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Economic Growth and Carbon Emissions in CESEE Countries

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The European Green Deal and Agriculture: Are EU Regional Farming Systems Ready for the Green Transition?

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

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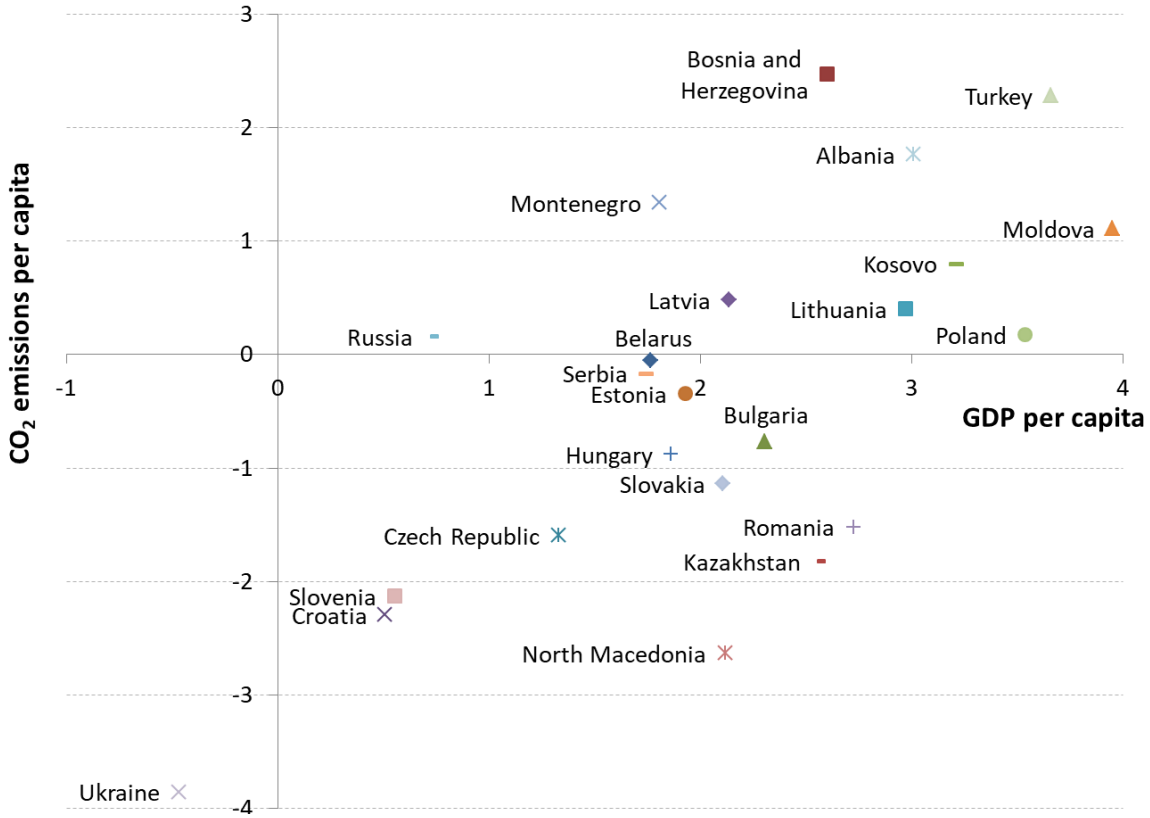
Chart of the month: Economic growth and carbon emissions in CESEE countries

BY AMBRE MAUCORPS

Real GDP and CO_2 emissions per capita

year-on-year percentage change, 2008-2018 average



Source: World Bank (GDP per capita) and International Energy Agency (CO_2 emissions per capita).

The above chart depicts the average annual change in CO_2 emissions per capita against the average annual change in GDP per capita over the decade 2008-2018 in the CESEE countries. Although fairly scattered across the chart, the data points show a distinguishable upward trend: higher growth rates of GDP tend to be associated with (larger) increases in CO_2 emissions, and vice versa. That is, more rapid economic development has generally been achieved at the expense of the climate and the environment.

As a remarkable exception, Ukraine has significantly reduced its carbon emissions in relation to the population (by almost 4% yearly, i.e. the largest rate of decline among CESEE countries); but it was also the only country to experience an annual decrease in GDP per capita on average (due to the two sharp recessions of 2009 and 2014/2015). EU-CEE countries have generally reduced their carbon emissions per

capita over the ten-year period, in line with the European Commission's Europe 2020 Strategy, while carbon emissions per capita increased by more than 1% each year on average in Bosnia and Herzegovina, Turkey, Albania, Montenegro and Moldova.

It is noteworthy that the picture is very different when it comes to GDP and CO_2 emissions per capita *levels* (not shown in the chart). In 2018, Estonia, Kazakhstan and Russia, despite not being the richest CESEE countries, were the most polluting economies, with carbon emissions ranging between 11 and 12 tonnes per inhabitant. At the other hand of the scale, Albania emitted only 1.5 tonnes of CO_2 per inhabitant in 2018, i.e. one third of Kosovo's level, despite having a 24% higher GDP per capita (in PPS) than its neighbour. At a time when climate change risks are dramatic and pervasive, decoupling economic development from environmental harm is of the utmost importance for the long-term prosperity of the CESEE area.

Opinion Corner*: Is a carbon border tax a good idea?

BY ROMAN STÖLLINGER

This contribution argues that a carbon border tax is a promising tool to achieve the goals of the European Green Deal. Its implementation would enable the EU to earn a 'triple dividend' consisting of support for its ecological transformation, the mitigation of carbon leakage, and the provision of significant new funds for the EU budget.

In December 2019 the incoming European Commission announced the European Green Deal (EGD) which aims at making the EU a climate neutral, circular economy. One of the most promising elements in the EGD is the introduction of a carbon border adjustment (CBA) mechanism (European Commission, 2019, p. 5). The CBA should be seen as a supplementary measure to the European Emissions Trading System (ETS), the EU's internal carbon pricing system, introduced in 2005. The European ETS in turn was implemented to reduce CO2 and other greenhouse gas emissions and should help achieving the emission reduction target the EU committed to under the Paris Agreement – i.e. reducing greenhouse gas emissions by 40% until 2030 (compared to 1990). This target is envisaged to be raised to 50-55% as part of the EGD.

EU EMISSIONS TRADING SYSTEM

In economic terms, the European ETS is an instrument to correct for a so-called 'negative external effect' which is an important market failure, i.e. a phenomenon that prevents market from delivering socially desirable outcomes. In fact, for economists environmental degradation and man-made climate change are primarily the result of negative external effects (e.g. Weitzman, 2014). In this vein, Sir Nicolas Stern, in his Royal Economic Society Lecture in 2007, referred to climate change as the result of *'the greatest market failure that the world has seen'*. A negative external effect arises when producers do not have to pay for the full costs that their production activities impose on society. Air pollution and its negative consequences for the environment and human health are a prime example of such a negative externality (on the production side). In the absence of any efficient carbon pricing, firms will produce more than is socially desirable because they do not take into account the damage that their production-related emissions impose on society.

Recognising the global dimension of the issue, the ideal solution would be to set a price for CO2 and other greenhouse gas emission at the world level. Since a global carbon pricing system is unlikely to be agreed upon any time soon, the EU has resorted to unilateral action, i.e. to implement the European ETS. The ETS is a 'cap-and-trade' system which does not impose a tax on emissions, i.e. it does not set a price on emissions directly. Rather firms require the permission to emit CO2. This permission is obtained by acquiring emission certificates, so-called 'allowances'. A pre-defined amount of these

* 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.

allowances (which is reduced over time) is issued each year. And while there is a maximum amount of CO2 to be emitted (within the sectors covered by the EU ETS) – i.e. a 'cap' – firms are free to buy (sell) allowances if they are unable to reduce emissions (do not require allowances previously obtained). This is why the EU ETS is a so-called cap-and-trade system. The advantage of such a system is that the regulator does not need to set a price for CO2 emissions. Rather the price is determined by demand and supply within a market mechanism which reduces the risk of distortions due to 'inadequate' prices.

Any EU-internal carbon pricing mechanism supports the EU's environmental objectives as it makes production in carbon-intensive industries more expensive, thereby causing these industries to contract.

CARBON LEAKAGE AND CARBON BORDER ADJUSTMENT MECHANISM

While the EU's internal carbon pricing mechanism is able to address the market failure within the European Single Market, it creates another distortion in trade with third countries – at least with those that do not have a comparable carbon tax in place. The fact that EU producers have to bear the cost of the EU-internal carbon pricing while foreign producers remain unaffected may result in a loss of international competitiveness of EU producers. This phenomenon, also known as 'carbon leakage', is a situation where production is shifted outside the EU even if the EU industry could produce at lower costs. This has raised serious concerns in Member States and the risk of carbon leakage is explicitly mentioned in the EGD and also in the EU's revised industrial policy strategy (European Commission, 2020).

This is where the so-called carbon border adjustment (CBA) mechanism comes into play. A CBA potentially comprises two elements: *(i)* a carbon border tax (CBT), which is a tax on imports, i.e. an import tariff and *(ii)* a rebate of the carbon costs borne by EU producers for their exports. Ruling out the second component (for it would undo much of the environmental progress to be achieved by an EU carbon pricing system), we focus on the implication of a European CBT in combination with a domestic carbon tax. In the analysis ecological and economic effects of a unilaterally imposed European CBT are studied, along with possible implications for the EU budget. Moreover, some legal aspects regarding the WTO compatibility of a CBT and the implications for the EU's (free) trade policy are discussed.

THE 'TRIPLE DIVIDEND' OF A CARBON BORDER TAX

Our analysis (Stöllinger 2020) suggests that the introduction of a European CBT offers the triple advantage of ***(i)* supporting the ecological transformation**; ***(ii)* reducing carbon leakage** and ***(iii)* providing new funds for the EU budget** that are independent of member states' direct contributions. These findings lead to the following conclusions:

› A CBT is a necessary supplement to the EU's internal carbon pricing mechanism in order to avoid inefficient and economically harmful EU imports of energy-intensive products. Still, it remains a 'second-best' solution to remedy a global market failure.

› A CBT levied on imports is an effective tool to support the environmental objectives laid down in the EGD deal and to fight carbon leakage. In contrast, the idea of rebates of the carbon-related costs for EU exporters should be dropped as it runs counter the necessary shakeout of emission-intensive industries.

› A *domestic carbon pricing cum CBT system* could be part of broader green industrial policy mission. Such a 'green mission' (see also Mazzucato, 2018) should be to make the EU carbon-independent, defined as zero imports of petroleum, natural gas and coal (see Stöllinger and Landesmann, 2020).

› A European CBT must be carefully designed in order to ensure WTO-compatibility. The latter could be achieved by designing the EU CBT as a charge equivalent to an internal tax (Krenek, 2020). Such a charge should be permissible under WTO rules, provided it does not exceed the domestic tax so as not to discriminate against imports. Moreover, a transparent, WTO-consistent CBT requires a stable benchmark in order to evaluate the non-discriminatory nature of the CBT which in turn calls for turning the current EU ETS, a cap-and-trade system, into a carbon tax.

› WTO compatibility notwithstanding, the introduction of a CBT by the EU is bound to lead to further tensions in the global trading system as major trading partners without a national carbon tax will perceive the EU CBT as a protectionist measure.

› The CBT also lays open the policy inconsistency between the objectives of the EGD and the EU's (bilateral) trade policy which aims at concluding deep and comprehensive free trade agreements (FTAs) with fast-growing economies. To resolve this inconsistency, the EU should refrain from concluding FTAs with countries that do not have a domestic carbon pricing system and revise (or suspend) existing FTAs.

› The CBT could be a lucrative new source of funds for the EU budget. Based on estimates for France, an approximation for the revenues generated by the CBT for the EU as a whole could be in the order of 20% of the EU budget. Moreover, the CBT could substantially strengthen the EU's true own-resources which would make the EU less dependent on national contributions by member states.

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Are we tired of cohesion?

BY ROMAN RÖMISCH

Smaller EU transfers and low investment rates are dampening growth expectations in the EU's less developed regions. As a consequence, we might soon see the end of the 20-year-long convergence process.

For more than 20 years, the European Union (EU) has enjoyed an economic convergence process, with the less developed regions and countries of the East and South generally catching up with the more developed regions and countries of the North.

But this process is now in danger, for two reasons. First, future EU cohesion policy support will be substantially less than it has been over the past 12 years. And second, domestic investment rates in most Southern and Eastern cohesion regions are at a particularly low level.

SMALLER EU COHESION POLICY TRANSFERS IN THE FUTURE

The positive effects of EU cohesion policy on economic growth and development have been highlighted in many studies.[1] And indeed, the importance of EU cohesion policy in the Southern and Eastern EU regions is such that it would be surprising if positive effects were lacking.

The importance of EU cohesion policy is illustrated by the actual European Regional Development Fund (ERDF) and Cohesion Fund (CF) expenditure in the EU NUTS-2 regions, expressed in terms of the regions' GDP and investment (gross fixed capital formation – GFCF). The spending is shown in Figure 1.

From 2007 to 2018, the annual average inflows of ERDF and CF support to Central and Eastern European (CEE) regions varied from around 1% to over 4% of GDP. It was particularly large in the Eastern Polish and the Southern and Eastern Hungarian regions. All these regions were structurally weak, were by and large heavily agriculturally based and furthermore are located in countries that have received overall large amounts of EU cohesion policy support (in per capita terms). In the cohesion regions[2] of the Southern EU countries of Italy, Greece, Portugal and Spain, the inflows were around 0.5-2.5% of GDP in the respective regions.

In terms of investment, average annual inflows of ERDF and CF support to the CEE regions (except the capital city regions) amounted to around 4-16%. Again, inflows were most important in the Eastern Polish and the Southern and Eastern Hungarian regions. In the Southern EU cohesion regions, these inflows were most important in Portugal and Greece: in many regions of both countries, ERDF and CF

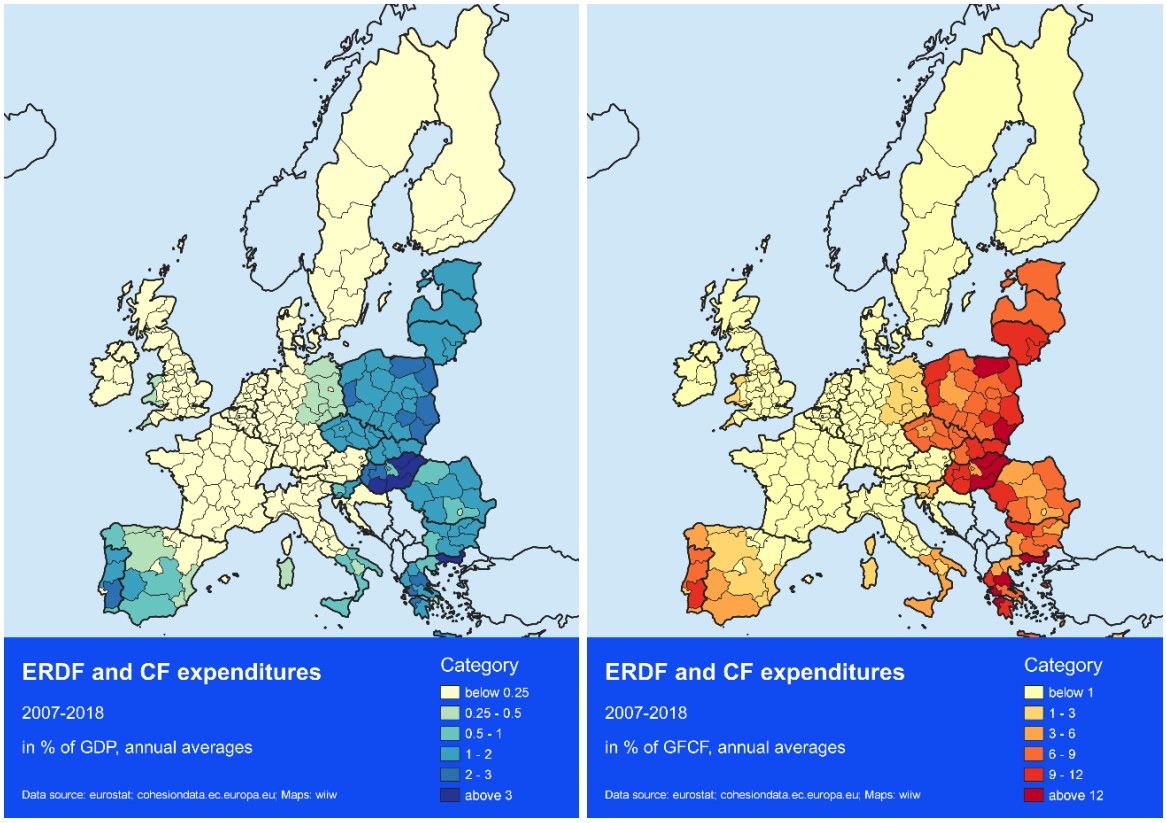
[1] See e.g. the recently completed wiiw project on the 'Effects, opportunity costs and spillovers of EU Cohesion Policy', https://wiiw.ac.at/effects-opportunity-costs-and-spillovers-of-eu-cohesion-policy-pj-179.html

[2] Cohesion regions are those regions with an income level below 75% of the EU average. They are also officially referred to as 'less developed regions'.

support was around 9-18% per year in terms of their GFCF expenditure, as – particularly in the Greek regions – investment rates were very low.

Although not all ERDF and CF spending in those regions goes on investment, much of it does and includes, for example, investment in transport infrastructure (often financed by the CF) or new production technologies and capacities or R&D (financed through the ERDF). Hence, the numbers presented indicate that EU cohesion policy support in the Southern and Eastern EU regions has been an important source of their investments – and thus of their economic development.

Figure 1 / ERDF and CF expenditure, as % of GDP (left-hand chart) and % of GFCF (right-hand chart), annual averages 2007-2018



Source: Eurostat, cohesiondata.ec.europa.eu

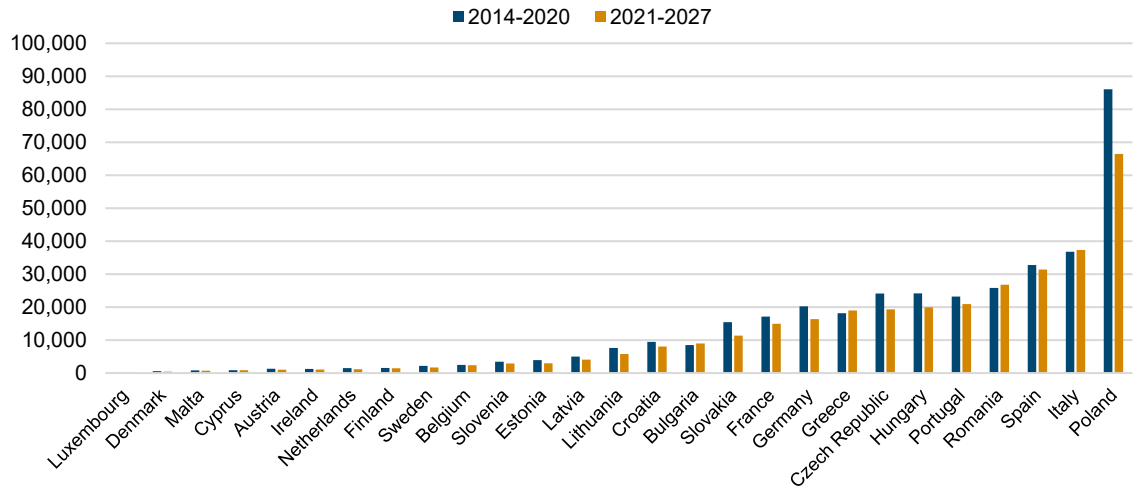
However, the new Multiannual Financial Framework (MFF) of the EU for the period 2021-2027 (yet to be approved) will reduce the importance of EU cohesion policy. As a result of Brexit, the funds in the EU budget available to support economic, social and territorial development will be significantly lower. Given the numbers recently published by the European Commission,[3] allocations for EU cohesion policy (including the ERDF, CF, European Social Fund and European Territorial Cooperation) will be around EUR 47 billion lower than in the period 2014-2020 (in 2018 constant prices).[4]

[3] https://ec.europa.eu/info/strategy/eu-budget/long-term-eu-budget/eu-budget-2021-2027_en

[4] This difference is an estimate based on the numbers published by the EU Commission.

The main burden of this reduction will fall on Poland, whose EU cohesion policy support will be reduced by approximately EUR 20 billion – from EUR 86 billion in the period 2014-2020 to EUR 66 billion in the period 2021-2027 (in constant 2018 prices). The remaining EUR 27 billion are more equally distributed across countries (see Figure 2). Interestingly, in four countries (Bulgaria, Greece, Italy and Romania), EU cohesion policy support will actually increase in 2021-2027.

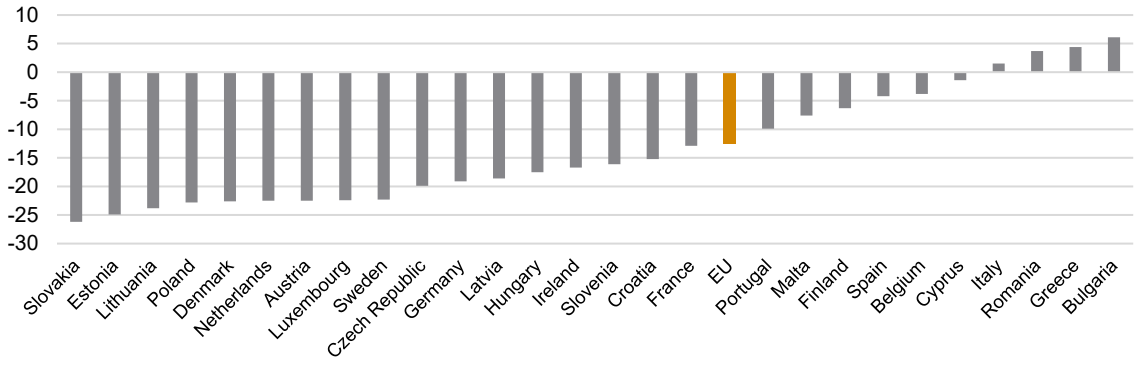
Figure 2 / EU cohesion policy support in 2014-2020 & 2021-2027, by EU member state, in EUR million (2018 constant prices)



Source: EU Commission, wiiw calculations.

Expressed in percentage terms, the new MFF will reduce EU cohesion policy support in the EU by around 12.6% in real terms, compared to the 2014-2020 levels (see Figure 3). Those countries with the biggest reductions (i.e. over 20%) include Slovakia, Estonia, Lithuania and Poland, as well as the non-cohesion countries of Denmark, the Netherlands, Austria, Luxembourg and Sweden. By contrast, EU cohesion policy support will increase by 1.5-6% in Italy, Romania, Greece and Bulgaria.

Figure 3 / Change in EU cohesion policy support 2014-2020/2021-2027, in % (2018 constant prices)



Source: EU Commission, wiiw calculations.

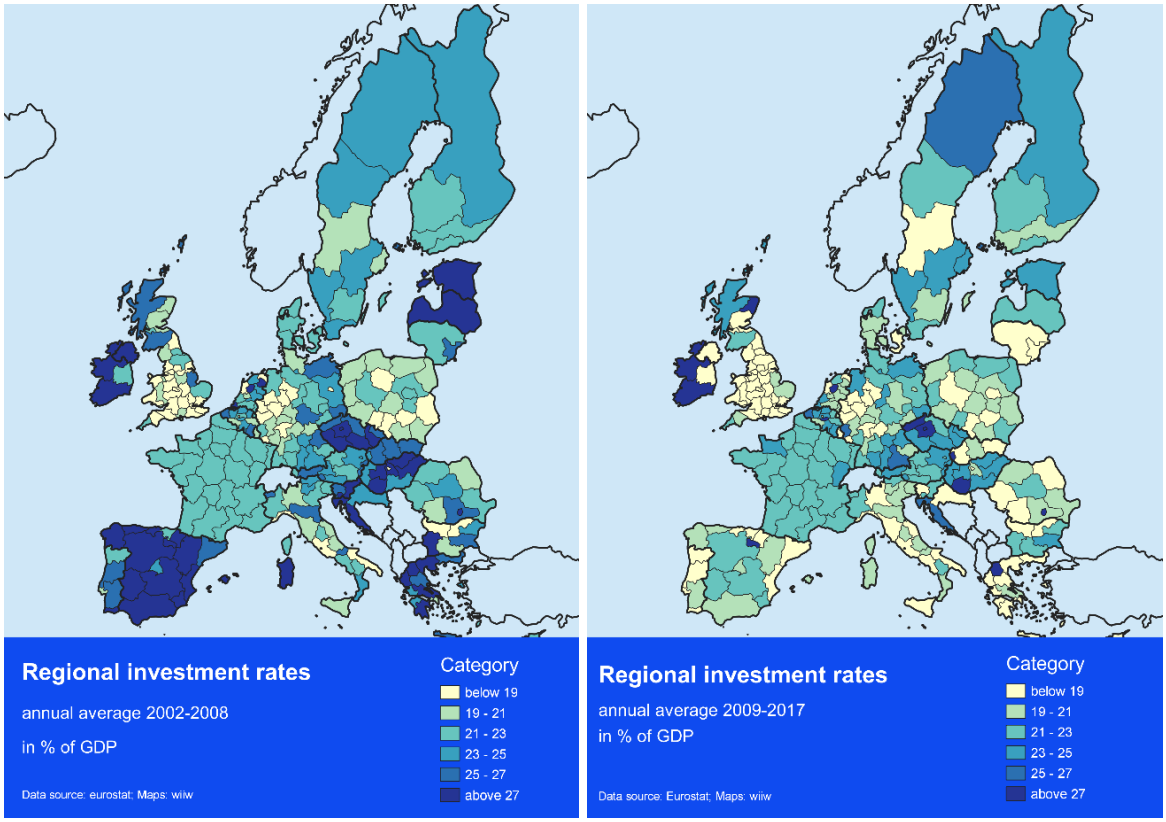
LOW REGIONAL INVESTMENT RATES

Investment is the single most important contributor to economic growth. Not only is it an important component of the effective demand for goods and services, but it also determines long-term growth prospects, by increasing and upgrading the regions' capital stock through investment in new production capacities, modern technologies and vital infrastructure.

From this perspective, the declining trend in regional investment rates in the cohesion regions of the Southern and Eastern EU countries is of major concern. A comparison of investment rates (as a percentage of GDP) before and after the economic and financial crisis of 2008 illustrates this (Figure 4). Up to the year 2008, investment rates in the cohesion regions (except Poland and partly Romania) were very high, at around 25% of GDP or more. Especially in the CEE regions, this investment was geared towards improving and upgrading domestic production capacities, and as a result was accompanied by high economic growth and rapid convergence with the more developed EU regions.

After the 2008/2009 crisis, investment rates dropped sharply in the cohesion regions, and in many cases never recovered to their pre-crisis levels, e.g. in Slovakia, Slovenia, Hungary, Romania, Greece or Spain. Thus, for most cohesion regions, investment rates ranged from 16% to 25% of GDP; exceptions to this were two regions in the Czech Republic and the capital city regions of Slovakia and Romania, which all recorded higher investment rates.

Figure 4 / Regional investment rates 2002/2008 (left-hand chart) and 2009/2017 (right-hand chart), annual averages, as % of GDP



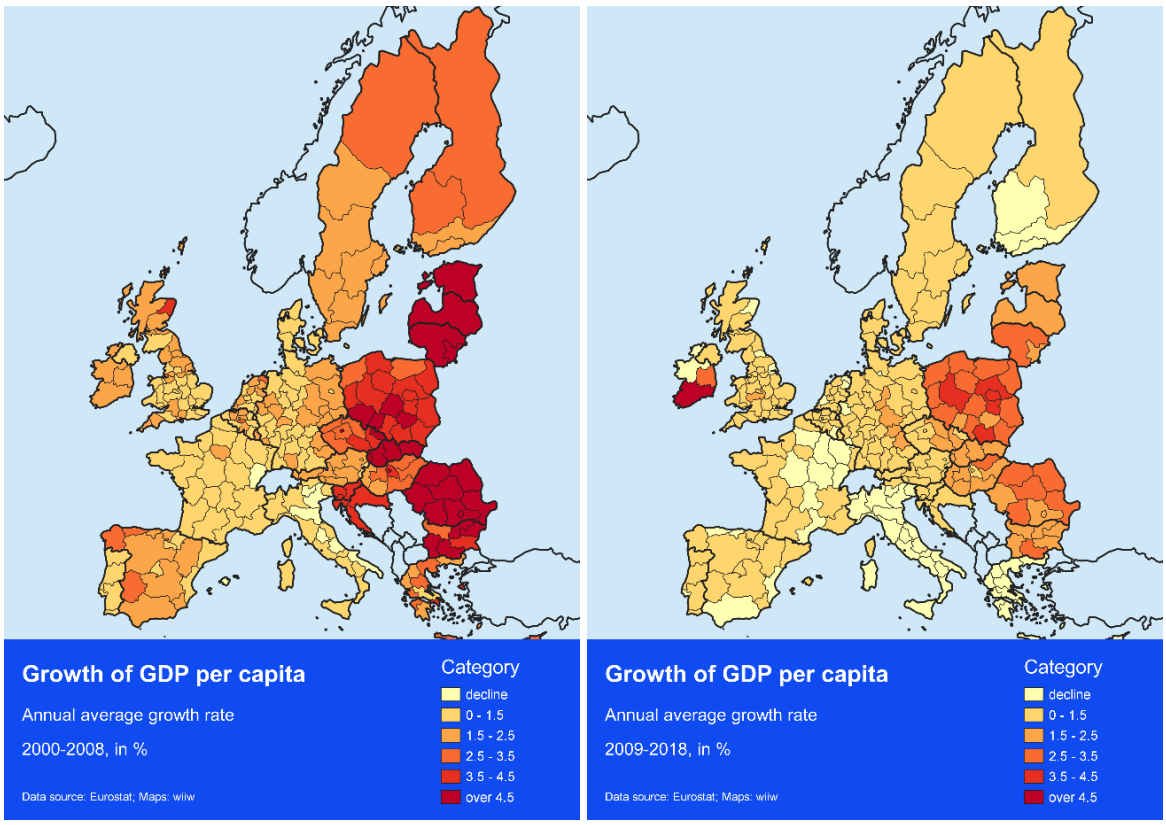
Source: Eurostat.

Particularly worrying for cohesion is the fact that investment rates in the Southern and Eastern cohesion regions are, in most cases, at the same level as (or even lower than) those in the more developed regions, such as Austria, Southern Germany or France, and there is little reason to expect this to change in the future. This implies that over the longer run, economic growth in the cohesion regions could be at, or even below, that in other EU regions.

LONG-RUN ECONOMIC CONVERGENCE IN DANGER

The consequences of the combination of lower EU cohesion policy support and low investment rates could be quite dramatic. As growth rates in the cohesion regions decline to the levels seen in the more developed EU regions, so economic convergence will first slow and then stop altogether. In fact, the first signs of a convergence slowdown are already visible and are illustrated by the declining GDP growth rates in Figure 5. Additionally, if no countermeasures are taken, we could even see *divergence* in the EU, as the weaker regions start to lag even further behind. The forthcoming reduction in EU cohesion policy support will only add to the problem. In many EU-CEE countries, this support has been de facto the only policy tool for regional development, as similar domestic policies are lacking.

Figure 5 / Growth in regional GDP per capita 2000/2008 (left-hand chart) and 2009/2018 (right-hand chart), annual average growth rates



Source: Eurostat.

It would seem that, for rather too long, we have taken EU support and regional convergence for granted. But it is not assured. Economic, social and territorial convergence depends on the policies we implement

and on the decisions we take – in particular, the investment decisions. Keeping the convergence process going thus means keeping investment going – or (given current trends) stimulating it so that it can reach pre-crisis levels in the cohesion regions.

It also means that the EU, especially the more developed regions and countries, need to be aware of the strongly positive effects that EU cohesion policy has in the less developed regions. Thus, they are advised to think twice (at least) about the level of resources that they make available for EU cohesion policy support. Given the importance of this support for many regions in the South and East of the EU, cutting it will almost certainly reduce the longer-run growth prospects of those regions. Indeed, it may actually be worthwhile for the more developed regions to spend *more* on EU cohesion policy now: although the financial cost would be a bit higher in the short run, in the medium and long term they would benefit through having more prosperous and developed regions in the Southern and Eastern EU countries.[5]

[5] See also the findings of the recent wiiw research project 'Effects, opportunity costs and spillovers of EU Cohesion Policy'.

The European Green Deal and agriculture: are EU regional farming systems ready for the green transition?

BY AMBRE MAUCORPS

The European Green Deal calls on the farming sector to become more carbon efficient and environmentally friendly. Even though the majority of EU countries have reduced their greenhouse gas emissions from agriculture over the past three decades, only a few regions have a proper sustainability-oriented agriculture. The green transition is expected to be particularly problematic for the farming systems of Eastern European regions.

The outbreak of the ongoing COVID-19 pandemic has severely undermined one of the core objectives of the EU – that of its 'overall harmonious development' – as EU member states have been (and still are) affected in different ways and to varying degrees. As a matter of fact, many regions and countries have resorted to a radical and comprehensive shutdown of their economies to contain the spread of the disease, resulting in an unprecedented recession. This exceptional situation logically required a dedicated recovery mechanism designed at the EU level: the Next Generation EU (NGEU) financial package.[1] This is to be rolled out in a manner consistent with the European Commission's new long-term growth strategy: the European Green Deal. That comprehensive and cross-cutting strategy aims at achieving climate neutrality – i.e. net zero greenhouse gas (GHG) emissions – in the EU by 2050, and thus serves as the overall policy framework within which EU policies across different fields (industry, agriculture, power generation, etc.) must be designed, implemented and evaluated. Consequently, national recovery and resilience plans under the NGEU recovery mechanism must clearly demonstrate how reform and investment will contribute to the green and digital transition advocated by the Green Deal.

THE FARM TO FORK STRATEGY: AIMING AT SUSTAINABLE AGRO-FOOD SYSTEMS

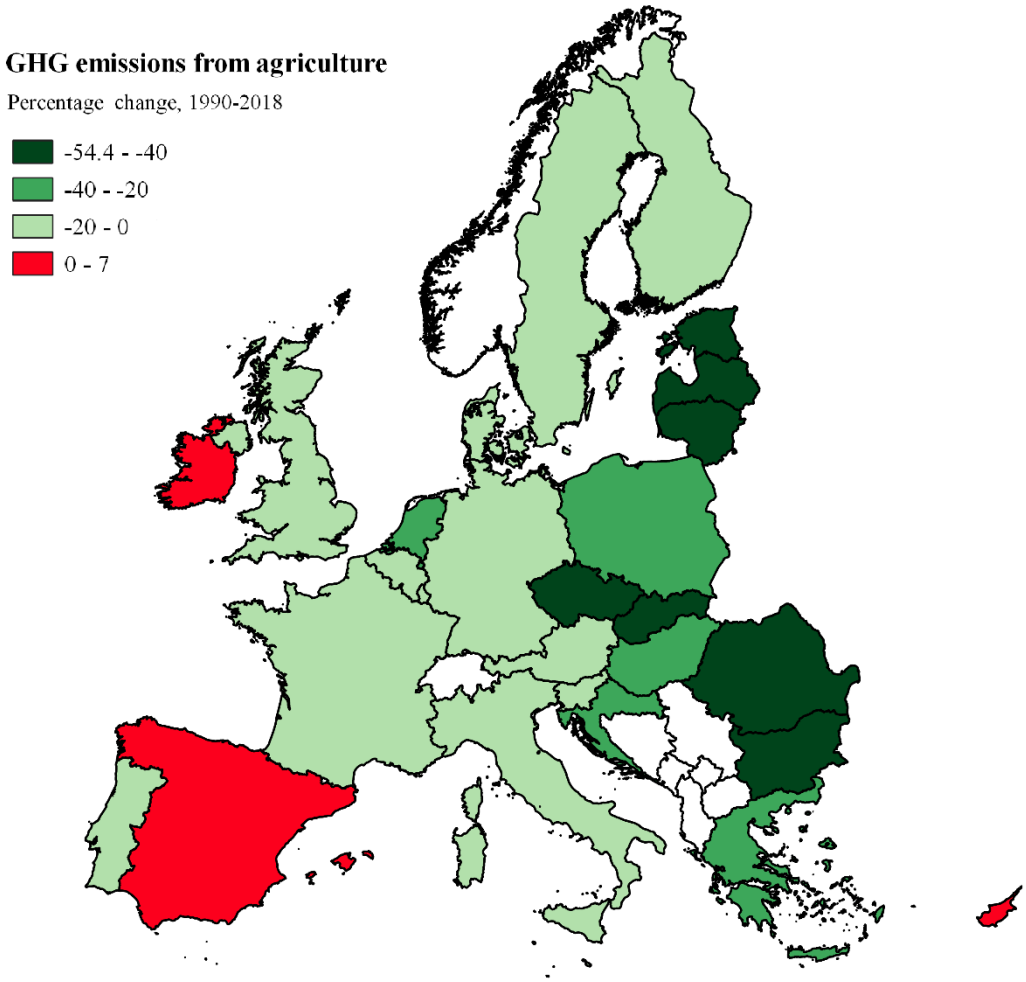
This article focuses on one of the several (interrelated) European Green Deal initiatives: the so-called Farm to Fork Strategy (European Commission, 2020). Published in May 2020, this strategy lays out the rationale for sustainability in European agriculture, fisheries and aquaculture along the entire food chain – as well as the ambitions for achieving it. The endeavour is an extremely challenging one, since it is not only the production of food through intensive farming that is responsible for air, water and soil pollution and GHG emissions, but also its manufacturing, processing, retailing, packaging and transportation (European Commission, 2020). Overall, agriculture remains one of the major sources of GHG emissions at the EU level,[2] with the volume of GHG emissions again on the rise since 2013, after a steady decline

[1] Approved in July 2020 by the European Council, the NGEU package consists of EUR 390 billion of grants and EUR 360 billion of loans to finance economic revival.

[2] Agriculture accounts for around 10% of the EU's greenhouse gas emissions (European Commission, 2020). However, this share would increase significantly if land use, land use change, on-farm energy use and agricultural product transportation (inside the EU) and importation (from outside the EU) were included.

between 1990 and 2012.[3] Besides, national efforts to reduce these emissions differ significantly across the EU, as is shown in Figure 1.

Figure 1 / Percentage change in GHG emissions from agriculture, 1990-2018 (national level)



Notes: green shades refer to negative values, i.e. a reduction in GHG emissions, and red to positive values, i.e. an increase in GHG emissions. GHG emissions defined as the total of CO_2, N_2O in CO_2 equivalent, CH_4 in CO_2 equivalent, HFC in CO_2 equivalent, PFC in CO_2 equivalent, SF_6 in CO_2 equivalent, NF_3 in CO_2 equivalent emissions.
Source: EEA (Greenhouse gas emissions inventory) and Eurostat (env_air_gge indicator).

At the regional level, the picture is expected to show even more of a contrast, with some farming-oriented regions at the forefront of sustainable agriculture (e.g. organic farming) and other regions still relying largely on industrial, intensive agriculture.

Nonetheless, the challenges induced by the 'sustainabilisation' of farming systems also come with a range of opportunities for regions and countries. The transition to sustainable agriculture is expected to bring about short- to long-term environmental, social and economic benefits, such as climate-change mitigation and the preservation of biodiversity and natural resources, as well as improved human health,

[3] Source: Greenhouse gas emissions inventory, as reported by the European Environment Agency (EEA) and republished by Eurostat (env_air_gge indicator).

job creation (e.g. in the production of bio-fertilisers, protein feed, bioenergy and bio-chemicals), fair income distribution and increased resilience.[4] However, farmers and policy makers must be ready to engage and invest in the digital and green transition of farming systems. With a view to providing some preliminary insights into the readiness, propensity and potential of regional farming systems to become more sustainable, this article tackles the transition-related opportunities and challenges for the EU agro-food sector, from a regional perspective:

› What are the drivers of a successful green transition in the regional agro-food systems?

› Can regions be characterised according to these drivers, and can a typology of 'transition readiness' be defined at the regional level?

› How can the EU support those regions that are ill-placed to harness the growth potential offered by the Farm to Fork Strategy?

This last question is relevant not only in the context of the post-pandemic recovery, but also more generally against the backdrop of Europe as a sustainable, inclusive and thriving place for future generations to live in.

CONVERSION TO HEALTHY AND ENVIRONMENTALLY FRIENDLY AGRO-FOOD SYSTEMS

There are various ways of reducing the carbon footprint of the agricultural sector, while increasing its sustainability. Organic farming, geographical indications (protected designation of origin, protected geographical indication, and traditional speciality guaranteed), local distribution networks and fair-trade agriculture feature among the most common models of sustainable agriculture; but a full-fledged quantitative assessment of the socioeconomic costs and benefits of such models along the entire value chain is still largely missing (ADEME et al., 2018).

At the same time, the generalisation of a sustainable agricultural model (such as organic farming) also implies a shift from the currently highly productive European agriculture (in particular, through the intensification and consolidation of the farming sector) to one that uses fewer inputs and local resources, and that consequently produces less. The conversion to a sustainable, agro-ecological farming system in Europe that still produces enough (quality) food for all Europeans by 2050 is deemed feasible, if the use of pesticides and synthetic fertilisers is reduced, if there is widespread creation of agro-ecological infrastructures (as well as permanent grassland), and if balanced and seasonal diets are adopted by EU citizens, with a drastic reduction in the consumption of meat and dairy products (Poux and Aubert, 2018). Interestingly, the importance of a mainly vegetarian diet – or at least one that cuts out ruminant meat – as an effective way of reducing GHG emissions has been clearly emphasised in several modelling studies (Bryngelsson et al., 2016; Strapasson et al., 2020).

[4] Farm resilience is defined by the European Innovation Partnership for Agricultural Productivity and Sustainability (EIP-AGRI) as the autonomy of farmers to respond to their needs with the use of long-term solutions. In particular, agro-ecological farming practices 'help improve soil health and carbon sequestration, water quality and nutrient flows, and control pests and diseases, [and can thereby make] farming systems more climate-resilient' (EIP-AGRI, 2020).

However, achieving full conversion to a carbon-neutral agro-ecological farming system by 2050 will require more than a reduction in GHG emissions in both food production (higher productivity and efficiency) and consumption (dietary change, reduced food waste) patterns: it will also need carbon sequestration capacity (e.g. reforestation) and circular bio-economies to be widely developed (Lóránt and Allen, 2019). In this regard, it is noteworthy that carbon sequestration on formerly agricultural land (now re-growing vegetation) would be facilitated by a vegetarian diet, which requires significantly less land to be taken up for farming purposes (Bryngelsson et al., 2016).

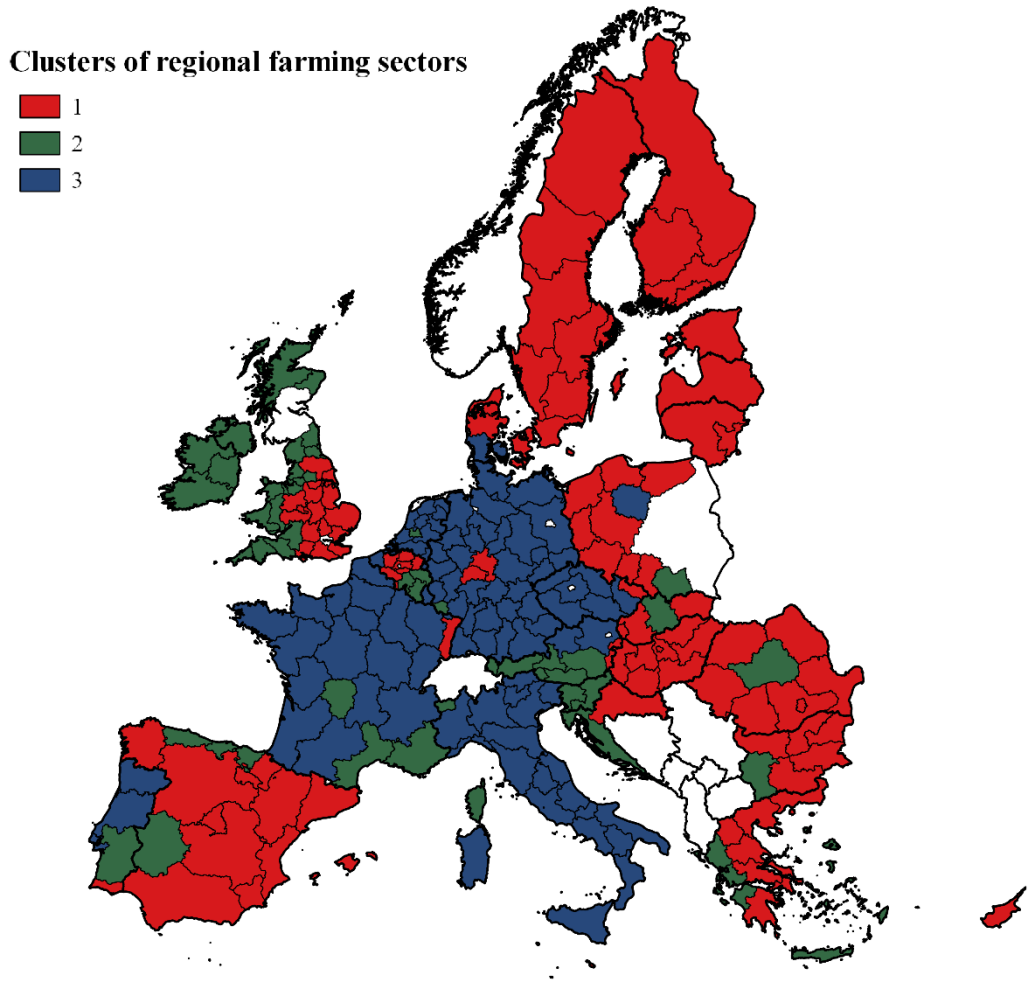
DRIVERS AND TERRITORIAL PATTERNS OF GREEN TRANSITION IN AGRICULTURE

EU-wide agri-environmental data have been collated, with a view to offering an initial, rapid assessment of the EU regional farming systems' readiness to become sustainable (as defined by the changes in production and consumption patterns outlined above). More specifically, the data consist of agri-environmental indicators used to characterise the prevailing systems of regional agriculture, with regard to their (potential for) sustainability. As regional indicators on consumption patterns are scarce (particularly regarding diet, food waste and local distribution networks), the indicators used here relate specifically to agricultural production, land use and farmers' training as key determinants of sustainable farming. These include:

- The share of total utilised agricultural area covered by permanent grassland and meadow, as a proxy for agro-ecological infrastructure;
- The share of total utilised agricultural area (including natural grassland) under Natura 2000, an indicator of protected agricultural lands;
- The share of total utilised agricultural area under organic farming (fully converted or under conversion);
- The share of total utilised agricultural area managed by farms with low input intensity per hectare, as a proxy for the limited use of pesticides, fertilisers and purchased animal feed;
- The share of total utilised agricultural area not (yet) affected by moderate to severe water erosion;
- The share of farm managers with basic or full agricultural training (as opposed to practical experience only), on the assumption that training increases a farmer's knowledge of, and readiness to adapt to, sustainable practices.

The characterisation of regional farming systems along these indicators is performed through a clustering of EU regions: regions that share comparable indicator values are grouped together (intra-cluster homogeneity), while regions with differing indicator values are allocated to distinct clusters (extra-cluster heterogeneity). The resulting clusters of regions are depicted in Figure 2.

Figure 2 / Clusters of EU regions based on farming sustainability indicators



Note: Uncoloured EU regions are regions which could not be allocated to a cluster because of missing indicator values.
Source: author's own elaboration, based on CMEF indicator data.

The first cluster (cluster 1, coloured red in the figure) consists of regions whose current farming systems are mostly ill-adapted to the green transition: they have the lowest shares of total utilised agricultural area covered by permanent grassland and meadow, the lowest shares of total utilised agricultural area managed by farms with low input intensity per hectare (although with values close to those of cluster 3), the lowest shares of farm managers with basic or full agricultural training (although close to those of cluster 2) and moderate shares of total utilised agricultural area protected under Natura 2000 or covered by organic farming (although with wide variations across the regions). On the other hand, regions in this cluster generally have a high proportion of total utilised agricultural area not affected by moderate to severe water erosion.

The second cluster (cluster 2, coloured green in the figure) consists of regions that are widely engaged in sustainability efforts: they have the largest shares of total utilised agricultural area that are covered by permanent grassland and meadow, that are protected under Natura 2000 and that are managed by farms with low input intensity per hectare. However, these regions also have relatively small proportions

of agricultural areas covered by organic farming (although there is wide variation across regions) and larger proportions of areas affected by moderate to severe water erosion.

The third cluster (cluster 3, coloured blue in the figure) is a 'middle cluster', broadly made up of regions with a high sustainability potential for their farming sectors. Indeed, these regions have a relatively high level of organic farming and significantly more farmers (proportionately) with basic or full agricultural training, hinting at an emerging dynamic of sustainable agriculture and a high level of adaptability of their farming practices. However, regions in this cluster still have moderate shares of total utilised agricultural area that are covered by permanent grassland and meadow, that are managed by farms with low input intensity per hectare and that are not affected by moderate to severe water erosion.

Once again, it is important to recall that the patterns displayed in Figure 2 are mostly for illustrative purposes – to give an initial impression of the territorial distribution of sustainable farming assets across the EU. These assets are reflected through only a limited selection of agri-environmental indicators, and are therefore not representative of the multifaceted sustainability potential of regional farming systems. On the one hand, by grouping all EU regions into three distinct clusters, we can clearly categorise EU regions along a typology similar to that of the Cohesion Policy: sustainability-lagging regions (cluster 1), regions with a strong transition potential (cluster 3) and sustainability-engaged regions (cluster 2). On the other hand, the clusters still conceal a wide variety of regional features, and hence some regional farming systems might be much farther along the road of green transition than other farming systems within the same cluster. For instance, cluster 1 includes regions that are identified as 'lagging' either because their agriculture is largely input intensive and barely organic (e.g. most Bulgarian and Romanian regions) or because their agricultural land has little permanent grassland and meadow and is scarcely protected under Natura 2000 (e.g. Finnish regions). This typically translates into a wide variety of challenges faced by EU regions when transforming their agriculture. Notwithstanding these regional challenges, sustainability-engaged regions grouped within cluster 2 are spread across Europe – from Portugal and Ireland in the west to the newest member states in the east – giving European countries many 'best-practice' examples on which to build when designing and implementing agricultural policies conducive to the green transition.

POLICY IMPLICATIONS

The scattered distribution across the EU of regions which are lagging behind in the transition to farming systems that emit less carbon and are more environmentally friendly raises several questions as to the best supportive policy mechanisms. Indeed, these lagging regions – here defined on the basis of their current land use and farming practices – encompass different farming models (e.g. in terms of the involvement of family or temporary workers), different farm business dynamics (e.g. in terms of the ageing or rejuvenation of the farm-manager population) and different levels of agricultural factor income (per annual work unit). Therefore, regional farming systems across the EU are likely to respond differently to any policy stimulus.

The 'greening' of the Common Agricultural Policy (CAP) envisaged in the 2021-2027 Multiannual Financial Framework (MFF) has already triggered heated debate between and beyond EU institutions, highlighting diverging views on CAP conditionality, environmental protection measures and their associated expenditure. Nevertheless, the need to mobilise both Pillar 1 (direct payments to farmers)

and Pillar 2 (rural development investments) of the CAP is evident, in order to incentivise and finally realise the transition to a green and sustainable agriculture. In its publication *The post-2020 Common Agricultural Policy: Environmental benefits and simplification*, the European Commission (2019) outlines how Pillar 1-funded eco-schemes and Pillar 2-funded environment- and climate-related measures are expected to help achieve the Green Deal ambitions. Given that these schemes and measures are largely voluntary, and given the diversity of the regional challenges when it comes to sustainable farming, the CAP will have to introduce stricter requirements and criteria related to conditionality and governance (Guyomard, Bureau et al., 2020), on the one hand, and seek powerful synergies with other EU policies, on the other, if it is to achieve climate neutrality by 2050. This primarily concerns the Cohesion Policy – a policy that draws on the European Regional Development Fund (ERDF), the European Social Fund (ESF) and the Cohesion Fund to address economic, social and territorial inequalities across the EU.

So far, the CAP and the Cohesion Policy have not consistently demonstrated synergies across the EU, having either a positive or a negative combined effect on agricultural economic growth, depending on the initial regional gross value added in agriculture (Calegari et al., 2020). Creating synergies between the CAP and the Cohesion Policy might be even more difficult under the next MFF, since CAP rural development funding will no longer be covered by the Common Provisions Regulation.[5] Thus, coordination of the various EU investment policies that affect regional farming sectors either directly or indirectly becomes a key priority, if new forms of regional disparity are to be avoided. This is particularly important, as farming-dependent regions have demonstrated slower economic growth (thereby supporting the theory of a 'natural resources curse' in the EU), allegedly because of a general lack of innovation and productivity-enhancement investments in regions that rely on primary-sector endowments (Corrocher et al., 2020).

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[5] The Common Provisions Regulation sets the ground for all European Structural and Investment Funds, including the ERDF, the ESF and the Cohesion Fund.

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Monthly and quarterly statistics for Central, East and Southeast Europe

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

Baseline data and a variety of other monthly and quarterly statistics, **country-specific** definitions of indicators and **methodological information** on particular time series are **available in the wiiw Monthly Database** under: **https://data.wiiw.ac.at/monthly-database.html**. Users regularly interested in a certain set of indicators may create a personalised query which can then be quickly downloaded for updates each month.

Conventional signs and abbreviations used

%	per cent
ER	exchange rate
GDP	Gross Domestic Product
HICP	Harmonized 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

The following national currencies are used:

ALL	Albanian lek	HRK	Croatian kuna	RON	Romanian leu
BAM	Bosnian convertible mark	HUF	Hungarian forint	RSD	Serbian dinar
BGN	Bulgarian lev	KZT	Kazakh tenge	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) and Slovenia (from January 2007, euro-fixed before).

Sources of statistical data: Eurostat, National Statistical Offices, Central Banks and Public Employment Services; wiiw estimates.

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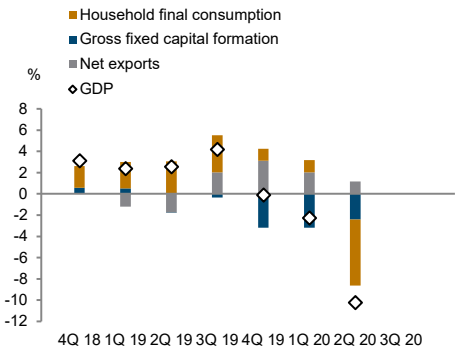
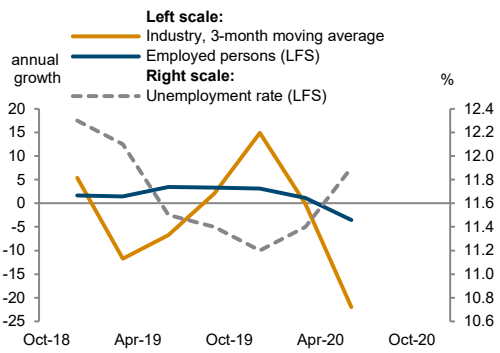
Albania

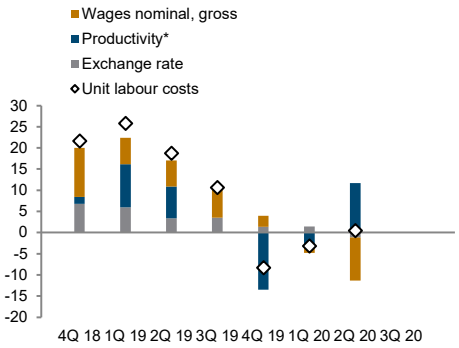
Real GDP growth and contributions
year-on-year



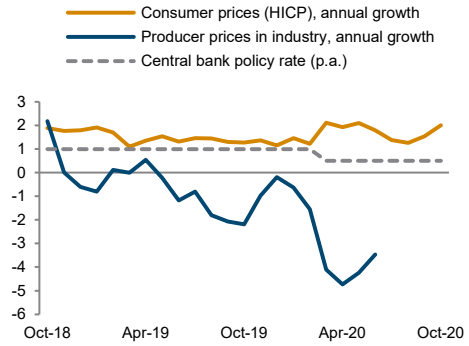
Real sector development
in %



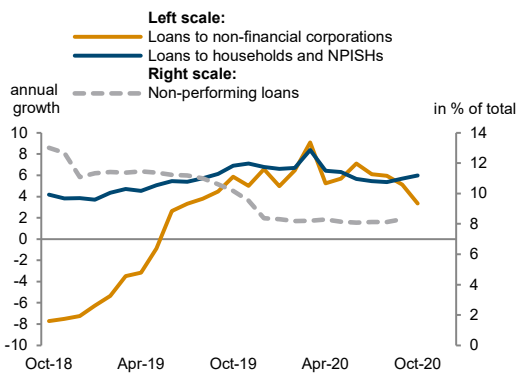
Unit labour costs in industry
annual growth rate in %



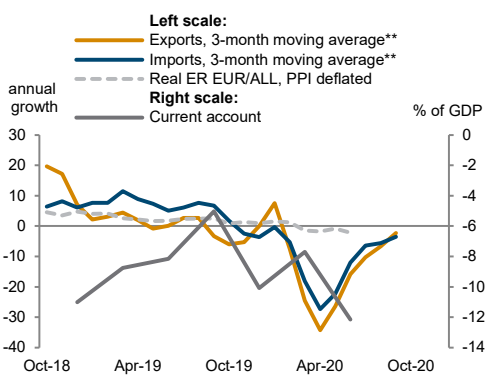
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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**EUR based.

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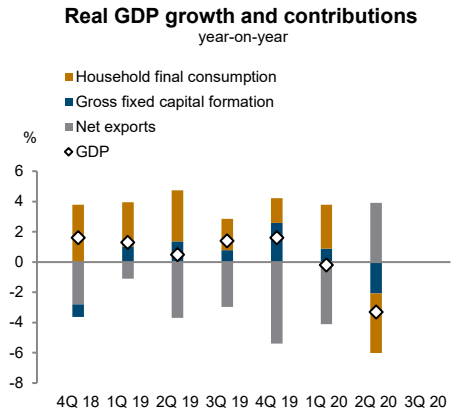
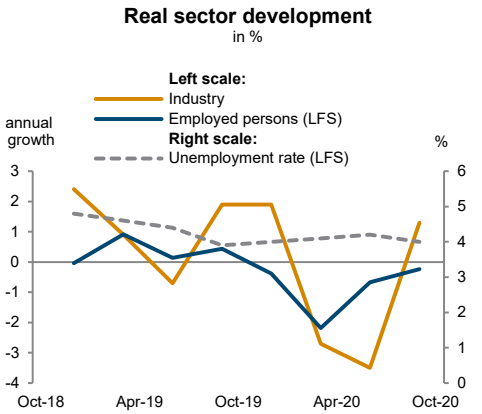
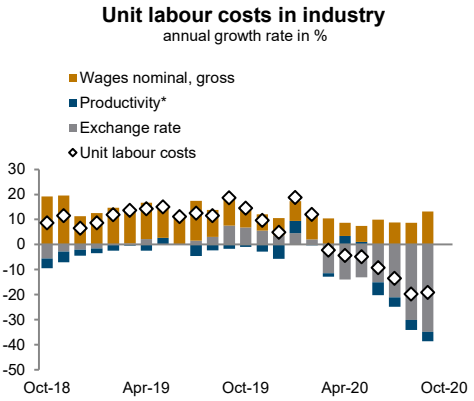
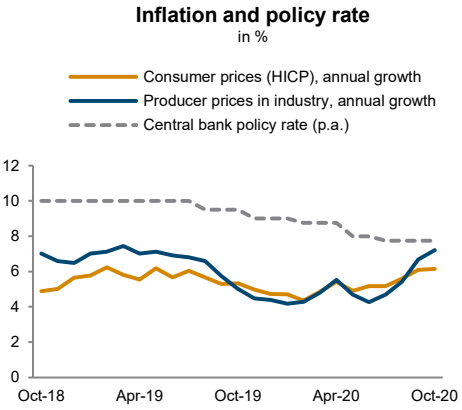
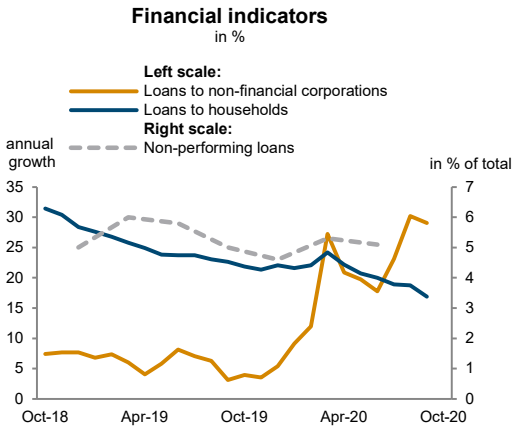
Belarus

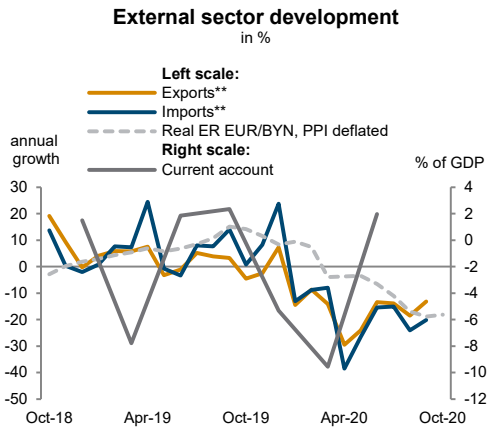












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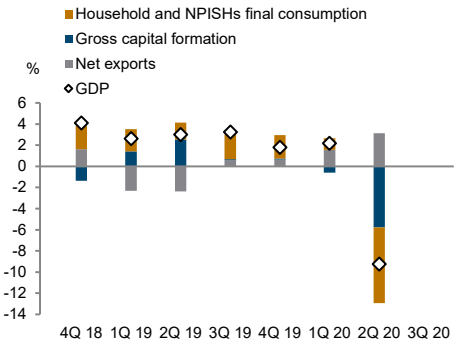
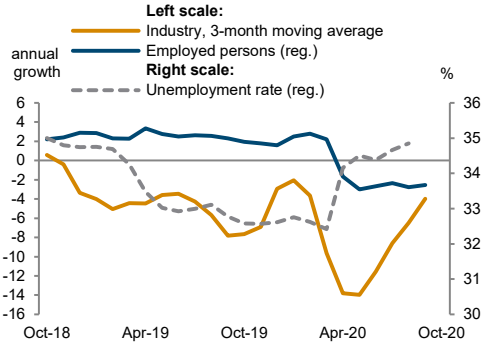
Bosnia and Herzegovina

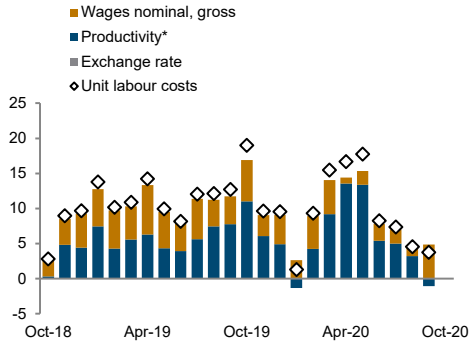
Real GDP growth and contributions
year-on-year



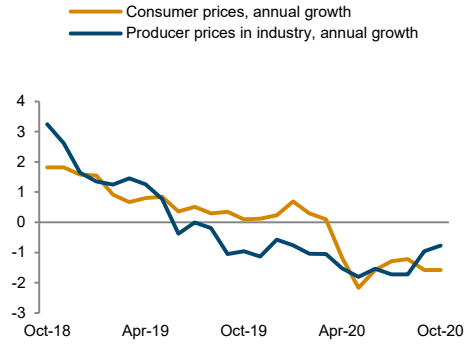
Real sector development
in %



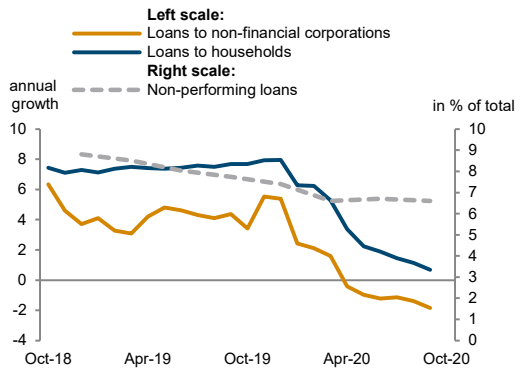
Unit labour costs in industry
annual growth rate in %



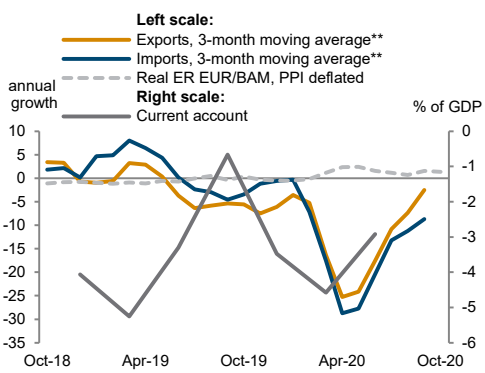
Inflation
in %



Financial indicators
in %



External sector development
in %



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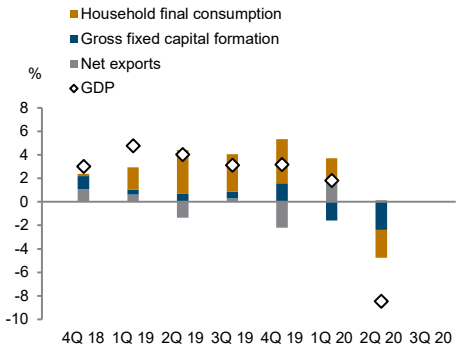
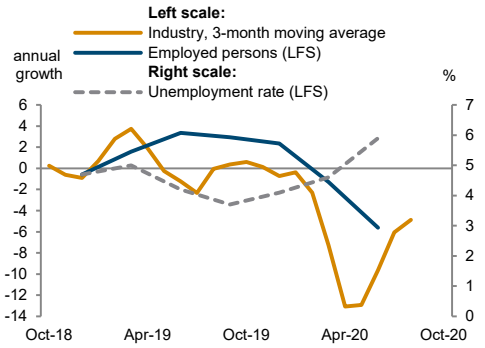
Bulgaria

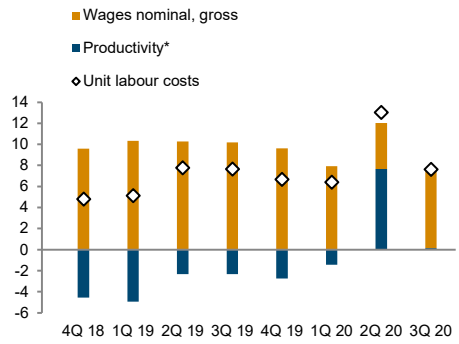
Real GDP growth and contributions
year-on-year



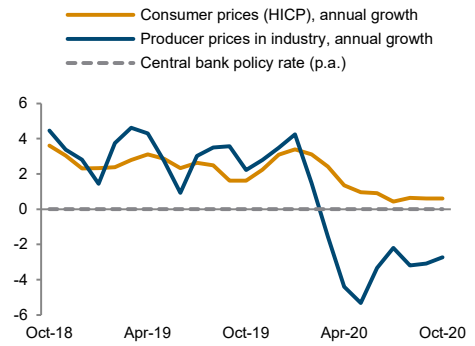
Real sector development
in %



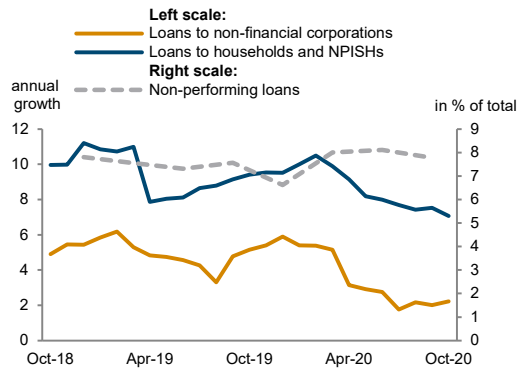
Unit labour costs in industry
annual growth rate in %



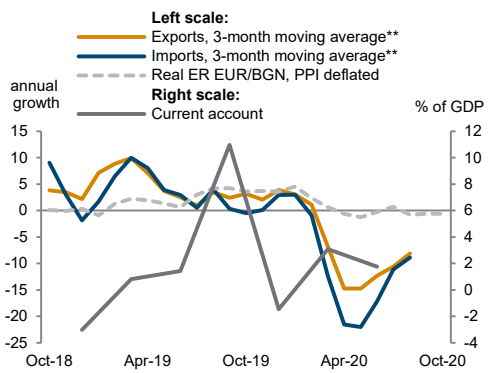
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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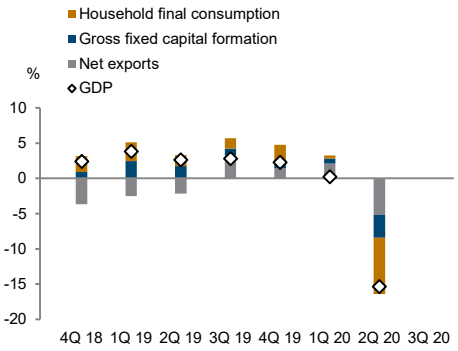
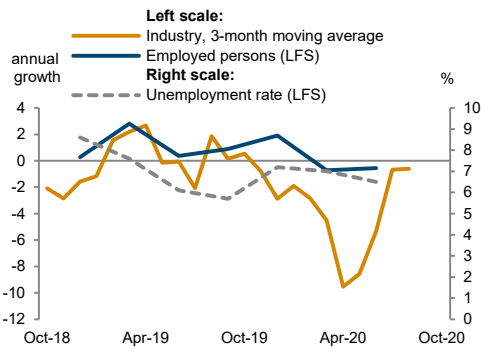
Croatia

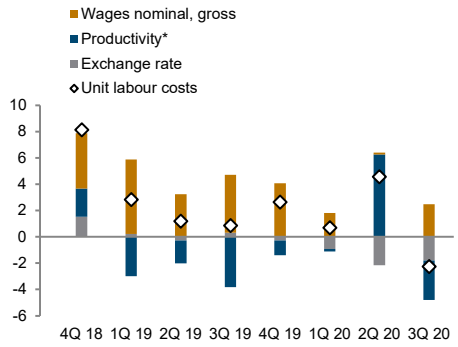
Real GDP growth and contributions
year-on-year



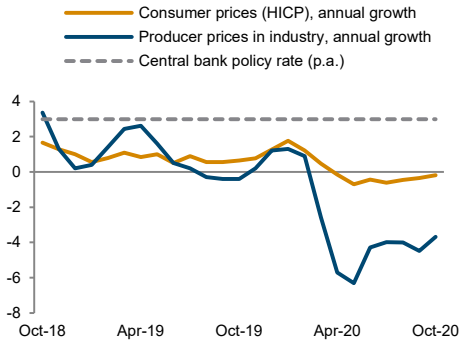
Real sector development
in %



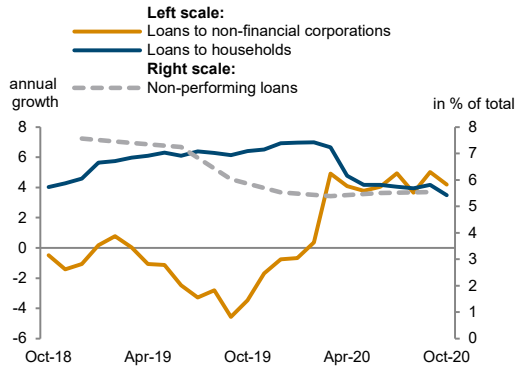
Unit labour costs in industry
annual growth rate in %



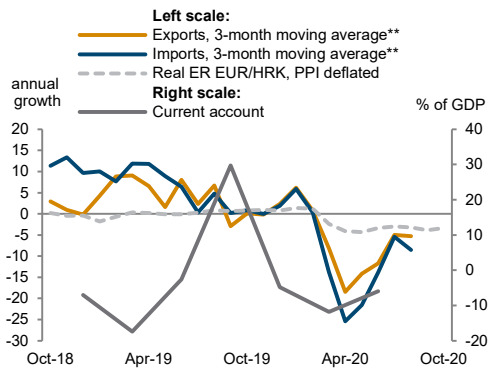
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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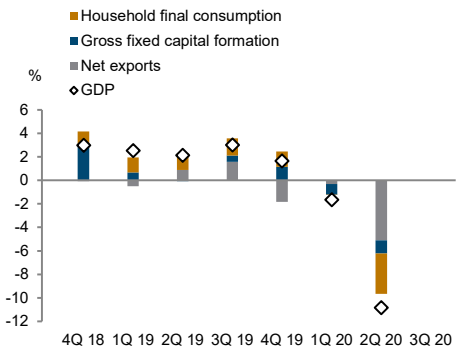
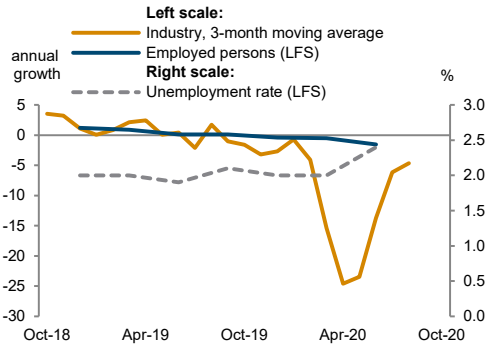
Czech Republic

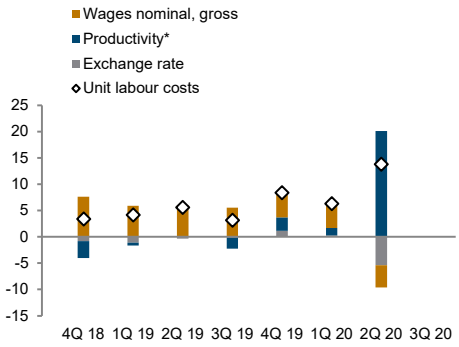
Real GDP growth and contributions
year-on-year



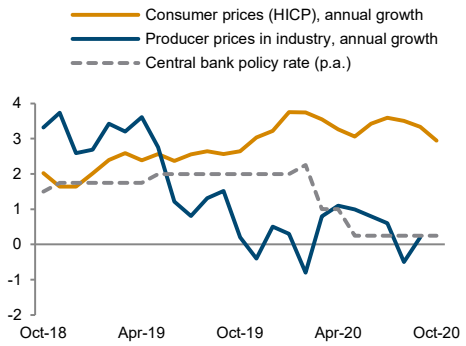
Real sector development
in %



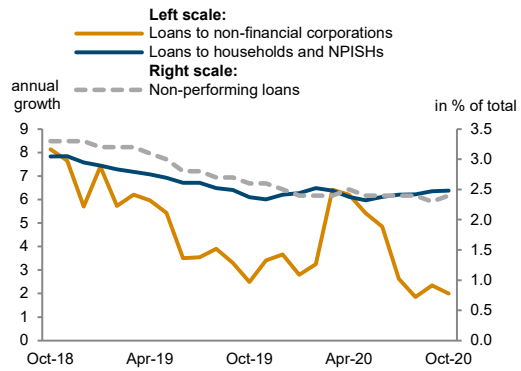
Unit labour costs in industry
annual growth rate in %



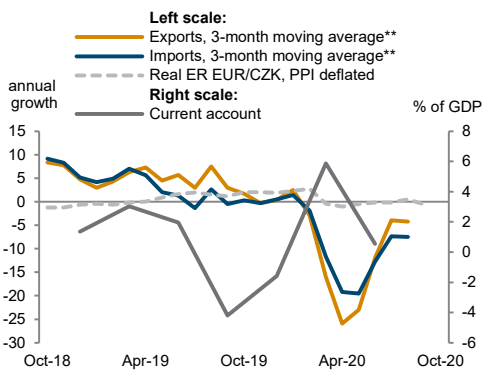
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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**EUR based.

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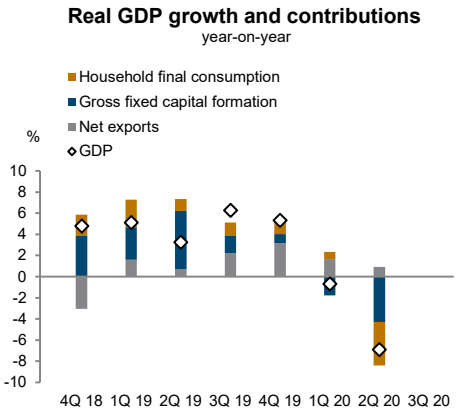
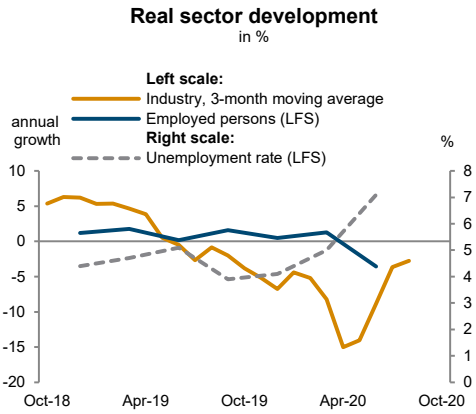
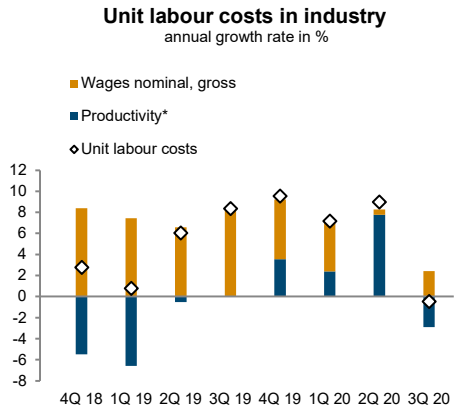
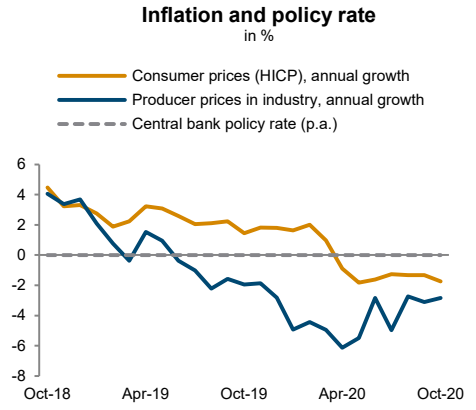
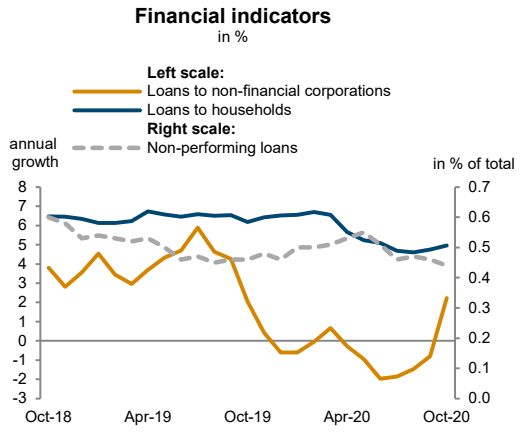
Estonia

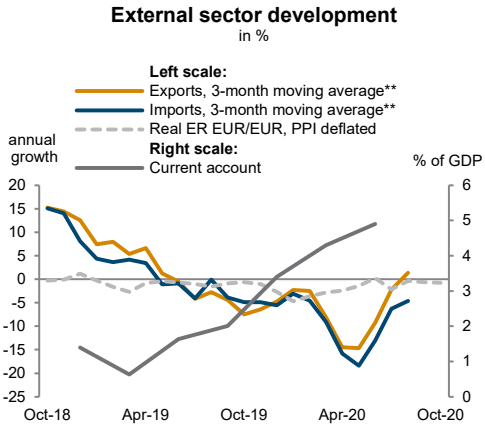












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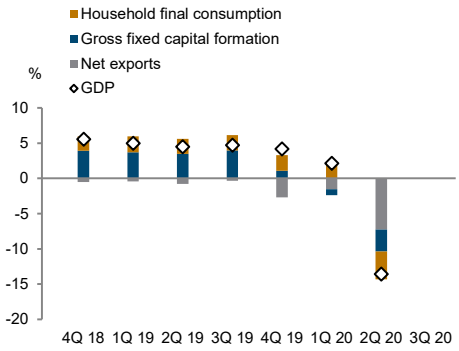
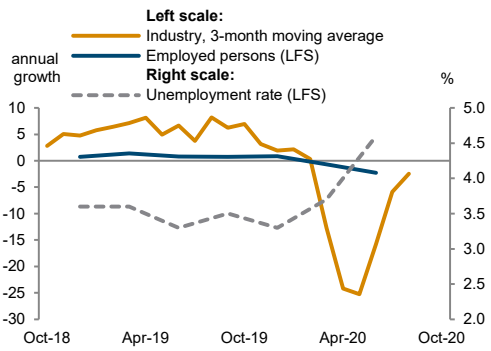
Hungary

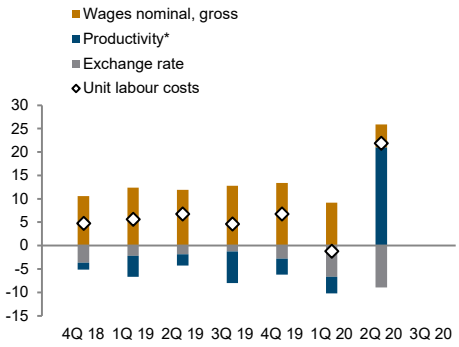
Real GDP growth and contributions
year-on-year



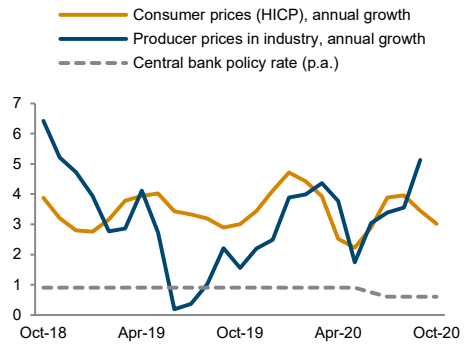
Real sector development
in %



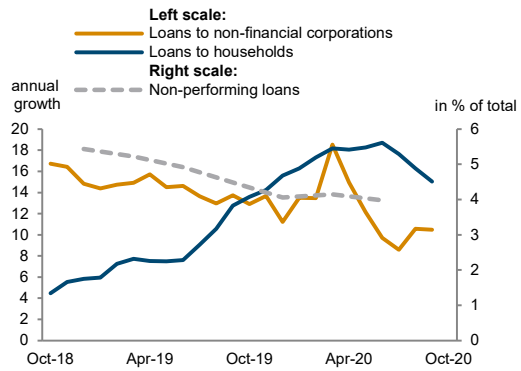
Unit labour costs in industry
annual growth rate in %



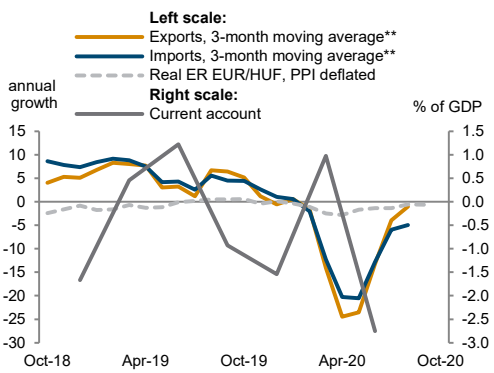
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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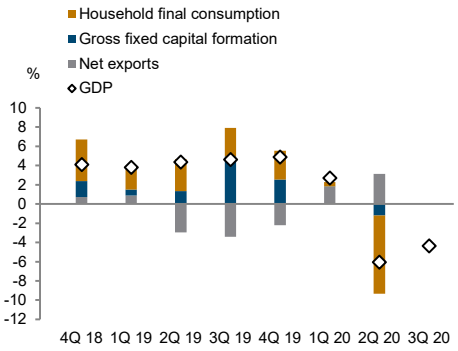
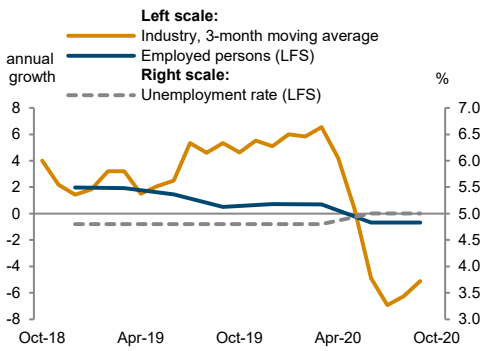
Kazakhstan

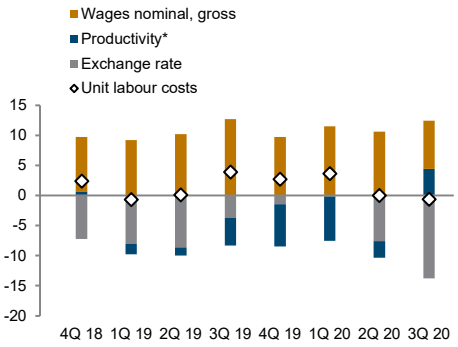
Real GDP growth and contributions
year-on-year



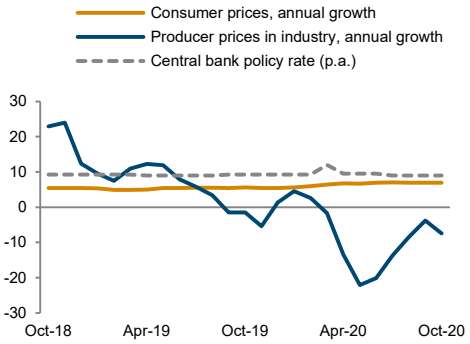
Real sector development
in %



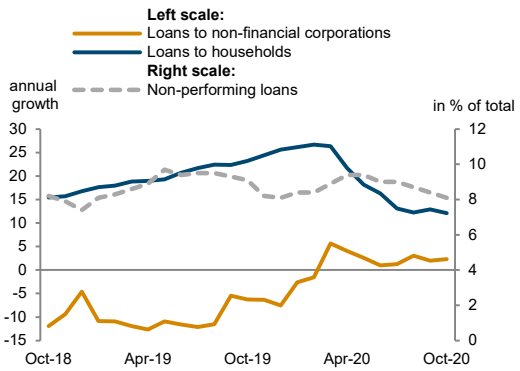
Unit labour costs in industry
annual growth rate in %



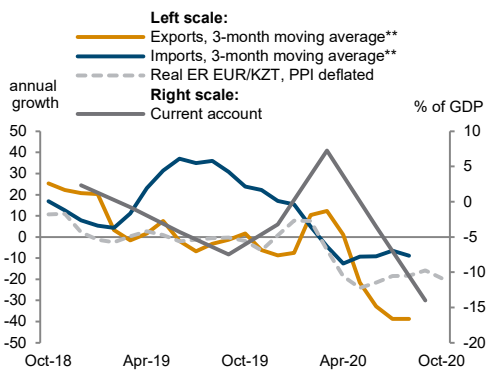
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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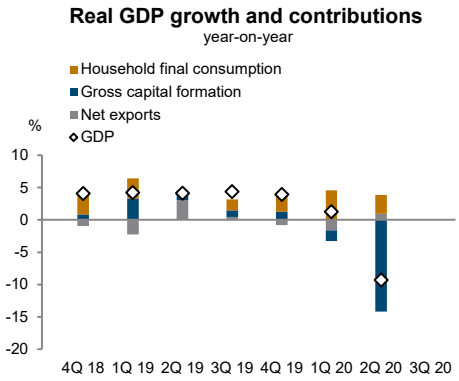
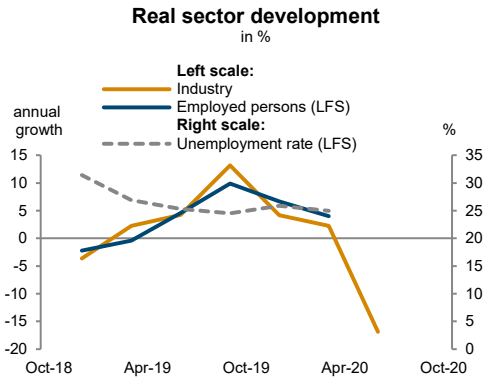
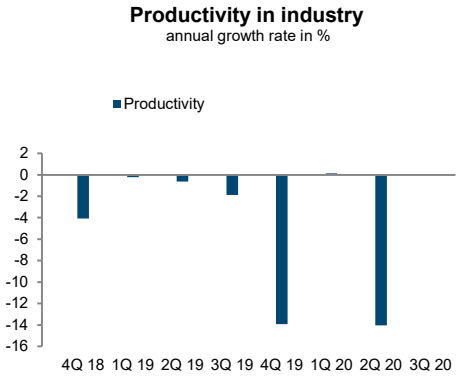
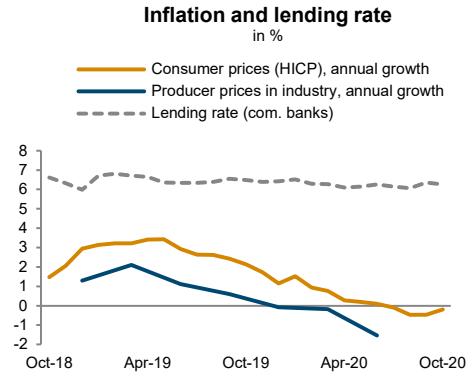
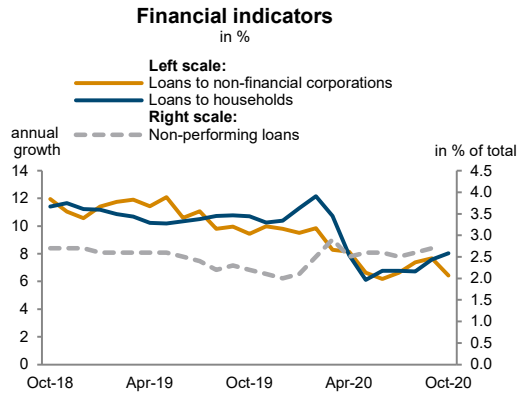
Kosovo

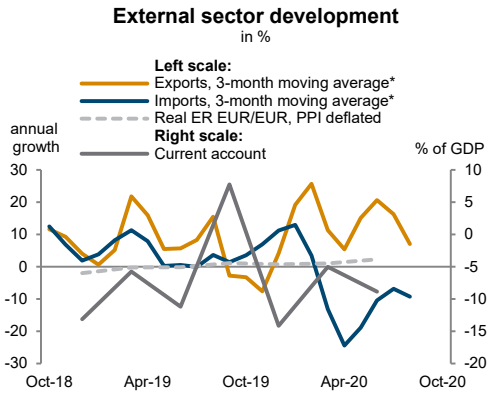












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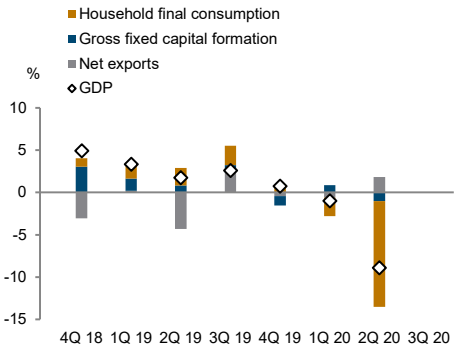
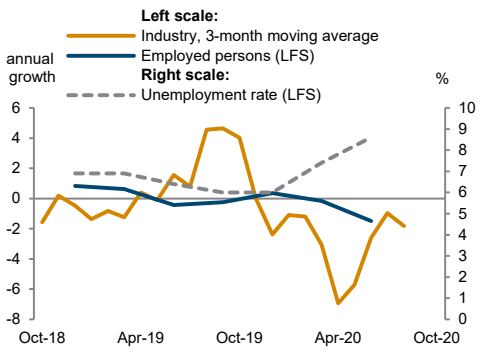
Latvia

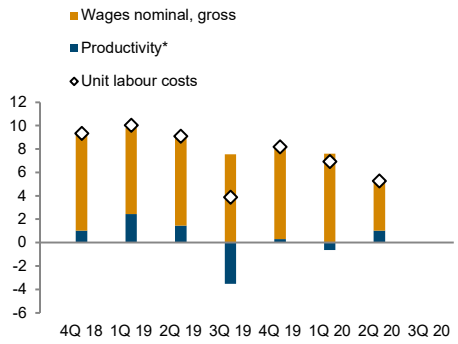
Real GDP growth and contributions
year-on-year



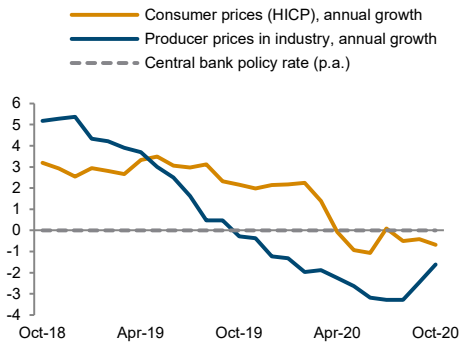
Real sector development
in %



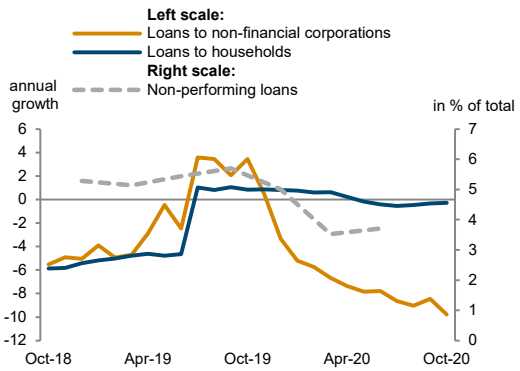
Unit labour costs in industry
annual growth rate in %



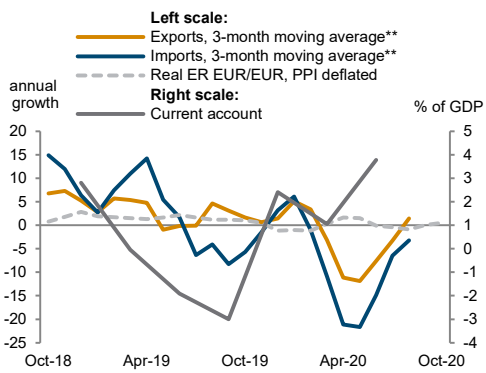
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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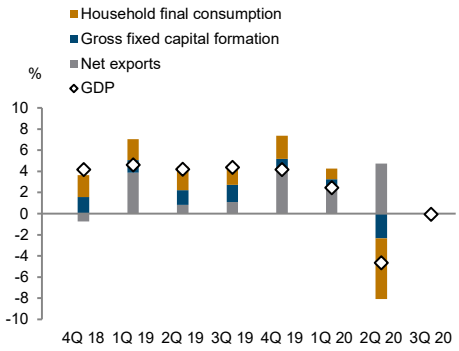
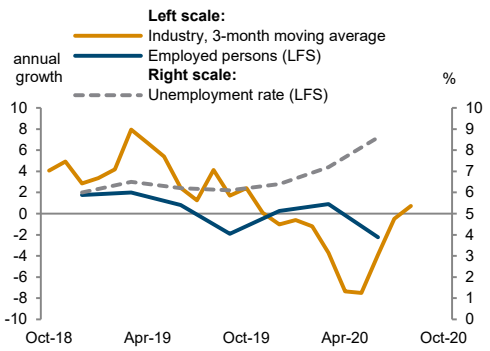
Lithuania

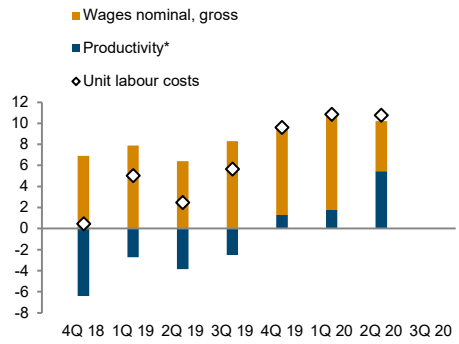
Real GDP growth and contributions
year-on-year



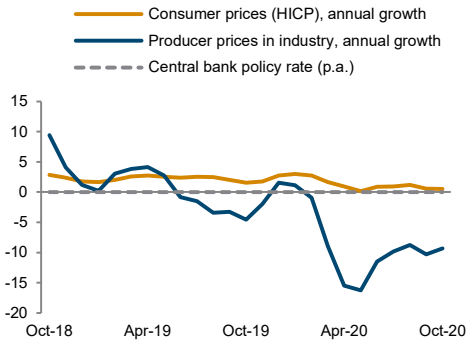
Real sector development
in %



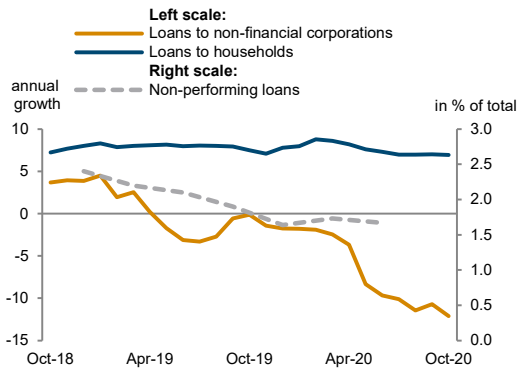
Unit labour costs in industry
annual growth rate in %



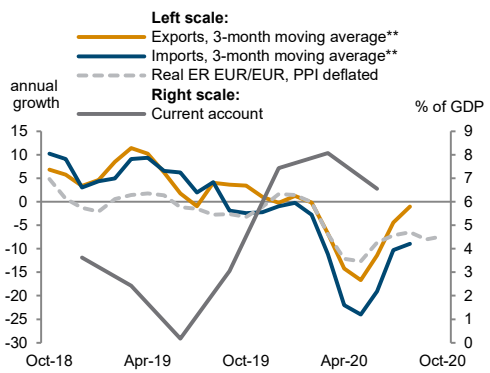
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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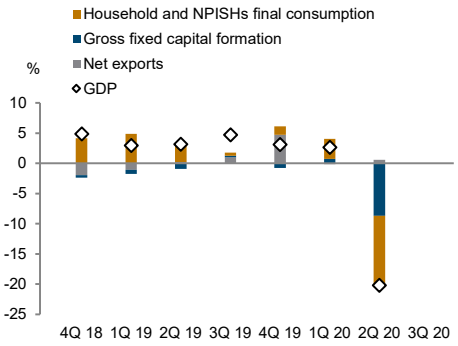
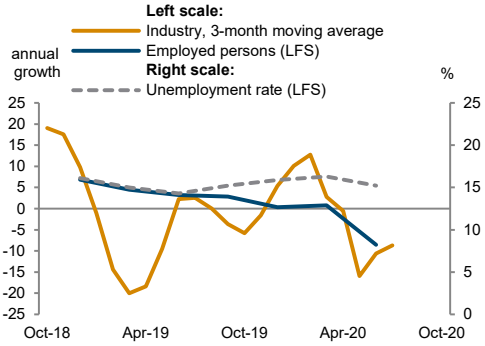
Montenegro

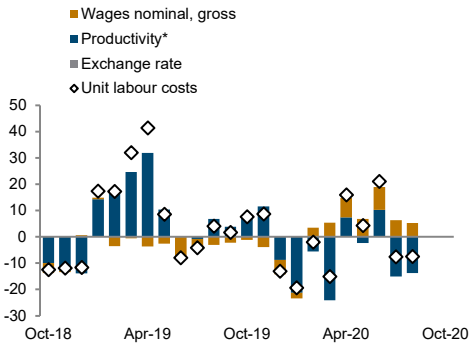
Real GDP growth and contributions
year-on-year



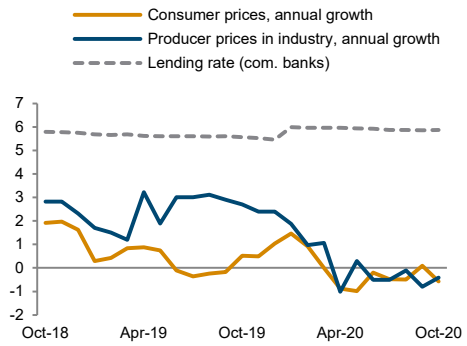
Real sector development
in %



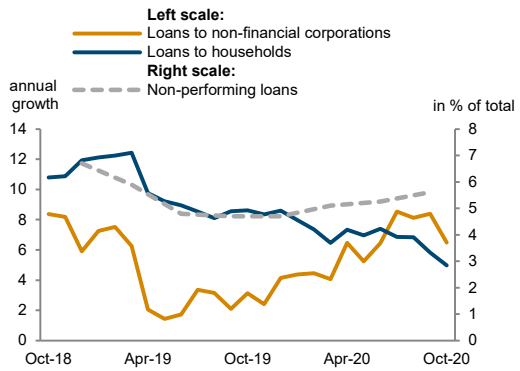
Unit labour costs in industry
annual growth rate in %



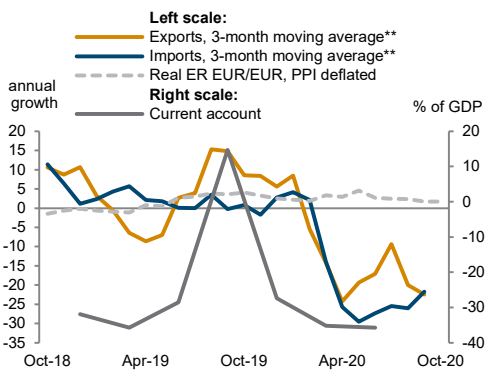
Inflation and lending rate
in %



Financial indicators
in %



External sector development
in %



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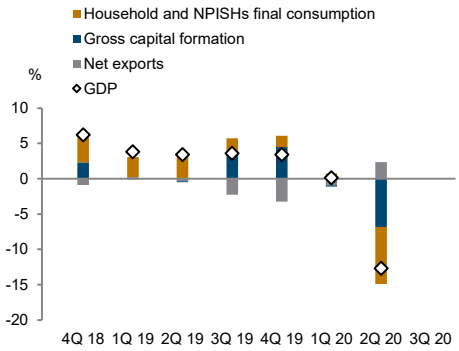
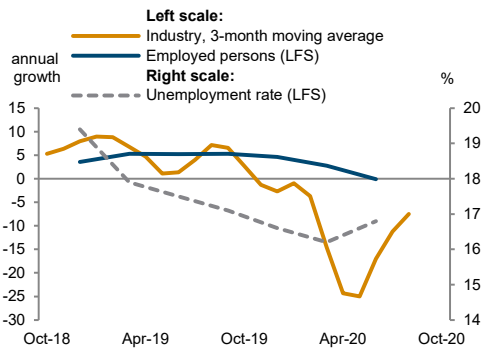
North Macedonia

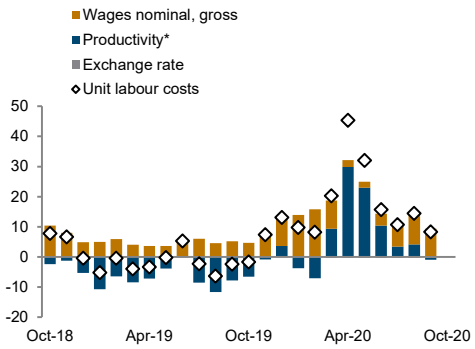
Real GDP growth and contributions
year-on-year



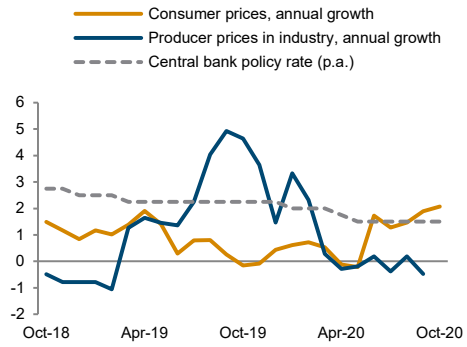
Real sector development
in %



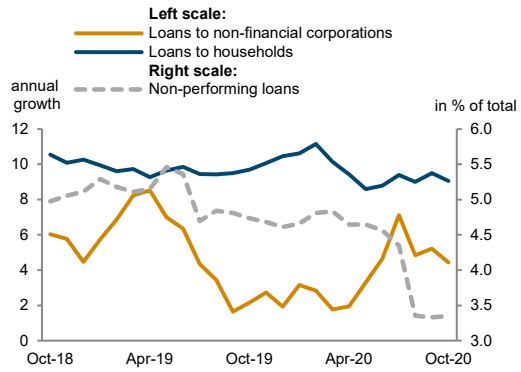
Unit labour costs in industry
annual growth rate in %



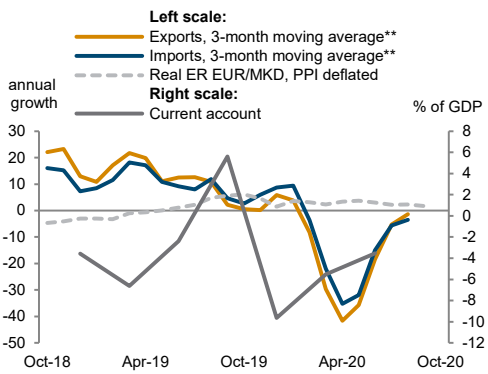
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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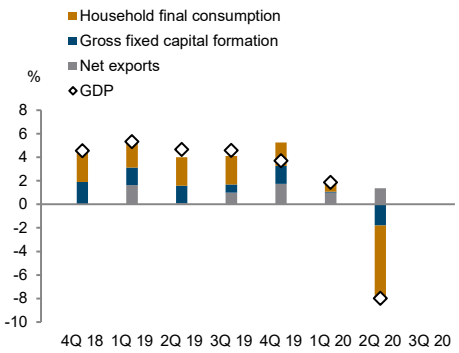
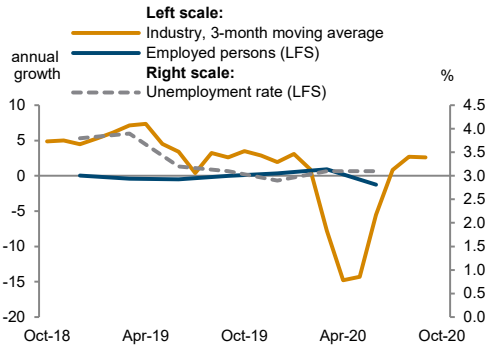
Poland

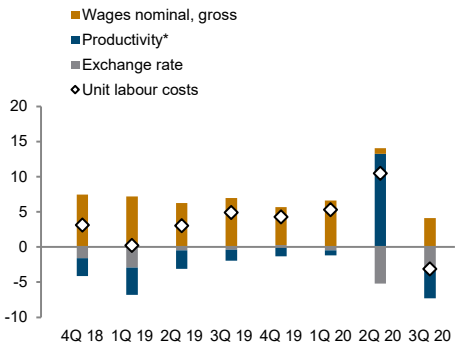
Real GDP growth and contributions
year-on-year



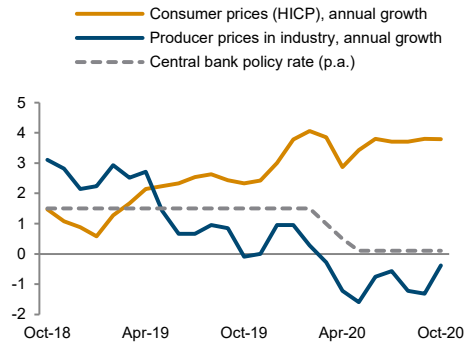
Real sector development
in %



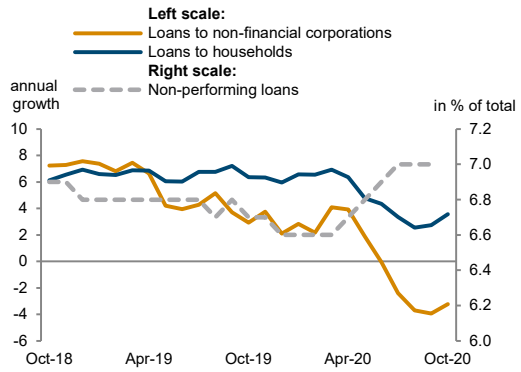
Unit labour costs in industry
annual growth rate in %



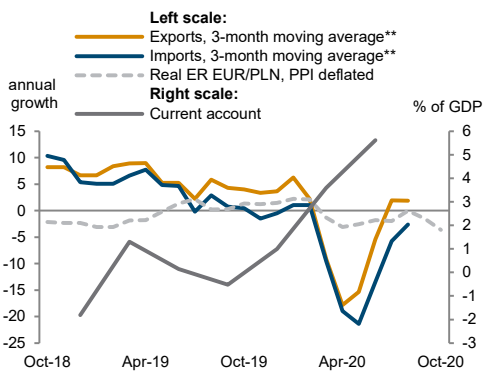
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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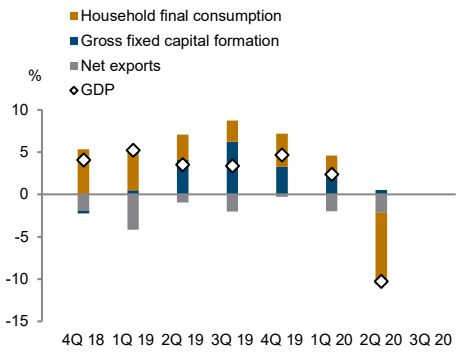
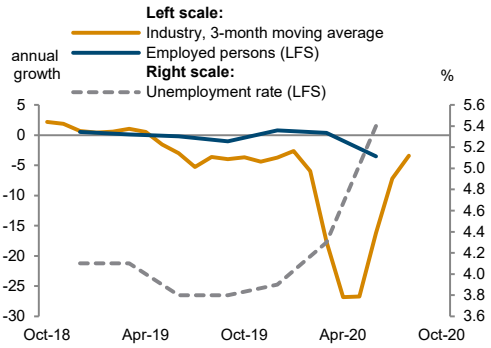
Romania

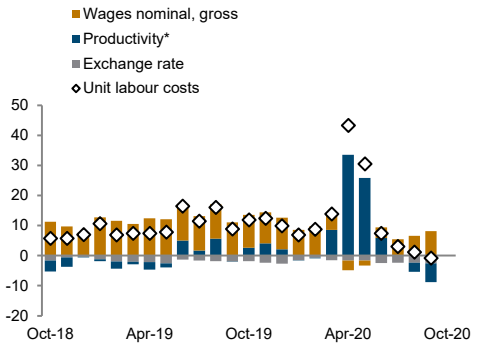
Real GDP growth and contributions
year-on-year



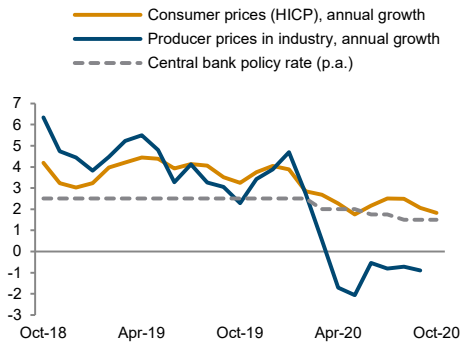
Real sector development
in %



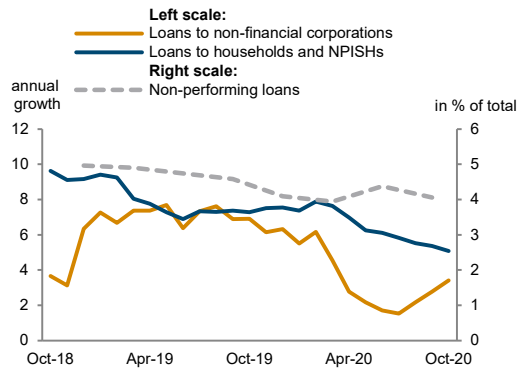
Unit labour costs in industry
annual growth rate in %



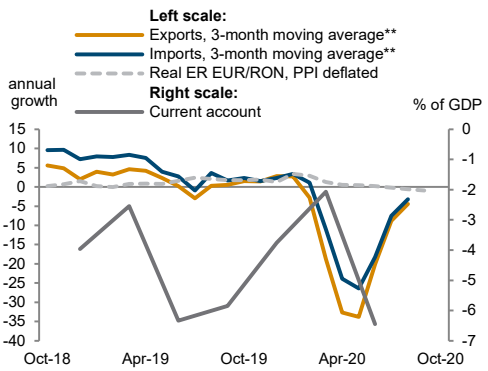
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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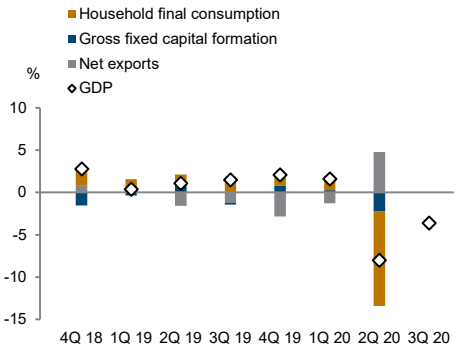
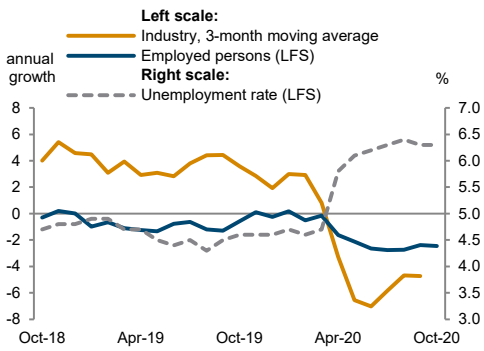
Russia

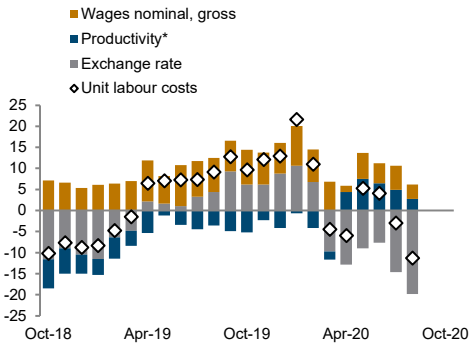
Real GDP growth and contributions
year-on-year



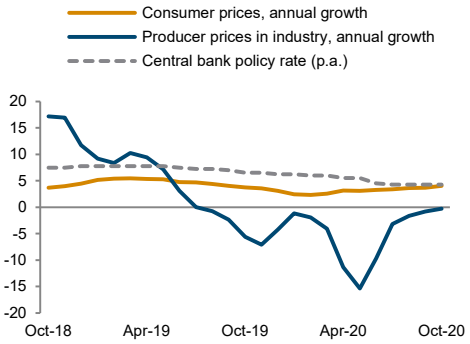
Real sector development
in %



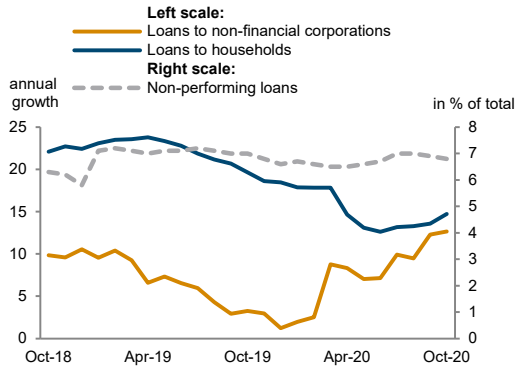
Unit labour costs in industry
annual growth rate in %



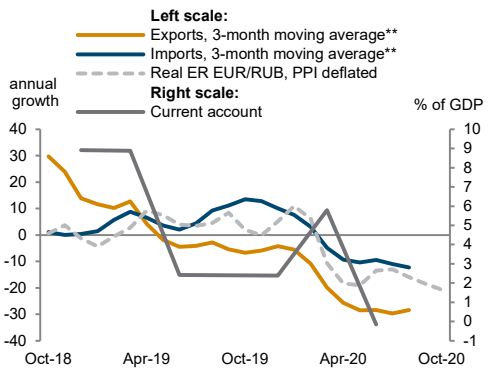
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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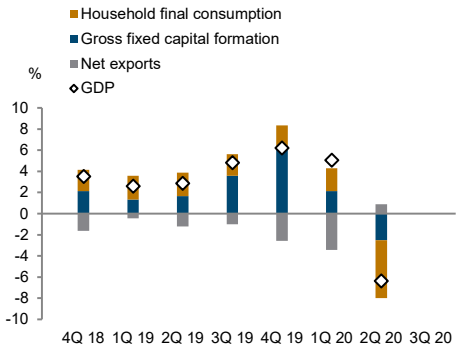
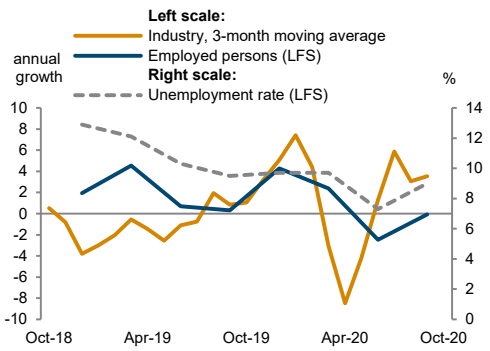
Serbia

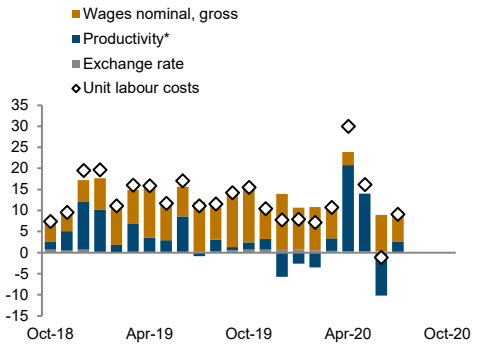
Real GDP growth and contributions
year-on-year



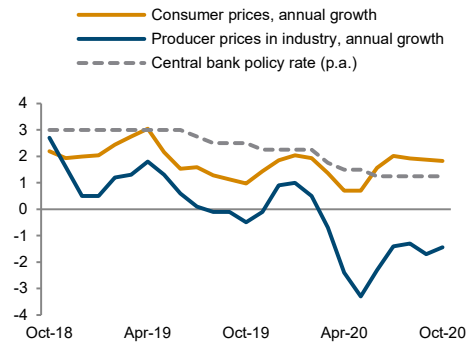
Real sector development
in %



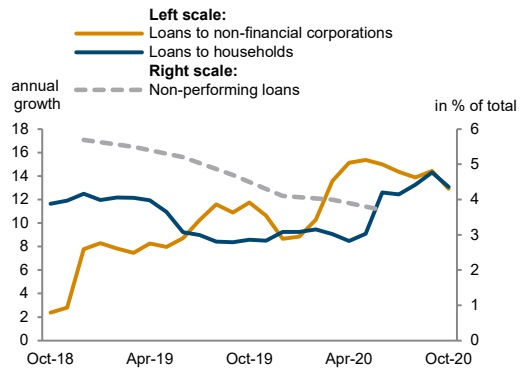
Unit labour costs in industry
annual growth rate in %



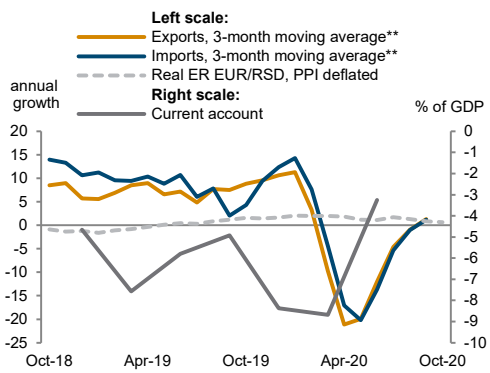
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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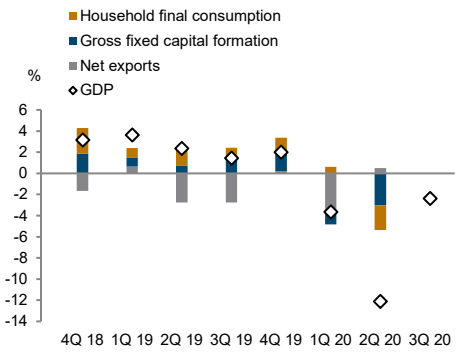
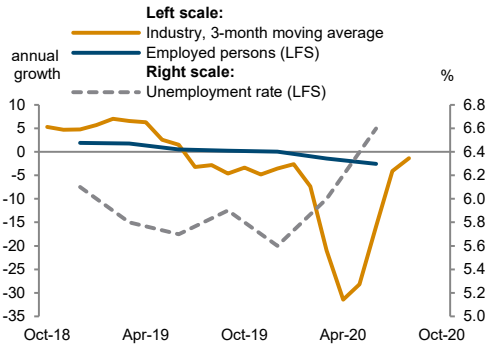
Slovakia

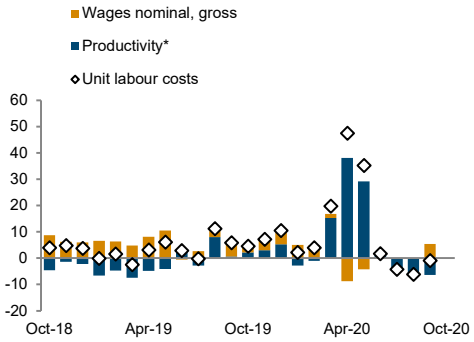
Real GDP growth and contributions
year-on-year



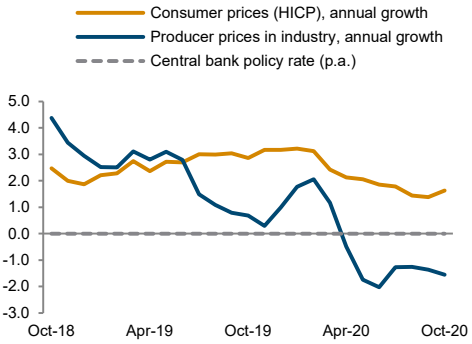
Real sector development
in %



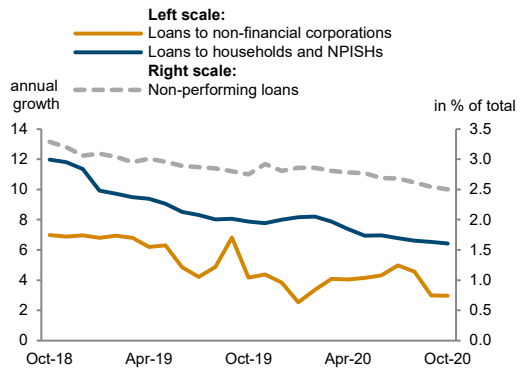
Unit labour costs in industry
annual growth rate in %



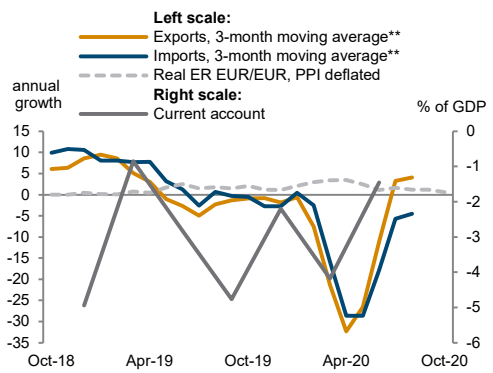
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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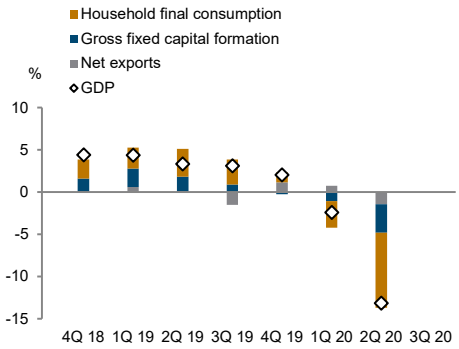
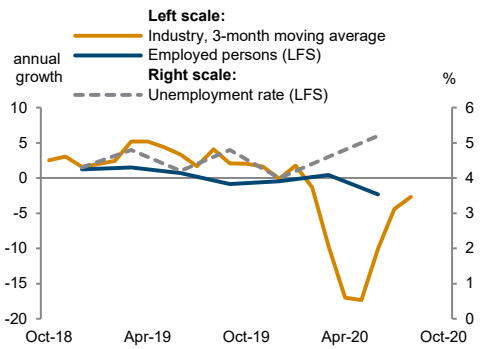
Slovenia

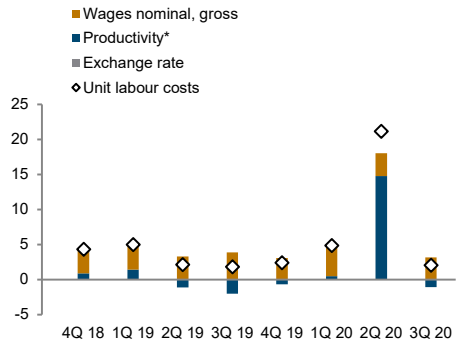
Real GDP growth and contributions
year-on-year



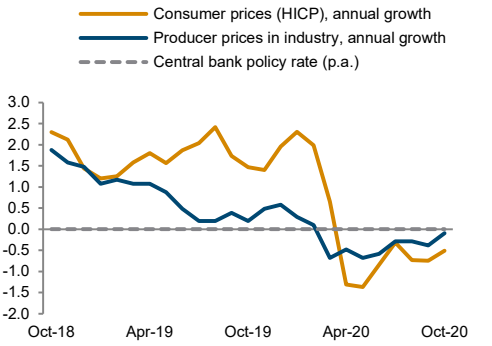
Real sector development
in %



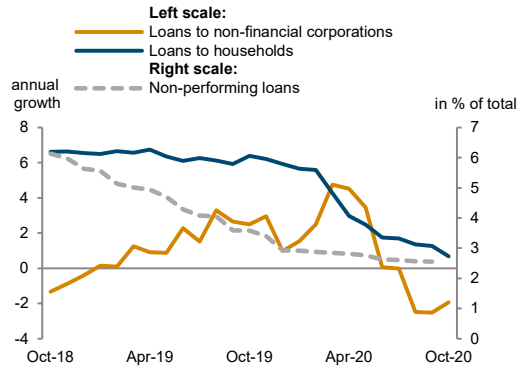
Unit labour costs in industry
annual growth rate in %



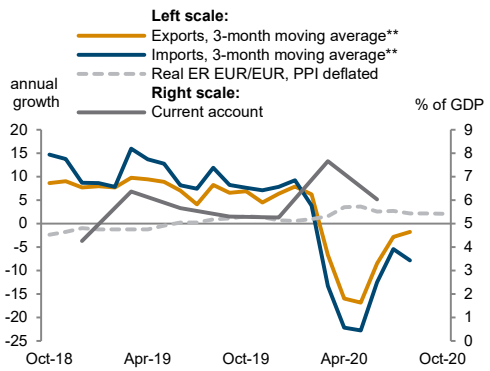
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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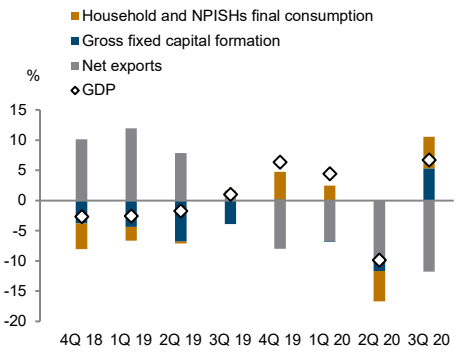
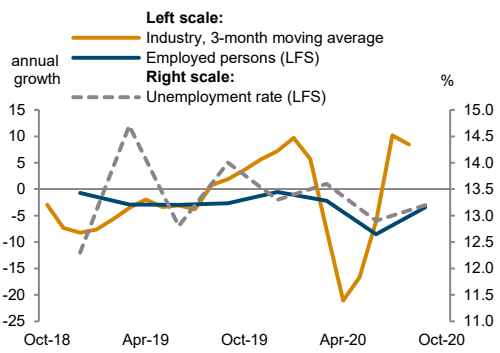
Turkey

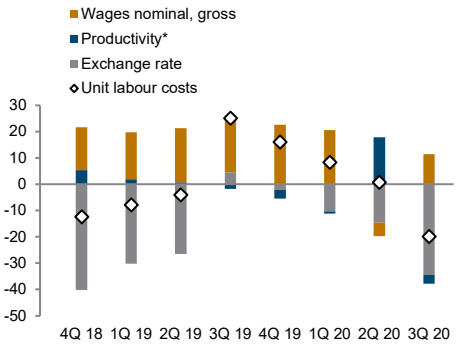
Real GDP growth and contributions
year-on-year



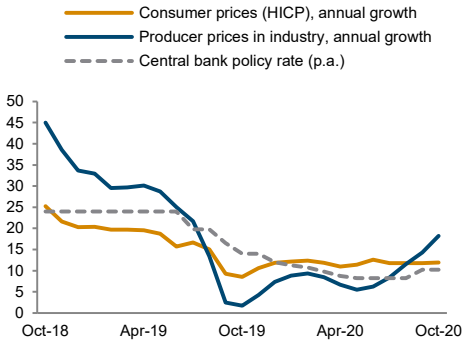
Real sector development
in %



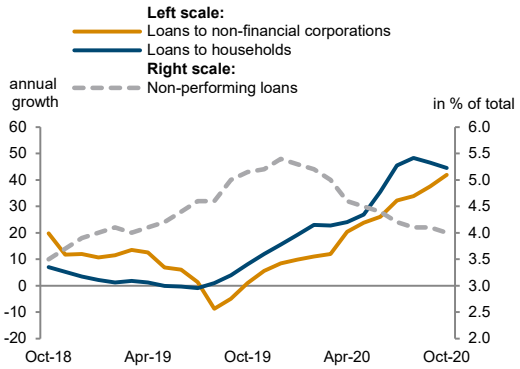
Unit labour costs in industry
annual growth rate in %



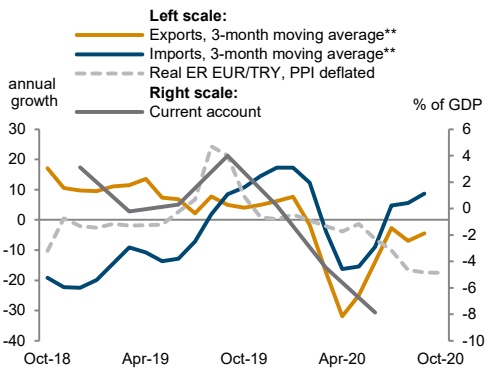
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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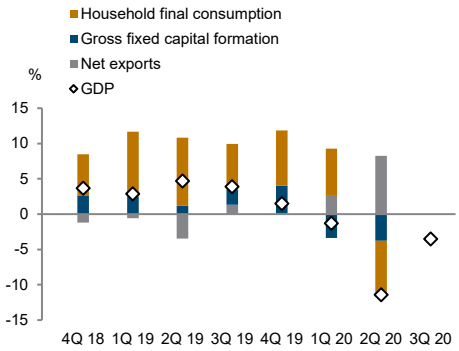
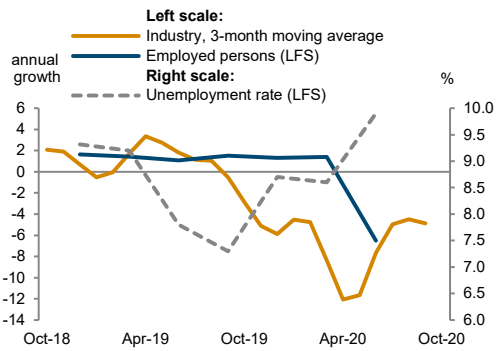
Ukraine

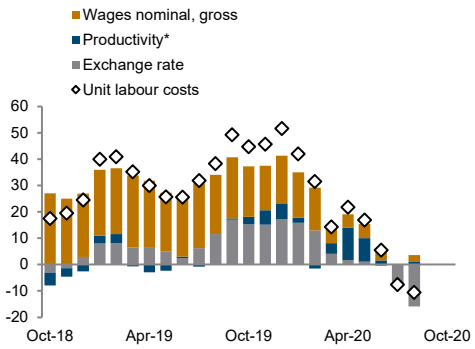
Real GDP growth and contributions
year-on-year



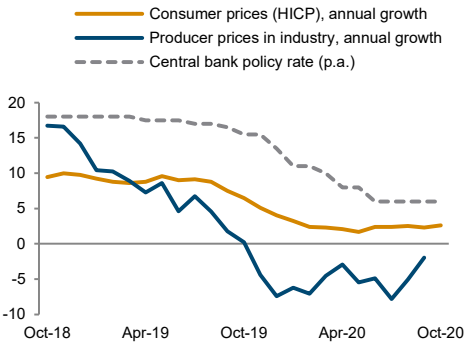
Real sector development
in %



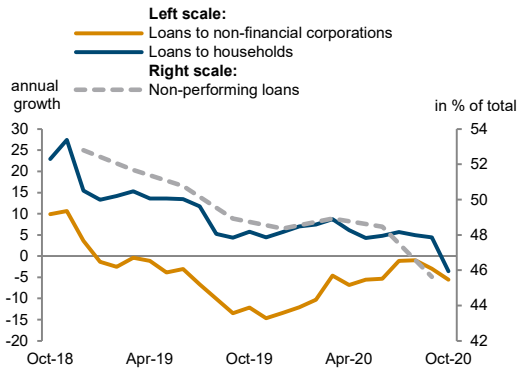
Unit labour costs in industry
annual growth rate in %



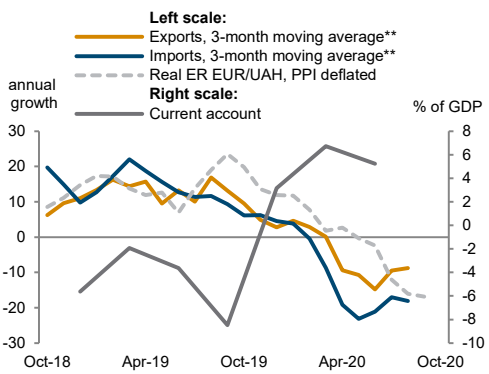
Inflation and policy rate
in %



Financial indicators
in %



External sector development
in %



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multi-country articles and statistical overviews

Economics editor: Vasily Astrov

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Offenlegung nach § 25 Mediengesetz: Medieninhaber (Verleger): Verein "Wiener Institut für Internationale Wirtschaftsvergleiche", A 1060 Wien, Rahlgasse 3. Vereinszweck: Analyse der wirtschaftlichen Entwicklung der zentral- und osteuropäischen Länder sowie anderer Transformationswirtschaften sowohl mittels empirischer als auch theoretischer Studien und ihre Veröffentlichung; Erbringung von Beratungsleistungen für Regierungs- und Verwaltungsstellen, Firmen und Institutionen.

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