. Indeed, in the wake of Russia's invasion of Ukraine, European leaders met at Versailles on 10-11 March 2022 to discuss how best to respond to the Kremlin. An important element of the Versailles Declaration was the leaders' call for greater investments to fill the critical military capability gaps of Europe's armed forces. Spurred on by the seismic announcement of an additional €100 billion for defence in Germany, and drawing on the experiences of NextGenerationEU, the Declaration asked the European Commission to analyse the defence investment gaps facing the EU and to make recommendations on how to further strengthen the European Defence Technological and industrial Base (European Council, 2022). While we are yet to see how ambitious the Commission will be, or whether EU member states will underwrite further capital borrowing powers for the EU's executive arm, one of the theories is that the EU may start borrowing billions more for investment in the defence sector. Anything close to the €100 billion announced by Germany would be potentially game-changing for European collaborative capability development and open the door for ambitious EU joint procurement and defence planning.

Investing wisely?

Naturally, any discussions about increased levels of defence spending will imply a need to reflect on the types of military capabilities Europe should procure in the short (2022-2025), medium (2025-2030) and long term (2030+). Even in a context of renewed war in Europe, this discussion is not as easy as it may first appear. Being able to prioritise the development and/or procurement of military capabilities is an intensely political discussion between states that is ultimately conditioned by geographical, industrial and cultural considerations. For example, one can perhaps agree that European states need to substantially and rapidly increase their stocks of main battle tanks and naval vessels. Tanks would address the necessity of repelling any Russian intervention in Europe, frigates and aircraft carriers would allow Europe to exert maritime power. In a context where financial resources are still limited, and where European states have different strategic priorities, should Europe bet on the tanks or naval vessels? This type of question bedevils defence planners across Europe when any decision about European cooperation is considered.

Russia's war on Ukraine has, of course, only sharpened arguments in favour of military capabilities that can deter Moscow from expanding their armed aggression. In fact, Russia's actions have vindicated the European Defence Agency's assessment – made in November 2020, and thus before the 2022 invasion – that European states should urgently invest in main battle tanks, soldier systems/force protection technology, patrol class surface ships, counter unmanned aerial systems, defence-space capabilities and military mobility. Each of these military capabilities can be of use to European armed forces in deterring further Russian aggression, even if the progress in each of these capability areas has been relatively sluggish. For example, the EU has called for modernised tanks, soldier systems and patrol vessels to be ready within the next decade (European Defence Agency, 2020a), but this hardly seems fast enough given the strategic issues confronting Europe.

Indeed, policymakers have tended to view military capabilities as investments for the future. The war in Ukraine has shown that capability acquisition requires credible industrial capacity and reliable supply chains. The war has also shown that an ability to get off-the-shelf equipment and solutions into the field as soon as possible is of the utmost importance. For example, the Ukrainian military are using Turkish-made remotely piloted Batraktar aerial

vehicles that cost a fraction of the price of American or Israeli offerings (Witt, 2022). The US defence firm, Lockheed Martin, has also announced that it will double its production of javelin anti-tank missiles, even if this could take up to two years to fully adjust production cycles and timelines (Jones, 2022).[1] Indeed, one of the major issues facing Europe's defence planners and military leaders is that Europe's industry might be unable to completely deal with the surge in demand for military products. This may mean that European suppliers lose to competitors, which could be negatively perceived by those who were reluctant to increase defence spending in the first place.

Of course, the additional aspect that has emerged since the outbreak of war in Ukraine is how best to balance investments between short-term needs and longer-term programmes. For example, many NATO and EU states are focusing on the need to enhance and replenish their own stocks of ammunition and munitions, especially since many governments have transferred existing stocks to Ukraine. The war has also given rise to discussions about the desire to maintain Soviet-era capabilities in European military inventories. The practice at present is to transfer Soviet-era equipment (e.g. armoured vehicles, guns and tanks) to Ukraine because forces in that country are familiar with how to use them. The flip side of this strategy for European governments is to replace Soviet-made transfers with more modernised Western equipment (e.g. Poland replacing its T-72 tanks with American-made Abrams tanks). Again, this short-term need to replenish and replace military equipment may not necessarily work in favour of Europe's defence industry, even if there are credible strategic explanations to buy from non-European suppliers. This, in turn, only adds pressure to European suppliers seeking to capitalise on increased defence spending.

Beyond this relatively new dynamic in the European defence market, however, there is also a need to consider how the war in Ukraine might challenge capability development assumptions in Europe. One of the obvious changes that could be on the horizon is a shift towards more ambitious European investments in missile defence, air interdiction assets and cyberdefence. The apparent need for such capabilities becomes all the more evident when one considers how NATO's defence posture could evolve on Europe's eastern flank. To date, NATO's Response Force has operated on a rotational basis, and this has placed a premium on ensuring that investments in military mobility can ease the speedy movement of troops and equipment in case of further Russian aggression. However, should NATO opt for a permanent presence in Eastern Europe, this will have broad implications for Europe's defence investments.

Indeed, the first step that would have to be taken is the modernisation – and in some cases complete overhaul – of military bases in Central and Eastern Europe. New or refurbished military bases and barracks would have to be connected by secure and modernised transport links, which is already the objective of the EU's work on military mobility, i.e. seeing financial investments into dual-use transport infrastructure (Fiott, 2022). Yet a more permanent NATO presence would equally imply a need for integrated air and missile defence and investments in cyberdefence. Of course, such investments come with sensitive political considerations. For example, to date the EU has only invested in dual-use transport infrastructure, and it would need to find new ways of financing military installations such as land, naval and air bases. An off-budget EU financing tool in the guise of the European Peace Facility could be a possibility.

Additionally, some European governments may balk at the idea that EU financial resources should be spent on installations that will largely house American forces. The risk here being that the EU is perceived to subsidise – directly or indirectly – the US military and its bases in Europe, which can challenge the idea of EU strategic autonomy and, for select EU states, neutrality. Of course, it is equally possible to claim that EU investments in military installations and air and missile defence would put the Union into the "deterrence game" and drastically increase its relevance in European defence – not least because missile defence will also contribute to keeping civilian urban populations safe. Investments of this nature would also be a serious statement of intent to Europeanise the NATO alliance and ensure that the EU and NATO can effectively work together in an era where the US may eventually re-direct troops and military assets to the Indo-Pacific theatre. Any substantial and permanent repositioning of European armed forces to better protect Europe's eastern flank would also clearly need modern and secure military bases and transport links, regardless of the future US footprint in Europe.

Conclusions

In the face of Russia's military aggression, European countries are now faced with a number of dilemmas that will seriously challenge its security over the next decade. First, there is a need to address Russia but this will not be easy. Some may argue for a complete strategic downgrading of Moscow, but it is not easy to see how this might be achieved when Russia sits on a formidable nuclear arsenal. Alternatively, while Russia's conventional forces may be bruised following its invasion of Ukraine, and

1 And for a helpful corrective to the title of Witt's (2022) New Yorker piece, see Calcara et al. (2022).

its defence industrial sector severely wounded through sanctions, Vladimir Putin may use the coming years to reinvigorate its position by developing stronger ties with Beijing for technologies, raw materials and services. Furthermore, Russia may use its nuclear forces to probe and challenge Europe's unity and security, while also relying on tools such as cyberattacks, espionage and energy to disrupt European economies and buy time for a reinvigoration of Russian forces. In this regard, the strategic conversation in Europe is likely to revolve around enhanced deterrence and an upgrading of conventional forces.

However, Europe faces an important challenge to its overall standing in international affairs. While the war in Ukraine will consume much of Europe's political and economic bandwidth, it is necessary not to neglect the wider world. If anything, Russia's invasion is already raising questions about global food security and energy prices, and such structural issues – when married to challenges such as China's global power status and climate change – imply that Europe cannot only focus on its eastern flank. Being able to balance Europe's global and regional interests in a context of finite resources will increasingly shape what type of actor Europe will become in global affairs. Despite this serious consideration, the immediate effects of Russia's war in Ukraine will likely raise questions about the extent of increased European defence spending and how best to use these additional resources to modernise and bolster Europe's military capabilities.

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Intereconomics, 2022, 57(3), 157-163

JEL: Q13, Q17, Q18

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The War in Ukraine, Agricultural Trade and Risks to Global Food Security

The war in Ukraine has aggravated existing tensions on the agricultural commodities market. Since late 2021, prices for commodities such as grains and vegetable oils have reached record highs, surpassing even the levels of the global food price crises of more than a decade ago. Now, the invasion of Russian forces in Ukraine has sent prices soaring even higher. This has above all affected import-dependent countries in the Middle East and North Africa (MENA) region and sub-Saharan Africa, which rely heavily on Russian and Ukrainian wheat. Disruptions to exports from the Black Sea region and high prices are further destabilising food security in these regions. However, global demand for wheat is expected to be met in the current marketing year since countries such as Australia, Brazil and the USA will increase exports to fill the gap left by Russia and Ukraine. It is difficult to predict what will happen beyond this marketing year, as this will be determined by the development of the current conflict in addition to agricultural fundamentals in key supply and demand regions. Global food systems and competitive international trade structures, in particular, are key to dealing with crises and mitigating the risks of food shortages. That way, disruptions in some exporting regions can be compensated for by exports from another. However, this requires greater collaboration in international trade. Any calls to move towards a centrally planned economy or autarky are strongly advised against, as this would only be to the detriment of food security in the Global South.

Open Access funding provided by ZBW – Leibniz Information Centre for Economics.

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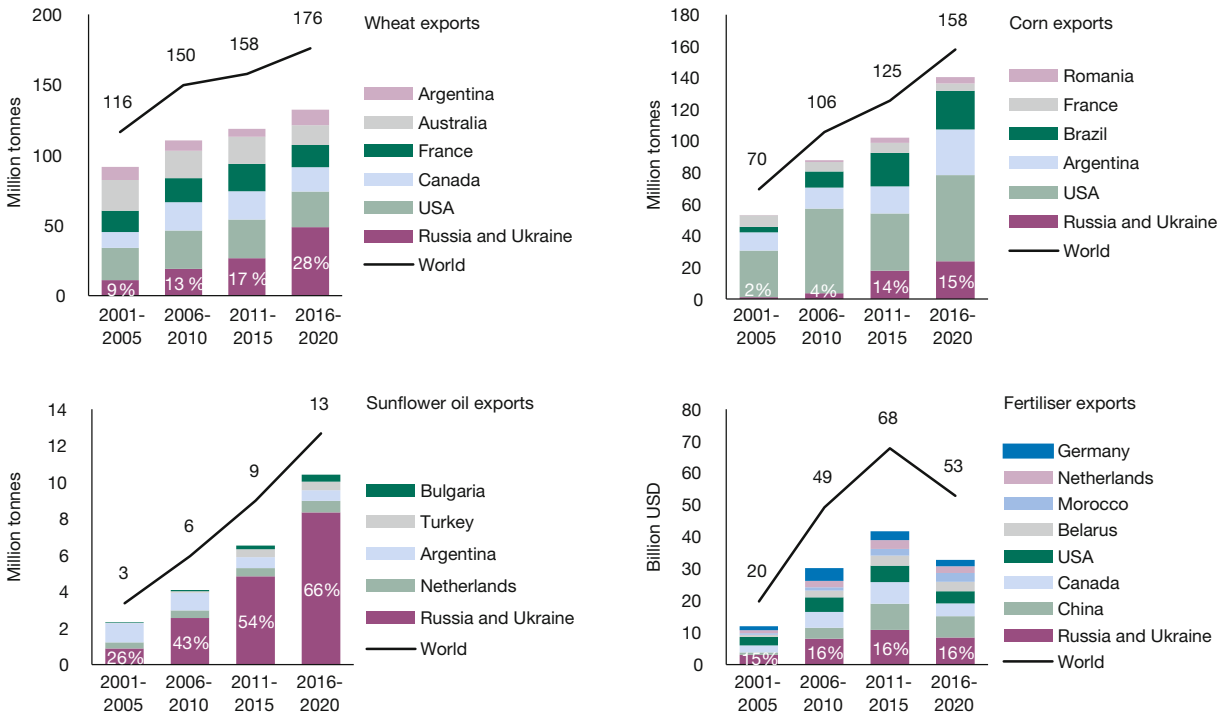
Russia and Ukraine are key exporters of agricultural commodities

Russia is the top global exporter of wheat[1] and fertilisers, while Ukraine is the largest exporter of sunflower oil in the world and the fourth largest exporter of corn. Their combined export market share for 2015-2020 was 28% for wheat, 15% for corn, 66% for sunflower oil and 16% for fertilisers. In highly dynamic markets, Russia and Ukraine have almost tripled their export market share for wheat and sunflower oil over the past two decades while their combined export market share for corn has grown by a factor of seven. Fertiliser exports, on the other hand, have remained relatively stable (Figure 1).

The number of export markets has also increased, indicating a relatively high diversity of export structures. Between 2018 and 2020, 56 million tonnes of wheat and 31 million tonnes of corn were exported annually from Russia and Ukraine to 123 and 95 countries, respectively. The largest wheat export markets are Egypt (19%) and Turkey (13%), while the largest corn export markets are China (16%), the Netherlands and Spain (11% each), and Egypt (10%). Ten million tonnes of sunflower oil were shipped annually to 166 countries, with

1 Although Russia's export market share is considerable in some wheat-importing countries, empirical IAMO studies (e.g. Uhl et al., 2016; Pall et al., 2014) have yet to find any sign that Russian wheat traders influence prices on international wheat markets. Market structures can therefore largely be described as competitive rather than oligopolistic.

Figure 1
Wheat, corn, sunflower oil and fertiliser exports on the world market
Five-year average, 2001-2020



Source: UN Comtrade. Authors' representation.

the largest markets being India (27%) and China (15%). Mineral fertilisers from Russia and Ukraine were exported to 143 countries, with Brazil (21%), the USA (9%) and China (8%) as the main destinations. In countries in Africa, East Asia and the Pacific, demand for wheat imports rose rapidly, in particular for Russian wheat.[2] Meanwhile, the MENA region became the largest export market for Russian wheat (approximately 40% of Russian wheat exports).

The MENA region benefits from Russian and Ukrainian wheat

Wheat is the main staple food for many of the world's poorer regions. The war in Ukraine is likely to have the greatest impact on regions that depend on imported wheat, particularly from Russia and Ukraine, as a key part of their diets. The greater this combination of factors, the more the population is at risk of suffering from food insecurity.

At highest risk are the 14 countries in the MENA region, the South Caucasus and Turkey, shown in Figure 2. The total combined population of these countries is around 330 million, and together they source more than 40% of their wheat from Russia and/or Ukraine. The most vulnerable are Albania, Egypt,[3] Lebanon, Libya, Georgia, Mauritania, Sudan, Tunisia and Yemen as large parts of their population are already subject to high risk of undernourishment (FAO et al., 2020).

Even countries that are less dependent on wheat imports from the Black Sea region could face food security issues. These include MENA countries such as Algeria, Morocco, Saudi Arabia and Jordan, as well as countries in Central Asia and Afghanistan, which consume large amounts of wheat per capita. Even though these countries import wheat mainly from regions other than Ukraine or Russia, (persistently) high wheat prices could have spillover effects for them. Furthermore, high wheat prices on world markets could also have a negative impact on less import-dependent poorer countries with high wheat consumption (such as Turkmenistan, Iran and Mongolia) if there is price transmission from the world to domestic markets.

2 Russian wheat exports to sub-Saharan Africa, East Asia and the Pacific rose from less than 5% in 2008-2010 to almost 30% in 2018-2020.

3 IAMO studies show how important Egypt is for global wheat markets. For example, Egyptian tender prices play a key role in price discovery on these markets. Furthermore, the price series of the three largest exporting countries, Russia, France and the USA, are highly integrated with Egyptian tender prices (see Heigermoser et al., 2021).

Figure 2
Countries at "critical high risk" of food insecurity

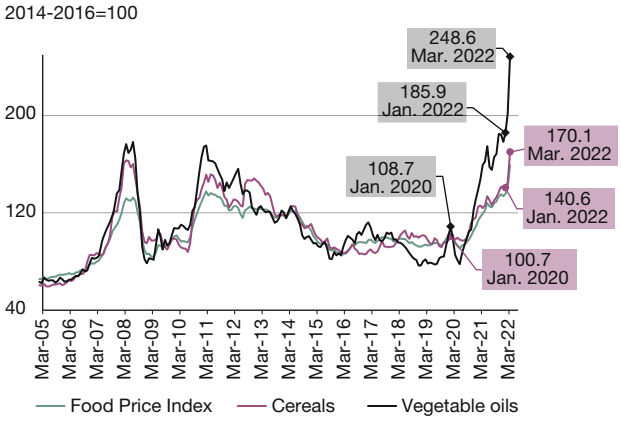
Population (million)	
Egypt	102.3
Turkey	84.3
Sudan	43.8
Yemen	29.8
Tunisia	11.8
Azerbaijan	10.1
UAE	9.9
Israel	9.2
Libya	6.8
Lebanon	6.8
Mauritania	4.6
Armenia	3.0
Georgia	3.7
Albania	2.8
Total	328.9

Share of imports from Russia and Ukraine in a country's wheat imports
41% 98%

Note: Wheat accounts for more than 20% of total per capita calorie intake (2019), import dependence accounts for more than 30% (2018–2019), and imports from Russia and Ukraine account for more than 30% (2018–2020).

Source: FAOSTAT, UN Comtrade, World Bank. Authors' representation.

Figure 3
Food and Agriculture Organization price indices



Source: FAO. Authors' representation.

Continuously high prices in demand-driven global agricultural markets

As in previous years, global markets are demand-driven and prices remain high, particularly for wheat and vegetable oils.

At the beginning of 2021, the Food and Agriculture Organization (FAO) Food Price Index, which tracks monthly changes in prices, began to exhibit significant increases over previous years and, in January 2022, reached an all-time high (Figure 3). Similar trends were recorded for cereals and vegetable oils. For example, in January 2022, cereal prices rose by 33% while vegetable oil prices jumped by 80% from January 2020. In March 2022, these both rose a further 33% from January 2022, causing the Cereal Price Index to reach its highest level ever, exceeding the record prices of 2007/08 and 2010/11.

Euronext futures prices provide insight into price movements between the end of February and March 2022 as well as price expectations for the coming 2022/23 marketing year (ZMP, 2022).[4] Wheat futures quickly rose by 25% from €316.5/t (24 February, 2022) to a high of €396.5/t (7 March 2022). They have since fallen some 6% to €372.7/t (8 April 2022). The September futures contract (contract for the next harvest) is currently trading at around €352/t and the December contract is currently at €345/t (8 April 2022). The price of the corn futures contract has also risen 25% from €280/t (24 February 2022) to €351.5/t (7 March 2022) and has since been trading at a slightly lower level at around €320/t (8 April 2022) as well.[5] The November contract (next harvest) is currently trading at around €300/t. This indicates that the grain markets have somewhat calmed following initial panic, but remain at a high level[6] and are once again more strongly oriented towards (expected) fundamentals.[7]

Fertiliser prices also rose sharply between February and March 2022. The fertiliser price index rose by 43% from around 890 (25 February 2022) to 1270 (25 March 2022), possibly as a result of Russia's announcement of tempo-

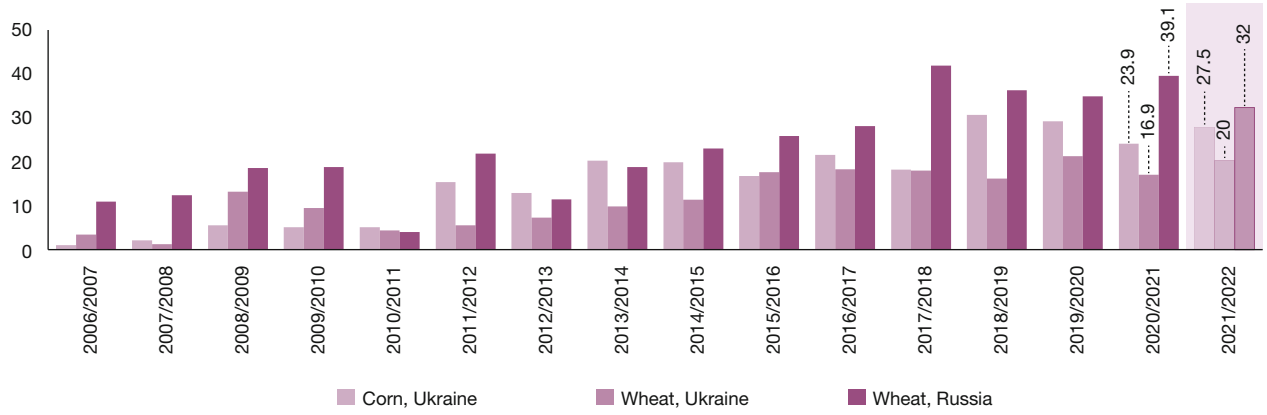
4 It is important to note that price increases appear more significant than they really are, as prices were converted from US dollars into euros and the euro lost value in 2022.

5 Corn prices have risen again, most likely as a result of the US government's recent decision to increase the blending requirement of bioethanol in gasoline from 10% to 15%.

6 Further in-depth analysis would be needed to understand why grain prices remain at a relatively high level. However, it is very likely a symptom of the continuing uncertainty caused by the Black Sea conflict, ongoing supply chain disruptions due to the COVID-19 pandemic, growing import demand in China and in Africa, higher costs for inputs and rising crude oil prices. The latter, however, appear to have peaked on 7 March 2022 (approximately $123) and are now at levels similar to late January/early February 2022 (approximately $95; 7 April 2022) (Oil Price, 2022).

7 IAMO studies show that there have also been noticeable price reactions on the Chicago Board of Trade (increased price volatility) resulting from reports out of the Black Sea region, such as announcements of grain export restrictions in Russia. However, these prices were relatively quick to return to normal levels (see Heigermoser, 2022).

Figure 4
Russian and Ukrainian wheat and corn exports: Observed (2006/07-2020/21) and forecast (2021/22)
in million tonnes



Source: USDA. Authors' representation.

rary export restrictions on fertiliser.[8] However, it should be noted that fertiliser prices had been rising since 2020/21 and at the end of 2021 (26 November 2021), the index was at 1,118 points, which is not far below the current level.

Impact of grain shortages

Despite tensions on the export market, no physical shortages are expected in terms of global wheat supply. Furthermore, import destinations are mostly not expected to face shortages.

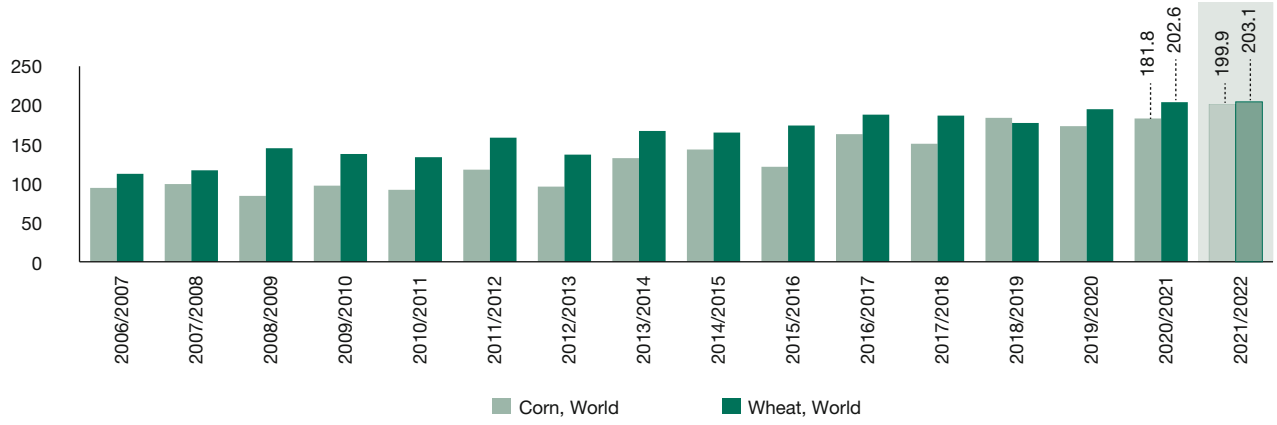
Russia has largely resumed exports via the Black Sea (Reuters, 2022a). However, as a result of sanctions, the US Department of Agriculture (USDA, 2022a) projects Russian wheat exports to fall by 8.6% (three million tonnes) below original forecasts for the 2021/22 marketing year. Financing restrictions and increased marine cargo insurance requirements are furthermore affecting shipments (Farm Futures, 2022a). However, agricultural products are exempt from the latest round of sanctions announced by the EU Commission banning transportation through EU territory and access to EU ports. Accordingly, Russian wheat shipments are expected to be around 32 million tonnes, which is slightly lower than export volumes in the 2018/19 and 2019/20 marketing years, but still higher than most export volumes over the past 15 years.

Currently, Ukrainian corn and wheat cannot be shipped via the Black Sea. Although efforts are underway to increase exports via rail and/or trucks travelling across the country's western borders, total volumes are likely to be very low, substantially due to the significant logistic challenges. Accordingly, the USDA has revised its original forecasts for Ukrainian corn and wheat exports in 2021/22 from 33.5 to 27.5 million tonnes for corn (down by 18%) and 24 to 20 million tonnes for wheat (down by 12%). Nevertheless, export volumes this marketing year are expected to be among the highest over the past 15 years (Figure 4).

Additional exports from Australia, Brazil, the EU and the USA are expected to fill the supply gap left by Russia and Ukraine this season. Contrary to this, India, intending to increase wheat supplies to the world market after the beginning of the war, has suspended private exports of wheat on 13 May 2022 due to the worsened harvest forecast. Despite this ban, Indian government still allows private exports contracted prior to the ban and considers future exports to foreign governments requesting supplies to meet their food security needs. For example, after the ban, India shipped 61,500 tonnes of wheat to Egypt and has received requests from governments of other countries (Haq, 2022). In addition, government officials from Egypt are holding "grain talks" with Argentina, France and the USA to offset potential shortages (Reuters, 2022b). Furthermore, the ENSO Outlook (2022) predicts that the unfavourable weather conditions caused by La Niña will dissipate over major growing areas in the USA and Europe. FranceAgriMer and the Deutsche Raiffeisenverband likewise

8 Russia imposed a two-month export ban on ammonium nitrate to control domestic prices on 8 February 2022. Nevertheless, Brazil imported about 900,000 tonnes of potash fertilisers from Russia since the beginning of the war. Furthermore, the permit procedures for exporting NPK fertilisers, which were introduced in December 2021, have been extended until the end of 2022. Russia's measures followed China's export ban on phosphate fertilisers, which is to last until June 2022. In addition, supply difficulties arose after several international shipping companies stopped loading at Russia's ports (Zinke, 2022). Russia is not currently expected to impose further supply restrictions, according to statements made by the Russian government on 5 April 2022.

Figure 5
Global wheat and corn exports: Observed (2006/07-2020 /21) and forecast (2021/22)
in million tonnes



Source: USDA. Authors' representation.

do not predict any problems with wheat harvests in France and Germany, the two major wheat producers in Europe (Farm Futures, 2022b, 2022c).

The USDA expects only minor downward revisions to its original forecasts for total volumes of wheat and corn traded on the world market in 2021/22 (Figure 5). For both wheat and corn, this is (projected to be) around 200 million tonnes. As such, global wheat and corn trade would still be above the level of previous years.

The situation remains critical for poorer, import-dependent regions

Even if no fundamental supply disruptions are expected on the world grain markets (so far) this marketing year, local supply gaps are likely to remain critical or possibly worsen as a result of the additional price increase in 2022, especially in the above-mentioned countries of the MENA region and in Africa.

In 2020, an estimated 118 million more people faced chronic hunger than in 2019 and 161 million more people experienced acute food insecurity, largely as a result of the COVID-19 pandemic. Overall, 320 million more people lacked access to adequate food in 2020 (World Bank, 2022). FAO estimates that the global number of undernourished people could increase by eight to 13 million as a consequence of the war in Ukraine. Of these, some three million will be in sub-Saharan Africa and one million in the MENA region. However, it remains unclear to what extent these increases are the result of previous developments, such as ongoing supply chain disruptions caused by the COVID-19 pandemic (FAO et al., 2020), or a direct result of the Black Sea conflict.

Supply disruptions could intensify in the medium term, causing further food instability in the Global South

No noticeable respite is expected for the coming 2022/23 marketing year. As stated above, the September futures contract for wheat on Euronext (contract for the next harvest) is currently at around €350/t and the December contract is at €345/t. This means that trader expectations and uncertainties regarding the conflict have already been priced in. Nevertheless, market developments in the coming marketing year and beyond are difficult to predict, leaving room for speculation only. The major unknown variable is how long the conflict will last and if, when and how peace will eventually be reached. This will largely determine production and investment opportunities, market access and trade logistics, and the political (economic) conditions in the agri-food sector, especially in Ukraine and Russia. The extent to which these two countries will be integrated into international agricultural commodity markets in the future will also play a decisive role, as well as their willingness (or ability) to contribute to "smooth" market operations, the stabilisation of international prices during high-price rallies and, ultimately, to global food security. A key factor for Ukraine is how quickly and extensively it can rebuild its production and logistics infrastructure and whether it will have access to the sea for trade. Russia's future participation in global agricultural trade is likely to be influenced among others by the extent of sanctions.

This will subsequently affect the extent and the speed with which other world regions adjust to the changes, both in terms of supply and demand, as well as international trade flows and agricultural commodity prices. Beyond this, agricultural trade and global food supplies will continue to be exposed to paral-

lel developments and (potential) crises. These include the repercussions of the COVID-19 pandemic, which has been ongoing for two years now; the growing demand for imports of grains, vegetable oils and fertilisers, particularly in China; and finally, weather conditions in various regions of the world.

The next question is how key producers on international and regional agricultural commodity markets will react in high-price phases. Many short-term effects can be mitigated via adjustments, in particular production and trade diversions. However, during the food price crises of 2007/08 and 2010/11, major grain exporters, including Russia and Ukraine, noticeably restricted their wheat exports by imposing quotas or even export bans with the aim of stabilising domestic prices as much as possible and generating tax revenues. Supply on international markets was restricted, international prices rose, further increasing the strain on consumers, especially in import-dependent developing countries (Svanidze et al., 2019). The Russian government furthermore introduced export restrictions on grains in response to price spikes in 2020,[9] and the Ukrainian government restricted vegetable oil exports to stabilise domestic consumer prices (Heigermoser and Glauben, 2021; Svanidze et al., 2021). Similar trade barriers were also observed in other countries (Laborde and Mamun, 2022).

At present, it cannot be ruled out that Russia or other exporting countries will extend or even increase wheat export restrictions to stabilise domestic prices and/or generate tax revenues under the current – most likely persisting – high prices on world markets. However, a complete export ban like the one imposed in 2010/11 as a result of poor harvests in the country seems rather unlikely at present. In particular, in anticipation of continuing economic sanctions, an influx of export revenues is needed, especially since the crop outlook is good but there is limited domestic storage capacity (Nasdaq, 2022).

A complete export ban and the resulting supply shortages coupled with higher grain prices would mostly hurt import-dependent regions, for example in Africa and Southeast Asia, who still exhibit a rather neutral position towards the conflict, while major wheat suppliers in the EU and North America would benefit greatly. It therefore appears very unlikely that Russia would impose massive export restrictions to provoke food insecurity in the import-dependent Global South and trigger waves of refugees to Western Europe or the USA, as is sometimes reported in the media. This would not be a viable geopolitical strategy, as supply and demand adjustments in other regions would largely compensate for supply shortfalls in the medium term. In addition, experience from the political unrest of the Arab Spring shows that waves of refugees from MENA countries did not flow into Europe despite massive bread price increases in 2007-2011. In this respect, it is more likely that Russia will increasingly apply export quotas or export tariffs to ensure, that enough wheat is available on the domestic market to stabilise domestic prices, and at the same time sufficient quantities of grain can be exported.

Price spikes on international grain markets combined with (possible) supply restrictions by major players often trigger reactions from other exporting nations (Djuric et al., 2015; Götz et al., 2013, 2016). For example, the current panic on international grain markets spilled over to the domestic market in Serbia, one of the major grain suppliers in the Western Balkans, leading to an increase in domestic prices. In order to stabilise domestic prices, the Serbian government consequently imposed an export ban on grains and corn on 10 March and on refined sunflower oil on 17 March. Similar reactions were observed, for example, in Hungary and Kazakhstan.

China is a different story. Although China is largely self-sufficient in wheat, it nevertheless eased existing import barriers to Russian wheat as early as 24 February 2022, in order to be able to meet domestic demand through storage and price stabilisation. China's increased demand is also expected to lead to higher prices on international markets. China has been trying to strategically diversify its imports for some time now. High corn imports, which so far mostly originated from Ukraine, are likely to be supplemented from the USA. Similar developments can currently be observed for most strategically important agricultural raw materials. Here, too, further intensified trade relations with North and South America are expected.

Overall, as long as major grain suppliers do not disrupt markets by imposing strict export restrictions, the war in Ukraine, *ceteris paribus*, is not expected to have a major impact on the global trade volume, i.e. global supply and global demand for key agricultural commodities in the coming 2022/23 marketing year. However, international agricultural production and trade flows may have to reorganise, which might lead to higher costs of global agricultural trade flows. Prices are likely, *ceteris paribus*, to rise or remain high with consumers in developing countries in particular forced to bear the burden. For European agriculture and consumers, no major effects on food supply are expected in the medium term.

Openness to global trade is needed to cope with the crisis

The current conflict exposed and exacerbated tensions on international agricultural commodity markets existing amid

9 In addition to the export quota, which was introduced in 2020 in response to the COVID-19 pandemic and extended in 2021 and 2022, Russia imposed an export tax in July 2021, which taxes export prices above $200/t at a rate of 70%. However, on 15 February 2022, a floating export tax was implemented: If the price is between $200 and $375, the old rule applies; if the price exceeds $375 ($400), the price difference above $375 ($400) is taxed at 80% (90%) (USDA, 2022b).

the COVID-19 pandemic. Import-dependent countries with low per capita incomes are particularly vulnerable to shocks occurring amid the war in Ukraine, which further increase their risk of food insecurity. To overcome the challenges of potential food shortages, agricultural markets must be internationally open and competitive, and global supply chain structures must be in place to facilitate global trade. This would result in more resilient food markets and help mitigate the risk of food shortages by compensating for supply disruptions in one region with supply adjustments from another.

The smooth flow of goods across international borders is key to achieving and maintaining global food security, even in times of crisis. It is therefore advisable in the short term to reduce bureaucratic and tariff barriers to trade. An example of this is the Green Corridor, established in 2020 as a response to the COVID-19 pandemic, which facilitated cross-border trade between Western Balkan countries including Serbia, North Macedonia and Albania. Likewise, international business relations should be further diversified, although this may come at a cost. Currently there is no reason to panic buy or increase export controls on world grain markets in the coming marketing year, as markets appear to be calming. In addition, pressure should not be placed on import-dependent countries to stop wheat imports from specific regions, in particular Russia. Rather, targeted political efforts are needed to ensure that Ukraine and Russia remain integral parts of the world agricultural trading system. Their high production and export potential (Svanidze and Götz, 2019a, 2019b) remain important for combatting hunger in the Global South. This is especially true when global supply chain disruptions, such as those caused by the COVID-19 pandemic, or supply risks from other regions of the world endanger the food security of growing populations in import-dependent countries.

Last but not least, the current crisis must not be used as an excuse to once again bring about further large-scale reform of the European or global agricultural system – of any kind. While health and environmental aspects have to be part of agricultural production systems and supply chains, the planned-economy nature of the EU taxonomy as part of the European Green Deal is not the way to go about it. This will only lead to a shortage economy and invalidate achievements of market-oriented food systems of the past decades. Calls for ad hoc transitions to (more) closed food economies in the name of food security are likewise not advisable, as this would remove players from international markets, potentially lead to food shortages in many countries and take focus away from environmental and health-related issues. Instead, (unbureaucratic) actions are necessary to facilitate adaptation, innovation and resource-efficient processes along globally integrated agricultural production and supply chains, and ultimately promote growth and international trade.

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Intereconomics, 2022, 57(3), 164-170

JEL: F22, O15, R23

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The War in Ukraine and Migration to Poland: Outlook and Challenges

The outbreak of war in Ukraine has impacted many spheres of political, economic and social life. In particular, the flight from war zones drastically changed the migratory situation in Ukraine itself as well as in many countries of the EU, including Poland. Poland is playing the most important role among the countries receiving war refugees from Ukraine,[1] with around 3.5 million persons who arrived in Poland between 24 February and mid-May 2022. As we show in this article, this phenomenon is due not only to geographic factors (common border) but also due to the long-lasting tradition of (labour) migration between Ukraine in Poland. This notwithstanding, the unprecedented inflow of war refugees clearly raises questions about future developments and challenges related to the presence of Ukrainian citizens in Poland. This contribution presents an attempt at estimating the possible future stocks of immigrants from Ukraine in the country and points out related challenges. For obvious reasons, this attempt is subject to great uncertainty. However, the presented scenarios indicate that regardless of developments on the front line, we have to reckon with the fact that the number of immigrants from Ukraine in Poland will be significantly higher in the coming months (or maybe years) than at the beginning of 2022, and this poses certain challenges for public services and public institutions in Poland. We show that labour immigration to Poland, the crisis on the Polish-Belarusian border, and an influx of war refugees from Ukraine changed the status of Poland from a typical emigration country to an immigration one, without going through the intermediate phase, i.e. the emigration-immigration status. On top of that, in the second half of 2021 and the first half of 2022, Poland and refugees were a focus not only in the media but also in political discussions at the highest levels. This will have, both in the medium and long term, a huge impact on the perception of Poland in the world and could be (and possibly will be) a subject of internal political debate.

The first section of this paper discusses the contextual issues that, in our understanding, explain the patterns of recent inflows and allow for the understanding of the reception practices. The second section presents the process itself and provides the first estimates of future stocks of Ukrainian immigrants in Poland. In the concluding section, we look at the most important challenges faced by Poland as a destination country and by war refugees themselves.

Contextual issues

The recent inflow of Ukrainians fleeing the war zones to Poland is, by all means, an unprecedented event. This section examines several contextual factors that, firstly, explain, to an extent, why Poland is the major destination country and, secondly, help predict and understand the development of Ukrainian migration and the presence of Ukrainians in Polish society in the future. It is important to note that, just a decade ago, Poland was not an immigration country. On the contrary, due to the post-2004 mass mobility to the West, the migration balance of the country was negative (Górny et al., 2010; Okólski, 2012; King and Okólski, 2018). Particularly if long-term immigration is considered, the inflow of immigrants to Poland was very limited. According to the 2011 population census, the total number of foreigners staying in the country was estimated at approximately 100,000. Just seven years ago (in 2015), Poland was ranked as one of the last among EU member states in terms of the share of immigrants in the total population. Immigration to Poland also had several important qualitative features, starting with a very limited number of source countries (with a clear majority of post-Soviet countries and Ukraine as the most important country of origin), through a clear concentration in a few big agglomerations (with Warsaw and the Mazowieckie region playing a central role). It also had predominantly tem-

1 We use the term "war refugees from Ukraine" so as to adequately reflect their specificity. These people are not granted refugee status under the 1951 Geneva Convention, and most of them also do not intend to apply for one of the forms of international protection. Therefore, it was necessary to find another term for their status in the European Union. The proposed term includes very different categories of people, both Ukrainian citizens and foreigners who, at the outbreak of the war, were on the territory of Ukraine and left it by crossing the border with, for example, Poland. Thus, citizenship does not matter here, but only the fact of leaving Ukraine after 24 February. In this article, we use the term "war refugees from Ukraine", but unless otherwise indicated, we only refer to Ukrainian citizens.

Open Access funding provided by ZBW – Leibniz Information Centre for Economics.

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porary or even circular mobility (Górny and Kaczmarczyk, 2019; Górny et al., 2010).

This picture changed substantially after 2014, i.e. after the first war in the eastern part of Ukraine. In a very short time, Poland became a European leader in newly issued residence permits and even a global leader when the seasonal foreign workforce was taken into account. According to available estimates, the stock of immigrants in Poland has increased from around 100,000 in 2011 to more than two million in 2019 (Statistics Poland, 2020). Ukrainian citizens represented the majority of this population, and certainly, the radical change in the migration situation in Poland is attributable to the inflow from this country. This was possible only because of an interplay of factors operating on two sides of the process (Górny and Kaczmarczyk, 2018, 2019; Górny, 2017). First of all, the 2014 Russian invasion of eastern Ukraine and the related socio-economic developments in Ukraine created a large migration potential. Nonetheless, the "transformation" of Poland into a country of immigration occurred due to its fast economic growth and related, persistent (and growing) demand for labour in the Polish labour market. As a result, and contrary to expectations of some observers, the potential mentioned above did not transform into humanitarian migration. Rather, Poland experienced a mass increase in labour migration, particularly based on a simplified procedure, which made Poland one of the most liberal regimes in terms of the employment of foreigners (additionally, being a fast-growing recruitment sector also contributed to the increase in the scale of labour migration).

There are several structural characteristics of pre-2022 war migration from Ukraine to Poland that are highly relevant in the context of recent inflows:

- Already before the war, there was a substantial group of Ukrainians working/residing in Poland that can be estimated at around 1.35 million (based on the Central Statistical Office's data); this group was mostly male and comprised of predominantly economically active persons (over 95% of the total).

- Ukrainian immigrants clearly dominated in the case of all possible channels of inflow into the Polish labour market; if we consider three major channels of inflow over the period 2018-2021, Ukrainians made up 88% of declarations, 71% of work permits and 98% of seasonal work permits.

- Immigration – including migration from Ukraine – has been more equally distributed across the country than in the pre-2014 period, with immigrants being present in almost all regions of Poland (with a few important concentration centres – big agglomerations).

- Due to specific forms of migration, i.e. temporary or even circular mobility between Ukraine and Poland, the two countries were connected through well-developed transportation routes (and Poland and the Polish labour market could be described in terms of well-trodden social and economic spaces).

- As in many similar cases, such a massive migration was possible not only due to the active involvement of formal and informal recruiters but also because it was strongly driven by well-developed migrant networks (Kindler and Wójcikowska-Baniak, 2019).

- Despite the increasingly common presence of Ukrainians in the Polish labour market, the scale of economic and social/cultural tensions remained at relatively low levels. This can be attributed mainly to very positive developments in Poland's economy and a flourishing labour market, with the lowest levels of unemployment recorded since the systemic change in 1989 (Duszczyk and Matuszczyk, 2018).

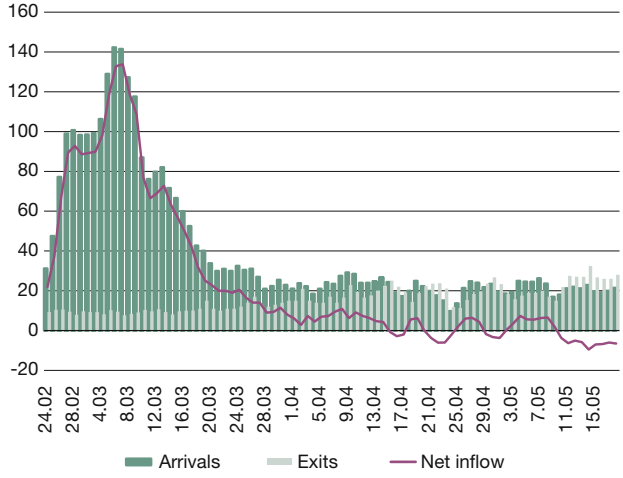
It is important to note also that the substantial inflow of immigrants to Poland took place in practice without a coherent and (clearly) articulated migration policy. In 2009, the Polish government attempted to create a coherent strategic document. Such a document was accepted in 2012, but it has been rejected by the government that came to power in 2015, without replacing it with a new one (until today). It can be concluded that the migration policy pursued in Poland is highly dispersed and continuously focuses on liberalising access to the labour market. As a consequence, before the 2022 war and the massive inflow of war refugees from Ukraine, there was no general integration policy in Poland (except measures dedicated to refugees, but this group constituted a very small share in the total number of persons arriving in Poland).

Ukrainian migration to Poland after the Russian invasion

The war initiated by Russia against Ukraine in February 2022 has resulted in the largest refugee migration in Europe since World War II, estimated by UNHCR (2022) at 6.3 million persons. In the first two months, almost 3.5 million war refugees crossed the Polish border, of which over 95% were Ukrainian citizens. Figure 1 presents the scale of the border traffic between Ukraine and Poland and points to a remarkable increase in the scale of mobility in the first two to three weeks after the outbreak of the war.

Figure 1 shows that most of the inflow is the consequence of the first few weeks since the war started. The cumulative outcome of this migration is over 3.46 million inflows

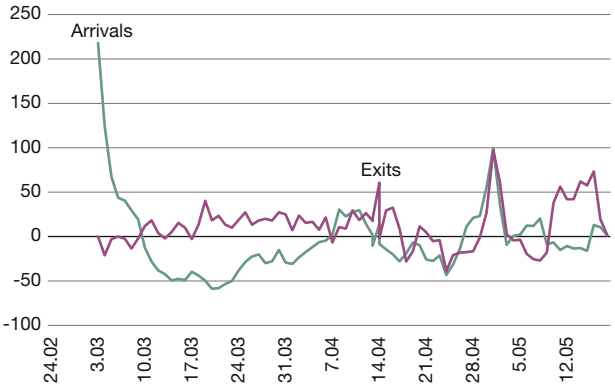
Figure 1
Daily border traffic between Ukraine and Poland, 24 February - 19 May 2022
in thousands



Note: Including non-Ukrainian citizens.

Source: Own elaboration based on the Border Guard data.

Figure 2
Weekly changes in daily border traffic between Ukraine and Poland, 24 February - 19 May 2022
in %



Note: Including non-Ukrainian citizens.

Source: Own elaboration based on the Border Guard data.

and over 1.39 million outflows. Figure 2 presents the weekly changes in the number of inflows and outflows and shows that since early May, there is an apparent tendency to move out of Poland rather than to leave Ukraine and arrive in Poland. Additionally, the volatility of both inflows and outflows is very high, which reflects changing war-related realities, but also points to the fact that we are dealing with a highly mobile population that is inherently interested in returning to their places of origin (if only possible). This mobility pattern resembles to some extent the reality of pre-war migration between Ukraine and Poland, which comprised large numbers of temporary migrants and circulants moving between the two countries regularly. We still lack data to estimate the scale of the phenomenon, but anecdotal evidence shows that some of the labour migrants continue their trips despite the war.

The above-mentioned numbers (almost 3.5 million arrivals in Poland) equalled more than 60% of all border crossings with Ukraine's neighbours. At the same time, more than 1.3 million people left for Ukraine during the period under consideration. Among them, there were about 50,000-60,000 people who had lived in Poland before the outbreak of war and returned to Ukraine to join the army or territorial defence. This means that the net flows of war refugees crossing the border were about 2.2 million. It does not mean, however, that so many people arriving in Poland were still in the country at the end of April 2022. Those who only passed through Poland on their way to other countries, especially the European Union and – to a much lesser extent – Canada, the USA or Israel, should be subtracted from this total flow. Based on available register data from receiving countries, this number can be estimated at 800,000 people.[2] At the same time, we also dealt with arrivals of war refugees to Poland from Ukraine who, after a short stay in other countries (mainly EU countries), decided to move to the country which is relatively close in cultural and linguistic terms (leaving aside the natural tendency for staying as close to the border with Ukraine as possible). Their number can be estimated at 70,000-80,000.[3] Summing up, the number of war refugees who were staying in Poland at the end of April 2022 can be estimated at 1.4-1.55 million people (we will use the latter estimate for further assessments).

The influx of war refugees from Ukraine has one very important feature. Those crossing the Ukrainian border with EU member states and Moldova are immediately covered by the provisions of the Temporary Protection Directive,[4] which grants them numerous rights. In principle, it makes the status of war refugees from Ukraine similar, but not the same, as that of EU citizens in terms of rights under the free

2 This number was obtained by adding the numbers (presented in official statistics or during government press conferences) from countries not bordering with Ukraine.
3 This number was cited by the Polish government when the law on help for Ukrainian citizens of 12 March 2022 was amended.
4 Council Directive 2001/55/EC of 20 July 2001 on minimum standards for giving temporary protection in the event of a mass influx of displaced persons and on measures promoting a balance of efforts between member states in receiving such persons and bearing the consequences thereof.

Table 1
Demographic structure of war refugees who registered to obtain the PESEL number in Poland

	Number of war refugees	Share (%) of total
Children (aged 0-18)	519,567	47.35
Working age	503,071	45.85
Female	460,361	41.96
Male	42,710	3.89
Retirement age	74,579	6.80
Female	63,878	5.82
Male	10,701	0.98
Total	1,097,217	100.00

Note: Data as of 15 May 2022. PESEL is a personal identification number.

Source: Own elaboration based on the PESEL register.

movement of persons. This is the first time in EU history that the Directive's provisions have been put into practice.

The estimations based on border crossing data can be supplemented with early information on the registration process, as Ukrainians are expected to register to obtain the Polish ID number (PESEL), necessary to get access to public goods and services. As of 15 May, the number of registered persons was as high as 1.1 million (see Table 1), with a very specific demographic structure: over 47% children (persons aged 0-18), with a majority of them (34% of the total) aged 3-14, 42% females (at working age) and roughly 7% elderly (persons at retirement age, defined as 60+ for females and 65+ for males). Places of registration clearly reflect the locations of the biggest Polish agglomerations, with Mazowieckie (20% of the total), Śląskie (10%) and Dolnośląskie (10%) playing the most important role. The Polish Ministry of Family and Social Policy reports that so far around 160,000 adult war refugees have already entered the Polish labour market (Business Insider Polska, 2022).

Other data is scarce and very incomplete. For this reason, we refer only to the data provided by the city council of Warsaw (as the city that has received the largest number of war refugees). According to the available data, the number of persons who arrived in Warsaw was as high as 700,000 (as of 24 April 2022). Out of these, approximately 300,000 persons were still staying in the city, and around 100,000 registered to obtain their ID number. The majority of persons who arrived in Warsaw have found shelter in private flats/homes, and the number of persons in temporary housing was as high as 90,000 (cumulated number). The scale of the challenge faced by the local administration is visible through the number of children staying in Warsaw, estimated at 150,000, which massively increased the number of children of school age in the city. Out of those, roughly 16,500 have already been integrated into the schooling system (data courtesy of Warsaw City Council).

Outlook

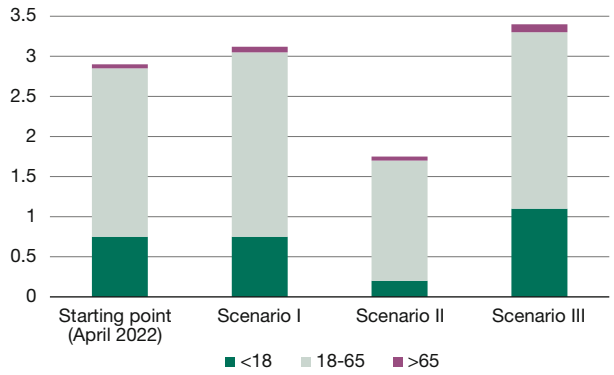
We are perfectly aware of how difficult it is to predict the future of Ukrainian war refugees in Poland (and other countries). Their numbers – as well as the number of those returning to Ukraine – mainly depend on war-related developments and the future reconstruction of the country. Additionally, one may select other criteria defining particular scenarios (e.g. EU policy, socio-economic situation in Poland, attitudes towards war refugees). The main aim of the exercise provided in this section is to estimate the scale of possible challenges Poland will expectedly face.

We estimate the scale of Ukrainian presence in Poland in April 2022 at approximately 2.9 million. Importantly, this number is a sum of two sub-populations: those persons who were staying in Poland before the war (around 1.35 million) and those who arrived since then (around 1.55 million, as discussed above). This is a key remark, as our further estimates refer not only to the recent inflows but also to those persons who were/are unable to return to Ukraine because of the war and, as a consequence, are also experiencing the impact of the situation in Ukraine. Due to the very special demographic structure of the newly arrived war refugees, we estimate that the total population is drastically different from typical labour migration as observed before the war, i.e. 40% women (aged 18-65), 26% children and 2% elderly.

In the next step, we consider three main hypothetical scenarios (numerical estimates are presented in Figure 3 – please note that these are rough estimates only based on certain assumptions concerning the main demographic groups). In all cases, we consider the short/medium term, i.e. we are estimating the stock of immigrants from Ukraine in the next 12-20 months, i.e. until the end of 2023.

In the first scenario (long continuous war, mostly on a regional level), we expect the continuation of the conflict (with varying intensity, scope and scale of activities) for the next several years, i.e. similar to the war over Donbas and Luhansk after the Russian aggression of 2014. This would mean that within the next 18 months, (large) parts of Ukraine will still be under threat. This will result in a continuous flow of refugees, but also economic migrants to Poland. There will certainly also be numerous temporary and permanent returns to regions not affected by the war, mainly western Ukraine. It should be assumed that, as a result of the continuation of the conflict, which will have different phases of calming down and intensifica-

Figure 3
The future stock of Ukrainian immigrants in Poland, possible scenarios
in millions



Note: Scenario I is a long continuous war, mostly on a regional level; Scenario II is a quick and lasting peace; Scenario III is similar to Scenario II, but it is assumed that the war will lead to greater destruction also in the west of Ukraine, but a peace agreement will be signed earlier than assumed for Scenario I.

Source: Own elaboration.

tion of fighting, the economic situation in Ukraine will be bad, which will stimulate more intensive economic migration than in the past. This means that the structure of the inflow may change, with an increasing share of men and older people (we assume that the ban on leaving Ukraine by men aged 18-60 will be significantly liberalised or even lifted). Presuming factors influencing flows and patterns of residence of particular demographic groups are as described above, this scenario implies that about 3.1 million Ukrainians will reside in Poland in the medium term (economic migrants who came to Poland before outbreaks of the war and war refugees). Considering the assumptions described above, we can conclude that the demographic structure will be as follows: 24% children, about 37% women and 37% men (at working age). About 72% of people will be of working age, which means that the age structure would be similar to the one we have now.

In the second scenario (a quick and lasting peace), one should assume a quick (by autumn) conclusion of peace, which will stabilise the situation in the short run and will also bring relatively favourable conditions for Ukraine (territorial, reparations, possibilities of joining the EU, etc.) in the medium and long term. It would mean a relatively large reduction (during the 12 months following the signing of the peace agreement) in the stock of women and children, some outflow of men (including those residing in Poland in the pre-war period), and a stable stock of elderly people. In this scenario, it should be assumed that the number of Ukrainian citizens staying in Poland will stabilise at around 1.75 million, of which 1-1.25 million would be "pre-war" immigrants (mainly males) and 0.5-0.75 million war refugees would transform into "post-war" immigrants (mainly females, children and the elderly, to a large extent family members of those staying in Poland before the war). It should be assumed that mainly people from eastern Ukraine will stay in Poland, since the destruction of the infrastructure is the greatest there, and reconstruction will take the longest. The demographic structure would be as follows: 11% children, about 37% women and about 49% men. The economically active adult population would account for about 86%, which would mean a gradual but rather slow return to the structure of the population residing in Poland before the outbreak of war (share of economically active persons: over 95%).

The third scenario is – at the level of assumptions – similar to the previous one, but we assume that the war will also lead to greater destruction in western Ukraine, whereas a peace agreement will be signed earlier than assumed in scenario one. This means that regardless of the conditions of the assumed peace, an additional influx of children, the elderly and women should be expected, as well as a possible outflow of men (ongoing fighting, reconstruction of the country after signing the peace agreement). In this variant, one should assume an increase in the number of Ukrainians in Poland to around 3.4 million (by the end of 2023). This is due to the potential devastation caused by the prolonged war and the partial integration of Ukrainians into Polish society, which would encourage part of the population to remain in Poland for longer. The demographic structure would be as follows: 32% children, 40% women and about 25% men. The economically active adult population would account for about 65%, due to the increased proportion of minors compared to the pre-war (or even baseline) period.

Scenarios two and three should assume significant investment to rebuild damaged infrastructure, financed either by international aid or reparations. If the funds for this purpose are substantial, it may cause an exodus of workers currently employed in the construction industry in Poland. However, it is difficult to assume that Ukraine's GDP will quickly return to pre-war values. Therefore, labour immigration to Poland and other EU countries will be higher than before the war (with higher shares of females). There will also be a reunification of families that are now separated, especially from areas where Ukrainian control will not be restored or bordering them, as well as those most damaged by war. The end of the war refugee/humanitarian immigration should be assumed in this scenario. The period of temporary protection in the EU, granted based on the 2001 Temporary Protection Directive, is likely to end. An EU Council decision will be required. Numerous actions by the Ukrainian government to induce emigrants to return can also be expected.

In another scenario, which is currently unlikely and unwelcome but cannot be completely ruled out, Russia gains military advantage and eventually occupies much of Ukraine's territory. Ukrainian citizens, knowing what happened in Bucha, Mariupol and other cities/territories occupied by Russia, flee en masse to Poland and other European countries. In such a scenario, the number of refugees could even exceed ten million, of which about 60% would stay for some time in Poland. In this scenario, all existing assumptions would have to be changed. Poland and the European Union would be hit by a humanitarian crisis that would require a massive relocation within the EU. It would be crucial to provide basic needs in the form of housing, food, medical care, etc. However, this scenario is not explored further within this article.

As shown in Figure 3, all three scenarios considered would mean a substantial increase in the number of Ukrainian citizens residing in Poland as compared to the pre-war situation, however, the scale of this presence varies depending on the scenario. Differences lie not only in the scale of the process but also in its structural features with scenarios one and two linked to a significantly higher presence of children (and elderly).

Challenges ahead

Long-term stays of war refugees in Poland, depending on the presented scenario, will generate numerous challenges in the field of social services, which must be prepared to serve a larger number of people. This is the issue we discuss in this final section.

We believe that in each scenario, the key challenge is to provide housing infrastructure. It is unsustainable (even in the short term) for war refugees to live mainly in private houses or apartments and this has become a common "reception practice" in the first weeks of the war. While the challenge is easier overcome in the summer months, by autumn it will be an absolute priority. The solution to the situation would be relocation within the EU, within Poland, and the construction of modular housing estates, in which people who do not have an apartment would be able to spend autumn and winter. In the absence of immediate actions or the case of an additional influx of war refugees, it may be necessary to build large reception centres (as in the first phase of the inflow) or centres of temporary stay.

In scenarios one and three, it will be a massive challenge to provide education and care to children from Ukraine residing in Poland. In an extreme situation, there could be as many as one million children in need of care and education. Without it, it is difficult to expect most mothers or family members performing care functions to be able to take up employment. Therefore, it is necessary to prepare extraordinary solutions based on a few models (in fact, all of the models are already functioning – to a limited extent of course). In the first one, Ukrainian children will continue to follow the Ukrainian curriculum, and the goal of the government and local governments will be, on the one hand, to provide infrastructure for distant learning and, on the other, to recognise the qualifications of Ukrainian teachers residing in Poland and to create Ukrainian school classes, particularly in big cities. In the second model, preparatory classes can be created to help Ukrainian children get ready for entry into Polish schools next year. In the third model, directed only at those children from Ukraine who have a sufficient command of the Polish language, the possibility of attending Polish schools on the same terms as Polish children should be created. The decision to choose a given model should be left to parents (but be conditional on the command of the Polish language).

All three scenarios described in Figure 3 show that the presence of elderly war refugees, who presumably require regular medical care, is limited. However, even if numbers of elderly are not high, this is a completely new phenomenon in Poland as before the war as many as 97% of the total stock of immigrants constituted persons of working age. Furthermore, the Polish health system has been strongly affected by the pandemic and many people have postponed their medical care. Meanwhile, an additional one to two million people are now entitled to use the health care system, and this will surely create severe challenges (both in terms of general and specialist health care). Considering additional risks resulting from the COVID-19 pandemic, it may be necessary to ask other member states for support to provide temporary hospitals and to post doctors in Poland for a certain period. Solving communication problems will also be crucial.

As we showed in the first part of this text, the presence of Ukrainians in the Polish labour market was significant already before the war. It can therefore be assumed that there should not be a problem with employing another several hundred thousand people (and this is already partially confirmed by the fact that almost 150,000 newly arrived war refugees have entered the Polish labour market). Unfortunately, such a perspective can be too optimistic. As mentioned in the previous section, the recent inflow comprises mainly women with children, while before the war, Ukrainians had been employed in Poland mostly in male-dominated occupations. Thus, we may be dealing with mismatches in terms of skills available and the needs of the labour market. This will require a very high level of training and retraining offers tailored to the professional profile of Ukrainians. Moreover, it will be necessary to em-

ploy additional measures to prevent threats such as exploitation in the workplace, bullying or sexual harassment as those may be expected considering the scale of the phenomenon and low bargaining power of war refugees.

Preventing conflicts that may occur between Ukrainians and Poles is also a very important challenge. Such a large influx of foreigners affecting the daily life of the host society has the potential to cause conflicts. Even though in the short term, due to the uniqueness of the situation, tensions can be easily avoided, they will certainly emerge in the medium and long term. Especially people using public services may experience a deterioration in the standard of living due to the presence of a significant number of war refugees, who will also be entitled to benefit from state support. A similar situation may also take place in the labour market, with possible adverse effects, particularly on the local scale. These risks should be identified, monitored and addressed through well-tailored public policies, including communication campaigns.

The issue of migration has for many years been included on the list of key political topics both nationally and internationally. The inflow or outflow of people to or from a given country is the axis of dispute in virtually every election campaign. Thus there is a risk that the presence of war refugees in Poland could easily become the subject of tense political debate, with all the accompanying negative consequences.

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DOI: 10.1007/s10272-022-1054-5

Intereconomics, 2022, 57(3), 171-174

JEL: E61, F00, P40

Karl Aiginger

Who Will Shape the New World Order?

Globalisation has brought large benefits: It has reduced poverty at an unprecedented pace, opened up new possibilities, and led to more diverse and cheaper products. But it has also led to problems such as greater inequality in rich countries due to job losses in old industrial regions, a necessity for change in education and occupations, and international monopolistic firms exerting a great influence on politics. The division of labour has led to new dependencies, with firms producing intermediate products for distant customers. Technologies have changed, requiring new resources and rare metals. Supply chains have become longer, increasing the danger of disruptions.

At the same time, recent developments have led to a call for a new type of globalisation requiring better rules that force firms to take responsibility for their input chains. It has become clear that free riding on climate and social policy issues should be prevented, whether through carbon border taxes or emissions trading. International courts should be less dominated by rich countries and should follow World Trade Organization supervision. This has been called "responsible globalisation" or the "end-of-fast-track globalisation".

The war in Ukraine has created a new context and made rapid changes necessary, especially if the old problems are not to be exacerbated. As with any radical new situation, it can either become a turbo mechanism for reform or an excuse for delaying the necessary changes that are unpopular among lobbies and vested interests. We argue that this presents an opportunity that should be taken, and the temptation to return to past policy should be avoided.

Globalisation will change

The share of people living in absolute poverty as defined by a monetary boundary of one or two dollars' income per day has declined rapidly – it was halved much faster than envisaged by the Millennium Development Goals. This initially happened primarily in Asia, then later in other emerging countries, and most recently – limited by large population growth and increasing droughts – in Africa.

Growth in poor countries has been higher than in rich ones, with the US maintaining its lead in GDP per capita. Many countries shifted production from raw materials to industry, which led to low-or-middle-income traps and cases of "Dutch disease" for those countries that did not use the resources provided by raw material exports to upgrade skills and climb the quality ladder.

Higher income has not led to reduced inequality within nations; inequality returns in ever new forms, if it is not addressed by political policy. Regional inequalities increased as a result of rapid globalisation, since old industrial regions felt left behind, creating fertile ground for populist or nationalist movements claiming past times were much better. Firms have been closed in old industrial areas, and these regions have not succeeded in attracting new ones. Migrants or refugees have been made responsible for problems (e.g. in Hungary, France, the UK and the US).

Climate change was acknowledged as an important problem but did not receive enough attention in terms of policy. Developing countries had no chance to limit emissions due to a lack of resources and technologies. Rich countries claimed poorer countries should not have a free pass with regard to ecological concerns, as they were generating greater emissions per population or output. While the latter is correct, the assertion did not take into consideration that the industrialised countries had the technology for change and had used up the largest share in the storage capacity of our planet in the past.

The rewards of globalisation have often been skimmed off by oligarchs, rather than used to increase wages, which have, for example, stagnated in the US over the past 30 years. High-income earners and the financially independent have been able to escape taxation by shifting headquarters and profits into tax shelters. Strong firms have been able to demand free access to markets through international investment compacts and courts. Reducing child labour and racial or gender inequality has not always been successful, with corrupt and autocratic governments

Open Access funding provided by ZBW – Leibniz Information Centre for Economics.

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seeking to buy weapons and rich countries competing to provide them. Meanwhile, regional conflicts have persisted and the streams of refugees, initially directed towards neighbouring countries, have remained substantial.

The benefits of globalisation have been measured by old GDP, though this was never a measure of welfare. Switching to other narrow or broader measures, such as life expectancy or Sustainable Development Goals, revealed many benefits. It has become clear that democracy does not automatically deepen with higher income or welfare. And freedom can take on different forms, while still not being guaranteed by higher incomes and open trade. Rich countries always think that they are the leaders in democracy and freedom, even if old structures and racial conflicts remain. Leading policy groups can do a lot to maintain their power. The reduction of early deaths and the prolongation of life expectancy, including healthy life terms, continues to be a benefit of globalisation. Adding peace and free movement is also all-important.

Globalisation needs to be accompanied by a forward-looking and responsible policy. In developing countries, this may mean using rewards to upgrade education, basic skills and innovation. Medium-income countries have to learn from foreign technologies and invest in vocational and high schools. High-income countries must invest in international and open universities, and industrial policy has to change to include the definition of lead industries and digitisation. Improving education is imperative in all groups.

The dichotomous impact of war on Europe

If we leave out the direct impact of the war in Ukraine on human suffering, we see that several options exist for countries not directly involved in the conflict.

Most people and nations have meanwhile realised that climate change is real, that it is human made, that fossil energy sources played an important role and that global warming is dangerous. Following the Paris Agreement and last year's UN Climate Change Conference in Glasgow, many nations committed to ambitious goals that offer a last chance to stop global warming at a time when deaths due to heat waves and erratic weather are already playing a larger role than deaths caused by traffic accidents. The negative consequences of climate change are furthermore unevenly divided between nations that have contributed significantly to it in the past and nations that have had fewer possibilities to stop it. The goals set for achieving climate neutrality by mid-century would require action. Due to the new problems created by the war, the climate goals have been downgraded on the agenda or postponed. Peace is all-important but is used as a justification for finding new sources of fossil energy and further exploring the sea and other regions to find liquid natural gas, even if this in turn requires new resources, emissions and long transport chains. Expenditures on limiting climate change have been delayed, while new importance has been placed on current production along old paths.

We knew that we could significantly save energy and waste, but we now realise the extent to which many nations, including Germany and Austria, still rely on imports of gas and oil, much of which comes from Russia or its partners. We knew that we needed to have reserves, since clean energy is only discontinuously available and to a degree unstable, but then had to acknowledge that the storage capacities for gas were not even half-replete (and were partly owned by Gazprom).

We knew that external safety could to an extent be ensured by a peaceful agenda in Europe, but that NATO and its weapons and forces would ultimately be responsible for security in case of an aggression or conflict. Many European countries currently feel safer as members of NATO, with Finland and Sweden now applying for membership. Other countries are trying to increase their defence expenditures, even if existing expenditures are oriented towards past conflicts, instead of helping prevent humanitarian and ecological emergencies.

Europe may react by postponing necessary changes …

The economic consequences of the war could potentially be used to postpone climate policy, energy saving and the shift to renewable energy. This includes investments in atomic energy – perhaps in smaller plants – as there is still no satisfactory solution for the storage of nuclear waste.

This scenario can be observed in many countries. Several mainstream parties have proposed cutting taxes on energy and populist parties have been able to win elections with strongmen. But people seem generally discontent, as the large shares of the population voting for both right-wing and left-wing parties demonstrate – for example, in France where these parties together have been stronger than that of Macron and the old mainstream parties.

European countries are longing for new providers of fossil energy, whether this means buying more oil from Arab countries, Iran or Turkey, or more liquefied gas from the US, provided additional terminals are created in Europe. Some have deplored the idea of horizontal drilling in Europe due to its environmental costs. There is an imminent

concern that Russia and Gazprom will cease to fulfil their contracts.

Europe has the largest public sector relative to GDP and very high taxes, but also larger subsidies for fossil energy sources than for renewables. A proposal to cut taxes makes sense, but this should not begin with taxes on energy, which are set at a level far below their external costs, and planned steps to tax carbon emissions should not be delayed, even amid rising inflation.

…or become more ambitious

The better alternative would be to accelerate overall energy and resource saving, while shifting further energy needs to renewables. We know that energy efficiency is very different e.g. it is three times higher in Switzerland than it is in the US. The shift to renewable energy could happen at a much faster pace. Southern European countries can cover a large portion of their demand through wind and solar energy but may not have excelled in the field of renewable technologies. France has a better greenhouse gas balance, but this is mainly due to its use of nuclear energy. New European funds for investment and resilience should be used much more intensively to shift demand to non-fossil energies, public transportation, electric cars or cycling. Power for ships and planes must be taxed, and innovations for better fuels are around the corner. Short flights of up to 500 kilometres are inefficient. Public expenditures should be redistributed from subsidising energy consumption to improving buildings and making towns greener, while taxes should be reduced on low incomes.

Europe has taken some steps in this direction with its Green Deal and in setting earlier targets for climate neutrality. The Fit for 55 package looks much better than past plans, but the goals still lie far below the change required to meet the Paris target (a 55% reduction over forty years amounts to not much more than one percent annually). That any further compromises – thought as necessary because of a possible end to gas deliveries from Russia – would lead Europe further away from the Paris path is evident, but this has been forgotten by both the mainstream and the populist parties.

Towards a new world order

It is no consolation that Europe is not the only region taking steps in the wrong direction. Negative externalities – domestically and around the world – are priced much lower than necessary, with some politicians calling for a return to old solutions. Ecological policy is not looking for synergies with social and health policy. Even in countries that have a long tradition of democracy, the realisation of democracy is far from perfect and populistic inroads are frequent (Aiginger and Colcuc, 2022).

Who will act?

The old world order broke down after the demise of the Soviet Union. The unipolar moment for the US as a leader was neither accepted by other countries nor very successful, since problems and demand are very different and the US is not ready to take other preferences into account. China has invested significantly domestically and around the world, always from a perspective of what was best for China. It is attempting to change world institutions and become the first socialist superpower (with ambitions to expand its territory, such as in Taiwan and the Solomon Islands).

One possibility would be a closer cooperation between Russia and China. Russia may wish to export resources eastwards, if sanctions and isolation persist after the Ukraine war. China is reluctant to cooperate, fearing it could be included in the sanctions, but will accept higher bilateral trade if new resources help its economy.

A closer cooperation between Europe and the US is possible in theory, but the US is focusing more on the Indo-Pacific region, perhaps in the form of an extended AUKUS bloc (Australia, the UK and the US). Meanwhile, the UK is seeking to play as central a role as it did under the Commonwealth, which will not be easy after Brexit.

India does not wish to cooperate all that closely with China, but has not yet decided how to proceed. It has not criticised Russia's war with Ukraine, it continues to have problems with Pakistan, and it must manage an enormous population striving for work and higher welfare under a nationalist government.

Europe has been divided internally for a long time, with differences between northern and southern EU countries as well as older and newer members. And there has been tension between the bloc and the countries that wish to become members, but do not fulfil all the requirements. The EU has not been able to agree on border control policies or quotas for refugees, and the accession process for the Western Balkan countries has been too slow. Planning a step-by-step future enlargement would be a possibility (Wieser et al., 2022).

The war in Ukraine could be a game changer. Europe has reacted swiftly and to an extent in a more united way than ever before. The member countries quickly agreed that Russia was the aggressor, and that NATO could

not interfere directly, while European countries could provide either weapons or humanitarian aid. Europe's borders have been open to refugees from Ukraine, who are free to travel wherever they wish and are quickly welcomed in childcare facilities, schools and the work force. This also signals a change in overall attitude towards migrants, which could place less of an emphasis on the countries of origin in the future.

Do we need a leader and, if so, who could assume the role?

Some of the current problems will subside in the wake of the COVID-19 pandemic crisis and the war in Ukraine. But both of these crises have only accelerated the reshaping of globalisation and the formation of a new world order.

Europe has assumed a central role with regard to the Ukraine war, imposing sanctions on Russia and providing assistance to Ukraine, which was previously not considered possible, due to Europe's smaller size and lack of internal consensus. However, this new role is indeed necessary, following the retreat of the US from its position as the sole remaining superpower often engaging in conflicts without long-lasting reason and China still focusing on its self-centred agenda, including a zero-COVID-19 strategy. European countries still have differing positions with respect to Russia (Serbia and Hungary have, for example, refrained from criticising the invasion of Ukraine). An EU offer of fast-tracked membership to Ukraine – perhaps in phases – would accelerate the accession process for the Western Balkans (Wieser et al., 2022).

Europe can play a much stronger role in the new world order. It currently leads in terms of broader welfare measures, life expectancy, ecological sustainability and most Sustainable Development Goals (Aiginger and Colcuc, 2022). Russia has long disqualified itself. The US has dropped out of advances in climate policy, shrunk its military role and hesitated in deciding on its future course, partly due to midterm elections and internal divisions. China has hesitated to criticise Russia's aggression in Ukraine, hoping the war will increase its chances of obtaining oil from Russia and distract attention from its territorial policies regarding Taiwan, the South China Sea or the Artic.

However, Europe must keep an eye on potential new world partners and prioritise better cooperation among current and future members. It should invest resources in fighting disease and preventing environmental damage in Africa as well as in neighbouring countries. It must focus on forward-looking policies, also with regard to inflation or migration, and it is absolutely unacceptable to postpone necessary changes when a new problem occurs. Large and often dysfunctional taxes and government systems must be addressed.

Putin's war constitutes a break. Europe should accelerate its active path of decarbonisation and partnerships with neighbours, rather than return to anachronistic technologies, including the import and use of fossil fuels. The public sector can navigate this future path by imposing taxes on emissions and externalities while rewarding innovative solutions, training for young people and retraining. Steps can include a different kind of cooperation with Russia after the war in Ukraine, for example, in the form of investments like those outlined in the Marshall Plan after World War II that fostered peace, reconciliation and reconstruction. This would strongly position Europe in a new world order, given its strength in many aspects that are necessary for increasing welfare.

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DOI: 10.1007/s10272-022-1044-7

Intereconomics, 2022, 57(3), 175-178

JEL: H57, Q58, O52

André Sapir, Tom Schraepen and Simone Tagliapietra

Green Public Procurement: A Neglected Tool in the European Green Deal Toolbox?

Public procurement amounts to around 14% of European Union GDP and, given this size, could well represent an important tool to foster the green transition. However, green public procurement continues to be underutilised in Europe, as several barriers to its application persist. A new EU regulatory action in this field could unlock the potential of green public procurement and add an important element to the European Green Deal toolbox.

The purchase of goods, services and works by governments and public bodies makes up a major part of the European economy, accounting for over 14% of European Union GDP (European Commission, 2022a). The figure varies from as little as 4% in Portugal to around 18% in Finland (see Figure 1). These differences reflect variations in public procurement structures and public service portfolios – for instance, whether healthcare is provided by private or public bodies (European Commission, 2022b).

Given this situation, an important question is whether public procurement could and should be used more by governments to help achieve one of the top EU policy goals: decarbonisation.

In principle, public procurement can contribute to the greening of the economy through two channels: by changing consumption patterns and by changing production patterns.

Public procurement can reduce greenhouse gas emissions directly if the public sector substitutes its purchases of polluting goods and services with more environmentally friendly alternatives, i.e. changing public *consumption* behaviour.

Open Access funding provided by ZBW – Leibniz Information Centre for Economics.

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Meanwhile, by actively promoting and using green public procurement (GPP),[1] public authorities can push industry to develop green technologies and products (Joint Research Centre, 2019). This can lead to a spillover effect that increases demand for greener goods and services across the whole market, as a result of the creation of lead markets, innovation and example setting. For instance, the purchasing decisions of public authorities can strongly encourage (green) innovation by giving start-ups access to economies of scale (Mazzucato, 2013). This is especially true for sectors in which public purchasers make up a large share of the market, including public transport, construction, health services and education. Thus, public procurement can change *production* patterns.

How green is public procurement in Europe?

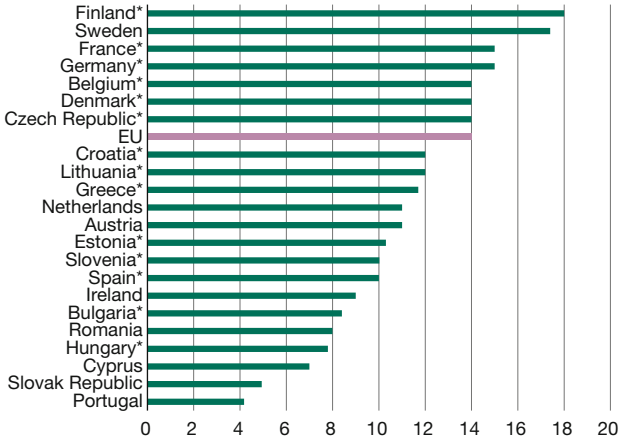
Only a limited amount of data is available on the extent of green public procurement in EU countries. The Tenders Electronic Daily (TED) database registers all tenders above EU thresholds, including whether environmental considerations have been taken into account. However, because of many missing values and the absence of a standard format, the numbers remain estimates.[2] Figure 2 shows an estimate for the average proportion of green public procurement relative to all public procurement from 2006 to 2017, based on the TED database.[3] It is apparent that there are major differences be-

1 Green public procurement is defined by the European Commission (2008) as "a process whereby public authorities seek to procure goods, services and works with a reduced environmental impact throughout their life cycle when compared to goods, services and works with the same primary function that would otherwise be procured".

2 Other problems with estimating the size of green public procurement using this data source are: an estimated 25% of data is missing, misfiling and the fact that there is only mandatory reporting above EU thresholds.

3 Rosell (2021) categorised public procurement as green when the selection criteria include the keywords "environment" or "sustainable" and their variations in all the official languages of the EU countries. This omits other green concepts (e.g. life cycle assessment, emission standards, carbon footprint) and technical tender clauses. Additionally, sustainable procurement differs from green procurement as it goes beyond taking the environmental impact into account (European Commission, 2022c).

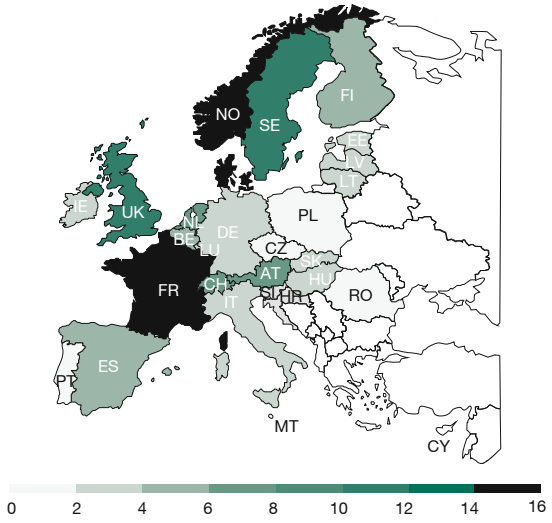
Figure 1
Public procurement expenditure as percentage of GDP, 2019



Note: *Data is from 2018 instead of 2019. Data for Italy, Latvia, Luxembourg, Malta and Poland is missing.

Source: Bruegel based on The World Bank (2022).

Figure 2
Green public procurement as percentage of all public procurement by country, 2006-2017



Source: Rosell (2021).

tween countries, with the proportion ranging from less than 0.5% in Malta to more than 15% in Denmark and France. Moreover, most countries only apply GPP to procure less than 5% of their contracts.

Another approach to estimating the size of GPP is to look at the award criteria used in public procurement tenders. Figure 3 shows the proportion of procedures awarded following the most economically advantageous tender (MEAT) principle, which allows contracting authorities to award the contract to bidders based on criteria, including green criteria,[4] beyond only price (OECD, 2011). Other procedures are awarded to the bidder that meets pre-specified technical requirements at the lowest price. Using the lowest-price criterion means, for example, the life cycle cost of purchased goods is not taken into account, limiting the opportunity for green procurement. In this case, a good that is low priced but has high energy consumption would be chosen over a good that might be more expensive up front but would be preferred on sustainability grounds because it consumes less energy. Thus, taking into account the life cycle cost would create a preference for more environmentally friendly goods.

Figure 3 shows clearly that there are big differences among countries in the use of the MEAT principle, and there is ample room for increasing the uptake of GPP. Croatia, France and the Netherlands make the most use of the MEAT principle, while Slovakia, Lithuania and Romania all use the lowest-price criterion in more than 90% of procedures. Additionally, there does not seem to be a general trend observable over time.

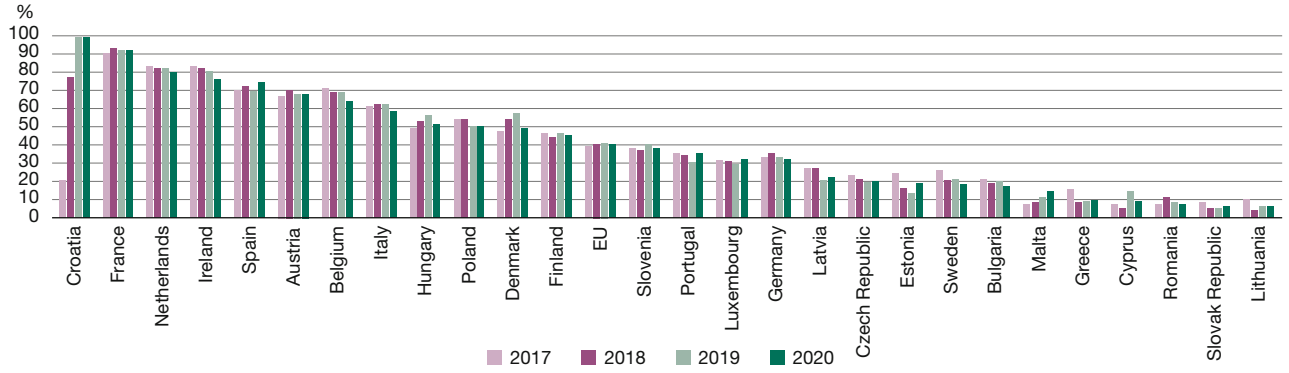
The European Commission (2022d) provides a list of GPP good practices, including the use of the MEAT criterion. For example, the Department of Public Works in the Dutch Ministry of Infrastructure and the Environment uses two methods to monetise the environmental impact of infrastructure projects in the award criteria (European Commission, 2013). First, bidders are required to make use of an environmental assessment tool, DuboCalc, which calculates the environmental impact of proposals by applying a life cycle assessment. The total impact is then converted to an environmental cost indicator which reduces the quote of the bidder (the lower the environmental impact, the bigger the quote reduction). In short, the negative externality is internalised. Second, bidders' efforts to reduce carbon emissions caused by the project are taken into account in the "CO_2 performance ladder". Depending on the chosen level of ambition, the quote is further reduced by 1% to 5%. Projects are awarded to bidders with the lowest adjusted quoted price. It is important to note that the materials proposed in the DuboCalc tool and the chosen level of ambition in the CO_2 performance ladder both become contract performance requirements.

The application of these award criteria has resulted in, for example, reduced concrete use, increased green electricity and more recycled and reused materials. Alongside this direct consumption effect, there is likely to be a strong production effect because of the Department of Public Works' consid-

4 Note that the use of the MEAT principle does not necessary imply that green criteria have been used. A non-exhaustive list of other criteria: quality, price, technical merit, aesthetic and functional characteristics, running cost, cost-effectiveness, after-sales service and technical assistance, delivery date and delivery period.

Figure 3

Proportion of procedures awarded using the most economically advantageous tender principle, 2017-2020



Note: EU average is unweighted.

Source: European Single Market Scoreboard (European Commission, 2022a) based on Tenders Electronic Daily data.

erable annual budget of €3.5 billion and the subsequent increased demand for green goods and services.

The current EU regulatory framework for (green) public procurement

Public procurement in EU countries is only covered by EU procurement rules when the value of tenders exceeds a certain threshold, and when tenders are presumed to be of cross-border interest (European Commission, 2022e). The threshold value differs depending on the sector and type of procuring authority. For below-threshold tenders, national procurement legislation applies, within the general EU regulation framework. Regardless of whether EU or national procurement legislation applies, public procurement by public bodies must respect World Trade Organization rules contained in the Government Procurement Agreement.

The EU Public Procurement Directive (2014/24/EU) recognises the need "to enable procurers to make better use of public procurement in support of common societal goals" (European Parliament and the Council, 2014). The Directive permits the inclusion of environmental considerations at various stages of the public procurement procedure, such as in technical specifications, contract awards (MEAT) and the performance stage (Pouikli, 2021). But ultimately, it is up to EU countries and contracting authorities to decide if and when environmental considerations are actually included.

Only rarely does the EU set binding GPP requirements. Examples are the recently amended Clean Vehicles Directive, which includes a binding minimum target for clean vehicles as a percentage of total concerned vehicles procured for each EU country; the Energy Performance of Buildings Directive; and the Energy Efficiency Directive. Nonetheless, the EU plays a strong role in facilitating GPP by, for example, developing green criteria, training and sharing best practices.

Because of the lack of comprehensive mandatory targets at the EU level, the amount of GPP taking place in Europe largely depends on decisions by EU countries and their public bodies. A summary of national action plans in this field indicates stark differences. Some countries set no target at all or have no national GPP plan,[5] while others aim for a certain share of all public procurement contracts to include green criteria (European Commission, 2021). This share is 100% in the Netherlands. Such differences in national regulation, together with differences in the size and structure of the public sector and barriers to GPP (see next section), largely explain the cross-country differences observed in Figures 2 and 3 (Rosell, 2021).

Barriers to green public procurement in Europe

The optional nature of GPP severely limits its uptake. For example, an impact assessment (European Commission, 2017) of the original Clean Vehicles Directive of 2009 concluded that because of the absence of clear minimum quantitative criteria for procurement of clean vehicles, among other reasons, a similar outcome might have been achieved by market participants even in the absence of the Directive (Blažo, 2020).

Green public procurement is influenced by how contracting authorities manage their budgets. Research indicates that if sustainability is part of an organisation's overall strategy, the implementation of sustainable public procurement[6] increases (Andhov et al., 2020). Consequently, politics plays a role, as heads of public contracting agencies can be political appointments. In addition, because of the short-term bias of politics,

5 Estonia, Hungary, Luxembourg and Romania.

6 Sustainable public procurement is defined as "a process by which public authorities seek to achieve the appropriate balance between the three pillars of sustainable development – economic, social and environmental – when procuring goods, services or works at all stages of the project" (European Commission, 2022c). Thus, green public procurement is a subset of sustainable public procurement.

less expensive but less environmentally friendly products may be preferred over more expensive and greener alternatives that might be more cost-effective over the long term.

Public authorities face significant uncertainty when trying to implement GPP because of the legal complexity stemming from EU public procurement directives. A first source of uncertainty goes back to the fact that public procurement legislation in the EU was intended as an instrument to ensure the integrity of the internal market in public contracts. As a result, public authorities cannot discriminate between domestic and other EU products. Including green criteria throughout the procurement process can unintentionally lead to discrimination as a consequence of, for example, differences in environmental standards or the environmental impact of transport (Mélon, 2020). Although, there is a proportionality requirement, it can be difficult to estimate for public authorities. Secondly, the requirement to have a link to subject matter when setting award criteria beyond price, is included in almost all procurement stages in the EU directives. This requirement limits the contracting authorities' discretionary power to insert environmental considerations into the public procurement setting, as it makes it difficult to implement hard-to-verify award criteria, such as environmental criteria relating to the supplier or further along in the product life cycle (Pouikli, 2020). For this reason, Andhov et al. (2020) advocate the removal of the link to the subject matter concept and its replacement by the life-cycle concept.

Purchasers require knowledge and skills in order to green their procurement. In addition to mastering the legal framework, purchasers often need sufficient knowledge about the relevant goods or service market. They need to be able to calculate the total cost of ownership or the life-cycle cost, which requires specific tools. Thus, implementing GPP requires investment in training of the employees of contracting agencies.

Other barriers to GPP include perceived higher costs (Chiappinelli and Zipperer, 2017), limited established environmental criteria for goods or services, a lack of co-operation between authorities and a lack of practical tools. A study by Rosell (2021) provided a comprehensive overview of the determinants of GPP on macro and meso levels.

Unlocking the potential of green public procurement in supporting the European Green Deal

The current public procurement directive has not been modified since 2014. Given the increased ambition of the EU in decarbonising the economy, it is time to update the directive to specifically address green public procurement and the associated (regulatory) barriers, since the Green Deal advocates for minimum mandatory green criteria or targets for public procurement in sectorial initiatives. The list of sectors that should be prioritised or have a higher mandatory target should not only be decided on the basis of their contribution to greenhouse gas emissions, but also based on the relative weight of public procurement in each market, in order to create spillover effects to private industry. This requires improving the collection and harmonisation of data on GPP to better understand the current situation and develop a clear roadmap for the future. All these changes should be accompanied by sufficient investment in training of public authorities and monitoring of the uptake and performance of GPP.

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Intereconomics, 2022, 57(3), 179-186

JEL: F63, F64, N10

Thomas Junghanns and Jan Körnert

The Potential for a Sovereign Wealth Fund to Acquire and Exert Influence Over the Eurozone

The financial clout of the world's sovereign wealth funds (SWFs) is massive, and many of these are controlled by authoritarian regimes. It cannot be ruled out that these funds might acquire shareholdings in banks that play key roles in other countries. This paper studies the extent to which SWFs have the potential to use shareholdings in critical banks as mechanisms to exert influence on other countries' banking, economic and political systems. We identify banks holding critical positions within the eurozone countries that might be exploited in the pursuit of power and determine whether SWFs could acquire simple or qualified majorities in these banks and whether they would have sufficient assets to enter into such investments. The paper concludes that three authoritarian regimes – China, Abu Dhabi and Saudi Arabia – each have a SWF which would need to invest not even half of its assets to acquire such sweeping influence.

As described by Schumpeter (1939) and later Diamond (1984), banking systems are an indispensable part of modern economic systems and thus have significant and broad influence. According to Weber (1980) and Albert (1955), this influence may also be understood as power because it allows banks to steer socio-political processes in pursuit of their own interests or even to more forcibly assert their will. Moreover, these mechanisms to potentially exert influence, or even raw power, do not end at the borders of national economies. Because of the interdependencies of economies and political systems in developed industrial societies, the influence of banks may be observed not only in the political systems of nations, but it may also be extended to supranational structures such as the institutions of the European Union (Körnert, 2019).

For this reason, banks that play a key role in national banking systems may be attractive targets for certain investors, whereby a controlling shareholding in a bank could serve as a means to gain influence or even directly assert power. The large external investments into the financial sector witnessed over the past two decades should therefore come as no surprise, even as the financial returns from these have often been below average (Brett, 2017). Sovereign wealth funds (SWFs) are special-purpose institutional investment vehicles created and owned by national governments, often with very substantial assets and concentrated financial resources (TheCityUK, 2015; SWFI, 2019). In viewing SWFs as external investors, special considerations arise when these are domiciled in and controlled by authoritarian regimes, which could potentially seek to acquire controlling shares in key banks in order to gain and assert power over the banking, economic and political systems of other countries and even undermine democracy and the rule of law.

This paper examines which eurozone banks occupy key positions in their respective countries through which such potential power could be acquired and exercised. It then analyses whether full control over each of these banks through a qualified majority shareholding could be attainable, or at least the limited control of a simple majority. Subsequently, it investigates which SWFs have sufficient assets to acquire simple or qualified majority shareholdings in not just one but a broad constellation of these banks. Finally, the article considers what percentage of the SWF's assets would be required to acquire these shareholdings.

Open Access funding provided by ZBW – Leibniz Information Centre for Economics.

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Of the 27 member states of the EU, 19 are members of the eurozone, with the European Central Bank (ECB) acting as the common central bank for all 19 of these national banking systems. Of the 5,561 banking institutions within the EU, 4,452 are domiciled in the eurozone (Statista, 2020).

Through this study, we aim to contribute to an international discussion already documented by Alhasel (2015) and recently put into a broader and more current context by Wang et al. (2021). The underlying question is whether the investments of SWFs are purely financial or whether they could be intended to serve a geopolitical aim. In our attempt to partly answer this question by adding a new layer of understanding, we consider the world's major SWFs in the context of the Democracy Index ratings of their home countries. In his study of the literature, Alhasel (2015) also refers to the earlier study by Balding (2008), who asserted that it is still unclear whether the financial power of SWFs might be sufficient to influence markets and cause political damage. Through this study, and through the analysis presented herein specifically of national banking systems within the eurozone and of potential mechanisms for the assertion of broader influence on economic and political systems, we aim to bring greater clarity to this question. Our investigation relies substantially upon two earlier preliminary studies by Körnert and Junghanns (2019, 2020), which outlined a methodology and presented initial results for the five smallest EU member states: Malta, Cyprus, Estonia, Latvia and Lithuania.

Sovereign wealth funds and the Democracy Index

SWFs are investment vehicles established and owned by a sovereign government. Their overt aim is invariably the pursuit of conventional investment objectives. For 55 of the world's 89 SWFs, the investable wealth is derived from the home country's production and export of commodities. The remaining 34 non-commodity-based SWFs derive their wealth from trade and balance of payment surpluses, from foreign exchange transactions or from privatisation transactions (TheCityUK, 2015; SWFI, 2019). Although several have their origins in the 19th century, two-thirds of the world's SWFs active today were established just within the past 20 years (Capapé, 2018).

Table 4 lists the countries with the largest total SWF assets. Within each of these, state-controlled funds manage total wealth in excess of $100 billion. The largest single SWF is that of Norway. China (excluding separately listed Hong Kong), however, has the world's greatest total SWF assets, although these are divided among four different SWF vehicles. The Democracy Index published by *The Economist* (2020) provides a convenient measure of the degree of democracy in each country, and thus of its government's proximity to democratic principles and the rule of law. Every year, *The Economist* assesses the state of democracy in 167 different countries, ranks these countries according to various criteria and divides them into four classifications: full democracies, flawed democracies, hybrid regimes and authoritarian regimes. The disproportionate share of SWF wealth under the control of authoritarian regimes should already raise eyebrows.

The obvious concern is that authoritarian regimes could use SWFs to acquire controlling shareholdings in strategically important companies abroad, thereby pursuing not just ostensible conventional investment objectives but also economic advantage or even hegemonistic aims. The gateway for such geopolitical ambitions could very well be the banking system of the target country.[1] For example, an investment position in a banking institution may establish not only management control over the bank itself but also, by extension, significant levers of influence on the respective country's economic system, its political system and even supranational political structures to which it belongs.

Mechanisms for asserting power on banking, economic and political systems

Various conspiracy theories about the "power of the banks" accusing Jews, Freemasons, Marxists and Bolsheviks (Tanner, 1998) prompted the West German government in the 1970s to appoint a study commission on "fundamental issues of the banking industry" (*Grundsatzfragen der Kreditwirtschaft*) to investigate the power position of Germany's banks. The study commission argued that it is the combined interplay of four instruments that enables the transfer of power beyond the banking system to the broader economic system (Studienkommission, 1979). These four instruments, which have since been further examined many times under the label "accumulation theory", can be briefly summarised as follows: Building upon the (1) lending relationships, banks also (2) take equity stakes in these same client companies. The bank's involvement as both lender and shareholder often leads to (3) a seat on the client company's supervisory board. Furthermore, one must additionally consider (4) the limited discretionary voting power (in the same client companies as well as many other companies) which third parties may and typically do assign to German banks for shares held in custody.

1 Banking systems are part of the critical infrastructure of countries (CISA, 2021; Körnert and Junghanns, 2019).

Political economy also offers an insightful approach to examining the fundamental interrelationship between economy and politics, which in turn suggests a theoretical framework for the mechanism by which power may be transferred from the economic system to the political sphere. The relationship between the economic and political systems may, for purposes of understanding, be reduced to four basic types: primacy of the economic system, primacy of the political system, totalitarian control and coordination over all aspects of society (*Gleichschaltung*), and interdependency.[2] In modern industrial societies such as the EU, it is the fourth type which is normally prominent: mutual interdependency between the economic and political systems. On the one hand, the government in power seeks to influence and guide developments in the economic sphere to further its political and policy goals; on the other hand, the stakeholders in the economic system go to great lengths to assert their interests within the spheres of politics and public policy.

Political leaders and policymakers are, not surprisingly, by no means immune to the interested parties within their banking and economic systems. These powerful voices may be brought to bear not only on political leaders and policymakers at the national level but also beyond, to supranational bodies such as the structures and institutions of the EU. In particular, the Council of the European Union and the European Council are both susceptible to such influence (Körnert, 2019). Thus, should a foreign power, by way of its SWF, acquire controlling stakes in eurozone banks sufficient to exert power over national banking systems, and more broadly entire economic systems, this acquired power could potentially be further exerted not only on national political systems but also on supranational structures.

Significant banks as first-level filter

Assuming for the moment that there are foreign-controlled SWFs that would strive to acquire controlling shareholdings in eurozone banks with the express aim of gaining and exerting influence upon the economic and political systems to which these banks belong, then not all 4,452 banks in the 19 eurozone countries are equally suited to this aim. The starting point for such geopolitical or even hegemonistic ambitions might well be the eurozone's "significant banks" under the Single Supervisory Mechanism, which the ECB has since 2014 been identifying and placing under its own direct supervision. The number of eurozone banks designated by the ECB (2020) as such was 117. When determining which banks are significant, the ECB applies five criteria; meeting any one of these is sufficient to qualify a bank as significant. Specifically, these criteria are: the absolute size of the bank, the economic relevance of the bank to the respective member state or to the monetary union as a whole, the cross-border activities of the bank, direct public financial support to the bank within the framework of the European Stability Mechanism and the size of the bank relative to the banking system of the respective member state.

For our purposes, however, we consider these criteria for the selection of significant banks to be insufficient to assert that a foreign power could gain access to the mechanisms described earlier simply by controlling any one of these banks. Only banks which are both vulnerable to acquired foreign control and hold a systemically vital position in the target country's banking system are candidates for gaining influence over the country's banking, economic and political systems. Thus, we further assume that a bank may only exert influence or outright power within a country if it is either of disproportionate and thus systemically problematic size, or if it – alone or in a narrow combination – has a dominant market position within the country. We shall designate any bank which is of problematic institutional size and/or which has a dominant market position as a "critical bank". It should be noted that critical banks under either of these two criteria are a pure subset of ECB-designated significant banks.

Critical banks because of problematic institutional size

A eurozone bank may be deemed problematic because of its institutional size[3] when

1a it is designated as a global systemically important bank (G-SIBs) by the Financial Stability Board and is based within the eurozone, or

1b the respective bank's consolidated total assets exceed a set percentage of the host country's annual GDP, with this threshold percentage depending upon the country rating.

Under the first of these two criteria (1a), we can readily determine that there are eight such G-SIB in five different eurozone countries: Deutsche Bank in Germany; BNP Paribas, BPCE, Crédit Agricole and Société Générale in France; UniCredit in Italy; ING in the Netherlands; and Banco Santander in Spain (FSB, 2019).

2 For more information on the four basic types as subsequently summarised, see Schmid and Buhr (2015).

3 For further discussion on the formulation of similar criteria, see Körnert and Junghanns (2020).

In constructing the second criterion (1b), we decided against a fixed percentage threshold in relating the total assets of a bank to the annual GDP of its host country and opted instead for a sliding schedule of percentage thresholds based upon the respective country's Standard & Poor's (2019) rating. Starting with the entire spectrum of 22 ratings used by Standard & Poor's, we neglect the lowest rating of D (default) and begin with the country rating of C, assigning a threshold percentage of 20 (i.e. a bank is deemed critical if its total assets exceed 20% of the country's annual GDP).

Critical banks because of dominant market position

In order to identify those banks within a country that are critical because of their dominant market positions, we rely upon the definition of dominant market share under the competition and anti-cartel law of Germany, the eurozone's largest member state, specifically section 18 paragraphs 4 and 6 of the German Act against Restraints of Competition. Using this same definition,[4] we consider a bank to have a dominant position in a eurozone country if

2a the bank holds at least a 40% share of the total market, or

2b a combination of up to three of the country's banks would together hold at least a 50% share of the total market.

We determine market share by dividing the consolidated total assets of the bank (or narrow combination of banks) by the aggregate total assets of the country's entire banking system. This asset-based calculation of market share is usual within the banking sector and can be readily and objectively determined (Schildbach, 2017). It is also particularly suitable within the context of this study because each of the aforementioned four instruments of accumulation theory can be logically related to bank assets.

Assignment and exclusion of critical banks

In order to identify the critical banks within each country of the eurozone under the above criteria, we must necessarily determine to which national banking system each should belong. The ECB's process for the determination of significant banks presents a particular problem here in that it assigns branches and subsidiaries in eurozone countries to the top-level consolidating entity, i.e. the parent company. If we were to take this approach in this study, this would mean that eurozone bank subsidiaries and bank branches owned by foreign banks would be assigned not to the banking system of the countries in which they operate – and could potentially be exploited for the acquisition and assertion of power – but rather in the country in which the parent entity is based. Thus, in order to carry out our analysis of power misuse potential, we must instead identify and select banks – including subsidiaries and branches – at the level of the countries in which they operate.

In cases where several banks meet multiple selection criteria, we further impose a simplifying restriction: For reasons involving both the theoretical mechanisms of power and transaction cost theory, we consider only those variants which result in the fewest designated banks. Because more than one bank in a country may fulfil criterion 1a, 1b or 2a, we shall in such cases examine only the largest bank (i.e. with the greatest consolidated total assets or largest market share). In addition, it is possible that more than one combination of two or three banks might fulfil criterion 2b; in this case, we limit further examination to the single combination of banks with the largest overall market share. The following section examines the practical attainability of majority shares in the critical banks which we will, through the above process, identify within each eurozone country.

Controlling share thresholds and willingness to sell

For an investor, an equity stake in a critical bank can offer a convincing power base, particularly where the investor is able to acquire a qualified majority, that is more than 75% of the share capital of a stock corporation. This is an important distinction because, under the relevant provisions of the stock corporation laws of eurozone countries, an investor in this position has the legal power to decide, for example, to amend the articles of association, to increase or decrease capital, or to dissolve the company. Qualified shareholdings also pave the way for members of the supervisory board to be dismissed. However, even a simple majority stake, in which an investor acquires more than 50% of a target bank's share capital, opens up the potential to exert a significant degree of control because the investor can, with this simple majority, take the opportunity of a general shareholder meeting to force the adoption of any shareholder resolutions not specifically requiring a qualified majority.

We thus refer to the potential for the exercise of power arising from simple majority control as "limited" power exercise potential. By the same token, we refer to the far stronger position of control over a bank arising from a shareholding above the threshold for a qualified majority as "extensive" power exercise potential. Here, however,

4 See also the similar discussion of this issue in Körnert and Junghanns (2020).

we must address the particular situation that may arise when, under criterion 2b, a narrow combination of banks offers the means for a foreign-controlled SWF to gain a position of influence in a country. In this case, it is the weakest control position among the two or three acquired banks that should determine the power exercise potential of the combination. In other words, if a SWF cannot obtain a qualified majority at any one of the banks, the combination of banks meeting criterion 2b shall be assumed to offer only limited power exercise potential.

Moreover, in order to acquire majority control of a bank, the current owner(s) must be willing and able to sell the relevant shares. For a bank that is organised as a stock corporation, the greater the proportion of shares in free float, the easier it is to acquire the bank. This arises from the fact that small shareholders, in contrast to institutional or strategic investors, lack a strategic motivation and tend to act based on their short-term interests (Guserl and Pernsteiner, 2015; Buss, 2010). We therefore assume, for the purpose of this analysis, that the entirety of a bank's shares in free float could be acquired provided that the offered price is sufficiently attractive.

This point at which a takeover offer becomes sufficiently attractive to induce shareholders to sell can be estimated on the basis of historically paid control premiums. Various studies have found that control premiums range on average between 15% and 40%, with premiums paid for past acquisitions in the banking and financial sector being at the lower end, namely 15% to 25% (Gilmour et al., 2017). In order to determine a realistic acquisition cost while at the same time not underestimating the ease by which an unwanted foreign investor could take over a critical bank, we assume that the acquisition of a critical bank would cost a control premium of 25% in excess of its current market capitalisation.

Methodology for assessing attainability of control over critical banks

The study applies seven steps to identify those critical banks which could be exploited to exert influence upon the eurozone's banking, economic and political systems, and to subsequently calculate the percentage of total assets that a SWF would need to commit in order to acquire control of not just one but a broad constellation of these critical banks across the eurozone. The first step is to create a list of all significant banks within the eurozone, which is already conveniently provided by the ECB, with 117 eurozone banks currently deemed significant. In the second step, we narrow down this list to a smaller subset of critical banks using the criteria defined above. Applying these, we identify a total of 36 banks in the eurozone that meet our definition of critical banks. After ensuring that these 36 critical banks are correctly assigned to the relevant countries (step three) and excluding certain banks that are less relevant to our analysis (step four), a total of 21 critical banks remain for closer examination. In the fifth step, the 21 remaining critical banks are then examined for their vulnerability to takeover, considering in particular the legal form and ownership structure of each potential target. In our sixth step, we likewise determine the maximum attainable shareholding of each, whether this would represent a simple or qualified majority share, and thus whether the target bank would offer limited or extensive power exercise potential. In the seventh and final step, we estimate the acquisition cost for each of these critical banks, including the assumed control premium, which would have to be paid, along with the total cost to acquire a broad constellation of these critical banks across the eurozone. We then relate this combined acquisition cost to the total assets of the world's largest SWFs, thereby providing a sense of the potential to acquire such sweeping power through the acquisition of this set of critical eurozone banks.

Determination of critical banks, power exercise potential and acquisition cost

Table 1 summarises the power exercise potential in each eurozone country that could be achieved through such acquisitions, meaning firstly that critical banks must be identifiable, and secondly, that majority control must be attainable. In Austria and Luxembourg, there are none. Although there are critical banks in Ireland, Portugal and Slovakia, their ownership structures preclude any opportunity for a SWF to acquire a controlling share: state ownership in the critical banks in Ireland and Portugal, and cooperative ownership in the case of a critical bank in Slovakia. The banking systems of these five countries thus offer no evident potential to gain power through the acquisition of critical banks.

In the case of Greece, Malta, Slovenia, Belgium and Latvia, simple majority control of critical banks could be attained, but anchor shareholders would preclude the possibility of obtaining a qualifying majority, as summarised in Tables 1 and 2. In the case of the Greek, Maltese and Slovenian critical banks, the anchor shareholder is the state, while in the case of the Belgian and Latvian banks, major corporate shareholdings would pose a difficult obstacle.

In the nine remaining banking systems of the eurozone – Cyprus, Finland, France, Germany, Italy, the Netherlands, Spain, Estonia and Lithuania – we assume that qualifying majorities could be acquired due to a high proportion of

Table 1
Power exercise potential within the banking systems of the eurozone countries

Countries	Rationale		
Austria, Luxembourg	No critical banks identified	None	Power exercise potential
Ireland, Portugal	Controlling share unattainable (state-owned)		
Slovakia	Controlling share unattainable (cooperative ownership)		
Greece, Malta, Slovenia	Anchor shareholder (state) precludes 75% share	Limited	
Belgium, Latvia	Anchor shareholder (private) precludes 75% share		
Estonia, Lithuania	Full control indirectly attainable via parent company	Extensive	
Cyprus, Finland, France, Germany, Italy, Netherlands, Spain	Qualifying majority directly attainable		

Source: Authors' own elaboration.

Table 2
Acquisition cost of simple or qualified majority shareholdings in critical eurozone banks

	Target country	Critical banks	Criteria	Acquisition cost (USD billion)
Extensive power exercise potential through qualified majority share	Cyprus	Bank of Cyprus	1b	0.55
	Estonia	Swedbank (Estonia)	2a	15.60
	Finland	Nordea Bank	1b, 2a	30.68
	France	BNP Paribas	1a	69.29
	Germany	Deutsche Bank	1a	15.01
	Italy	UniCredit	1a	30.59
	Lithuania	Swedbank (Lithuania)	2b	15.60
		Luminor (Lithuania)	2b	7.37
	Netherlands	ING	1a, 1b	43.74
	Spain	Banco Santander	1a, 1b, 2a	65.20
Limited power exercise potential through simple majority share	Belgium	KBC Group	2b	19.58
		BNP Paribas Fortis	2b	69.29
	Greece	Eurobank Ergasias	2b	3.59
		Alpha Bank	2b	3.12
		National Bank of Greece	2b	1.93
	Latvia	Swedbank (Latvia)	2b	15.60
		SEB (Latvia)	2b	12.85
		Luminor (Latvia)	2b	7.37
	Malta	Bank of Valletta	1b	0.43
	Slovenia	NLB	2b	0.85
		Nova KBM (incl. Abanka)	2b	2.58

Source: Authors' own elaboration.

shares in free float (see Tables 1 and 2). While in Estonia and Lithuania this qualified majority control of critical banks could only be indirectly achieved through control of the parent companies, each of the remaining seven countries offers a critical bank target in which a qualifying majority could be directly acquired.

Thus, 14 of the eurozone's 19 member states offer potential avenues for a foreign SWF to gain either limited or extensive power through the acquisition of critical banks, as presented in Table 2. For each target country, the relevant critical banks are named along with the criteria that resulted in designation as a critical bank. We have, in addition, included the estimated cost for acquiring qualified or simple majority control for each of these banks.

Table 2 summarises the estimated cost to acquire control of these critical banks organised by target country. Should the research objective be to consider the potential for power acquisition not just in one country but rather throughout the eurozone in the broadest possible constellation, then the sum of the final column of Table 2 would be an incorrect aggregation due to double counting, as certain parent banks are critical banks in multiple countries.

Table 3 eliminates this double counting by listing target banks rather than target countries; it is comprised of the 17 banks in which a qualified or simple majority would need to be acquired in order to be able to control the critical banks in all 14 eurozone countries where such control is possible. In other words, if a SWF were able to acquire simple or qualified majority ownership of all 17 of these banks, it would gain limited or extensive power potential in the banking systems across 14 out of 19 eurozone countries, which is sweeping dominance indeed. To achieve this aim, we calculate that the investor would need to commit a total of some $322.96 billion. The following section relates this amount to the total assets of the world's largest and most powerful SWFs.

Percentage of total SWF assets required to gain sweeping dominance

As shown in Table 4, China – the world power with the greatest SWF assets – would need to commit 19.47% of

Table 3
Critical banks in the eurozone

Critical bank	Home country of bank/parent	Potential target country	Acquisition cost (USD billion)
Alpha Bank	Greece	Greece	3.12
Banco Santander	Spain	Spain	65.20
Bank of Cyprus	Cyprus	Cyprus	0.55
Bank of Valletta	Malta	Malta	0.43
BNP Paribas	France	France, Belgium	69.29
Deutsche Bank	Germany	Germany	15.01
Eurobank Ergasias	Greece	Greece	3.59
ING	Netherlands	Netherlands	43.74
KBC Group	Belgium	Belgium	19.58
Luminor	Estonia/USA	Latvia, Lithuania	7.37
National Bank of Greece	Greece	Greece	1.93
NLB	Slovenia	Slovenia	0.85
Nordea Bank	Finland	Finland	30.68
Nova KBM	Slovenia	Slovenia	2.58
SEB	Latvia/Sweden	Latvia	12.85
Swedbank	Estonia, Latvia, Lithuania/ Sweden	Estonia, Latvia, Lithuania	15.60
UniCredit	Italy	Italy	30.59
Total cost to acquire control of all 17 critical banks:			322.96

Source: Authors' own elaboration.

Table 4
Percentage of total SWF assets required to gain power exercise potential through eurozone banks

		SWF assets		Democracy Index	
	Country with SWF	Total (USD billion)	Percentage required	Rank	Regime type
1	China	1,658	19.47	153	Authoritarian
2	Norway	1,217	26.54	1	Full democracy
3	Abu Dhabi	932	34.65	145	Authoritarian
4	Singapore	815	39.63	75	Flawed democracy
5	Saudi Arabia	697	46.34	159	Authoritarian
6	Kuwait	592	54.55	114	Authoritarian
7	Hong Kong	457	70.67	75	Flawed democracy
8	Qatar	328	98.46	128	Authoritarian
9	Dubai	210	153.79	145	Authoritarian
10	Malaysia	160	201.85	43	Flawed democracy
11	South Africa	160	201.85	40	Flawed democracy
12	Russia	153	211.08	134	Authoritarian
13	Kazakhstan	126	256.32	139	Authoritarian
14	South Korea	122	264.72	23	Full democracy
15	Australia	102	316.63	9	Full democracy

Note: In the case of countries with multiple SWFs, total SWF assets are shown as a single aggregated amount. The SWF assets of certain sub-national government entities are listed separately where direct control by the higher-level national government cannot be determined.

Source: SWFI (2020); Economist (2020).

its total SWF assets to acquire this sweeping control. In fact, the SWFs of eight different countries have total SWF assets in excess of the amount required to acquire the complete constellation of these banks. Any one of these could, in principle, pursue this course of action. Where the particular concern arises is that five of these eight countries with massive SWFs are categorised as authoritarian regimes: China, Abu Dhabi, Saudi Arabia, Kuwait and Qatar. Each of these can and must be regarded in this scenario as an undesirable investor because each of these is ruled in defiance of democratic and constitutional principles.

In considering the percentages of total SWFs that would have to be committed to gain power in the eurozone through national banking systems, there is another important point to be made, which is that considerable influence may also be exerted on EU institutions through individual EU member states. For example, Malta and Cyprus, each have one critical bank, Bank of Valletta and Bank of Cyprus respectively. The acquisition of both of these together would cost just $0.98 billion (Table 2), which is only 0.06% of China's total SWF assets. Even Kazakhstan would only have to invest 0.7% of its SWF assets. Although Malta and Cyprus are very small countries, each has a powerful veto right within institutions of the EU.

Summary

Critical banks within the eurozone countries are a pure subset of significant banks as defined and designated by the ECB. For any foreign power with hegemonistic ambitions, these banks are acquisition targets of the highest order because they offer opportunities to gain and exert power upon the national banking systems of eurozone countries which can then be more broadly transferred to their economic and political systems. Where decision-making and voting processes are structured as they are in the EU, such influence can be further extended to the su-

pranational level. Any nation which values democracy and the rule of law – both within the EU and beyond – would do well to keep a vigilant watch on the ownership structure of its critical banks, just as it would with any other critical infrastructure. In the case of the EU, it is essential that protections against this threat not depend upon a patchwork of national investment protection laws but rather that such long overdue protective regulations be thoughtfully and carefully anchored into law at the EU level.

It is fervently hoped that these findings are translated into action before SWFs, with their massive wealth, attempt a large-scale entry into the eurozone as described in this study. Of particular concern as such unwanted investors are the SWFs of authoritarian regimes, which must be presumed to pursue geopolitical ambitions beyond their overt investment objectives. Authoritarian regimes are, moreover, particularly prone to abrupt and unanticipated changes in policies and behaviour, and their SWFs are not necessarily constrained by any declared investment policies or purpose. In order to acquire a broad constellation of critical banks across the eurozone, thereby jeopardising European democracy and rule of law, China, Abu Dhabi or Saudi Arabia would have to commit less than half of their total SWF assets to achieve such sweeping dominance. This should not only raise alarm bells but also serve as a clarion call to timely action.

In terms of suggestions for further economic policy research, we see the potential for further insights in an expanded scope of study beyond the eurozone countries – for example, to the entire EU. A particular problem in extending our methodology to the eight EU countries outside the eurozone is that the ECB does not identify significant banks in these other countries. We also believe that European banking regulation should be further strengthened for critical banks.

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DOI: 10.1007/s10272-022-1046-5

Intereconomics, 2022, 57(3), 187-191

JEL: F63, F64, N10

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The Limits to Growth – 50 Years Ago and Today

***The Limits to Growth* was published 50 years ago. Ordered by the Club of Rome, the study was a milestone in the analysis of the economic, demographic, technical and ecological effects of the existing economic system. In industrialised Western countries in particular, the critical examination of the development model of continuous economic growth led to a broad discussion about the far-reaching implications of a global economy focusing on growth, on a planet with finite natural resources.**

Criticism of the growth paradigm, dominant in both market-based and planned economic systems, has existed (almost) as long as economic growth itself. For example, Thomas Malthus (1798) reflected on the natural boundaries of economic and population growth very early on (Hussen, 2018). However, Meadows et al. (1972) carried out a notably broad system analysis. On the one hand, they examined existing ecological as well as socio-economic development trends and their global effects in detail. Secondly, the use of computer models to simulate different development scenarios of the world economy, based on the availability of data, was a methodological novelty at the time.

The study of 1972, as well as its later updates, paved the way for growth-critical contributions of the recent past. Existing approaches that dominate current discussions, such as "post-growth", "de-growth", or "green growth", do not merely reproduce the critique of growth, but rather expand it to include additional perspectives on global consequences, such as climate change, species extinction, social inequality or unemployment (see e.g. van den Bergh and Kallies, 2021; Jackson, 2017). Moreover, from today's perspective, the limits to growth are no longer seen primarily in terms of depleting raw materials, but rather as planetary boundaries, with the ecological functioning of the planet being endangered (see Rockström et al., 2009; Foley et al., 2010; Persson et al., 2022 for more details). Due to the intensity of human intervention in nature, researchers believe that the limits of biodiversity, the nitrogen and phophate cycle, chemical pollution and climate change have already been exceeded, creating a threat to the natural basis of life for future generations. The German Federal Environmental Agency (2021) estimates that the cost of the global consequences of climate change and the loss of biological diversity alone will be around 25% of global GDP by 2050.

Open Access funding provided by ZBW – Leibniz Information Centre for Economics.

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The Limits to Growth report

Based on a computer-simulated world model, the report analysed five basic development trends with global consequences: population growth, industrialisation, malnutrition, exploitation of raw materials and destruction of the living environment. The scenarios analysed differed in their assumptions in supply of raw materials, efficiency in agricultural production, as well as the level of birth control and environmental protection. Most of the simulations found an initially ordinary population and economic growth until the year 2050. After that, there was a tipping point that marked a sharp and unstoppable reduction in population and industrial capacity, combined with environmental destruction and widely depleted raw materials. The source of this collapse of the world economy in the various scenarios was, above all, the dynamics of growth that tended to be unproblematic initially but had increasingly negative environmental aspects as time progressed.

Nevertheless, it was also possible to calculate scenarios characterised by a long-term sustainable ecological as well as economic equilibrium with a constant population and prosperity level. However, the prerequisite for this was fundamental changes in the preconditions for growth, such as instant and drastic measures for environ-

mental protection, birth control, a reduction of economic growth as well as various technological measures such as an increase in the recycling rate, an extended use of investment and other capital goods and an increase in agricultural productivity.

In order to address the problem of partly unavailable data, the calculations assume a much higher stock of raw materials than known in 1972. Additionally, different assumptions concerning the economic growth rate were applied. However, despite these modifications, the stock of raw materials still ran short before 2100 in the majority of simulated scenarios. Moreover, according to the forecasts, a possible state of equilibrium could only be achieved under a rapid implementation of massive countermeasures.

Reactions and updates

In light of the oil crisis in 1973, *The Limits to Growth* has led to a recognisable rethinking in industrialised countries in the course of a more qualitative-oriented growth. This rethinking was reflected in technological innovations aimed at a better energy efficiency as well as an improved decoupling of economic growth and use of resources.

However, the results of the study were controversial from the beginning. Points of criticism were: underestimated possibilities in solving growth-related environmental problems due to a pure extrapolation of technological progress; a lack of traceability based on an inconsistent use of growth functions for the future development of the world population, industrial capital, environmental pollution and technologies for a more efficient use of resources; and the opinion that predictions about the potential end of raw material sources were unfounded (for more details, see Wallich, 1972; Simon, 1981; Bardi, 2011).

Against this criticism, the Meadows et al. (1972) study deals with the question of technological progress in particular and in detail, with the result that, at least within the model framework, technological solutions alone, however far-reaching they may be, cannot prevent a collapse of the system. Moreover, empirical investigations concerning the projected developments with data from 1970 to 2000, later also with data beyond, reached the conclusion that the real development so far is more or less identical with the development forecasts of the basic scenario, which projects a collapse of the world economic system by the middle of the 21st century (Turner, 2008; Turner, 2014). Additionally, updates of the original study with latest data and findings on developments that occurred in the meantime (such as the effects of greenhouse gases on climate) came to similar results. Simulations based on these updates also led to an excess of growth limits and a subsequent system overshoot and collapse within the calculated standard model (Meadows et al., 1992; Meadows et al., 2004).

Accordingly, another report to the Club of Rome (Randers, 2012), forecasted growing influences on climate and nature by economic activity up to 2052. Moreover, a rising consumption of energy was expected, despite an increasingly efficient use of energy. Due to growing environmental damage and gradually scarce natural resources, it was anticipated that productivity and subsequently global economic output would grow much slower, i.e. it was expected that increasing environmental damage would limit economic growth.

World without growth: De-growth

In the recent past, new approaches to dealing with growth have been developed, such as de-growth, green growth, or post-growth. All of these concepts are in line with the explanations made so far, as all concepts follow the idea of a realised balanced development, as formulated within the study *The Limits to Growth* and its updates. However, the stipulated assumptions and consequent recommendations for action differ in many aspects diametrically from each other. Moreover, there is no self-contained theory behind the mentioned approaches; they can rather be seen as a pool for various contributions and political initiatives following a common main idea.

For example, the considerations on a decline of growth (de-growth) are manifold, varying roughly by contributions focusing on social reforms, capital criticism or resource orientation (Schmelzer, 2017). Although their emphasis differs, they all fundamentally question the possibility of decoupling economic growth and resource consumption. They rather assume that under a continuation of the traditional paradigm of growth and its linked increase in consumption and production, the global energy and resource consumption could not be reduced to a level needed for sustainable development – even if existing potentials for efficiency increases are completely exploited (see exemplarily Martinez-Alier et al., 2010; or Demaria et al., 2013). One explanation is that it would not only require a surplus of technical efficiency but also fundamental changes in consumer behaviour. However, as experience – especially within a growth economy – shows, progress made in reductions of material or energy are often cancelled by an increase in demand, so-called rebound effects. Such rebound effects can be explained by lower costs in the purchase or use of goods and services due to efficiency improvements, consequently leading to a higher demand and thus fully or partly cancelling the savings potential of efficiency improvements (e.g. higher demand for larger

vehicles due to more energy-saving car engines). Moreover, we see a permanent increase in energy demand due to an increase in world population associated with a rise in purchasing power of the global middle class.

Consequently, to get rid of the existing forces of growth, a radical change would be needed. There are different scenarios for such a change, e.g. an increased handling of economic activities outside of established markets or in fundamentally differently designed markets; a reform of the existing monetary and interest system; a reduction of the global division of work and its connected principle of external supply; a reallocation of time between paid work and leisure, as well as differently designed social relationships and gender roles. Even if such actions lead to a reduction of economic performance (measured in GDP per capita), this should not be the case for social welfare. Rather, economic growth is seen as the source for manifold undesirable social developments, such as tendencies of social acceleration, the increase of disaffected work or the decline of meaningful activities, which could be avoided by an abandonment of growth.

Green growth and post-growth

The need for a fundamental transformation of the economic system is also shared by various contributions considering the approach of green growth. However, the content and direction of this transformation process is a different one, as the dominating idea suggests that ecologically sound growth is very much possible if economic development is embedded in an ecological orientation (see e.g. Jacobs, 2013; Jacobs and Edelhofer, 2014). For this, the promotion of ecological innovation is seen as central. It is based on the concept that technical innovations in favour of greater efficiency in the use of raw materials and energy as well as an increase in existing recycling rates could decouple the tradeoff between economic growth and resource consumption. If these innovations are realised and adapted to worldwide markets, it would generate economic growth at the same time. This is of particular relevance since it is assumed that without an increase in GDP per capita, the needed investments for an ecological transformation could not be financed and the existing level of social well-being could not be sustained (German Federal Advisory Council on Global Change, 2011).

Simulations based on the concept of green growth show the possibility of a relative decoupling of economic growth and environmental consumption with a lower increase in ecological damage than economic performance. Moreover, alternatively modelled scenarios lead to an absolute decoupling, i.e. constant or even decreasing negative environmental impacts with a simultaneous increase of economic output (Giljum et al., 2008; Meyer et al., 2012). However, the results of such simulations strongly depend on the upcoming legislation framework of governments and corresponding market incentives. Measures in favour of green growth include financial incentives for ecological innovations as well as a reduction of legal barriers that prevent green innovations and business models. This approach of green growth differs from the de-growth approach, especially concerning the strong focus on technological progress as a driving force for sustainable economic growth. However, the latest research insights regarding the empirical evidence on decoupling of GDP also show that existing economic systems are still far away from green growth in terms of sufficient reductions of resource use or emissions (see Haberl et al., 2020; Hickel and Kallis, 2020; Parrique et al., 2019).

In order to be able to analyse how realistic the assumptions and statements of both approaches are, knowledge about the relationship between resource consumption, ecological burdens and economic development is needed. However, reliable models are not yet available (Petschow et al., 2018). Another recent position has been formulated under the paradigm of a precautionary post-growth strategy, which sees the dependency of relevant societal areas and institutions on growth as a central obstacle for political measures adressing a sufficient reduction of ecological burdens, in particular in industrial countries (Seidl and Zahrnt, 2012). This position is also known as “a growth” or “new economics of prosperity” (see e.g. van den Bergh, 2011). The question of whether in the future, for the compliance of the planetary boundaries, growth must either be compelled or restricted to environmentally compatible innovations is not central anymore. It is yet uncertain which of these two developmental paths is ecologically sound, as the current state of knowledge does not allow a clear theoretical or empirical statement on this. The main challenge, especially in the case of declining economic output, is to keep central social institutions such as social security systems as resilient as possible, so that their ability to function no longer depends on constant economic growth. To do this, for example, it is recommendable to increase the statutory pension age, implement a supplementary funded provision or switch to a public guaranteed standard pension in order to decrease the dependency of old-age security systems on growth. To forward with another proposal, it is advisable to establish a citizen insurance and abolish the existing income thresholds in order to address health insurance.

Generally, it has been noted within the previous explained growth concepts that GDP per capita is not a compre-

hensive or reliable indicator considering the relationship between economic growth and social well-being. Accordingly, this indicator should not have a central role in the legitimation of political measures concerning the design of sustainability policies, or should always be considered in the context of other well-being indicators (Petschow et al., 2020).

Economic growth and measuring well-being

From an economic point of view, GDP only measures a part of societal well-being, as welfare is not only determined by material well-being but also by the social situation as well as an intact environment. In operationalising the latter two components, there are different possibilities. Hence, it is not surprising that there are currently a large number of measurement methods for prosperity, which differ greatly considering their definition (see for an overview German Federal Parliament, 2013). For some approaches, only material well-being is measured, for others non-material aspects such as the existing level of knowledge or education, aspects of health, social relationships, environmental quality or political participation are taken into account. The basis for this is not only objective but also subjective assessments and surveys, investigating e.g. individual life satisfaction or perceived economic insecurity.

Welfare can be expressed in monetary terms (e.g. expenditures on private consumption, education, health or environmental protection) or non-monetary terms (e.g. infant mortality or unemployment). Depending on the method, the result is depicted as a singular number or a series of collocated numbers. In the first case, aggregated welfare indices are used, which has the advantage of reducing the complexity of the different facets of welfare. Accordingly, the results are not only simple and comprehensible, but allow for interpretations about whether the overall welfare of a country has risen or fallen. One disadvantage of this approach is its more or less arbitrary weighting of individual welfare components. Moreover, problems in interpreting the results may arise, if singular components within the overall index develop in the opposite direction, not being reflected in the aggregated result.

Well-known examples are the National Welfare Index, which includes, contrary to GDP, data on private consumption, income distribution, ecological damage and public debt; the Human Development Index, which contains, in addition to GDP per capita, life expectancy at birth and school attendance (but no ecological data); the Weighted Index of Social Progress, which comprises economic, ecological and demographic indicators as well as measures on the status of women, the extent of "social chaos" and cultural diversity. Other, newer well-being indicators also consider environmental quality by including variables such as healthy life expectancy (Bloom et al., 2019).

The counterpart to these aggregated welfare indices are clusters of economic, social and ecological indicators. The individual indicators stand on an equal footing for different sub-aspects of wealth, their results not being offset against each other. Such indicator sets have the advantage of being useable for specific political decisions due to their attention to detail. A disadvantage is that they often do not allow for a definite statement if the well-being of a country has generally risen or fallen. Moreover, they can be confusing and lead to problems of understanding. In order to avoid this, it is common to define specific sets of indicators. An example is the indicator set developed by the German Council of Economic Experts and the French Conseil d'Analyse Économique, which – based on the recommendations of the Stiglitz-Sen-Fitoussi Commission (Stiglitz et al., 2010) – includes different measures on economic performance and environmental and fiscal sustainability, as well as objective data on quality of life and subjective assessments of well-being. Comparable is the Better Life Index of the OECD, which is complimented by green growth indicators, if the progress in ecological sustainable growth is in focus.

Finally, when considering *The Limits to Growth*, the calculation of specific sustainability indices should also be mentioned, which differ from the approaches presented so far, as they measure primarily stock variables (such as capital or natural assets) and their change over time in relation to investments and natural regeneration. The question in focus is, whether a society is depleting its economic, social and/or natural resources and endangers its future level of well-being. The best-known example might be the Ecological Footprint, calculated annually by the Global Footprint Network. One result of its calculation is the Earth Overshoot Day, which was reached in 2021 on the 29 July, much earlier than when it was calculated for the first time 40 years ago – it then fell on the 19 December.

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DOI: 10.1007/s10272-022-1047-4

Intereconomics, 2022, 57(3), 192-198

JEL: F4, O11, R4

Jan Wedemeier and Lukas Wolf

Navigating Rough Waters: Global Shipping and Challenges for the North Range Ports

Ports and shipping have been in the spotlight in 2021 with surging demand, skyrocketing freight rates and week-long queues. This development stands against the background of the current global COVID-19 pandemic. Amid these disruptive waves, the North Range ports (Le Havre to Hamburg) face numerous challenges. This short analysis gives an overview of recent developments in international shipping and the potential for maritime transport as an early indicator for commodity trade. The article also explores the connection in import and export of the North Range ports to their respective countries and the EU. This article contributes to the extent to which maritime traffic data can be linked to economic data. Three long-term key challenges – sustainability, digitalisation and (de)globalisation – are discussed with a focus on the North Range ports as well as the newest effects of Russia's war in Ukraine.

International shipping has been in rough waters over the past years. In 2019, the growth of global trade started to slow (Straubhaar, 2021), and after the COVID-19 pandemic emerged in late 2019 and hit most countries and their real economy worldwide for the first time in early to mid-2020 (Grömling, 2021). This caused significant disruptions in supply chains and logistical problems. As economies started to recover, demand rapidly surged in 2021 and international shipping has frequently been in the spotlight with tenfold increases in freight rates for containers, week-long queues in major ports as well as singular events such as the blockade of the Suez Canal (The Economist, 2021).

Considering these developments, we look at the North Range ports – the ports from Le Havre (France) via Rotterdam (the Netherlands) to Hamburg (Germany) – both their role as indicators for economic activity in the countries of the North Range and the European Union, as well as the major challenges that lie ahead.

Open Access funding provided by ZBW – Leibniz Information Centre for Economics.

* The authors would like to thank André Wolf (CEP), Claudia Wellenreuther (HWWI) and Sinja Rostalski (University of Göttingen) for helpful contributions, discussions and suggestions.

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The linkage between trade and ports

Precise indicators for economic development are always in demand but became much more important in light of the short-term disruptions of the pandemic. Delayed publication by statistical offices are critical in the majority of indicators for the economy, making real-time indicators difficult. For instance, the Federal Statistical Office of Germany has issued an early indicator for the economy based on freight rates of different transport modes: road, track, air and inland shipping. These transport indication data are connected to economic activity. There is, e.g. a high correlation with so-called experimental data between truck traffic on German motorways and the production of manufacturing. These experimental data, however, are not harmonised Europe-wide. Moreover, the degree of maturity, but also the quality of the results, differ from official statistics. To conclude, international shipping is strikingly lacking in these indicators. In this respect, a link between maritime transport and trade could close a gap to link these to economic data.

The immediate connection of shipping to nations' economies is in trade. In the EU, 80% of all imports and exports in volume and 50% in value are transported by ship (IHS, 2021). Especially countries that export and import internationally, such as Germany or the Netherlands, depend highly on global trade.

One established approach to measuring international trade volume is the Container Throughput Index (RWI/ISL, 2022). It includes data on container throughput from 91 international ports, which together account for around 60% of global container throughput. The index does not include goods shipped without containers, e.g. vehicles or bulk goods (Döhrn, 2019). It is published monthly with a delay of about two weeks. The index represents an estimate of shipping activity and is comparable to the so-called truck toll mileage index of the Federal Statistical Office (Destatis, 2022a). Looking at the development of the Container Throughput Index of the past years, a long-term increase to 117.9 can be seen until mid-2019 (base year 2015 = 100). Afterwards, the index slowly starts to decline, indicating a reduction of global trade before the pandemic. Once the pandemic hit the global economy, the index dropped to 106.8 in March 2020 and 105.6 in May 2020 – its lowest value since spring 2017. The two major slumps in March and May can be associated with the lockdown in China, and later in the rest of the world economy. Afterwards, the container index recovered and quickly surpassed pre-pandemic levels (ISL/RWI, 2022).

Apart from the slightly delayed Container Throughput Index, research has been put into using real-time shipping data as an immediate indicator for international shipping, and thus economic activity. Cerdeiro et al. (2020) from the IMF have set the methodological foundation, using the automatic identification system of ship vessels as a basis. Stamer (2021) has expanded on this, including not only nowcasting but accurate forecasting of economic trade with shipping data. Applying the model to Germany, the results show that shipping is more accurate in indicating trade volume than existing indicators and can be a valuable extension for early economic indicators for decision-makers (Stamer, 2021). Thus, the connection between shipping and economic activity of specific countries is being established and invites further research on the European and international levels.

Throughput-flows of North Range ports

Seeing the potential of shipping in general as an early economic indicator for business cycles, brings into focus the role of the ports and their significance for their respective countries' economy. Looking at the North Range ports, we examine how far their container throughput may indicate their respective countries' economic trade volume. The major ports of the North Range from west to east are Le Havre, Zeebrugge, Antwerp, Rotterdam, Bremen/Bremerhaven and Hamburg. Occasionally, the Ports of Amsterdam, Wilhelmshaven and Dunkirk are also considered, but they are left out in the following analysis. The ports of Amsterdam and Dunkirk only have a small throughput relative to the main ports and tend to lose importance in goods handling, while Wilhelmshaven shows strong fluctuations and level effects due to the port extension. Listing the North Range ports by total trade volume in 1,000 tonnes in the second quarter of 2021, Rotterdam (151,478) has the highest volume, followed by the port of Antwerp (52,212), Hamburg (31,402), Le Havre (21,934), Bremen/Bremerhaven (15,902) and Zeebrugge (8,484) (Eurostat, 2022b).

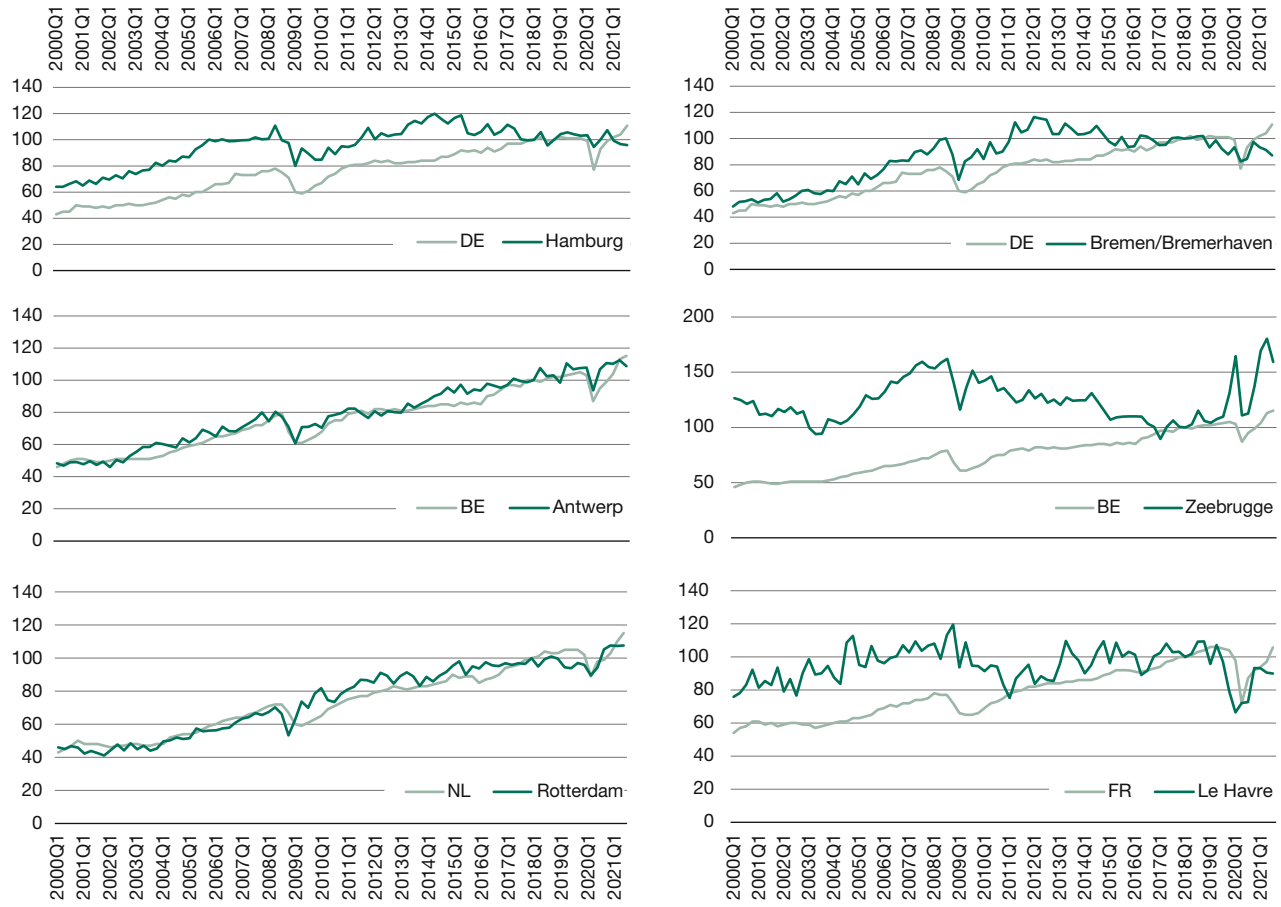
Figures 1 and 2 provide an overview of the main North Range ports and their countries' and the EU's economic activity, using key statistical data provided by Eurostat (Eurostat, 2022a, 2022b; Destatis, 2022b). The analysis shows outflows, inflows, and total volume of the North Range ports compared to their countries' and the EU's export and import levels (Figure 3). The imports and exports have been transformed into an index based in the first quarter of 2018.

The smaller ports of the North Range, Zeebrugge and Le Havre, have highly fluctuating volumes with declines after the 2007-2008 global financial crisis and the COVID-19 pandemic. Apart from these business cycle crises, their port development is decreasing, running opposite to their countries' overall development in exports and imports. The downturn development indicates that these minor ports alone have no major significance for their country and are not able to indicate business economic activity on their own.

The German ports of Hamburg and Bremen/Bremerhaven had a similar development in Germany's foreign trade until 2015. But while the German imports and exports kept increasing, the ports disconnected from this development and fluctuated at a slightly decreasing level until the COVID-19 pandemic hit the European economy in 2020. This was also observed by Jessen-Thiesen (2022) when comparing port of Hamburg exports and imports to the EU. The sanctions against Russia due to the occupation of Crimea in 2014 (Kholodilin and Netunajev, 2016) may explain some of this decline in trade, but not the full stop in growth. As Germany's imports and exports kept increasing, the question arose about whether goods switched transport modes or were imported/exported through other (North Range) ports. Two of those may be the port of Wilhelmshaven or Gdansk, which have seen exploding volumes over the past years (Eurostat, 2022b).

The port of Antwerp mirrors nearly perfectly Belgium's trade volume, both in imports and exports. This does not change when comparing exports and imports from third countries to total volume. This underlines the major economic role of the port of Antwerp and the potential in us-

Figure 1
The outflow of North Range ports and North Range countries, 2000-2021
Index, 100=Q1 2018



Source: Eurostat (2022a, 2022b); Destatis (2022).

ing this connection as a business cycle indicator for the Belgian economy (see Figures 1 and 2).

The port of Rotterdam reflects the exports of the Netherlands to third countries. Both the Netherlands and the port's volumes are steadily increasing. In contrast, imports from third countries through Rotterdam decreased since the global financial crisis as the Netherlands' imports to third countries increased. In total imports and exports, the port of Rotterdam saw slight increases, though slower than the rest of the country (see Figures 1 and 2).

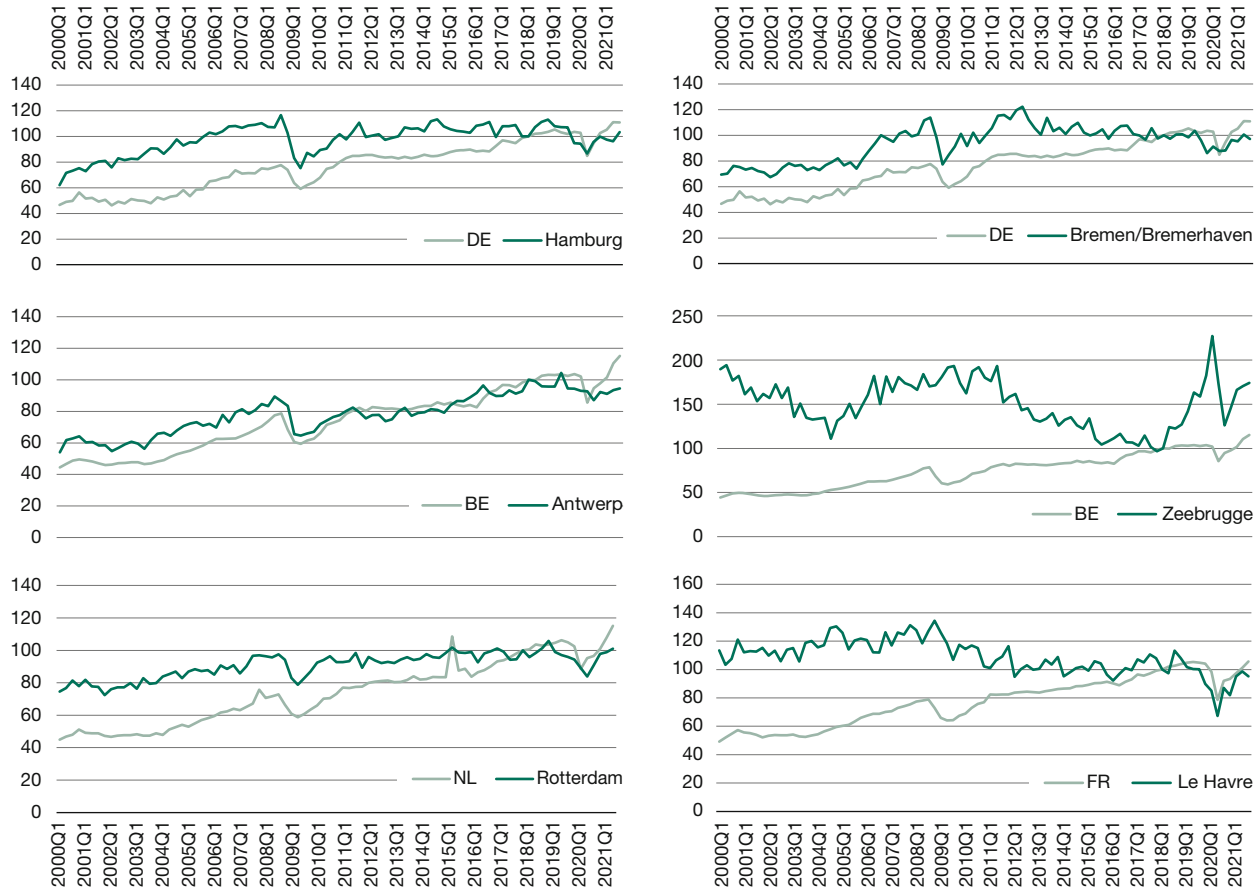
Shifting the focus to the European level, a strong connection can be seen between total exports of the North Range ports and the EU27. The development is similar in imports, although the EU27 grew faster, indicating that imports through other ports or means of transportation within the EU are becoming more important. Yet, both time series show a strong relation, indicating the importance of the North Range ports for the European economy (see Figure 3).

This short analysis has shown similar patterns for the major North Range ports and their countries' economies. Especially the port of Antwerp and Belgian foreign trade have shown strong similarities. At the same time, we have also highlighted a disconnection of the German ports to their country's trade and the unimportance of the minor ports of Zeebrugge and Le Havre on the national level. Unquestionably, the North Range ports are vital for the European Union and their countries' economies. It is also evident that the ports of Antwerp and Rotterdam had a stronger overall growth rate in recent years than the ports of Hamburg and Bremen/Bremerhaven, indicating the tough competition within the North Range ports and the competitive advantage of the former ports. It raises ques-

Figure 2

The inflow of North Range ports and North Range countries, 2000-2021

Index, 100=Q1 2018



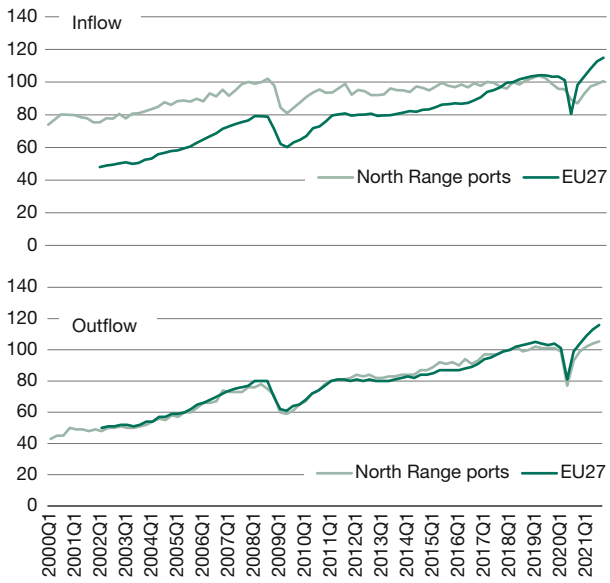
Source: Eurostat (2022a, 2022b); Destatis (2022).

tions about the challenges that await the North Range ports in the upcoming years.

Recent effects of the war in Ukraine on the North Range ports

Russia's ongoing war in Ukraine poses a new challenge and uncertainty for the North Range ports. Looking at the direct effects, only a small reduction in traffic is to be expected. The North Range ports have no significant connection to the Ukrainian economy, as there is only a negligible amount of shipping and hinterland transport to or from Ukraine. Rotterdam had the largest container trade volume with Ukraine of all the North Range ports with an average of one million tonnes per year over the past ten years. This represents 0.0025% of the total throughput of goods in Rotterdam. In all the other ports, this proportion is close to zero (Eurostat, 2022b). Thus, the effects of the war can be expected to be small. However, sanctions imposed upon Russia by the European Union and its member states, restricting specific goods, will have a much stronger impact on the North Range ports. All North Range ports handle a significant share of their volume with Russia. Especially in Hamburg and Rotterdam, the share of Russian volume of total goods throughput ranged from 10% to 15% between 2016 and 2020. The remaining ports have fluctuating trade with Russia from 1% to 17% of total handling (see Figure 4). The global economic upheavals due to the war are enormous, so that a further decline in trade is to be expected. A global supply crisis could grow from this and will imply geo-strategical changes (Jung, 2022; Kappel, 2022). In addition, inflation is gaining momentum due to recent shocks. The COVID-19 pandemic, which has been going on for two years, has disrupted the complex international supply chains in industrial production. The

Figure 3
Inflow and outflow of North Range ports and EU27, 2000-2021
Index, 100=Q1 2018



Source: Eurostat (2022a, 2022b); Destatis (2022).

recovery process hoped for in 2022 was interrupted by Russia's war in Ukraine. Not only were the supply chains running through Ukraine affected here, but the West's strict sanction policy against Russia is disrupting international trade (Berlemann et al., 2022). Currently, there is no end in sight, which implies a potential disruption to trade through the North Range ports.

Further challenges for the North Range ports in the context of the COVID-19 shock

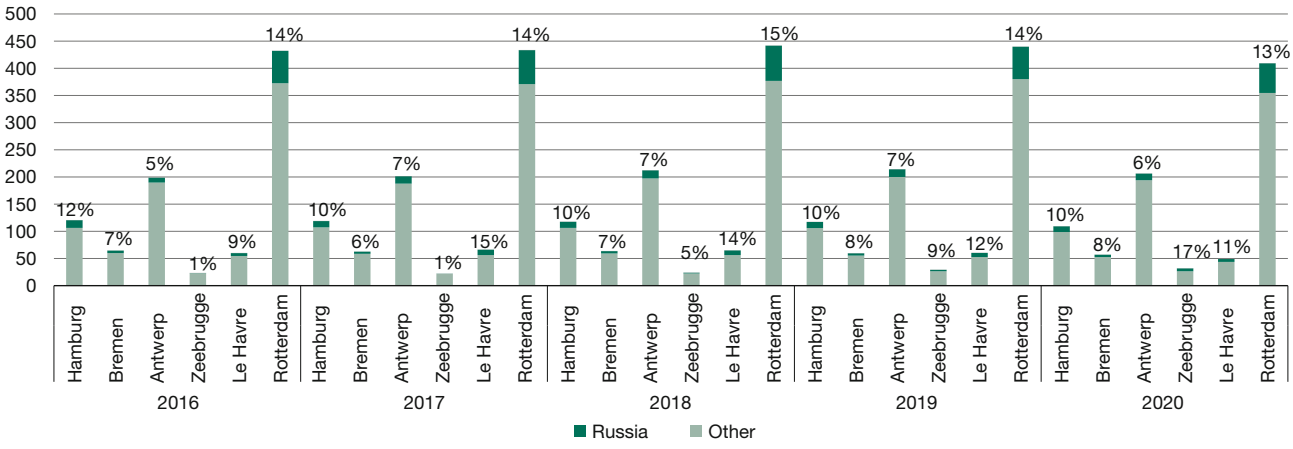
The North Range ports as major transport hubs are intertwined with Europe's economic activity. But they are faced with many immediate challenges, caused by the COVID-19 pandemic, as well as long-term transformations.

The effects of the pandemic-related recession on cargo handling in the ports cannot be foreseen. Maritime traffic has recovered quickly, however, after the initial phase of the COVID-19 pandemic. A further increase in freight volumes is expected worldwide in the coming years, which could have a positive effect on cargo handling volumes of the ports. It remains to be seen whether COVID-19 could accelerate pressing global trends in the maritime economy and thus require a massive restructuring of the industry. However, the key dimensions of sustainability, digitalisation, and (de)globalisation have played critical roles during the pandemic and will influence ports' development in the long-term perspective.

To further the discussion on the effects of the COVID-19 pandemic and the key issues for port development, Figure 5 presents the expected interactions in the short- and long-term qualitative forecast scenarios for the key dimensions with regards to port development. The correlations are estimated based on the preceding analysis and literature and do not represent an econometric relationship, nor do they present a comprehensive, all-encompassing forecast.

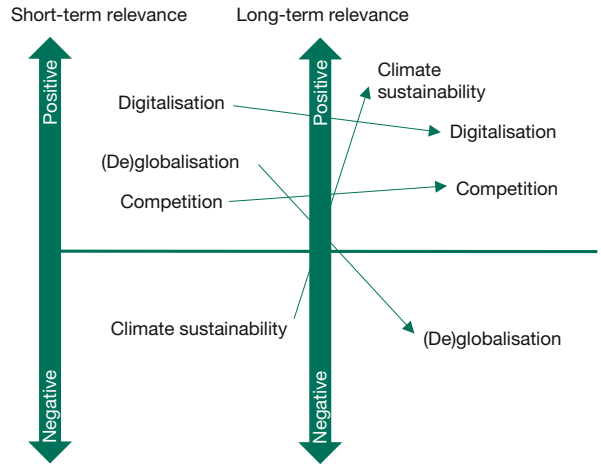
For sustainability, the short term has been dominated by a strong reduction in relevance. The immediate ef-

Figure 4
Share of Russian good throughput in the North Range ports, 2016-2020
Total volume in million tonnes



Source: Eurostat (2022b).

Figure 5
Expected interactions of key dimensions with port development



Source: Authors' own illustration.

fects of the COVID-19 pandemic might have decreased shipping and thus emissions, but the importance of the topic in society and the urgency for sustainable transformation processes were disrupted. Since then, sustainability has re-emerged as a key issue, especially for ports. Looking at the long-term perspective, ports have to achieve a green transformation of port infrastructure. This article differentiates the overarching themes of port sustainability into three dimensions. First, at the local level, ports need to adapt their infrastructure to operate (nearly) emission-free and to adapt to the changing environment. Additionally, waste management, pollution in air and water, and conflicts with natural habitats also play a role (Hossain et al., 2021). Secondly, in their role as maritime transport hubs, ports need to provide the necessary infrastructure for international shipping and hinterland transportation to run sustainably. Ports can create the stimulus for green shipping. However, the uncertain energy future for ships remains a problem (UNCTAD, 2021). Third, ports provide the necessary infrastructure for importing future in-demand resources, such as hydrogen or ammonia (EEA, 2021). The North Range ports have, for instance, begun a broad offense in implementing hydrogen strategies and infrastructure (for Hamburg, see HHLA, 2021; for Antwerp, Hydrogen Import Coalition, 2021; for Amsterdam, World Hydrogen Summit, 2022). European ports are particularly at the forefront of implementing sustainability measures and innovations (Hossain et al., 2021), supported by vast EU-funded projects (Nitt-Drießelmann and Wedemeier, 2021). Although sustainability adaptations come with costs and risks, they are increasingly pushed by national regulations and may present an advantage, turning the tide in the tough competition.

Digitalisation has benefited most from COVID-19 pandemic. Ports primarily faced disrupted supply chains and therefore needed to solve logistical problems (Mankowska et al., 2021; Notteboom and Haralambides, 2020). This underlined the importance and advantages of efficient digital processes, although implementing new digital infrastructure is difficult within a short time frame. In the long term, ports primarily transform their existing processes and implement new digital tools. Ports may use real-time data in all their infrastructure to enhance efficiency and decision-making. This gives ports the additional role of "information integrator and provider" (Heilig et al., 2017, 1347). New digital processes may also generate new data and information, which in turn can be used to analyse ports and improve port efficiency.

The COVID-19 pandemic had strong deglobalising effects with countries closing their borders, withholding critical resources and calling for a return to specific production facilities to Europe. These initially strongly affected ports rely on flourishing international trade and benefit from globalisation. But the resurgence of world trade in 2021 indicates that these developments will not have a lasting impact. In the long-term perspective, juxtaposed trends in recent years, e.g. the China-US trade war, Brexit, the COVID-19 pandemic and tensions over Ukraine, are on the rise, as are national foreclosures and deglobalising tendencies. There are growing numbers of geopolitical conflicts such as the war in Ukraine or Yemen, to name a few, and global changes such as the Belt and Road Initiative that could restructure competition between markets and ports. Global transport substitutes, power shifts and supply disruptions raise the geo-economic focus on the aspect of competition (Van de Putten et al., 2016). In contrast, (re-)established trade agreements such as the Regional Comprehensive Economic Partnership Agreement or the updated United States-Mexico-Canada Agreement enhance macro-regional and global trade (Flach et al., 2021). Despite calls for deglobalisation, a reversal of globalisation is not expected to produce the benefits of continuously great wage differentials between developing and industrial nations, specialisation, and the global interconnectedness through digitalisation (Dullien, 2018). However, a shift from physical to digital goods and services may take place (Straubhaar, 2021). If globalisation were to slow or be reversed to a certain extent, the immediate reaction for ports is a fall in demand and increased competition for cargo.

In summary, all three key issues ultimately affect the competition on throughput and hinterland shares,

though port adaption to these dimensions differ. (De)globalisation is an exterior force setting the stage and specific adaption is difficult. The key issues of digitalisation and sustainability are general transformations in society and economy, which will force adaption, either voluntarily, by regulation or the expectations of customers. But these issues also allow North Range ports the opportunity to strengthen their positions and gain an edge in the already tight competition within the North Range and beyond.

Conclusion

This analysis has demonstrated the importance of the North Range ports for the European economy and highlighted the advances in using maritime shipping as an early indicator. The discussed relations of ports to their respective countries' economy show similarities and imply the strong value of these relations. However, the graphical nature of the analysis can only give an overview and no conclusions on causal relations. A more sophisticated econometric analysis may provide insights into the importance of (North Range) ports and expand the knowledge on economic indicators. Additionally, the observed differences in the time series might be caused by unique events, such as massive shifts of shipping lines from one port to another or economic sanctions.

Looking ahead, ports will have to adapt to an array of challenges. In the short term, the lockdown in Shanghai and Russia's war in Ukraine will cause significant disruptions. Sustainability, digitalisation and globalisation are long-term issues, which will inevitably affect the development and competitiveness of the North Range ports. In the long run, the COVID-19 shock might weaken. It remains to be seen how the ports adapt individually and whether alliances will emerge to increase competitiveness and resilience. This may also allow sharing knowledge on key issues and jointly tackling transformation processes. However, Kappel (2022) states that the world situation has changed fundamentally as a result of the Russian war. Russia's aggressive move slows global growth on the brink of recovery from the COVID-19 pandemic. The growing supply crisis could herald a major global development. Western trading partners are looking for new leeway, but many states that are developing close to the EU and the United States are turning their backs and primarily looking for partnerships in fast-growing countries like China and India. The positioning of the North Range ports remains tense in this context.

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Intereconomics, 2022, 57(3), 199-200

JEL: J13, I18, H75, I11, J16, I12, J18

The Cost of Restricting Abortion Access

On May 2, 2022, an unprecedented leaked draft U.S. Supreme Court opinion was published. If it ends up being the final decision, it would overturn the nearly 50-year old *Roe v. Wade* decision and the 30-year old *Planned Parenthood v. Casey* decision, which recognized a national constitutional right for a pregnant individual to have an abortion. Language from particular justices in both recent oral arguments and in the draft itself suggests a willful disregard of a plethora of scientific data.

First, a few salient facts about abortion in the United States. In 2011, 45% of pregnancies were unintended; 42% of these unintended pregnancies ended in abortion (Finer and Zolna, 2016). And 24% of American women will have had an abortion by age 45 (Jones and Jerman, 2017). Even before this potential leaked decision and the state-level policies in the past year that spurred it, abortion access had been decreasing in the U.S. for over a decade, including numerous clinic closures. An increase in travel distance from zero to 100 miles to the nearest abortion facility reduces the abortion rate by 21% and increases the birth rate by 2.4%, according to Myers (2021). Myers (2022) extrapolated from these results what will happen if the draft decision comes into effect: 100,000 women will seek abortions and be unable to reach a provider, and 75,000 of them will give birth.

As an economist, I worry about the broader costs of these missed abortions. The best evidence comes from the Turnaway Study (Dobkin et al., 2014), which collected data on nearly 1,000 women who visited 30 abortion facilities across the US from 2008 to 2010. Some of their pregnancies were before the gestational age cut off and so could receive an abortion, whereas others were "turned away" as their pregnancies were too far along. While there are many papers published as part of the Turnaway Study, the most salient economics paper matches those 1,000 women with their credit bureau files from Experian. From this data, we learn that before seeking an abortion the women who were turned away were ex ante similar to those who were not (validating this natural experiment), and that those turned away had worse household financial situations for years to come (Miller et al., 2020).

As a healthcare economist, I also worry about the non-reproductive consequences. Cecile Richards, then president of Planned Parenthood Federation of America (2014), often said, "For many Americans, our doctors and nurses are the only health care providers they see." My own work has investigated the relationship between access to women's health clinics and preventive care in: Texas, Wisconsin and Ohio. We found that a 100-mile increase in driving distance to the nearest clinic (which may be the case when a clinic closed) decreases the annual utilization rates of clinical breast exams by 11%, mammograms by 18% and Pap tests by 14%. These effects are larger for women of lower educational attainment and for ethnic minorities (Lu and Slusky, 2016).

An amicus brief filed by 154 economists summarized not just this broad literature but also the causal inference methods that recently won a Nobel Prize. Unexpectedly, the brief came up in the Supreme Court's oral arguments (Dobbs v. Jackson Women's Health Organization, 2021b):

> Julie Rikelman (Lawyer from the Center for Reproductive Rights): In fact, the data has been very clear over the last 50 years that abortion has been critical to women's equal participation in society. It's been critical to their health, to their lives, their ability –
>
> Chief Justice John Roberts: I'm sorry, what kind of data is that?

David Slusky, University of Kansas, Lawrence, USA.

> Rikelman: I would refer the court to the brief of the economists in this case, your honor. It compiles data showing studies based on actually on causal inference, showing the legalization of abortion and have these benefits for women in society. Again, those benefits are clear for education, for the ability to pursue a profession, for the ability to –
>
> Chief Justice Roberts: Putting the data aside…

This exchange to me really exemplifies my key points here. First, there is an enormous wealth of economic research that shows that access to abortion and reproductive health care has broad economic benefits. Second, many of those who sit on the United States Supreme Court seem intentionally unaware of this research. Justice Alito, author of the leaked draft, writes that:

> When a concrete reliance interest is asserted, courts are equipped to evaluate the claim, but assessing the novel and intangible form of reliance endorsed by the Casey plurality is another matter. That form of reliance depends on an empirical question that is hard for anyone—and in particular, for a court—to assess, namely, the effect of the abortion right on society and in particular on the lives of women.

Professor Myers summarized this disregard of scientific data as follows: "I think we need the data. And we have it. And we gave it to them…And it just seems to not be reflected in that draft" (Kolhatkar, 2022).

Legislators, policymakers, judges and justices are free to say that economic data and conclusions are outweighed by other factors. But it is not intellectually honest to disregard these conclusions – to "put the data aside" or to claim that tangible, quantitative questions are "hard for anyone to assess". It is not hard. Economists have done the work and presented the results. Intellectually honest and morally consistent individuals in positions of power have an obligation to own the consequences of policy they make or make other policy that mitigates those consequences. Willfully ignoring those consequences is reprehensible.

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Review of European Economic Policy

Issued by

ZBW – Leibniz Information Centre for Economics
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Open Access funding provided by ZBW – Leibniz Information Centre for Economics.

Abstracted/Indexed in:

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ISSN 1613-964X (electronic edition) 0020-5346 (print edition)

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