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The European Central Bank's Bemusing 'Strategy'

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Investment in Natural Gas Capacities in the Western Balkans

The Vienna Institute for International Economic Studies
Wiener Institut für Internationale Wirtschaftsvergleiche

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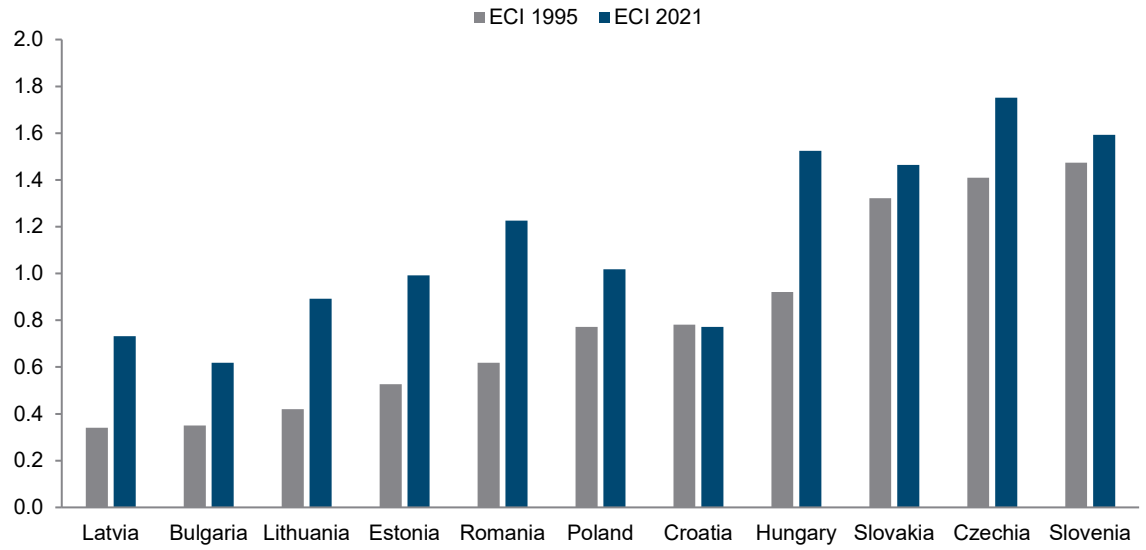
Chart of the month: Moving up the ladder of 'complexity' via structural transformation

BY FRANCESCA GUADAGNO

The chart below compares the Economic Complexity Index (ECI) of EU-CEE economies in 1995 and 2021, drawing on the recently released estimates of Harvard University's Atlas of Complexity. The ECI measures the extent to which economies are diversified and complex, based on their export basket. The key notion behind the index is that products are not alike: producing a sophisticated product (e.g. a microchip) requires more knowledge and skills than manufacturing a simple product (e.g. potato crisps). Therefore, economies that export a wide range of sophisticated products are deemed *complex*.

Figure 1 / Economic Complexity Index of EU-CEE countries in 1995 and 2021



Source: Author's elaboration, based on data from the Atlas of Complexity.

As the figure shows, Czechia has the most complex of the EU-CEE economies; it is followed by Slovenia, which was the most complex economy back in 1995. As a matter of fact, the levels of complexity of Czechia, Slovenia, Hungary and Slovakia are not too far removed from those of Germany, Austria and Sweden. However, while those EU-CEE countries have successfully mastered the *production* of complex products, they need to engage in more complex *activities* within these value chains, by moving from production to product design and R&D, thereby introducing innovation and new products and services – as advanced economies do.

The figure also illustrates the fact that virtually all the region's economies have improved their complexity index since 1995. This suggests that all the countries have undergone some growth-enhancing structural change, though in some the leap has been more pronounced than in others. Indeed, some of the economies – most notably the Baltic states, but also Bulgaria and Romania – started out from low

complexity levels in 1995 and are now converging with the other economies of the region. In those countries, more profound structural change is required to achieve further diversification and upgrading to more sophisticated products.

Croatia and Poland had similar levels of complexity to Hungary in 1995, but since then their export basket has not become significantly more complex. For those countries, the identification of complex products that could successfully be added to the export basket is paramount if they are to see convergence with the Western EU member states and sustain economic growth.

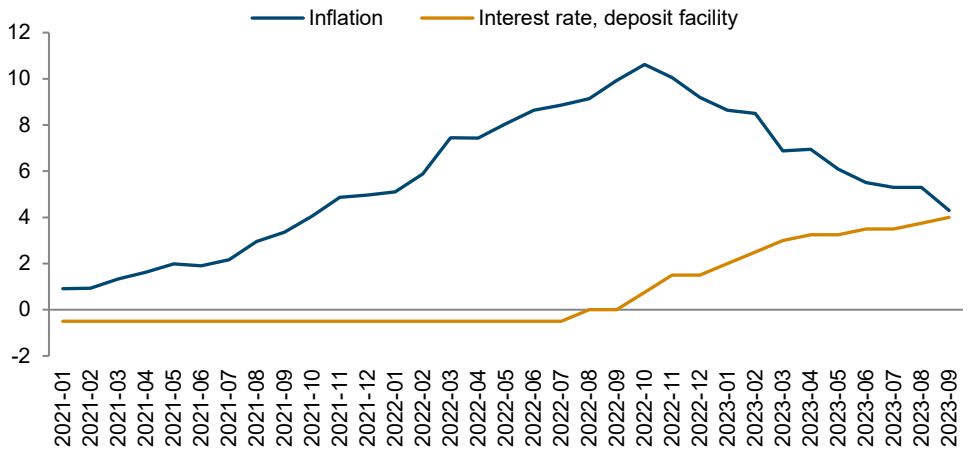
Opinion Corner*: The European Central Bank's bemusing 'strategy'

BY LEON PODKAMINER[1]

After a protracted period of inaction, in November 2022 the ECB finally embarked on policy tightening – even though inflation in the euro area had by that time already started to decline. One possible explanation for this paradox may have been the ECB's motivation to 'save face' in a situation where inflation could hardly be contained by conventional monetary policy tools.

Inflation in the euro area parted company with the European Central Bank's (ECB) inflation target of 2% as early as July 2021. After a year of relentless growth, by July 2022 annual inflation in the euro area had reached 8.9%. However, throughout that period the ECB remained unresponsive, maintaining a negative deposit rate of -0.50% (see Figure 1). The bank only 'woke up' in July 2022, when it raised the deposit rate to 0% (and the main lending rate to 0.50%). That increase was followed by a further, fairly modest rise (0.75%). None of this made any visible impression on inflation, which continued to climb, reaching 10.6% in October 2022. However, from November 2022 onwards it began to decline quite steadily. (Paradoxically, at least from a mainstream point of view, disinflation has been running in parallel to the falling unemployment rate. This calls into question the desirability of monetary tightening, the main justification for which is the need to cool the economy – by provoking a rise in unemployment.)

Figure 1 / Inflation in the euro area and deposit rate of the ECB, %



Note: Inflation is measured by the Harmonised Index of Consumer Prices.
Source: Eurostat, ECB.

* Disclaimer: The views expressed in the Opinion Corner section of the Monthly Report are exclusively those of the authors and do not necessarily represent the official view of wiiw or the National Bank of Poland.

[1] Advisor to the President of the National Bank of Poland (NBP) and a research associate at wiiw. An earlier version of this text was published (in Polish) in *Rzeczpospolita* on 25 June 2023: https://www.rp.pl/opinie-ekonomiczne/art38653091-leon-podkaminer-strategia-ebc-jest-zdumiewajaca

However, it was precisely in November 2022 that the ECB felt an urgent need to demonstrate its determination to 'fight' inflation. From then on, policy rates began to be raised regularly. By October 2023, the deposit rate had reached 4% and the main lending rate 4.5%. Meanwhile, inflation continued its downward trend, reaching a mere 4.3% in September.

How do we explain the ECB's extraordinary passivity in a period of accelerating inflation – and its extraordinary hyperactivity in a period of accelerating deflation? Incidentally, we see similar phenomena in the US and the UK: there, too, the central banks took a long time to react to the rising inflation, but are now apparently over-reacting as inflation falls. Undoubtedly, in the euro area the shift from passivity to over-reaction can be explained in several ways. For example, the ECB may have 'cottoned on' to the fact (albeit with some delay) that it was, after all, dealing with an inflation that required a response. Or else some previously absent inflationary factors had emerged in the meantime, necessitating a pre-emptive response (even if, to simple-minded folk, inflation seemed to be cooling down anyway). Any such explanation assumes that something had changed – either the economic reality or the ECB's perception of it.

It cannot be ruled out that such 'rational' explanations for the change from passivity to hyperactivity are indeed correct. However, there is another explanation that is worth considering. Namely, that in both periods (i.e. of passivity and hyperactivity) the ECB may have been motivated by one and the same imperative: to 'save face'.

Passivity in a period of rising inflation may have reflected a belief (possibly nurtured at the ECB) that hiking interest rates would not significantly affect the rising inflation – which was mainly driven by supply-side factors, such as increasing food and energy prices. In that situation, any ECB activity would serve only to demonstrate that in fact its monetary policy could achieve fairly little... Ergo, in order to save face, the ECB would be better off doing nothing.

Conversely, in a period of falling inflation, it may be desirable to demonstrate assertiveness – and to take credit for the disinflation already under way. But inflation tumbling without any action on the part of the ECB? Well, that would suggest the ECB's monetary policy is largely just for show. Ergo, in this situation it is beneficial for the ECB's image to 'do something' – even if, for the real economy, nothing good can come of it.

Patents as green technology barometers: Trends and disparities

BY MAHDI GHODSI AND ZAHRA MOUSAVI[1]

As the urgency of the climate crisis grows, this study offers a unique perspective on eco-innovation, through the analysis of patents granted in green and environmental technologies. The research identifies energy generation and transportation as the leading sectors, with 36% and 34%, respectively, of all green patents granted globally. However, while the advanced economies are at the forefront of green innovation, the developing nations are lagging significantly behind. This inequality not only exacerbates climate vulnerabilities, but also widens the global divide.

INTRODUCTION

Climate change is undeniably one of the most significant threats to humanity, and its severity is becoming increasingly evident over time. According to the Copernicus Climate Change Service (C3S),[2] July 2023 marked the hottest month on record globally, and there is the likelihood of even hotter Julys in the future. Wildfires have been raging worldwide, from California and Canada to Spain and Greece. In its latest report, the Intergovernmental Panel on Climate Change (IPCC), a United Nations body with a focus on environmental change, emphasises the urgent need to secure a liveable and sustainable future for all, noting that the window of opportunity is rapidly closing.

Thus, urgent action is required to combat climate change, and technology plays a crucial role in this. Given that technological innovations are essential to mitigate climate change, they must be carefully identified, measured and analysed, in order to pinpoint the most critical areas requiring a policy response. The analysis of environmental technologies can assist policymakers in crafting more effective policies to promote green innovations, and to foster new business opportunities and emerging markets. This article measures the stock of those technologies that could help mitigate climate change consequences, using the number of patents granted for novel green and environmental technologies, and exploring their evolution across different categories, sectors and countries over recent decades.

HOW DO WE MEASURE INNOVATION IN ENVIRONMENTAL TECHNOLOGIES?

Innovation typically begins with an initial idea, which is then developed through capital investment. A successful innovation often culminates in a new product or a novel production procedure. To safeguard the intellectual property of such an innovative process from plagiarism or theft, inventors register their innovation with a patent office. Consequently, patents are considered to be the ultimate outcome of an innovative process. If the patent application is deemed novel and innovative – meaning that the same innovation has not been patented previously – the office grants the patent, and its intellectual property is

1 Ferdowsi University of Mashhad, Iran.

2 https://climate.copernicus.eu/july-2023-warmest-month-earths-recent-history

then protected across international jurisdictions. Businesses can then utilise the patent granted to produce the novel product or to implement the innovative production procedure. As a result, obtaining patents and securing patent grants can significantly increase a firm's market share, turnover and valuation (Kline et al., 2019; Farre-Mensa et al., 2020; Exadaktylos et al., 2021).

Thus, one can use the number of patents granted as a very rigorous and robust way of measuring innovation. However, as with any other research, patents should identify the technological category in which they are innovating. There are more than 240,000 technology classes defined in the Cooperative Patent Classification (CPC), which is managed by the European Patent Office (EPO) and the US Patent and Trademark Office. This classification system is an extension of the International Patent Classification (IPC) managed by the World Intellectual Property Organization (WIPO). Basing their work on CPC, Haščič and Migotto (2015) identify six major categories of technologies that can mitigate climate change and environmental degradation. These are: 1- Environmental management; 2- Water-related adaptation technologies; 3- Climate change mitigation technologies related to energy generation; 4- Capture, storage, sequestration or disposal of greenhouse gases (GHG); 5- Climate change mitigation technologies related to transportation; 6- Climate change mitigation technologies related to buildings.

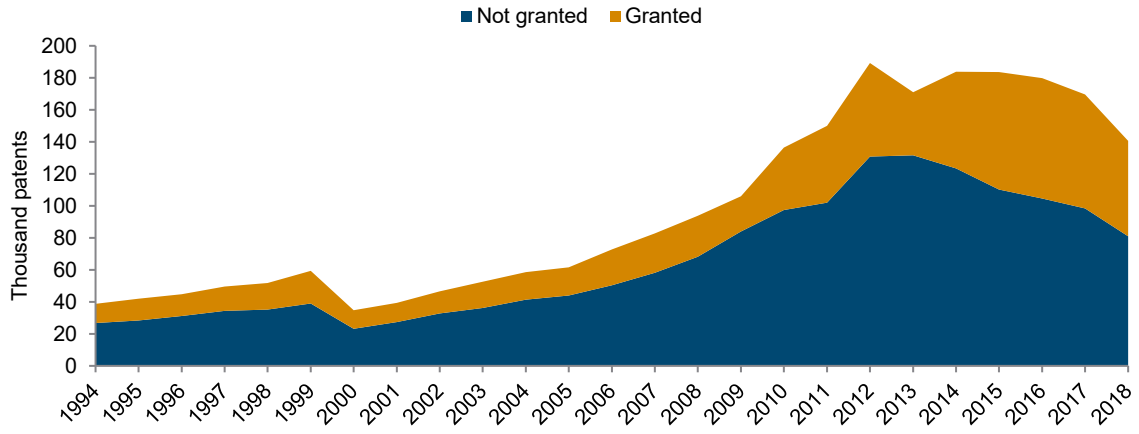
Using patent and company-level data collected from Amadeus, which is provided by Bureau van Dijk (BvD), we have compiled a dataset on environmental patents owned by businesses in the global economy. Then, using the sector of activity of firms reported in the Orbis data (again provided by BvD), we identify environmental innovations across sectors and countries. The date of publication of the patent is used to identify the year of patenting. However, regardless of whether or not it is granted, a patent application is published at most 18 months after the 'priority date' (that is, the first time the application is filed with a patent office). It then takes an average of 10 months (though sometimes up to six years) after the publication date to provide a decision on whether or not the patent is to be granted (Farre-Mensa et al., 2020).

EVOLUTION OF ENVIRONMENTAL TECHNOLOGIES OVER THE YEARS

Figure 1 presents the development of environmental patents in the period 1994-2018. Over this period, around 32% of all published patents applications citing environmental technologies were granted. The proportion of patents granted rose to 42% in the final years under consideration. The slight reduction in the total number of patents since 2015 could be a result of problems in data collection encountered by Amadeus, which ceased to provide data after 2020. Thus, more recent years do not report patents comprehensively.

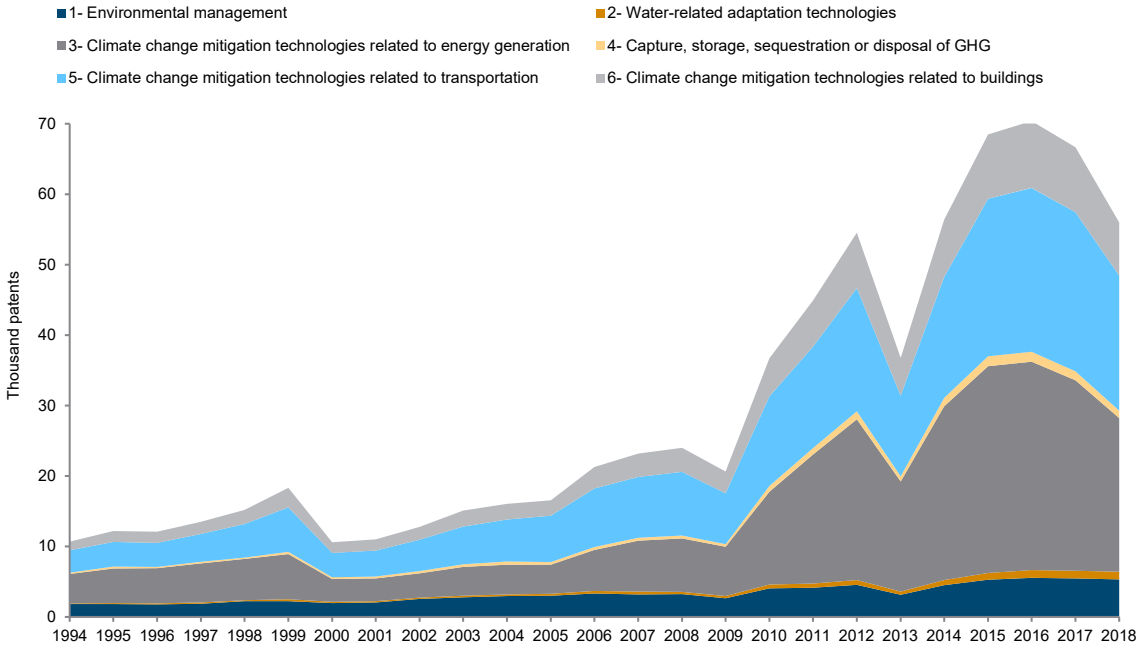
Figure 2 shows the number of patents granted globally across the six categories of environmental technologies over the period 1994-2018. Even a cursory glance makes it plain that the two categories of 'climate change mitigation technologies related to energy generation' and 'climate change mitigation technologies related to transportation' accounted for by far the greatest number of environmental patents in each year: their average share in the total number of environmental patents granted over the whole period was 36% and 34%, respectively. These general figures show that those two technologies are the most prominent green technologies adopted by global firms. This is because many advanced economies have introduced policies to develop these technologies, which are crucial in reducing the consumption of fossil fuels and cutting the consequent emissions.

Figure 1 / Number of global environmental patents, granted versus not granted, 1994-2018



Source: Amadeus, Orbis, authors' calculations, downloaded March 2022.

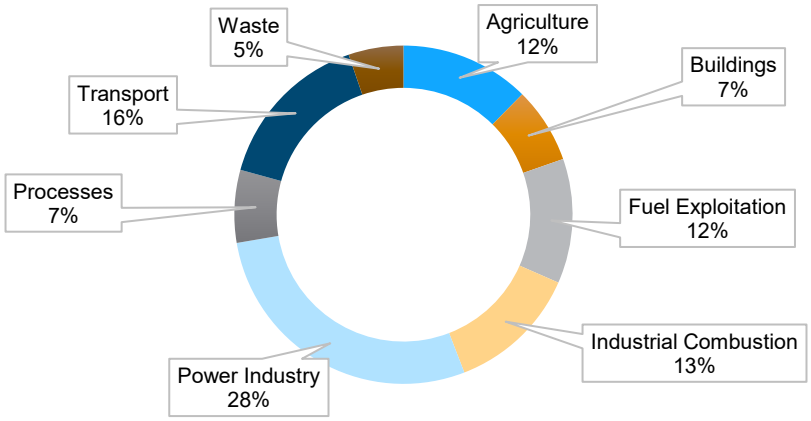
Figure 2 / Number of patents granted globally in six categories of environmental technologies



Source: Amadeus, authors' calculations, downloaded March 2022.

The fact that energy and transportation lead the way in the number of green patents granted squares with the pivotal role of these two sectors in global GHG emissions (Figure 3). Energy and transportation stand out as the two primary sources of global warming over the past couple of centuries. According to Monforti-Ferrario et al. (2021), energy production emitted a staggering 14.77bn tonnes of greenhouse gases in 2022, accounting for approximately 28% of the total. The transportation industry, which produced 8.10bn tonnes of emissions (or roughly 16% of the global total) ranks as the second-largest emitting sector.

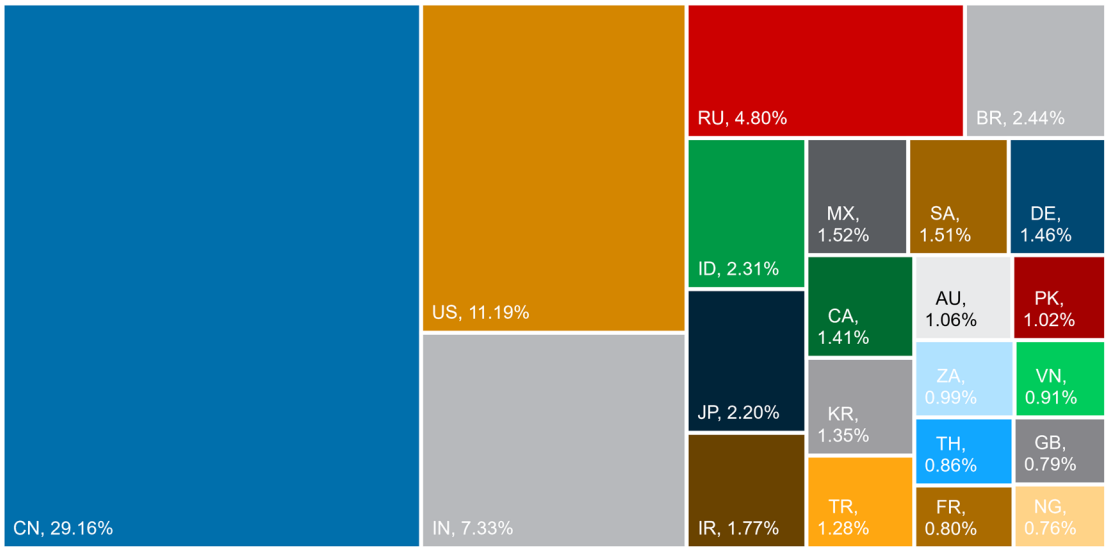
Figure 3 / Global greenhouse gas emissions, by sector, in 2022



Source: Joint Research Centre (JRC) of European Commission, in Monforti-Ferrario et al. (2021).

By contrast, water-related adaptation technologies have seen limited development over the years compared to other technologies, despite its notable growth since 1994. One could argue that, since the advanced economies are primarily situated in regions with abundant water resources, adequate financial resources and policies may not have been devoted to the development of these critical technologies. Such innovations are particularly vital for less-developed economies in Africa and emerging economies in the Middle East.

Figure 4 / Top 22 countries emitting GHGs in 2022, percentage of global total



Source: Joint Research Centre (JRC) of European Commission, in Monforti-Ferrario et al. (2021).

In many cases, developed nations tend to prioritise their domestic challenges, with the focus primarily on reducing emissions – as is evident from their technological development efforts. While 23 wealthy economies account for half of the total accumulated carbon emissions from 1750 to 2020, in recent decades those economies have made great strides in becoming greener and emitting fewer greenhouse

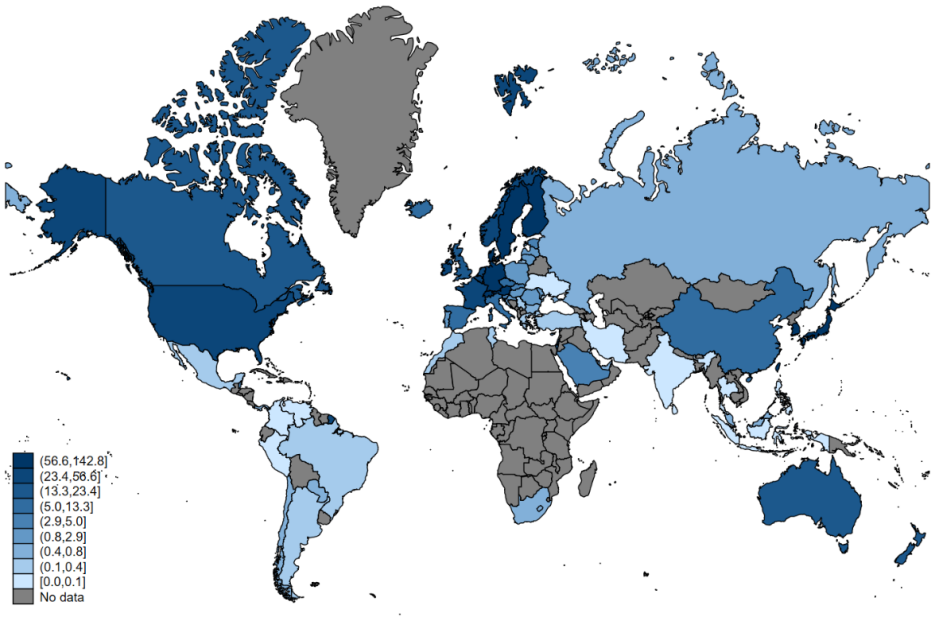
gases.[3] As is shown in Figure 4, by 2022 the top ranking for global GHG emissions had shifted to such emerging economies as China, India, Russia, Brazil and Indonesia. Given the limited access to the knowledge and resources necessary for technology development in developing and emerging countries, these unique challenges may persist, exacerbating the climate change vulnerability gap between the developed and the developing world.

WHICH COUNTRIES PATENT MORE?

Advanced economies clearly dominate innovation in environmental technologies (Figure 5). Denmark is the top innovator in green technologies, with 142.79 patents granted per million inhabitants, followed by South Korea with 138.42, Japan with 135.34, Switzerland with 124.26 and Germany with 84.48 per million inhabitants – all countries at the forefront of environmental technology development. Notably, even non-advanced economies such as China and Saudi Arabia are making significant strides in these technologies.

One major factor contributing to greater innovation in the Northern European and Scandinavian countries may be the imminent threat of climate change – particularly rising sea levels, which could endanger these regions. Since 1880, global sea levels have risen by 21-24 cm due to global warming (Church and White, 2011). However, this is not the sole reason: the most critical factor is the implementation of policies in those countries that support innovation and the development of new technologies and increased R&D expenditure. In the latest Climate Change Performance Index, released in 2023, Burck et al. (2022) rank Denmark, Morocco and the Netherlands as the top three countries in implementing climate policies. The other Northern European and Scandinavian countries all receive a medium rating for their performance.

Figure 5 / Number of patents granted in environmental technologies per million inhabitants, averaged over period 2015-2018



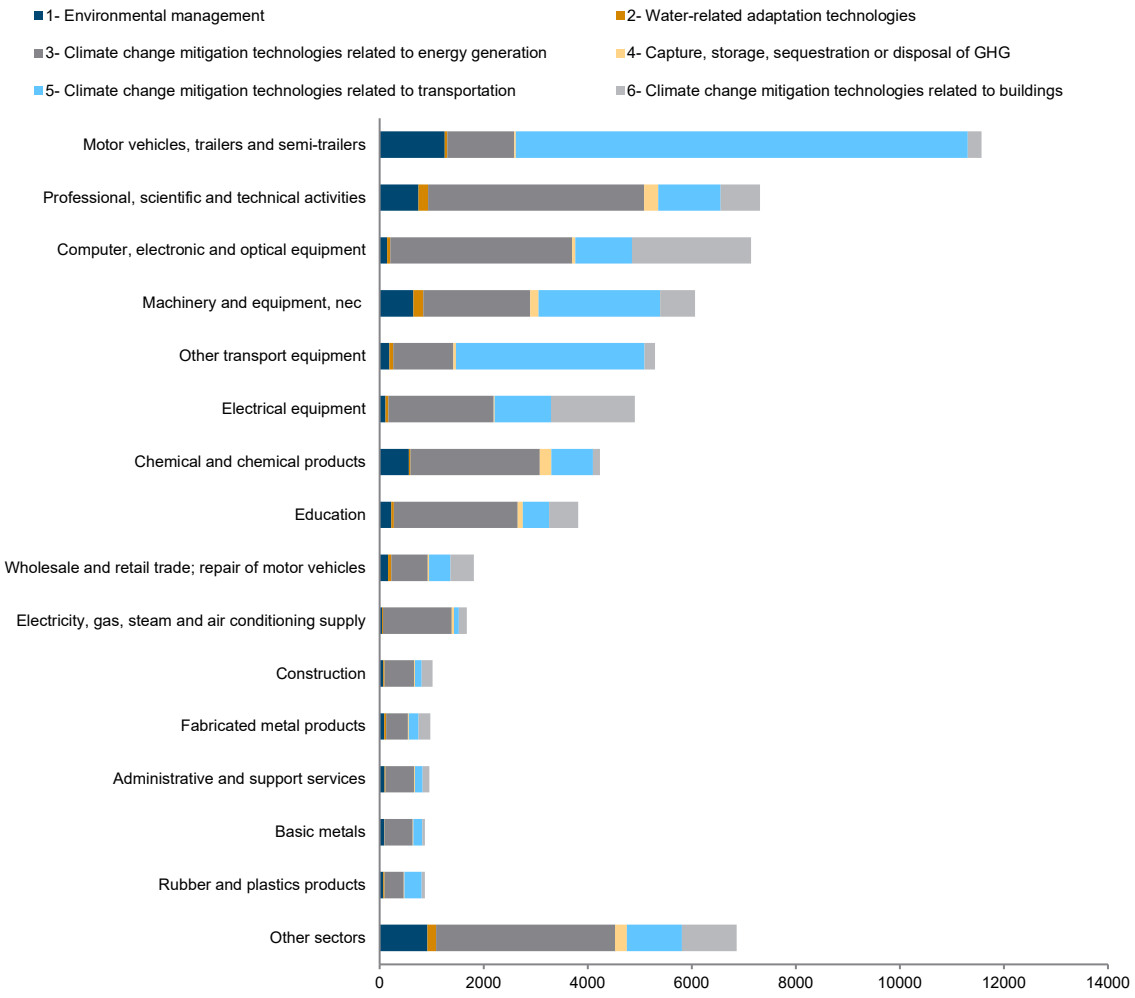
Source: Amadeus, authors' calculations, downloaded March 2022.

[3] https://www.nrdc.org/stories/rich-polluting-nations-still-owe-developing-world

WHICH SECTORS ARE PARTICULARLY INNOVATIVE?

Figure 6 presents the average annual number of patents in environmental technologies across the globe, categorised by sector and averaged over the period 2015-2018. In general, high-tech manufacturing sectors and knowledge-intensive service sectors stand out as the most innovative segments of the global economy, particularly the manufacture of automobiles. It is hardly surprising that 75% of the patents in this sector should relate to transportation; this squares with the fact that transportation has historically been the second-most polluting sector (as discussed above). According to the US Environmental Protection Agency,[4] 58% of GHG emissions in the transportation sector are produced by light-duty vehicles, 23% by medium- and heavy-duty trucks, 8% by aircraft and only 2% by rail transport. The emergence of novel technologies in the sector of motor vehicles over the past three decades has mostly been visible in manufacturers of light-duty electric vehicles or trucks, and has been aimed at significantly reducing emissions.

Figure 6 / Total annual number of patents granted, by sector and type of environmental technology, averaged over period 2015-2018



Source: Amadeus, authors' calculations, downloaded March 2022.

[4] https://www.epa.gov/greenvehicles/fast-facts-transportation-greenhouse-gas-emissions

The second-most innovative sector is the services sector, encompassing professional, scientific and technical activities. Approximately 57% of patents in this sector concern climate change mitigation technologies related to energy generation, while around 16% are related to transportation.

The third-most innovative sector is the manufacture of computers, electronic and optical equipment. Roughly 49% of green patents in this digital manufacturing sector – which is the driving force behind the modern global economy – are focused on energy generation. Additionally, approximately 32% of patents in this sector are related to buildings, which could include consumer electronic devices and appliances used within buildings, such as air conditioners.

The fourth-most innovative sector is the production of machinery and equipment, where 38.5% of the patents granted related to transportation and 33.9% to energy generation. In addition, 11.1% related to buildings and 10.6% to environmental management.

The fifth-most innovative global sector is the production of other transport equipment: 68.5% of the patents granted in that sector related to transportation and 21.9% to energy generation. In particular, the growth of air transport and the expansion of global aviation (included under 'other transport equipment'), which has facilitated commercial passenger transportation, is thought to account for 1.9% of all GHG emissions and 2.8% of global CO_2 emissions.[5] According to Lee et al. (2020), from 1940 to 2018 global aviation released a total of 32.6bn tonnes of CO_2, with approximately half of this occurring within the past two decades. As of 2018, carbon dioxide emissions from aviation accounted for approximately 2.4% of overall human-generated CO_2 emissions, including land-use changes. However, other fuels – such as helium or hydrogen – have failed to make major inroads as aviation fuel. Any technology that is capable of replacing the fuels currently available with renewable energy could significantly reduce emissions in the transportation sector.

POLICY RECOMMENDATIONS

In recent decades, many businesses within the global economy have succeeded in developing innovative green technologies, resulting in the granting of numerous patents. The ownership of these vital technologies is concentrated primarily in the developed world. The advanced economies of the northern hemisphere possess the financial wherewithal to implement policies that support the advance of green technologies, while also allowing inventors to safeguard their intellectual property rights to these globally significant innovations. By contrast, the global South and the least-developed nations find themselves most vulnerable, lacking access to such advances and struggling with severe drought conditions and other immediate consequences of global warming. These ongoing vulnerabilities serve as driving factors for both internal and external migration, potentially leading to increased waves of climate-induced migration towards the environmentally advanced Northern countries. The least-advanced economies lack the financial and human capital resources required to develop and adopt the crucial technologies for mitigating climate change.

Meanwhile, climate change has exacerbated economic inequality across countries. Diffenbaugh and Burke (2019) showed that the economic inequality between the wealthiest and the poorest nations has

[5] https://ourworldindata.org/co2-emissions-from-aviation#:~:text=In%20this%20article%20we%20take,2.5%25%20of%20CO2%20emissions

increased by 25% more than it would have done without global warming. Therefore, the wealthy nations, which account for most of the GHG emissions so far, have an ethical responsibility to tackle the crisis they have contributed to. According to the United Nations Intergovernmental Panel on Climate Change (IPCC, 2023), by the end of this decade the developing countries may require up to USD 300bn annually for adaptation measures.

A recent study by Ghodsi and Jovanovic (2022) underscores the significance of foreign direct investment (FDI) as a powerful tool for transferring green technologies from various parts of the world to advanced economies like Austria. Consequently, it is imperative that international organisations (including the United Nations) take the lead – with the support of advanced economies – in shaping global policies aimed at attracting environmentally friendly FDI to poor countries and at developing green technologies that are accessible to the least-developed countries. Such policies have the potential not only to facilitate the transfer of knowledge, expertise and technology from the resource-rich Northern countries, but also to create employment opportunities and promote development in the global South and the least-developed nations.

The spectrum of green technologies is vast and diverse, and offers multifaceted benefits to global society. For instance, one such policy initiative could empower economically robust advanced economies to develop cutting-edge technologies, patented by firms, to desalinate seawater and purify waste water. Such innovations could significantly enhance living conditions and agricultural output in vulnerable regions across the world.

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Investment in natural gas capacities in the Western Balkans

BY BERND CHRISTOPH STRÖHM

Russia's military invasion of Ukraine in February 2022 forced those EU countries that relied on Russian gas to diversify their energy supplies. In the Western Balkans, Croatia in particular is transitioning to become a regional energy powerhouse and power hub, while the governments of Montenegro and Serbia are also investing in the expansion of natural gas capacities. With those investments, LNG could temporarily become the main energy source for Western Balkan countries and could facilitate the phasing-out of coal use in the region by 2050.

CROATIA'S DEVELOPING ROLE AS 'ENERGY POWERHOUSE' IN SOUTHEAST EUROPE

The liquefied natural gas (LNG) terminal at Omišalj, on the island of Krk, is already playing an important role in Croatia's natural gas market, which accounts for 48% of the country's energy needs. Croatia began acquiring LNG through the terminal in 2020, and in 2021 it handled approximately 23% of the natural gas consumed in Croatia; meanwhile, only 28% was imported from Russia and approximately 30% was produced domestically. The terminal was deemed by the EU to be strategically significant, which is why its construction received a subsidy of EUR 101.4m, having been listed as one of the EU's Projects of Common Interest.[1]

Moreover, in the context of the move to expand the European energy market and enhance the security of gas supplies for EU member states, the Krk terminal has a geopolitical and strategic component. In particular, EU countries of Central and Southeast Europe are seeking to reduce their reliance on Russian gas: they would like to establish new and safe gas supply routes, in light of Russia's decision last year to cut gas supplies to Poland and Bulgaria (after those countries refused to switch to payment in Russian roubles, as demanded by Russia) – a decision that adversely impacted the energy security of the EU and the Western Balkan region. With Croatia's strategic position between Western and Eastern Europe, the terminal could serve as an LNG distribution point for neighbouring countries such as Italy, Austria, Hungary, Romania and Slovenia, as well as for Western Balkan countries such as Serbia and Bosnia and Herzegovina. Croatia could thus become a regional heavyweight on the energy market, similar to Germany with its LNG terminals.

In August 2022, in a further bid to diversify Croatia's gas supplies, the government announced that it would invest EUR 180m in expanding the capacity of the Krk LNG terminal and in constructing a new gas pipeline: Croatia is hoping to expand the annual capacity of the LNG terminal from 2.9bn to 6.1bn cubic metres.[2] For that, the country needs partners to help it gain EU co-financing. The country already has Germany and Austria on board in its attempts to persuade the European Commission to fund LNG

1 See https://lng.hr/en/about-terminal/ (accessed on 1.8.2023).

2 See https://balkangreenenergynews.com/croatia-plans-to-expand-lng-terminal-on-krk-island/ (accessed on 1.8.2023).

expansion projects through the Connecting Europe Facility (CEF) or the REPowerEU scheme (which envisages a total investment of EUR 210bn to end the EU's reliance on Russian fossil fuels by 2030). Croatia will likely use the funds to expand its pipeline infrastructure to Austria and southern Germany, so as to be able to deliver gas and green hydrogen. An agreement on that was reached during a meeting that Croatia's Prime Minister Plenković had with Austrian Chancellor Nehammer and Bavarian Premier Söder at the LNG terminal on the island of Krk in November 2022.[3] In April 2023, the foreign ministers of Austria and Slovenia announced that both of their countries would support Croatia's plans to increase the total storage capacity at the Krk LNG terminal, as a means of strengthening EU energy independence.

The Croatian government also decided to boost its own production of hydrocarbons between 2022 and 2024 by about 30%. The state-owned INA oil and gas company began drilling for natural gas in the northern Adriatic's Ika gas field in March 2022, with a view to producing an additional 55m cubic metres of gas per year, or about 7% of INA's total annual output.[4]

Finally, in May 2023, Economy Minister Filipović announced that Croatia was supporting plans to accelerate the Adriatic-Ionian pipeline project, which seeks to facilitate the transport of gas from Azerbaijan into the country by constructing a gas pipeline from Albania through Montenegro and Bosnia and Herzegovina to Croatia – another project aimed at strengthening Croatia's strategic position as an energy hub in Southeast Europe.

Despite those investments, Croatia is still planning to comply with its National Energy Development Strategy for achieving carbon neutrality by 2030. To hit this target, it can only utilise LNG as a transitional energy source. Taking advantage of Croatia's Adriatic coastline, the government is also investing in the development of solar and wind power: its target is to expand Croatia's solar power capacities from 160MW to 7GW, and to double the country's wind power capacity from the current 1GW. Those measures are necessary in the long term to facilitate the country's planned coal power plant phase-out by 2033.[5]

SOUTHERN GAS INTERCONNECTION PROJECT TO DIVERSIFY BOSNIA AND HERZEGOVINA'S ENERGY SUPPLIES

In February 2023, the Croatian government announced that it was going to take part in a project aimed at connecting its natural gas pipeline network and the Krk LNG terminal with the network of neighbouring Bosnia and Herzegovina. Thereby, Croatia wants to accelerate the Southern Gas Interconnection, a proposed EUR 100m project aimed at building a 180 km cross-border pipeline between Croatia and Bosnia and Herzegovina, in a bid to reduce the latter's total dependence on Russian gas.[6]

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3 See https://www.kleinezeitung.at/wirtschaft/6219739/Terminal-Krk_Fluessiggas-soll-ueber-Kroatien-nach-Oesterreich-fliessen (accessed on 1.8.2023).

4 See https://glashrvatske.hrt.hr/de/wirtschaft/ina-beginnt-mit-neuen-erdgasbohrungen-an-der-nordadria-6255406 (accessed on 3.8.2023).

5 See https://www.iene.eu/croatia-aims-for-role-as-eastern-europes-energy-gateway-p6820.html (accessed on 3.8.2023).

6 Rozansky et al. (2023).

The first gas pipeline interconnector within the framework of this project will have a capacity of 1.5bn cubic metres per year. The pipeline will consist of a 74 km Split–Imotski section in Croatia and a 74 km Bosnian section to Novi Travnik, with a 53 km branch to Mostar.[7]

Figure 1 / Proposed and existing gas supply systems in Bosnia and Herzegovina

Note: UGS – underground gas storage facility.
Source: WBIF (2018).

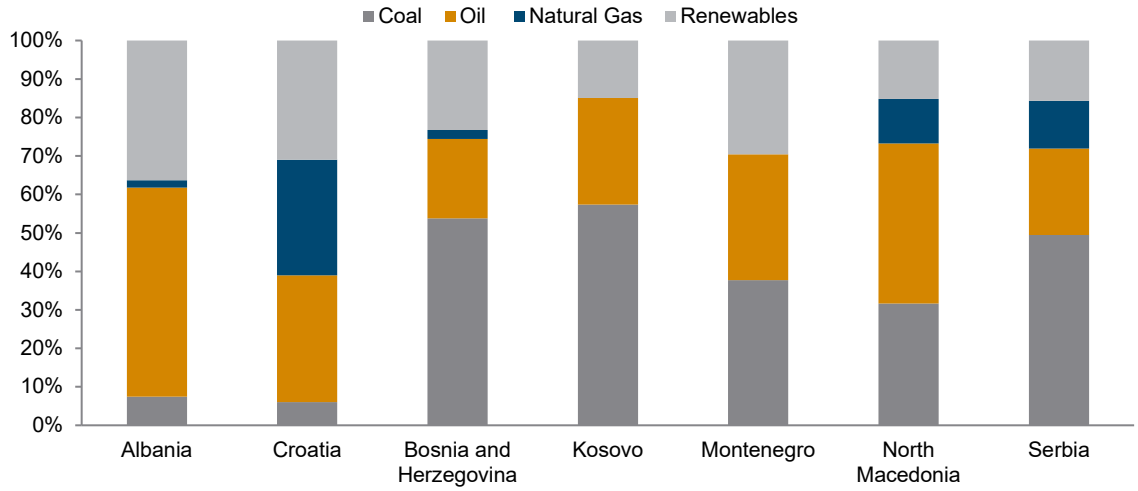
Natural gas is still an underutilised energy source in Bosnia and Herzegovina, compared to e.g. Croatia or Serbia. Despite the fact that it pledged to phase out coal by 2050, coal remains the main source of energy in the country, accounting for 56% of total energy consumption in 2020; of the Western Balkan countries, only Kosovo had a higher share (Figure 2). In particular, coal is the fuel source used most for electricity production in Bosnia and Herzegovina: in 2021, over 61% of all the electricity generated in the country was sourced from lignite, of which the country has an abundance. Hydropower accounted for another 35%, while solar and wind power plants provided only 5% of the country's electricity.[8]

7 Wankiewicz (2023).

8 Statista: Distribution of electricity generation in Bosnia and Herzegovina in 2022, by source, https://www.statista.com/statistics/1234901/bosnia-and-herzegovina-distribution-of-electricity-production-by-source/

The planned Southern Gas Interconnection between Bosnia and Herzegovina and Croatia will further diversify the former country's energy supplies and increase the share of gas in its energy mix: that can be regarded as a temporary solution toward reducing the country's carbon footprint. Due to the country's heavy reliance on coal as an energy source, towns in Bosnia and Herzegovina are among the most polluted in Europe. The use of gas as a transition fuel could help the country become carbon neutral by 2050.

Figure 2 / Energy mix of Western Balkan countries (2020)



Source: OECD (2022); IRENA (2023).

SERBIA'S INVESTMENT IN DIVERSIFICATION OF ITS GAS SUPPLIES

In light of Serbia's heavy reliance on Russian gas, the government is also actively investing in diversification by expanding the country's gas supplies, with the planned construction of a new underground gas storage (UGS) facility and with additional gas supplies from Greece in 2023. With the construction of the UGS facility, Serbia aims to have a total of 2bn cubic metres of gas stored annually (it currently stores 450m cubic metres at the Banatski Dvor facility, in which the Russian state-owned Gazprom company has a 51% stake).

The construction of a 170 km natural gas pipeline between Bulgaria and Serbia may be regarded as a strategically important investment for Serbia's energy diversification – this will facilitate the flow of non-Russian gas from the Bulgarian town of Novi Iskar to the Serbian city of Niš. The Bulgarian government has announced that it should be operational by the end of 2023.

The Serbian government's intention of shutting down ten of the country's coal-powered plants by 2035 and of completely removing coal from its energy mix by the end of 2050 at the latest is very ambitious. As with most Western Balkan countries, Serbia relies heavily on coal as an energy source – almost 50% of Serbia's energy consumption was sourced from coal in 2020 (Figure 2). Nevertheless, according to a draft bill from April 2023, the Serbian government intends to invest EUR 4.8bn in additional renewable

energy sources over the next 15 years, in order to boost the country's renewable energy output from 3GW to 7GW.[9]

MONTENEGRO'S INVESTMENT IN LNG INFRASTRUCTURE

In May 2023, the Montenegrin government signed a memorandum of understanding with the North American companies Enerflex Energy Systems and Wethington Energy Innovation, aimed at facilitating the construction of an LNG terminal at Bar, due to launch operations by the end of 2025. The planned offloading pier of the terminal will be able to handle 25,000 barrels per hour, and the storage facility will have an approximate capacity of 250,000 barrels (0.5bn cubic metres). The agreement signed envisages an investment of between EUR 130m and EUR 250m. The Serbian government was quick to express an interest in purchasing gas from the planned Bar terminal, from which it would take more than 2.7m cubic metres daily.[10] The Bar LNG terminal could supply gas not only to Montenegro and Serbia, but also to other neighbouring countries, most notably Bosnia and Herzegovina, Kosovo and Albania.

CONCLUSION

Gas is still heavily underutilised as an energy source in the Western Balkans – partly a consequence of the lack of inter-state gas pipeline interconnections. Albania, Bosnia and Herzegovina, Kosovo, Montenegro, North Macedonia and Serbia rely mostly on coal and hydropower to generate their electricity. In Serbia, Bosnia and Herzegovina and North Macedonia, the gas that is used goes mainly on heating and electricity generation. Albania, Kosovo and Montenegro utilise hardly any gas, as they lack the infrastructure necessary to import gas and to operate distribution networks.[11] Croatia's investment in the construction of the Southern Gas Interconnection pipeline, Serbia's construction of a new gas pipeline linking it with Bulgaria, and Montenegro's plan to construct its own LNG terminal will likely contribute to an upsurge of gas in the region's energy mix.

Investment in the expansion of LNG and gas transportation capacities offers only a temporary solution to the problem of energy security in the Western Balkans, given the region's efforts to align itself with the EU's ambition of achieving carbon neutrality by 2050. The use of LNG as a non-Russian energy source must not result in the countries being 'locked into' gas: alongside LNG and alternative gas routes, the governments of Western Balkan countries should also focus their investment on renewable energy, such as hydro and solar, for which there is huge untapped potential in the region. Nevertheless, in light of the region's heavy reliance on coal, gas could become a viable transitional energy source until such time as investment is completed in the expansion of renewables in the region, also supported by EU funds. The expansion of gas consumption could assist in the region's transition to a low-carbon economy.

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9 See https://www.energetika.net/eu/novice/envision/new-serbian-legislation-foresees-coal-phase-out-by-2050 (accessed on 10.8.2023).

10 See https://balkaninsight.com/2023/07/10/serbia-ready-to-use-planned-gas-terminal-in-montenegro (accessed on 10.8.2023).

11 Rozansky et al. (2023).

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Monthly and quarterly statistics for Central, East and Southeast Europe

The monthly and quarterly statistics cover **22 countries** of the CESEE region. The graphical form of presenting statistical data is intended to facilitate the **analysis of short-term macroeconomic developments**. The set of indicators captures trends in the real and monetary sectors of the economy, in the labour market, as well as in the financial and external sectors.

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Conventional signs and abbreviations used

%	per cent
ER	exchange rate
GDP	Gross Domestic Product
HICP	Harmonised Index of Consumer Prices (for new EU member states)
LFS	Labour Force Survey
NPISHs	Non-profit institutions serving households
p.a.	per annum
PPI	Producer Price Index
reg.	registered
y-o-y	year on year

The following national currencies are used:

ALL	Albanian lek	HUF	Hungarian forint	RSD	Serbian dinar
BAM	Bosnian convertible mark	KZT	Kazakh tenge	RUB	Russian rouble
BGN	Bulgarian lev	MKD	Macedonian denar	TRY	Turkish lira
BYN	Belarusian rouble	PLN	Polish zloty	UAH	Ukrainian hryvnia
CZK	Czech koruna	RON	Romanian leu		

EUR euro – national currency for Montenegro, Kosovo and for the euro-area countries Estonia (from January 2011, euro-fixed before), Latvia (from January 2014, euro-fixed before), Lithuania (from January 2015, euro-fixed before), Slovakia (from January 2009, euro-fixed before), Slovenia (from January 2007, euro-fixed before) and Croatia (from January 2023, euro-fixed before).
Sources of statistical data: Eurostat, National Statistical Offices, Central Banks and Public Employment Services; wiiw estimates.

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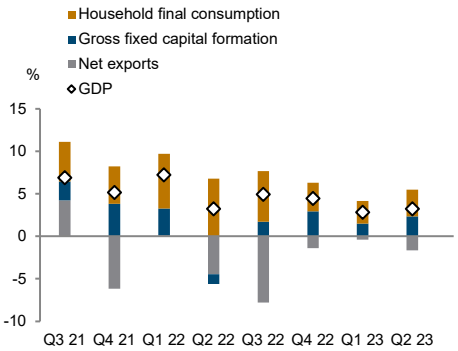
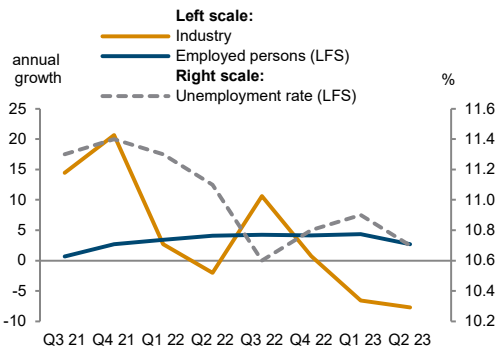
Albania

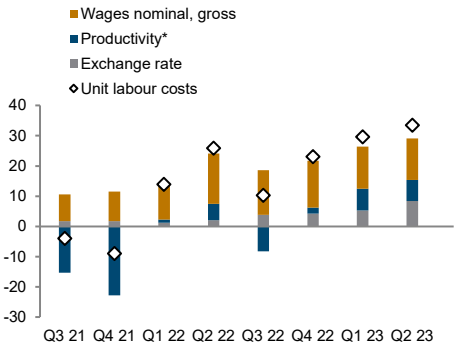
Real GDP growth and contributions
y-o-y



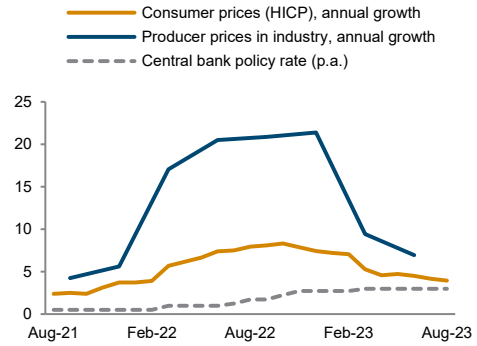
Real sector development
in %



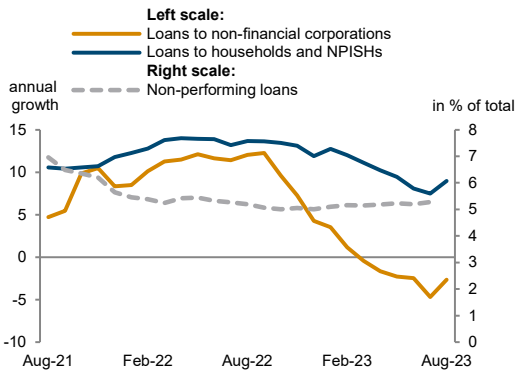
Unit labour costs in industry
annual growth rate in %



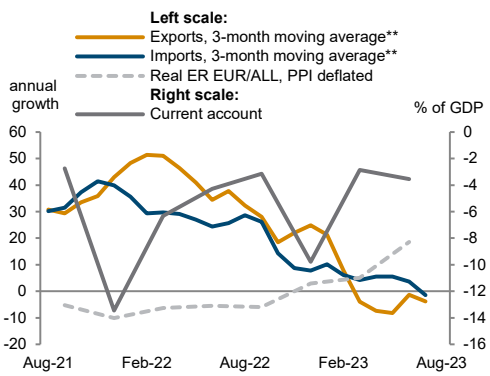
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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**EUR based.

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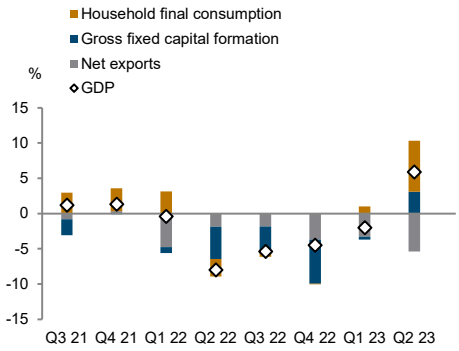
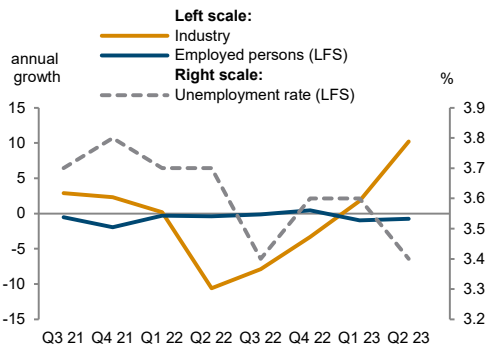
Belarus

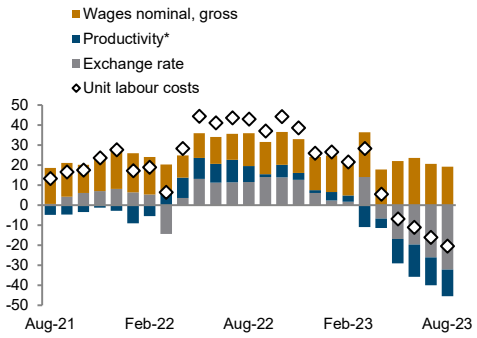
Real GDP growth and contributions
y-o-y



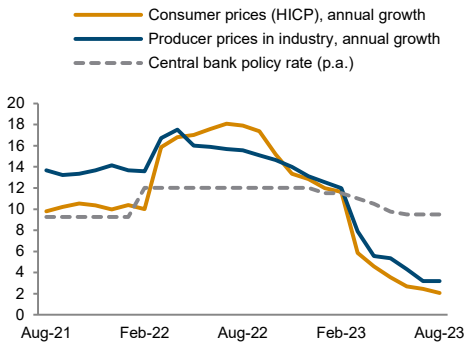
Real sector development
in %



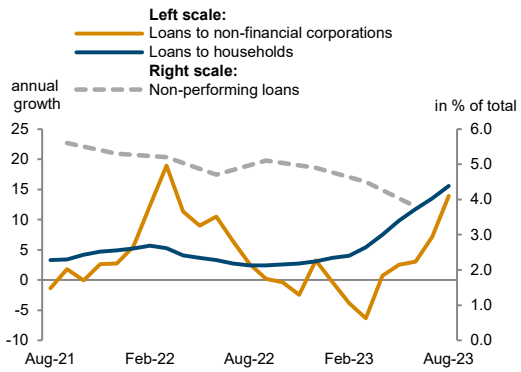
Unit labour costs in industry
annual growth rate in %



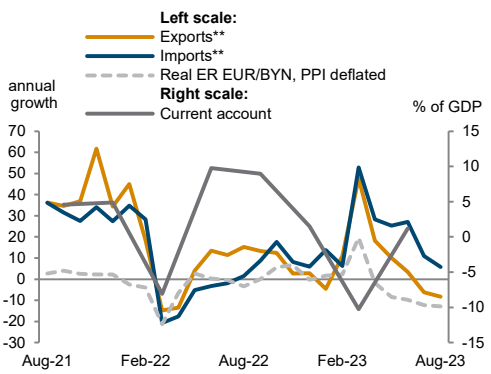
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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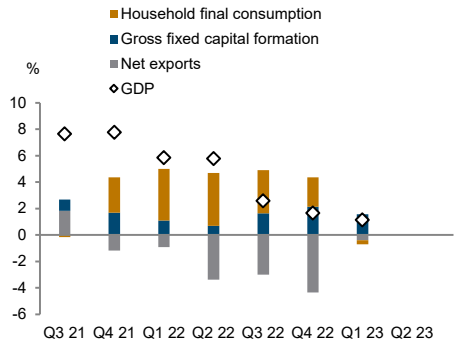
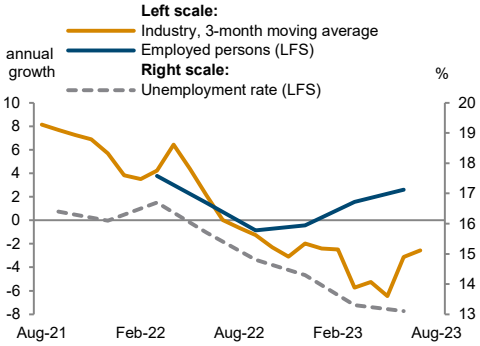
Bosnia and Herzegovina

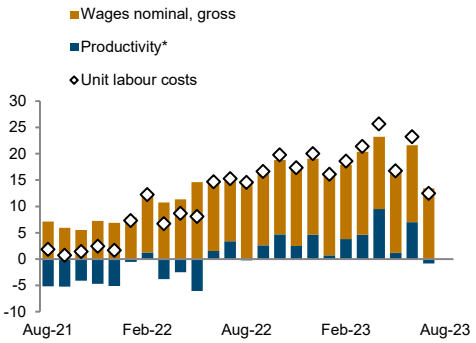
Real GDP growth and contributions
y-o-y



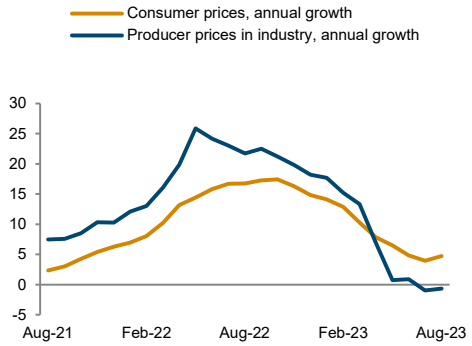
Real sector development
in %



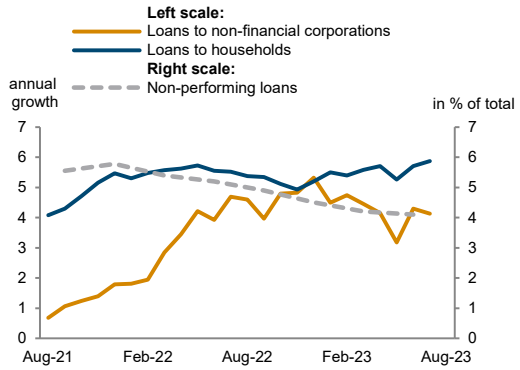
Unit labour costs in industry
annual growth rate in %



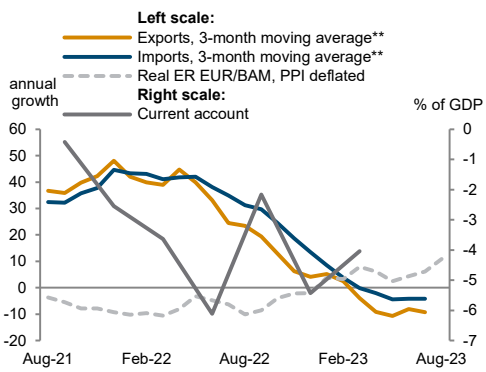
Inflation
in %



Financial indicators
in %



External sector development
in %



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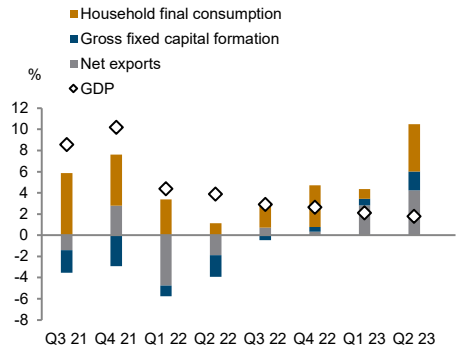
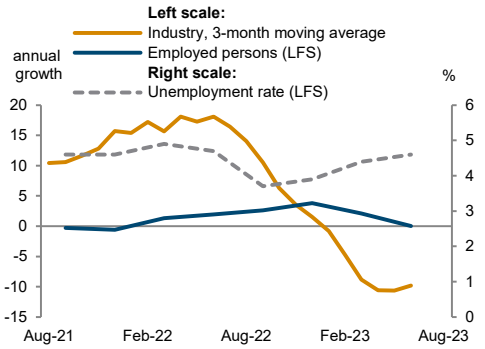
Bulgaria

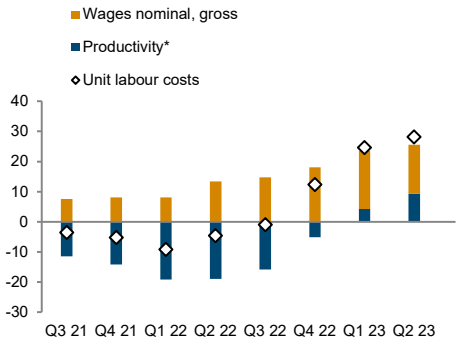
Real GDP growth and contributions
y-o-y



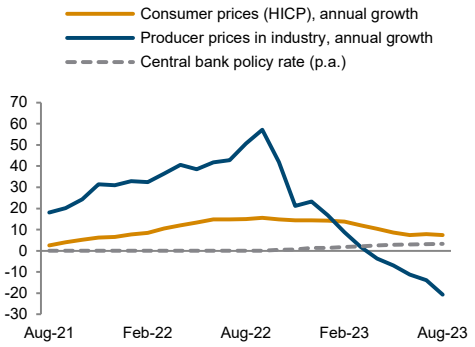
Real sector development
in %



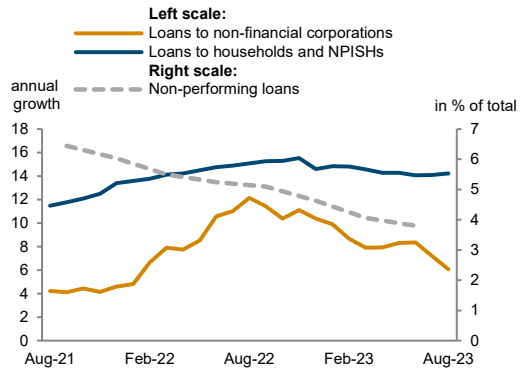
Unit labour costs in industry
annual growth rate in %



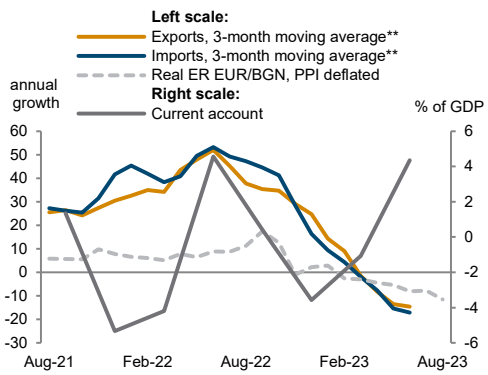
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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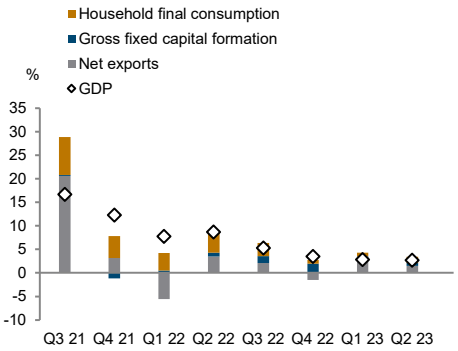
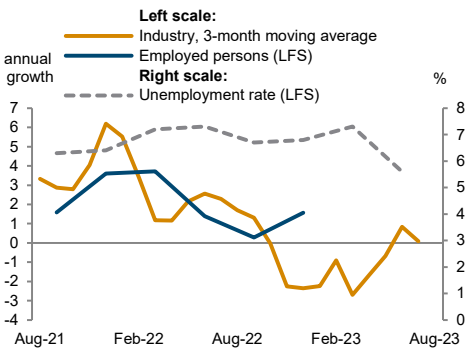
Croatia

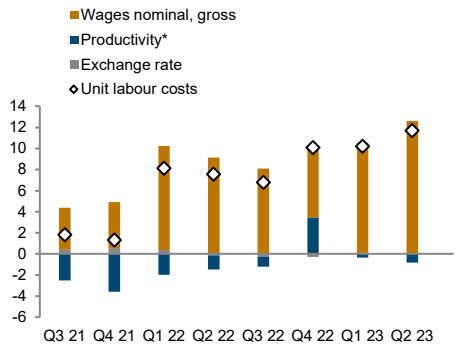
Real GDP growth and contributions
y-o-y



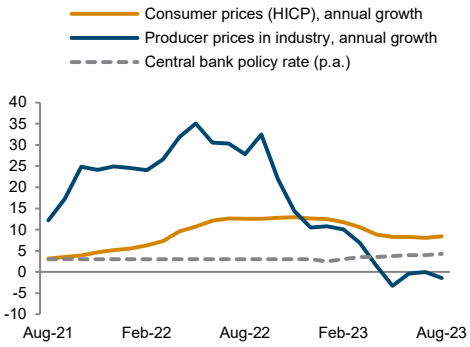
Real sector development
in %



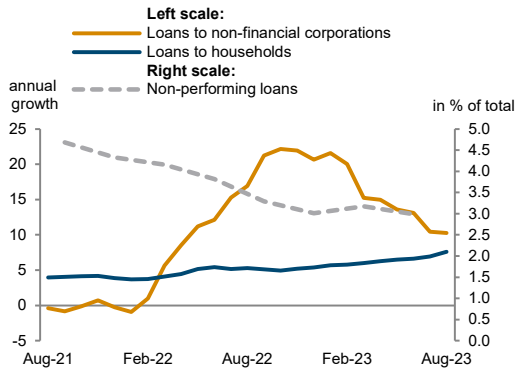
Unit labour costs in industry
annual growth rate in %



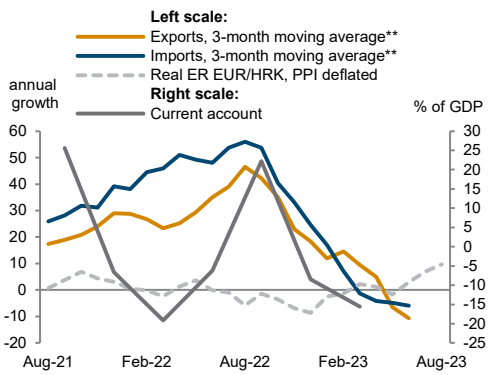
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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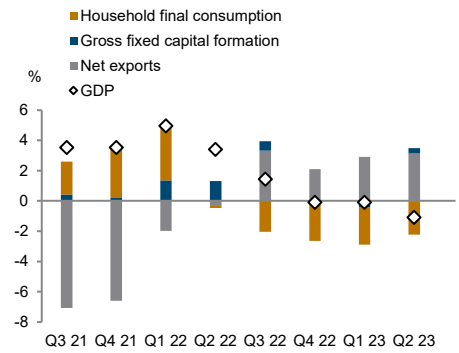
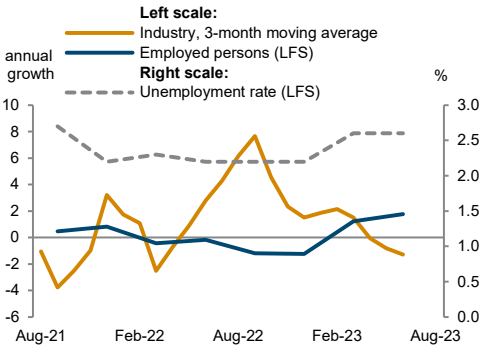
Czechia

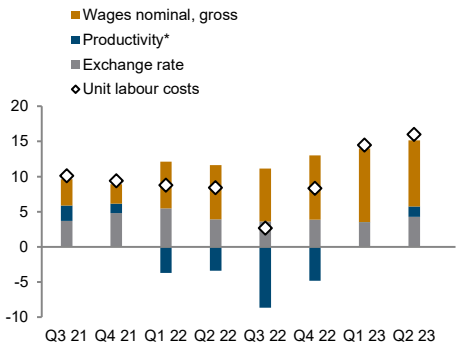
Real GDP growth and contributions
y-o-y



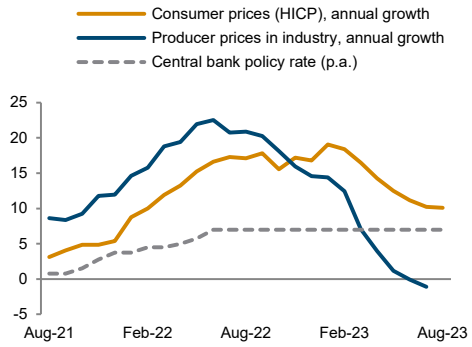
Real sector development
in %



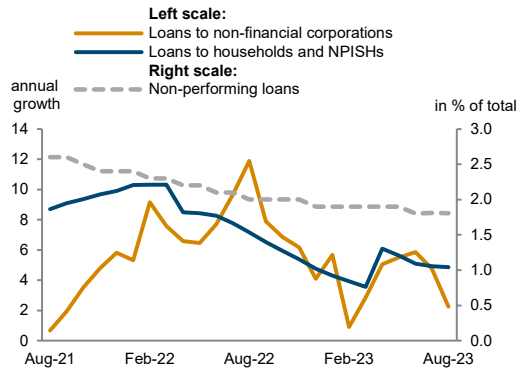
Unit labour costs in industry
annual growth rate in %



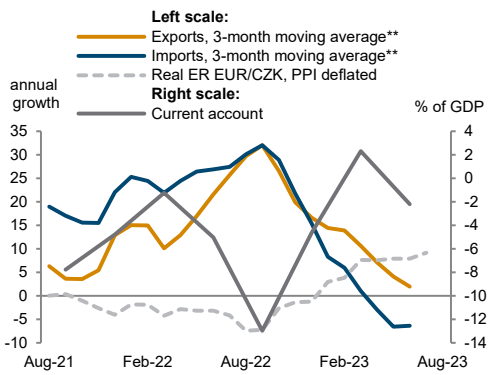
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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**EUR based.

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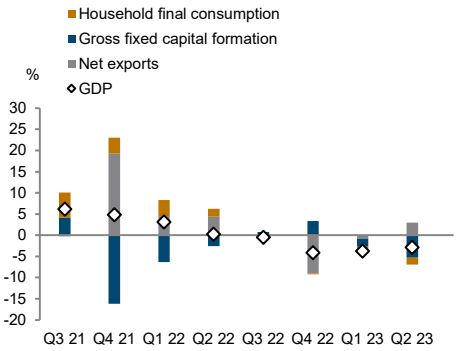
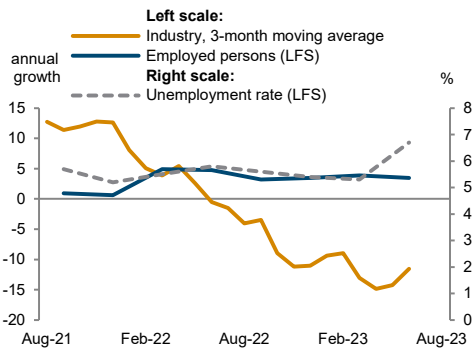
Estonia

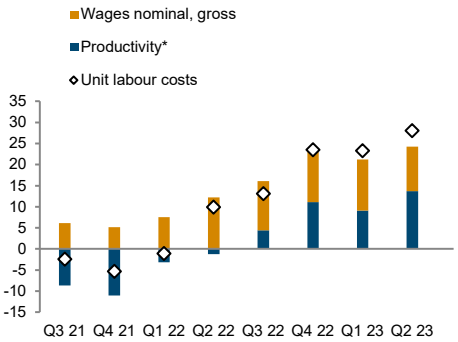
Real GDP growth and contributions
y-o-y



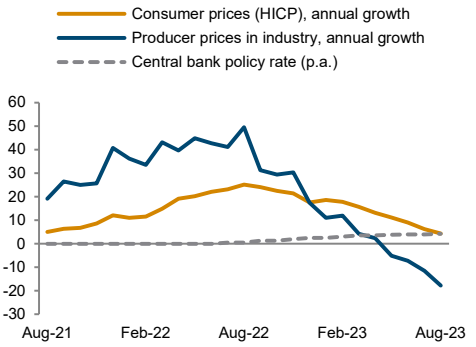
Real sector development
in %



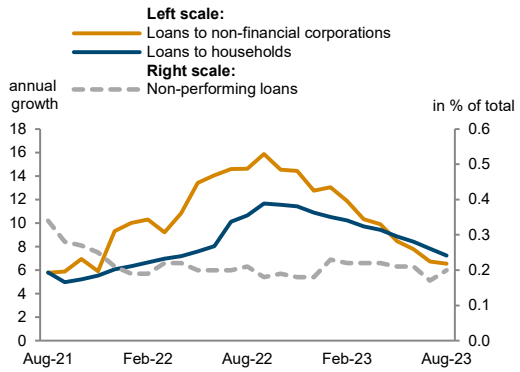
Unit labour costs in industry
annual growth rate in %



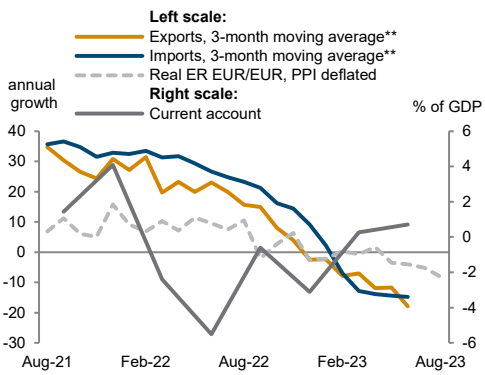
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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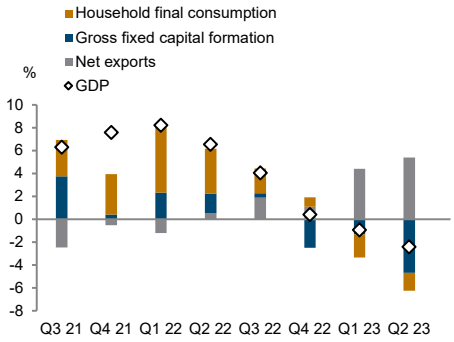
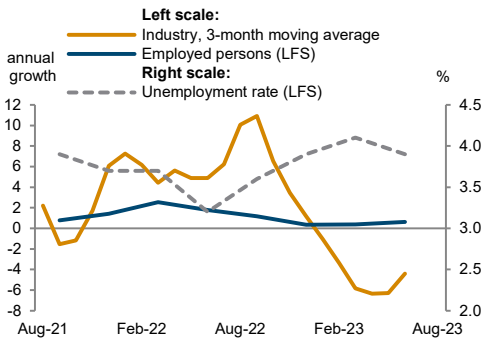
Hungary

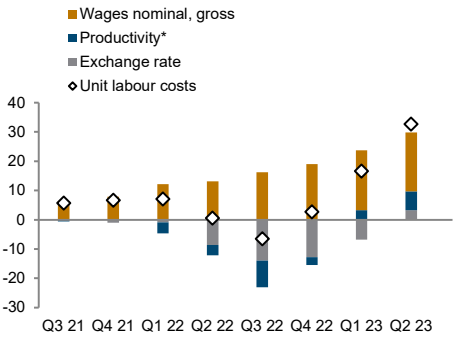
Real GDP growth and contributions
y-o-y



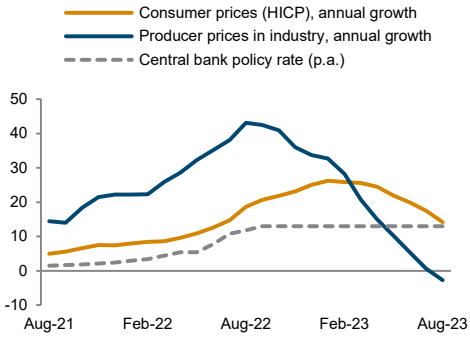
Real sector development
in %



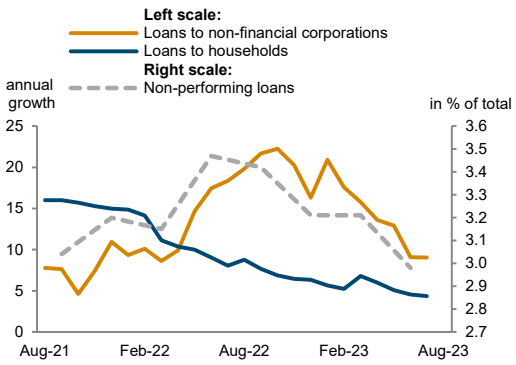
Unit labour costs in industry
annual growth rate in %



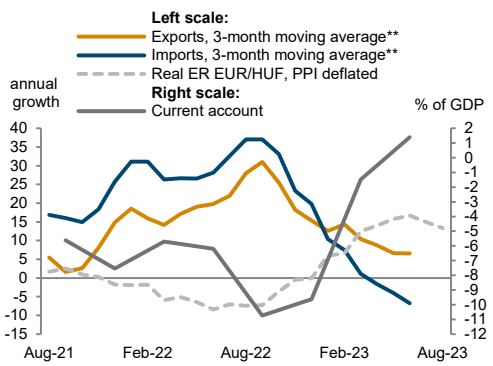
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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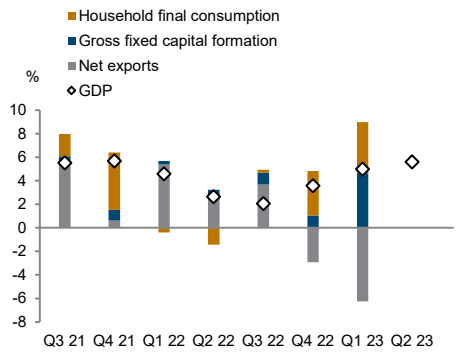
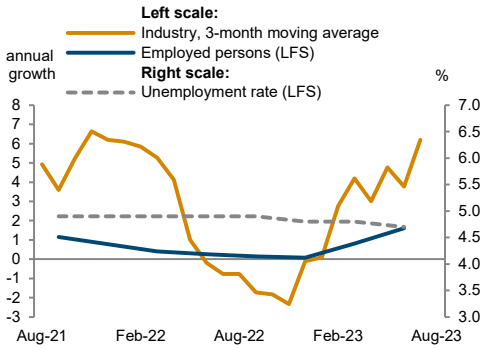
Kazakhstan

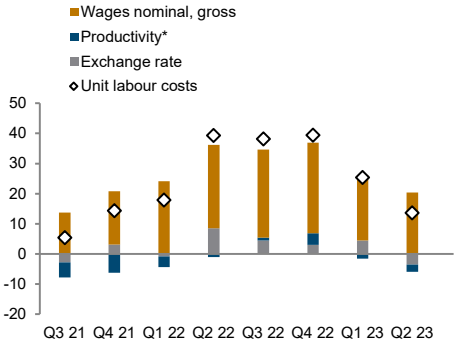
Real GDP growth and contributions
y-o-y



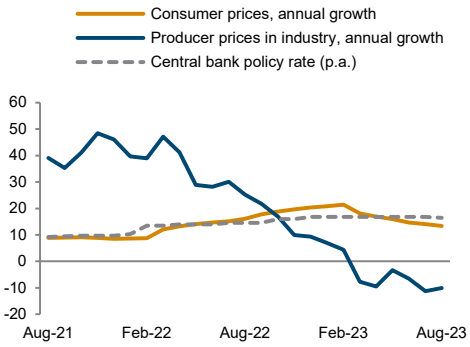
Real sector development
in %



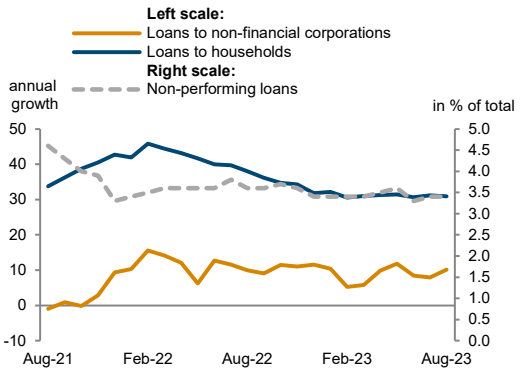
Unit labour costs in industry
annual growth rate in %



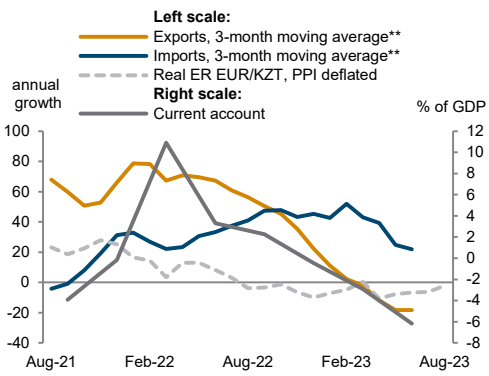
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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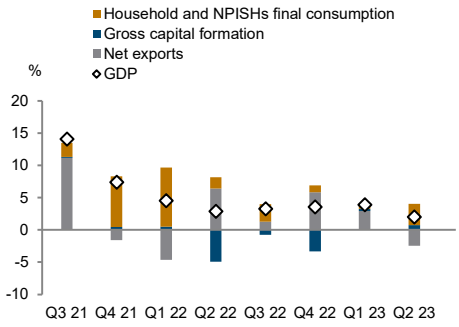
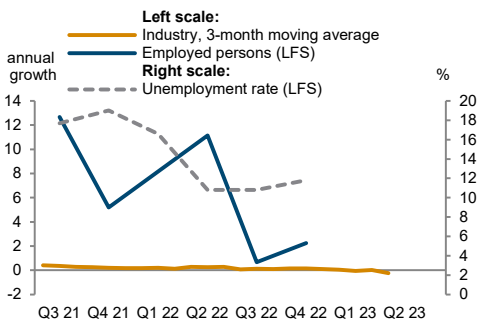
Kosovo

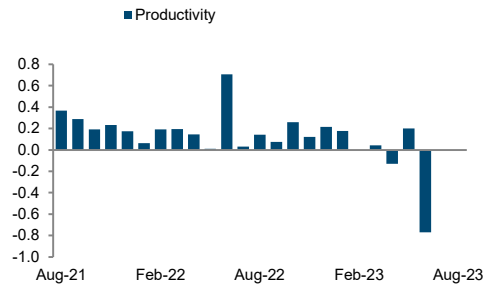
Real GDP growth and contributions
y-o-y



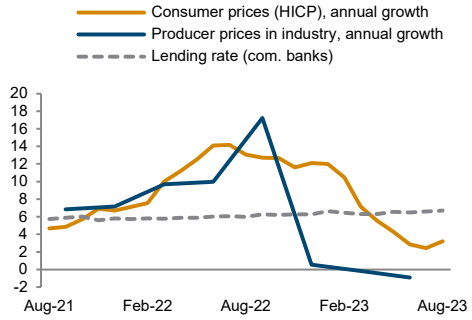
Real sector development
in %



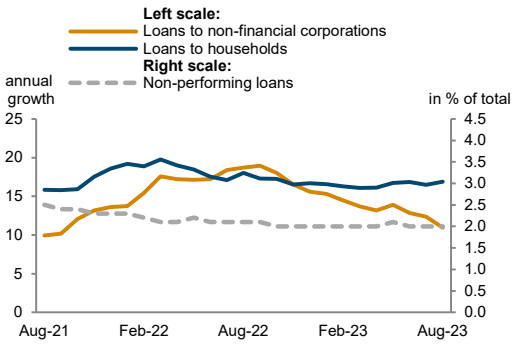
Productivity in industry
annual growth rate in %



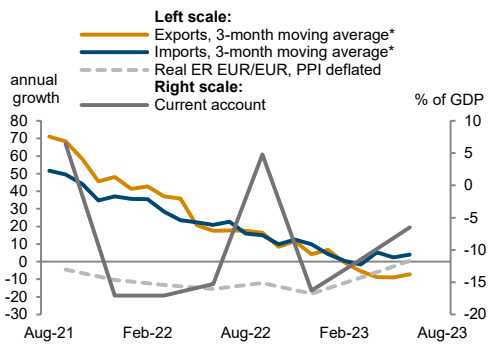
Inflation and lending rate
in %



Financial indicators
in %



External sector development
in %



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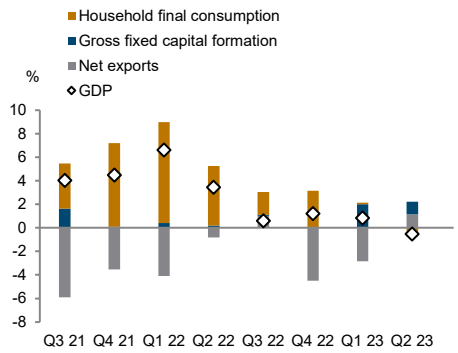
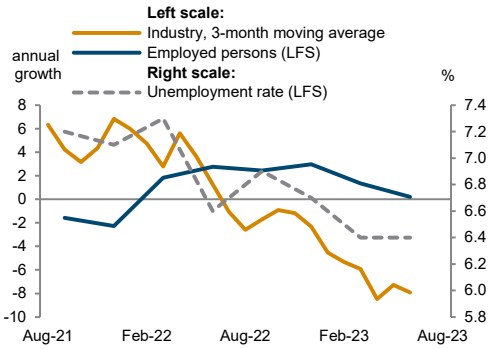
Latvia

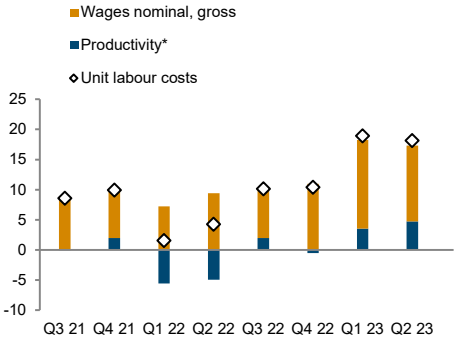
Real GDP growth and contributions
y-o-y



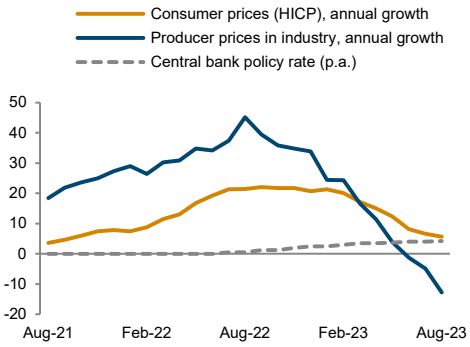
Real sector development
in %



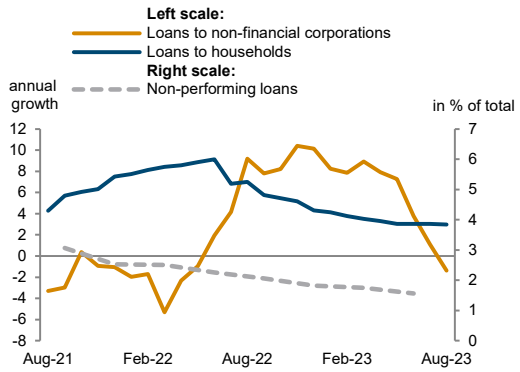
Unit labour costs in industry
annual growth rate in %



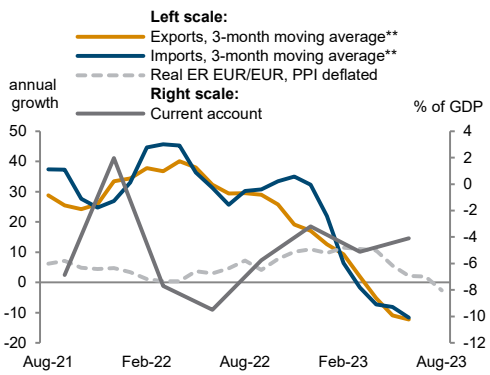
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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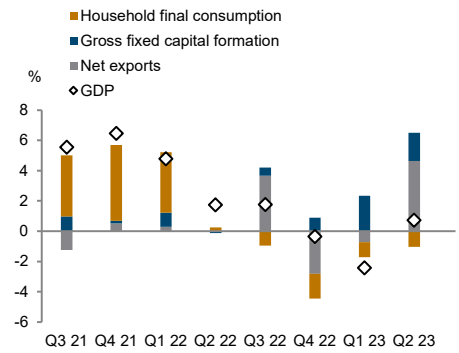
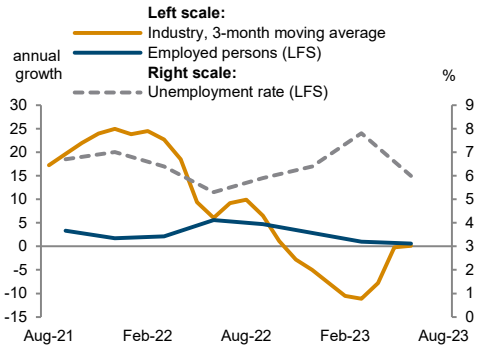
Lithuania

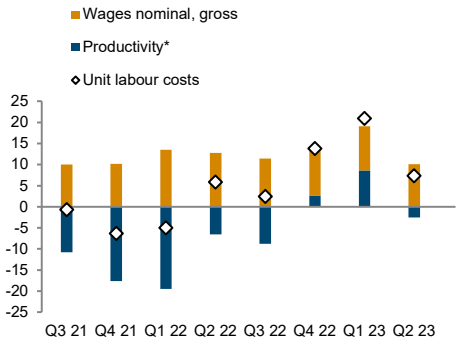
Real GDP growth and contributions
y-o-y



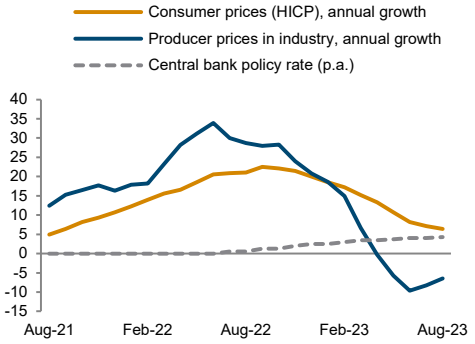
Real sector development
in %



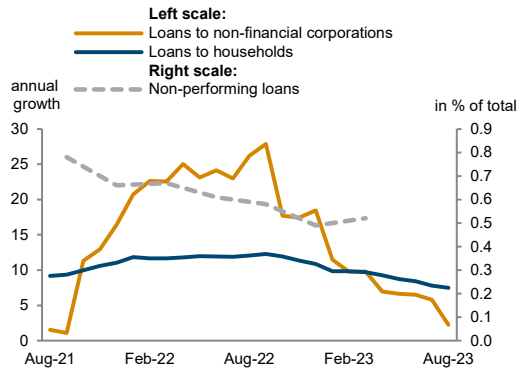
Unit labour costs in industry
annual growth rate in %



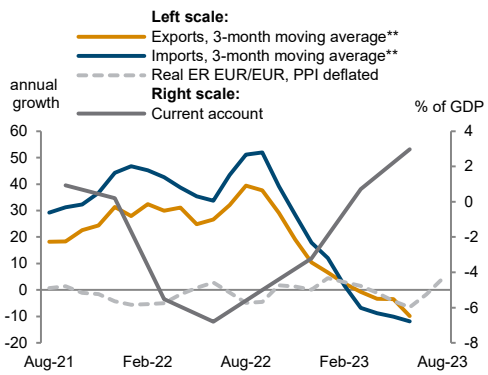
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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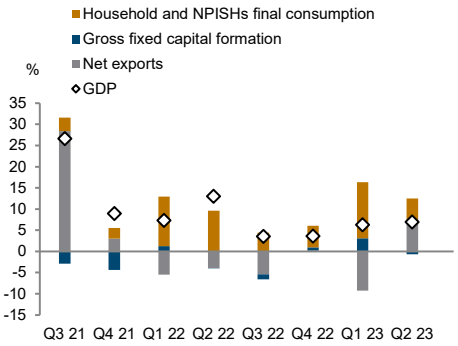
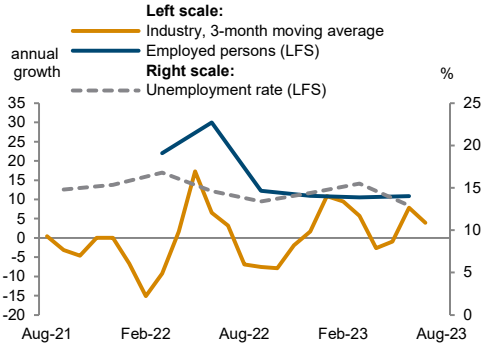
Montenegro

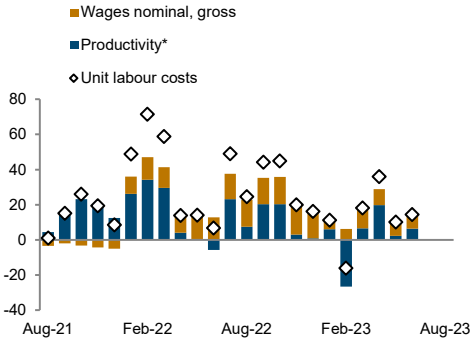
Real GDP growth and contributions
y-o-y



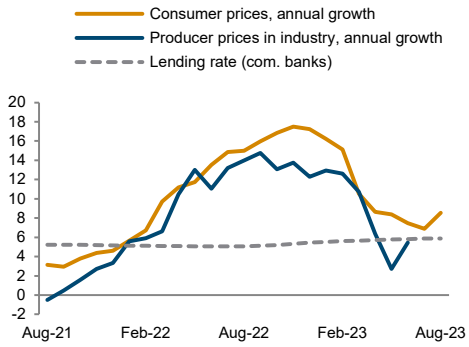
Real sector development
in %



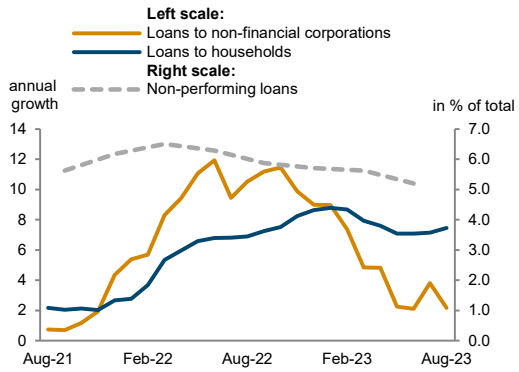
Unit labour costs in industry
annual growth rate in %



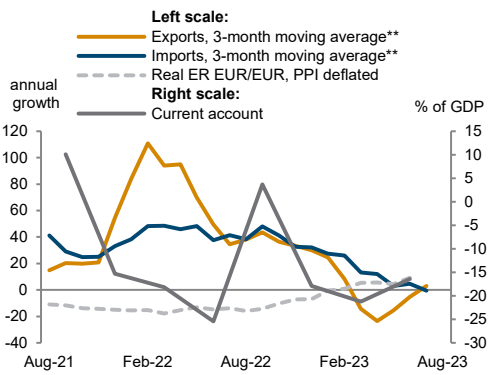
Inflation and lending rate
in %



Financial indicators
in %



External sector development
in %



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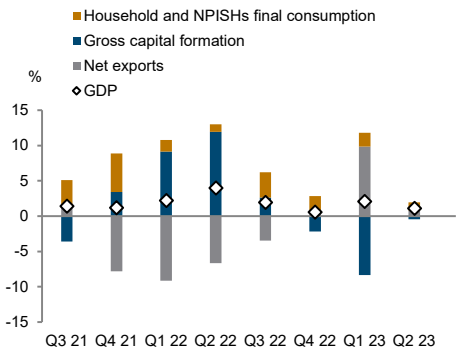
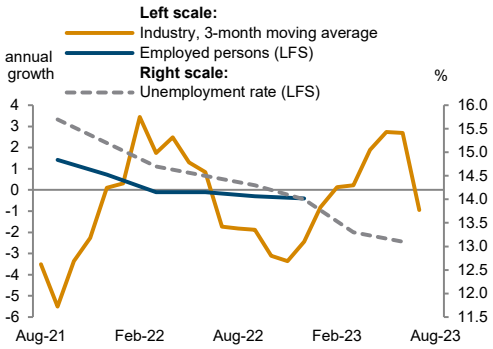
North Macedonia

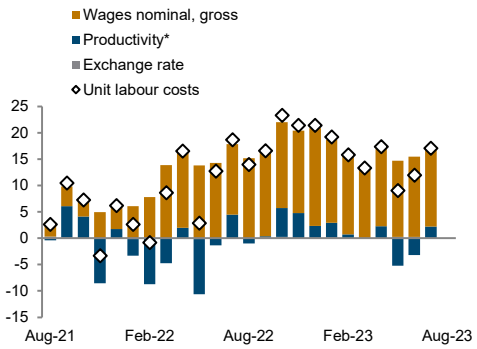
Real GDP growth and contributions
y-o-y



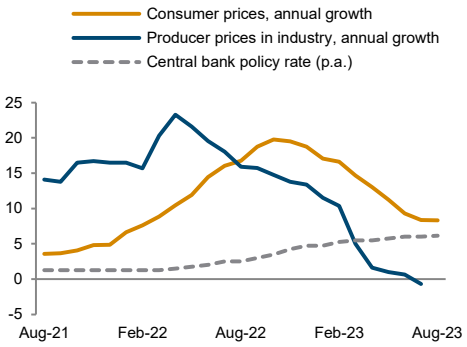
Real sector development
in %



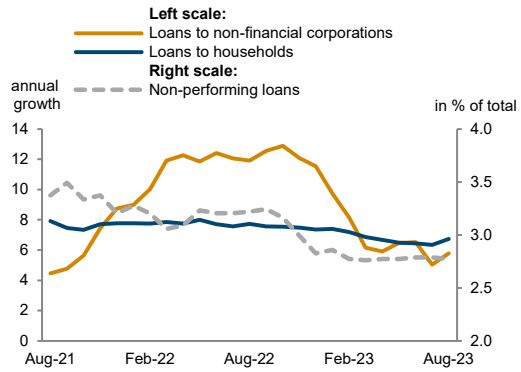
Unit labour costs in industry
annual growth rate in %



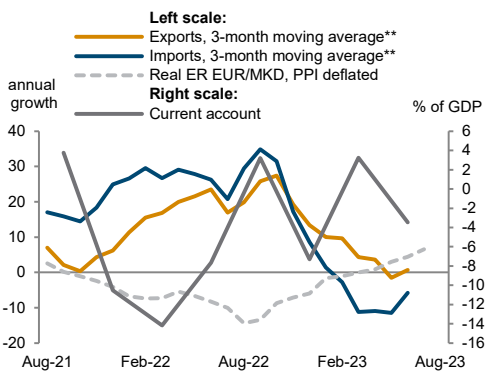
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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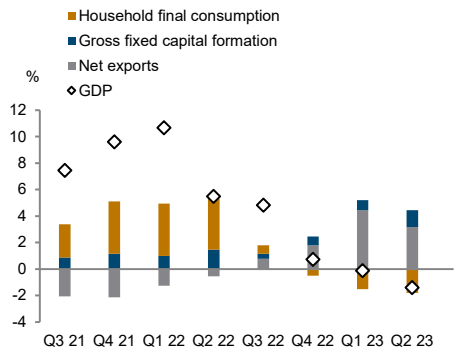
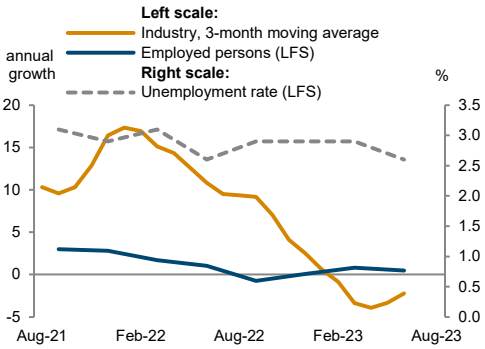
Poland

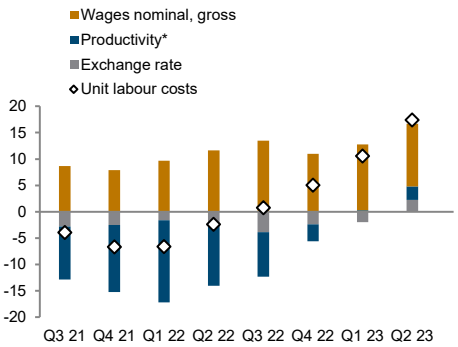
Real GDP growth and contributions
y-o-y



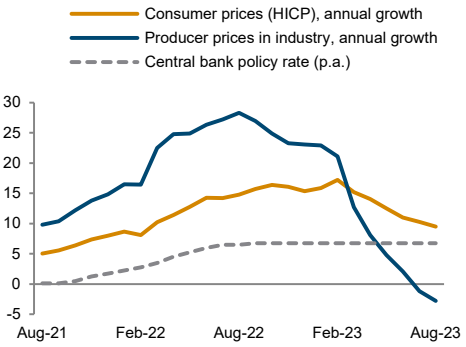
Real sector development
in %



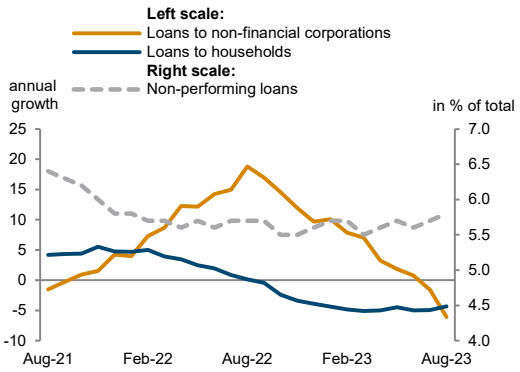
Unit labour costs in industry
annual growth rate in %



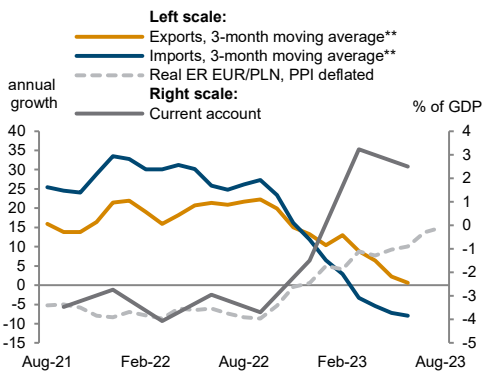
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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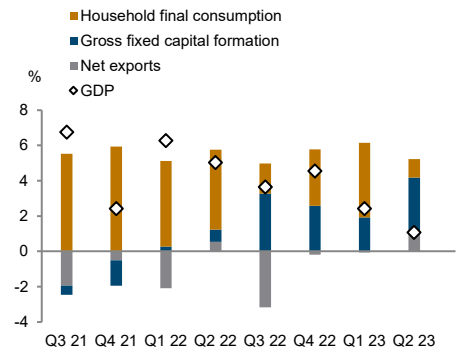
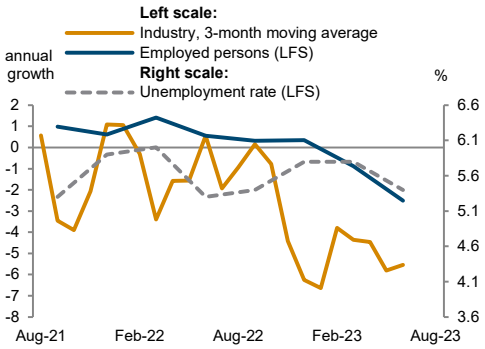
Romania

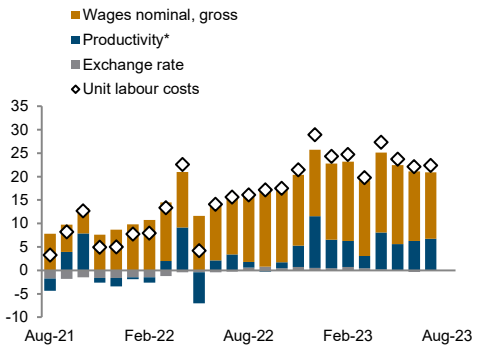
Real GDP growth and contributions
y-o-y



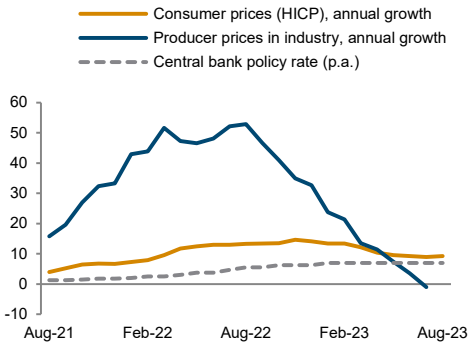
Real sector development
in %



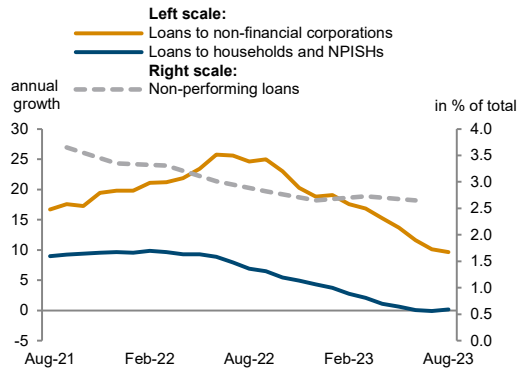
Unit labour costs in industry
annual growth rate in %



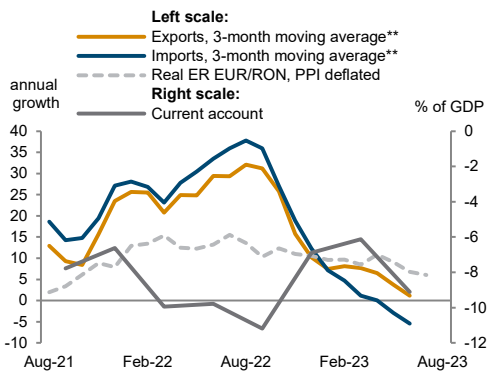
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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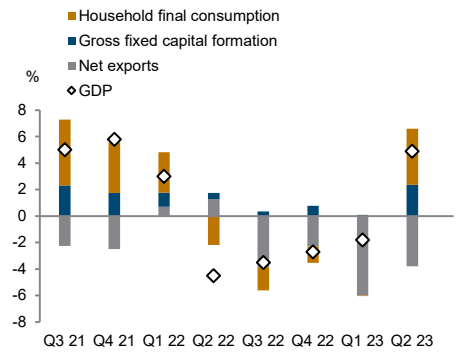
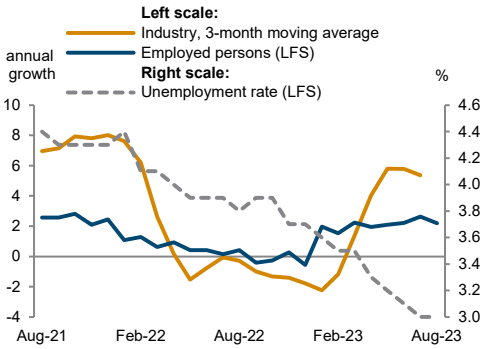
Russia

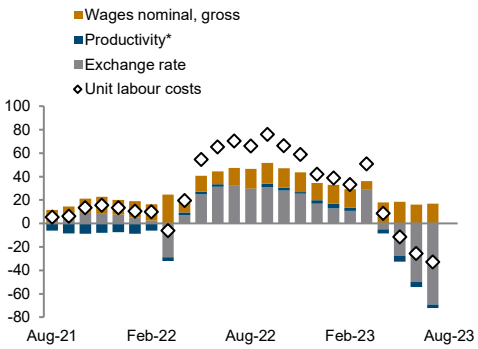
Real GDP growth and contributions
y-o-y



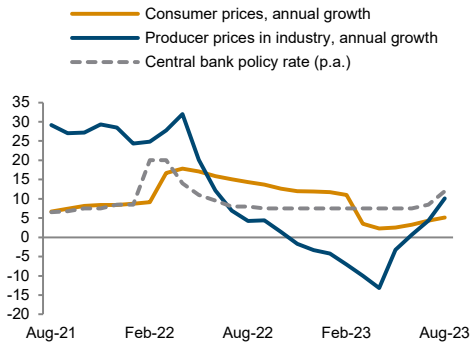
Real sector development
in %



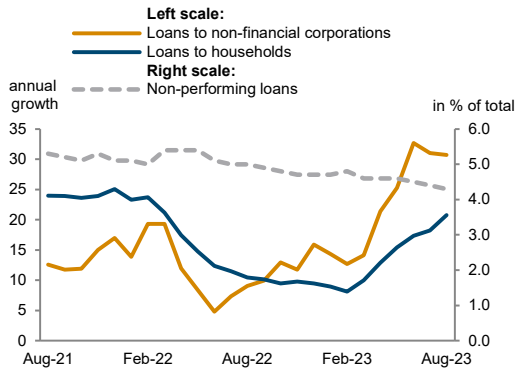
Unit labour costs in industry
annual growth rate in %



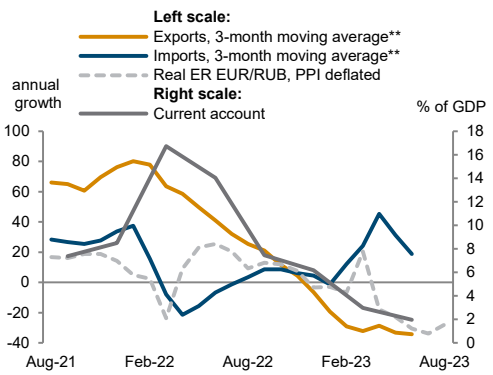
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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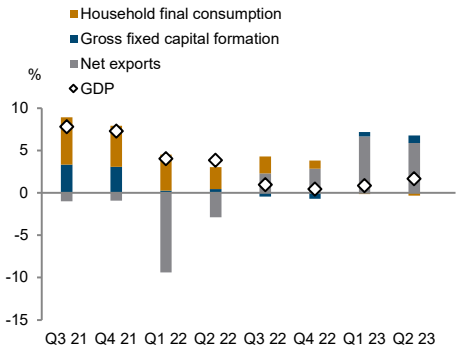
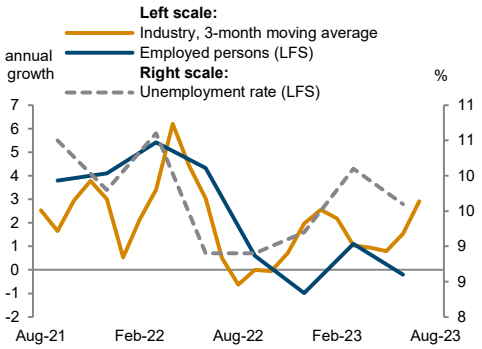
Serbia

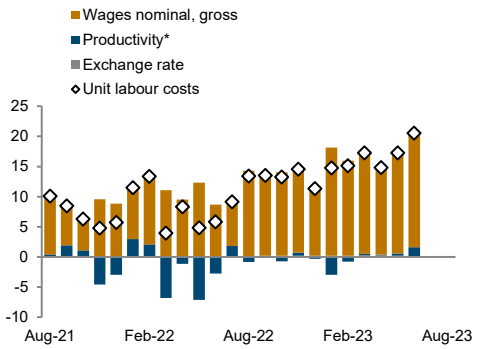
Real GDP growth and contributions
y-o-y



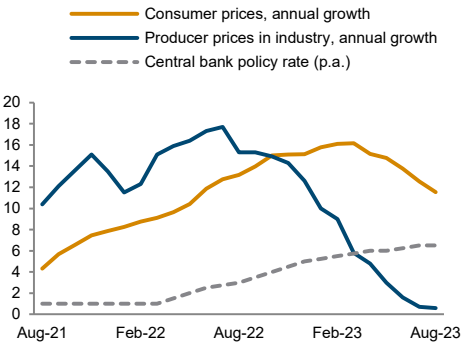
Real sector development
in %



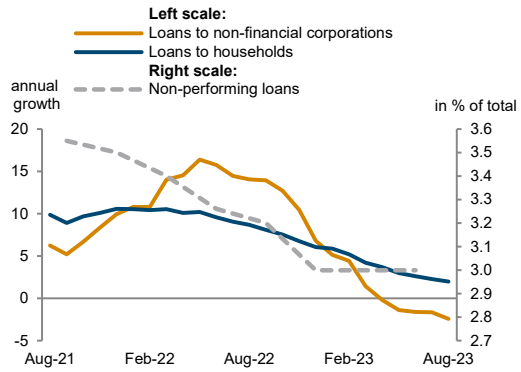
Unit labour costs in industry
annual growth rate in %



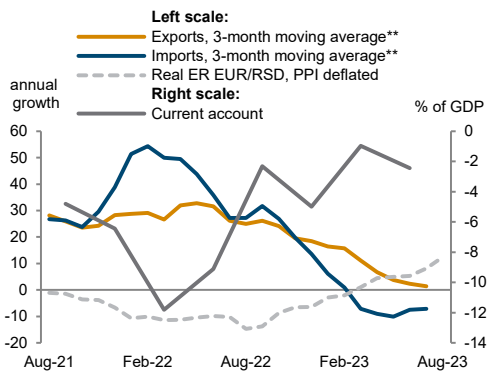
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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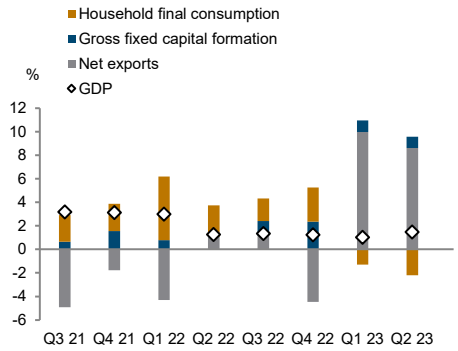
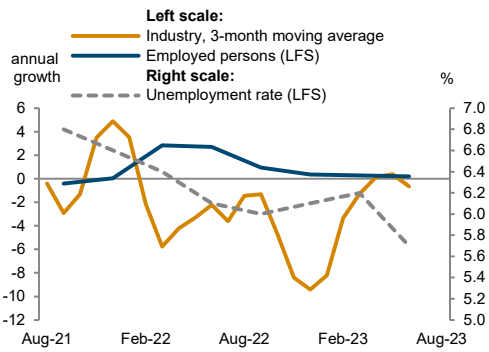
Slovakia

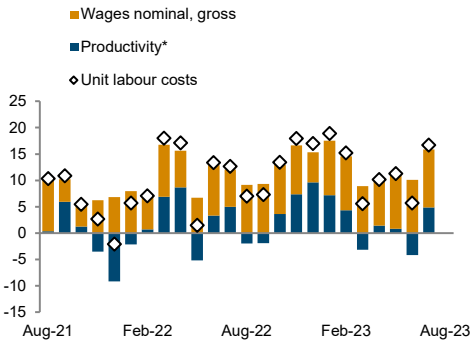
Real GDP growth and contributions
y-o-y



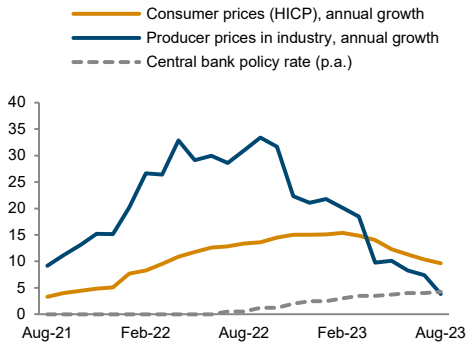
Real sector development
in %



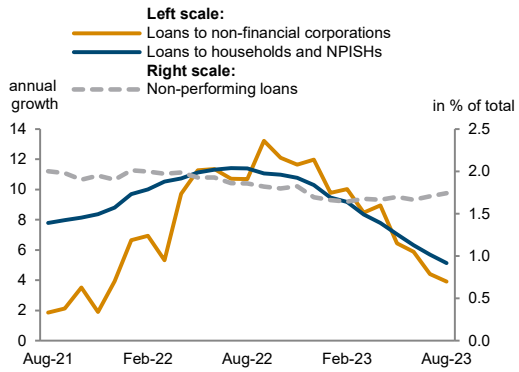
Unit labour costs in industry
annual growth rate in %



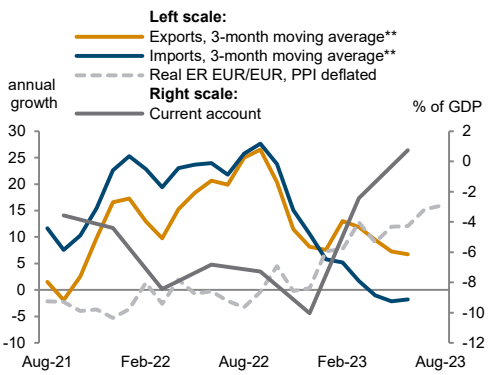
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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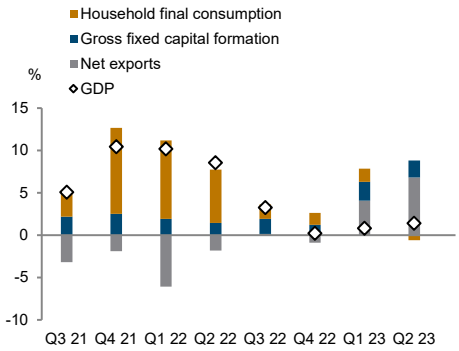
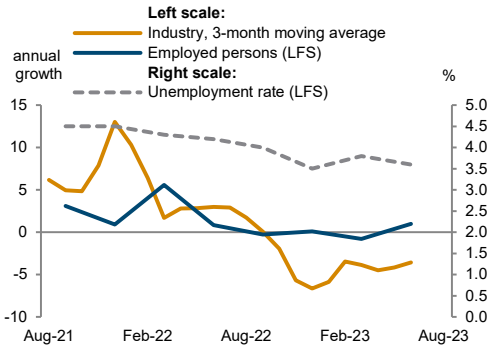
Slovenia

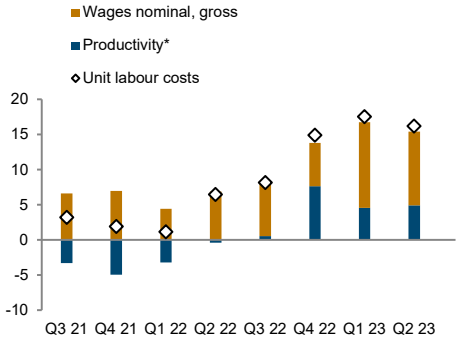
Real GDP growth and contributions
y-o-y



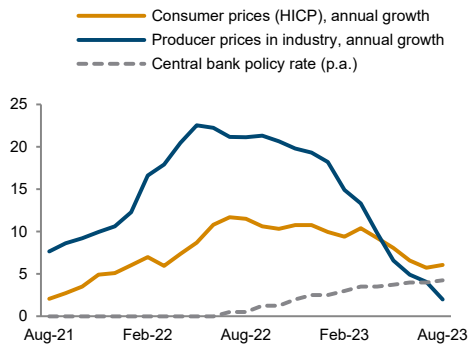
Real sector development
in %



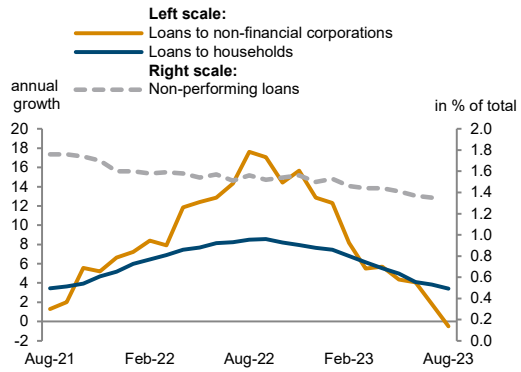
Unit labour costs in industry
annual growth rate in %



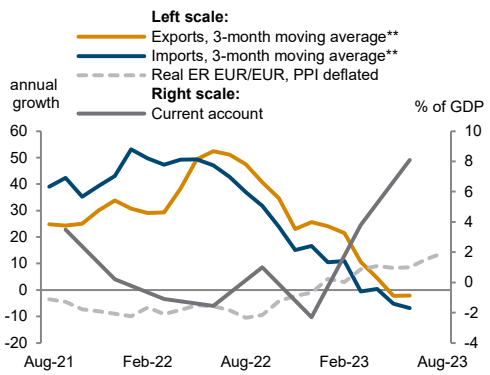
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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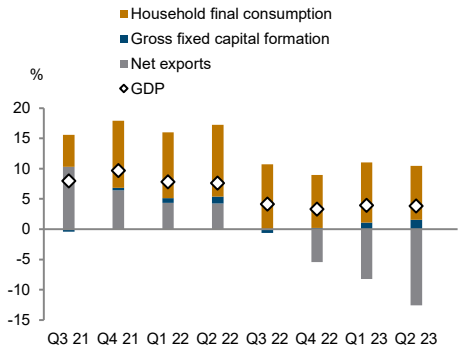
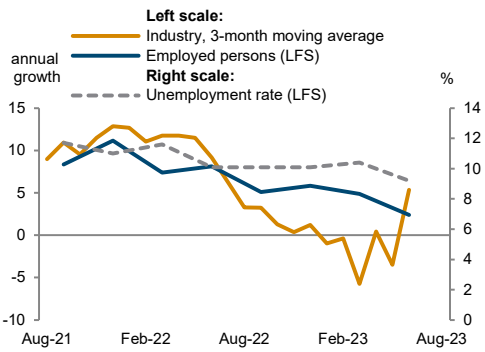
Turkey

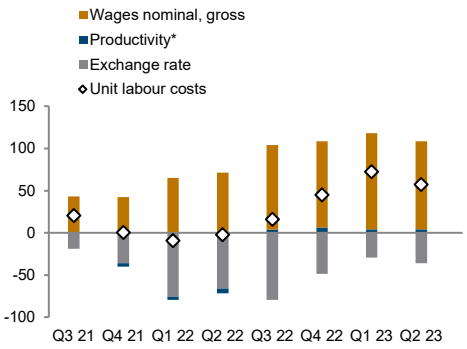
Real GDP growth and contributions
y-o-y



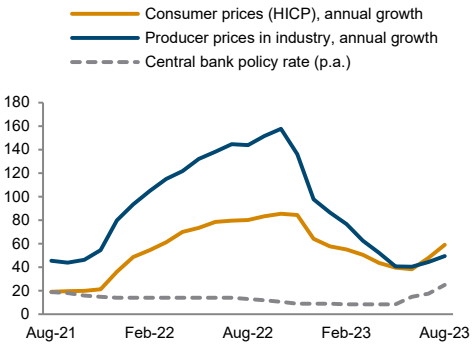
Real sector development
in %



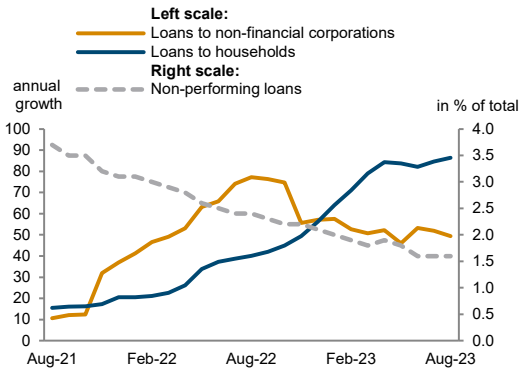
Unit labour costs in industry
annual growth rate in %



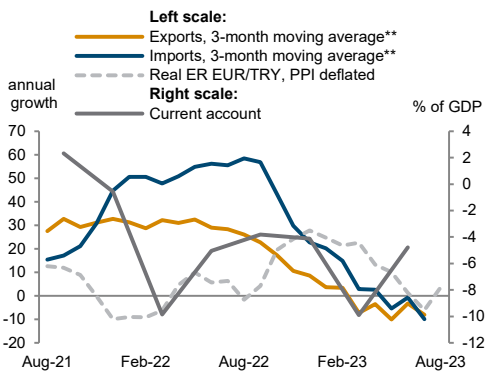
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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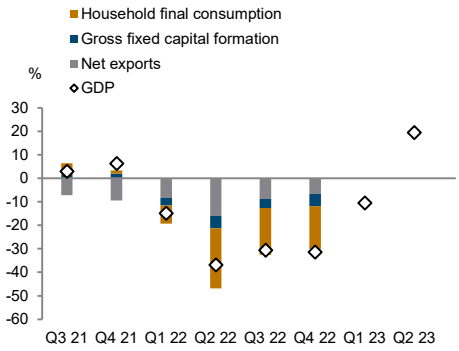
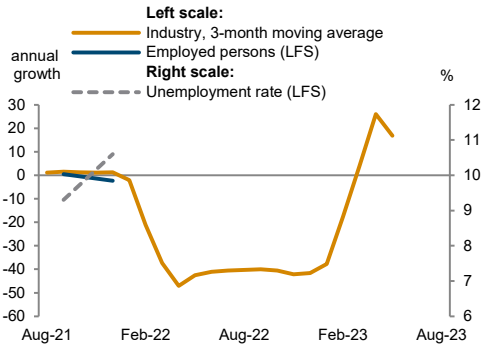
Ukraine

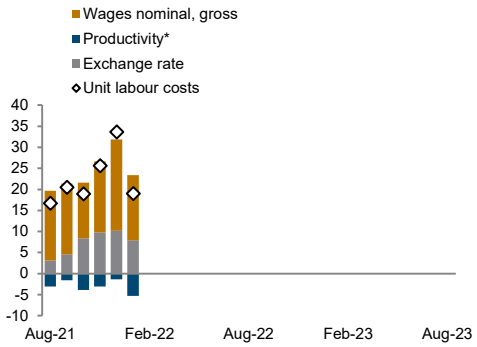
Real GDP growth and contributions
y-o-y



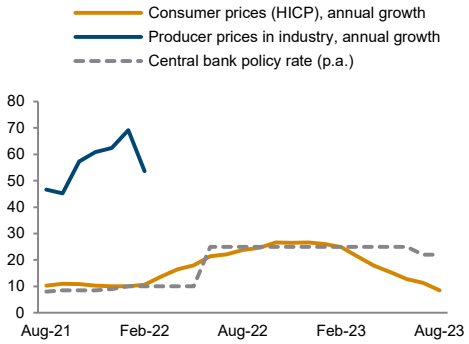
Real sector development
in %



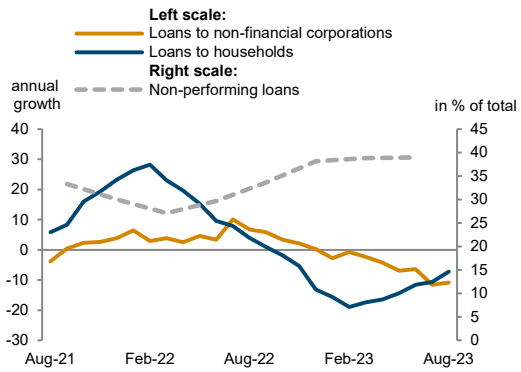
Unit labour costs in industry
annual growth rate in %



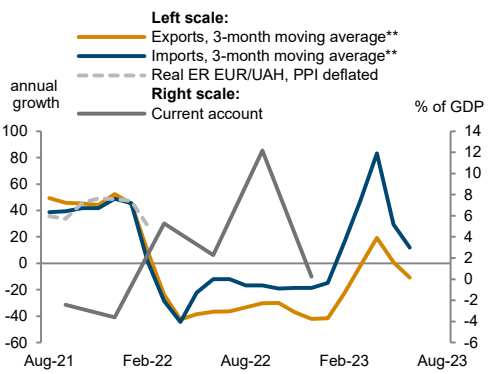
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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multi-country articles and statistical overviews

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