GLOBAL ECONOMIC OUTLOOK - JUNE

2019

Monetary Department
External Economic Relations Division

CZECH NATIONAL BANK

Cut-off date for data
14 June 2019

CF survey date
10 June 2019

GEO publication date
21 June 2019

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 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

Global tensions eased somewhat in June, although the level of uncertainty in the global economy remains high. Trade talks between the USA and Mexico had a positive outcome, eventually averting the planned introduction of tariffs on Mexican goods by the USA. By contrast, the situation regarding the USA and China, i.e. the main agents of trade disputes, saw no improvement after an escalation of tensions in May. These giants continue in sharp rhetoric with no sign of reaching a compromise soon. Some hope could lie in the end-June G20 summit in Japan. The question of the manner of the UK's exit from the EU is still unanswered three years after a referendum and is very likely to remain so until end-July when a new leader of the ruling Conservative Party should be known. The situation in Italy also raises great concerns despite some calming. Italy is still facing the threat of sanction proceedings with the EU due to its very unsatisfactory public finances. There is no need to emphasise what it would mean for the EU and the euro area if the situation in Italy worsened further and followed the "Greek" scenario.[1]

The 2019 GDP growth outlooks have been raised since last month only for Japan, while the outlooks for the USA, including those for 2020, have been lowered. The outlook for the euro area stays at levels slightly above 1% growth, reflecting below-average outlooks for Germany as its strongest part. According to CF, Germany will grow just by 0.8% this year and record the same slow GDP growth as steadily slowly growing Japan.

June GDP growth and inflation outlooks for monitored countries, in %

GDP	EA		DE		US		UK		JP		CN		RU	
2019	1.1	→	0.8	→	2.5	↘	1.4	→	0.8	↗	6.3	→	1.5	→
2020	1.3	→	1.4	↘	1.8	↘	1.4	→	0.4	→	6.0	↘	1.8	→

Inflation	EA		DE		US		UK		JP		CN		RU	
2019	1.3	↘	1.5	→	1.9	→	1.9	↘	0.6	→	2.3	→	4.6	→
2020	1.4	→	1.6	→	2.1	→	2.0	→	0.9	→	2.3	↗	4.0	↘

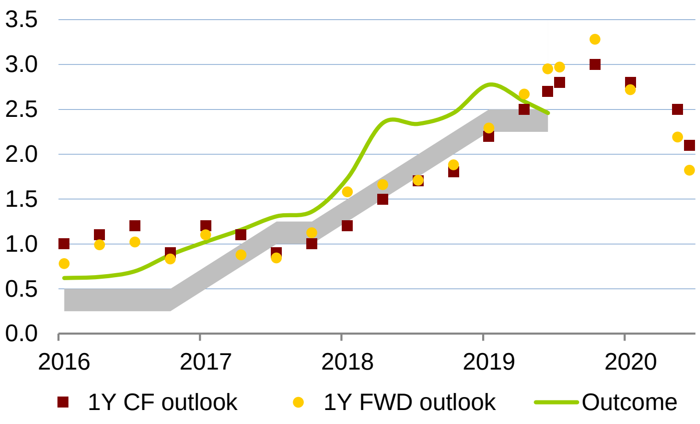
Source: Consensus Forecasts (CF)
Note: Arrows in GDP and inflation outlooks show the direction of revisions compared to last GEO.

The inflation outlooks for this year have been revised down for the euro area and the UK. In none of the advanced countries we monitor is inflation expected to be below the figures expected for this year in 2020. The dollar will slightly depreciate against the currencies we monitor at the one-year horizon. According to the June CF, the Brent crude oil price outlook moved only slightly lower at the 12-month horizon to USD 66.5/bbl (highest estimate USD 79/bbl, lowest estimate USD 50/bbl).

The outlook for 3M USD LIBOR market rates is still slightly falling, while 3M EURIBOR rates will remain negative at the end of 2020. The ECB Governing Council now expects the ECB's rates to stay at their present levels at least through 2020 H1. The ECB also presented the terms of the new TLTROs-III, which are less generous than those of TLTROs-II. However, financial markets now focus on the growing probability of a cut in monetary policy interest rates by the US Fed, very likely to happen at the July meeting and almost certainly this year.[2]

The chart in the June issue, devoted to a retrospective evaluation of interest rate outlooks in the USA, shows that one-year outlooks for three-month money market dollar rates did not expect such a fast pace of interest rate normalisation in the USA. By contrast, higher interest rates than were the actual outcomes were expected in both CF outlooks and outlooks derived from forwards until December 2015 before the start of the rate-rising cycle in the USA. The Fed has raised the cadence of rate hikes since December 2016, which further deepened the errors of the one-year outlooks for three-month rates. The April 2018 outlooks estimated the subsequent outcomes at the one-year horizon correctly. The Fed last increased rates in December 2018 when the corridor of rates for open market operations was 2.25–2.5%. However, the trend in one-year outlooks reversed early this year, as the

Annual outlooks for and actual outcomes of 3M rates in the USA and the Fed rate, in %



Source: Bloomberg
Note: Grey area shows the corridor of the Fed's rates.

[1] Viewed in terms of nominal GDP, the economy of Italy is roughly eleven times larger than that of Greece.

[2] The implied probability of this step derived from the Fed Funds futures gives it a chance of almost 31% at the June meeting but of 86% in July. According to financial markets, the rates will fall by the end of the year with an almost 100% (99.5%) certainty.

outlooks declined markedly (both CF and forward ones). One-year outlooks for ten-year government bond yields also simultaneously dropped. Based on economic agents’ assessment, the current cycle of rate hikes by the Fed has thus reached its peak.

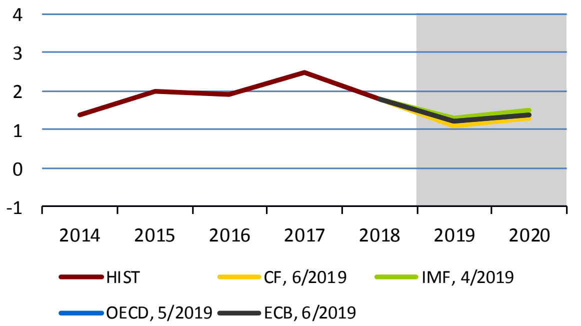
The June issue also contains a regular analysis: Annual assessment of the forecasts included in GEO. It examines in detail the forecasts we presented the readers in the past year. The main finding is that the monitored institutions expected higher GDP and consumer inflation and slightly higher outlooks for short-term interest rates in the euro area on average. By contrast, the outlooks for US interest rates and oil prices and confidence in appreciation of the dollar were underestimated compared to the actual developments.

II.1 Euro area

Economic growth in the euro area surprisingly accelerated to 0.4% at the start of the year. The faster expansion was due mainly to the German economy that returned to growth (also of 0.4%) after having stagnated a quarter earlier. On the one hand, the euro area economy was affected by a slowdown in international trade reflecting uncertainty linked with growth in protectionism and Brexit; on the other hand, developments in the labour market, the household and services sectors and construction remained favourable. The growth in Q1 was also driven by one-off factors (mild winter and vehicle purchases after the introduction of new emission regulations). Other large euro area economies growing at a sold rate were Spain (by 0.7%) and France (by 0.3%); Italy returned to slight growth (of 0.1%) after two quarters of decline. Available indicators are signalling a slowdown in economic expansion in 2019 Q2. The economy, particularly manufacturing, is negatively affected by global factors, related mainly to continuing uncertainty in US-Chinese trade relations. Industrial production thus went down by 0.4% year on year in April. The May PMI in manufacturing (of 47.7) signalled continued contraction. Its component of new orders fell for the eighth consecutive month. However, positive developments on the labour market continued, with unemployment falling to 7.6% in April. Nevertheless, growth in retail sales slowed year on year to 1.5% in April.

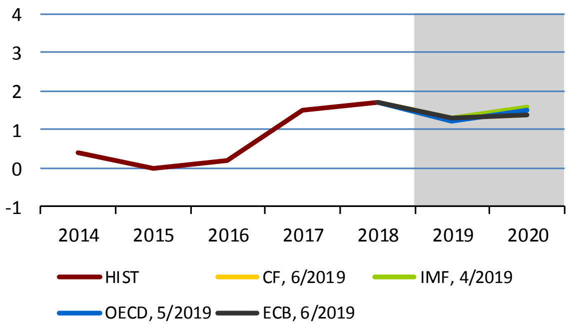
Available outlooks expect a slowdown in growth in the euro area and a subsequent slight acceleration in 2020. According to the June CF, the euro area will grow by 1.1% this year and 1.3% next year. The new ECB projection expects similar figures. The ECB projects growth of 1.4% for 2021. The new Bundesbank forecast expects the German economy to slow markedly this year. German GDP should grow by just 0.6% this year and pick up to 1.2% next year. This outlook is thus slightly more pessimistic than the CF outlook that expects a 0.2 pp higher rate of growth for Germany both this year and the next.

GDP growth, %



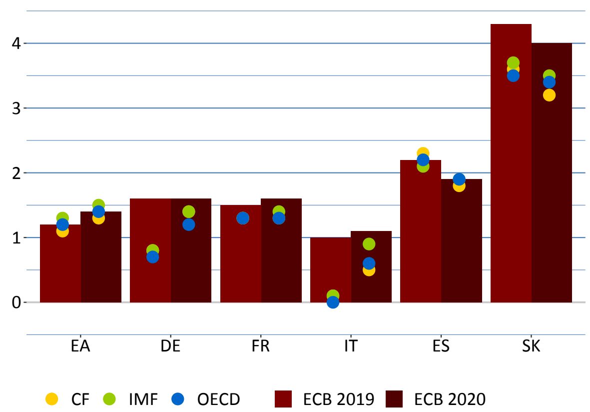
	CF	IMF	OECD	ECB
2019	1.1	1.3	1.2	1.2
2020	1.3	1.5	1.4	1.4

Inflation, %

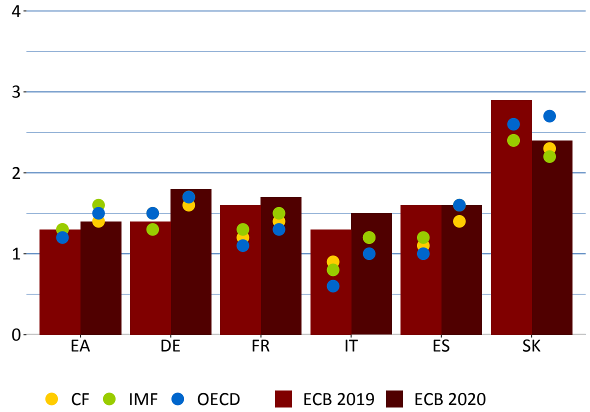


	CF	IMF	OECD	ECB
2019	1.3	1.3	1.2	1.3
2020	1.4	1.6	1.5	1.4

GDP growth in selected euro area countries in 2019 and 2020, %



Inflation in selected euro area countries in 2019 and 2020, %

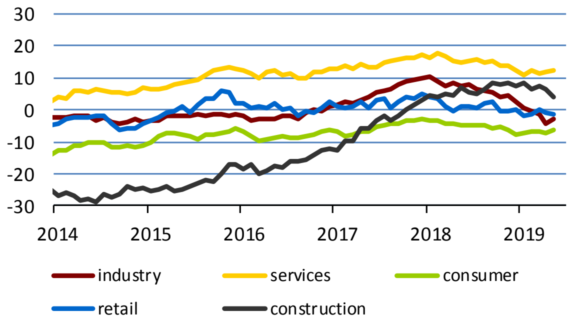


Note: Charts show institutions' latest available outlooks of for the given economy.

HICP inflation in the euro area slowed to a more than one-year low of 1.2% in May. The sharp decline of 0.5 pp was due in part to a high April level, which reflected the timing of Easter. A decline was recorded for growth in energy prices, but particularly core inflation, which fell to 0.8%. Fundamental inflation pressures in the euro area thus remain very subdued. Similarly low or even lower inflation levels can be expected in the months ahead due a drop in energy prices. Inflation should then gradually rise, mainly reflecting a higher contribution of core components. For this year as a whole, the June CF expects average inflation of 1.4% in the euro area. The new ECB projection foresees a slightly lower level (1.3%). Next year, average inflation should reach 1.4% based on both outlooks. In 2021, the ECB expects it to accelerate to 1.6%. Inflation expectations based on five-year/five-year swap rate continued to fall. They reached a historical low of almost 1.2% in mid-June.

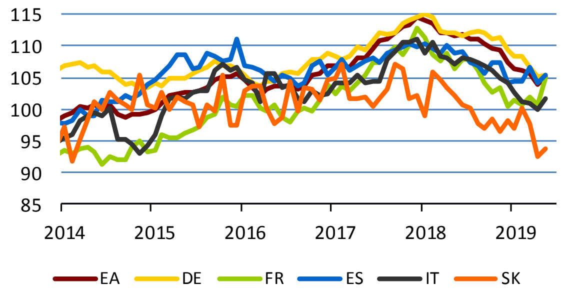
The ECB Governing Council left the key rates unchanged at its June meeting. However, it extended the expectations of rate stability by six months (i.e. at least through 2020 H1). The Governing Council extended the period of reinvestments of the principal payments from maturing securities to the same extent, past the date when the ECB starts raising its key interest rates. Possible instruments to ease monetary policy if the inflation outlook worsens were also discussed at the meeting. A further cut in the deposit rate or restarting the asset purchase programme were mentioned at the press conference. As regards negative interest rates, the ECB signalled the possibility to introduce measures to mitigate their possible side effects on banks' profitability. Overall, the longer end of the 3M EURIBOR market rate curve shifted lower after the ECB meeting. Markets thus do not expect the ECB's key rates to grow by the end of 2019. The yield on the ten-year German government bond dropped to a historical low of below -0.2% due to risk aversion. The yields of most other euro area countries have also fallen significantly since the start of the year; in Italy, the decline was less pronounced due to uncertainty about the country's compliance with the EU budgetary rules.

Leading indicators



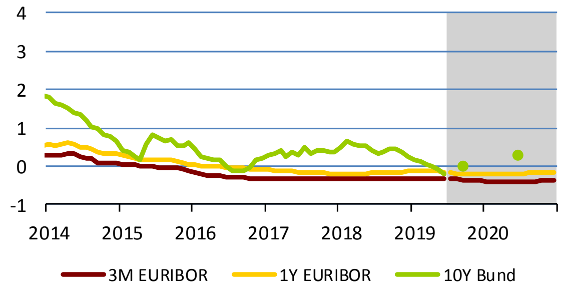
	industry	services	consum.	retail	constr.
3/19	-1.6	11.5	-6.6	0.3	7.5
4/19	-4.3	11.8	-7.3	-1.1	6.5
5/19	-2.9	12.2	-6.5	-1.2	4.1

Leading indicators



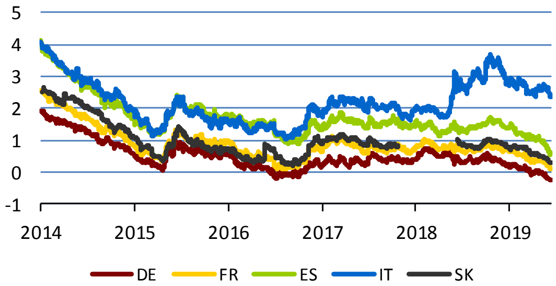
	EA	DE	FR	ES	IT	SK
3/19	105.6	106.6	102.0	106.7	101.0	97.7
4/19	103.9	105.1	100.8	104.1	100.0	92.5
5/19	105.1	105.5	104.8	105.4	101.7	93.7

Interest Rates, %



	5/19	6/19	9/19	6/20
3M EURIBOR	-0.31	-0.32	-0.36	-0.40
1Y EURIBOR	-0.13	-0.18	-0.20	-0.19
10Y Bund	-0.08	-0.20	0.00	0.30

10 year government bond yields, %



	DE	FR	ES	IT	SK
4/19	0.05	0.40	1.05	2.54	0.59
5/19	-0.07	0.33	0.99	2.70	0.47
6/19	-0.24	0.11	0.58	2.36	0.29

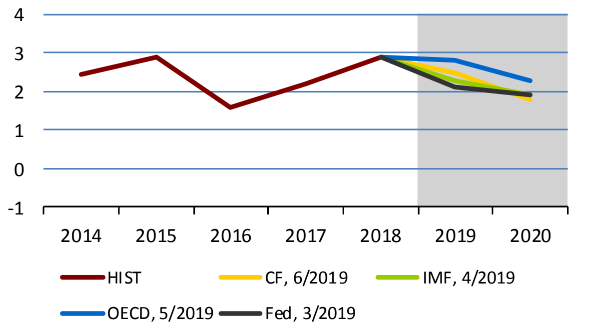
II.2 United States

The trade war between the USA and China escalated further in the past month, with both sides declaring readiness to continue fighting. China raised tariffs on imports of US goods totalling USD 60 billion from 10% to 25% in response to the US May steps. Both sides are compiling lists of undesirable companies, planning production transfers and threatening with constraints on exports of some commodities and goods (of rare-earth metals from China, for example). A truce between the USA and Huawei is also hard to reach. In addition, China has raised tariffs on imports of US and EU steel tubes. Continued efforts of US President Donald Trump to reach his political goals using tariff threats newly hit Mexico (see section II.7) and a global trade war has become a real threat to economic growth.

The Fed assesses the further escalation of US-Chinese conflicts as a prominent risk and announced willingness to respond appropriately. It left monetary policy settings unchanged at its May meeting but its communications suggest the possibility to cut rates if the war escalates further. Financial markets thus expect the first cut in the target range for the policy rate to very likely happen at the end of June. New data from the US economy, where growth is slightly slowing amid relatively moderate inflation pressures, also support easier monetary policy. Non-farm payrolls reached just 75,000 in May and average hourly wage growth slightly slowed year on year (to 3.1%). Annual growth in industrial production declined further in May. Leading indicators in industry fell further but remain in the expansion band. According to the Atlanta Fed, the economy will grow by 1.4% in Q2 (in quarter-on-quarter annualised terms), with relatively strong household spending remaining the main driver of the growth.

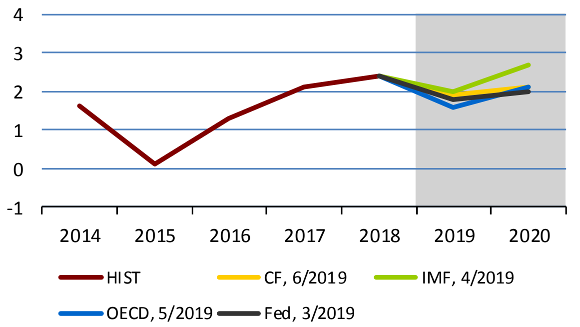
The June CF thus revised the GDP growth outlook for both years downwards while keeping the inflation outlook flat. By contrast, the OECD raised the estimate of the rate of US economic expansion in both years. Expected inflation pressures, by contrast, will be lower according to the new publication.

GDP growth, %



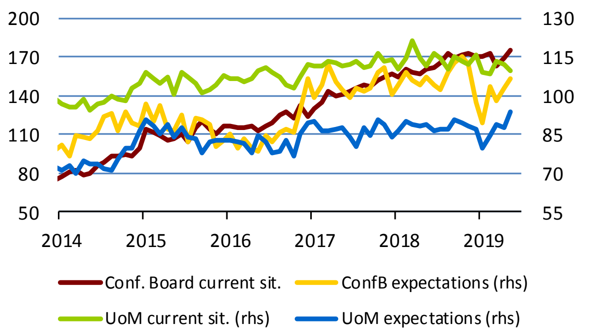
	CF	IMF	OECD	Fed
2019	2.5	2.3	2.8	2.1
2020	1.8	1.9	2.3	1.9

Inflation, %



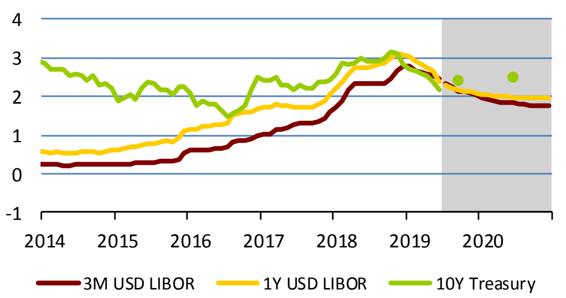
	CF	IMF	OECD	Fed
2019	1.9	2.0	1.6	1.8
2020	2.1	2.7	2.1	2.0

Leading indicators



	ConfB curr.	ConfB exp.	UoM curr.	UoM exp.
3/19	163.0	98.3	113.3	88.8
4/19	169.0	102.7	112.3	87.4
5/19	175.2	106.6	110.0	93.5

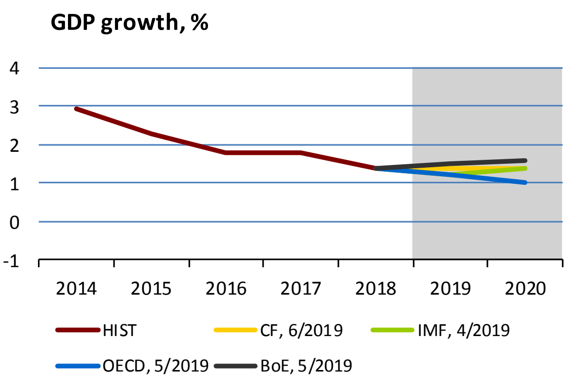
Interest Rates, %



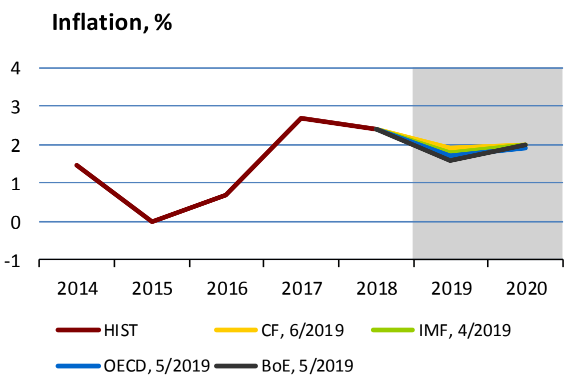
	5/19	6/19	9/19	6/20
USD LIBOR 3M	2.53	2.46	2.14	1.82
USD LIBOR 1R	2.66	2.66	2.18	1.98
Treasury 10R	2.39	2.15	2.40	2.50

II.3 United Kingdom

The UK economy was stimulated to unprecedented growth by fears of a disorderly Brexit but now it is expected to fall. Annual GDP growth went up to 1.8% in Q1. This was due mainly to higher growth in household consumption and government expenditure and a return of fixed investment to growth (despite a continued decline in business investment). By contrast, net exports recorded a sizeable negative contribution. Household confidence indicators remain low but households are now the driver of the economy. Companies hire people instead of investing. Unemployment fell to 3.8%. Real wage growth is weakening but still reaches about 1%. Retail sales rose by more than 5% in both March and April as a result. However, economic activity will probably drop in Q2 (NIESR: -0.2% quarter on quarter). Manufacturing output fell by 4% in April as production in many car plants halted.[3] GDP declined by 0.4% (month on month) in April and the industrial PMI slumped below 50 points in May.



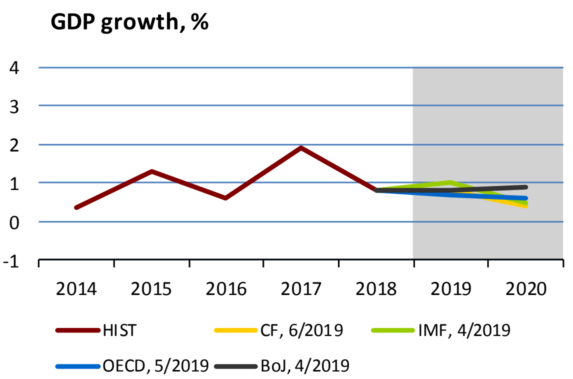
	CF	IMF	OECD	BoE
2019	1.4	1.2	1.2	1.5
2020	1.4	1.4	1.0	1.6



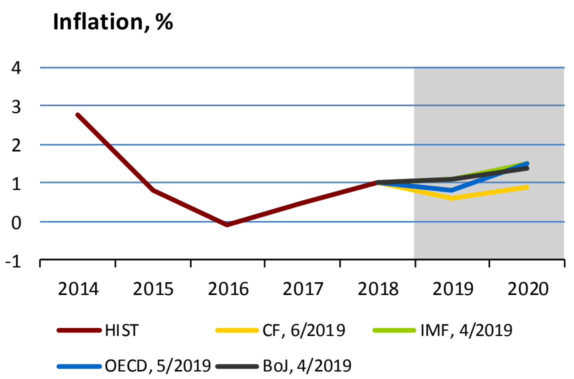
	CF	IMF	OECD	BoE
2019	1.9	1.8	1.7	1.6
2020	2.0	2.0	1.9	2.0

II.4 Japan

Japanese GDP growth was revised upwards in Q1. According to the revised estimate, the economy grew by 0.6% quarter on quarter. The biggest contributor to the growth was net exports (0.4 pp). However, this was due to imports falling more strongly than exports (-4.6% against -2.4%). In annualised terms, GDP growth reached 2.2%, being 0.1 pp higher than at the end of 2018. CF raised its economic growth outlook for this year by 0.2 pp to 0.8%. The outlook for next year is unchanged. Consumer price inflation accelerated to 0.9% year on year in April (from 0.5% in the previous month) due to growth in food prices, which followed a decline in the previous months. The full-year inflation outlook for 2019 remains low. A return to the target in 2020 is not expected either. Monetary policy remains easy. The key short-term rate has been negative (-0.1%) since January 2016 and its hike is not planned in the near future.



	CF	IMF	OECD	BoJ
2019	0.8	1.0	0.7	0.8
2020	0.4	0.5	0.6	0.9



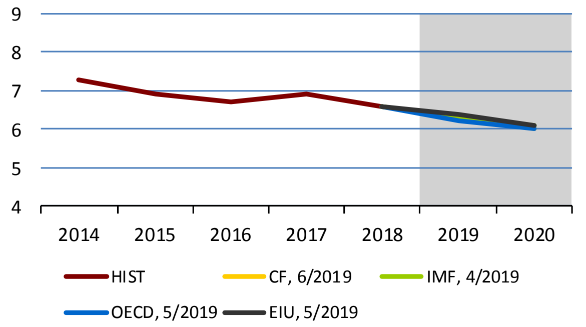
	CF	IMF	OECD	BoJ
2019	0.6	1.1	0.8	1.1
2020	0.9	1.5	1.5	1.4

[3] planned shutdowns to minimise potential impacts of a hard Brexit as of 31 March, a bringing forward of summer plant maintenance

II.5 China

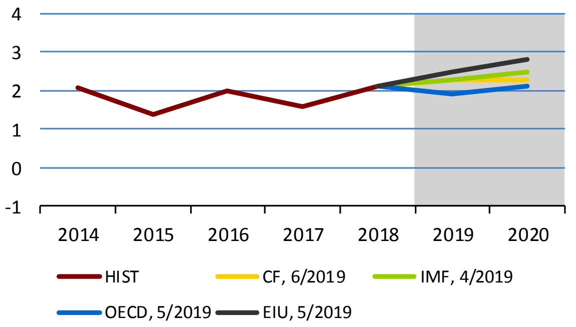
The escalation of tensions in trade relations with the USA was reflected in the performance of the Chinese economy but its impacts are under control according to official sources. As the leading PMI indicators suggests, industrial activity fell into a contraction band, with domestic orders also recording a decline. Export orders slowed significantly, confirming the negative effect of higher tariffs in trade with the USA. The year-on-year decline in car sales is accelerating and the April retail sales growth was the lowest in 16 years. The central bank let the domestic currency weaken to mitigate the negative trend in foreign trade, with the latest data confirming just limited foreign exchange interventions. The government announced new options of funding local governments' investment while high liquidity will be maintained in the financial system. The new CF outlook revised growth downwards and inflation upwards, but only in 2020.

GDP growth, %



	CF		IMF	OECD		EIU
2019	6.3	→	6.3	6.2	→	6.4
2020	6.0	↘	6.1	6.0	→	6.1

Inflation, %

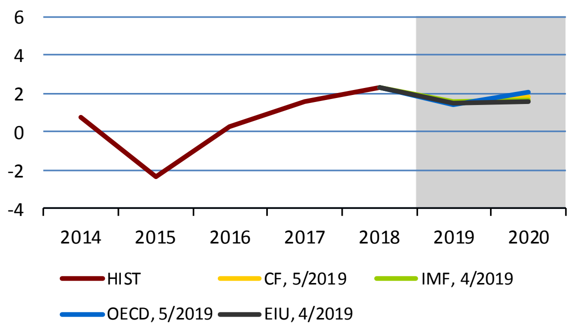


	CF		IMF	OECD		EIU
2019	2.3	→	2.3	1.9	↘	2.5
2020	2.3	↗	2.5	2.1	↘	2.8

II.6 Russia

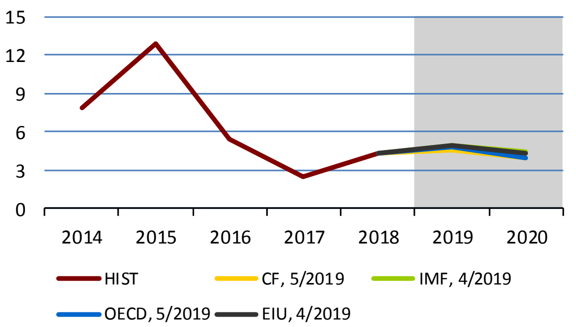
Performance of the Russian economy slightly improved after a weaker start. Industrial production rose the fastest since the start of the year (by 4.6% year on year). Manufacturing grew at almost the same pace. However, the May PMI suggests a slight worsening of activity in this sector due to a further drop in export orders and a sharp fall in employment. According to quarterly outlooks published in the May CF, the start of this year was the weakest both in terms of industrial output growth and GDP in total. However, year-on-year economic growth accelerated to 1.2% in Q2 from the previous 0.5% and is expected to reach around 1.5% in H2. A further slight improvement can be expected next year. By contrast, inflation probably hit this year's high in Q1 when prices grew largely due to a rise in the base VAT rate from 18% to 20% (as of 1 January). Inflation will gradually fall to 4.2% one and a half year ahead.

GDP growth, %



	CF		IMF	OECD		EIU
2019	1.5	→	1.6	1.4	→	1.5
2020	1.8	→	1.7	2.1	↗	1.6

Inflation, %



	CF		IMF	OECD		EIU
2019	4.6	→	5.0	4.8	↘	4.9
2020	4.0	↘	4.5	4.0	→	4.3

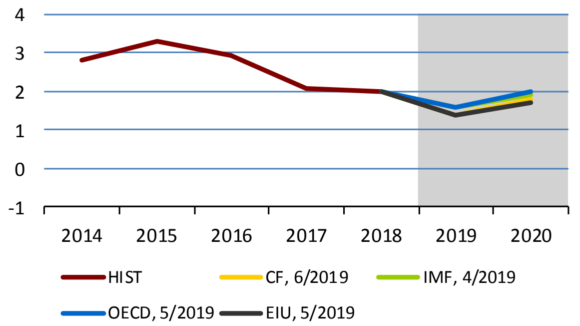
II.7 Developing countries in the spotlight

Mexico averted the threat of US tariffs. At least for the time being. President Donald Trump agreed with Mexico on measures to alleviate the immigration situation the USA is facing. Otherwise, the US administration would place 5% tariffs on Mexican exports to the USA and raise them gradually to 25%. In addition to strengthening guards at the Guatemala border where the number of migrants is growing, Mexico agreed to return them back to its territory where they will wait until their asylum applications filed in the USA are dealt with. Conversely, the USA dropped the requirement to make Mexico a "safe third country", which would force immigrants to apply for asylum in Mexico instead of the USA. Both US Secretary of State Mike Pompeo and President Donald Trump emphasised that if the measures "did not have the expected results", further unspecified steps would be taken within 90 days.

Placing tariffs would give Mexico a heavy blow. Exports make up a large part of Mexican GDP, with the USA receiving 80% of them. Tariffs would definitively bring the weakening economy, which recorded a quarter-on-quarter GDP fall of 0.2% in 2019 Q1, to its knees. Consumer price inflation slowed by 0.1 pp to 4.3% year on year in May. However, it remains above the Mexican central bank's tolerance band (3% ± 1 pp). The central bank left rates unchanged at its May meeting (8.25%). According to the bank, the current monetary policy stance is consistent with the expectations of a return of inflation to its 3% target.

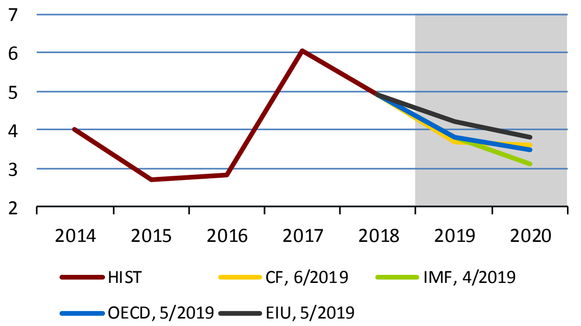
The June CF and the EIU estimate that Mexico will accelerate in the quarters ahead. They project the growth at 1.4% in 2019, due in part to a low comparison base and solid growth forecast for the USA (2.5%). The EIU assesses the long-term outlook for the Mexican economy positively due to the expected energy sector reforms, cheap but relative high-skilled workforce and trade links with the USA. CF and the EIU do not expect consumer inflation to hit the 3% target at the two-year horizon. Inflation should hover around the upper boundary of the tolerance band. The Mexican peso will weaken steadily and very gradually over the next two years, assuming that the USA is satisified with the solution of its immigration problem.

GDP growth, %



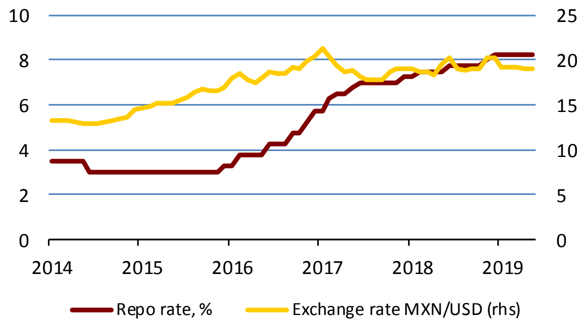
	CF	IMF	OECD	EIU
2019	1.4	1.6	1.6	1.4
2020	1.8	1.9	2.0	1.7

Inflation, %



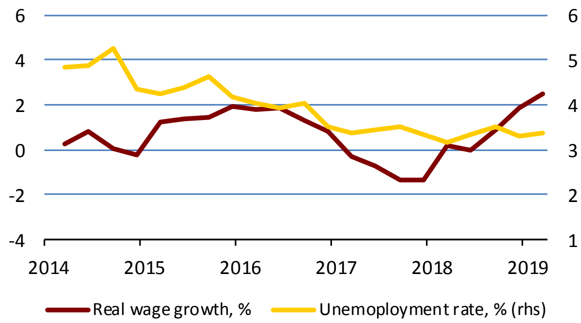
	CF	IMF	OECD	EIU
2019	3.7	3.8	3.8	4.2
2020	3.6	3.1	3.5	3.8

Key interest rate and exchange rate



	Repo rate	Exchange rate MXN/USD
3/2019	8.3	19.2
4/2019	8.3	19.0
5/2019	8.3	19.1

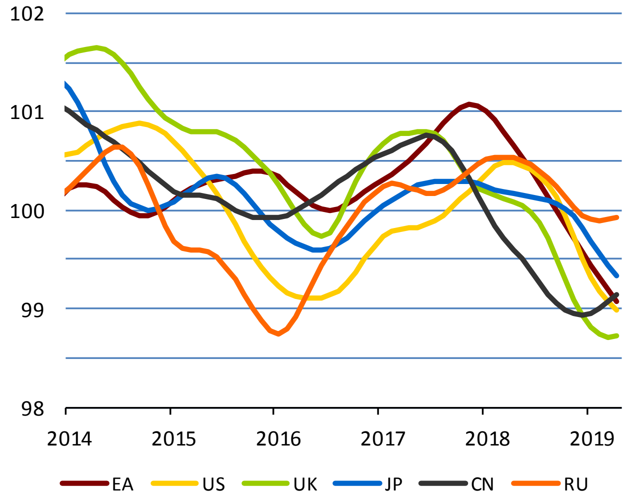
Wage growth and unemployment



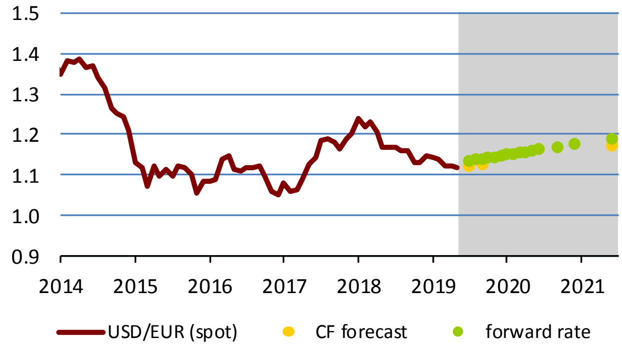
	Real wage growth	Unemployment
III/2018	0.9	3.5
IV/2018	1.9	3.3
I/2019	2.5	3.4

III. Leading indicators and outlook of exchange rates

OECD Composite Leading Indicator

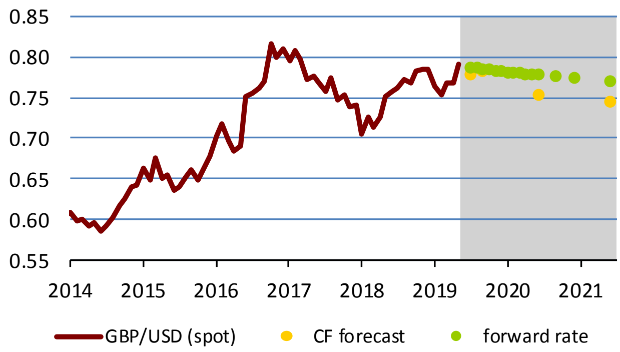


The US dollar (USD/EUR)



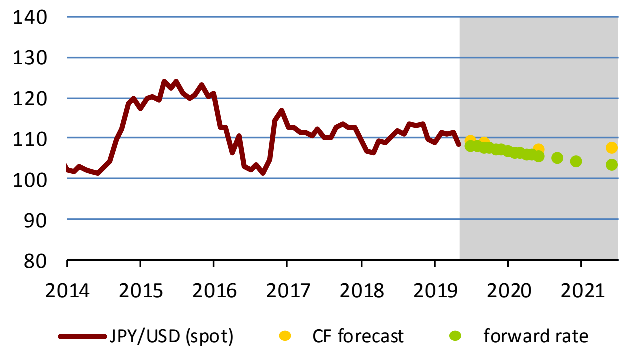
	10/6/19	7/19	9/19	6/20	6/21
spot rate	1.132				
CF forecast		1.124	1.127	1.162	1.173
forward rate		1.134	1.140	1.162	1.190

The British pound (GBP/USD)



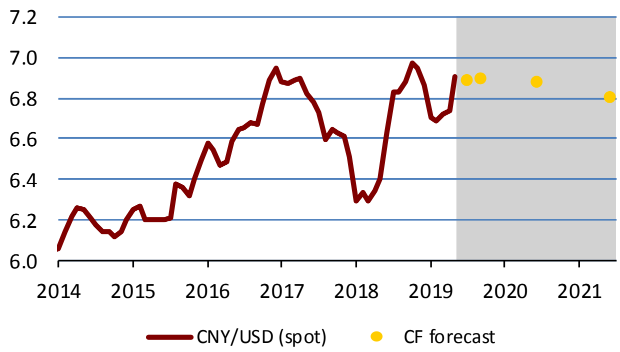
	10/6/19	7/19	9/19	6/20	6/21
spot rate	0.788				
CF forecast		0.779	0.782	0.753	0.744
forward rate		0.787	0.785	0.778	0.770

The Japanese yen (JPY/USD)



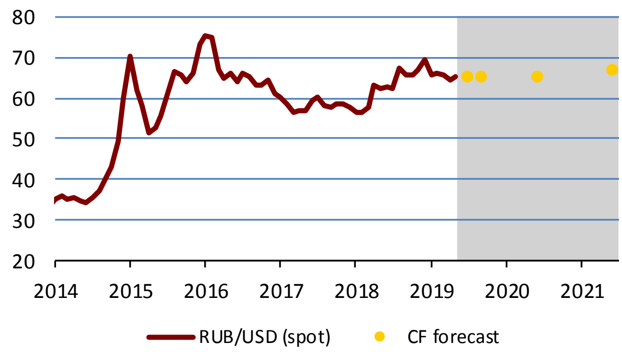
	10/6/19	7/19	9/19	6/20	6/21
spot rate	108.5				
CF forecast		109.5	108.8	107.4	107.6
forward rate		108.2	107.7	105.7	103.3

The Chinese renminbi (CNY/USD)



	10/6/19	7/19	9/19	6/20	6/21
spot rate	6.933				
CF forecast		6.892	6.900	6.876	6.805

The Russian rouble (RUB/USD)



	10/6/19	7/19	9/19	6/20	6/21
spot rate	64.70				
CF forecast		65.27	65.05	65.06	66.90

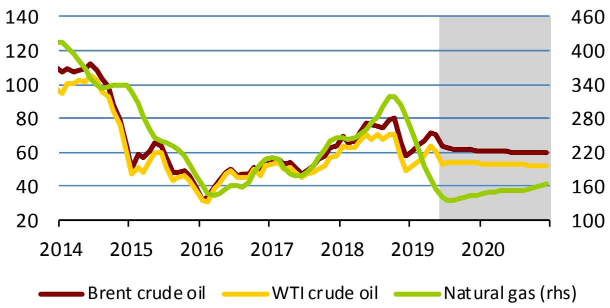
Note: Exchange rates as of last day of month. Forward rate does not represent outlook; it is based on covered interest parity, i.e. currency of country with higher interest rate is depreciating. Forward rate represents current (as of cut-off date) possibility of hedging future exchange rate.

IV.1 Oil and natural gas

The Brent crude oil price edged down in May but at the end of the month fell sharply. Concerns of oil undersupply dominated on the market in April. By contrast, signals of weakening growth in demand due to escalating trade disputes between the USA and its trading partners, particularly China, gradually started to strengthen in May. These disputes are starting to affect the global economy, which was confirmed by a larger-than-expected fall of the Chinese PMI in manufacturing in May. The Brent oil price fell from its April high of about USD 75/bbl to just above USD 60/bbl in early June where its fall halted. These developments give rise to ever-stronger expectations that OPEC and its allies will extend the deal on production limits into 2019 H2. Saudi Arabia is the country most interested in this, while Russia has just confirmed willingness to cooperate further. Rising output and oil stocks in the USA reduce concerns of oil shortages on the physical market despite a drop in supplies form Iran and Venezuela and a massive drop in supplies from Russia via the Druzhba pipeline. Hedge funds further cut their net long oil positions.

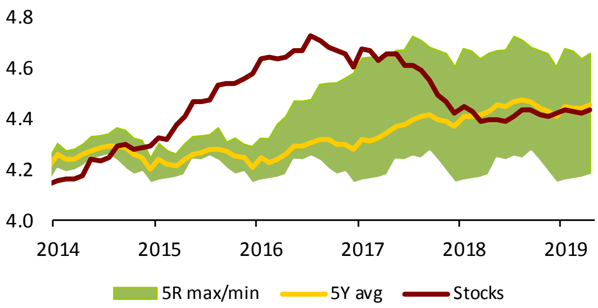
The EIA cut the Brent price outlook for this year by 3 dollars to USD 67/bbl, expecting the same price next year as well. The lower outlook is due to growing uncertainty about global economic growth and hence demand for oil. The June CF expects similar levels (USD 66.2/bbl three months ahead and USD 66.5/bbl one year ahead). The market curve for Brent oil futures became more negative at its short end and shifted lower compared to the previous month. It implies an average price of USD 64/bbl and 60/bbl for this year and the next respectively.

Outlook for prices of oil (USD/barrel) and natural gas (USD / 1000 m³)

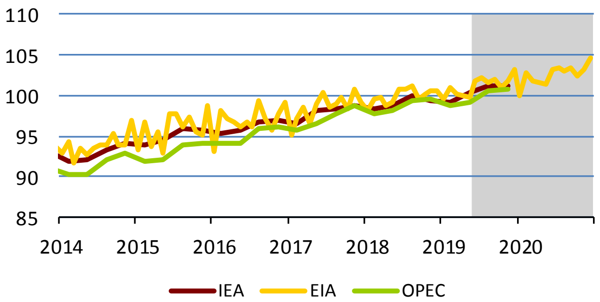


	Brent	WTI	Natural gas
2019	63.96	55.35	164.54
2020	60.07	52.73	153.64

Total stocks of oil and oil products in OECD (bil. barrel)

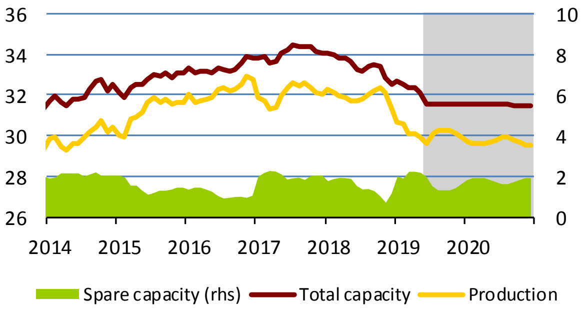


Global consumption of oil and oil products (mil. barrel / day)



	IEA	EIA	OPEC
2019	100.43	101.14	99.86
2020		102.56	

Production, total and spare capacity in OPEC countries (mil. barrel / day)



	Production	Total capacity	Spare capacity
2019	30.16	31.91	1.75
2020	29.71	31.52	1.81

Source: Bloomberg, IEA, EIA, OPEC, CNB calculation
Note: Oil price at ICE, average gas price in Europe – World Bank data, smoothed by the HP filter. Future oil prices (grey area) are derived from futures and future gas prices are derived from oil prices using model. Total oil stocks (commercial and strategic) in OECD countries – IEA estimate. Production and extraction capacity of OPEC – EIA estimate.

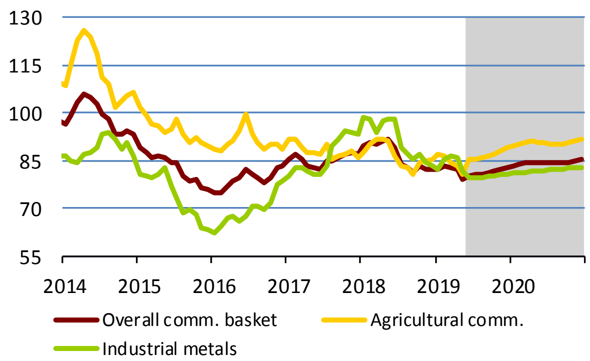
IV.2 Other commodities

After having fallen sharply in May, the aggregate non-energy commodity price index only slightly recovered in the first half of June due to growth of the food commodity price sub-index. The food sub-index more than offset the previous drop and is expected to rise further in the rest of the year. By contrast, the base metals price sub-index continued on its downward trend, although its outlook is also rising.

Base metals prices continue to be negatively affected by an ongoing slowdown in industrial activity and escalating US-Chinese trade disputes, and partly also appreciation of the dollar. The J.P.Morgan Global Manufacturing PMI fell from 50.4 to 49.8 in May and was the lowest since October 2012. The strongest response to its shift to the contraction band was recorded for the price of copper, whose stocks on the LME remain high despite a slight drop. A larger drop in copper prices was prevented only by output shortfalls in Peru. Prices of other base metals also declined. Only iron ore prices bucked this trend. They have gained 45% since December due to limited production in Brazil caused by stricter safety checks which followed a series of mining accidents.

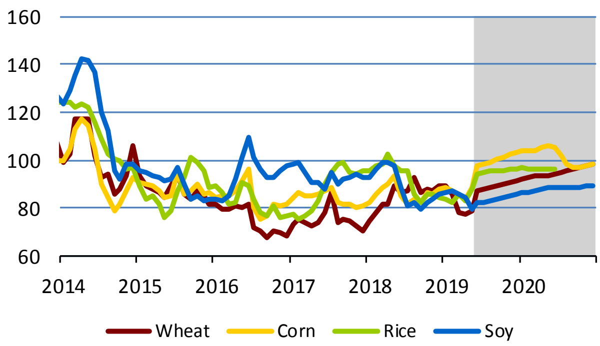
Grain, sugar and coffee prices recorded strong growth in May. This was due mainly to concerns of dry weather in Russia, Australia and Canada, and also heavy rains and floods in some parts of the USA, which are jeopardising the quality of harvest and delaying supplies to the market. Beef prices moved in the opposite direction, falling further following a seasonal drop at the end of April. Pork prices also declined moderately, although from relatively high levels.

Non-energy commodities price indicies



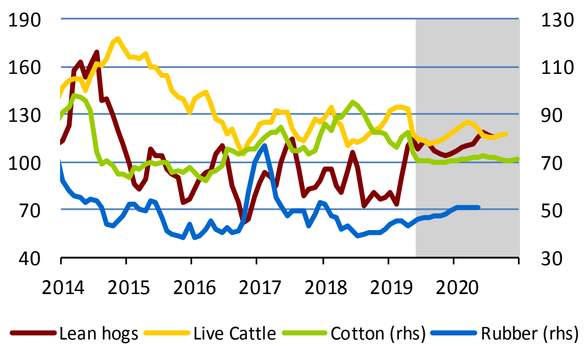
	Overall	Agricultural	Industrial
2019	81.6	85.7	81.8
2020	84.3	90.6	82.0

Food commodities



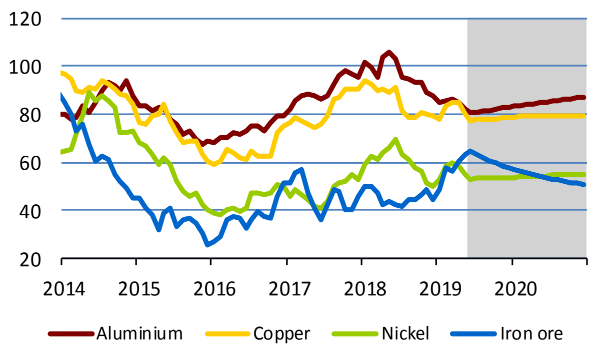
	Wheat	Corn	Rice	Soy
2019	86.2	94.8	91.0	84.2
2020	94.9	101.5	96.6	88.2

Meat, non-food agricultural commodities



	Lean hogs	Live Cattle	Cotton	Rubber
2019	102.1	120.8	73.6	46.1
2020	113.1	119.3	71.5	51.1

Basic metals and iron ore



	Aluminium	Copper	Nickel	Iron ore
2019	83.0	79.8	54.9	59.4
2020	85.3	79.4	54.5	53.6

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.

Annual assessment of the forecasts included in GEO[4]

Every month, Global Economic Outlook (GEO) provides an overview of the latest economic forecasts issued by international institutions, selected central banks and Consensus Economics. With the benefit of hindsight, it can be said that the monitored institutions were mostly too optimistic with their economic outlooks for 2018. Their forecasts for GDP growth expected higher levels on average. Likewise, expected consumer price inflation was higher than the subsequent outcomes in most cases. At the same time, the outlooks for short-term interest rates for the euro area were slightly overestimated, while those for rates in the USA were underestimated. As regards the exchange rates of the monitored currencies against the dollar, forecasters expected a stronger dollar for most currency pairs compared to what transpired. The crude oil price was also slightly underestimated in the forecasts on average over the entire assessment period. However, this was in line with the overshot expected inflation in some countries.

Introduction

Every year, we assess the accuracy of the forecasts of the economic variables regularly monitored in GEO. The results of this assessment provide valuable information about which of the monitored institutions produced estimates that were the closest to the subsequently recorded outcomes and were thus the most successful in their forecasts. In addition to Consensus Forecasts (CF), we assess the outlooks derived from market contracts when assessing the forecasts for interest rates, the dollar exchange rate and oil prices. The assessment always applies to the past year. In the case of the forecasts for GDP growth and CPI inflation for a given calendar year (fixed-event forecasts), we are now assessing the forecasts for 2018. In the case of the forecasts published for a fixed horizon that shifts further into the future each time a new forecast is published (rolling-event forecasts), the assessment covers the predictions since April 2017. From the outlooks regularly published in GEO, this category of rolling forecasts contains, for example, the outlooks for foreign interest rates and oil prices and the outlooks for the exchange rates of the monitored currencies against the dollar.

Owing to the short length of the time series under assessment, the analysis mainly uses the simple mean forecast error (MFE). The forecast error e_t is calculated as the difference between the ex post known actual value a_t and the corresponding forecast f_t: $e_t = a_t - f_t$. A positive forecast error therefore means that the forecasted value undershot the subsequent outcome, while a negative error means that it overshot it. The source of actual levels of GDP and consumer price inflation growth for 2018 is the database of the Economist (EIU Country Data). The source of actual levels of the other variables is Datastream. Futures contracts for interest rates, exchange rate and the Brent crude oil price are obtained from the Bloomberg database.

We also use the mean absolute percentage error (MAPE) to assess the accuracy of the GDP and inflation growth forecasts across institutions and also to assess the forecast accuracy across the currencies' exchange rates against the dollar. This variable, expressed in percentages, is suitable for cross-checking variables of various dimensions. Moreover, individual errors are given in absolute terms, so positive and negative forecast errors do not cancel each other out, as is the case of the MFE. The formal notation is as follows:

$$MAPE = \frac{100}{n}\sum_{t=1}^{n}\left|\frac{a_t - f_t}{a_t}\right|. \qquad (1)$$

Assessment of the accuracy of the GDP growth and CPI inflation forecasts for 2018

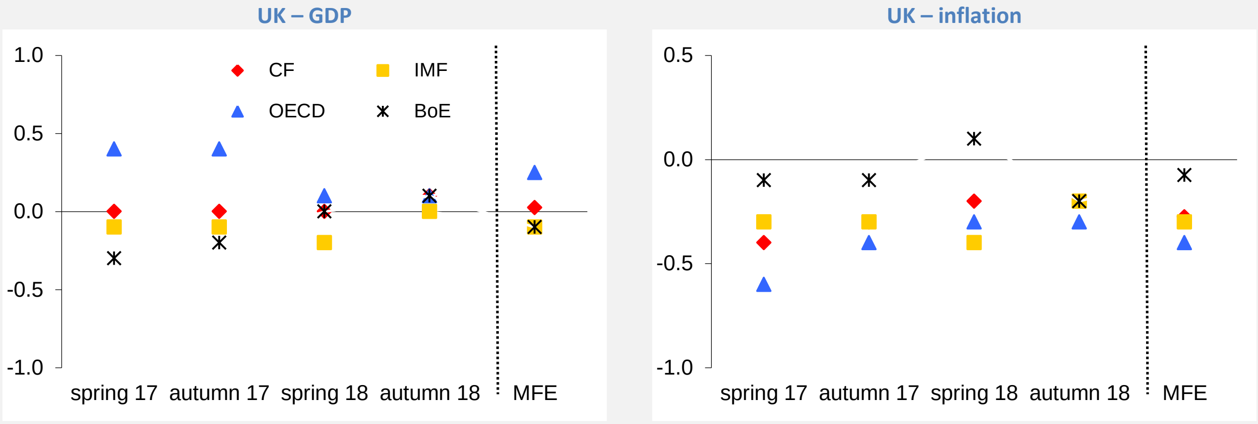
In the recent past, GEO regularly monitored actual and predicted GDP growth and CPI inflation in the euro area, the USA, Germany, Japan and the BRIC countries (Brazil, Russia, India and China); in 2017 it also started to monitor the UK.[5] The forecasts for GDP growth and inflation for these countries are taken primarily from the CF survey, the International Monetary Fund (IMF) and the Organisation for Economic Cooperation and Development (OECD). These three institutions cover all the countries monitored. In the case of advanced economies, we also monitor the forecasts of their central banks, i.e. the European Central Bank's (ECB), the Federal Reserve, Deutsche Bundesbank (DBB), the Bank of Japan (BoJ) and the Bank of England (BoE). For the BRIC countries, the forecasts of the Economist (the Economist Intelligence Unit (EIU)) are used instead. These institutions differ in the frequency and date of publication of their forecasts. The forecast updates range from monthly (CF and the EIU) and quarterly (the IMF, OECD, ECB, Fed and BoJ) through to half-yearly (DBB). For presentational reasons, only the half-yearly forecasts (i.e. the spring and autumn forecasts) are assessed. They correspond to the May and November CF.

[4] Author: Filip Novotný. The views expressed in this article are those of the author and do not necessarily reflect the official position of the Czech National Bank.

[5] The economies of Brazil and India stopped being monitored in January 2019. In April 2019, several new features were introduced in GEO on the occasion of its 100th issue. They include a new section called *Developing countries in the spotlight* and an expanded section *Euro area*, which now contains a previously independent section *Germany*.

The GDP growth outcomes came as a negative surprise in most of the countries under review. Chart 3 and the left-hand part of Chart 1 show the deviations of the GDP growth forecasts for the monitored countries from the subsequent outcomes. They reveal that only the growth forecasts for the USA, Russia and China were lower than the actual outcomes in 2018.[6] The GDP growth forecast for the UK materialised almost exactly. By contrast, the economy of the euro area, including that of Germany, came as a negative surprise. Euro area GDP growth slowed markedly last year, while the US economy accelerated. In spring 2017, expectations of the euro area and German GDP growth were relatively accurate. However, optimism regarding these territories increased in the period under review but never actually materialised. Other countries that negatively surprised forecasters were India and Brazil.

Chart 1 Forecast errors for GDP growth and consumer price inflation for 2018 (pp)

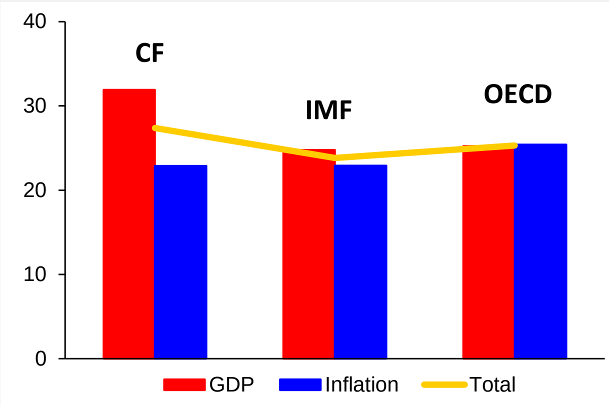


Note: CF – Consensus Forecasts, IMF – International Monetary Fund, OECD – Organisation for Economic Cooperation and Development, BoE – Bank of England. MFE is the mean forecast error for the given year.

As in the case of GDP growth, higher inflation than the subsequent outcomes was expected on average, especially in the BRIC countries and the UK (see Chart 4 and the right-hand part of Chart 1). By contrast, inflation expectations in the euro area, Germany and the USA were lower. This meant inflation expectations for the euro area, and within it also Germany, were below the ECB's 2% target, as actual inflation stood at 1.7% and 1.9 % respectively in 2018. Similarly, inflation in the euro area is also expected to be below 2% this year. Conversely, inflation in the USA amounted to 2.4% last year and the expectations for this year are approximately on target.

Among the institutions which forecast GDP growth and inflation for all the countries under review, the International Monetary Fund recorded the smallest mean absolute percentage forecast error (MAPE) overall for the forecasts of both variables (see Chart 2). Its GDP growth forecasts were more accurate than those of the other two institutions. CF was more accurate in inflation forecasts. However, it had the worst GDP growth forecasts. Chart 2 also shows that the inflation forecasts were more accurate than the GDP growth forecasts overall. The charts of the deviations of GDP growth and inflation (Charts 1, 3 and 4) reveal a general trend where most of the outlooks gradually became more accurate over the assessment period (spring 2017 to autumn 2018). The central banks' forecasts were in line with those of the other institutions. The BoJ was optimistic regarding GDP growth and inflation, while the Fed was conservative in its forecasts. High uncertainty (as measured by the variability of the forecasts across institutions) pertained to the forecasts for Brazil.

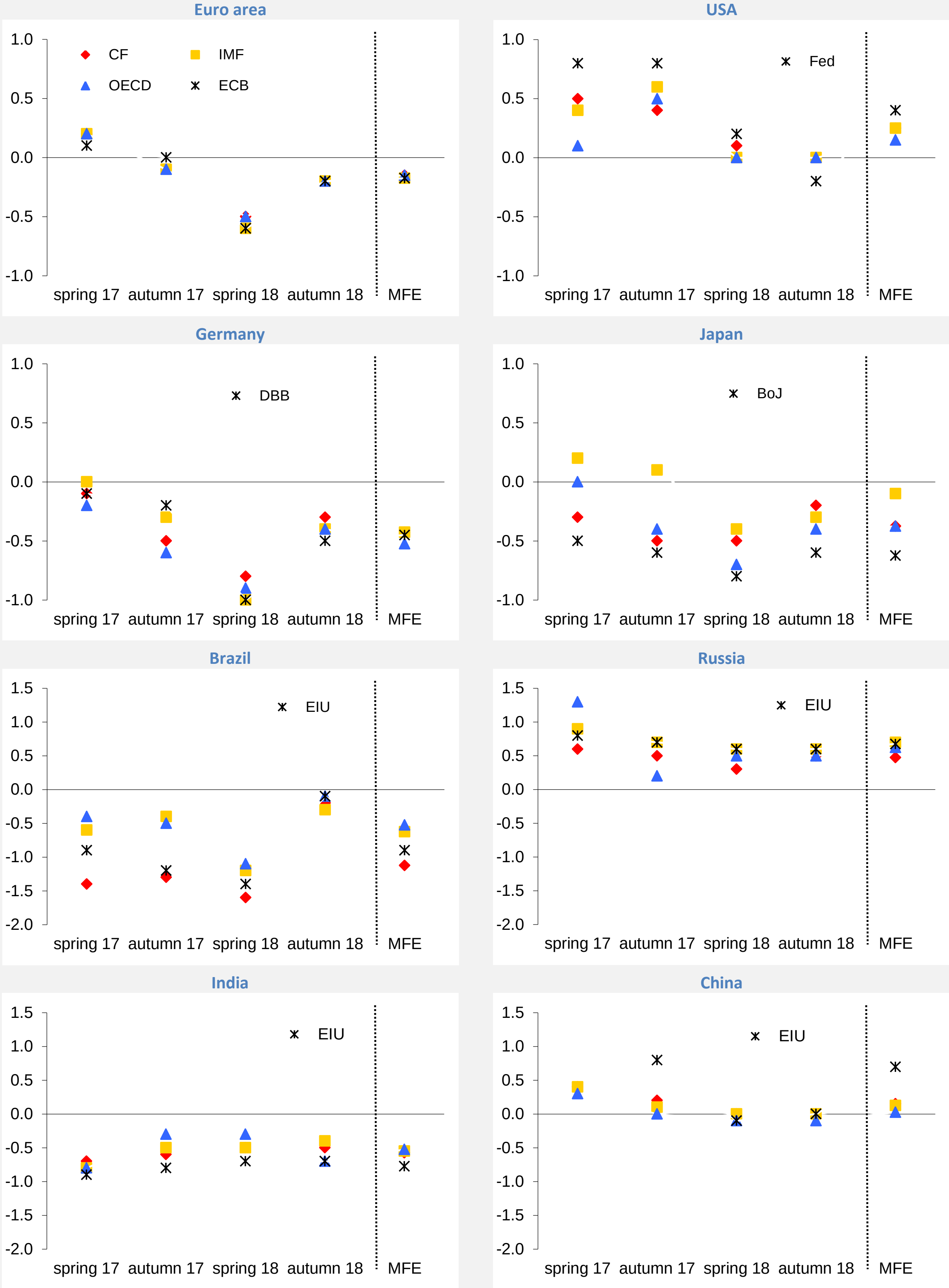
Chart 2 MAPE – comparison of the accuracy of institutions forecasting GDP and inflation for all countries (%)



Note: CF – Consensus Forecasts, IMF – International Monetary Fund, OECD – Organisation for Economic Cooperation and Development MAPE is the mean absolute percentage error.

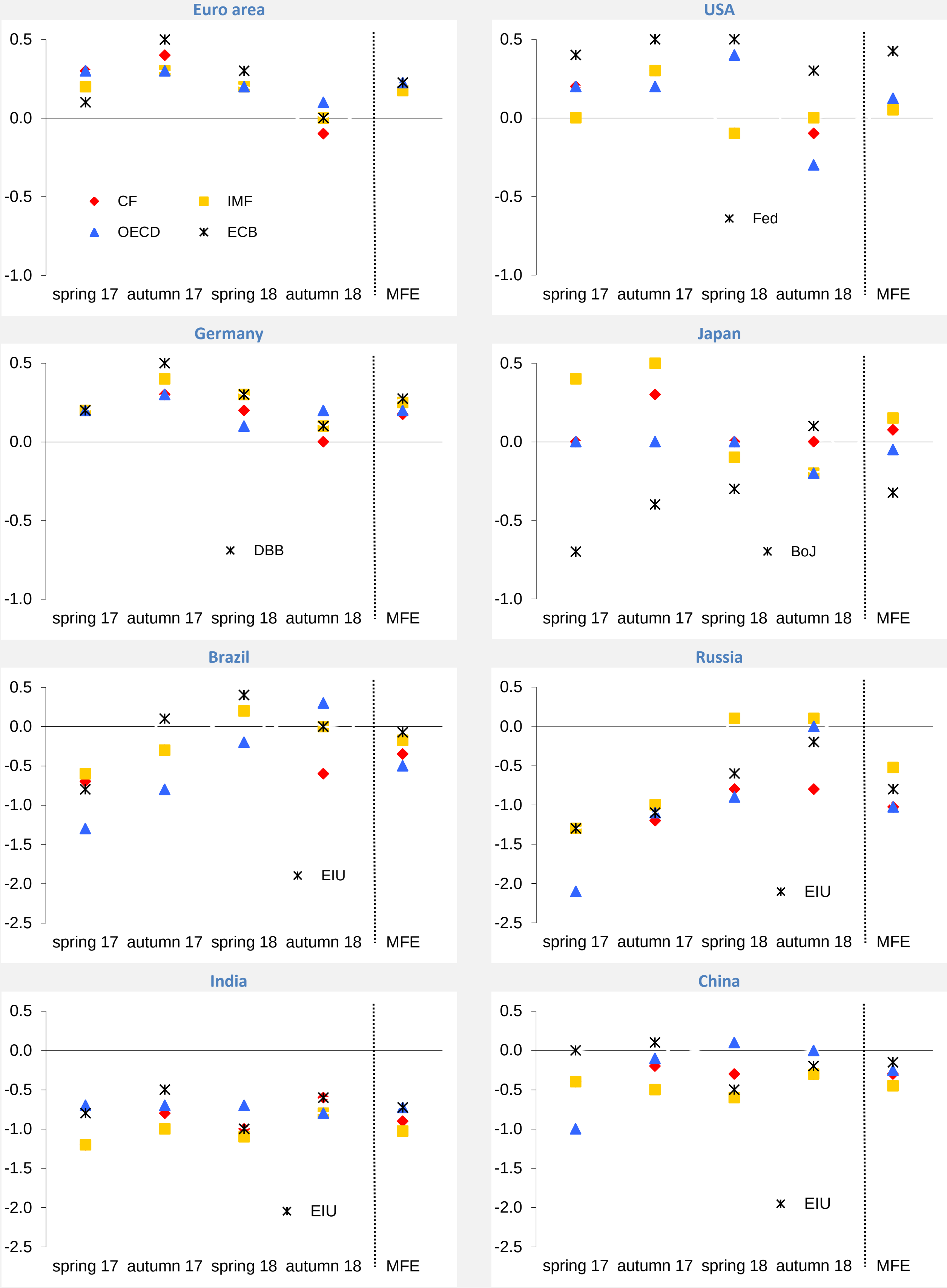
[6] Data for India pertain to the fiscal year, which begins on 1 April.

Chart 3 Forecast errors for GDP growth for 2018 (pp)



Note: CF – Consensus Forecasts, IMF – International Monetary Fund, OECD – Organisation for Economic Cooperation and Development, ECB – European Central Bank, Fed – Federal Reserve System of the USA, DBB – Deutsche Bundesbank, BoJ – Bank of Japan, EIU – Economist Intelligence Unit. MFE is the mean forecast error for the given year.

Chart 4 Forecast errors for consumer price inflation for 2018 (pp)

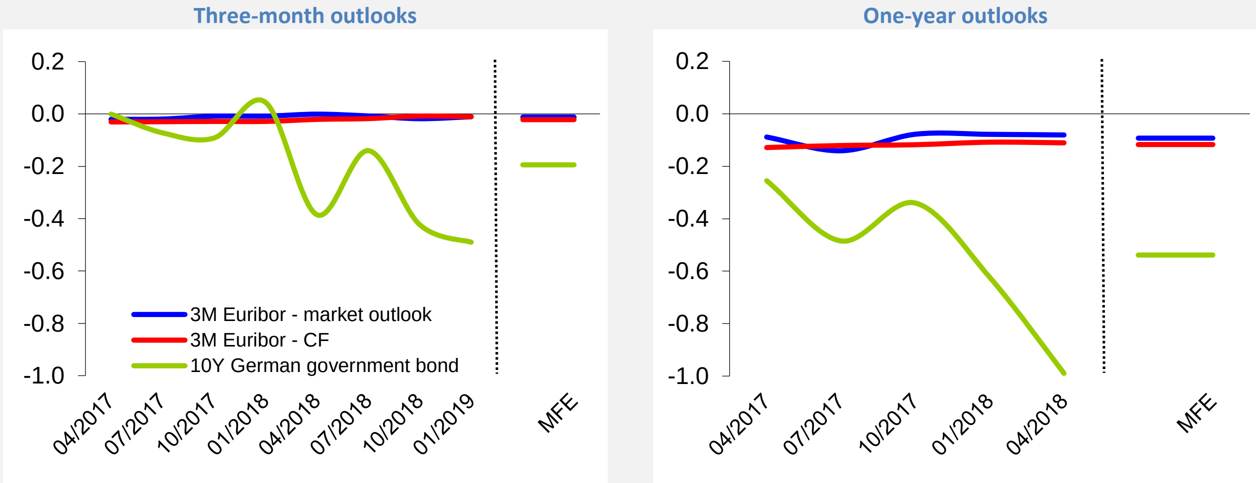


Note: CF – Consensus Forecasts, IMF – International Monetary Fund, OECD – Organisation for Economic Cooperation and Development, ECB – European Central Bank, Fed – Federal Reserve System of the USA, DBB – Deutsche Bundesbank, BoJ – Bank of Japan, EIU – Economist Intelligence Unit. MFE is the mean forecast error for the given year.

Assessment of the accuracy of the forecasts for foreign interest rates

In GEO, interest rate outlooks are monitored for the euro area and the USA. The outlooks for three-month interest rates are derived from futures. By contrast, the outlooks for long-term (ten-year) government bond yields are taken from CF. In the assessment we additionally use alternative three-month rate forecasts published in CF for comparison.

Chart 5 Forecast errors for interest rates for the euro area (pp)

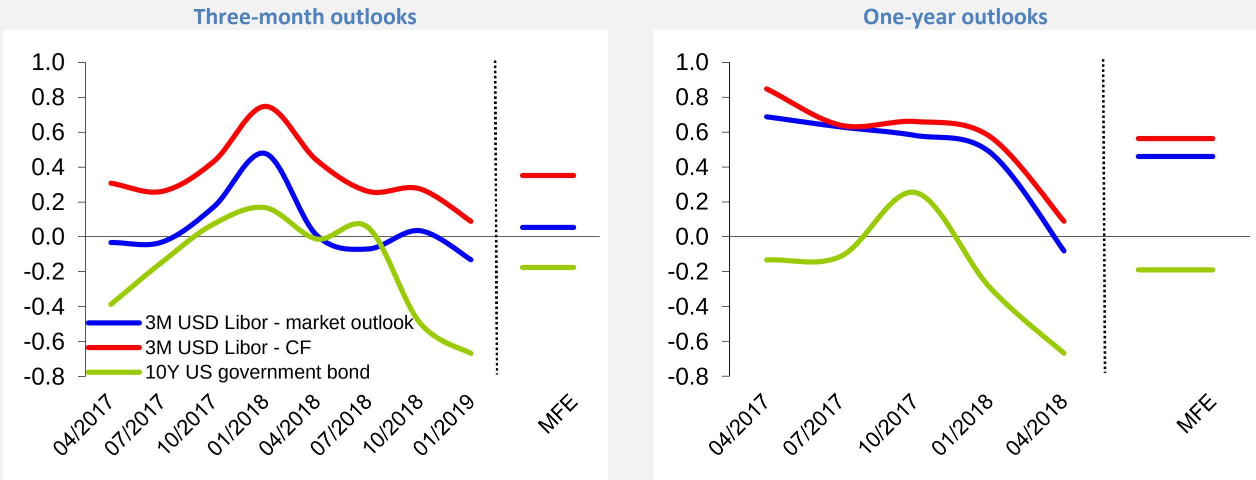


Note: MFE is the mean forecast error for the monitored period.

Short-term interest rate expectations for the euro area differed slightly from those for the USA (see Charts 5 and 6). While slightly higher rates were expected for the euro area, especially at the one-year horizon, the opposite applied to the USA to a much greater extent. On average, slower monetary policy tightening was expected in the USA. In the case of the three-month outlooks, the accuracy of the predictions was affected mainly by central banks' communications. As regards the short-term outlooks for euro rates, the forecasts were led by the ECB's current forward guidance, so expectations were firmly anchored at the current rate level (see Chart 5).

Increased uncertainty about interest rates at the short horizon (the three-month outlooks) was apparent in the USA. The first monetary policy rate increase (the first in seven years) happened in December 2015. This was followed by three hikes in 2017 and four hikes in 2018. It is therefore not very surprising that the error in the CF forecast for dollar rates at the three-month horizon was only slightly lower than that at the longer, one-year horizon. CF on average expected lower growth in the Fed's rates in the three-month outlook than that which actually materialised. The market outlooks for three-month rates were more accurate than the CF outlooks for both economies under review. We will thus continue to prefer them to the CF prediction in GEO's regular commentaries.

Chart 6 Forecast errors for interest rates for the USA (pp)



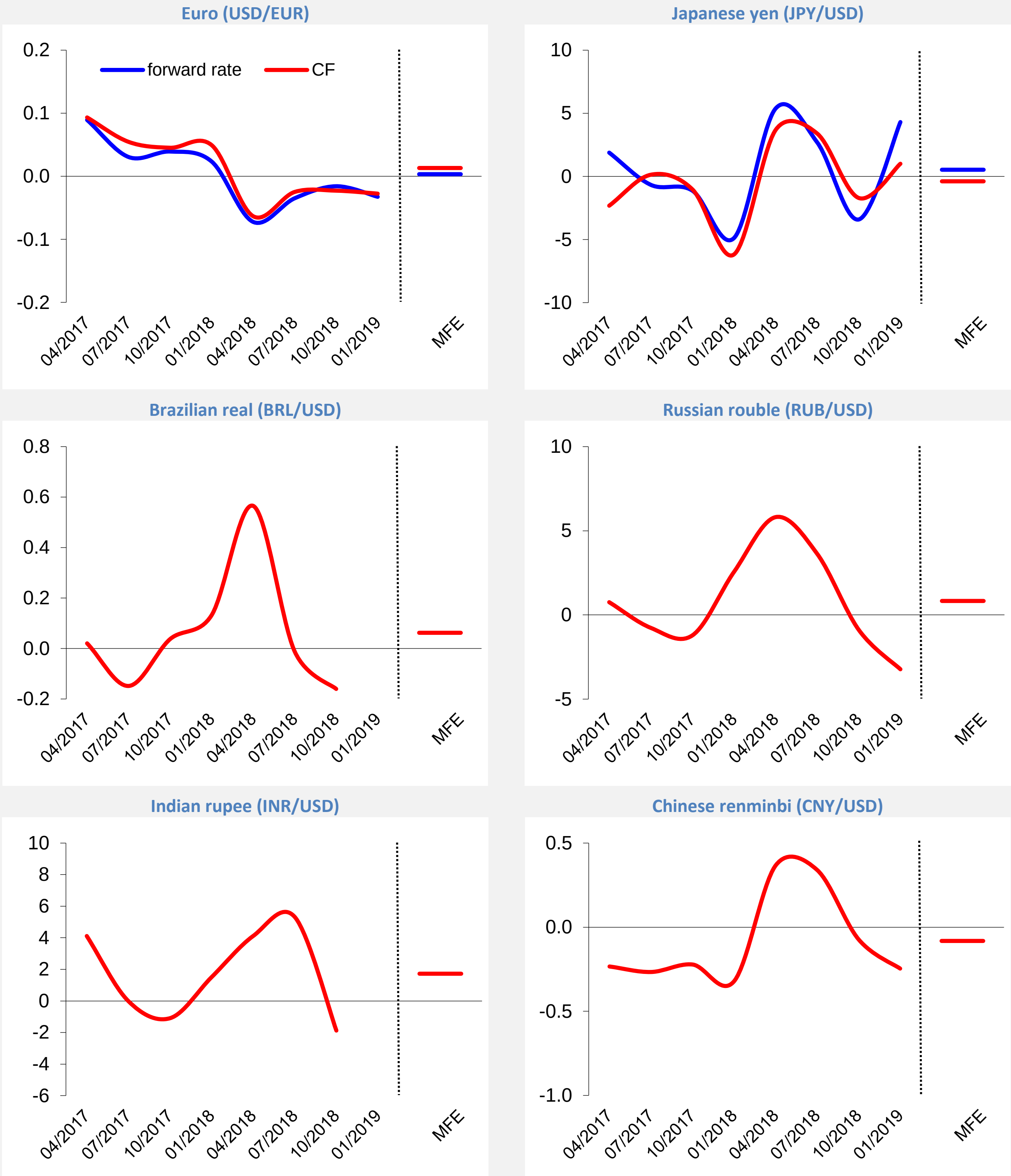
Note: MFE is the mean forecast error for the monitored period.

The forecasts for ten-year government bond yields were slightly overestimated on average both for the USA and the euro area. As for the short-term (three-month) outlooks, they were furthest from reality in January 2019, when they predicted higher yields than those the bonds eventually generated at the three-month horizon. The similarity in the deviations of the forecasts for long-term yields is due to the high correlation between German and US ten-year government bond rates. The deviations of the one-year outlooks for long-term rates increased gradually until April 2018.

Assessment of the accuracy of the forecasts for the dollar exchange rate

The deviations of the monitored exchange rates were negligible on average, especially in the three-month outlooks (see Chart 7 and the left-hand part of Chart 9). GEO provides information about

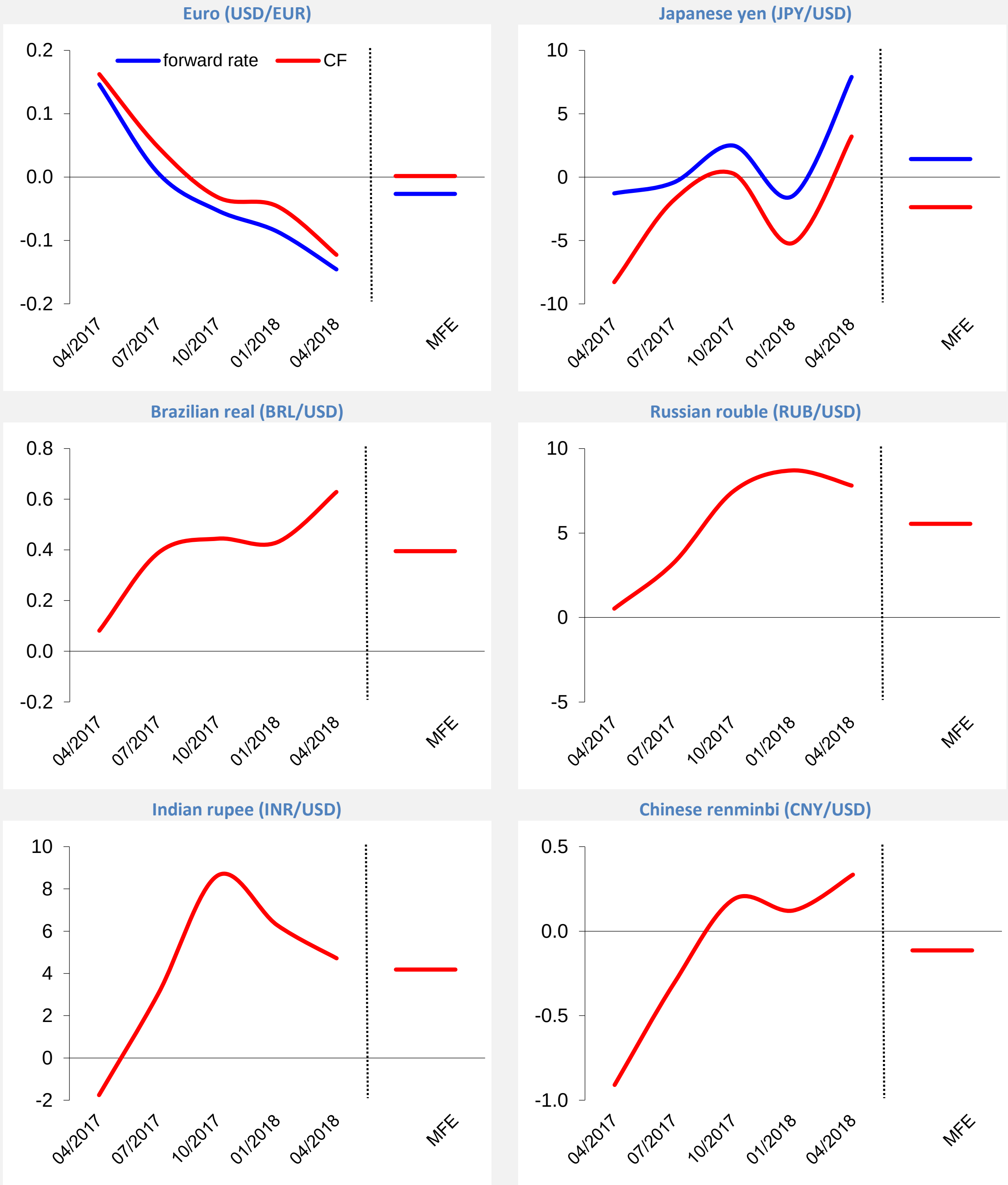
Chart 7 Three-month outlooks for exchange rates (deviations from reality)



Note: CF – Consensus Forecasts. MFE is the mean forecast error for the monitored period.

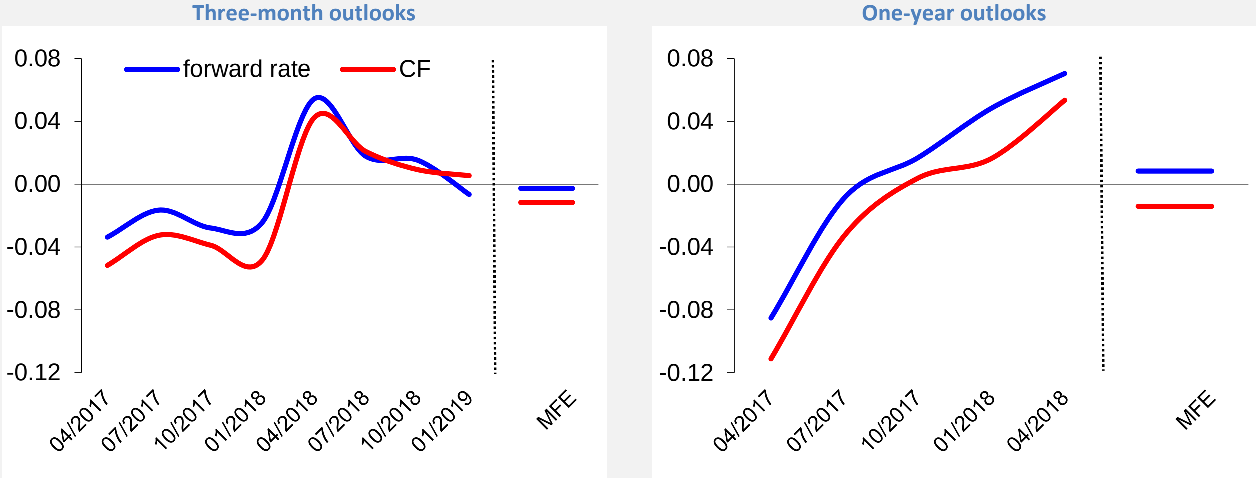
the outlooks for the exchange rates of selected currencies against the US dollar based on CF forecasts. In addition, forward rates are given for the euro, the Japanese yen and, since 2017, sterling. They are based on covered interest parity and represent the current ability to hedge the future exchange rate rather than the outlook. The outlooks derived from market contracts were more accurate than the CF outlooks in the case of sterling. By contrast, CF predicted better the one-year outlook for the euro (see Chart 8 and the right-hand part of Chart 9). The deviations of the three-month outlooks across currency pairs were similar. The highest error was recorded for a weaker dollar outlook in mid-2018. The euro-dollar outlooks deviated relatively less than the other currency pairs in the monitored period. As for one-year-outlooks, however, a stronger dollar against the euro than was the outcome was initially expected (until 2017 H2), followed by a weaker one. The errors in the one-year outlooks for the sterling-dollar rate were also fairly similar.

Chart 8 One-year outlooks for exchange rates (deviations from reality)



Note: CF – Consensus Forecasts. MFE is the mean forecast error for the monitored period.

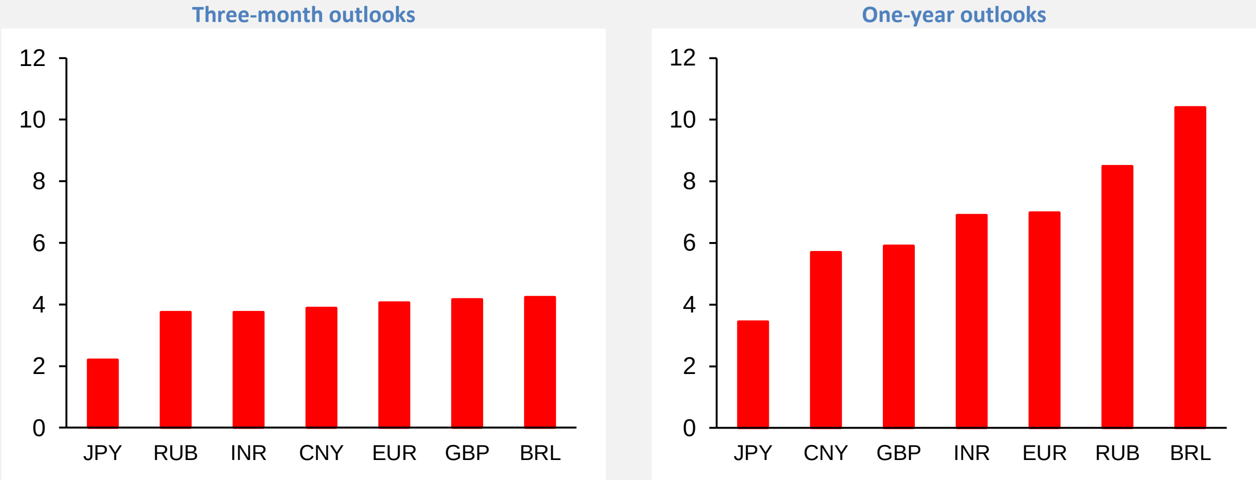
Chart 9 Forecast errors for the exchange rate of sterling (GBP/USD)



Note: CF – Consensus Forecasts. MFE is the mean forecast error for the monitored period.

The exchange rate of the Japanese yen was the most accurate of all the currency pairs at both the three-month and one-year horizons. By contrast, the forecasts for the Brazilian real were the worst performers (see Chart 10). The MAPE is used to compare the accuracy of CF forecasts across the currencies' rates against the dollar. This comparison also reveals that the forecasts for exchange rates against the dollar were relatively accurate, especially at the three-month horizon.

Chart 10 MAPE – forecast errors for the exchange rates of selected currencies against the dollar



Note: MAPE is the mean absolute percentage error.

Assessment of the accuracy of the Brent crude oil price forecasts

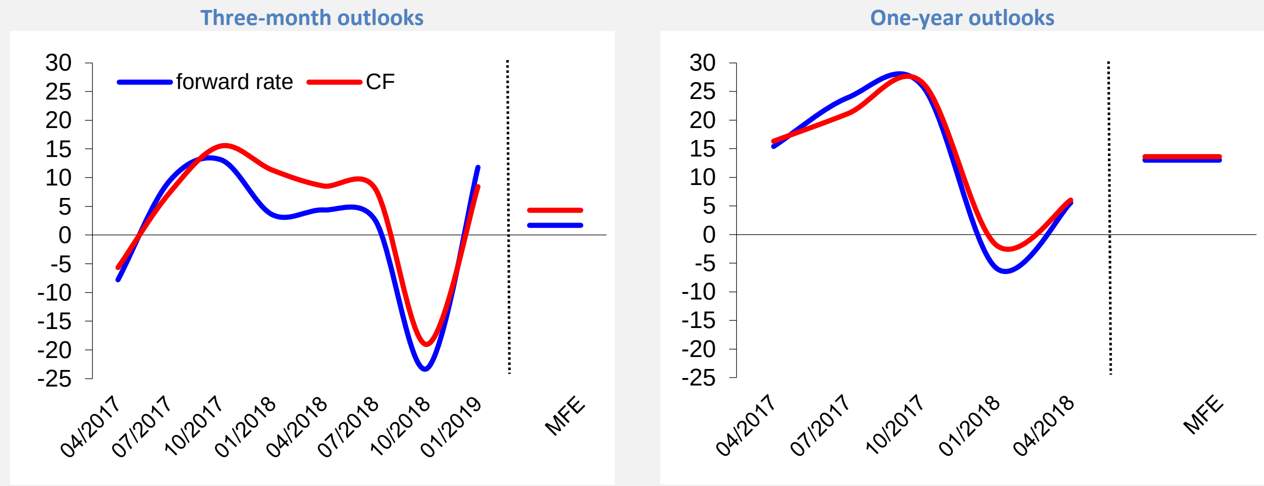
The market outlooks for the Brent crude oil price derived from both futures contracts and CF outlooks underestimated the actual price at both the three-month and one-year horizons. The picture is similar as in 2018. The curves of the forecast errors (see Chart 11) show that this was due mainly to a rise in the oil price from summer 2017 on. A comparison of the accuracy of the market outlooks and CF outlooks shows that the former were slightly more accurate. GEO regularly describes both types of outlooks.

Conclusion

This article uses simple methods to assess the accuracy of the forecasts monitored in GEO over the past year. The accuracy of the forecasts of the institutions covered by GEO changes from year to year (see Table 1). This is one of the reasons why several institutions' forecasts are monitored in GEO. However, longer time period would be needed to assess them more accurately.[7] The accuracy of the CF forecasts, which are a key input into the CNB's own forecast for the Czech economy, is comparable with the available alternative forecasts. However, CF has the advantage of being published monthly and covering

[7] One such assessment relevant to the CNB is Novotný and Raková (2010): *Assessment of Consensus Forecasts Accuracy: The Czech National Bank Perspective*. WP CNB.

Chart 11 Forecast errors for the Brent oil price (USD a barrel)



Note: CF – Consensus Forecasts. MFE is the mean forecast error for the monitored period.

a relatively wide range of economic variables. The high accuracy of CF stems from its defining characteristic, namely that it is the simple average of the forecasts from the contributing private institutions.[8] In the case of financial variables and the Brent crude oil price, forecasts derived from market futures contracts were more accurate than CF forecasts.

Table 1 Aggregate table of mean forecast errors (MFE)

MFE	CF		OECD		IMF		EIU	
in pp	2017	2018	2017	2018	2017	2018	2017	2018
GDP growth – adv. countries	0.60	-0.14	0.57	-0.13	0.63	-0.11	-	-
GDP growth – BRIC countries	0.03	-0.27	0.29	-0.10	0.19	-0.09	0.11	-0.08
Inflation – adv. countries	-0.08	0.05	-0.13	0.02	-0.03	0.06	-	-
Inflation – BRIC countries	-0.94	-0.64	-1.43	-0.63	-1.24	-0.54	-1.01	-0.44

	CF		FWD/FUTURES	
	2017	2018	2017	2018
3M Euribor (in pp)	-0.06	-0.07	-0.02	-0.05
3M Libor USD (in pp)	0.43	0.46	0.23	0.26
USD/EUR	0.06	0.01	0.03	-0.01
Brent crude oil (USD/bbl)	5.95	8.98	4.58	7.36

Note: The smallest average forecast error in the given year for the given indicator is shown in grey. A positive forecast error means that the forecasted value undershot the subsequent outcome, while a negative error means that it overshot it. CF – Consensus Forecasts, OECD – Organisation for Economic Cooperation and Development, IMF – International Monetary Fund, EIU - Economist Intelligence Unit.

Keywords:

Forecast error, economic outlook, Consensus Forecasts

JEL Classification

E66, E27, C18

[8] The characteristics of CF are described in more detail in an earlier article *How consensus has evolved in Consensus Forecasts* by Tomáš Adam and Jan Hošek in GEO 04/2015.

A1. Change in predictions for 2019

GDP growth, %

	CF		IMF		OECD		CB / EIU	
EA	0	2019/6 2019/5	-0.3	2019/4 2019/1	+0.2	2019/5 2019/3	+0.1	2019/6 2019/3
DE	0	2019/6 2019/5	-0.5	2019/4 2019/1	0	2019/5 2019/3	-1.0	2019/6 2018/12
US	-0.1	2019/6 2019/5	-0.2	2019/4 2019/1	+0.2	2019/5 2019/3	-0.2	2019/3 2018/12
UK	0	2019/6 2019/5	-0.3	2019/4 2019/1	+0.4	2019/5 2019/3	+0.3	2019/5 2019/2
JP	+0.2	2019/6 2019/5	-0.1	2019/4 2019/1	-0.1	2019/5 2019/3	-0.1	2019/4 2019/1
CN	0	2019/6 2019/5	+0.1	2019/4 2019/1	0	2019/5 2019/3	+0.1	2019/5 2019/4
RU	0	2019/5 2019/4	0	2019/4 2019/1	0	2019/5 2019/3	-0.1	2019/4 2019/1

Inflation, %

	CF		IMF		OECD		CB / EIU	
EA	-0.1	2019/6 2019/5	-0.4	2019/4 2018/10	-0.7	2019/5 2018/11	+0.1	2019/6 2019/3
DE	0	2019/6 2019/5	-0.5	2019/4 2018/10	-0.7	2019/5 2018/11	0	2019/6 2018/12
US	0	2019/6 2019/5	-0.1	2019/4 2018/10	-0.7	2019/5 2018/11	-0.1	2019/3 2018/12
UK	-0.1	2019/6 2019/5	-0.4	2019/4 2018/10	-0.6	2019/5 2018/11	-0.4	2019/5 2019/2
JP	0	2019/6 2019/5	-0.2	2019/4 2018/10	-0.6	2019/5 2018/11	0	2019/4 2019/1
CN	0	2019/6 2019/5	-0.1	2019/4 2018/10	-1.1	2019/5 2018/11	0	2019/5 2019/4
RU	0	2019/5 2019/4	-0.1	2019/4 2018/10	-0.2	2019/5 2018/11	0	2019/4 2019/1

A2. Change in predictions for 2020

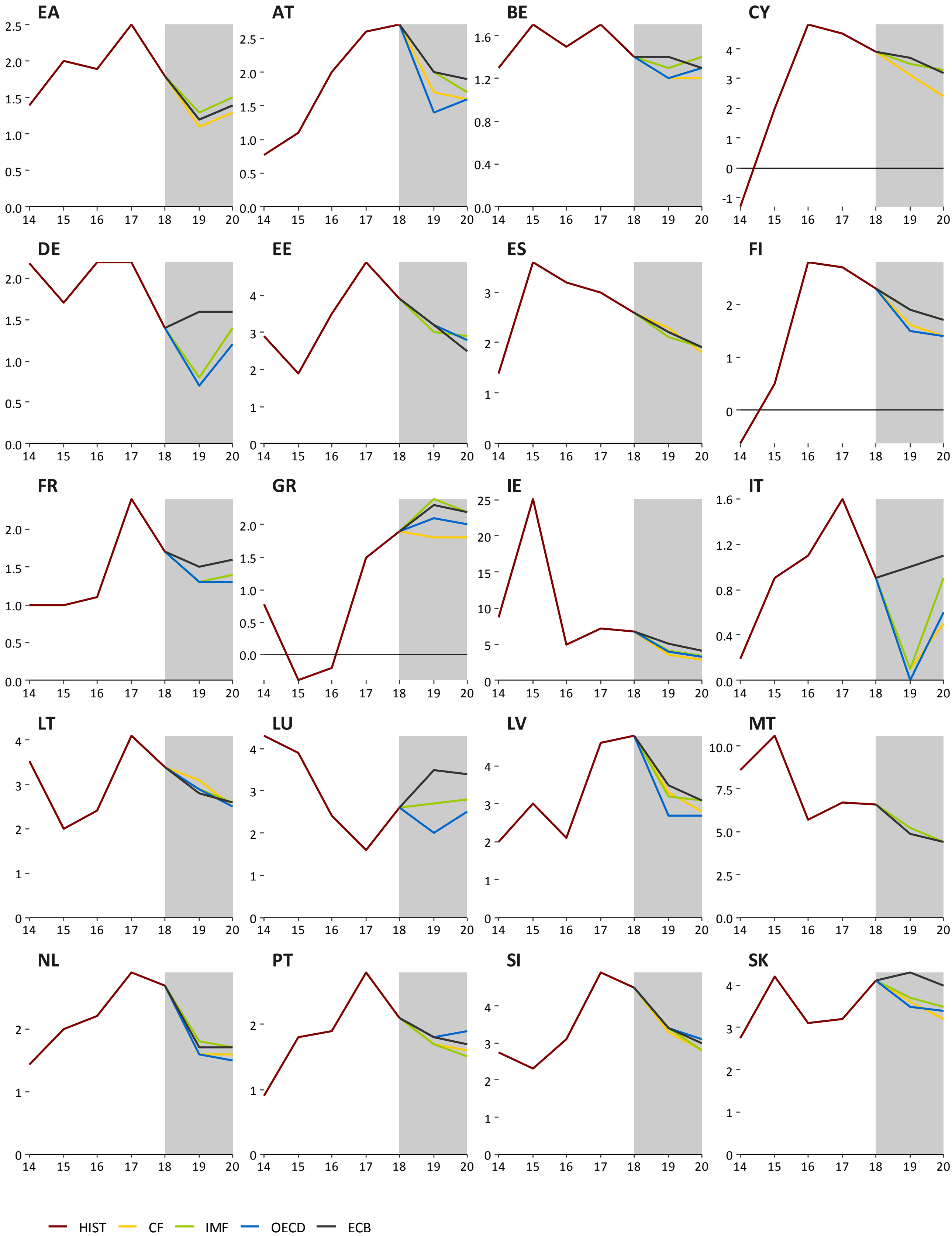
GDP growth, %

	CF		IMF		OECD		CB / EIU	
EA	0	2019/6 2019/5	-0.2	2019/4 2019/1	+0.2	2019/5 2019/3	-0.2	2019/6 2019/3
DE	-0.1	2019/6 2019/5	-0.2	2019/4 2019/1	+0.1	2019/5 2019/3	-0.4	2019/6 2018/12
US	-0.1	2019/6 2019/5	+0.1	2019/4 2019/1	+0.1	2019/5 2019/3	-0.1	2019/3 2018/12
UK	0	2019/6 2019/5	-0.2	2019/4 2019/1	+0.1	2019/5 2019/3	+0.1	2019/5 2019/2
JP	0	2019/6 2019/5	0	2019/4 2019/1	-0.1	2019/5 2019/3	-0.1	2019/4 2019/1
CN	-0.1	2019/6 2019/5	-0.1	2019/4 2019/1	0	2019/5 2019/3	0	2019/5 2019/4
RU	0	2019/5 2019/4	0	2019/4 2019/1	+0.6	2019/5 2019/3	0	2019/4 2019/1

Inflation, %

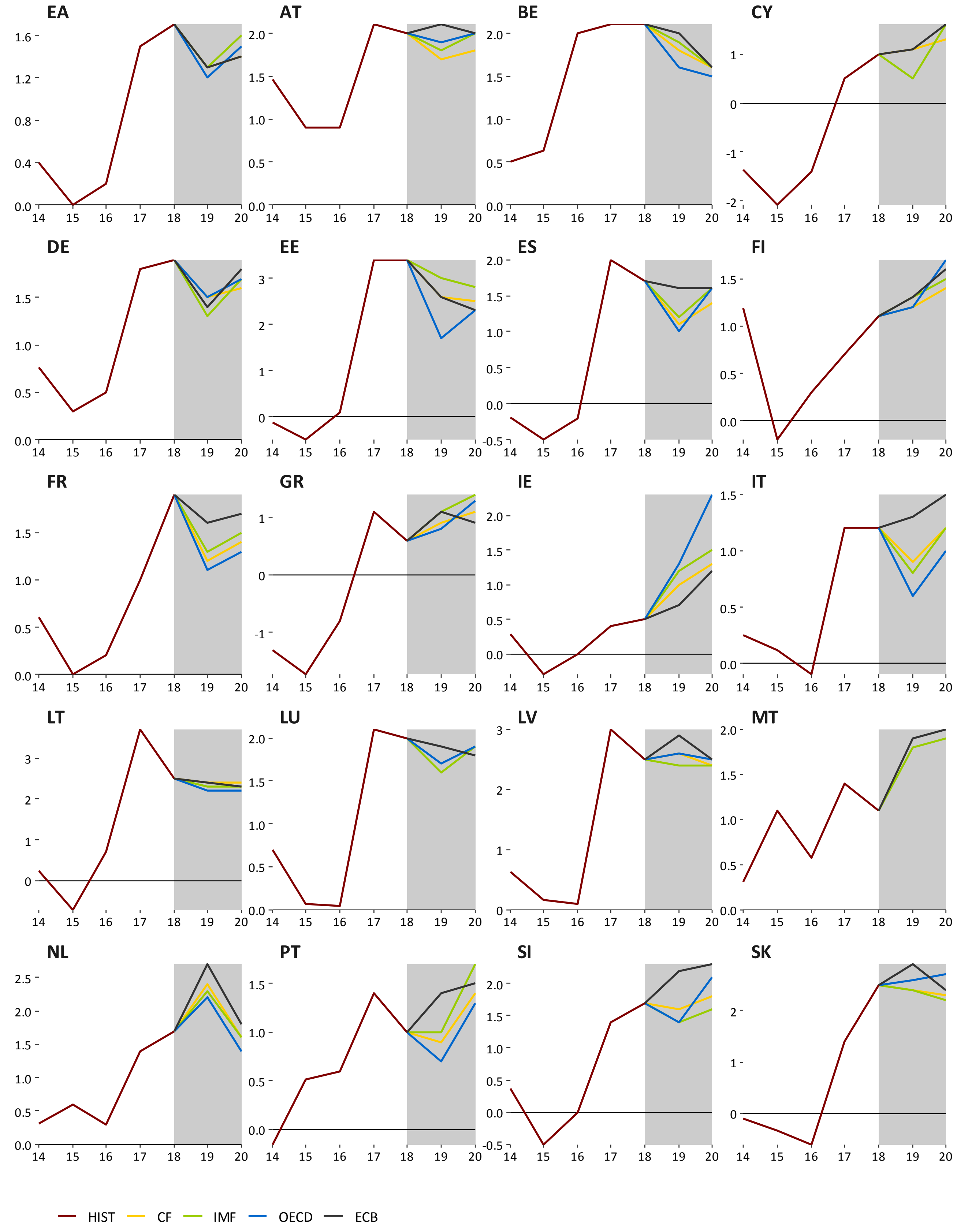
	CF		IMF		OECD		CB / EIU	
EA	0	2019/6 2019/5	-0.2	2019/4 2018/10	-0.4	2019/5 2018/11	-0.1	2019/6 2019/3
DE	0	2019/6 2019/5	-0.4	2019/4 2018/10	-0.5	2019/5 2018/11	-0.3	2019/6 2018/12
US	0	2019/6 2019/5	+0.4	2019/4 2018/10	-0.3	2019/5 2018/11	-0.1	2019/3 2018/12
UK	0	2019/6 2019/5	0	2019/4 2018/10	-0.2	2019/5 2018/11	-0.1	2019/5 2019/2
JP	0	2019/6 2019/5	-0.2	2019/4 2018/10	-0.4	2019/5 2018/11	-0.1	2019/4 2019/1
CN	+0.1	2019/6 2019/5	-0.2	2019/4 2018/10	-0.9	2019/5 2018/11	+0.4	2019/5 2019/4
RU	-0.1	2019/5 2019/4	-0.3	2019/4 2018/10	0	2019/5 2018/11	0	2019/4 2019/1

A3. GDP growth in the euro area countries



Note: The chart shows institutions' latest available outlooks of for the given country (in %).

A4. Inflation in the euro area countries



Note: The chart shows institutions' latest available outlooks of for the given country (in %).

A5. List of abbreviations

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