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The Vienna Institute for International Economic Studies
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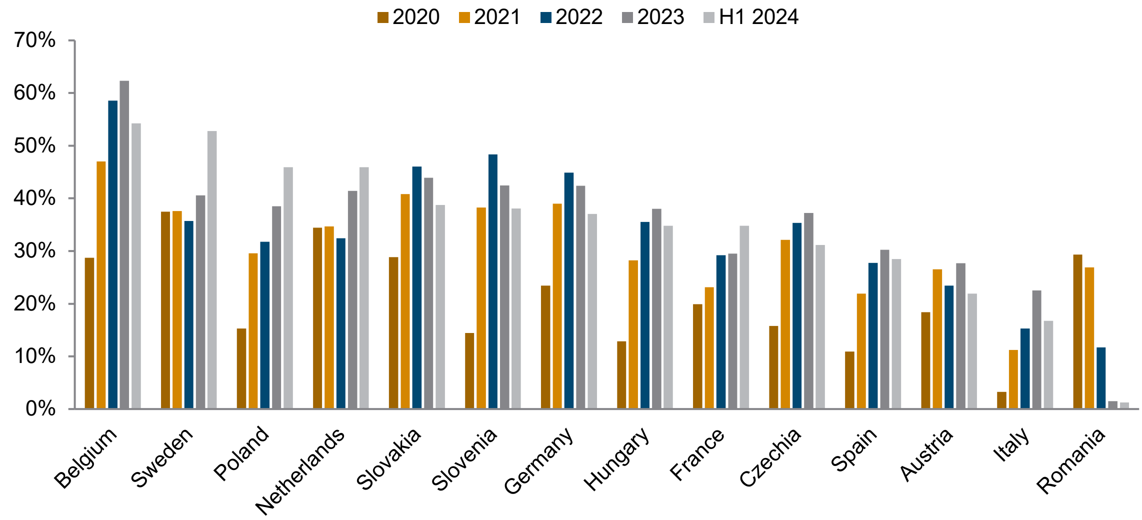
Chart of the month: Export data suggest the transition to electric vehicles is stalling in Europe

BY ZUZANA ZAVARSKÁ

Figure 1 / Share of electric and hybrid passenger cars in the automotive exports of the major car-exporting countries of the EU



Note: Calculated as the export value of electric and hybrid passenger vehicles divided by the total export value of all passenger motor vehicles, expressed as a percentage. Only the 14 largest automobile exporters in the EU (by value in EUR) are included in the figure.
Source: Calculations based on Eurostat Comext data.

The transition to e-mobility has become a topic of growing importance in recent years – not only because of its environmental implications, but also because of the intensifying global competition in the automotive industry. China's rapid advance in terms of its electric vehicle (EV) production capabilities has been of particular concern in Europe. It was this that motivated the launch of the anti-subsidy investigation into Chinese EVs earlier in the summer.[1] And it was this that led to the subsequent imposition of tariffs of up to 45% on Chinese EV imports over the next five years, in a move that was ratified by member states in a vote earlier this month. Automotive production is firmly embedded in the economic structures of the countries of Central and Eastern Europe: it accounts for a significant proportion of their employment, exports and value added (Zavarská et al., 2023). In this respect, a transition to e-mobility is vital for shaping the region's future competitiveness.

[1] https://ec.europa.eu/commission/presscorner/detail/en/ip_24_3630

Figure 1 shows the share of electric and hybrid passenger cars in the automotive exports of the EU's major car-exporting countries.[2] It maps developments over the past few years to see how the EV transition is progressing in the EU. As the figure shows, the focus on EVs varies significantly across EU member states. From the perspective of export share, the most EV-oriented countries are Belgium and Sweden: in both of those, EVs constitute over half of all passenger vehicle exports (54% and 53%, respectively, in H1 2024), suggesting that EVs are gradually entering the mainstream. By contrast, Romania finds itself at the tail end of the comparison, with EVs remaining a negligible part of the country's automobile export basket. The German-led Central European automotive cluster finds itself somewhere in the middle, with an EV export share of around 30-40%.

It is worth noting that there is a declining trend in the EV share across the majority of the countries shown in Figure 1. With the exception of Sweden, Poland, the Netherlands and France, all the countries under consideration saw the share of EVs in their exports decline in the first half of 2024, compared to 2023. While the years between 2020 and 2023 witnessed a dynamic transition towards EVs in Europe, the latest figures appear to partially reverse this trend. The most significant drop is observed in Romania, which even in 2023 had completely turned its back on EV production for the export market. Similarly, Belgium (-8.1 percentage points (pp)), Czechia (-6.1 pp) and Slovakia (-5.1 pp) saw relatively large declines between 2023 and H1 2024. These trends corroborate reports regarding the recent cooling-off in EV demand across the major global economies (Korst, 2024). While it is too early to tell whether the slowdown that has been observed is temporary or not, we can expect the EV transition to be a more gradual process than was perhaps initially expected by policy makers and businesses alike (Donahue and Scott, 2024).

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[2] Hereafter referred to as EVs for simplicity.

Russia-Ukraine: Of peace, victory and the art of the impossible*

BY SERGEY UTKIN[1]

Ukraine and Russia remain stuck in a zero-sum logic on all major issues, with diametrically opposed goals when it comes to Ukraine's NATO membership, its military infrastructure and the outcome of the war. Nevertheless, were Trump to win the election, the new US president would probably force Ukraine to negotiate. The West's lukewarm reception of Zelensky's 'victory plan', presented in October 2024, may assist the Ukrainian leadership in shifting the blame for any potentially painful concessions onto its partners, who are unable to provide the support requested.

In October 2024, Ukraine's president, Volodymyr Zelensky, presented his foreign partners and the public with a set of points that he called a 'victory plan' (Waterhouse and Gozzi, 2024). This diplomatic initiative comes at a time when the **situation on the battlefield** is becoming increasingly complicated for Kyiv; when the mood of '**Ukraine fatigue**', though not yet mainstream, is still discernible in European politics; and when the outcome of the crucial **US presidential election** remains unpredictable. Simultaneously, there is increasing discussion about negotiations between the warring parties, with a possible role for other great powers.

The 'fog of war' – a standard metaphor used to describe the multiple uncertainties of any warfare – is now complemented by the 'fog of politics', which is not easy to decipher. Key actors have little interest in achieving clarity ahead of 5 November and a US presidential election that could well upset the tables in terms of global and regional affairs: uncertainty leaves more opportunities available at the next step.

NATO OR NOT?

The first point of the Zelensky plan appeals for NATO members to extend **an invitation to Ukraine for it to join the North Atlantic Alliance**. The Ukrainian leadership regards this as the first, practical step on the longer road toward the final goal of full membership – a goal that, according to many commentators, remains well out of reach, at least so long as the war with Russia continues.

Meanwhile, the Russian demand – which the Kremlin positions squarely at the heart of the conflict – is for **Ukraine to pursue clearly defined and binding neutrality**. In the eyes of many supporters of Ukraine, this is just another reason to push for Ukrainian membership (which has officially been on NATO's agenda since the 2008 Bucharest summit). In principle, there is little or no middle ground left in the debate.

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* 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.

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In practice, Kyiv is well aware of the **complex internal situation in NATO**, where any country may object to a new member and any parliament may drag the ratification procedure out for years. The US remains the backbone of the Alliance; thus the internal turmoil in the US and the well-publicised criticism of NATO by former and possibly future President Donald Trump further complicate the task.

A separate important issue is the **effectiveness of NATO guarantees**. The level of support for Ukraine on the part of Western countries, including those outside NATO, is already unprecedented. Now, as another point of the Zelensky plan, Ukraine is asking for more (though political and technical considerations stand in the way of this). It is debatable how much further NATO might go in terms of guarantees, were Ukraine to become a NATO member and were the war with Russia to resume. The North Atlantic Treaty stipulates only that, in the event of an attack on a member state, every other member will take 'such action as it deems necessary' (NATO, 1949, Art. 5). Were such an occasion to arise, it may be that – when the governments of the NATO members came to weigh up the risks and options – their calculations would not differ dramatically from those today. The determination to ensure that the NATO guarantees appear ironclad is clearly proclaimed: but if the US is not on board, it would be **hard to forge a purely European response** in the foreseeable future. Indeed, Western conflict scenario analysis commonly focuses on the possible temptation for Russia to expose NATO as a mere paper tiger.

All of these complications impel Ukraine to consider the security guarantees in much more practical terms than simply getting the treaty signed and ratified.

UKRAINE AS A FORTRESS

Zelensky's plan also suggests the military containment of Russia, using a 'non-nuclear strategic **deterrent package deployed on Ukrainian soil**'. While the details of this have not been revealed, most observers understand the idea as an offer to set up Western military bases and industrial sites in Ukraine, so that Kyiv's ability to resist aggression remains credible in the long term.

Once again, Russia demands precisely the opposite: **the demilitarisation of Ukraine**, with low and controlled levels of permitted armaments and the absence of foreign troops. This difference is of even more consequence than the disagreement over the issue of Ukraine's NATO membership: whereas it is possible (at least in theory) for a parliament deliberately to choose to enshrine neutrality in a country's constitution, unilateral binding disarmament under the watchful eye of a foreign power could only come about in the event of a resounding military defeat.

Given the experience of the ongoing war, it is certain that virtually **any Ukrainian government** – except one controlled by Russia – **will do its utmost to boost the country's military capability**, as the only truly credible means of deterrence. Even if (purely hypothetically) Russia were suddenly to leave Ukraine alone, the breathing space thus gained would be employed by Kyiv to do precisely that – bolster the country's defences. Many in Russia certainly see this as justification for continuing the war until military victory is achieved, even as they conveniently 'forget' why it is that Ukraine is so keen to arm itself.

The Western political mainstream has seemingly learnt to live with the idea that Russia will remain an adversary that has to be deterred over the long term. Accordingly, **Ukraine's hopes of receiving steady and significant military support from the West are well founded** – so long as the country avoids outright military defeat.

The qualification of the 'deterrent package' as 'non-nuclear' reflects the significant level of fear of a possible **nuclear escalation** both in the West and among the Ukrainian public. Ukraine's geopolitical situation is sometimes compared to that of the divided Germany and Korea (since most observers do not expect Ukraine to be able to regain all of the territory captured by Russia any time soon). In those two Cold War-era cases, tactical nuclear weapons and, in broader terms, the US nuclear umbrella formed part of the deterrence calculus (Witting and Goldenberg, 2024; Kristensen and Norris, 2017). But the fact that Ukraine's immediate neighbour is an adversarial nuclear superpower clearly affects the thinking this time around.

THE BATTLE OF RESOURCES

The disparity between the economic resources of Russia and Ukraine is obvious (Russia's GDP is around ten times that of Ukraine); but the economic significance of the West far outweighs that of Russia. However, GDP figures as such do not win wars, and the Western countries are facing multiple domestic issues that they must tackle using funds from the same pot. Besides, all the Western hopes that the Russian economy would buckle under the pressure of sanctions now seem exaggerated. At least in the short term, the **Russian economy has successfully rewired itself to sustain the war challenge** (Prokopenko, 2024).

Kyiv understands that voters in Western democracies rarely think much about world affairs, but generally care a lot about government spending. Therefore, Zelensky's plan includes a vague notion of **'joint use' of Ukraine's natural resources** to make Western aid to Ukraine look like a good long-term investment, rather than a risky business. A similar spirit of 'you scratch my back and I'll scratch yours' can be discerned in Zelensky's **offer to station Ukrainian troops in Europe** and thus free up US troops – an offer that derives from an idea by former UK Prime Minister Boris Johnson (Johnson, 2024). While Ukraine is indeed a large country with significant natural potential and an exceptionally capable military, Zelensky's appeal will probably fail to have any significant influence on Western popular opinion or elite calculations. The more central question is whether Ukraine, with all the help it has received, will have enough **economic resources, as well as manpower**, to resist its much bigger adversary in the months to come.

The West is maintaining its attempts to strike at Russia's economic capability through **sanctions**, and it is striving to close the remaining loopholes – though some will most probably remain hard to plug (Kolyandr, 2024). It is also recognised that sanctions are something of a double-edged sword that can also harm whoever is wielding it, especially when it comes to restrictions imposed on the use of Russia's natural resources. These are more appealing than what Ukraine has to offer, and that will probably mean that Western **business continues to lobby** against the perpetuation of sanctions. While Russia initially refused to discuss the Western sanctions, judging them an illegal instrument, it is highly probable that, if a negotiated end to the war is attempted, the **lifting of major restrictions** will feature among the Russian demands.

NEGOTIATIONS: IMPOSSIBLE BUT IMMINENT

All of this explains why it is extremely hard to imagine negotiations in good faith, where Russia and Ukraine strike a compromise and settle the major issues. Nevertheless, **Ukraine may be forced to negotiate** either by developments on the battlefield or by pressure from its major foreign partners – or rather, the most important of them, the US.

Donald Trump has repeatedly promised to end the war in a day, raising concern on the part of the Ukrainian leadership (Carey and Butenko, 2024). Indeed, almost the only quick way of making it look as though the war was coming to an end would be to force the sides to the negotiating table by raising the issue of the crucial military support that Kyiv is receiving from the US. **On the Russian side, most of the demands vis-à-vis Ukraine would remain**, but Vladimir Putin could probably make it appear as though he was ready to play along, and in doing so could paint the Ukrainian government as the stumbling block to a negotiated solution. **If a result were actually to be achieved, it would most probably be disliked by Ukraine's supporters.** In the words of the seasoned foreign policy observer Robert Kagan, 'Americans need to decide soon whether they are prepared to let Ukraine lose' (Kagan, 2024).

Any negotiated settlement will also come up against the question of **sustainability**. A cessation of hostilities is badly needed – and may indeed be the immediate outcome; but the fear of a resumption of the war would remain. Mainstream voices in Moscow confirm that Russian control over the Ukrainian territory already captured is by no means the desired outcome of the conflict (TASS, 2024).[2]

Should the negotiations result in Ukraine having to make painful concessions, the rather **tepid Western reaction to Zelensky's 'victory plan'** may help the Ukrainian government shift the blame onto its partners, who feel unable to provide the support requested.

DOMESTIC FRONT

If the conflict reaches a negotiated stalemate, that will significantly affect the domestic political situation in Ukraine. The country has postponed elections until the end of the war, and the **resumption of competitive politics** could engender a lot of turbulence, fuelled by frustration over the country's losses, its destruction and its unfulfilled goals. While it is impossible to imagine any legal pro-Russian political force in Ukraine, Moscow will keep looking for opportunities to divide and rule over the country, and will focus particularly on **regional divides**.

While the Russian political system seems more solid than ever, it is nevertheless not immune to various shocks that are impossible to predict. The **aging leadership** probably hopes to remain in power for another 10-20 years, during which time it will seek to resolve the ongoing conflict in Russia's favour. But the burden of war and the sanctions will have a more adverse effect on the country's economy and society in the longer run. The war effort has involved a significant number of people who have ended up with physical and psychological trauma, and who will expect support from the state. But that will also help **maintain the official narrative** justifying Russia's actions in the conflict – something that will further complicate future attempts at reconciliation.

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[2] For instance, although four Ukrainian regions – Luhansk, Donetsk, Zaporizhzhia and Kherson – were formally annexed by Russia in late 2022, only certain parts of the latter three are de facto controlled by Russia. At the time of writing, the cities of Kherson and Zaporizhzhia remain under Ukrainian control.

Domestic developments in the West will also have an impact on the future of the conflict. The growth of **populist and marginal political movements** in major Western European countries could eventually lead to breaches of the sanctions regime against Russia and to a re-focusing of attention and resources onto issues other than Ukraine. In the US, the effects of **polarisation**, together with the long-term preoccupation of US elites with the challenge of **China**, could lead in a similar direction – and potentially more rapidly than in Europe.

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What drives the demand for typical and atypical employment in Europe?[1]

BY SANDRA M. LEITNER AND ALIREZA SABOUNIHA

Atypical, non-standard forms of employment have become more widespread, particularly in many advanced economies. This is of concern because of the negative impact on 'atypical' workers. We find that off-shoring and communication technology (CT) have been important drivers in the expansion of atypical employment in Europe – in the case of off-shoring, this has mainly been the case in service industries. The strictness of employment protection legislation (EPL) has played an important moderating role, damping down some of the negative effects, particularly in relation to off-shoring.

INTRODUCTION

In many parts of the world, and particularly in many advanced economies, atypical, non-standard forms of employment – such as temporary employment, marginal employment, part-time employment, temporary agency work or other forms of multiparty employment relationships, bogus or dependent self-employment – have become more common and have spread to sectors and occupations where they did not previously exist (ILO, 2016).

While atypical forms of employment have, for some time, been seen as a means of increasing employment opportunities and tackling high levels of unemployment, their spread has become a concern to policy makers, owing to the adverse effects on 'atypical' workers. Specifically, atypical forms of employment are associated with low job security, frequent movement in and out of the labour market, low pay, and a consequently high risk of (in-work) poverty and unemployment, all of which affect workers' employability and increase the likelihood that they will have a precarious employment history throughout life (Månsson and Ottosson, 2011; Blásquez Cuesta and Moral Carcedo, 2014; Görg and Görlich, 2015; Westhoff, 2022; Mäkinen et al., 2023). Moreover, as these workers are more likely than 'typical' workers to have an interrupted record of social insurance contributions (or even none at all), they also have limited entitlement to benefits in the event of unemployment, illness, maternity, disability and old age (Schmid and Wagner, 2017).

Although the reasons for the spread of atypical forms of employment are complex, the expansion of global supply chains – i.e. the international outsourcing, or off-shoring, of production stages – and the emergence and diffusion of new technologies (which have progressed in tandem with atypical forms of employment) are seen as important drivers of this trend. In particular, the imperatives of remaining flexible and cost-competitive are key incentives for both firms that off-shore and suppliers to consider atypical forms of employment. And technological change can also lead to an increase in atypical forms of employment, since the bargaining power of workers is reduced as new technology becomes better capable of replacing them.

[1] This paper was written for the Horizon 2020 project WeLaR. It has received funding from the European Union's Horizon 2020 Research and Innovation Programme, under grant agreement No. 101061388.

Hence, in view of the growing spread and negative consequences of atypical forms of employment, any form of labour protection plays an important role in securing better employment terms for workers. However, the moderating role of this on both typical and atypical employment remains unexplored.

Against this backdrop, we have used detailed industry-level data to study the short-, medium- and long-term effects on employment of (i) off-shoring (the international outsourcing of production stages) and (ii) technological change (including robotisation and the three dimensions of information and communication technology (ICT)), both generally and by type of employment (i.e. typical or atypical employment) in a group of European economies between 2009 and 2018. Off-shoring is measured by the share of imports of intermediate inputs in gross output and robotisation by the stock of industrial robots per 1,000 employees (referred to as 'robot density'); meanwhile the three ICT components are IT, CT and DB. IT refers broadly to computer hardware; CT to telecommunications equipment; and DB to intangible computer software and databases. Moreover, we have also examined the moderating role of labour market institutions and regulation – specifically employment protection legislation (EPL) that governs both individual and collective dismissal and the hiring of temporary workers – in order to show how legislation shapes the impact of both the above forces (off-shoring and technological change) on both types of employment.

We have focused on all industries, apart from the public-sector industries (O-U, and industries D-E), where off-shoring and technological change play only a limited role. Moreover, we have used two different data samples: (i) the total economy sample (comprising all industries except NACE O-T and D-E) and (ii) a manufacturing sample (comprising all manufacturing sectors from NACE 10 to 33), which is available at the more detailed two-digit industry level. A comparison of the results for both samples has enabled us to say more about the service industries, which make up the bulk of non-manufacturing industries in the total sample, but whose number was too small to allow separate analysis.

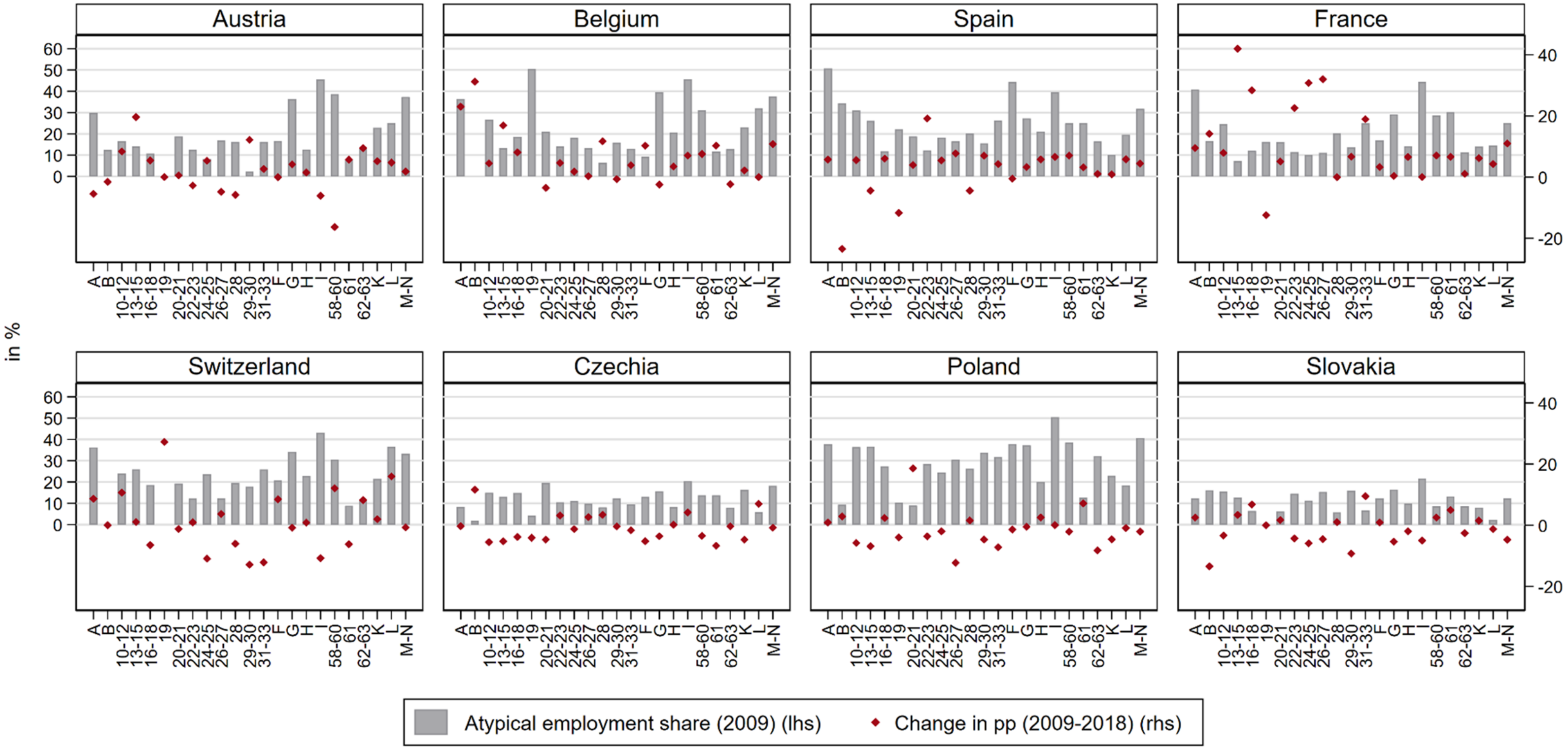
We have used detailed data from national EU Statistics on Income and Living Conditions (EU-SILC) – as provided by the various national statistical offices – and employed information on current economic status (i.e. employees working part time) and type of contract (i.e. temporary jobs/work contracts of limited duration) of the main job to identify atypical employment. Our country sample comprises Austria (AT), Belgium (BE), Czechia (CZ), France (FR), Poland (PL), Spain (ES) and Slovakia (SK) as EU member states, and Switzerland (CH) as a non-EU member state.

ATYPICAL EMPLOYMENT IN EUROPE – DEVELOPMENTS BETWEEN 2009 AND 2018

Figure 1 shows both the proportion of workers in atypical employment (as a share of total employment) and the growth in that proportion – the latter in terms of the percentage-point change between 2009 and 2018 – across those industries covered by our analysis. It shows for 2009 that, in many industries, the proportion of atypical employment was above 20%. This was particularly the case in Poland, where it exceeded 20% in almost all industries. By contrast, in both Czechia and Slovakia, the share of atypical employment was below 20% in all industries, except industry I (accommodation and food service activities). Moreover, in all the countries studied, the proportion of atypical employment tended to be relatively high in industry A (agriculture, forestry and fishing) and was generally higher in services than in manufacturing. Among service industries, industry I stands out as having had the highest share of employees in atypical employment.

Between 2009 and 2018, the share of atypical employment changed differently across countries in the sample. In the sample of ‘old’ EU member states (including Austria, Belgium, France and Spain), it declined in only a few industries – notably in 58-60 (publishing, audio-visual and broadcasting activities) in Austria; B (mining and quarrying) in Spain; and 19 (coke and refined petroleum products) in France – whereas in Switzerland and the sample of ‘new’ EU member states (including Czechia, Slovakia and Poland), it declined in the majority of industries. Hence, in Czechia and Slovakia, the share of atypical employment was not only low in 2009, but continued to fall in most industries until 2018. By contrast, many industries, particularly in the ‘old’ EU member states, also experienced an increase in the proportion of atypical employment, although this was rather moderate – less than 10 percentage points (pp) in most cases. The increase in the share of atypical employment was particularly high in some French manufacturing industries, at more than 20 pp.

Figure 1 / Atypical employment share in 2009 (lhs) and absolute change (in percentage points) between 2009 and 2018 (rhs)



Note: A refers to agriculture, forestry and fishing; B to mining and quarrying; 10-12 to food products, beverages and tobacco; 13-15 to textiles, wearing apparel, leather and related products; 16-18 to wood and paper products, printing and reproduction of recorded media; 19 to coke and refined petroleum products; 20-21 to chemicals and chemical products; 22-23 to rubber and plastics products, and other non-metallic mineral products; 24-25 to basic metals and fabricated metal products, except machinery and equipment; 26-27 to computer, electronic and optical products, and electrical equipment; 28 to machinery and equipment n.e.c.; 29-30 to transport equipment; 31-33 to other manufacturing; repair and installation of machinery and equipment; F to construction; G to wholesale and retail trade; repair of motor vehicles and motorcycles; H to transportation and storage; I to accommodation and food service activities; 58-60 to publishing, audio-visual and broadcasting activities; 61 to telecommunications; 62-63 to IT and other information services; K to financial and insurance activities; L to real estate activities; and M-N to professional, scientific and technical activities, administrative and support service activities.
Sources: National EU-SILC; own calculations.

OFF-SHORING, TECHNOLOGICAL CHANGE AND LABOUR DEMAND

Generally, the findings of our econometric analysis are quite different for the two samples analysed. Specifically, in the total economy sample, a rise in **off-shoring** increases demand for total employment and atypical employment – but only in the short run. In the manufacturing sample, off-shoring reduces demand for typical employment – in both the short run and also long term. This finding points to important differences between manufacturing and service industries (which make up the bulk of non-manufacturing industries in the total sample), suggesting that off-shoring has important differentiated compositional effects: more off-shoring leads to a reduction of typical employment in manufacturing industries, with unchanged demand for atypical employment; but to an expansion of atypical employment in service industries, with unchanged demand for typical employment.

With regard to **technological change**, with only one exception, we find little evidence that information technology (IT), communication technology (CT) or software and databases (DB) have an impact on labour demand in the total sample. The exception relates to CT: in the long run, an increase in CT raises demand for total employment, mainly because of an increase in demand for atypical employment.

This contrasts with what is observed for robot density, the expansion of which leads to a fall in total employment in the short, medium and long run, which is mainly due to a decrease in typical employment in all three of these timeframes. However, the effect declines over time. The negative effect on typical employment can be explained by the different educational and skill endowments of typical and atypical workers, and the polarisation effect of robotisation. In particular, as low-skilled workers are overrepresented in atypical employment (Leitner et al., forthcoming; Schmid, 2011), they are less vulnerable to the technology-induced displacement effects that mainly affect medium-skilled workers (Autor et al., 2003), who predominantly hold typical jobs. By contrast, atypical employment falls only in the long run.

THE ROLE OF EMPLOYMENT PROTECTION

In the analysis, we also take account of the role played by labour market institutions in potentially moderating the impact of both forces – off-shoring and technological change – on employment in total, as well as by specific type. Specifically, we use information on the strictness of EPL that governs the dismissal (both individual and collective) of workers on a *regular contract* and the hiring of workers on a *temporary contract*. We have grouped the countries in our sample according to the strictness of their EPL: there is a group of 'strict' EPL countries in the case of above-average EPL, and a group of 'weaker' EPL countries comprising those with average or below-average EPL. Specifically, we have classified Belgium, Czechia, France and Slovakia as those countries with strict EPL governing the dismissal of workers on a regular contract; and France, Slovakia and Spain as those with strict EPL governing the hiring of workers on a temporary contract. In the analysis, we have then used interaction terms between the individual EPL strictness country dummies and off-shoring and technological change, in an effort to bring out the moderating role of EPL.

Our results show that the strictness of EPL matters for labour demand in general, and for the type of labour in particular. Specifically, as concerns **off-shoring**, the results indicate that the 'other' type of employment appears to be affected more by the two different EPL indicators analysed: to wit, atypical employment increases more in countries with stricter EPL for *regular contracts*, while conversely, typical employment increases more in countries with stricter EPL for *temporary contracts*. This finding suggests that regulations tend to subdue off-shoring-induced employment adjustments in the case of more-protected types of employment, and to encourage greater adjustments in the case of less-protected types of employment.

As for **technological change**, our findings show that a rise in CT increases demand for atypical employment, but only in countries with stricter EPL for both regular and temporary contracts. However, the effect is to be observed only in the short to medium term; in the long term, an increase in typical employment may also be observed, especially in countries with stricter EPL for temporary contracts. We find no difference in the role of EPL with respect to either IT or DB.

Moreover, the effect of an increase in robot density differs by EPL indicator: countries with stricter EPL for regular contracts experience a stronger decline in demand for both typical and atypical employment than do those countries with weaker EPL for regular contracts. But there is no difference with respect to the strictness of EPL for temporary contracts.

CONCLUSION

In summary, our analysis shows that both off-shoring and technological change have had an impact on European labour markets, with important implications for policy intervention.

For instance, we find important differences between manufacturing and service industries: negative employment effects of off-shoring in manufacturing, but positive employment effects in services. Importantly, these changes were the result of a reduction in typical employment in manufacturing and an expansion of atypical employment in services. Hence, from a policy perspective, particular attention needs to be paid to the service sector, where atypical employment was more prevalent to begin with, and has expanded more, on average, because of off-shoring.

Moreover, technological change also affected labour demand. However, for the three ICT components (IT, CT and DB), only CT capital – i.e. communications equipment – mattered in this context, as a rise in CT capital raised demand for total employment, largely through greater demand for atypical employment. This makes CT an important driver of atypical employment in Europe, and workers employed in industries exposed to an increase in CT capital are particularly vulnerable to atypical employment.

By contrast, robotisation has had an important labour-displacement effect, mainly at the expense of typical employment. This finding is robust in the short, medium and long run. By contrast, atypical employment fell only in the long run. The negative overall employment effect of robotisation calls for policy intervention along three lines: (i) compensation policies that aim to offer financial assistance for workers displaced by technology, through the public provision of social protection; (ii) investment policies that aim to prepare new employees (or retrain displaced ones) – mainly medium-skilled workers – by providing them with skills relevant for the labour market; and (iii) steering policies, such as taxation or labour market policies, which aim to influence the pace and direction of technological change, by shaping the employment, investment and innovation decisions of businesses (Bürgisser, 2023).

We also find that the strictness of EPL is important for labour demand in general and by type of employment, but differs between off-shoring and technological change. Specifically, as concerns off-shoring, our findings show that regulation tends to moderate employment adjustments in the more-protected type of employment and to encourage stronger adjustments in the less-protected employment type. Hence, the 'gap' in the strictness of employment regulations becomes important for the relative employment effect of typical and atypical workers (Centeno and Novo, 2012; Hijzen et al., 2017). This calls for a balanced policy approach, with similarly strict EPL for both types of workers.

As regards technological change, the impact on labour demand is more nuanced and unexpected: the increase in demand for atypical employment in response to an increase in CT capital is observed only in countries with stricter EPL. Conversely, the demand for both typical and atypical employment has fallen far more in response to increased robotisation in countries with stricter EPL than in those with weaker EPL. This only holds for EPL for temporary contracts. Hence, strict EPL has amplified, rather than moderated, technology-induced employment adjustments.

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The digital transition at work in the EU: Socio-demographic challenges

BY SEBASTIAN LEITNER AND STELLA ZILIAN[1]

In this article we document patterns of age segregation in digital job tasks across the EU. We find clear generational differences, as younger workers are more likely to work in positions that require more frequent and more complex use of digital technology, whereas older workers are more likely to work in positions that require a lower level of digital skills or no digital skills at all. We further find evidence of a gender gap, with women exhibiting a lower probability than men of performing digital tasks. The gender gap is most pronounced among digital natives, and it decreases with age.

INTRODUCTION

The digital transition has a profound impact on how people work. With the continuous introduction of new digital technology into the workplace, it is becoming essential for workers to acquire the skills and competencies needed to use it effectively. This is also acknowledged by the EU, which has ambitious goals for boosting digital skills across its workforce, as part of broader strategies like its Digital Strategy and its Digital Education Action Plan. However, not all workers are equipped with the skills and abilities required to adjust to the spread of digitalisation and the concomitant shift in job tasks; in particular older workers tend to be disadvantaged in terms of digital skills (Falck et al., 2022). These skill disparities are also reflected in labour market outcomes, with older workers facing greater barriers to performing more complex digital job tasks.

Early research in economics into the effect of technology on older workers is rooted in standard human capital theory and the notion of skill-biased technological change – i.e. the idea that new technology increases the productivity of highly skilled (college-educated) workers more than that of low-skilled workers, leading to a rising wage disparity between different skill groups (see Acemoglu and Autor, 2011). It is assumed that older workers lack the kind of skills needed to allow them to keep up with rapid technological change, which reduces their competitiveness in the labour market and may lead to early retirement, unemployment or relative wage loss (Biagi et al., 2011). Moreover, older workers may be subject to ageist hiring practices because of negative assumptions about age and digital skills (Losh, 2013). With the availability of new international comparable microdata on skills and tasks used at work – e.g. the OECD's Programme for the International Assessment of Adult Competencies (PIAAC) or the European Centre for the Development of Vocational Training's (Cedefop) European Skills and Jobs Survey (ESJS) – a growing body of research is investigating the distribution of digital skills on the one hand, and on the other the use of information and communication technology (ICT) at work. Regarding PIAAC, one important finding is that older adults, women and people with a lower level of educational attainment tend to have poorer digital problem-solving skills, as measured by the computer-based assessment used by PIAAC (Ertl et al., 2020 Zilian and Zilian, 2020; Drabowicz, 2021; Non et al., 2021; Falck et al. 2022).

[1] This research was conducted as part of a project supported by the OeNB Jubilee Fund (Project No. 18934).

Falck et al. (2022) specifically address the age dimension of digital skills and labour market outcomes across 27 OECD countries, using PIAAC data. The authors focus on the prevalence of basic digital skills and show that the share of individuals with at least basic digital skills is always highest in the youngest age group (25-44) and always lowest in the oldest (55-64); however, the skills gap between the oldest and the youngest varies considerably across countries, with a smaller gap in Western Europe and Scandinavia than in East and Southeast Europe.

Switching perspective from skills to tasks carried out at work, Fernandez-de-Alava et al. (2017) use Spanish PIAAC data from 2011/2012 to compare how different generations use ICT at work. They categorise individuals on the basis of age and relative exposure to digital technology: digital natives (born 1980-1996), digital immigrants (born 1967-1979) and pre-digital immigrants (born 1947-1966). Digital natives grew up with digital technology from a young age; digital immigrants experienced the introduction and rapid expansion of digital technology during their formative years and early adulthood; while pre-digital immigrants had to adapt to digital technologies later in life. They find that digital immigrants use ICT at work significantly more than the other two groups, while pre-digital immigrants use ICT the least.

This article provides an updated picture of the relationship between age and the likelihood of engaging in digital tasks in EU using representative survey data from the most recent Cedefop European Skills and Jobs Survey (ESJS2).

THE SECOND CEDEFOP EUROPEAN SKILLS AND JOBS SURVEY (2021)

Cedefop's Second European Skills and Jobs Survey (ESJS2) was conducted in 2021 and it covers all 27 EU countries, plus Iceland and Norway. The total sample contains 45,000 adult employees aged 25-64. The survey provides comprehensive information both on the socio-demographic characteristics of respondents (e.g. age, gender, education and urbanisation) and on their jobs (e.g. industry, occupation, job tenure, business size, type of contract, work hours and earnings). Most importantly, it collects detailed information on the tasks and activities that employees carry out at work. ESJS2 focuses particularly on the frequency and intensity with which digital tools are used in a diverse set of work activities, such as word-processing, web browsing or data processing.

Our main variable of interest is the digital skills intensity (DSI) index, which is derived from information on the use of digital technology in ten different activities, ranging from basic tasks (such as web browsing) to highly complex tasks (such as ICT system maintenance or repair). It consists of two sub-components. The first is a quantitative measure: it captures the number of different digital activities performed, where a higher number signifies a higher level of DSI. The second sub-component is a qualitative measure: it assesses the complexity of digital activities, ranging from low (e.g. web browsing, using spreadsheets, preparing presentations) to medium (e.g. using specialised software, macros or formulas in spreadsheets) to high complexity (e.g. programming, ICT system maintenance). These two sub-components are merged into one overall DSI index that distinguishes four categories: no DSI (i.e. non-users), low DSI, medium DSI and high DSI. Following Fernandez-de-Alava et al. (2017), we adopt a generational perspective and differentiate between digital natives (aged 25-40), digital immigrants (aged 41-54) and pre-digital immigrants (aged 55+) to account for their different levels of exposure to digital technologies during their lives.

EMPLOYMENT PATTERNS ACROSS DIFFERENT CATEGORIES OF DIGITAL SKILLS INTENSITY IN EU

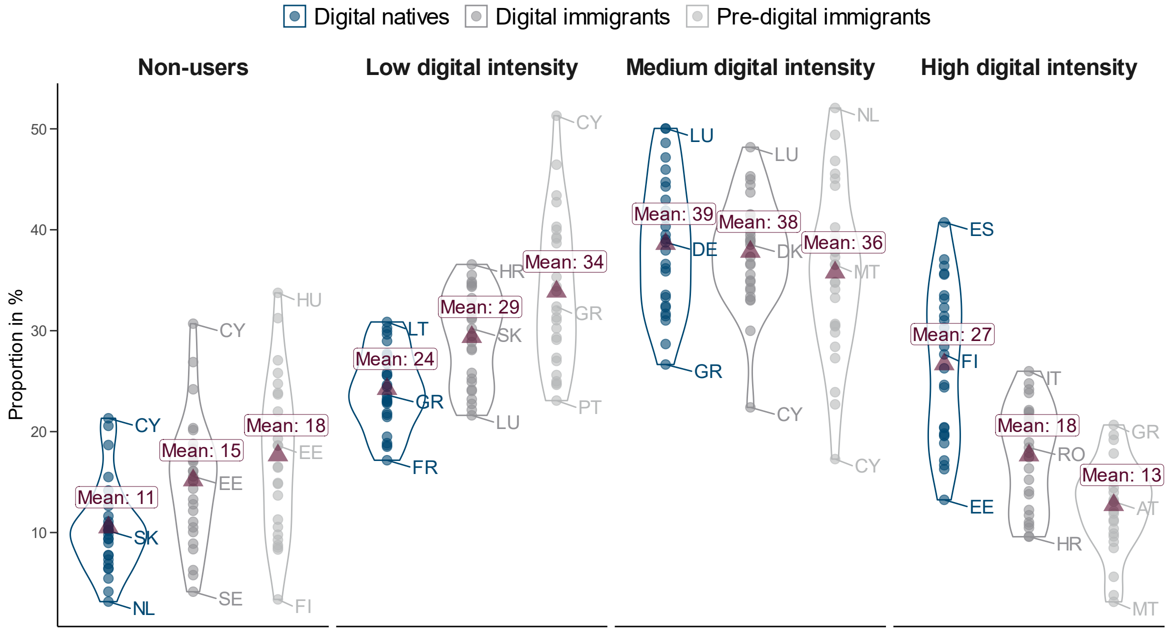
Figure 1 illustrates the distribution of the employment share of each digital generation across the four DSI categories using violin plots. The observations labelled are those countries with the highest, median and lowest values, respectively. We further report the simple mean within each DSI category and digital generation. The width of each violin shows the distribution density of the employment share within each group – i.e. the wider the section, the more countries have an employment share around these values. The violins thus highlight the extent of cross-country variation.

The distribution of the employment share of each generation across the DSI categories displayed in Figure 1 reveals clear generational differences in terms of how people use digital tools at work:

- On average, the employment share is highest in the medium DSI category for all generations: 39% of digital natives, 38% of digital immigrants and 36% of pre-digital immigrants perform activities of medium DSI. However, there is considerable cross-country variation within each digital generation, especially among pre-digital immigrants: less than 20% of pre-digital immigrants perform activities of medium DSI in Cyprus, whereas in the Netherlands the figure is over 50%.
- Digital natives are more heavily concentrated in the high DSI category: on average, 27% of digital natives are engaged in activities of high DSI, compared to 18% of digital immigrants and only 13% of pre-digital immigrants. Cross-country variation is most pronounced among digital natives, ranging from around 15% in Estonia to 40% in Spain.
- Older generations are comparatively more concentrated in the low DSI category: on average, 34% of pre-digital immigrants perform activities of low DSI, compared to 29% of digital immigrants and 24% of digital natives. Again, there is substantial cross-country variation among pre-digital immigrants, ranging from around 22% in Portugal to around 50% in Cyprus.
- Older generations are more likely than digital natives to be non-users: within this group, the employment shares of pre-digital immigrants (18%) and digital immigrants (15%) are on average higher than that of digital natives (10%). Cross-country variation is more pronounced among older generations, particularly pre-digital immigrants: the employment share of non-users ranges from around 2% in Finland to a third in Hungary.

In summary, when we focus on how total employment for each generation is distributed across the different DSI categories, we find clear generational differences and cross-country variation. The only exception is the medium DSI category, where the employment shares for the three generations are more similar.

Figure 1 / Employment distribution by digital generation across different categories of digital skills intensity



Note: The observations labelled are the countries with the highest, median and lowest values. Mean refers to the simple mean within each DSI category and digital generation. The width of each violin shows the distribution density of the employment share within each group – i.e. the wider the section, the more countries have employment shares around these values. The employment shares within each generation sum to 100% across the four DSI categories.
Source: ESJS2 (2021), own calculations.

Zooming in on cross-country differences, Figure 2 shows the employment share in the high and the medium DSI categories in selected countries, with EU-CEE countries highlighted in red. The countries are arranged (in descending order) on the basis of the share of digital natives in the high DSI category.

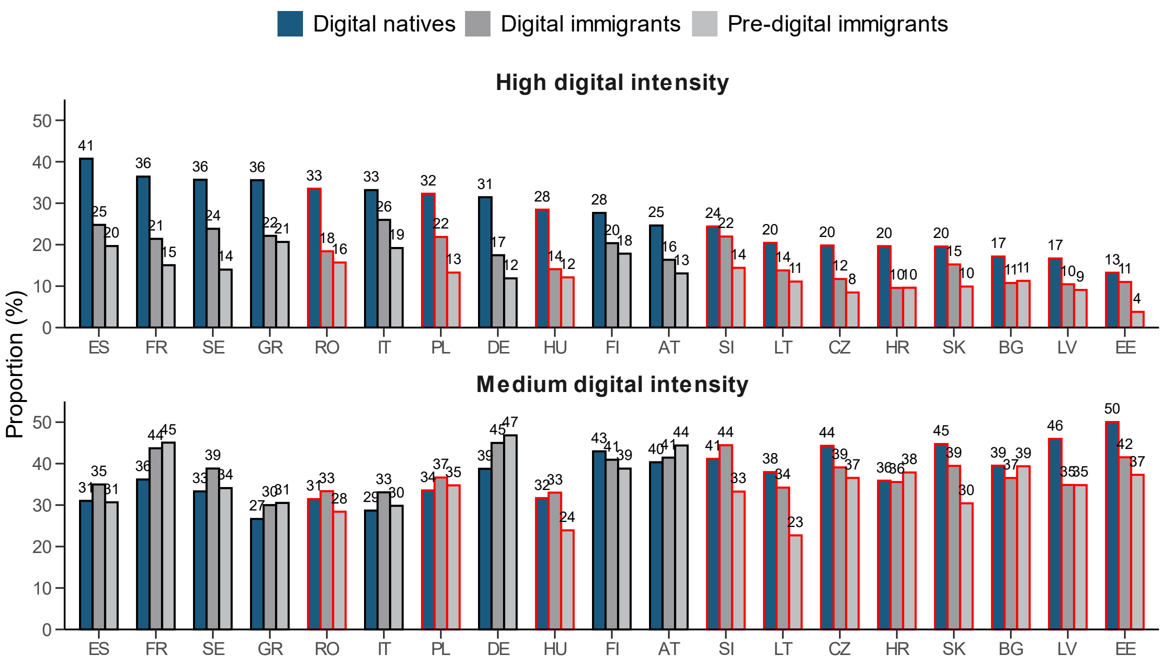
The upper panel of Figure 2 reveals that employees in EU-CEE countries tend to be less engaged with high DSI tasks than are employees in other selected EU member states. However, the lower panel indicates that a comparatively large share of employees in most EU-CEE countries, particularly digital natives, perform activities of medium DSI. This suggests that while many workers in EU-CEE countries are comfortable with – and regularly use – digital tools, they may not be as involved in more advanced, high-tech roles that drive significant innovation and a higher position in global value chains.

In addition, the following country differences may be observed:

› Spain stands out, with 41% of digital natives falling into the high DSI category (followed by France, Sweden and Greece on 36%). This is considerably higher than Finland's 28% (representing the median among the selected countries). Conversely, 17% of digital natives in Bulgaria and Latvia, and only 13% of digital natives in Estonia perform activities of high DSI, highlighting the fact that digital natives in those countries lag behind their peers in other countries.

- Among the EU-CEE countries, Romania and Poland fare best in terms of high DSI employment: 33% and 32%, respectively, of digital natives perform activities of high DSI. These shares are comparable to those of Italy (32%) and Germany (31%) and are higher than those in Finland (28%) and Austria (25%). However, the comparatively low employment share in the medium DSI category found in Romania and Poland implies that a significant proportion of employees in those two countries fall into the low DSI or non-user category. This points to a larger gap in those countries in terms of overall digital integration within the workforce.
- The generational divide in high DSI roles is stark in all countries, but Estonia stands out for its low level of integration of older generations in work that requires a high degree of digital skills: only 4% of pre-digital immigrants are employed in high DSI tasks. This is less than a third of the median employment share of pre-digital immigrants in this category (13% in Austria), indicating that Estonia may be facing particular challenges in transitioning older worker into more technologically advanced roles.
- Older generations are better represented in medium DSI roles in all countries, and the generational differences in those roles are less pronounced, suggesting that positions that involve medium digital skills are more accessible to older workers. However, in some EU-CEE countries, such as Slovakia and the Baltics, the percentage of digital natives in medium DSI roles is more than 10 points higher than that of pre-digital immigrants. This indicates that in those countries, digital natives tend to occupy both the high and medium DSI, while older generations are left behind.

Figure 2 / Employment distribution by digital generation across high and medium digital skills intensity categories in selected countries



Note: Employment shares within each generation sum to 100% across the four DSI categories (low digital intensity and non-users not shown). EU-CEE countries are framed in red. Countries are ordered according to the proportion of digital natives in the high DSI category (from highest to lowest).
Source: ESJS2, own calculations, weights applied.

In summary, there are fewer employees engaged in tasks that require high DSI in EU-CEE countries than in other EU regions; digital natives in EU-CEE often work instead in medium DSI roles. However, significant country differences do exist: countries like Spain, France and Greece have a much higher share of digital natives in advanced digital roles, whereas Estonia and Bulgaria, for example, are lagging behind – especially when it comes to the integration of older generations into high-tech roles.

THE RELATIONSHIP BETWEEN GENDER, DIGITAL GENERATION AND DIGITAL SKILLS INTENSITY AT WORK

Next, we use an ordered logistic regression model to explore how generation is associated with DSI at work. We will additionally highlight gender differences. The econometric model can be specified as follows:

$$P\left\{y_i = \{0,1,2,3\}\middle|A_{ij}, G_{ij}, \boldsymbol{X'_{ij}}\right\} = \alpha + \beta_1 A_{ij} + \beta_2 G_{ij} + \beta_3\left(A_{ij} \times \mathrm{G_{ij}}\right) + \boldsymbol{\gamma X'_{ij}} + \vartheta_j + \ \varepsilon_{ij} \quad (1)$$

where the dependent variable $y_i \in \{DSI_{ij}\}$ refers to the DSI of tasks performed at work by individual i in country j, A_{ij} is a categorical variable capturing the three age generations and G_{ij} denotes the female gender dummy. The interaction term between generation and age ($A_{ij} \times \mathrm{G_{ij}}$) captures gender disparities in age segregation in DSI. Vector $\boldsymbol{X'_{ij}}$ denotes a vector of other influential variables, including education, urbanisation, employment tenure, business size, type of contract, work hours and occupation-industry pairs. Finally, ϑ_j denotes country fixed effects and ε_{ij} is the error term. The econometric model specified in equation (1) is estimated separately for three groups of countries – EU-West, EU-CEE and EU-South – allowing us to compare differences in DSI by generation and gender across various EU regions.

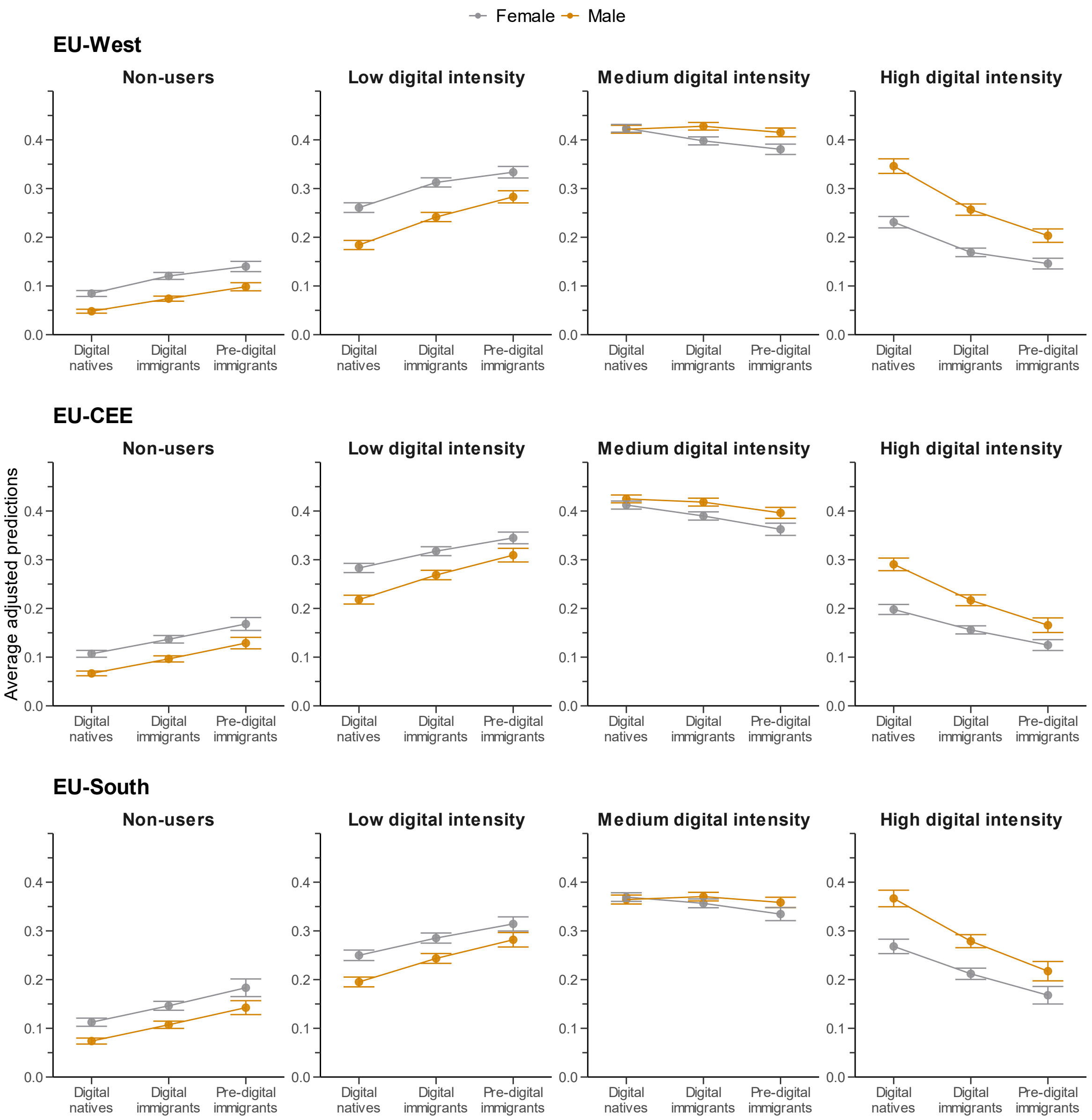
Note that the survey sample only includes employed people – i.e. those who have managed to secure and maintain employment. This implies that we might underestimate the true impact of generation on DSI, as we are missing data on individuals who are not in the workforce due to unobserved factors; this could disproportionately affect women or older generations, by virtue of caregiving responsibilities or health issues. Hence, the estimates can only be seen as a lower bound of actual generational and gender differences.

To illustrate how gender and generation are associated with the likelihood of belonging to the different categories of DSI (all other covariates being held constant), in Figure 3 we plot the average adjusted predictions (y-axis) of any given individual falling into each of the four DSI categories for the three digital generations (x-axis), differentiated by gender (yellow represents men, grey women). As before, the results are stratified by three regional clusters of EU27 countries: EU-West, EU-CEE and EU-South.

Figure 3 highlights a significant generational divide across all country groups that is most pronounced in the high DSI category. Thus, even after controlling for a rich set of variables, digital natives are much more likely to perform high DSI tasks than are digital immigrants and pre-digital immigrants; meanwhile older generations are much more likely to be non-users or to perform tasks of low DSI. There is also a clear gender gap: men generally have a greater probability than women of falling into the category of high DSI, whereas women – and in particular older women – are more likely to be non-users or to perform low DSI tasks. While the generational divides are very similar across all three regions, the gender gaps are more pronounced in the EU-West than in the other two regions. Across all regions, the gender gaps tend to narrow with age.

Despite these similarities in terms of generational and gender gaps, there are some notable regional differences: across all generations (and regardless of gender), the likelihood of someone falling into the high DSI category is consistently highest in EU-South and lowest in EU-CEE. By contrast, employees in EU-CEE are always most likely to perform low DSI tasks. This suggests that workers in EU-CEE are lagging behind in terms of digital skills intensity.

Figure 3 / Predicted probabilities: gender differences across generations and EU regions



Note: Average adjusted predictions (predictive margins) for each combination of gender and digital generation (all other covariates held constant). Covariates included are business size, contract type, tenure, educational attainment, urbanisation, occupation-industry pairs and country fixed effects.

CONCLUSION

In this article we have presented evidence on consistent patterns of age selection in digital tasks, based on detailed survey data from 2021, and we highlight EU-CEE's standing in comparison to other EU27 countries. Notably, older generations face a greater challenge in securing high-tech roles, with pre-digital immigrants especially underrepresented in high DSI tasks (visible in countries such as Estonia). While medium DSI roles appear to be more accessible to all generations, there are significant cross-country variations, particularly in EU-CEE, where digital natives are often concentrated in medium DSI roles. This indicates that while older workers are better integrated into work that requires moderate digital skills, they remain marginalised in high DSI work across many countries, especially in EU-CEE.

Despite country differences regarding the extent of the workforce's engagement with digital tools, we find that the overall picture of generational differences within countries is consistent. We show that digital natives gravitate towards high DSI tasks, while older generations are more likely to perform tasks that require lower (or no) digital skills. The econometric analysis highlights significant generational and gender differences, even controlling for a rich set of individual and workplace characteristics.

Of particular concern is the marked difference between digital natives and older generations in the high DSI category, as well as the gender gap in this category. As these high DSI task profiles are bound to become more in demand in future, with the appearance of increasingly smart digital technology in the workplace, male digital natives are in a much better position than women and older generations to benefit from the digital transition. Although these patterns are consistent across the three country clusters, it is noteworthy that employees in EU-CEE are consistently less likely than employees in EU-South and EU-West to perform high DSI tasks. This may point to a lack of access to digital training and education, and it may reflect the more lowly position of EU-CEE producers in the global value chain, which is linked to a slower adoption of new technology at work.

Given that they have the potential to exacerbate existing labour market inequalities both within and between countries, the differences observed call for focused policy intervention to address the multiple layers of digital inequality. In order to support a just digital transition, such policies should concentrate on improving access to advanced digital education and reskilling programmes, especially for older generations and women.

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

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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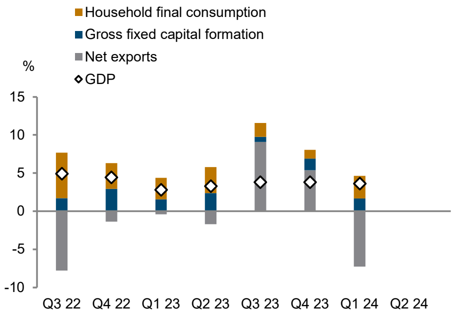
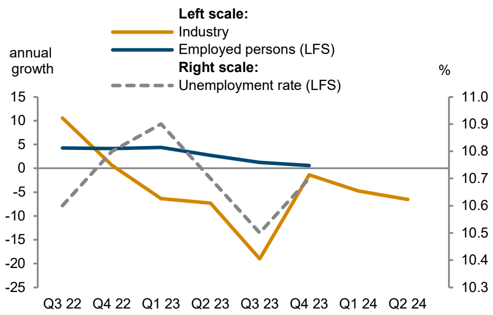
Albania

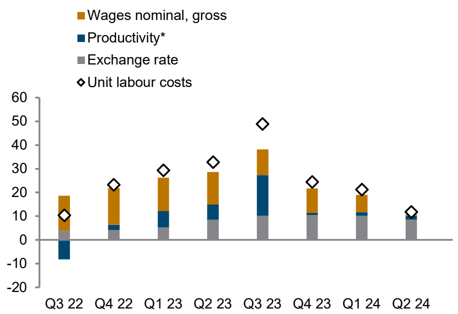
Real GDP growth and contributions
y-o-y



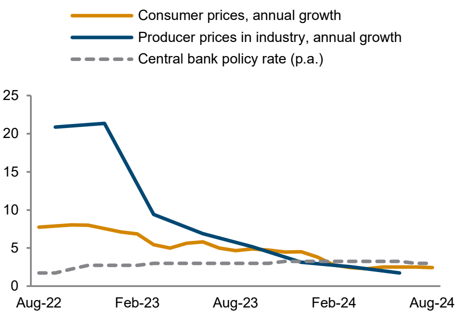
Real sector development
in %



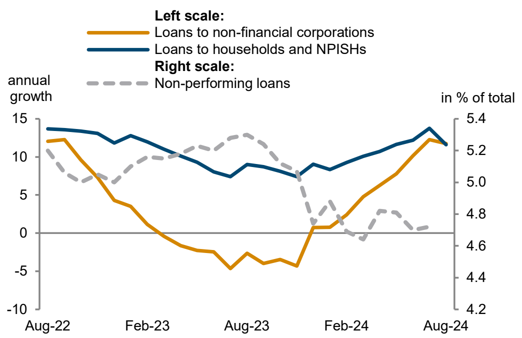
Unit labour costs in industry
annual growth rate in %



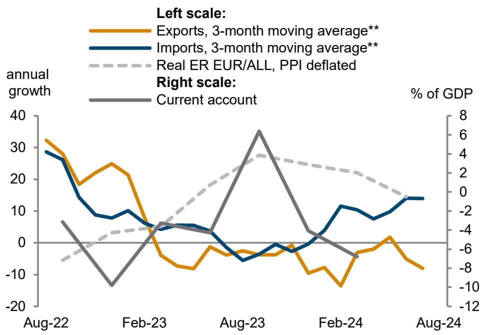
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



*Positive values of the productivity component on the graph reflect decline in productivity and vice versa.
**EUR based.

Source: wiiw Monthly Database incorporating Eurostat and national statistics.
Baseline data, country-specific definitions and methodological breaks in time series are available under:
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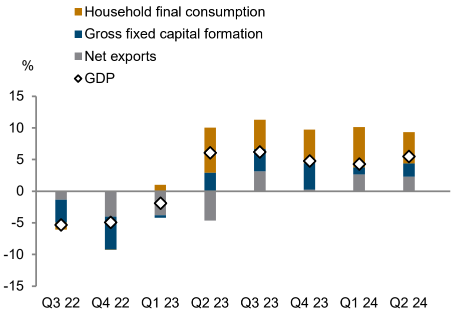
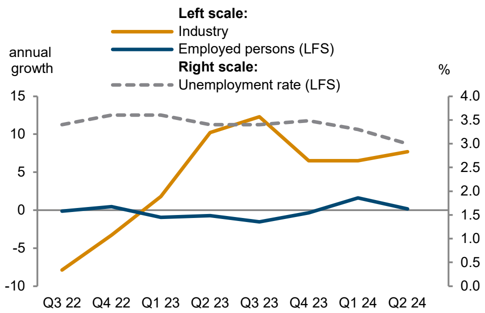
Belarus

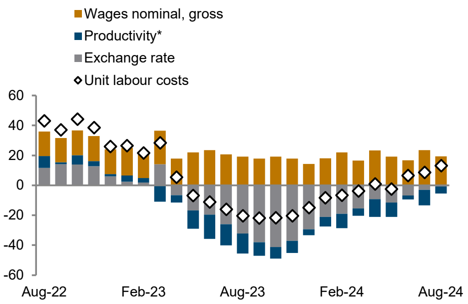
Real GDP growth and contributions
y-o-y



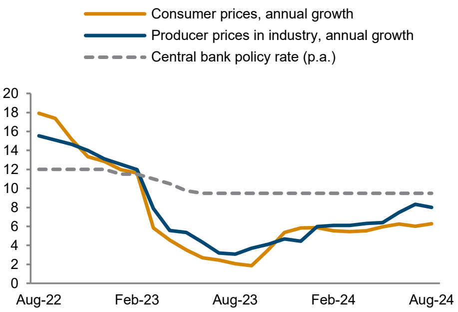
Real sector development
in %



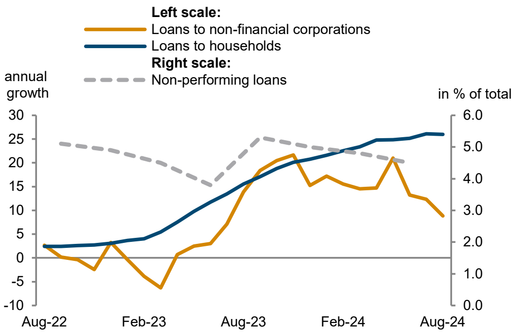
Unit labour costs in industry
annual growth rate in %



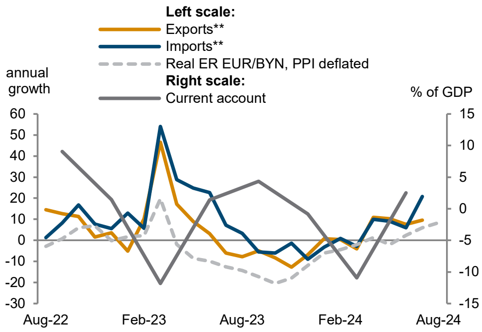
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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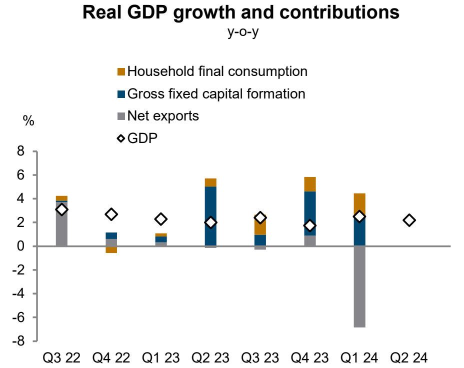
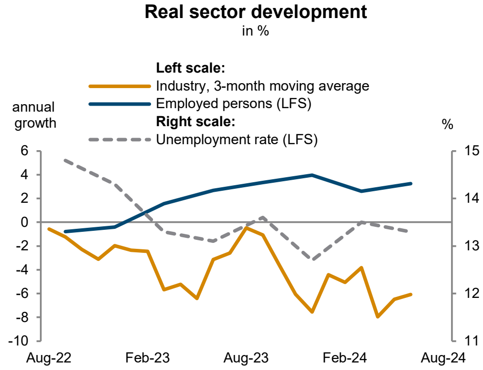
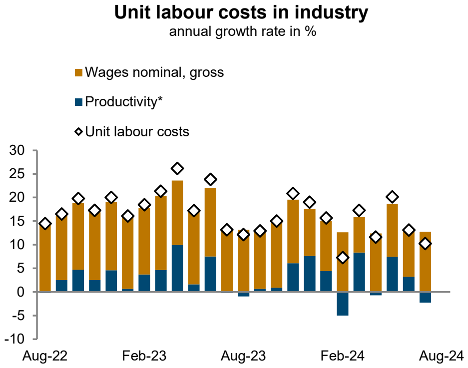
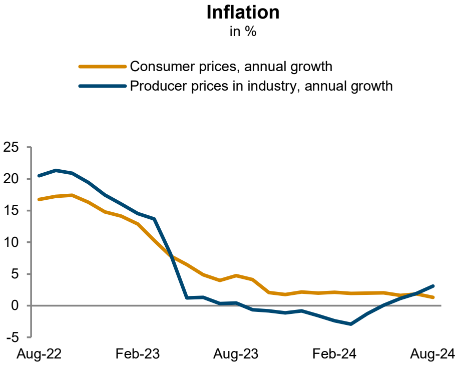
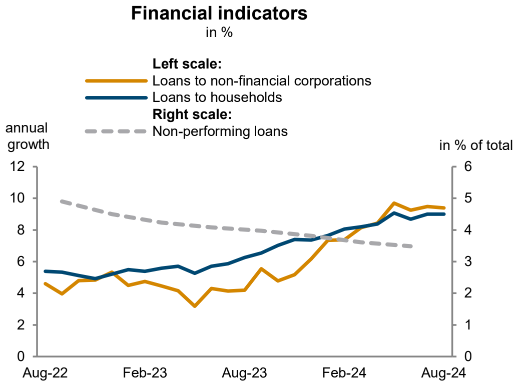
Bosnia and Herzegovina

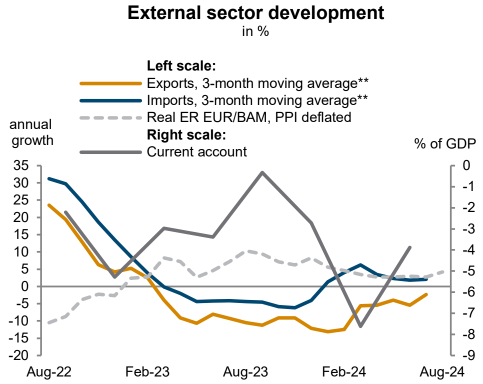












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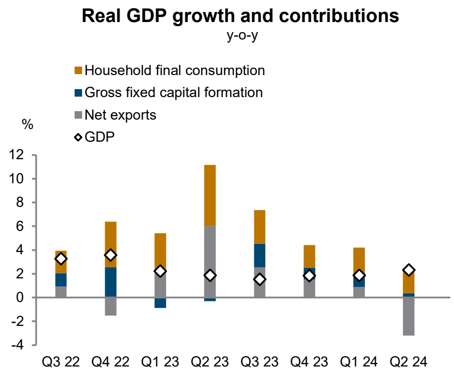
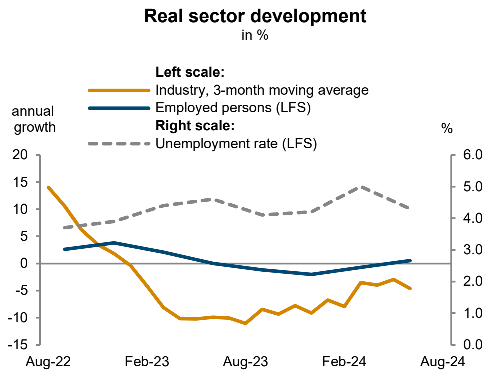
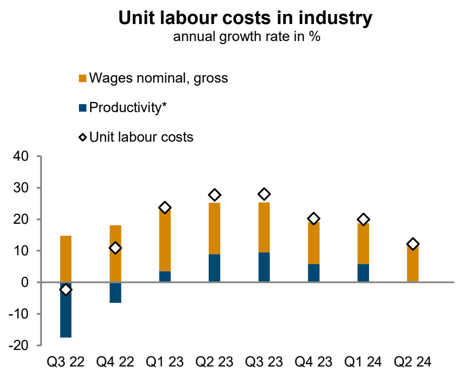
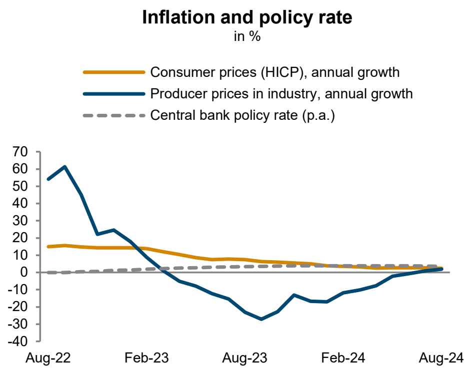
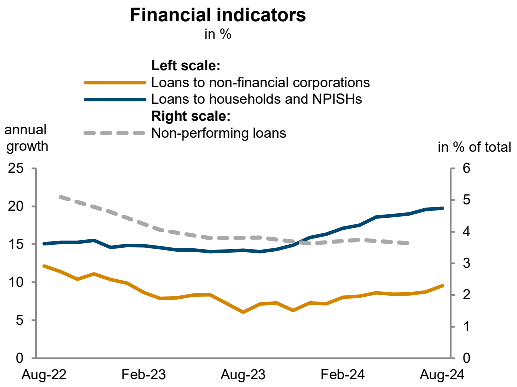
Bulgaria

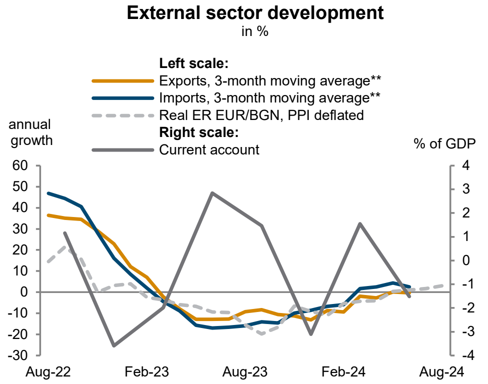












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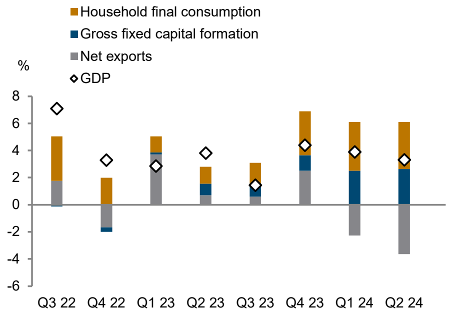
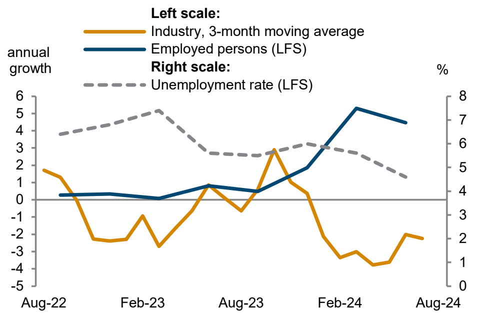
Croatia

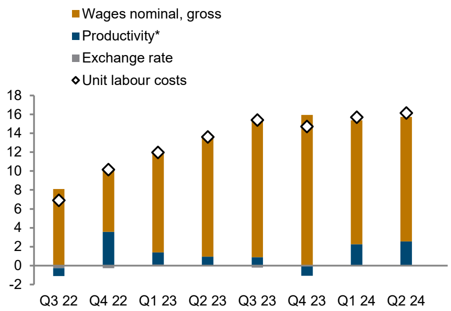
Real GDP growth and contributions
y-o-y



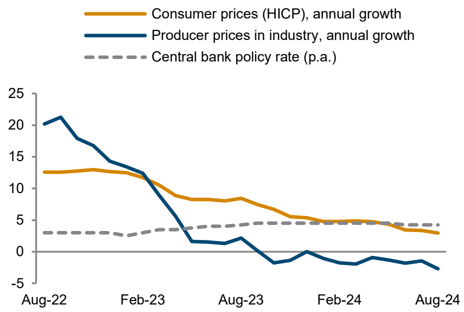
Real sector development
in %



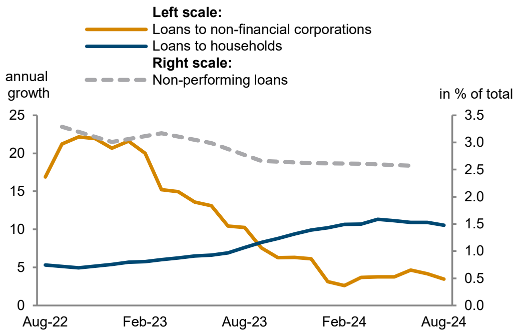
Unit labour costs in industry
annual growth rate in %



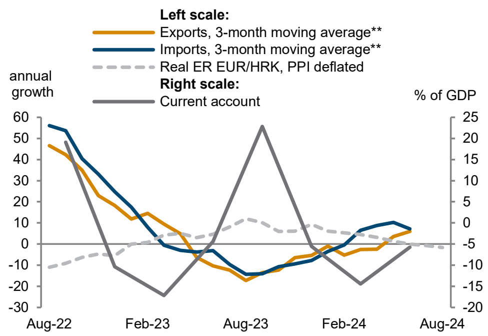
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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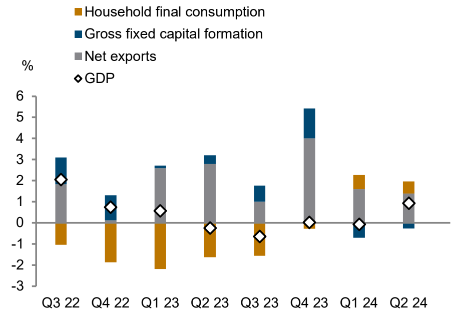
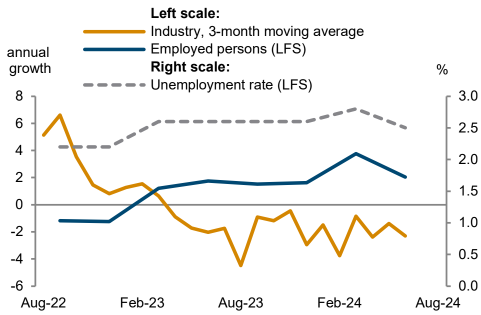
Czechia

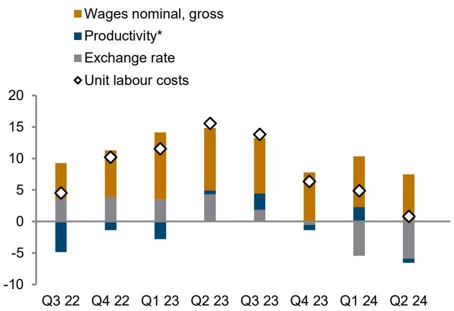
Real GDP growth and contributions
y-o-y



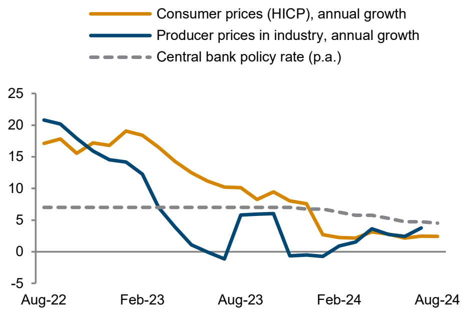
Real sector development
in %



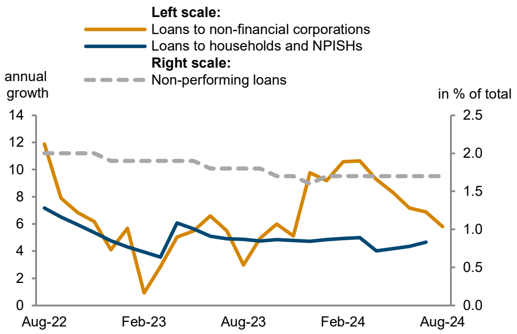
Unit labour costs in industry
annual growth rate in %



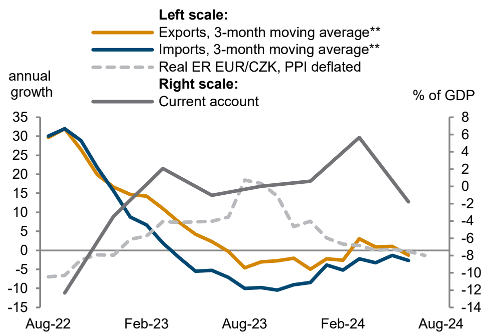
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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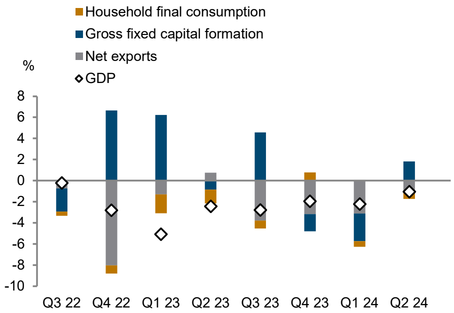
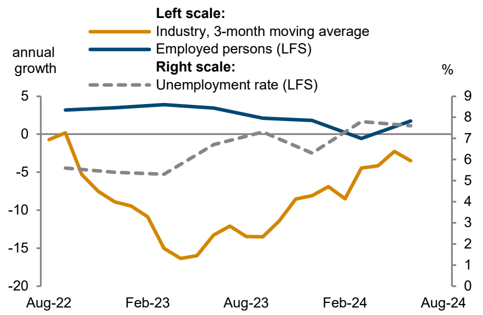
Estonia

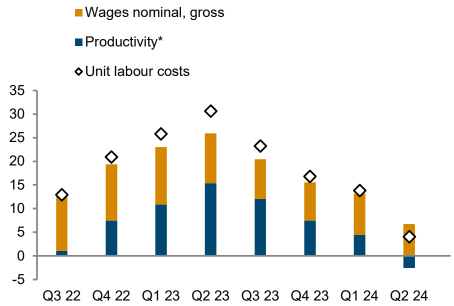
Real GDP growth and contributions
y-o-y



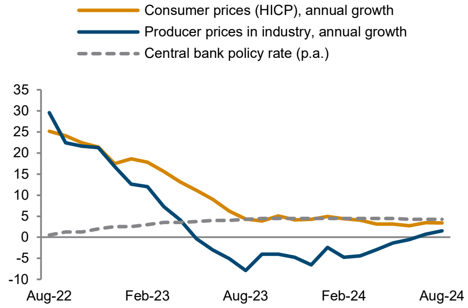
Real sector development
in %



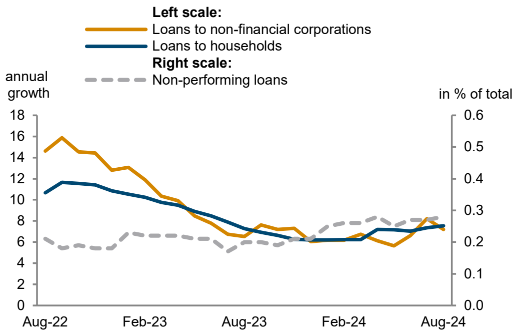
Unit labour costs in industry
annual growth rate in %



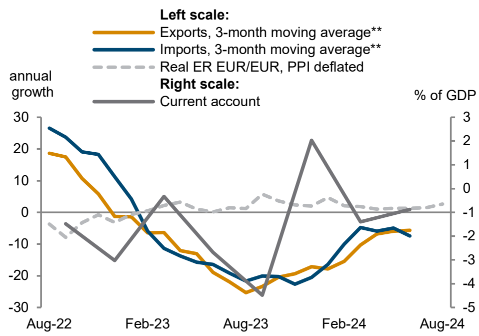
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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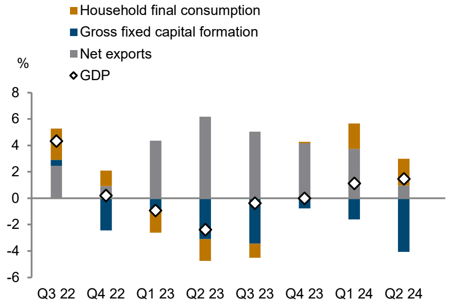
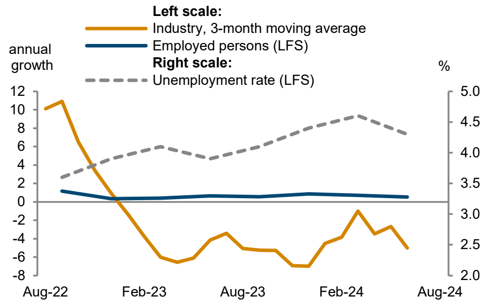
Hungary

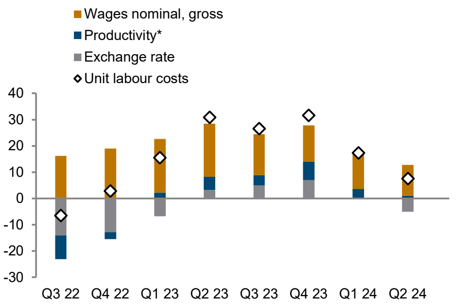
Real GDP growth and contributions
y-o-y



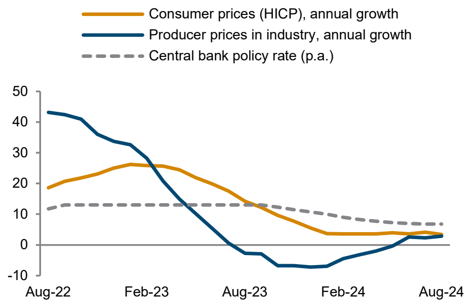
Real sector development
in %



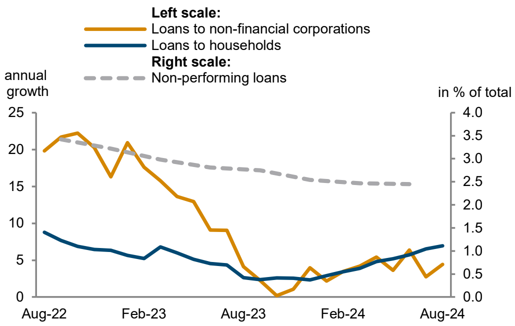
Unit labour costs in industry
annual growth rate in %



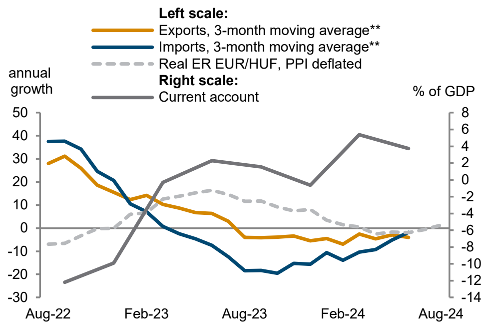
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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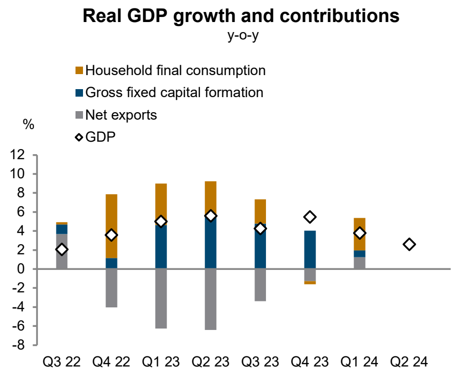
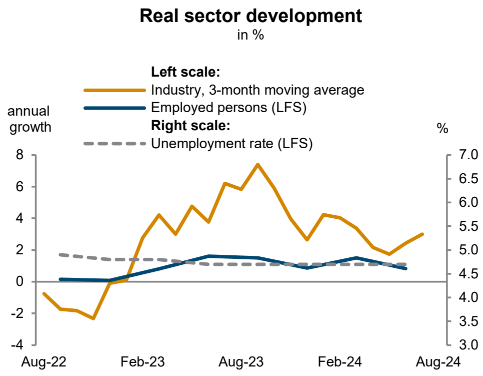
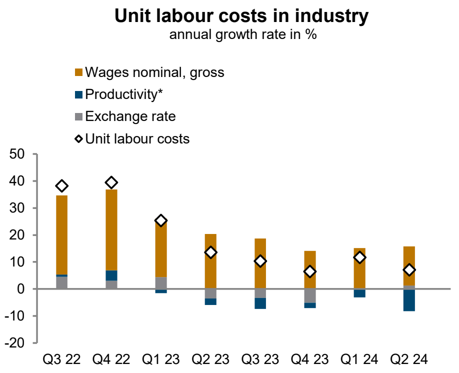
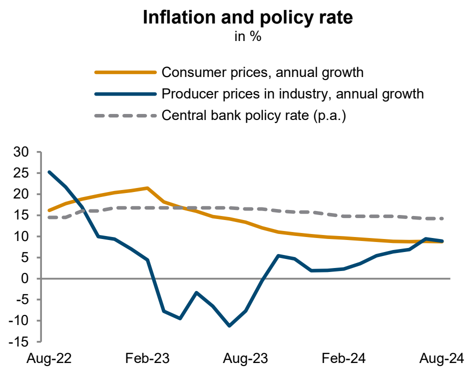
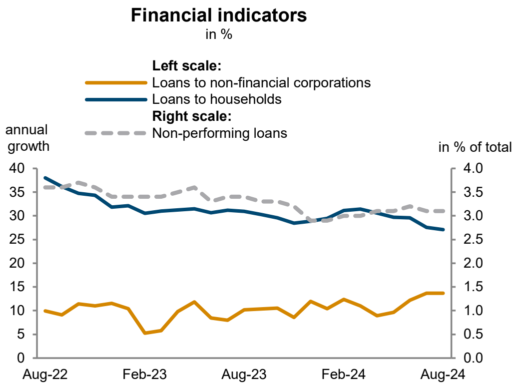
Kazakhstan

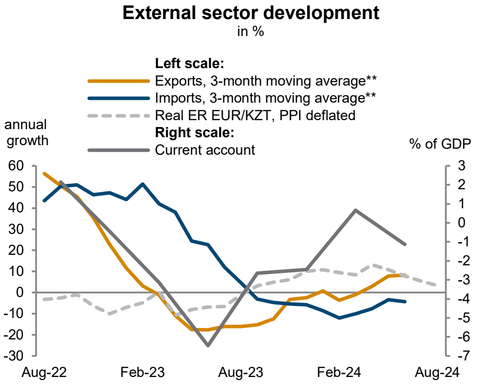












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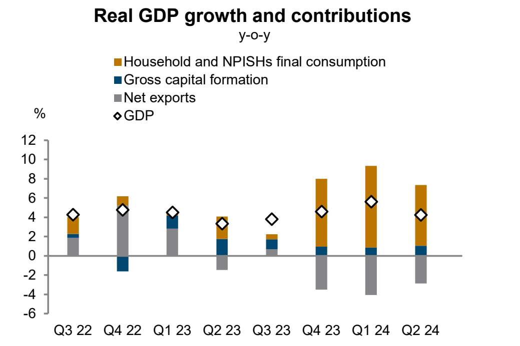
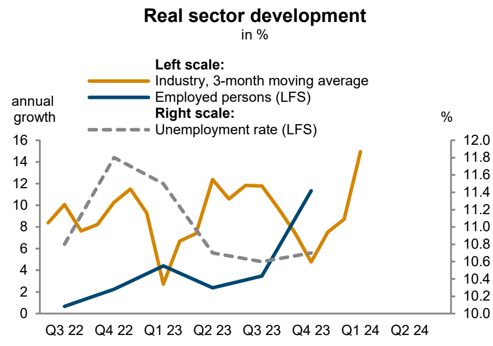
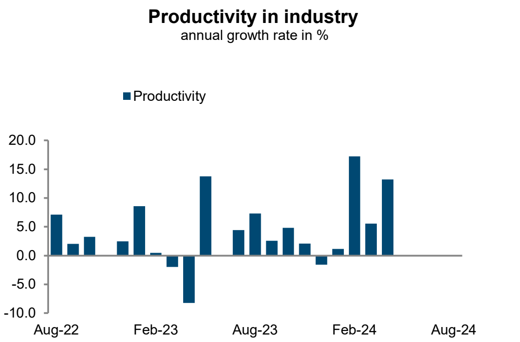
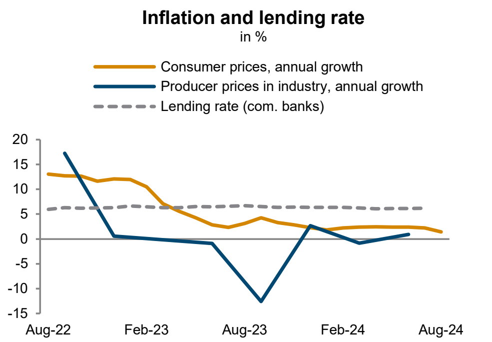
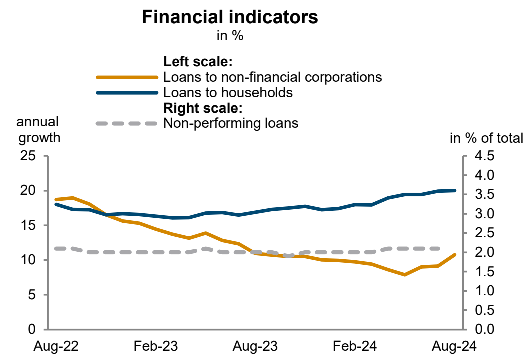
Kosovo

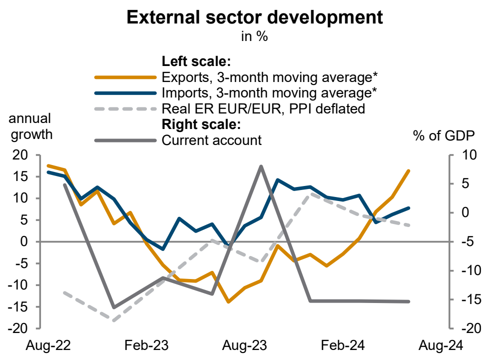












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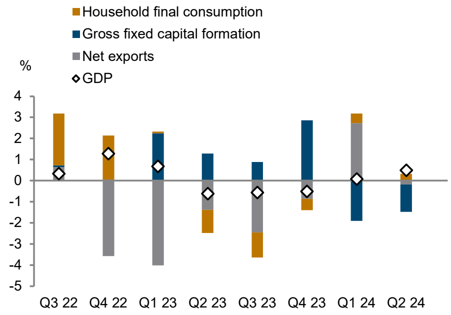
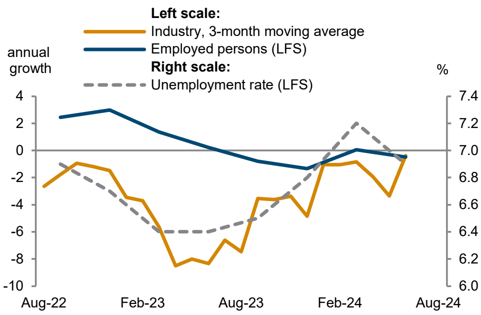
Latvia

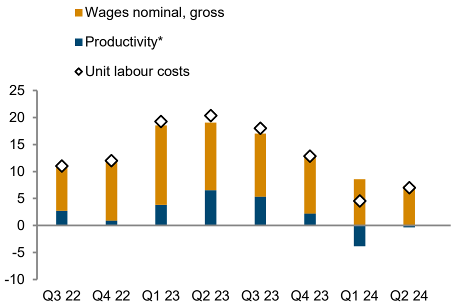
Real GDP growth and contributions
y-o-y



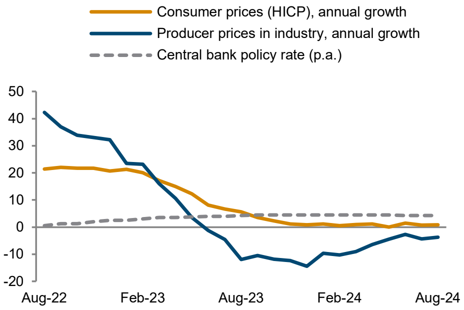
Real sector development
in %



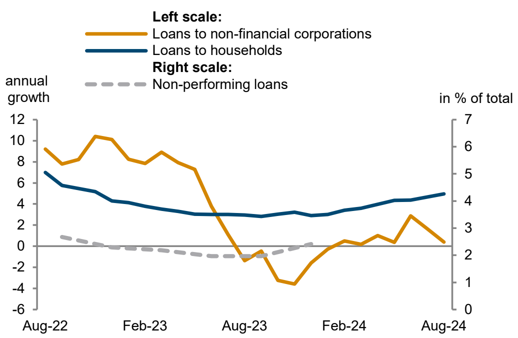
Unit labour costs in industry
annual growth rate in %



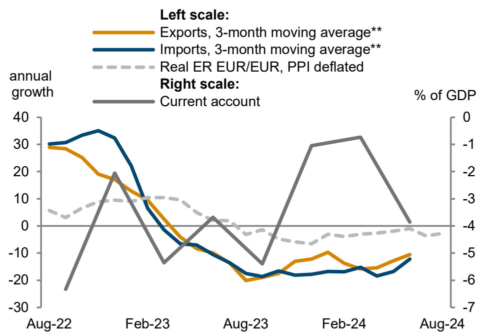
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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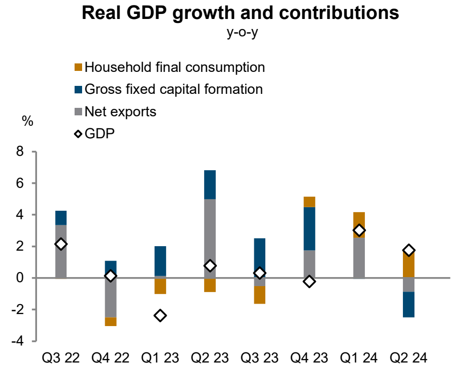
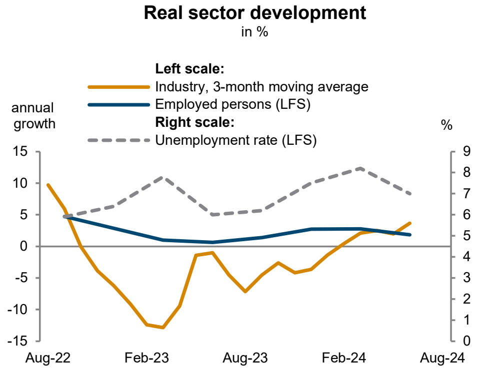
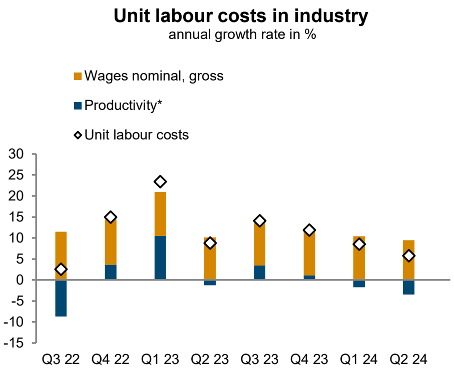
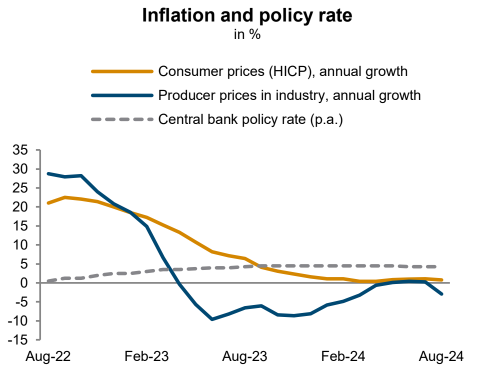
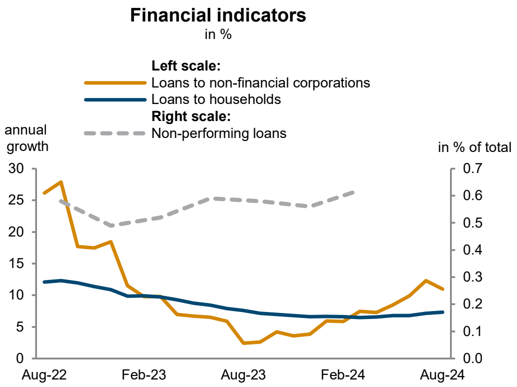
Lithuania

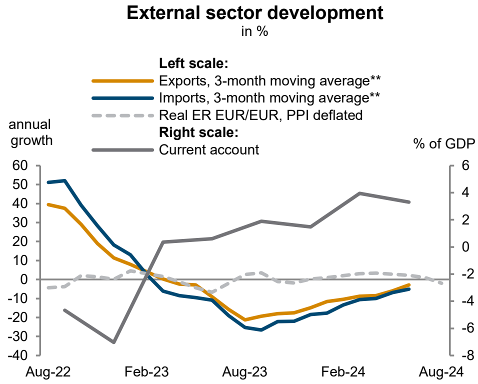












*Positive values of the productivity component on the graph reflect decline in productivity and vice versa.
**EUR based.

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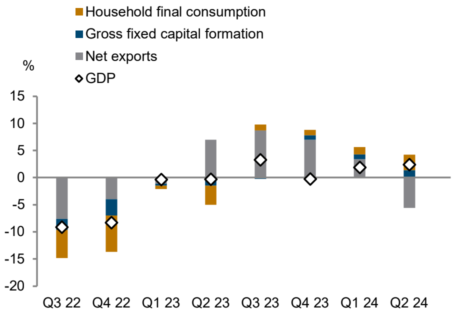
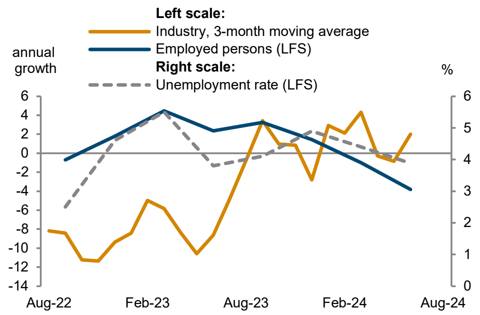
Moldova

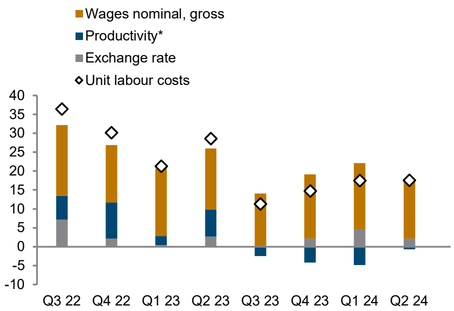
Real GDP growth and contributions
y-o-y



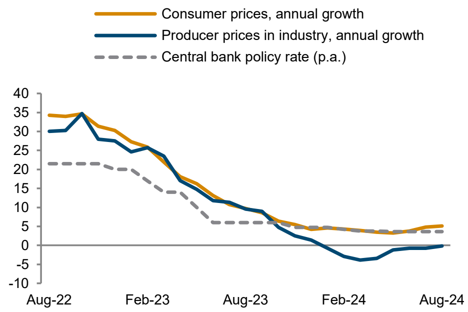
Real sector development
in %



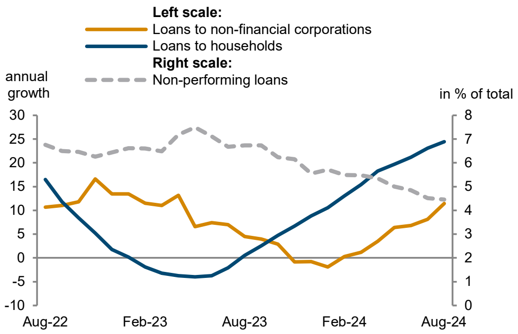
Unit labour costs in industry
annual growth rate in %



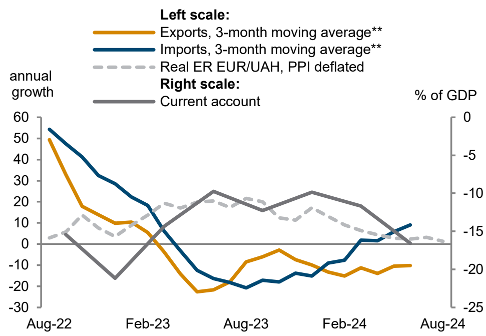
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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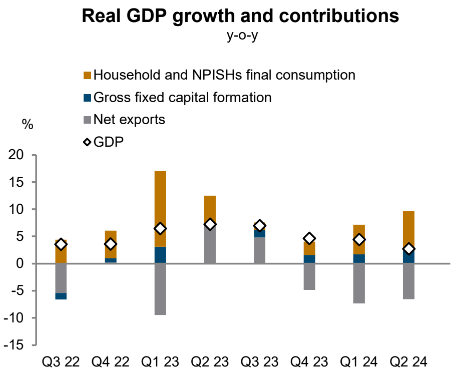
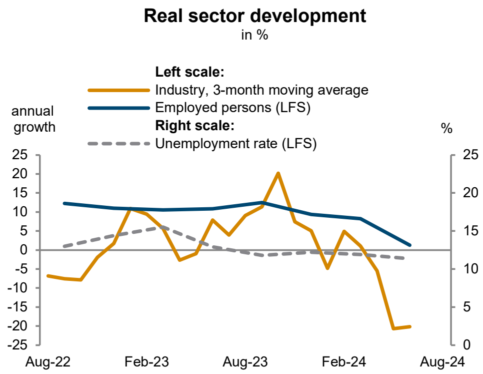
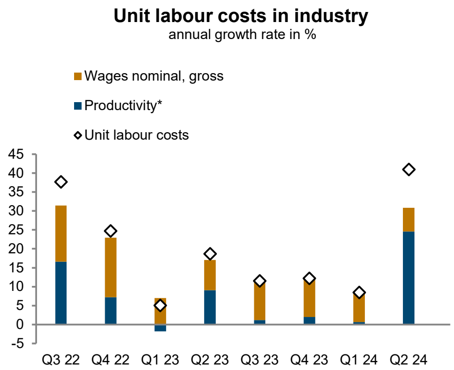
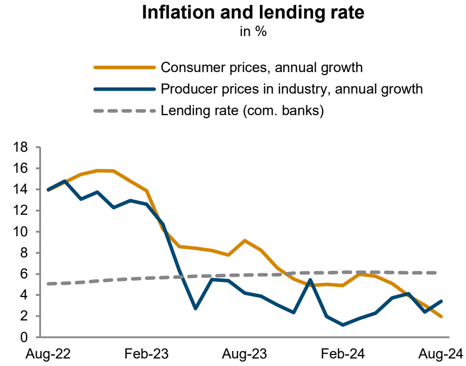
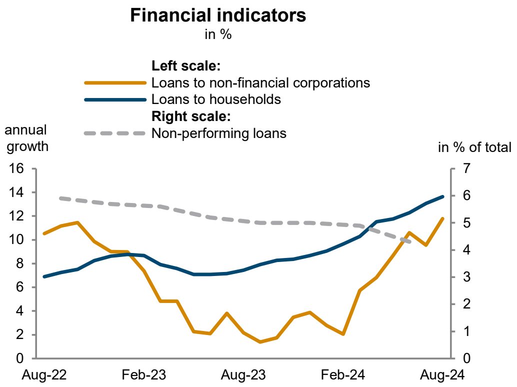
Montenegro

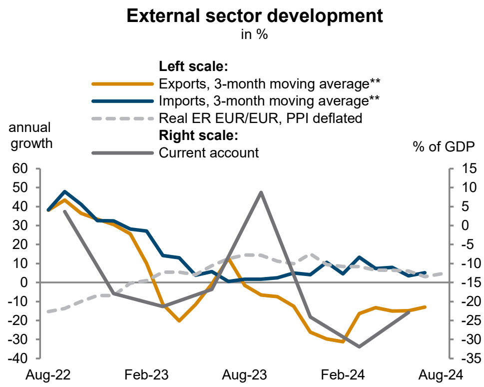












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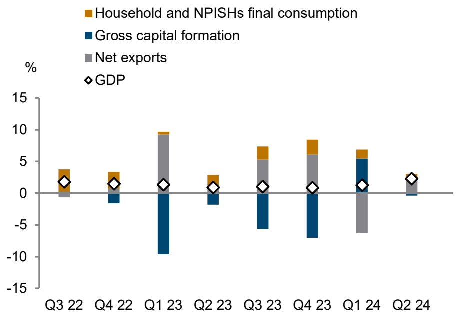
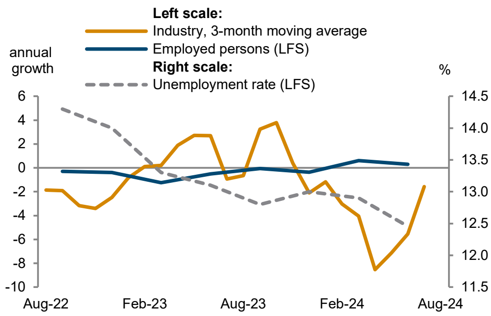
North Macedonia

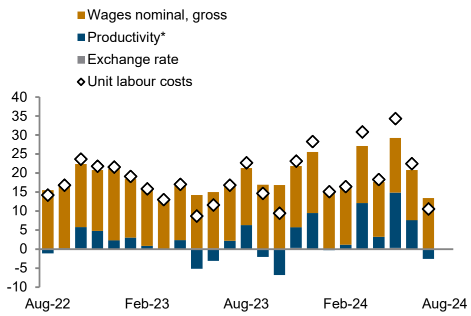
Real GDP growth and contributions
y-o-y



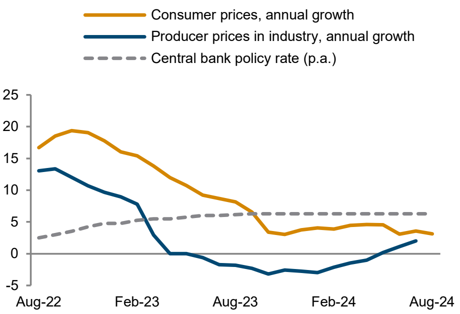
Real sector development
in %



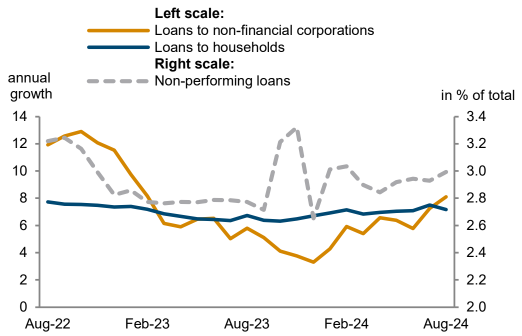
Unit labour costs in industry
annual growth rate in %



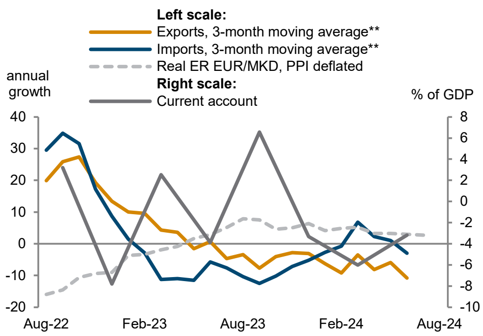
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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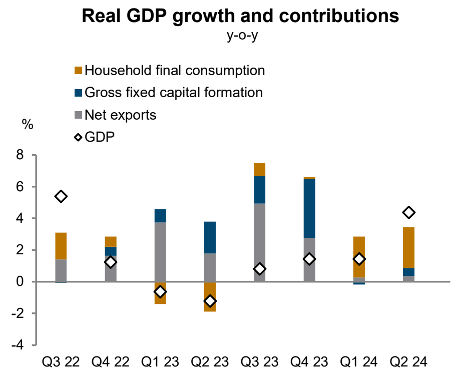
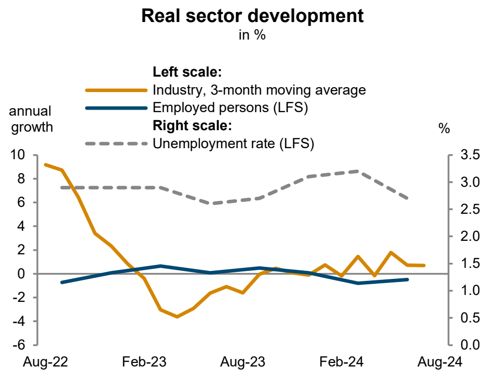
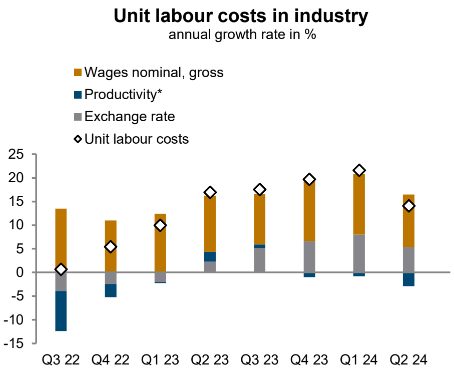
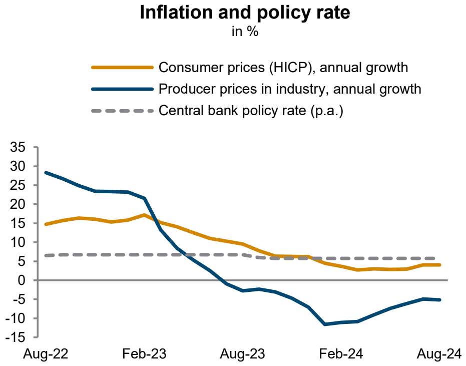
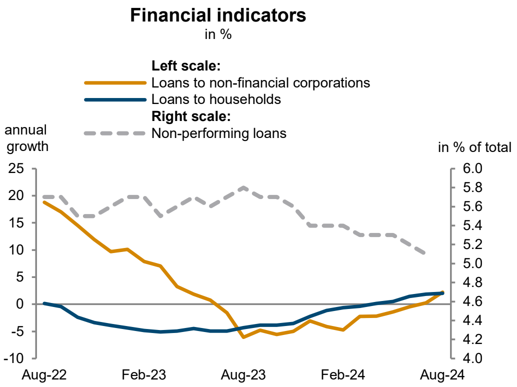
Poland

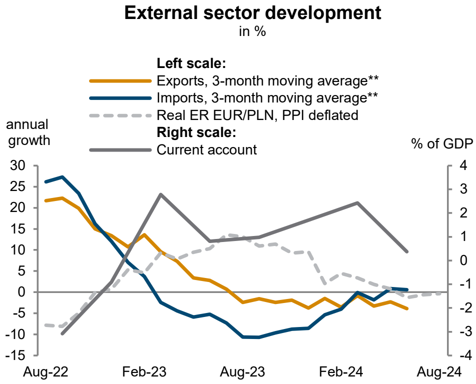












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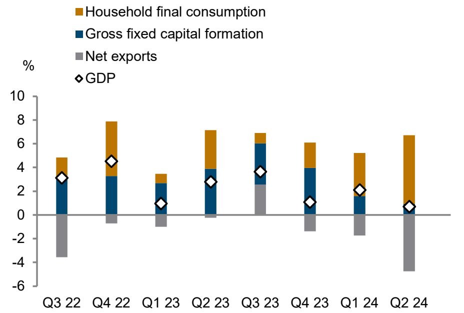
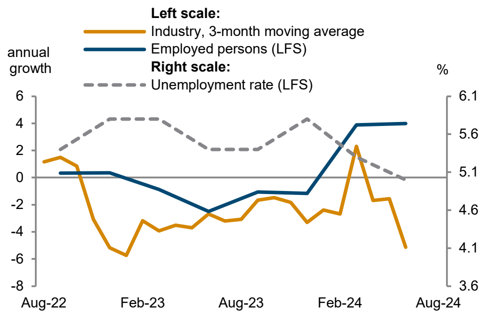
Romania

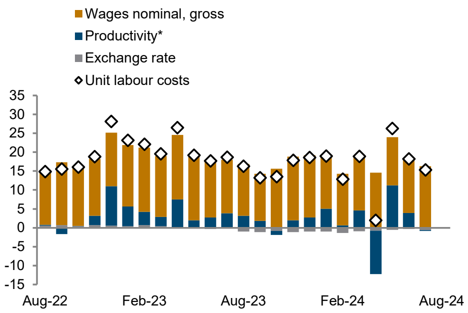
Real GDP growth and contributions
y-o-y



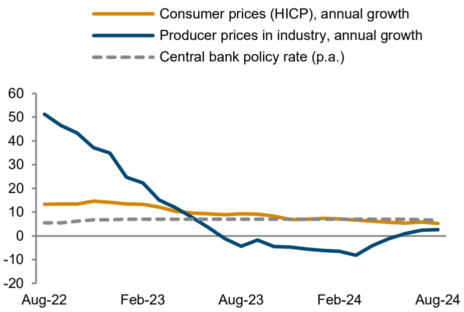
Real sector development
in %



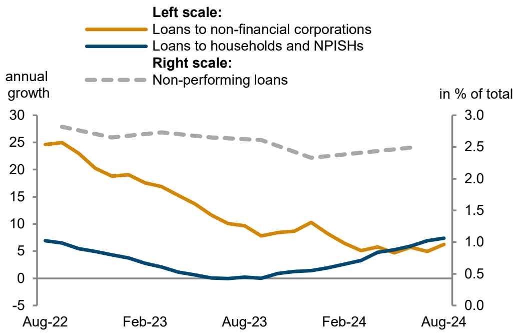
Unit labour costs in industry
annual growth rate in %



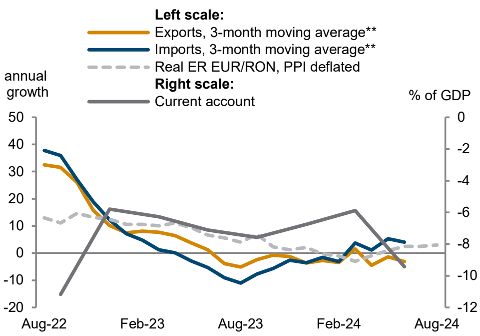
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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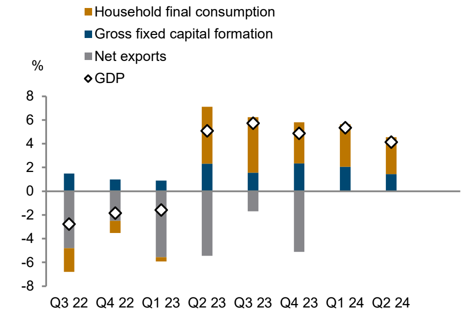
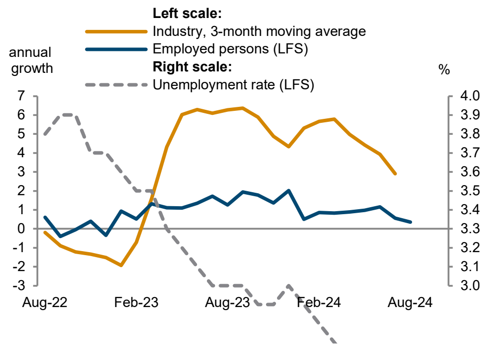
Russia

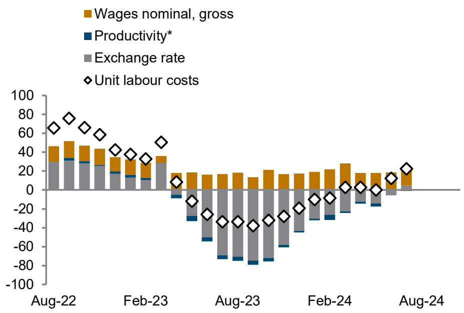
Real GDP growth and contributions
y-o-y



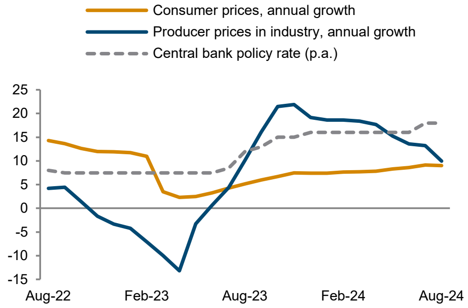
Real sector development
in %



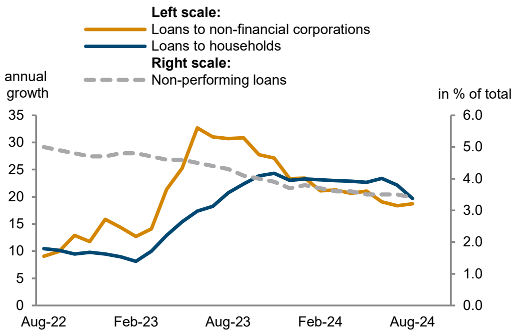
Unit labour costs in industry
annual growth rate in %



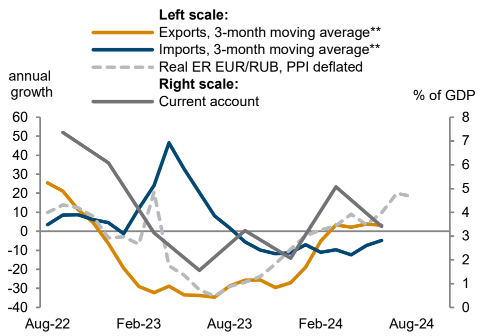
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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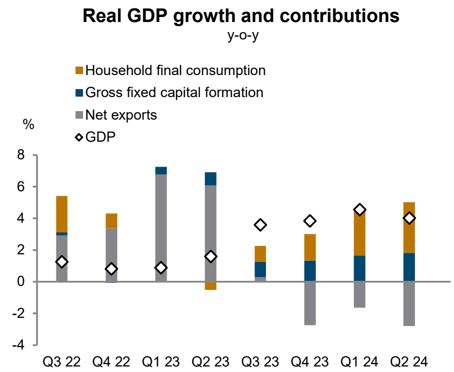
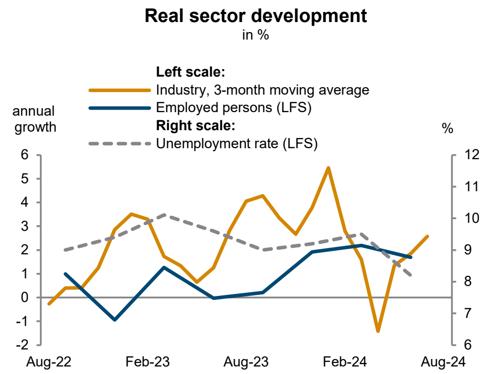
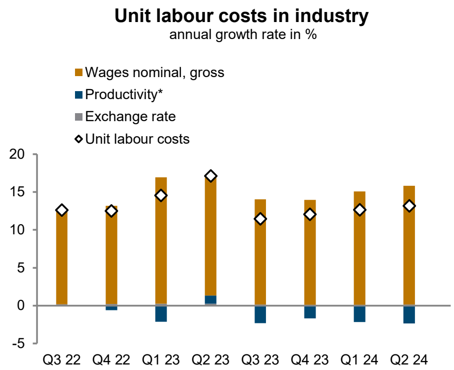
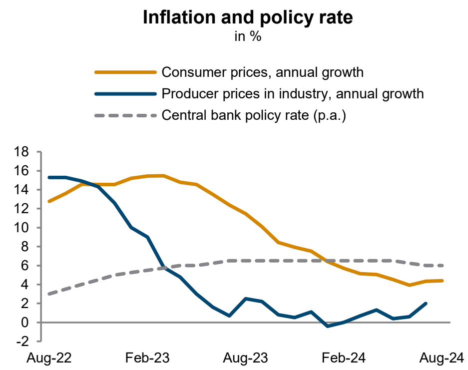
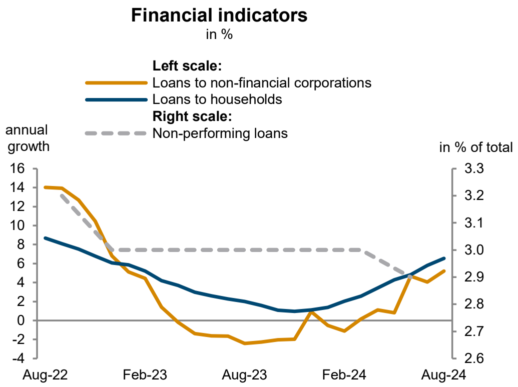
Serbia

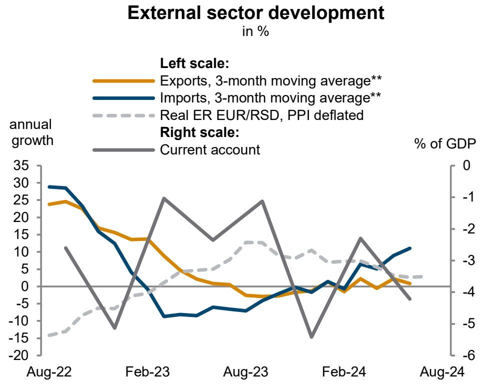












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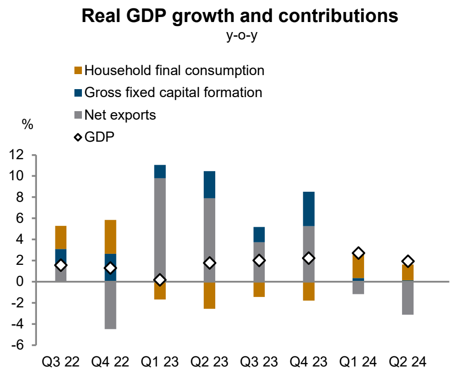
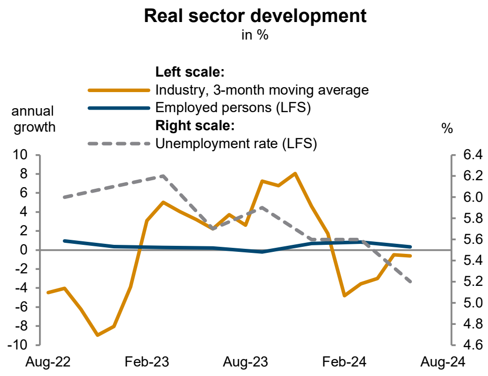
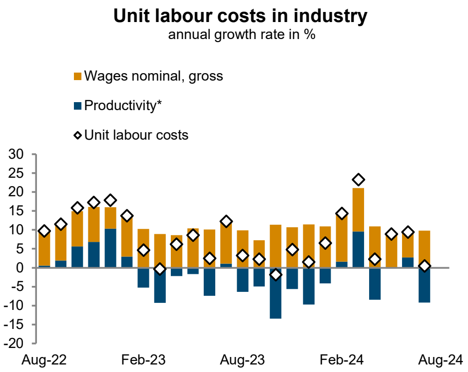
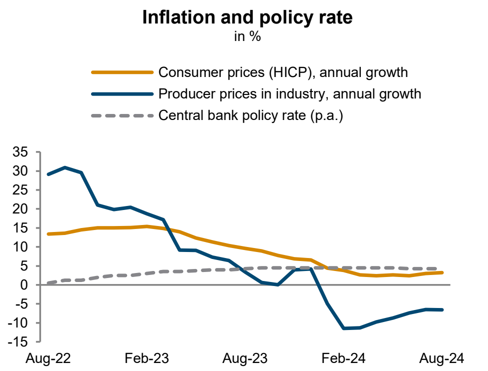
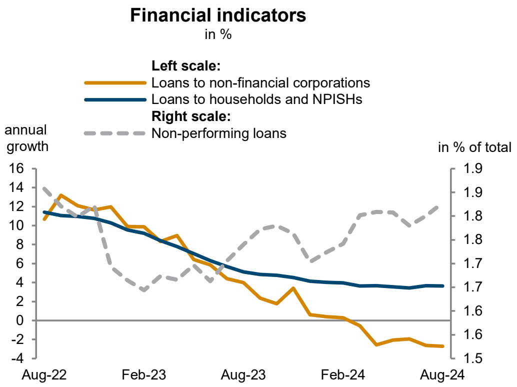
Slovakia

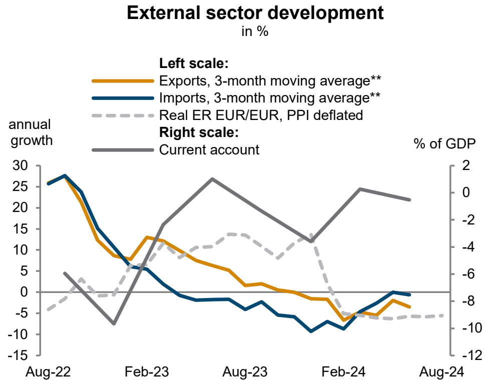












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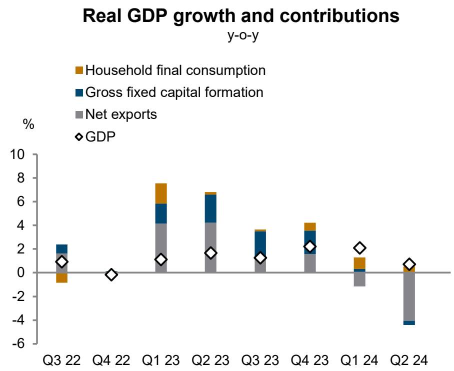
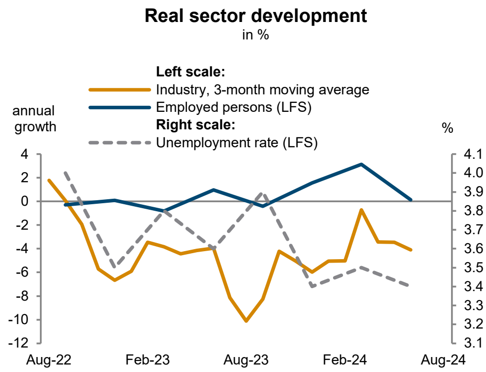
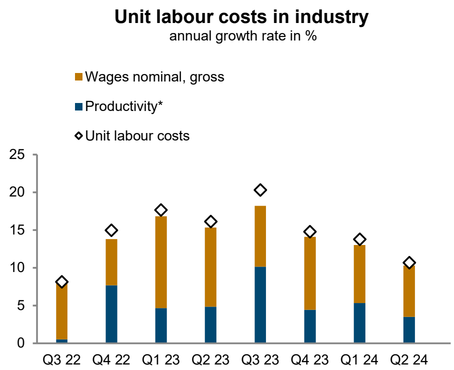
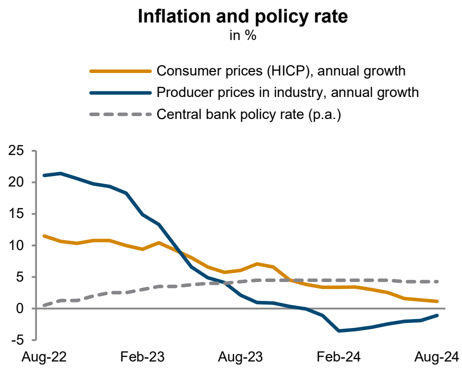
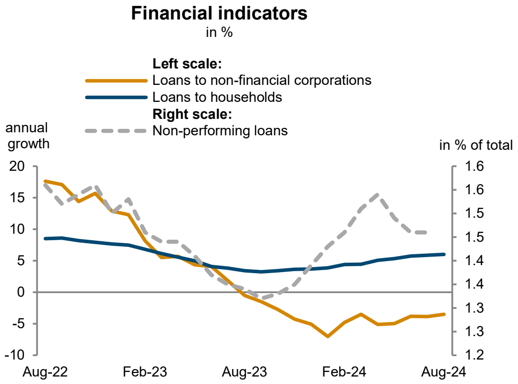
Slovenia

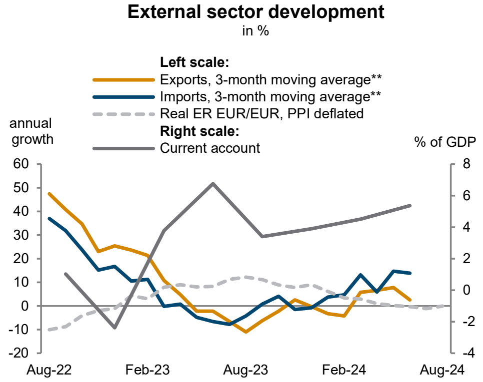












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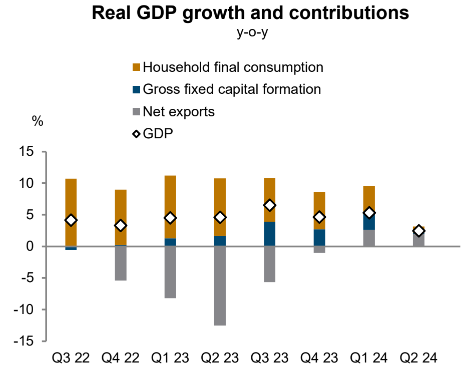
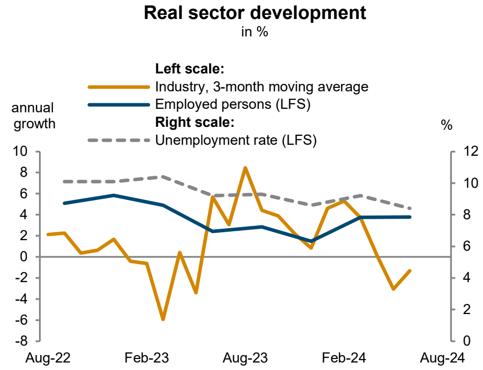
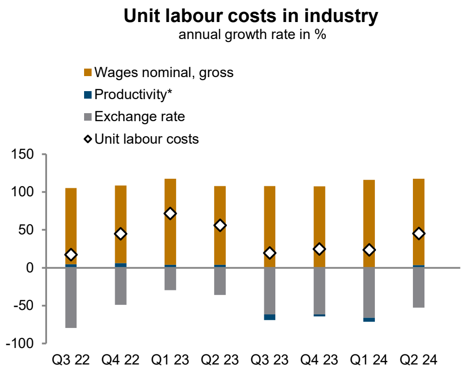
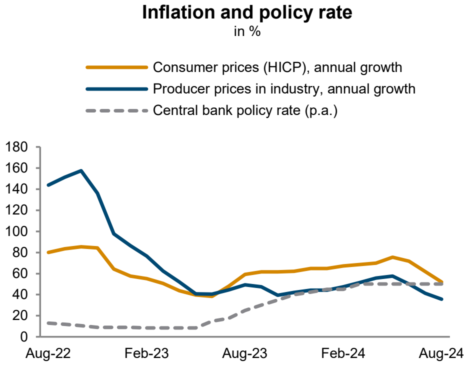
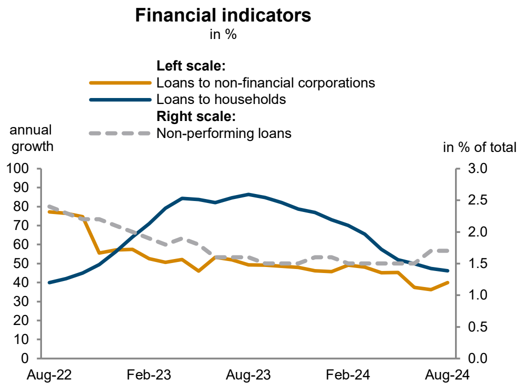
Turkey

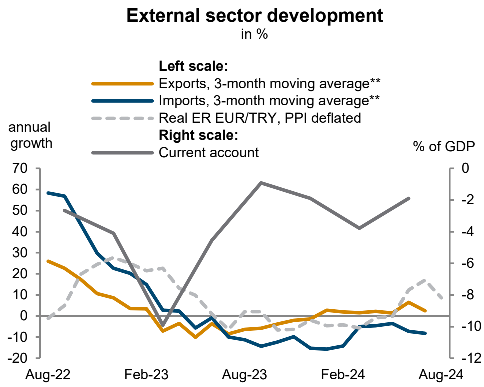












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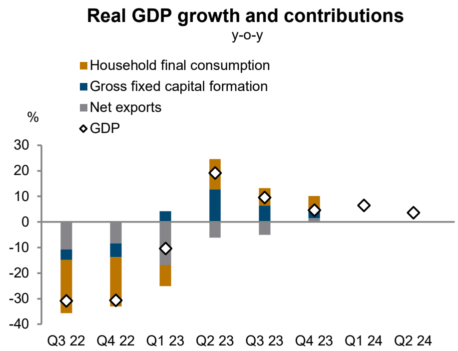
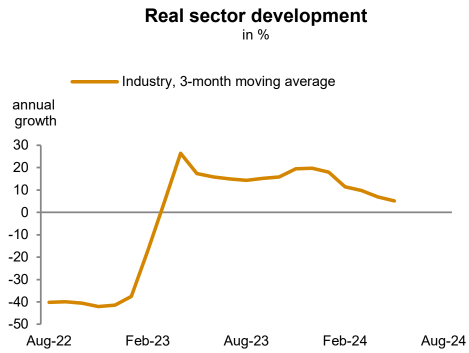
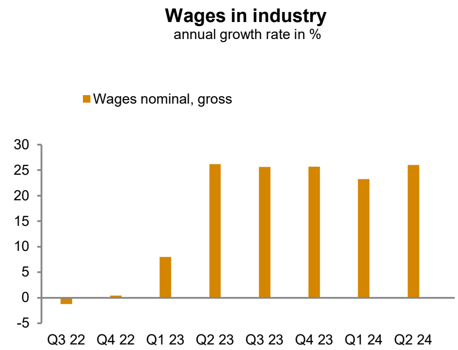
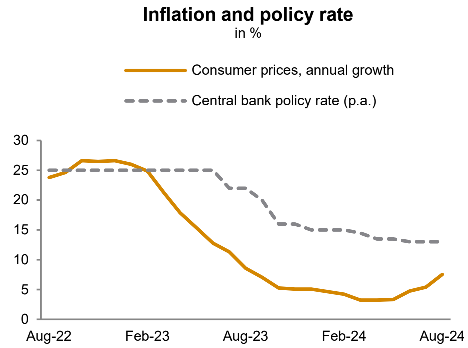
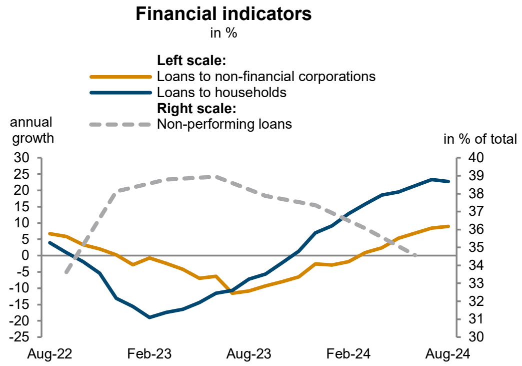
Ukraine

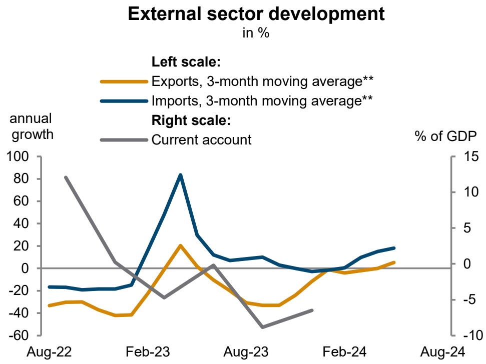












*Positive values of the productivity component on the graph reflect decline in productivity and vice versa.
**EUR based.

Source: wiiw Monthly Database incorporating Eurostat and national statistics.
Baseline data, country-specific definitions and methodological breaks in time series are available under: https://data.wiiw.ac.at/monthly-database.html

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multi-country articles and statistical overviews

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