

Global Economic Outlook

December 2022



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Cut-off date for data

9 December 2022

CF survey date

5 December 2022

GEO publication date

16 December 2022

Notes to charts

ECB, Fed, BoE and BoJ: midpoint of the range of forecasts.

The arrows in the GDP and inflation outlooks indicate the direction of revisions compared to the last GEO. If no arrow is shown, no new forecast is available. Asterisks indicate first published forecasts for given year. Historical data are taken from CF, with exception of MT and LU, for which they come from EIU.

Leading indicators are taken from Bloomberg and Refinitiv Datastream.

Forecasts for EURIBOR and LIBOR rates are based on implied rates from interbank market yield curve (FRA rates are used from 4M to 15M and adjusted IRS rates for longer horizons). Forecasts for German and US government bond yields (10Y Bund and 10Y Treasury) are taken from CF.

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I. Introduction

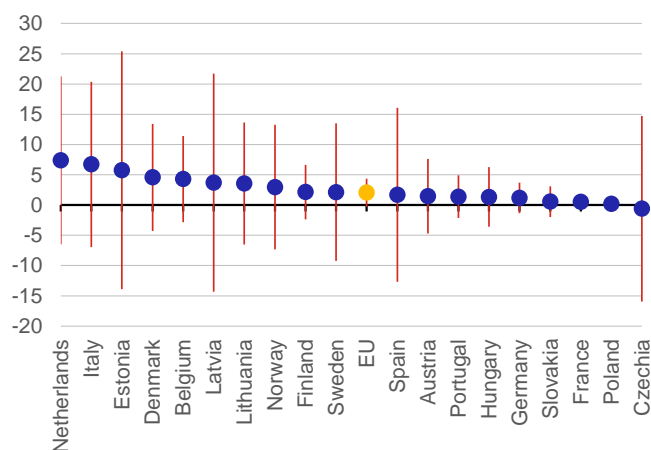
The “war year 2022” is coming to an end but Russian aggression in Ukraine unfortunately not ☹️. With the end of the year approaching, it’s a time to take stock of past economic developments and look to the future. Until 2022, 24 February went down in history as an event affecting each of us – the date in 1582 when Pope Gregory XIII introduced the Gregorian calendar. Unfortunately, from next year, our memories of this day will be the utterly pointless war started by Russia and the needless loss of tens of thousands of lives, not to mention the huge material damage. 2022 was also the year of an energy shock (which led, among other things, to further unprecedentedly high fiscal costs), a year of a long-unseen surge in inflation (accompanied by the delayed response of key central banks), but also one of extraordinary international solidarity.

The key central banks kept tightening monetary policy, albeit at a slower pace than expected just a few weeks ago. The Fed, the ECB and the BoE all raised their monetary policy rates by the expected 0.5 pp at their last meetings of the year. The Fed’s hawkish policy in particular is beginning to yield tangible results, as inflation in the USA has started to go down visibly – of the major central banks, the Fed set its interest rates at the highest levels. Consumer price inflation in the euro area also fell slightly. However, it would probably be premature to claim that euro area inflation has already peaked. The slower-than-expected inflation and other macroeconomic contexts are reducing pressures for aggressive interest rate increases in many countries.

The chart in the current issue focuses on what has undoubtedly been the most important topic in recent months, the general increase in energy prices, especially in Europe. Despite efforts to reach a consensus on the old continent on how to ease the burden for consumers, the impact of the present situation on family budgets differs greatly across countries. The chart also shows that the price shocks have been very strong. In the last two years, electricity prices throughout the EU have increased by 2% on average month on month. They have risen the fastest in the Netherlands, while remaining unchanged in Malta. However, the impacts on the household purse and company accounts can be expected to intensify further next year. Price caps are not the norm everywhere.

The current issue also features an analysis: “Fuel in Europe – what is the data on consumption telling us?” The article analyses the situation on the European market in the historical context and using the available economic knowledge. This year, in addition to high fuel costs, the European market has been hit by strong growth in electricity and natural gas prices, which has required a response from politicians and created additional costs for public budgets.

Consumer electricity prices in selected European countries in the last two years. Month-on-month percentage changes.



Source: Eurostat, CNB calculations
 Note: The vertical red lines indicate standard deviations. The calculation uses monthly data on changes in the components of the harmonised index of consumer prices for the “electricity” component. It is thus also affected by non-market price adjustments by individual governments.

GEO Barometr of for selected countries

		EA	DE	US	UK	JP	CN	RU
GDP (%)	2022	3.2 ➡	1.7 ↗	1.9 ↗	4.4 ↗	1.5 ➡	3.1 ↘	-4.2 ↘
	2023	-0.1 ➡	-0.7 ↗	0.2 ➡	-1.0 ↘	1.3 ↘	4.5 ➡	-3.0 ↗
Inflation (%)	2022	8.5 ➡	8.3 ↗	8.1 ➡	9.0 ↗	2.4 ↗	2.1 ↘	12.7 ↘
	2023	6.3 ↗	7.0 ↗	4.1 ➡	7.3 ↗	1.8 ↗	2.4 ➡	6.1 ➡
Unemployment (%)	2022	6.7 ↘	5.3 ➡	3.7 ➡	3.8 ↗	2.6 ➡	3.6 ↗	4.0 ↘
	2023	7.2 ➡	5.6 ➡	4.4 ➡	3.8 ↗	2.5 ➡	3.5 ➡	4.2 ↘
Exchange rate (against USD)	2022	1.06 ↗	1.06 ↗		1.21 ↗	132.8 ↘	6.96 ↘	62.7 ↘
	2023	1.08 ↗	1.08 ↗		1.24 ↗	126.8 ↘	7.02 ↘	73.3 ↘

Source: Consensus Forecasts (CF)

Note: The arrows indicate the direction of the revisions compared with the last GEO.

II.1 Euro area

The euro area economy grew by 0.3% quarter on quarter in 2022 Q3, 0.1 pp higher than the initial estimate. The highest GDP growth was recorded in Ireland (2.3%) and the largest decline in Estonia (-1.8%). Annual GDP growth slowed markedly to 2.3% in Q3 from 4.2% in the previous quarter. Subdued demand is slowing economic activity, with the energy crisis still having an unfavourable effect despite a drop in energy consumption thanks to a mild autumn. The economy is expected to go into a recession this winter. Employment rose by 0.3% quarter on quarter, the same pace as in the previous quarter, but the number of hours worked dropped by 0.1% in Q3. Retail sales recorded the largest month-on-month drop this year (of 1.8% in October), adding to the signs of an impending recession. The composite PMI confirmed the fifth consecutive monthly decrease in private sector activity in November, although the pace of decline slowed for the first time in this series (from 47.3 to 47.8). In addition to the slower decline in manufacturing, the decline in services picked up pace. Business confidence improved slightly but remained weak.

Inflation slowed year on year for the first time in 17 months in November, even more than expected in the surveys.

The slowdown in inflation to 10% from the record 10.6% in October was due mainly to slower growth in prices of energy (34.9% as against 41.5% in October) and services. Inflation fell in 14 of the 19 euro area countries. However, inflation in the euro area remains well above the ECB's 2% target. The lowest inflation was recorded by France (7.1%) and the highest by Latvia (21.7%). Core inflation was unchanged at 5%. The slower inflation and the drop in sales are reducing the pressure to aggressively raise interest rates. However, President Christine Lagarde said that there is still a long road ahead to low inflation and that the ECB needs to tighten further.

The GDP growth outlook in the new OECD forecast improved slightly for this year (3.3%) and the next (0.5%), while CF continues to forecast an economic decline in 2023 (-0.1%). The expected inflation for next year has shifted higher. However, it should drop to 6% in 2023 compared to inflation of more than 8% projected for this year.



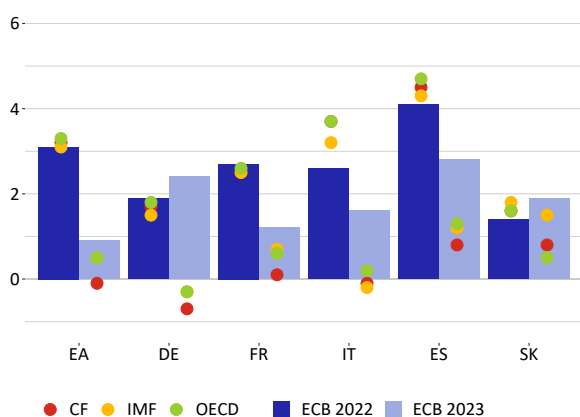
II.2 Germany

The latest data from Germany give hope of a light at the end of the tunnel. According to the final data, German economic growth was even slightly higher than implied by preliminary estimates. GDP grew by 1.3% year on year and 0.4% quarter on quarter. Therefore, earlier concerns of a recession before the year-end thus did not materialise. A detailed breakdown shows that the economy was driven by German household spending. By contrast, government consumption did not contribute to the surprising growth. The negative contribution of net exports fell sharply in the summer thanks to an improvement in the supply chain situation. As regards sectors, the economic expansion was fuelled mainly by services.

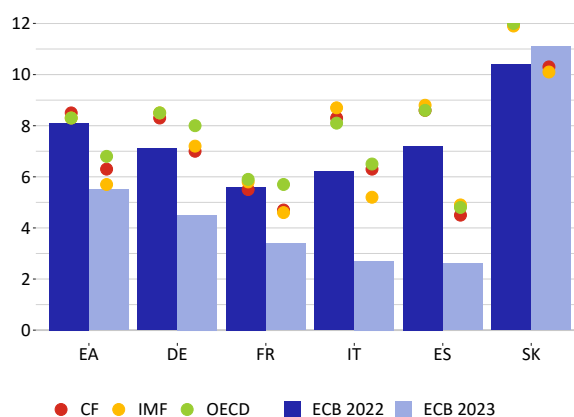
The outlooks for economic activity are up slightly for both 2022 (1.7%) and 2023 (-0.7%). However, they suggest that Germany is unlikely to avoid a year-on-year decline. Industrial production fell slightly in October. Retail sales also dropped. The composite PMI has been in the contraction band for five consecutive months. A combination of adverse factors – high energy costs, their spillover into headline inflation, the uncertain economic outlook and lower external demand (mainly from Asia and the rest of Europe) is taking its toll. However, there are still reasons for cautious optimism. The PMI in manufacturing and the overall PMI grew slightly in October. Sentiment indicators also suggest a turning point. The ZEW index rose markedly in November. The Ifo index also improved (mainly thanks to assessments of future developments). Consumer confidence measured by GfK is rising too. All the indicators remain below the long-term averages but imply a symbolic rebound.

One of the reasons for cautious optimism is slower inflation. According to preliminary data, inflation fell marginally to 11.3% in November. In month-on-month terms, consumer price growth halted. Industrial producer prices had already started to fall in October. Optimism linked with the long-awaited peak of inflation pressures is reducing government bond yields. Despite this, inflation outlooks have shifted slightly upwards (to 8.3% this year and 7% next year) since the last issue, as it appears that a more marked fall in the HICP cannot be expected until the spring of next year.

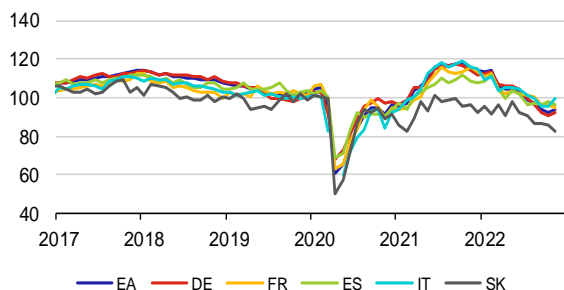
GDP growth in selected euro area countries in 2022 and 2023, %



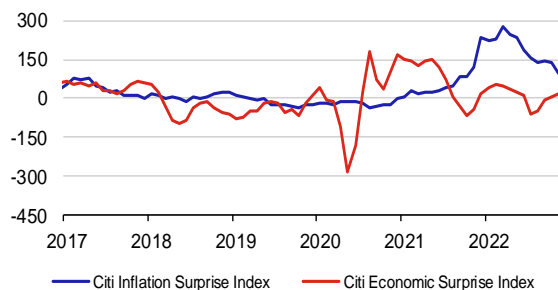
Inflation in selected euro area countries in 2022 and 2023, %



ESI leading indicators



Economic and inflation surprises in the euro area, %



Inflation expectations based on 5year inflation swap and SPF

	EA	DE	FR	ES	IT	SK	5y5y	SPF	
9/22	93.7	92.2	96.2	96.7	96.0	86.7	10/22	2.27	2.18
10/22	92.7	91.1	96.2	98.1	95.2	85.8	11/22	2.33	2.18
11/22	93.7	92.2	94.6	96.4	99.3	82.9	12/22	2.37	2.18

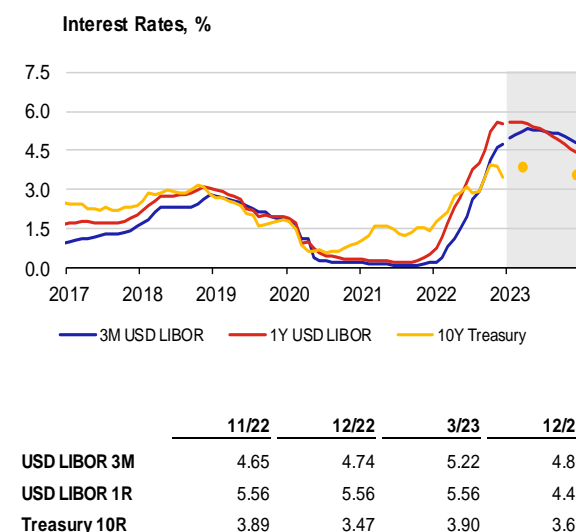
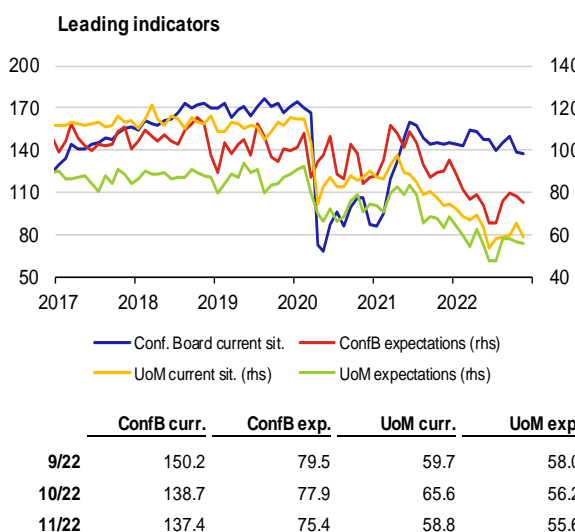
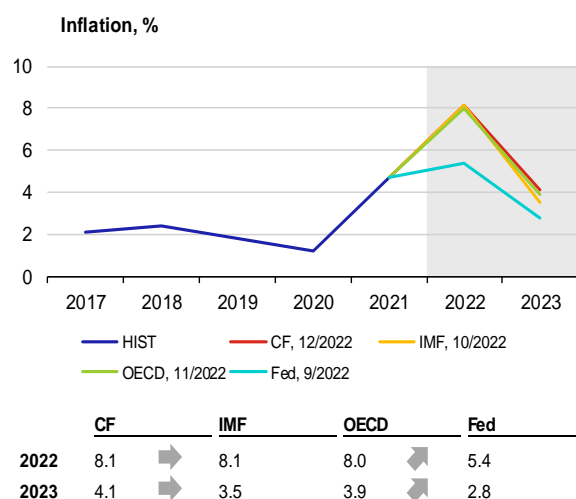
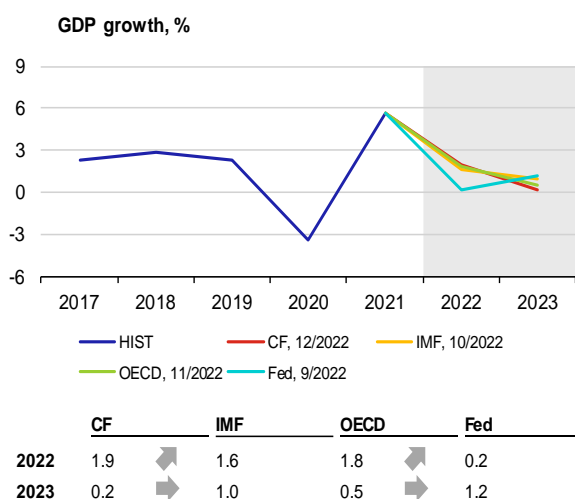
II.3 United States

The outlook for the US economy has shifted higher at the end of the year. A survey of analysts has shown that the recession expected next year will only be mild and short-lived. The new CF outlook expects GDP to grow by 1.9% in 2022 and just 0.2% in 2023. The first economic growth estimate for 2024 is 1.2%.

Inflation and its expected rates are the main source of financial market volatility. Annual inflation was lower than expected at 7.8% (core inflation at 6.3%) in November, which came as a surprise. Annual inflation is driven not just by energy prices (17.6%), but above all by accelerating growth of prices of services (6.7%) and food (10.9%). Industrial producer price inflation is gradually slowing (8.0% year on year in November), due also to falling sea transport prices which are returning to pre-pandemic levels.

Rates are expected to go up again at the Fed’s monetary policy meeting in December, this time by 0.5 pp. US Fed Chairman Jerome Powell is now faced with a very difficult task. The central bank needs to slow consumer price inflation and cool the labour market. Inflation figures were a downward surprise. As a result, the market expects a shorter period of high rates and a lower rate target. The dollar depreciated considerably in the second half of November, due mainly to these developments. On the other hand, the labour market is not cooling – non-farm payrolls rose by 263,000 in November (as against an expected 200,000), while the October figures were revised upwards. New jobs are being created mainly in services, while employment in retail, for example, is falling.

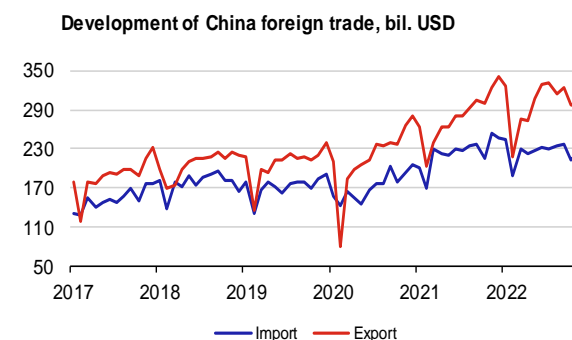
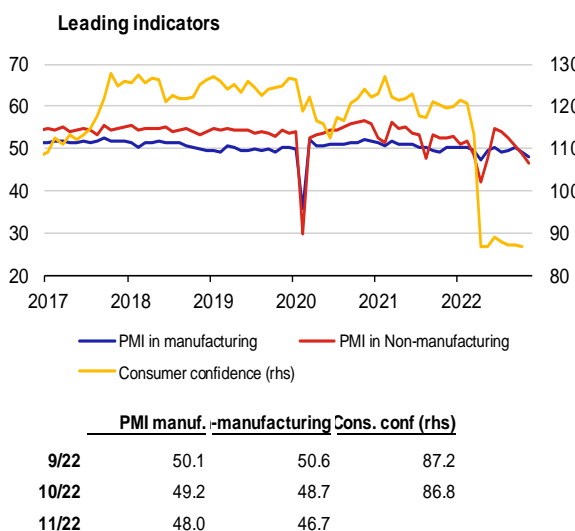
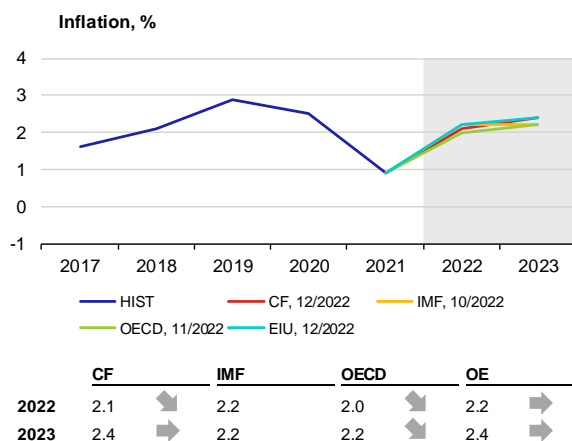
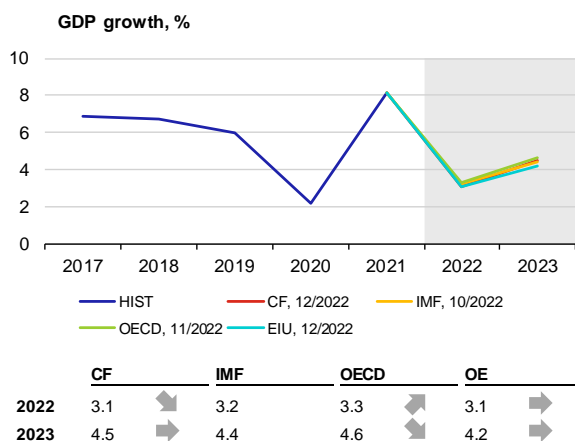
Forward-looking indicators fell in November. The PMI in manufacturing slid into the contraction band for the first time since June 2020. This was due mainly to a drop in new orders and a decline in production. Exports also decreased. Sentiment is affected mainly by uncertainty about consumer behaviour and future price developments.



II.4 China

The November leading indicators suggest a weaker performance of the Chinese economy in Q4, mainly as a result of subdued domestic demand. This reflects the rapid spread of Covid-19, to which the Chinese government has again responded with strict measures negatively affecting household consumption, industrial production and trade through lockdowns and restricted mobility. The PMI in manufacturing thus remained in the contraction band in November, as confirmed by the Caixin index. The PMI and Caixin in the non-manufacturing sector fell sharply to a seven-month low. A sharp drop in consumer expenditure was also confirmed by retail sales, which unexpectedly fell by 0.5% year on year in October. They will probably record an even greater decline in November. Moreover, the growth prospects for the Chinese economy are subject to external risks, especially weakening demand from the USA and Europe. This was reflected in a marked year-on-year decline in Chinese exports of 8.7% in November, the worst result since February 2020. According to the CF analysts' December outlook, the Chinese economy will grow by 3.1% year on year this year, well below the Chinese government's target of 5.5%. The target will not be reached in 2023 either, as GDP is expected to increase by just 4.5% next year.

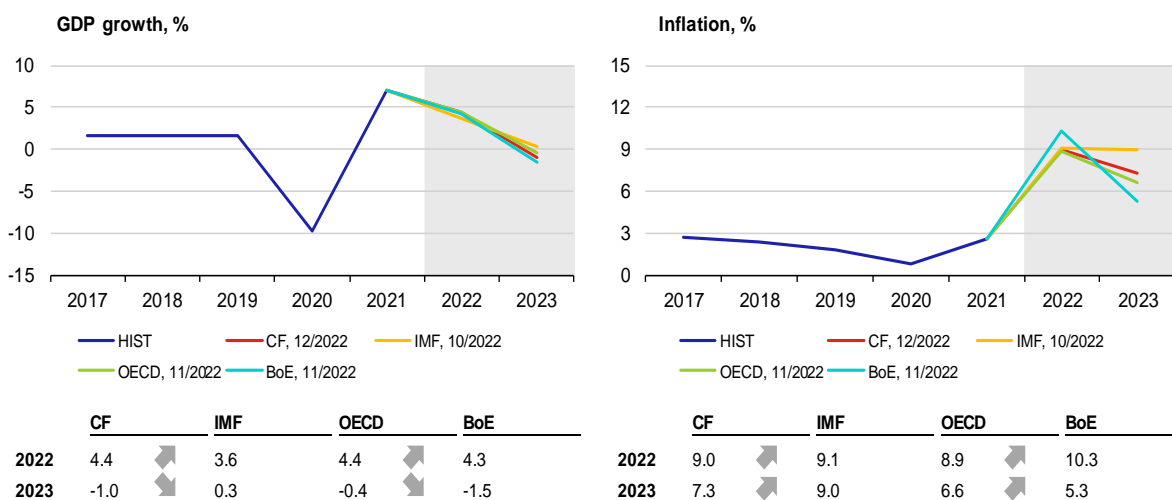
Inflation remained subdued in November, as consumer price inflation further slowed to 1.6% year on year and industrial producer prices dropped by 1.3%, as in the previous month. The lower inflation reflects weak domestic demand, hit hard by strict anti-epidemic measures. Consumer prices were also affected by slower growth in food prices, especially pork prices. Core inflation adjusted for energy and food prices grew by just 0.6% year on year in November. According to the CF outlook, consumer prices will rise by 2.1% this year, picking up to 2.4% next year. The continued producer price deflation most strongly reflected a drop in prices in the steel industry. On the other hand, slower inflation is creating room for expansionary fiscal and monetary policy that would support economic growth.



Source: Bloomberg

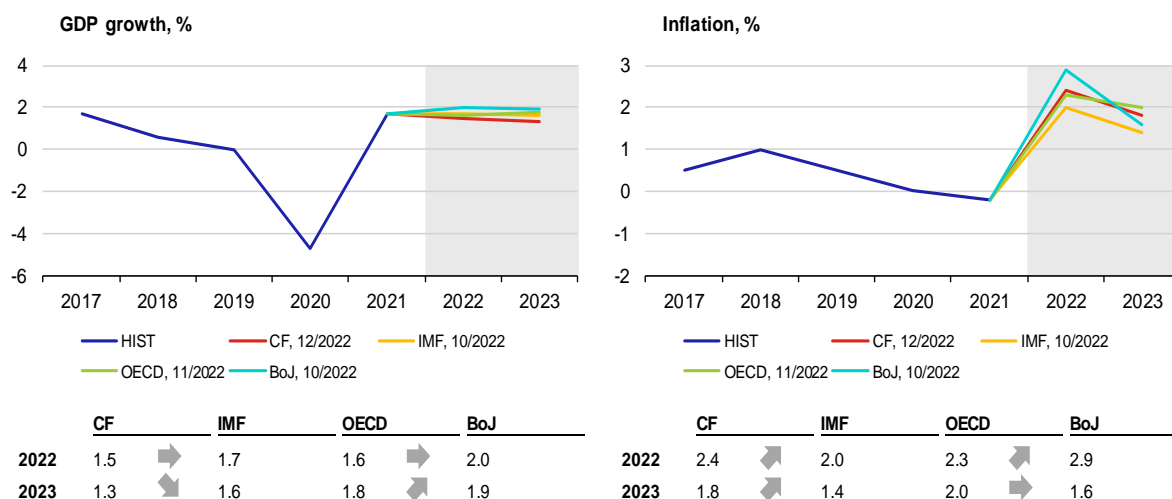
II.5 United Kingdom

Inflation was at a 41-year high in October, having picked up to 11.1% yoy (from 10.1% in September), which continues to put pressure on the BoE and the government. Food and energy prices particular rose, despite the government’s energy price guarantee. Core inflation in October remained the same as a month earlier (6.5%). In his autumn statement, the new Chancellor of the Exchequer Jeremy Hunt announced an increase in taxes and a reduction in public expenditure of GBP 55 billion to fight inflation and stabilise public finance. On this occasion, financial markets have largely embraced the new government’s plan, although several measures are being postponed until after the expected parliamentary elections in 2024. Moreover, the UK has entered a recession and the prospects are bleak. CF and the OECD presented a more pessimistic forecast of GDP decline for next year (-1.0% and -0.4% respectively). The composite PMI indicator remains in the contraction band, having stagnated in November (48.2). Business confidence remains low amid widespread concerns about the outlook for the domestic economy, higher borrowing costs and a reduction in unnecessary expenditure.



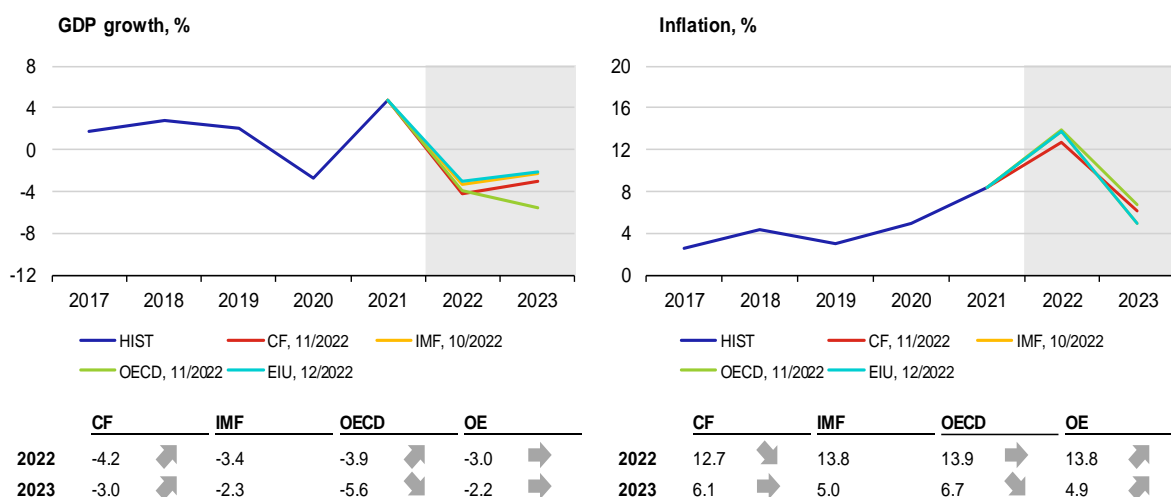
II.6 Japan

Under pressure from expensive imports, Japan’s GDP saw a surprise drop in Q3. The q-o-q economic decline of 0.2% was due mainly to a sharp fall in net exports. Although exports grew, the growth rate of imports was more than double. In addition to high energy prices, the weak yen was also a contributory factor. However, the currency bottomed out in late October, appreciating against the dollar by around 10% in November. This was due largely to new US macroeconomic data which convinced investors that the Fed would soon ease the pace of monetary tightening. Inbound tourism has been gradually recovering in Japan following a ban on entry during the Covid pandemic, but the number of tourists is still only about one-fifth of the 2019 figure. Consumer inflation, while still considerably lower than in other advanced countries, was at a 40-year high of 3.7% in October. Core inflation also rose from 1.8% in September to 2.5% in October.



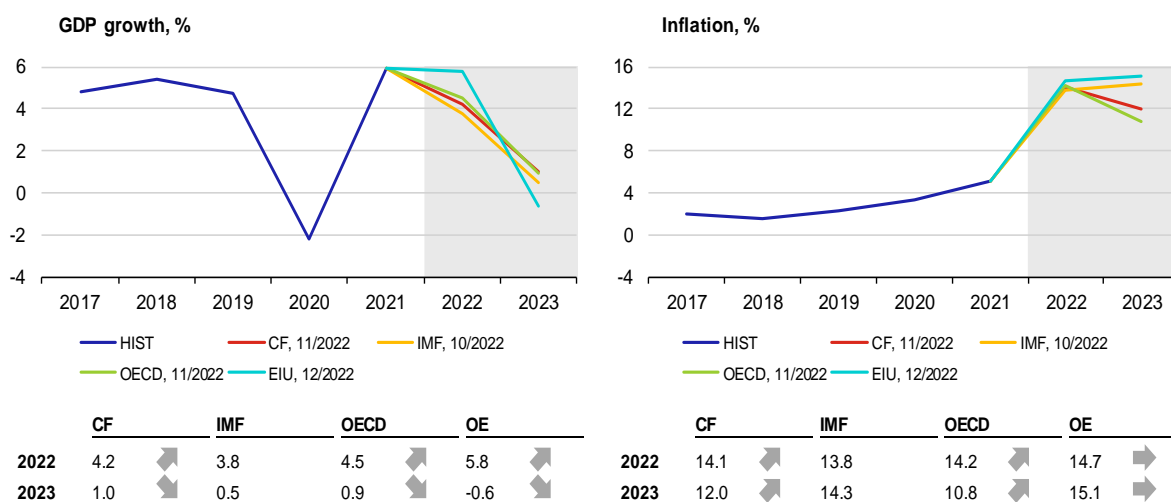
II.7 Russia

The drop in GDP slowed to 4.0% year on year in Q3. In Q2, the decline in economic activity was 0.1 pp larger and probably the largest in 2022 as a whole. Leading indicators suggest a slight recovery towards the year end. The November PMI in manufacturing rose to 53.2 points, among other things due to growth in new orders, and the PMI in services improved by 4.6 points (to 48.3). The decline in industrial production fell to 2.6% in October, while the drop in retail sales remained broadly at the previous month's level. However, substantial differences can be expected in the individual sectors. According to the AEB, sales of new cars fell by 61.6% year on year in November, with sales of Škoda cars dropping by 90%. The cap on prices of seaborne Russian oil (effective from 6 December) may adversely affect the economy and make Russia redirect its trade flows from Europe to Asia.



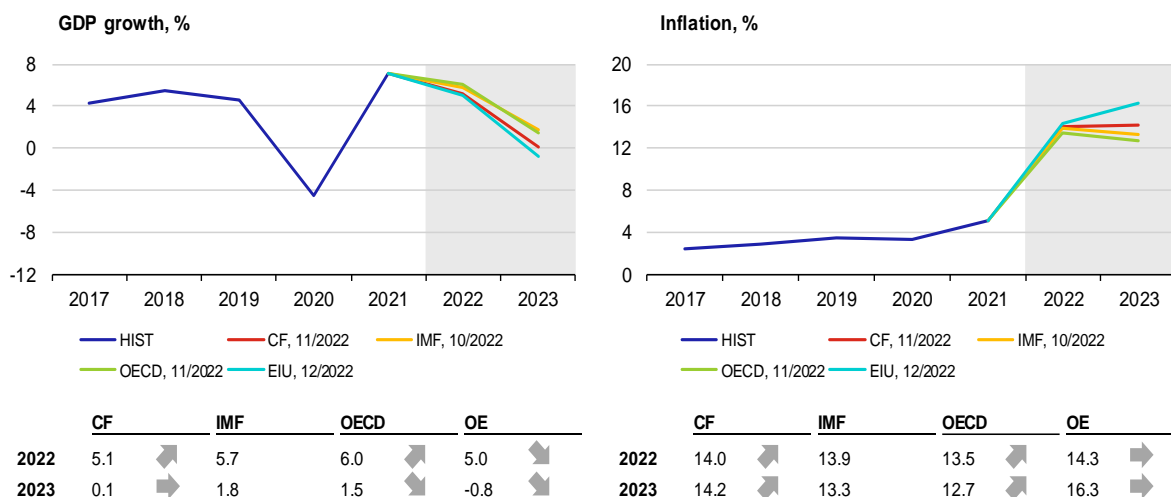
II.8 Poland

The Polish economy returned to growth, thus avoiding a technical recession. In Q3, GDP grew by 1% quarter on quarter. This confirmed that the decline in Q2 was mainly a correction of the surge in growth at the start of the year. Economic growth slowed to 3.6% year on year, due mainly to a decline in growth in household consumption. On the other hand, external demand made a positive contribution to economic growth as Polish exports grew faster than imports. The economic growth outlooks for this year and the next remain broadly unchanged (the surveys were conducted prior to the publication of GDP for Q3). Only weak growth or stagnation is expected in 2023; CF analysts expect a return to around 3% growth in 2024. Inflation slowed slightly to 17.4% in November (preliminary data) as the rise in fuel prices eased. But it will decline only slowly. It will remain in double figures next year and, according to CF, drop towards 6% in 2024. The Polish central bank left the key interest rate unchanged at 6.75% at its December meeting.



II.9 Hungary

Hungary's GDP declined in Q3. Its economic performance decreased by 0.4%, while annual growth slowed to 4%. This is due mainly to a sizeable fall in growth in the services sector and a deepening decline in agricultural performance. Conversely, industrial output continued to show solid annual growth. A similar trend continued into October. The outlooks by the monitored institutions expect GDP to grow by 5–6% this year and to remain flat in 2023. In 2024, CF expects a return to growth (of 3%). The MNB left the rates unchanged at 13% at its November meeting, in line with general expectations. Inflation picked up further to 22.5% (core inflation to 24%) in November, rising by a still high 1.8% in month-on-month terms. After the lifting of Hungary's cap on fuel prices after more than a year on 6 December, inflation will accelerate even further. The analysts have been expecting for some time that the decline will only be a very gradual one. It will be around 15% next year. CF expects it to drop below 5% in 2024.

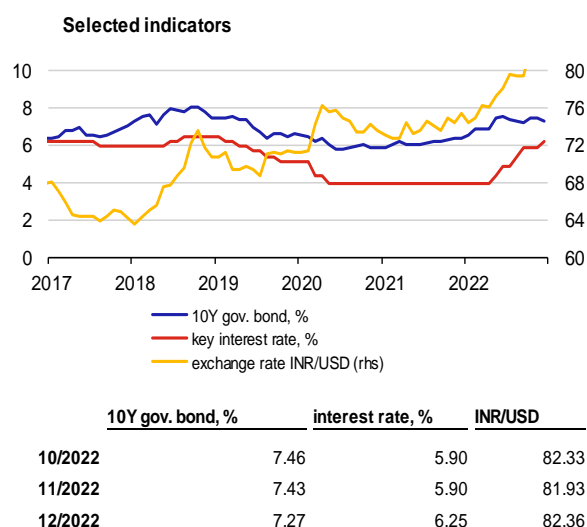
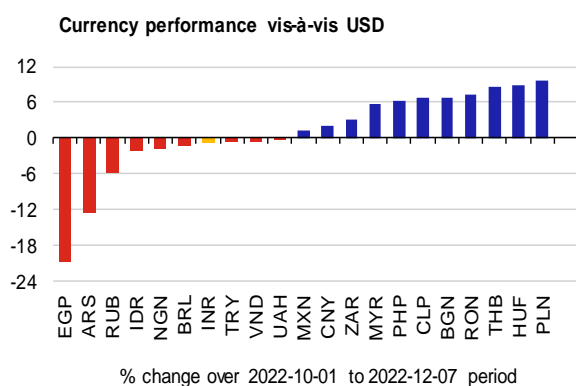
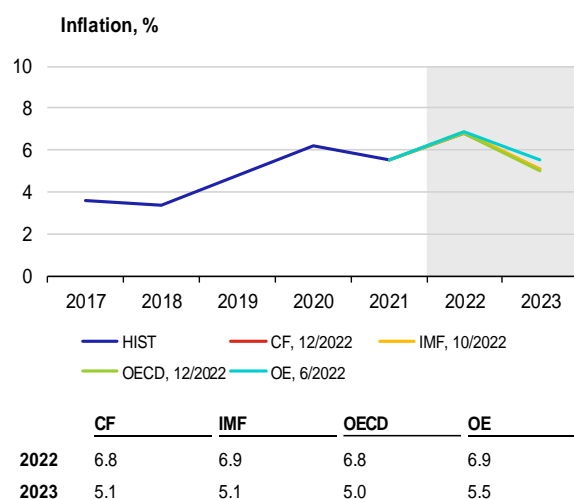
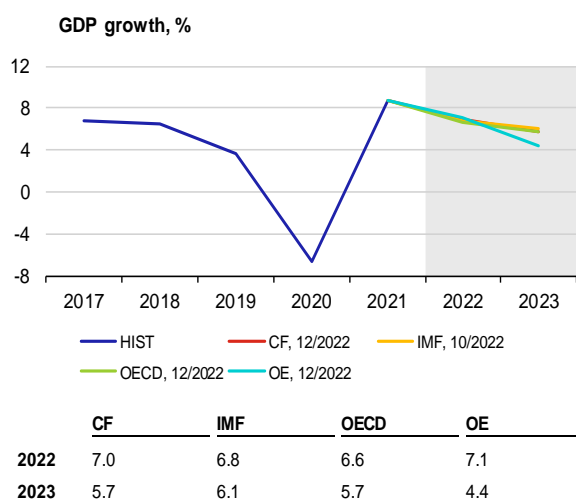


II.10 Countries in the spotlight – India

India was the fastest-growing G20 economy last year and is likely to remain the driver of growth this year and the next. The country has recently replaced the United Kingdom as the fifth largest global economy. According to some estimates, it may move up to third position within a decade. The robust growth is also reflected on the stock markets where Indian stocks have not only outperformed most indices of developing economies over the past decade, but also recorded growth in 2022 when securities' prices fell across countries and asset classes. India, with its policy of neutrality, is one of a small group of economies which stand to benefit the most from the ongoing global geopolitical disintegration. For example, it will profit from “friend-shoring”, a phenomenon where Western countries shift production to friendly countries. Many producers have moved capacity to India this year already, most often at the expense of China (including, for example, part of iPhone production).

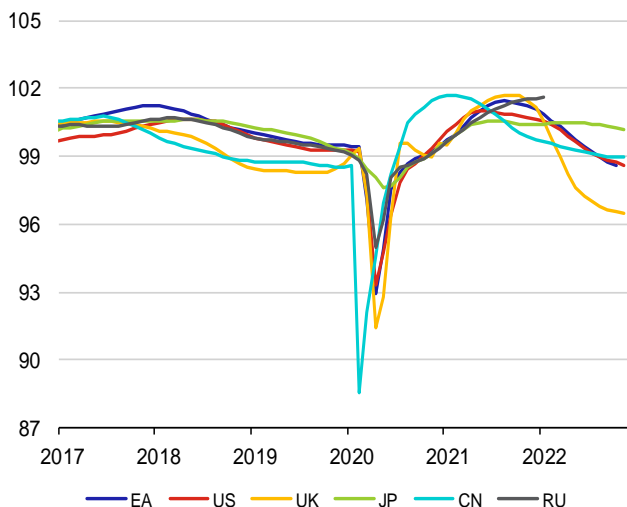
India's economy will be boosted by cheap imports of sanctioned Russian commodities, such as oil, coal and fertilisers. After the Russian invasion of Ukraine and the fall in demand for Russian oil in the West, it is almost one-third below the price of Brent oil. India therefore increased its imports of Russian oil more than tenfold and, according to some estimates, Russia became the largest supplier of oil to India in autumn, ahead of Iraq and Saudi Arabia. The recent cap on the price of Russian oil by the G7 and the ban on the import of Russian oil by tankers into the EU will boost further the bargaining position of Russian oil-importing countries. This is also why the USA explicitly supported India in its purchases of Russian oil at the lowest possible price. Western countries no longer see Asian imports from Russia as an act of undermining sanctions but as a way of maintaining the global oil supply while paying the lowest possible price to Russia. The diplomatic recovery between India and the West was also supported by Prime Minister Modi in September when he voiced concerns about the Russian war for the first time. India has also decided to redirect purchases of part of its arms industry from Russia to the West.

Thanks to the almost USD 40 billion in central bank interventions and several rate increases, the exchange rate of the rupee has weakened much less against the dollar this year than the currencies of other economies in the region, including South Korea, Japan, Australia and New Zealand.

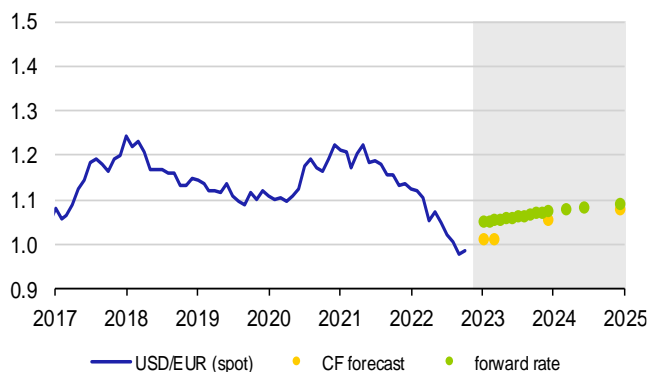


III. Leading indicators and outlook of exchange rates

OECD Composite Leading Indicator

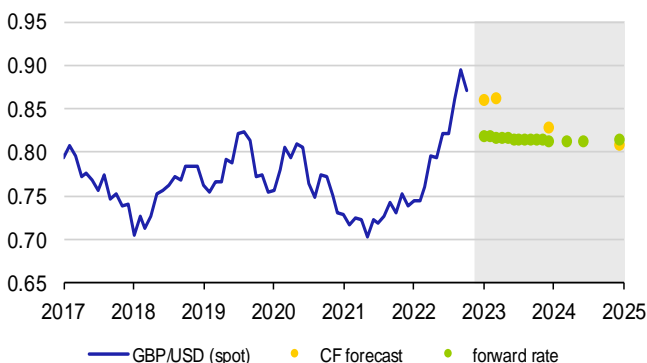


The US dollar (USD/EUR)



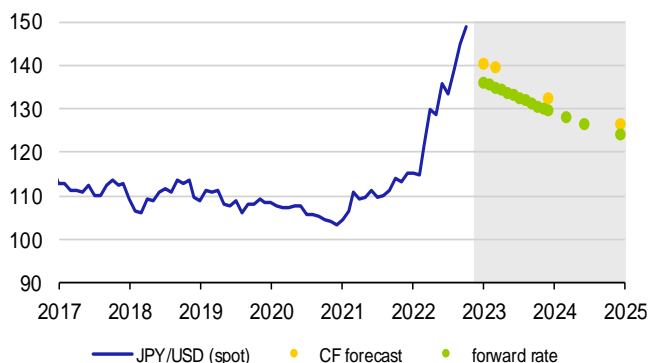
	5/12/22	1/23	3/23	12/23	12/24
spot rate	1.053				
CF forecast		1.014	1.014	1.057	1.083
forward rate		1.052	1.056	1.076	1.092

The British pound (GBP/USD)



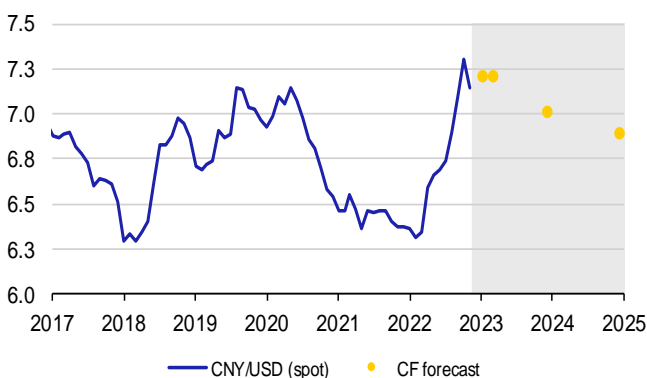
	5/12/22	1/23	3/23	12/23	12/24
spot rate	0.818				
CF forecast		0.861	0.864	0.830	0.810
forward rate		0.819	0.818	0.815	0.815

The Japanese yen (JPY/USD)



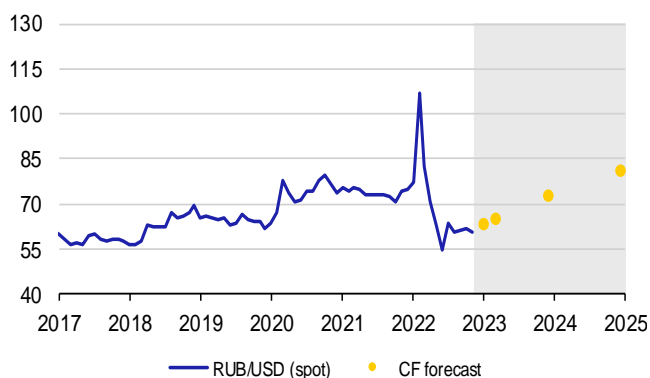
	5/12/22	1/23	3/23	12/23	12/24
spot rate	136.3				
CF forecast		140.4	139.6	132.8	126.8
forward rate		136.1	135.1	129.8	124.2

The Chinese renminbi (CNY/USD)



	5/12/22	1/23	3/23	12/23	12/24
spot rate	6.958				
CF forecast		7.212	7.214	7.021	6.894

The Russian rouble (RUB/USD)



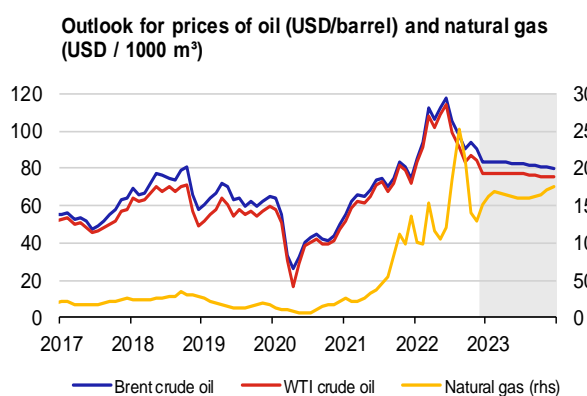
	5/12/22	1/23	3/23	12/23	12/24
spot rate	62.73				
CF forecast		63.75	65.55	73.34	81.60

Note: Exchange rates as of last day of month. Forward rate does not represent outlook; it is based on covered interest parity, i.e. currency of country with higher interest rate is depreciating. Forward rate represents current (as of cut-off date) possibility of hedging future exchange rate.

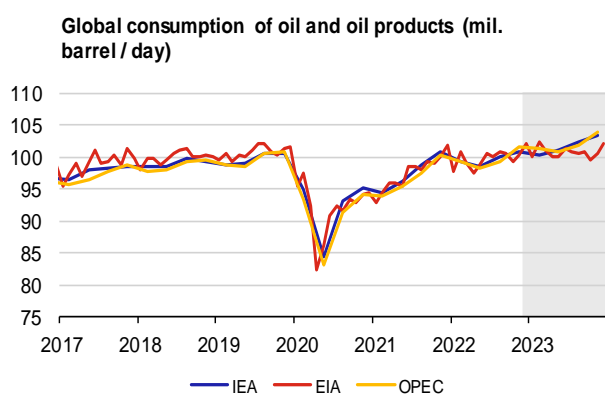
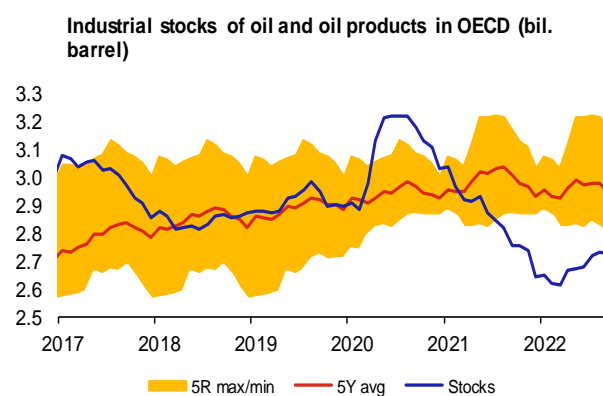
IV.1 Oil

The oil market came under pressure again in November due to the deteriorating global economic outlook. The Brent price fell from almost USD 100/bbl at the start of the month to below USD 80/bbl in December. Oil prices have shown a strong downward trend since early November although several factors should have acted in the opposite direction, e.g. increasing uncertainty regarding the supply of Russian oil with the approaching total ban on its seaborne imports to the EU, (later materialised) speculation on a possible easing of anti-epidemic measures in China, weakening sales of oil from strategic reserves in the USA and a depreciating dollar. The drop in oil prices halted temporarily in late November as some traders had expected OPEC+ to reduce further extraction quotas in response to price developments. As this did not happen in early December, the Brent price continued its free fall, dropping before mid-December to the lowest level since the start of 2022 (USD 76/bbl). The market remains pessimistic regarding the outlook for global economic growth and a fast recovery in China. Moreover, investors are reducing their open positions before the end of 2022 and poor liquidity in the market is intensifying oil price volatility. The resulting uncertainty is further weakening interest in investment in risky assets.

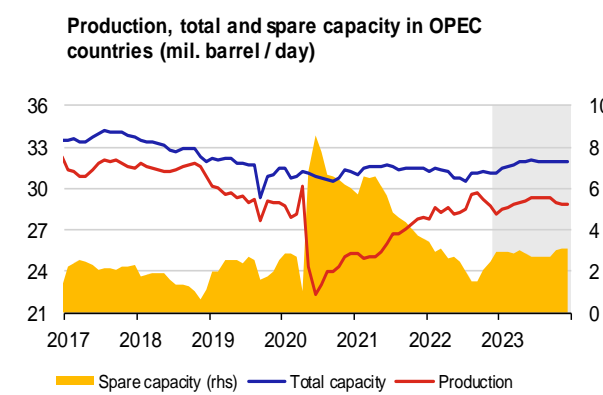
The market curve from the start of December continues to fall. It has shifted only slightly lower compared to the previous forecast, signalling the Brent oil price at USD 80 and 77/bbl at the end of 2023 and 2024 respectively. The EIA has revised the outlook for the Brent price downwards for 2023 (by around USD 3). The agency expects global oil inventories to decline slightly in the first half of 2023 (by 0.2 million barrels a day), which will lead to a rise in the Brent price to USD 94/bbl. Later, however, an oil glut will prevail on the market (around 0.7 million barrels a day) and the price will drop slightly to USD 93/bbl at the end of 2023. The December CF forecast of USD 86.4/bbl in late 2023 is roughly in the middle of the above figures.



	Brent		WTI		Natural gas
2022	99.06	↘	94.29	↘	1469.65 ↗
2023	82.14	↘	76.71	↘	1650.30 ↘



	IEA	EIA	OPEC
2022	99.69 ↗	99.83 ↘	99.67 ↗
2023	101.80 ↗	100.83 ↘	102.02 ↗



	Production	Total capacity	Spare capacity
2022	28.62 ↗	31.08 ↗	2.46 ↗
2023	28.99 ↗	31.88 ↗	2.88 ↗

Source: Bloomberg, IEA, EIA, OPEC, CNB calculation

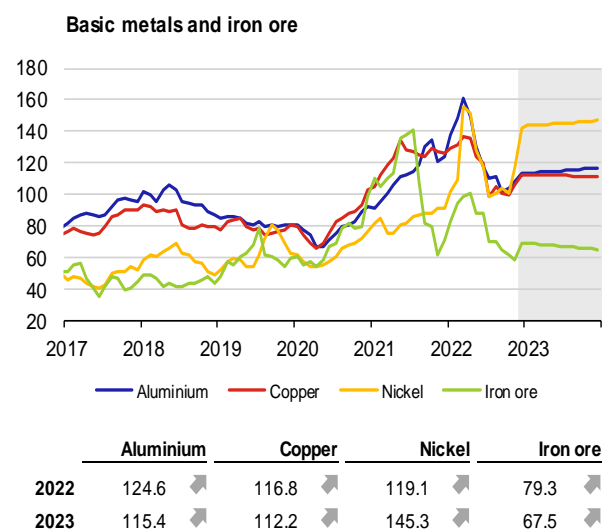
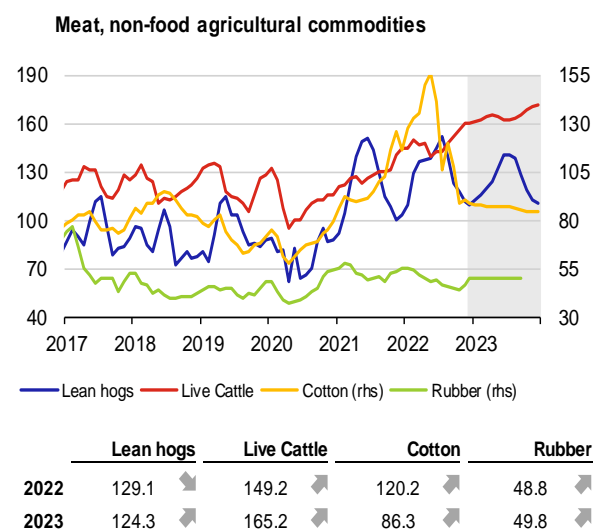
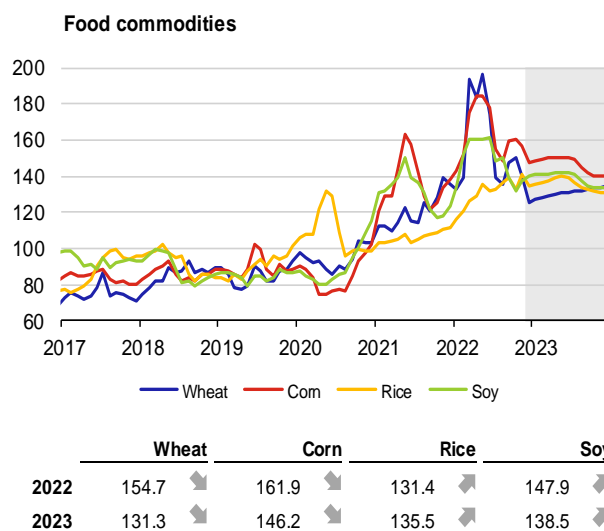
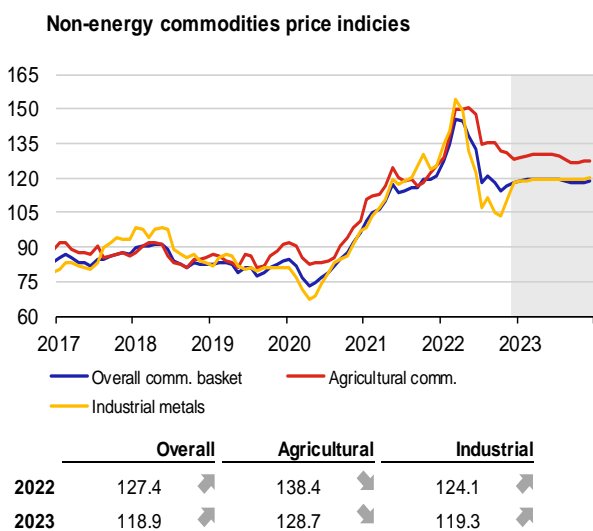
Note: Oil price at ICE, average natural gas price in Europe – World Bank data. Future oil and gas prices (grey area) are derived from futures. Industrial oil stocks in OECD countries – IEA estimate. Production and extraction capacity of OPEC – EIA estimate.

IV.2 Other commodities

The surplus of natural gas, which strongly pushed down its spot prices in Europe in October, has been exhausted and prices have been rising since November. Inventories in European storages peaked around mid-November, which was about 14 days later than usual due to favourable weather conditions. However, the decline in inventories has been picking up since then as the weather becomes gradually cooler, pushing the natural gas price in Europe up again. It stood close to EUR 150/MWh in early December and is expected to stay at this level or slightly higher until the end of next winter. The coal price shows similar developments, having surged in mid-November and fully offsetting the previous sharp fall. This was due to strong demand from Europe and India, while Australian production was disrupted by adverse weather conditions. Although a slight decline is expected during next year, the price of coal should remain historically high in the years ahead.

Following stagnation in November, the food commodity price index edged down again in December to the lowest level this year. This was largely attributable to the price of wheat, which has been declining since mid-October due to continued exports from Ukraine and high harvests in both the USA and Russia (where record-high levels were recorded). However, another major reduction in the price of wheat is expected after the 2024 harvest. Coffee and pork prices also recorded solid declines. On the other hand, the price of beef remains high.

The industrial metals price index rose in November, accelerating further in the first half of December. Prices across the index are fostered by expectations of higher demand from industry in China following the easing of anti-epidemic restrictions. The copper price is being kept higher due to very low global inventories and weak production in South America. The price of iron ore surged, even though the price of steel is still expecting a stronger rebound in construction in China.



Source: Bloomberg, CNB calculations.

Note: Structure of non-energy commodity price indices corresponds to composition of The Economist commodity indices. Prices of individual commodities are expressed as indices 2010 = 100.

Fuel in Europe – what is the data on consumption telling us?¹

Consumers around the world are feeling the rise in prices in commodity markets, especially in fossil fuels, not only in higher energy prices in their homes, but also in fuel prices at filling stations. According to the available data, consumers are not very sensitive to price when it comes to fuel consumption. At the same time, they spend on average a relatively small proportion of their income on this item. In spring, governments responded to the price increases in an effort to stop this rise and bring down the prices of expensive fuels. Given the situation on the car market and the current trend, it can be argued that fuel consumption, and thus the demand for primary raw materials, will remain at the current levels in the coming years.

Fuel prices

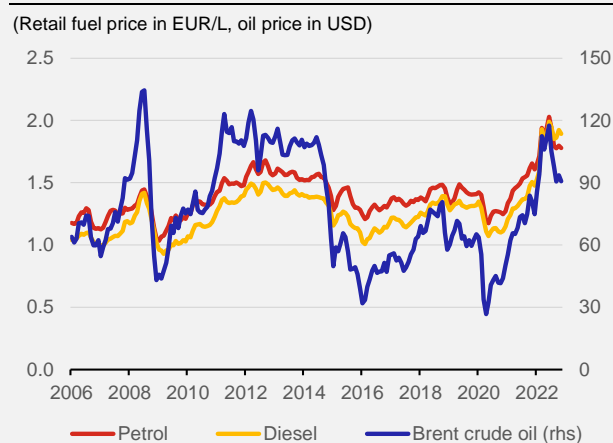
The current path of inflation is closely linked above all to the high growth in energy prices. The war in Ukraine has also caused fuel prices to rise to record highs. Petrol and diesel are petroleum products and therefore their price is derived from the price of the original commodity, i.e. oil.

Price developments may be similar, but the price of oil is much more volatile (see Chart 1). The price of oil is set by the international market situation, but the supply of this commodity is determined mainly by the OPEC+ agreements. Countries in this cartel can use oil production reductions and increases to influence the price of oil. The lower volatility of fuel prices is also due to the price structure, where taxes play a big role. Although it takes some time from the oil-processing stage for the end product to reach the filling stations, there is no time lag in the oil price pass-through to fuel prices. Fuel prices therefore do not necessarily reflect the actual costs of producers. The swift reaction of fuel prices to the market situation could be observed globally even after the start of the war in Ukraine in February 2022, when fuel prices rose very rapidly. The price of diesel is now higher than that of petrol, although this has historically never been the case. Diesel was always cheaper than petrol.

The current elevated petrol and diesel prices are record high, but the situation is not critical in terms of the price level. The historical data shows that petrol prices (the average price in the EU exceeded EUR 2/litre of both petrol and diesel in March 2022) currently exceed the previous highs from the second half of 2012 when the price of petrol attacked EUR 1.7 per litre and the price of oil exceeded EUR 1.5 per litre. In 2011–2014, the high oil prices, and by extension fuel prices, were due to conflicts in oil-producing countries (the war in Libya in 2011 and the sanctions against Iran in 2012). In these years, the oil price fluctuated around USD 110/bbl on average. From this perspective, it is interesting that although oil is currently being traded more cheaply than at that time, fuel prices are about one-quarter higher.

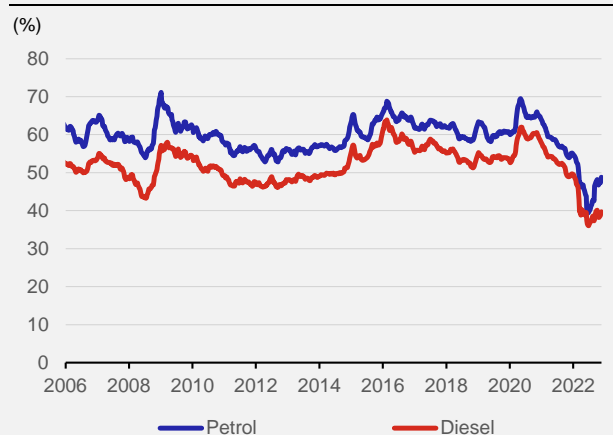
Fuel prices in the vast majority of European countries are mostly determined by taxes. Fuels are not only subject to value added tax, but also to excise duties. If we compare the prices excluding and including taxes, we find that, especially for petrol, the share of taxes in the final price for consumers is roughly one third, while for diesel, taxes account for slightly more than half of the final price. In the situation of high inflation, some European countries cut their taxes on fuels in an effort to reduce their price after the price hike in March 2022. The share of taxes in the price therefore fell to a historical low and there was also a slight price correction. It is important to emphasise that although nominal fuel prices are at all-time highs, if we take into account inflation, wage growth

Chart 1 – Oil and fuel prices in the EU



Source: European Commission, Bloomberg
Note: Average price including taxes – monthly averages.

Chart 2 – Share of taxes in total retail fuel prices



Source: European Commission, author's calculations.
Note: Average prices in Europe, weekly data.

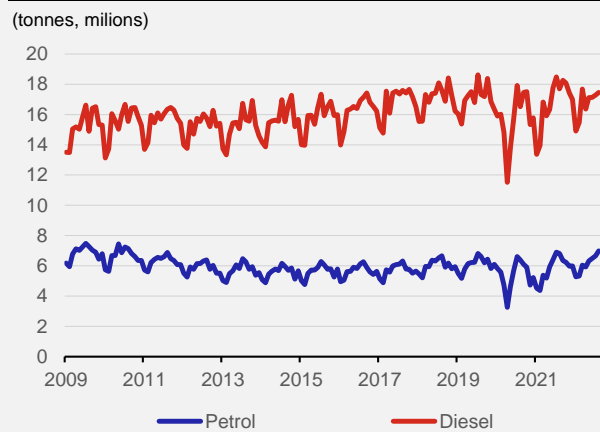
¹ Author: Petr Polák. The views expressed in this article are those of the author and do not necessarily reflect the official position of the Czech National Bank. The author would like to thank Martin Kábrt, Tomáš Adam and Pavla Růžičková for their valuable comments.

and purchasing power, fuel is not at its most expensive level in history. If you look at the EU average, then the price of diesel adjusted for inflation is the highest in the history, but the price of petrol is at the same level as in 2012. Critics of the tax cuts point to the fact that now, at a time when European countries are trying to end their dependence on Russian oil, efforts should also be made to reduce fuel consumption. However, the price cuts are working in precisely the opposite direction.

From the perspective of economic theory, the consumption of standard goods is determined by their price, and this is measured by economists using elasticity. Price elasticity expresses consumer sensitivity to price and indicates

how consumption changes when the price changes. In terms of elasticity, the demand for petrol and diesel is generally considered to be somewhat inelastic, i.e. price changes do not lead to large changes in consumption. In other words, consumers do not look on price as a deal breaker when they are filling up their tanks, nor do they consider how they drive. In the academic world, for example, Brions et al. (2008) confirm that demand is not price sensitive. Based on an analysis of 43 primary studies, which calculated both short- and long-term price elasticity, they concluded that the short-term price elasticity of petrol is -0.34 and the long-term price elasticity is -0.84. Havránek et al. (2011) in their study (which also provides an empirical summary of previously published studies) state that after adjusting for publication bias, short-term price elasticity reaches an average value of only -0.09 and long-term price elasticity -0.31, i.e. a one percent increase in price leads to a short-term decrease in consumption of 0.1%. That means that if prices were currently to increase by about 25%, petrol consumption would fall by 2.3% – a truly negligible decrease. Low price elasticity, and therefore a small consumer reaction to the price, may be due either to the fact that it is impossible to replace fuel or to consumers' reluctance to change their habits. This could be the result of falling real prices, where passenger car transport is still cheap and individuals do not have the incentive to make greater use of public transport.

Chart 3 – Petrol and diesel consumption in EU countries

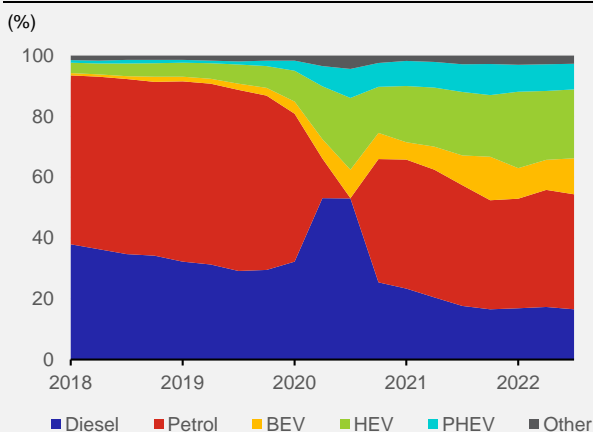


Source: Eurostat
Note: Not seasonally adjusted, last available data for August 2022.

Fuel consumption does not reflect fuel price developments. The low price elasticity is also evident from the almost unchanged consumption (see Chart 3), which does not in any way reflect the price developments (see Chart 1). Seasonality is always regular for both petrol and diesel consumption, with the lowest consumption recorded in January and February, and the highest in July. There has been a moderate long-term increase in diesel consumption, mainly due to developments in international transport. Petrol consumption has decreased slightly in the last 10 years, which is somewhat remarkable considering the growth of passenger car transport in Europe. One possible explanation for this is the impact of emission standards and consumer awareness on consumption. According to the IEA (2021), the average consumption of passenger cars decreased from 7 to 6 litres per 100 km between 2005 and 2019.

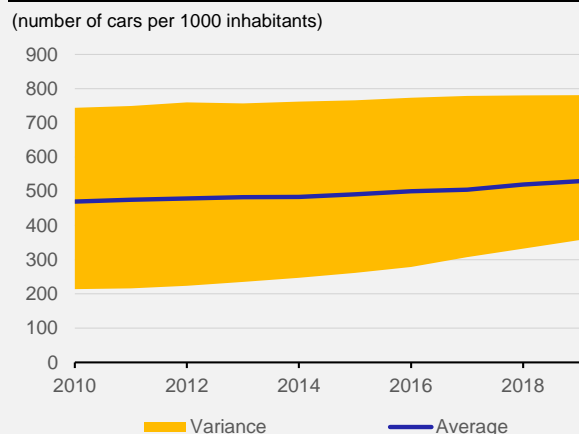
There was a temporary reduction in fuel consumption during the coronavirus pandemic. The biggest drop in petrol and diesel consumption in history was recorded in spring 2020, when economies were closed in Europe and strict quarantine measures were introduced to restrict people's movements. The largest decline was in April 2020, but it was only

Chart 4 – Registration of new cars in the EU by fuel type



Source: ACEA
Note: Quarterly data, BEV = battery electric vehicle, HEV = hybrid electric vehicle, PHEV = plug-in hybrid electric vehicle

Chart 5 – Size of the vehicle fleet in Europe



Source: Eurostat

temporary and consumption recovered very quickly. Petrol consumption then fell further below its long-term average in early 2021, with the onset of the Omicron variant in Europe and the reintroduction of strict quarantine measures. Annual consumption data from the European Commission, available since 2002, show that the global financial crisis had no discernible impact on petrol consumption and led to only a slight reduction in diesel consumption.

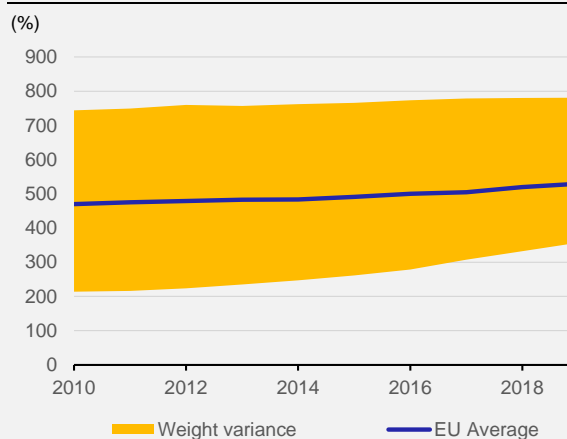
The number of newly registered cars is an important economic indicator for developed economies. That said, most cars still run on petrol or diesel. The share of manufactured and registered cars using alternative propulsion systems is slowly growing, but the vast majority of cars still need conventional fuel to run. According to the data from the Association of European Automobile Manufacturers (ACEA), the share of newly registered electric cars, including hybrids, was around 2% in 2014 (see Chart 4). In 2022 Q1, the share of electric cars, including hybrids, was one third. In addition, every tenth newly registered car is fully electric.

Furthermore, according to Eurostat, there has been a continuous rise in the number of cars per capita in European countries (see Chart 5). This trend would thus indicate a growing demand for fuel. The number of cars in European countries has increased by 13% on average in the last 10 years. The number of cars per capita is growing fastest in Romania (67%), Estonia (44%), Poland (42%) and Slovakia (41%), while in France it remains almost unchanged. On the other hand, stricter emission standards are being regularly introduced in Europe, which is creating pressure to cut down on fuel consumption. Customers often feel the same way. The two factors work against each other and based on total consumption, one seems to offset the other. Due to the rise in the number of electric cars, total petrol consumption in Europe has been gradually decreasing over time.

Fuels in the consumer basket

The importance of fuels for consumers can be assessed on the basis of their weights in the consumer basket. The weight of fuels in the consumer basket in European countries ranges from 3 to 10%, and is 5% on average (see Chart 6). This means that households spend about 5% of their income on fuel. Fuels have the smallest weight in the consumption basket in Slovakia, and the highest in Luxembourg. Consumer inflation is much more affected by, for example, gas and electricity prices in housing costs, which account on average for around 15% of household spending. Despite the relatively small weight of fuels in household consumption, governments introduced measures in March to reduce increased fuel prices, the most common being a reduction in excise duties. The reason for these steps was not so much the cost to households. It was more an effort to limit the negative sentiment caused by prices at filling stations and higher costs for hauliers and companies, where fuel prices further increase prices in the economy. The increase in costs in the manufacturing sector can be observed through the rapid growth of the industrial producer price index (PPI) which is growing at a much faster pace than the consumer price index (not only in Europe). For details on the difference between the two indices from a historical perspective see, for example, Novotný and Polák (2020).

Chart 6 – Fuel weight in the consumer basket for the EU customers



Source: Eurostat

Conclusion

As a result of the crisis in energy commodities, 2020 saw a very rapid development not only in oil and gas prices, but also in the derived prices of petrol and diesel. Historically, diesel has been cheaper than petrol. In 2022, however, diesel became more expensive than petrol. The reason for this is refinery margins, which are higher for diesel than for petrol (also from a historical perspective), but above all they have not returned to their pre-war level. Diesel can also be used as heating oil and is a suitable substitute for gas in heat production. As gas prices go up, so does the demand for diesel.

The EU countries have agreed on an embargo on the import of Russian diesel from February 2023. The EU is a large importer not only of oil, but also of oil products. It imports diesel mostly from Russia. So the question is how prices will develop next year. The consumption data shows that despite the growing number of newly manufactured and registered electric cars, neither petrol nor diesel consumption is decreasing significantly. Conversely, it has been increasing in recent years. The EU is trying to wean itself off its dependence on energy commodities from Russia, and this may lead to further price increases. So far this year, not even the markedly higher prices have had any major effect on consumption, confirming low price elasticity, i.e. a higher willingness of consumers to accept higher prices.

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Havranek, T., Irsova, Z., & Janda, K. (2012). Demand for gasoline is more price-inelastic than commonly thought. *Energy Economics*, 34(1), 201–207.

IEA (2021). Fuel economy in the European Union, <https://www.iea.org/articles/fuel-economy-in-the-european-union>, available on 1 December 2022

Novotný, F., & Polák, P. (2020). *Consumer and industrial prices in 2020 – the year of the coronavirus*, Global Economic Outlook 12/2020,

Keywords

fuel, price elasticity, oil price

JEL Classification

O13, Q43, D12

A1. Change in predictions for 2022

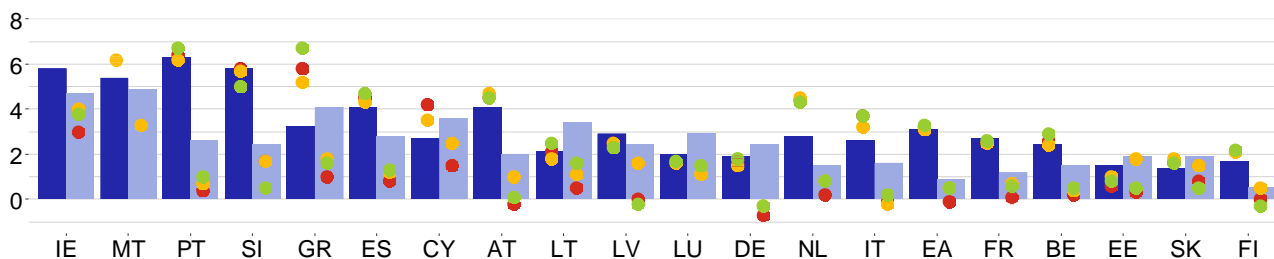
	GDP growth, %				Inflation, %			
	CF	IMF	OECD	CB / EIU	CF	IMF	OECD	CB / EIU
EA	0	+0.5	+0.2	+0.3	0	+3.0	+0.2	+1.3
US	+0.1	-0.7	+0.3	-1.5	0	+0.4	+1.8	+0.2
UK	+0.2	+0.4	+1.0	+0.8	+0.1	+1.7	+0.1	-2.7
JP	0	0	0	-0.4	+0.1	+1.0	+0.1	+0.6
CN	-0.1	-0.1	+0.1	0	-0.1	+0.1	-0.2	0
RU	+0.4	+2.6	+1.6	0	-0.2	-7.5	0	+0.1

A2. Change in predictions for 2023

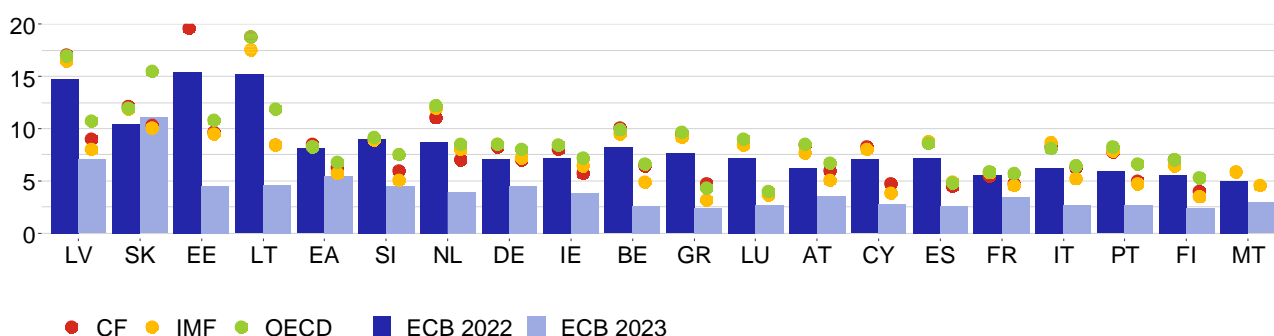
	GDP growth, %				Inflation, %			
	CF	IMF	OECD	CB / EIU	CF	IMF	OECD	CB / EIU
EA	0	-0.7	+0.2	-1.2	+0.3	+3.4	+0.6	+2.0
US	0	0	0	-0.5	0	+0.6	+0.5	+0.2
UK	-0.1	-0.2	-0.4	0	+0.2	+3.7	+0.7	-0.2
JP	-0.1	-0.1	+0.4	-0.1	+0.1	+0.6	0	+0.2
CN	0	-0.2	-0.1	0	0	+0.4	-0.9	0
RU	+0.1	+1.2	-1.1	0	0	-9.3	-0.1	+0.1

A3. GDP growth and inflation outlooks in the euro area countries

GDP growth in the euro area countries in 2022 and 2023, %



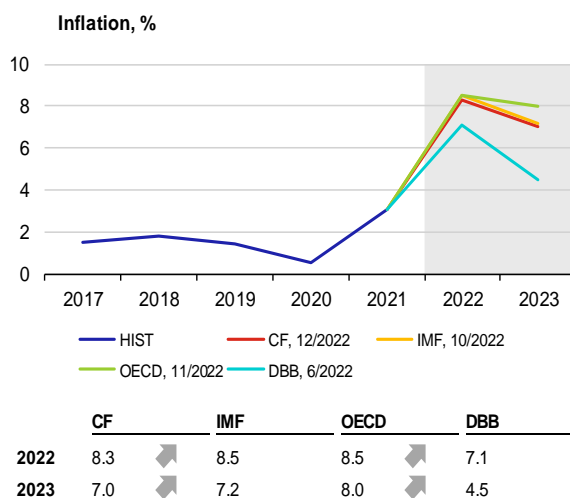
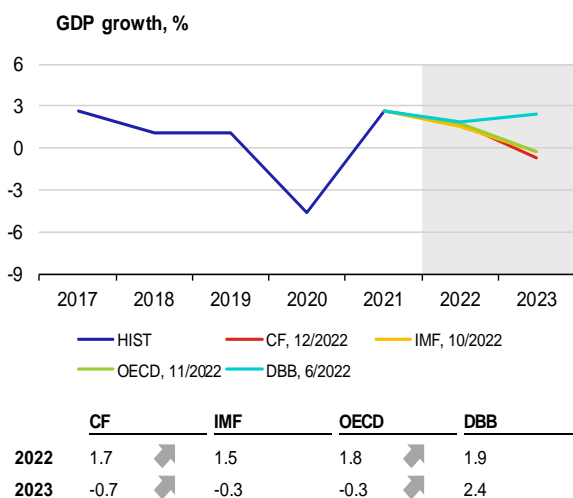
Inflation in the euro area countries in 2022 and 2023, %



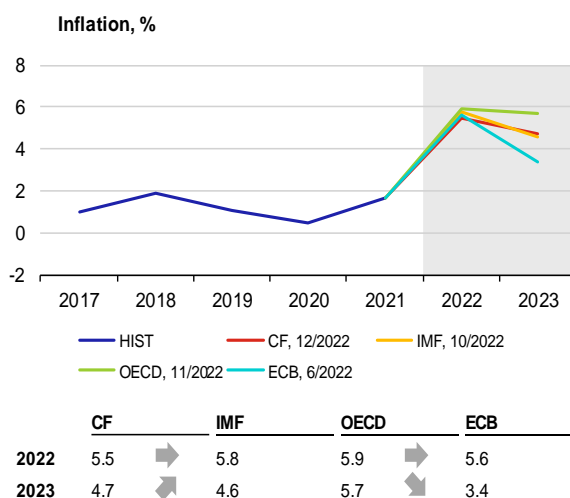
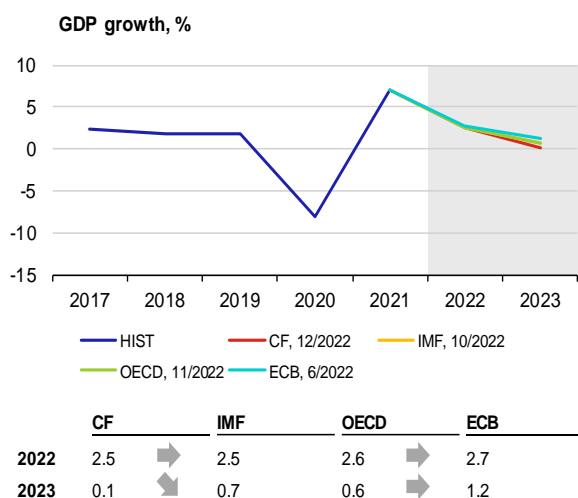
Note: Charts show institutions' latest available outlooks of for the given country.

A4. GDP growth and inflation in the individual euro area countries

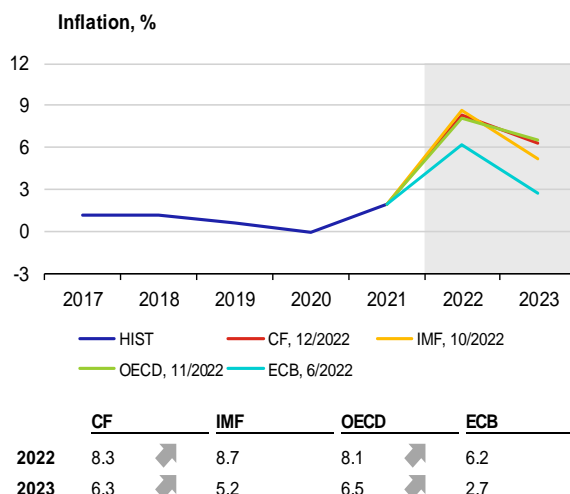
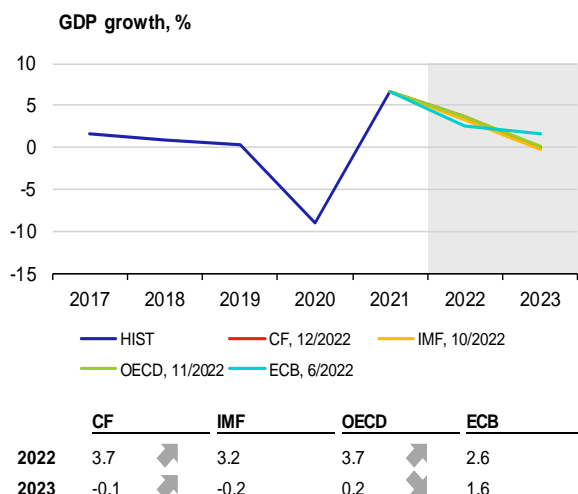
Germany



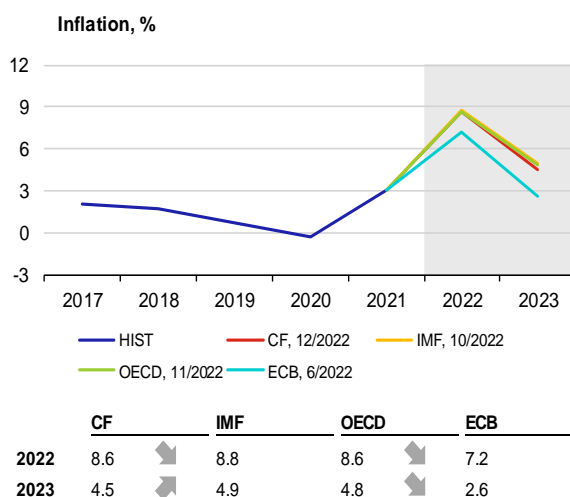
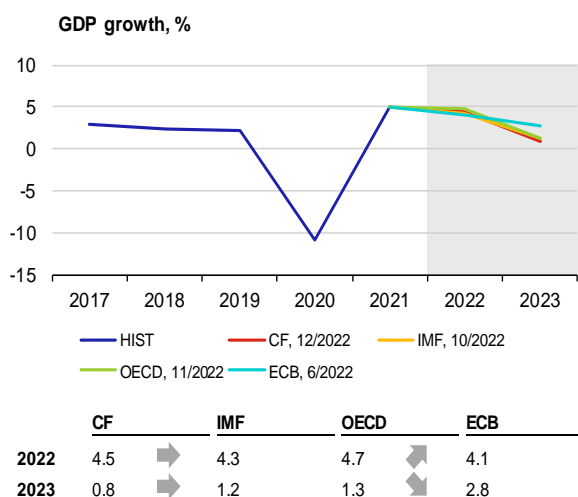
France



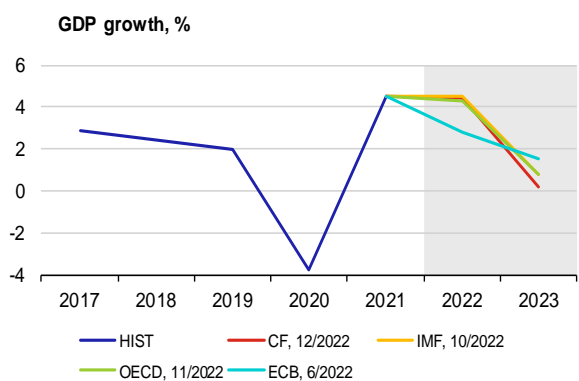
Italy



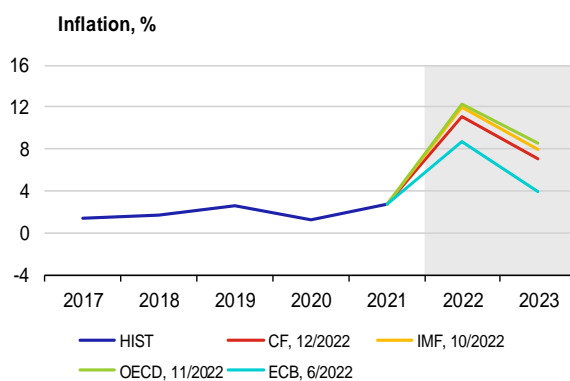
Spain



Netherlands

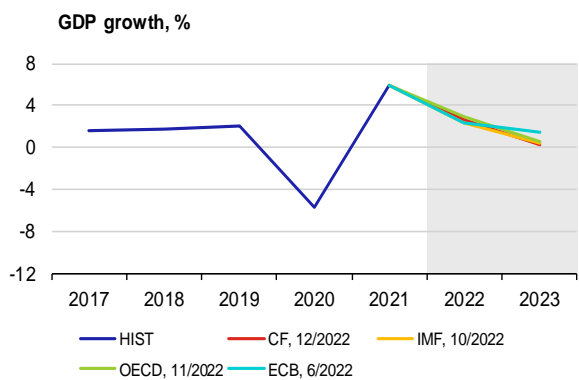


	CF	IMF	OECD	ECB
2022	4.4	4.5	4.3	2.8
2023	0.2	0.8	0.8	1.5

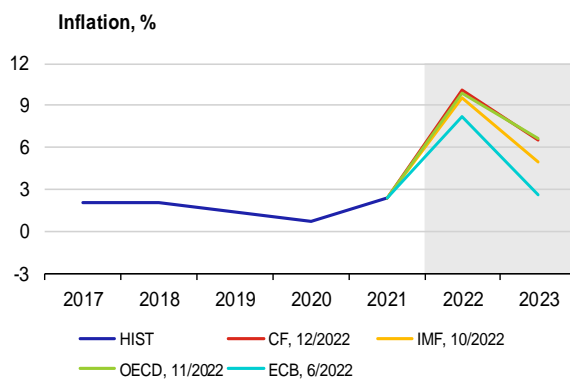


	CF	IMF	OECD	ECB
2022	11.1	12.0	12.2	8.7
2023	7.0	8.0	8.5	3.9

Belgium

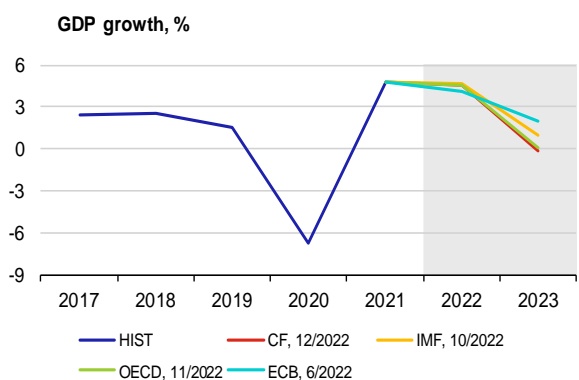


	CF	IMF	OECD	ECB
2022	2.6	2.4	2.9	2.4
2023	0.2	0.4	0.5	1.5

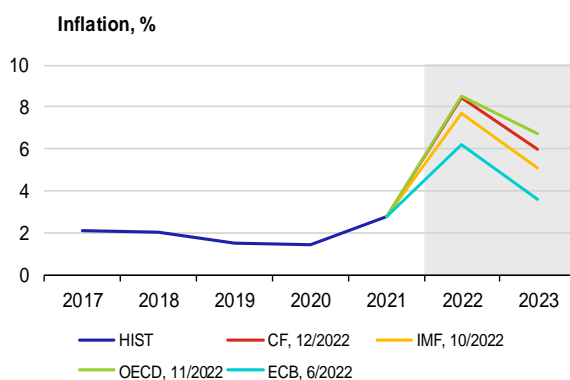


	CF	IMF	OECD	ECB
2022	10.1	9.5	9.9	8.2
2023	6.5	4.9	6.6	2.6

Austria

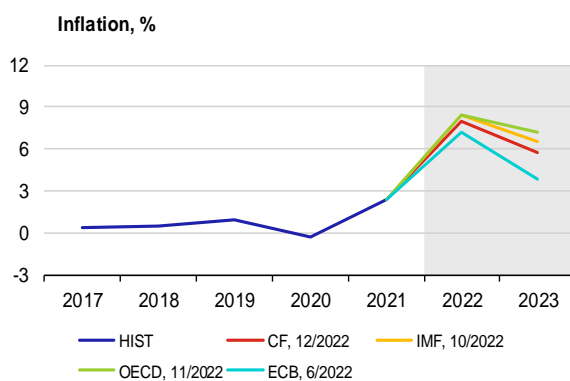
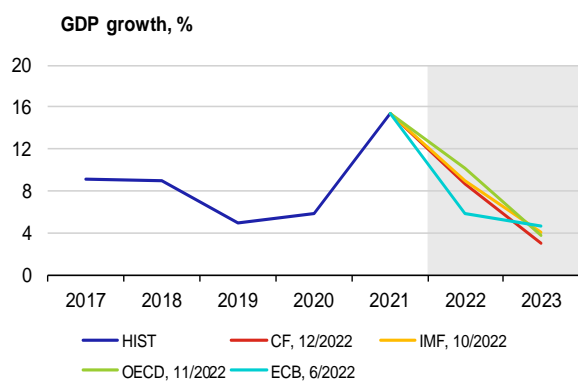


	CF	IMF	OECD	ECB
2022	4.5	4.7	4.5	4.1
2023	-0.2	1.0	0.1	2.0



	CF	IMF	OECD	ECB
2022	8.4	7.7	8.5	6.2
2023	6.0	5.1	6.7	3.6

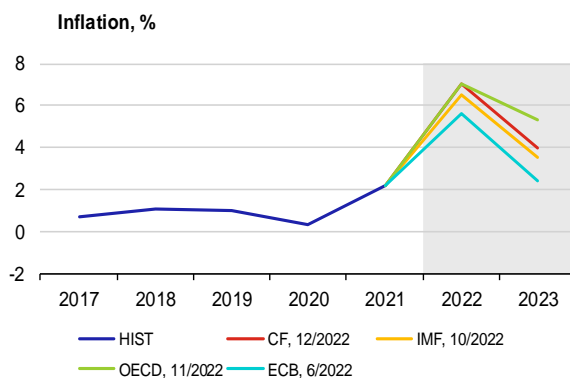
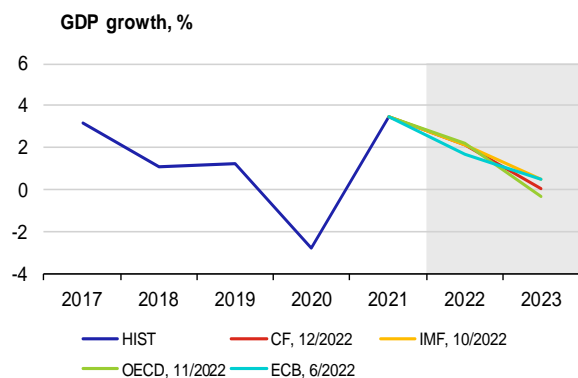
Ireland



	CF	IMF	OECD	ECB
2022	8.6	9.0	10.1	5.8
2023	3.0	4.0	3.8	4.7

	CF	IMF	OECD	ECB
2022	8.0	8.4	8.4	7.2
2023	5.7	6.5	7.2	3.8

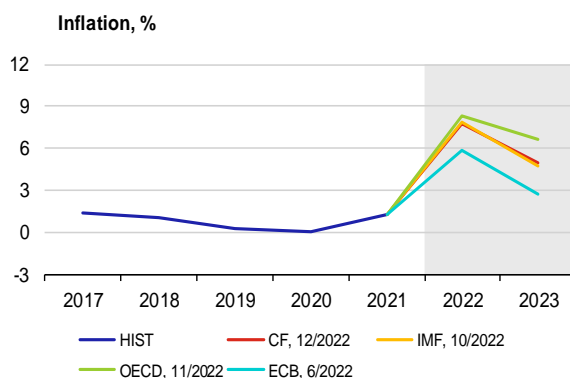
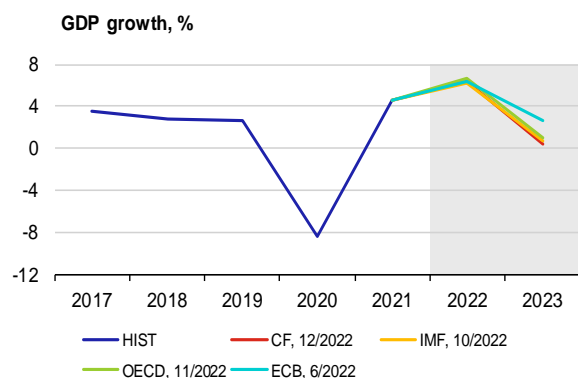
Finland



	CF	IMF	OECD	ECB
2022	2.1	2.1	2.2	1.7
2023	0.0	0.5	-0.3	0.5

	CF	IMF	OECD	ECB
2022	7.0	6.5	7.0	5.6
2023	4.0	3.5	5.3	2.4

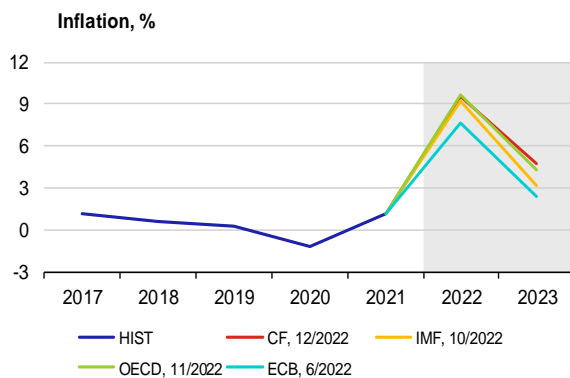
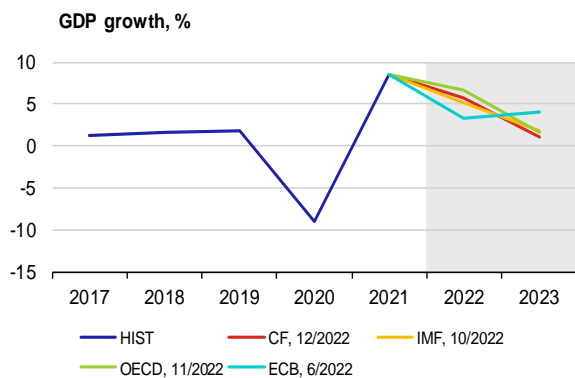
Portugal



	CF	IMF	OECD	ECB
2022	6.4	6.2	6.7	6.3
2023	0.4	0.7	1.0	2.6

	CF	IMF	OECD	ECB
2022	7.8	7.9	8.3	5.9
2023	5.0	4.7	6.6	2.7

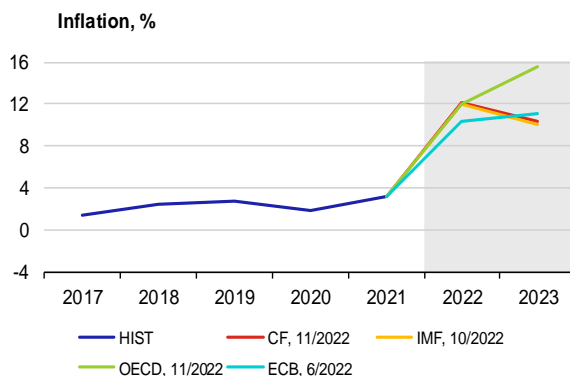
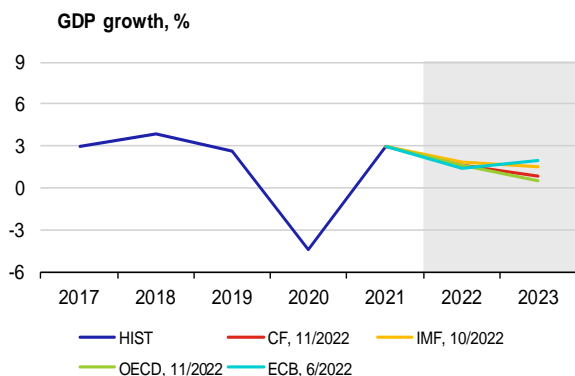
Greece



	CF	IMF	OECD	ECB
2022	5.8	5.2	6.7	3.2
2023	1.0	1.8	1.6	4.1

	CF	IMF	OECD	ECB
2022	9.5	9.2	9.7	7.6
2023	4.7	3.2	4.3	2.4

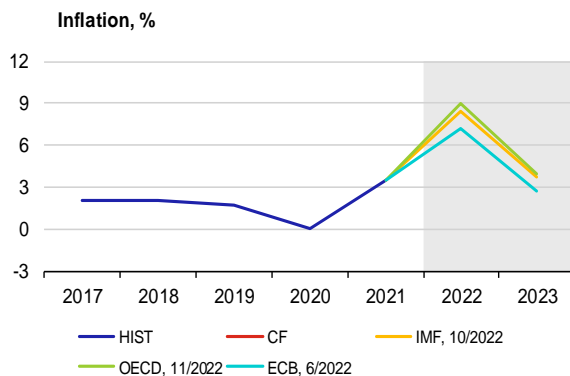
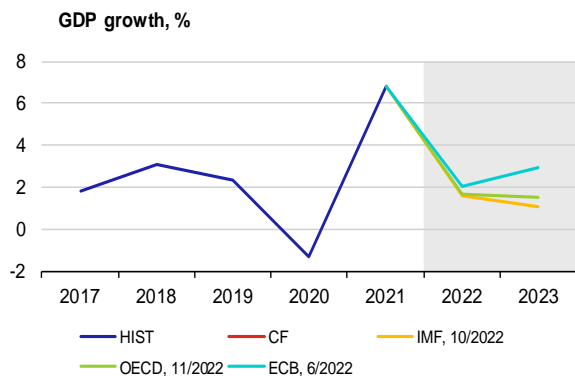
Slovakia



	CF	IMF	OECD	ECB
2022	1.6	1.8	1.6	1.4
2023	0.8	1.5	0.5	1.9

	CF	IMF	OECD	ECB
2022	12.1	11.9	12.0	10.4
2023	10.3	10.1	15.5	11.1

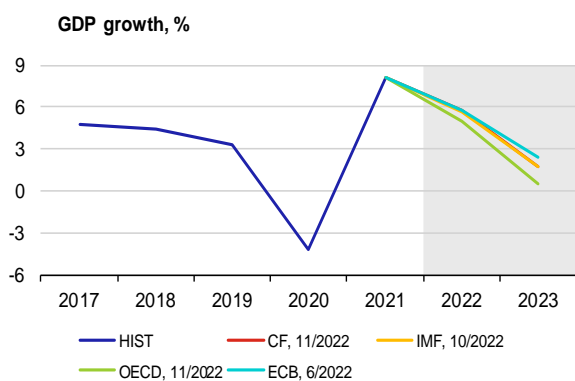
Luxembourg



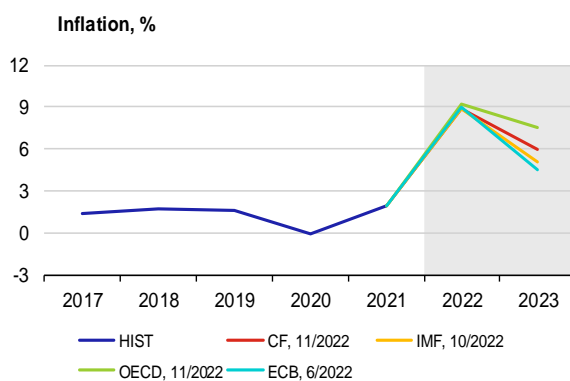
	CF	IMF	OECD	ECB
2022	n. a.	1.6	1.7	2.0
2023	n. a.	1.1	1.5	2.9

	CF	IMF	OECD	ECB
2022	n. a.	8.4	9.0	7.2
2023	n. a.	3.7	4.0	2.7

Slovenia

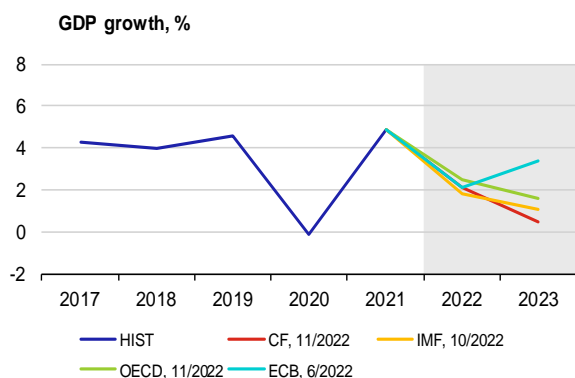


	CF	IMF	OECD	ECB
2022	5.8	5.7	5.0	5.8
2023	1.7	1.7	0.5	2.4

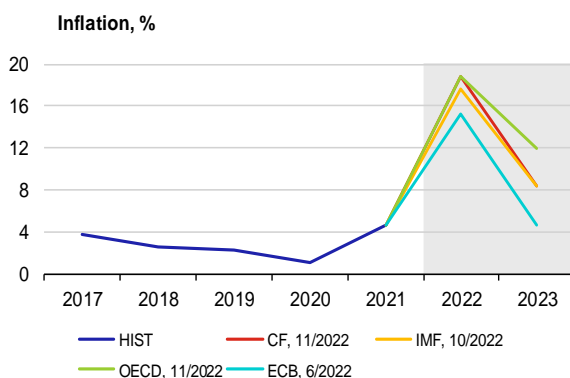


	CF	IMF	OECD	ECB
2022	8.9	8.9	9.2	9.0
2023	6.0	5.1	7.5	4.5

Lithuania

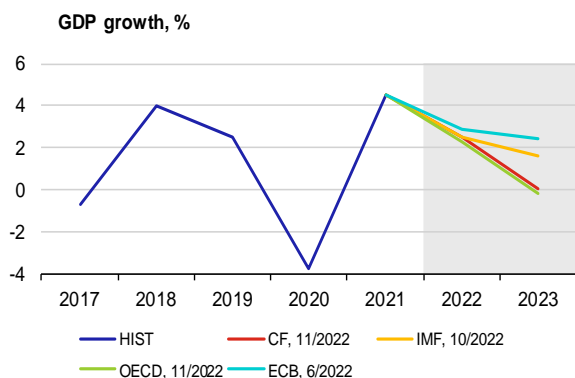


	CF	IMF	OECD	ECB
2022	2.1	1.8	2.5	2.1
2023	0.5	1.1	1.6	3.4

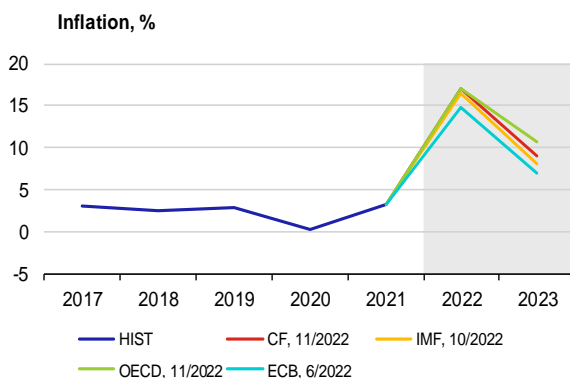


	CF	IMF	OECD	ECB
2022	18.8	17.6	18.8	15.2
2023	8.4	8.4	11.9	4.6

Latvia

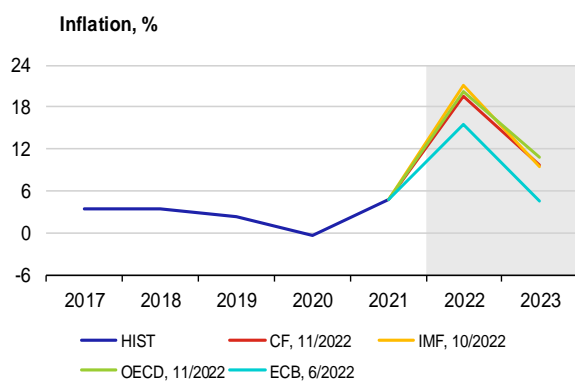
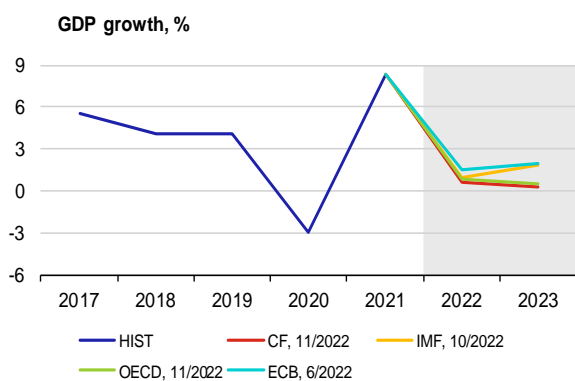


	CF	IMF	OECD	ECB
2022	2.5	2.5	2.3	2.9
2023	0.0	1.6	-0.2	2.4



	CF	IMF	OECD	ECB
2022	17.1	16.5	17.0	14.8
2023	9.0	8.0	10.7	7.0

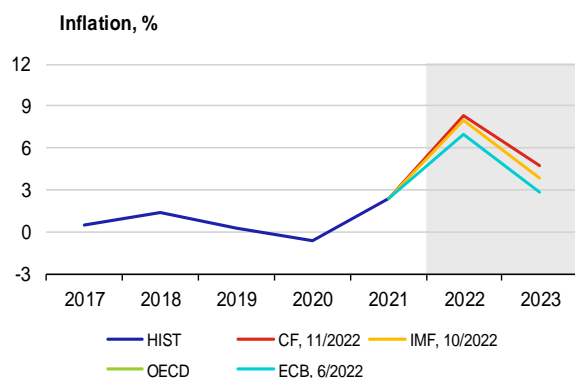
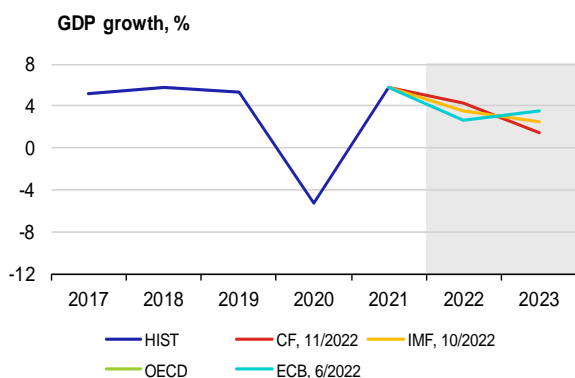
Estonia



	CF	IMF	OECD	ECB
2022	0.6	1.0	0.8	1.5
2023	2.2	1.8	0.5	1.9

	CF	IMF	OECD	ECB
2022	19.6	21.0	20.2	15.4
2023	9.7	9.5	10.8	4.5

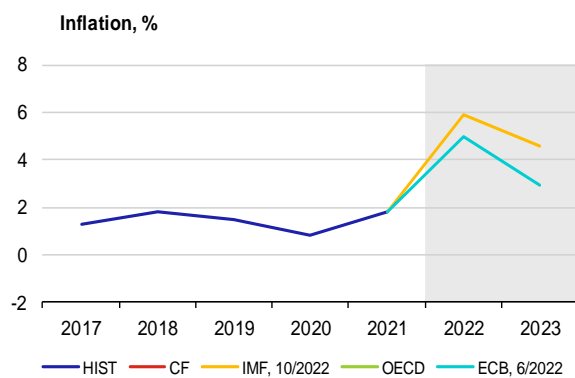
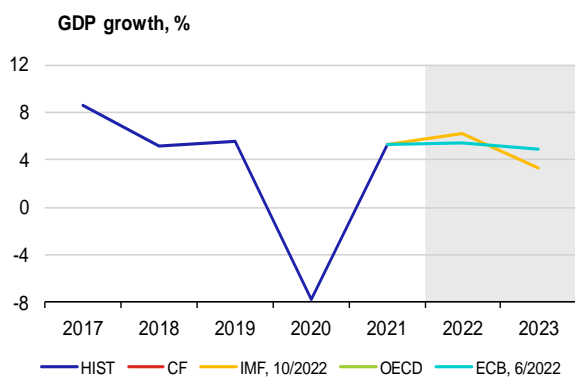
Cyprus



	CF	IMF	OECD	ECB
2022	4.2	3.5	n. a.	2.7
2023	1.5	2.5	n. a.	3.6

	CF	IMF	OECD	ECB
2022	8.3	8.0	n. a.	7.0
2023	4.7	3.8	n. a.	2.8

Malta



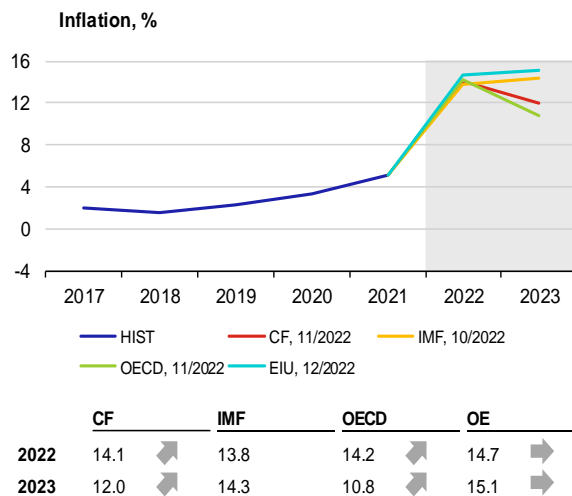
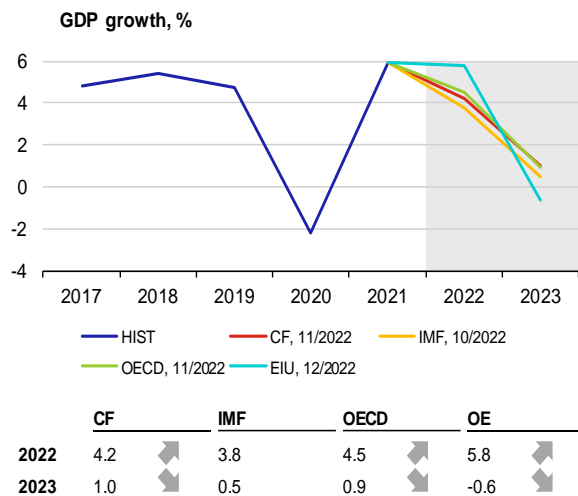
	CF	IMF	OECD	ECB
2022	n. a.	6.2	n. a.	5.4
2023	n. a.	3.3	n. a.	4.9

	CF	IMF	OECD	ECB
2022	n. a.	5.9	n. a.	5.0
2023	n. a.	4.6	n. a.	2.9

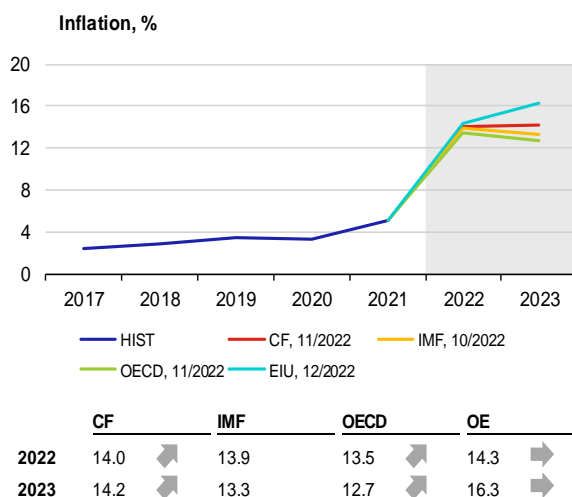
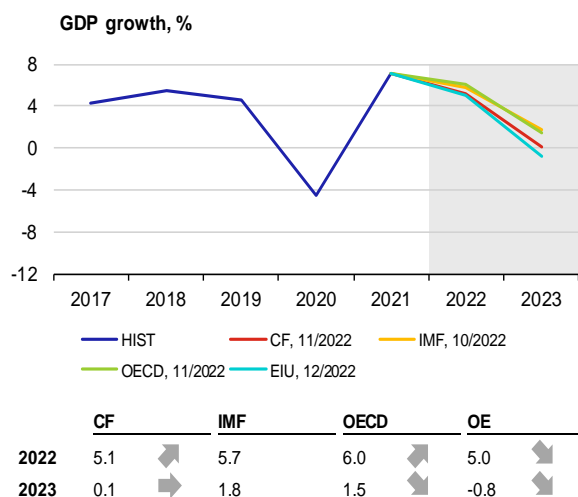
Ddd

A5. GDP growth and inflation in other selected countries

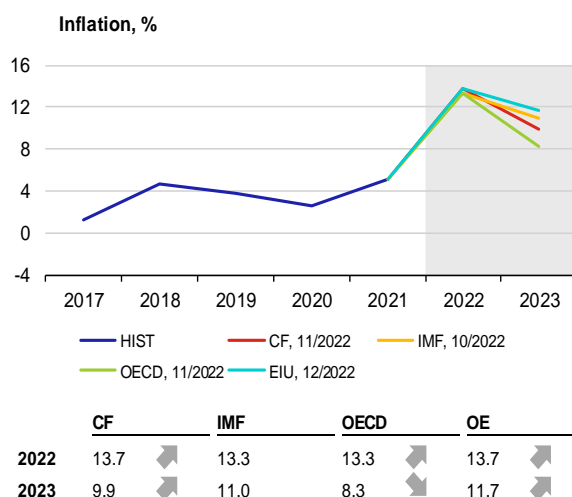
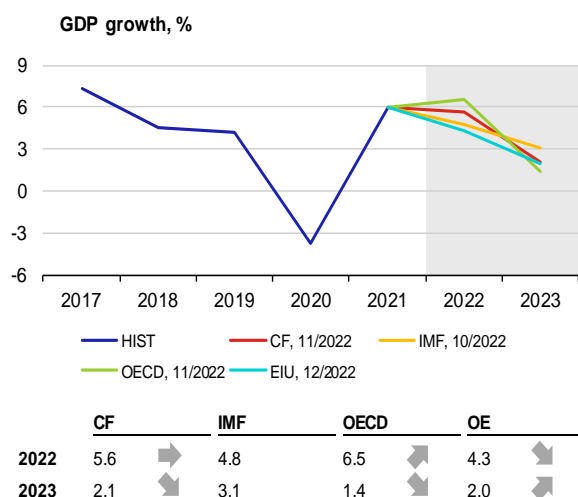
Poland



Hungary



Romania



A6. List of abbreviations

AT	Austria	IFO	Leibniz Institute for Economic Research at the University of Munich
bbl	barrel	IMF	International Monetary Fund
BE	Belgium	IRS	Interest Rate swap
BoE	Bank of England (the UK central bank)	ISM	Institute for Supply Management
BoJ	Bank of Japan (the central bank of Japan)	IT	Italy
bp	basis point (one hundredth of a percentage point)	JP	Japan
CB	central bank	JPY	Japanese yen
CBR	Central Bank of Russia	LIBOR	London Interbank Offered Rate
CF	Consensus Forecasts	LME	London Metal Exchange
CN	China	LT	Lithuania
CNB	Czech National Bank	LU	Luxembourg
CNY	Chinese renminbi	LV	Latvia
ConfB	Conference Board Consumer Confidence Index	MKT	Markit
CXN	Caixin	MT	Malta
CY	Cyprus	NIESR	National Institute of Economic and Social Research (UK)
DBB	Deutsche Bundesbank (the central bank of Germany)	NKI	Nikkei
DE	Germany	NL	Netherlands
EA	euro area	OECD	Organisation for Economic Co-operation and Development
ECB	European Central Bank	OECD-CLI	OECD Composite Leading Indicator
EE	Estonia	OPEC+	member countries of OPEC oil cartel and 10 other oil-exporting countries (the most important of which are Russia, Mexico and Kazakhstan)
EIA	Energy Information Administration	PMI	Purchasing Managers' Index
EIU	Economist Intelligence Unit	pp	percentage point
ES	Spain	PT	Portugal
ESI	Economic Sentiment Indicator of the European Commission	QE	quantitative easing
EU	European Union	RU	Russia
EUR	euro	RUB	Russian rouble
EURIBOR	Euro Interbank Offered Rate	SI	Slovenia
Fed	Federal Reserve System (the US central bank)	SK	Slovakia
FI	Finland	UK	United Kingdom
FOMC	Federal Open Market Committee	UoM	University of Michigan Consumer Sentiment Index - present situation
FR	France	US	United States
FRA	forward rate agreement	USD	US dollar
FY	fiscal year	USDA	United States Department of Agriculture
GBP	pound sterling	WEO	World Economic Outlook
GDP	gross domestic product	WTI	West Texas Intermediate (crude oil used as a benchmark in oil pricing)
GR	Greece	ZEW	Centre for European Economic Research
ICE	Intercontinental Exchange		
IE	Ireland		
IEA	International Energy Agency		

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