

GLOBAL ECONOMIC OUTLOOK - JUNE

Monetary Department
External Economic Relations Division

2017

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Cut-off date for data

16 June 2017

CF survey date

12 June 2017

GEO publication date

23 June 2017

Notes to charts

ECB and Fed: 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.

Authors

Luboš Komárek	Pavla Břízová	Tomáš Adam	Filip Novotný	Soňa Benecká
Editor-in-chief I. Summary	Editor II.4 United Kingdom	II.1 Euro area	II.2 Germany VI. Focus	II.3 United States III.1 China
Iveta Polášková	Oxana Babecká	Jan Hošek		
II.5 Japan III.2 India	III.3 Russia III.4 Brazil	V.1 Oil and natural gas V.2 Other commodities		

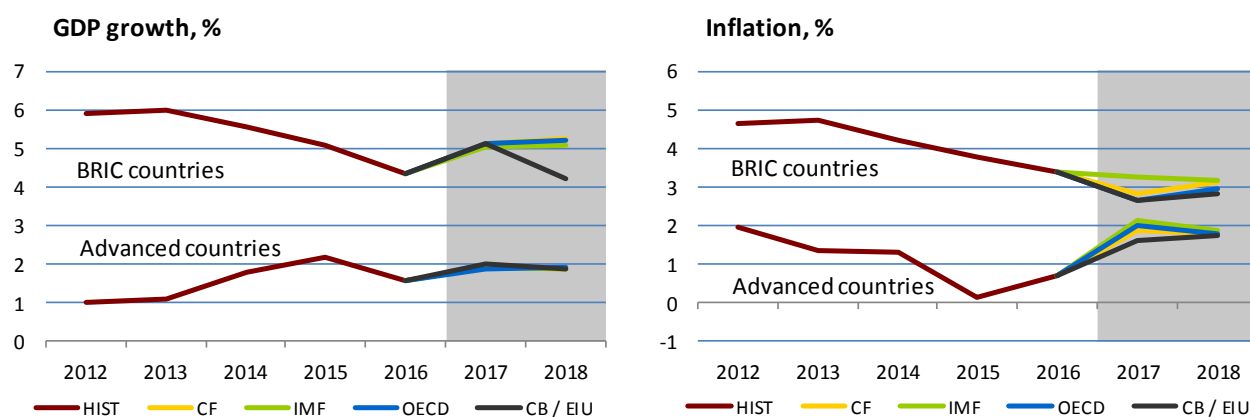
The June issue of Global Economic Outlook presents the regular monthly overview of recent and expected developments in selected territories, focusing on key economic variables: inflation, GDP growth, leading indicators, interest rates, exchange rates and commodity prices. In this issue, we also focus on assessing of the accuracy of the forecasts for 2016 published in Global Economic Outlook last year and the year before. The institutions under comparison were moderately optimistic with their economic outlooks. Their forecasts for GDP growth and inflation for 2016 expected higher figures on average than the subsequent outcomes. The outlooks for nominal interest rates in the USA and the euro area were also overestimated. The dollar did not appreciate against other currencies as much as expected by analysts. The price of oil was also mostly overestimated compared to the actual outcome.

Compared to the previous month, the outlooks for annual GDP growth in selected advanced economies up to the end of 2018 recorded a slight increase in the euro area and Germany, and also in the USA, where the hypothesis that the recent economic slowdown is temporary is being confirmed for now. The growth is expected to reach almost 2.5% at the end of next year. This was confirmed indirectly by the US Fed's interest rate hike in June, although its own predictions are a little more cautious. The GDP growth outlook for the UK for this year has been lowered slightly again. However, the outlooks for next year have been raised, pointing indirectly to confidence that the Brexit negotiations will run smoothly even after the recent parliamentary elections. According to Consensus Forecasts, the inflation figures expected for this year for the USA, Germany and Japan have dropped compared to the May outlooks; the outlooks for Germany and Japan for next year have been lowered as well. In the USA, as in the UK, inflation is expected to be visibly above 2%. Neither the euro area nor Germany will reach this level by the end of next year (probably further delaying any increase in interest rates in the euro area). In Japan, inflation will probably struggle to reach 1%.

Turning to the BRIC group, the growth outlooks for the Chinese and Indian economies were unchanged in May. A gradual slowdown in Chinese economic growth to around 6.5% continues to be expected. The Indian economy is expected to maintain impressive growth of about 7.5%. This is satisfactory news from the perspective of GDP growth. However, the inflation outlooks for both these economies have been lowered. In the case of the Chinese economy, this may send out a warning signal. Inflation in China will probably not exceed 2% in 2017. A shift towards lower imbalances was recorded by the less dynamic emerging economies (Russia and Brazil). The growth rate of the Russian economy is gradually increasing, as confirmed by a revision of its GDP growth this month. The Brazilian economy is not expected to achieve visibly higher performance until next year. Both economies are also expected to record a drop in inflation, which will gradually approach the 4% level from above.

The outlooks for euro area interest rates remain very low. They dropped slightly compared to the previous month in response to communications by ECB representatives. In the USA, by contrast, the June interest rate hike cannot be expected to be the last this year. According to CF, the US dollar will appreciate slightly against the yen, the rupee, the renminbi and the rouble at the one-year horizon and be broadly stable against the other monitored currencies. The outlook for the average Brent crude oil price has dropped to USD 50 a barrel. Prices of non-energy commodities are expected to rise very slightly at the one-year horizon due to food commodity prices, with prices of wheat, rice and corn expected to go up, and due to metals prices.

GDP growth and inflation development and outlook in monitored countries

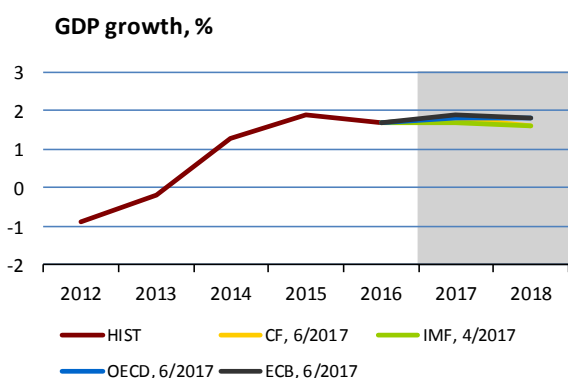


Note: The figures represent the weighted averages of historical series / outlooks in individual countries. The weights are based on nominal GDP measured in USD during 2011–2015 (source: EIU). Advanced countries: euro area, United States, United Kingdom, Japan. BRIC countries: China, India, Russia, Brazil.

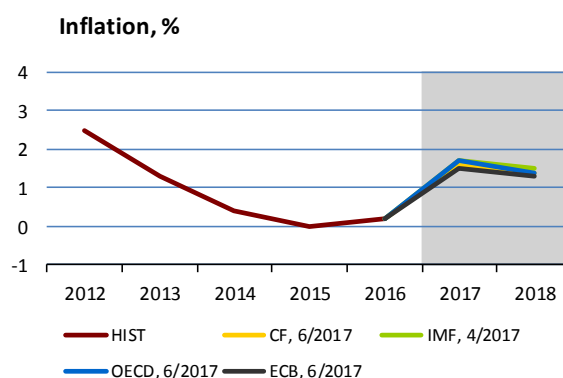
II.1 Euro area

Economic growth in the euro area accelerated slightly to 0.6% in quarter-on-quarter terms at the start of this year and continued to be driven by private domestic demand. The current figures for Q2 indicate that the recovery will continue at a solid pace. The [PMI](#) in manufacturing, for example, increased further in May to a six-year high (57), signalling the fastest expansion for Germany. The economic sentiment indicator (ESI) is also at a several-year high despite a slight drop in May. Favourable economic sentiment and developments in the labour market, where unemployment dropped to 9.3% in May, will – together with the ECB’s still easy monetary policy – foster growth in household consumption. Household consumption is expected to be the main driver of growth over the outlook horizon. According to CF, growth will accelerate to 1.8% this year and slow slightly to 1.6% in 2018. The ECB revised its growth outlook upwards and is slightly more optimistic than CF.

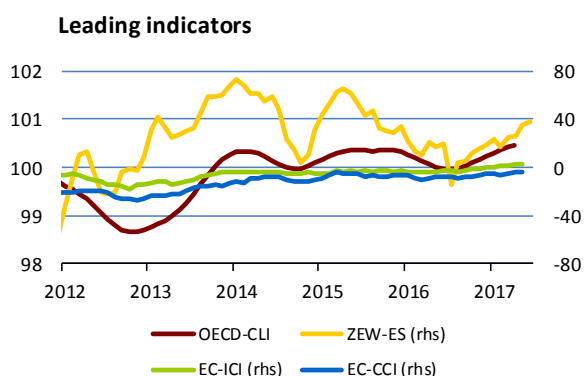
Headline HICP inflation fell by 0.5 pp to 1.4% in May due to a lower contribution from energy prices and the unwinding effect of the temporarily higher Easter-related contribution of transport prices. Core inflation returned to 0.9%, around which it has been fluctuating since mid-2015. Assuming stable energy prices, headline inflation thus should not rise markedly in the months ahead. CF expects an average of 1.6% this year and 1.4% the next. The ECB revised its inflation outlook downwards and expects rather lower average levels than CF. At its June meeting, the ECB confirmed its monetary policy stance. It will thus continue its net asset purchases at a monthly pace of EUR 60 billion until at least the end of this year. It also signalled that it would keep rates at their present levels at least for the duration of the asset purchase programme. Given the absence of a promise of tapering from the ECB, the EURIBOR market outlook shifted downwards slightly for both monitored maturities compared to the previous GEO and remains negative over the entire monitored horizon.



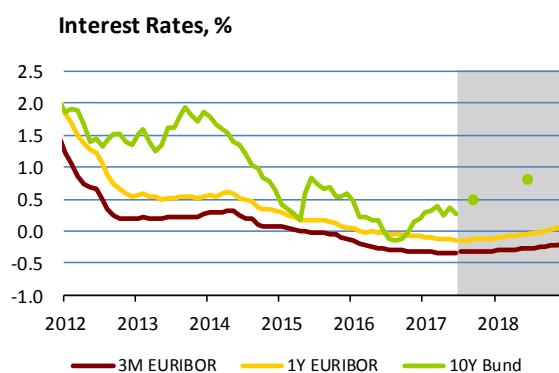
	CF	IMF	OECD	ECB
2017	1.8 ↗	1.7	1.8 ↗	1.9 ↗
2018	1.6 ↘	1.6	1.8 ↗	1.8 ↗



	CF	IMF	OECD	ECB
2017	1.6 ↘	1.7	1.7 ↗	1.5 ↘
2018	1.4 ↘	1.5	1.4 ↘	1.3 ↘



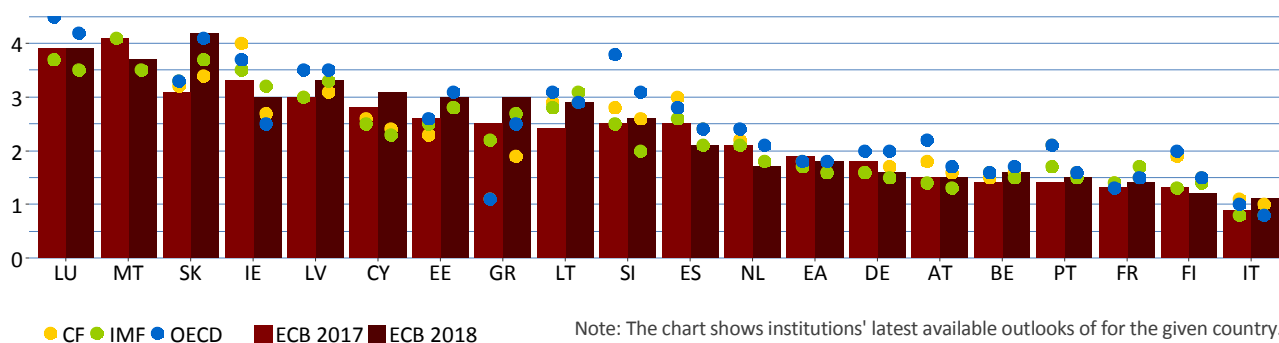
	OECD-CLI	ZEW-ES	EC-ICI	EC-CCI
4/17	100.5	26.3	2.6	-3.6
5/17		35.1	2.8	-3.3
6/17		37.7		



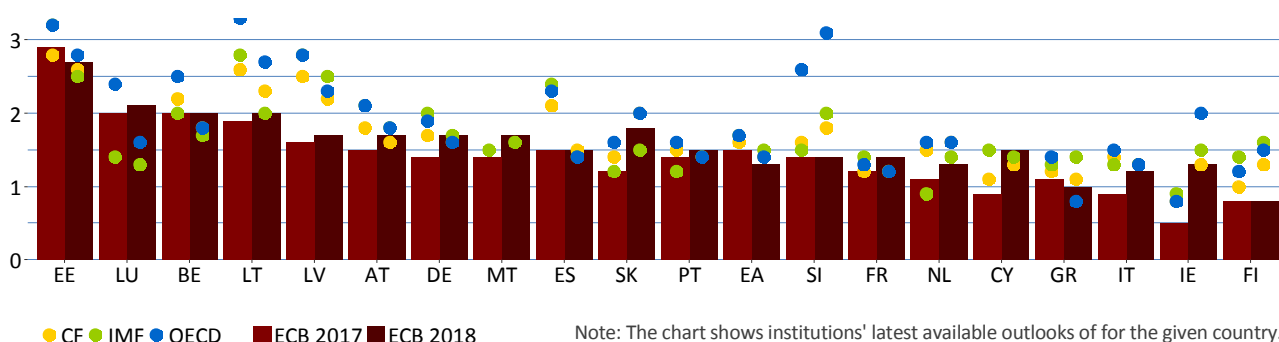
	05/17	06/17	09/17	06/18
3M EURIBOR	-0.33	-0.33	-0.32	-0.27
1Y EURIBOR	-0.13	-0.14	-0.13	-0.04
10Y Bund	0.38	0.28	0.50	0.80

II. ECONOMIC OUTLOOK IN ADVANCED ECONOMIES

GDP growth outlooks in the euro area countries in 2017 and 2018, %

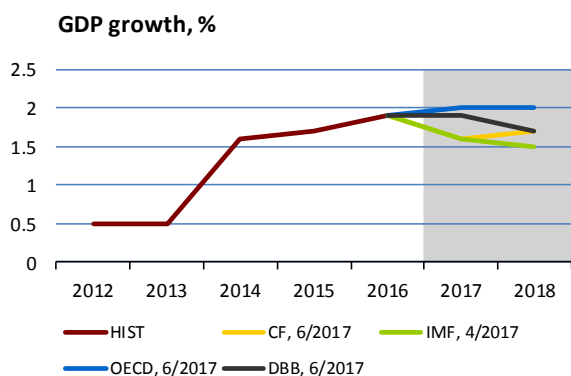


Inflation outlooks in the euro area countries in 2017 and 2018, %

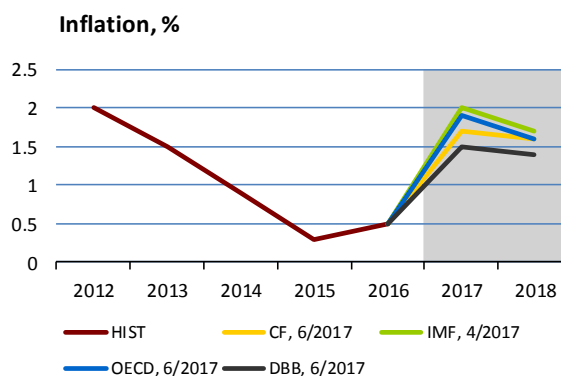


II.2 Germany

The current stable growth of the German economy is expected to continue. The GDP growth outlooks were increased for both this year and the next. In 2017 Q1, annual growth reached a solid level of 1.7%. The contribution of private consumption and government expenditure to total GDP growth decreased compared to the previous quarter. Nevertheless, the contribution of net exports increased. Quarterly GDP growth accelerated to 0.6%, with the growth rate of industrial production rising significantly in Q1. The favourable economic situation is being accompanied by low unemployment, which fell further to an all-time low in May. Leading indicators recorded a further improvement in 2017 Q2. The [PMI](#) in manufacturing rose to a six-year high in May. Inflation slowed to 1.5% in May, with the contribution from energy prices falling markedly. Inflation is expected to be below 2% this year and fall slightly next year.



	CF	IMF	OECD	DBB
2017	1.6 →	1.6	2.0 ↗	1.9 ↗
2018	1.7 ↗	1.5	2.0 ↗	1.7 ↘

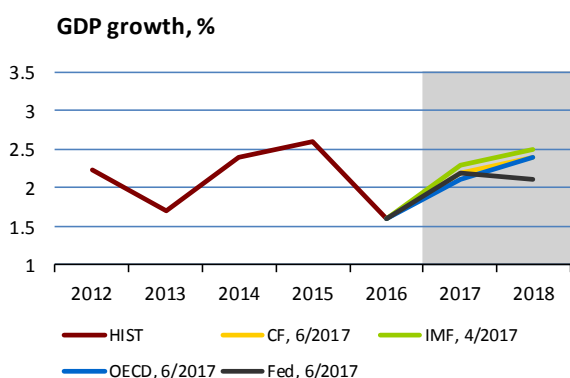


	CF	IMF	OECD	DBB
2017	1.7 ↘	2.0	1.9 ↘	1.5 ↘
2018	1.6 ↘	1.7	1.6 ↘	1.4 ↘

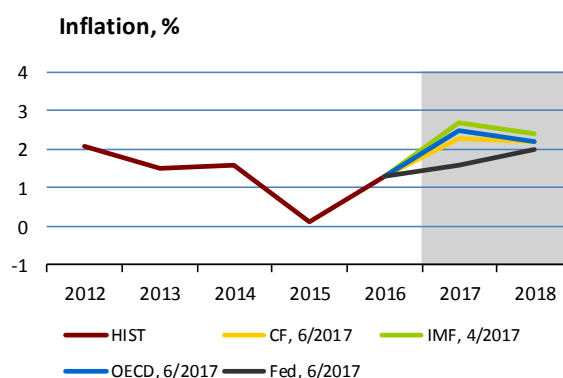
II.3 United States

At its June meeting, the US central bank raised the target range for its key federal funds rate by 25 bp to 1.00%–1.25%. Financial markets had expected this decision. According to CF analysts, the central bank will raise rates once more by the year-end. The Fed also released a plan to reduce its bond portfolio by gradually decreasing reinvestment of principal payments in purchases of further securities. The portfolio will decrease by no more than USD 10 billion a month (USD 6 billion for government bonds and USD 4 billion for other securities). The reinvestment caps will then be raised in three-month steps (of USD 6 billion for government bonds and USD 4 billion for other securities) over one year until they reach USD 50 billion (USD 30 billion and USD 20 billion). The central bank expects reserve balances to decline as a result of the portfolio reduction, although they should remain larger than before the start of the global financial crisis. Nonetheless, the Fed is prepared to resume reinvestment of principal payments as its main monetary policy instrument if a material deterioration in the economic outlook were to warrant a sizeable reduction in the range for its key rate. If monetary policy needed to be eased further, the Fed could also adjust the size and composition of its securities portfolio.

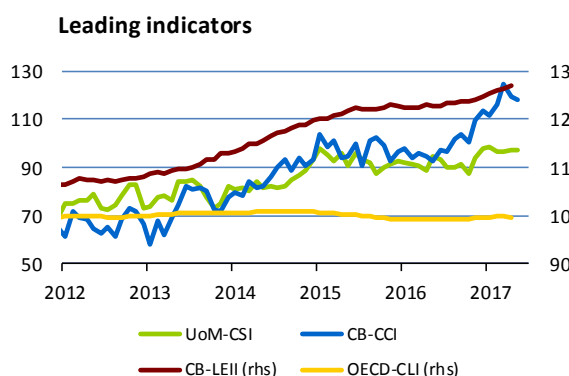
Besides an increase in inflation pressures, a further improvement in the labour market led the Fed to tighten monetary policy. The unemployment rate fell to a 16-year low in May (4.3%), with non-farm payrolls rising by 138,000 (as against an expected 182,000). However, tensions are now starting to appear in the labour market – firms are struggling to find qualified staff, particularly in IT. Headline annual inflation slowed to 1.9% in May and core inflation also dropped sharply (by 1.7%). In the Fed’s view, inflation will remain somewhat below 2% in the near term, but will stabilise around 2% over the medium term. The June CF, like the US central bank, revised its GDP growth outlook upwards and its inflation outlook downwards for this year. By contrast, the OECD’s new forecast contains a downward revision of growth in both years, while its outlook for inflation in 2017 is higher.



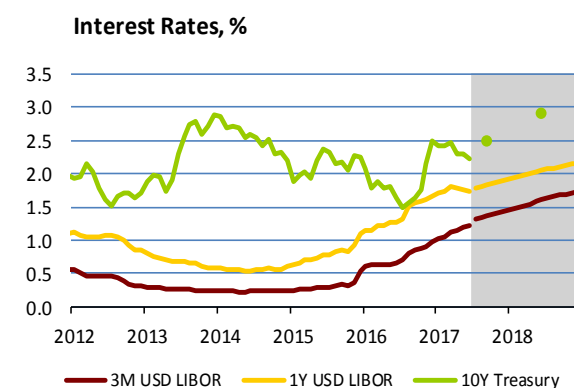
	CF	IMF	OECD	Fed
2017	2.2 ↗	2.3	2.1 ↘	2.2 ↗
2018	2.4 ↗	2.5	2.4 ↘	2.1 ↗



	CF	IMF	OECD	Fed
2017	2.3 ↘	2.7	2.5 ↗	1.6 ↘
2018	2.2 ↗	2.4	2.2 ↗	2.0 ↗



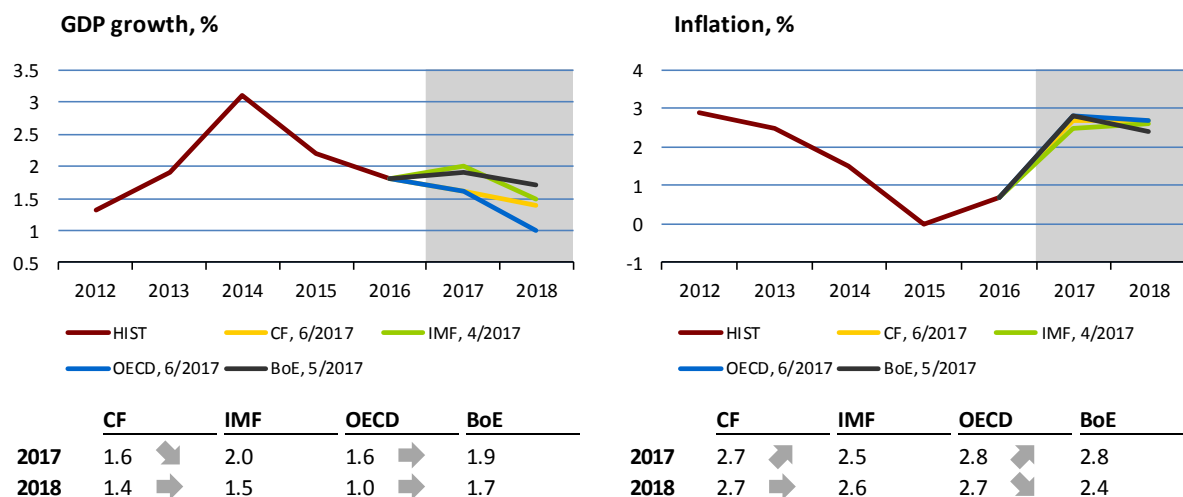
	UoM-CSI	CB-CCI	CB-LEII	OECD-CLI
3/17	96.9	124.9	126.5	99.8
4/17	97.0	119.4	126.9	99.8
5/17	97.1	117.9		



	05/17	06/17	09/17	06/18
USD LIBOR 3M	1.19	1.23	1.36	1.61
USD LIBOR 1R	1.75	1.75	1.83	2.05
Treasury 10R	2.30	2.22	2.50	2.90

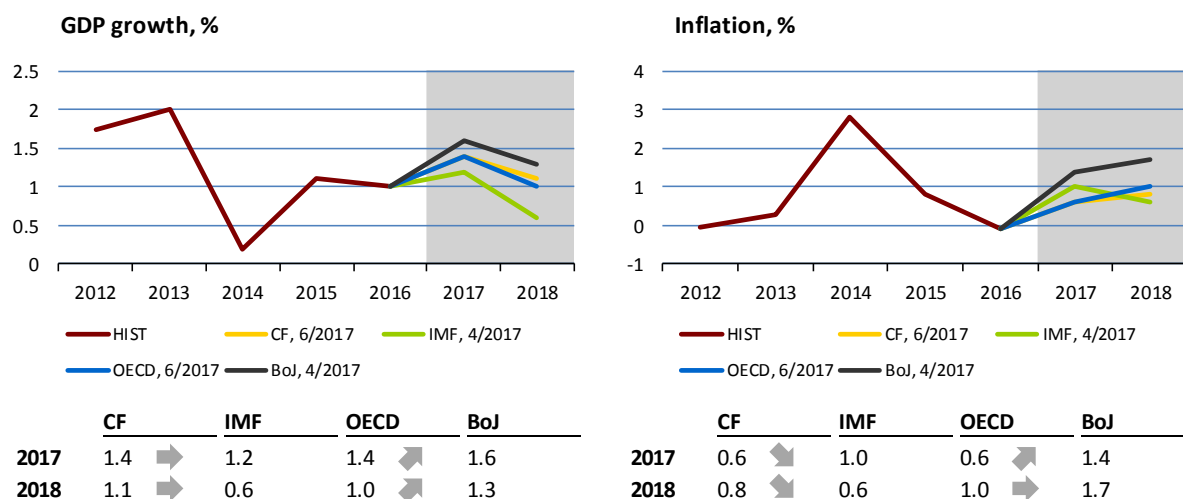
II.4 United Kingdom

The performance of the UK economy was slightly weaker in Q1 than indicated by the first estimates. According to revised data, GDP grew by just 0.2% in quarter-on-quarter terms, with growth in household consumption slowing sharply. Nevertheless, private investment returned to modest growth. The private sector performed well also at the start of Q2. Both industrial production and retail sales recovered from the fall observed in March. However, retail sales dropped in May again. Unemployment remains very low at 4.6%, a level last seen in the UK in 1975. Despite this, consumers have few reasons to spend. The [pound](#) weakened further after the results of the parliamentary elections were released. This fostered growth in inflation, which climbed to 2.9%. The latest outlooks therefore slightly raised the inflation estimates for this year. Inflation overtook wage growth in April, so wages are now falling in real terms. As for the outlooks for economic activity, annual GDP growth is expected to slow to 1.6%, similarly as in Germany.



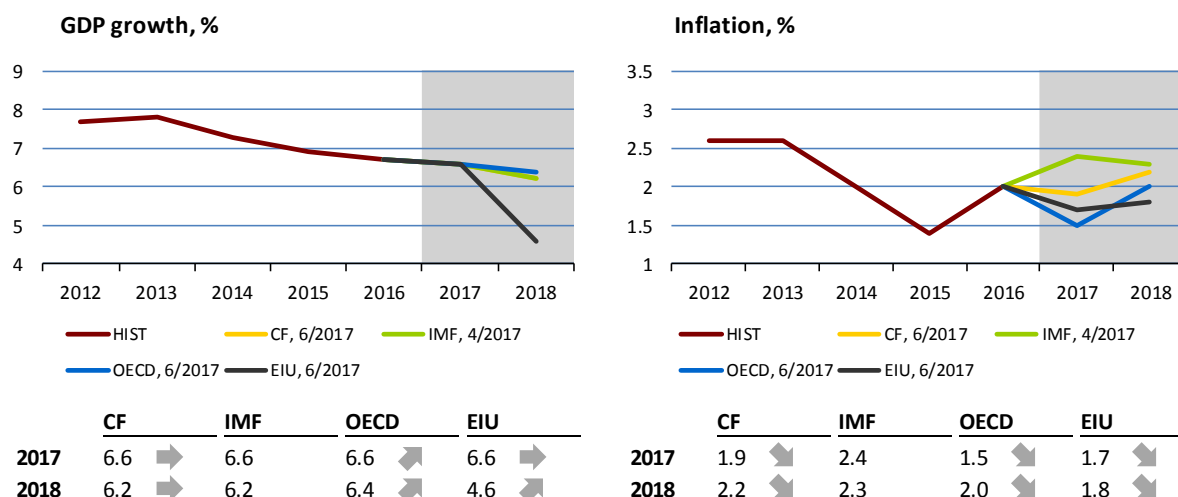
II.5 Japan

The Japanese economy grew at an annualised rate of 1% in 2017 Q1, down 0.2 pp from the previous quarter. The growth was due mainly to capital expenditure and private consumption. Annual retail sales growth rose again in April, driven by accelerating wage growth. Despite this, household expenditure continued to decline year on year. Industrial production growth rose significantly in both year-on-year and month-on-month terms in April. This was due to a rise in production of transport and electrical machinery and equipment. The [PMI](#) in manufacturing went up in May. Purchasing managers have a positive view of output, new orders and employment. The OECD was alone in revising its GDP growth forecast upwards by 0.2 pp for both years. Inflation went up to 0.4% in April on the back of rising transport and food prices. The inflation outlooks for both this year and the next remain well below the central bank's target of 2%. For this and other reasons, the BoJ left its monetary policy stance significantly accommodative at its June meeting.



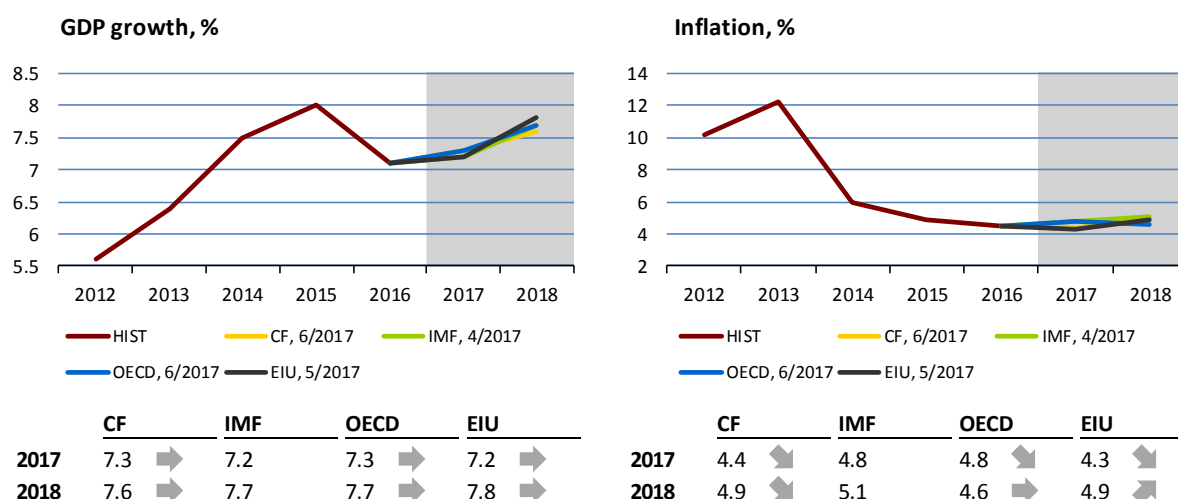
III.1 China

According to the available data, the Chinese economy will slow only slightly in Q2. Retail sales growth exceeded 10% in year-on-year terms in both April and May, while consumer confidence remained at a record high. However, industrial production growth was flat in both April and May (at 6.5% y-o-y) and the leading Caixin/Markit [PMI](#) indicator slid into the contraction band (49.6) in May. China's economic growth thus remains dependent on economic stimuli and the performance of heavy industry, while conditions for smaller firms are more difficult. Moody's cut China's credit rating (from Aa3 to A1 with a stable outlook) for the first time since 1989, citing uncertainty about the success of the efforts of the country's political leaders to reduce the debt burden and deliver economic growth as the reason for its downgrade. The June CF, like the OECD and the EIU, lowered its inflation outlook for both years. In addition, the OECD revised its GDP growth outlooks upwards, while the new EIU forecast raised its outlook for 2018 only.



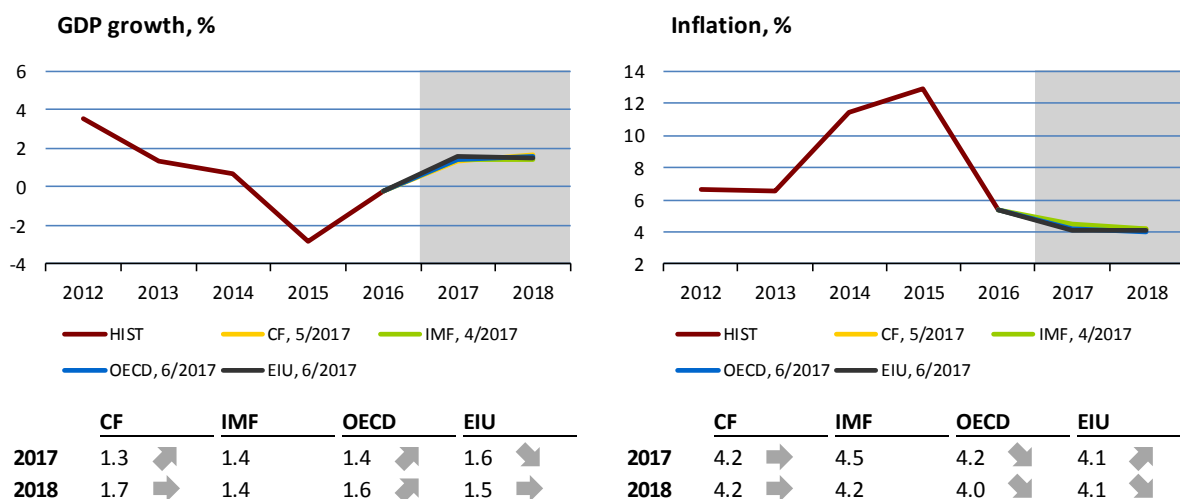
III.2 India

The Indian economy slowed by 0.9 pp to 6.1% in the final quarter of its fiscal year 2016/2017 (2017 Q1) compared to the previous quarter. This was due to a drop in household expenditure and investment following the November demonetisation. GDP rose by 7.1% in fiscal year 2016/2017 as a whole. The growth outlooks for the next two years were unchanged. The economy is thus still expected to accelerate marginally this year. However, the [PMI](#) in manufacturing dropped slightly in May, with growth in all the monitored components slowing according to purchasing managers. Inflation fell to 2.2% in May (the lowest level in more than 15 years) due to a drop in prices of food, in particular pulses and vegetables. Despite this, the RBI left its policy rate unchanged at 6.25% in June. The inflation forecasts for this fiscal year were lowered substantially given the fall in inflation. They are now in the range of 4.3%–4.8%. Only slightly higher figures are expected for the next fiscal year.



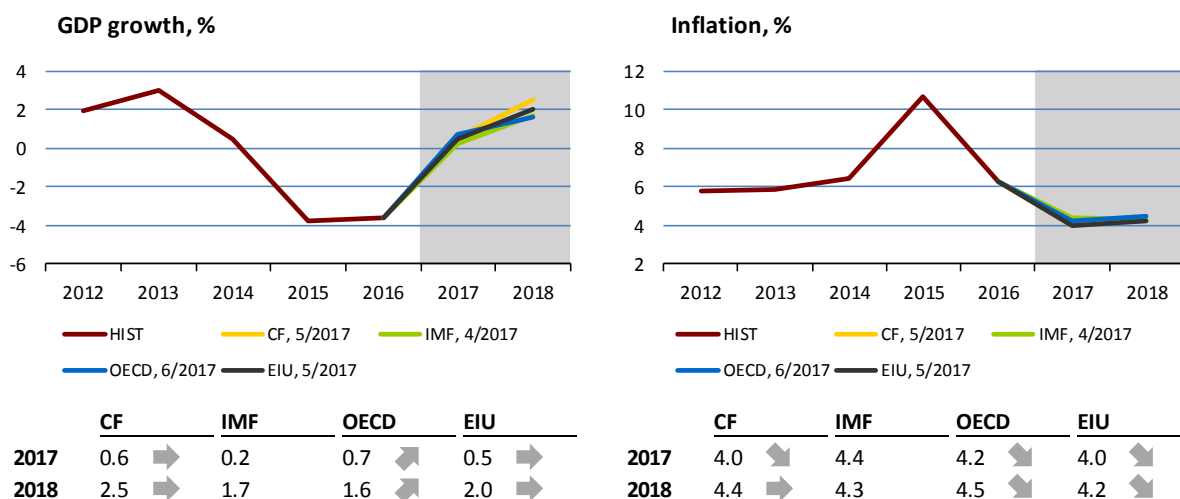
III.3 Russia

According to a preliminary estimate, Russia's economy grew by 0.5% year on year in Q1. Growth was thus observed for the second consecutive quarter (0.3% year on year at the close of last year). The May Markit PMI indicators remain in the economic expansion band. The [PMI](#) in manufacturing rose from 50.8 in the previous month to 52.4 on the back of favourable economic dynamics (growth in industrial production of 2.3% in April, growth in new orders on the domestic market and a rise in employment to a four-year high). The monitored outlooks are in relatively close agreement on future economic developments. According to the new CF, EIU and OECD forecasts, the growth rate of both GDP and consumer prices will remain at roughly the same levels this year and the next. According to the most optimistic forecasts, economic growth will thus not exceed 1.6%–1.7% and inflation will stay at no more than 4.2%.



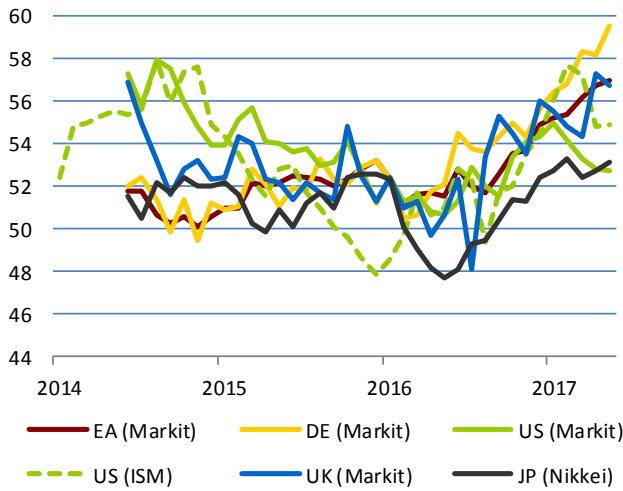
III.4 Brazil

In line with expectations, the Brazilian economy also returned to growth after two years of contraction. GDP recorded quarter-on-quarter growth of 1% in 2017 Q1, driven mainly by exports. Nonetheless, the decline in household expenditure also slowed. In addition, the drop in GDP at the close of last year was reduced by 0.4 pp (to 0.5%) due to data revisions. Economic activity has been falling in year-on-year terms so far (0.4%), although significantly less so than in the previous quarter (2.5%). The [PMI](#) in manufacturing and the [OECD-CLI](#) have been signalling a recovery for some time now. Moreover, Brazil is the only BRIC country where both these leading indicators have been rising sharply and continuously this year. The new CF, EIU and OECD outlooks expect growth of 0.5%–0.7% this year; next year the economy could expand at a rate of 1.6%–2.5% according to their estimates. Consumer inflation is expected to stabilise just above 4%.

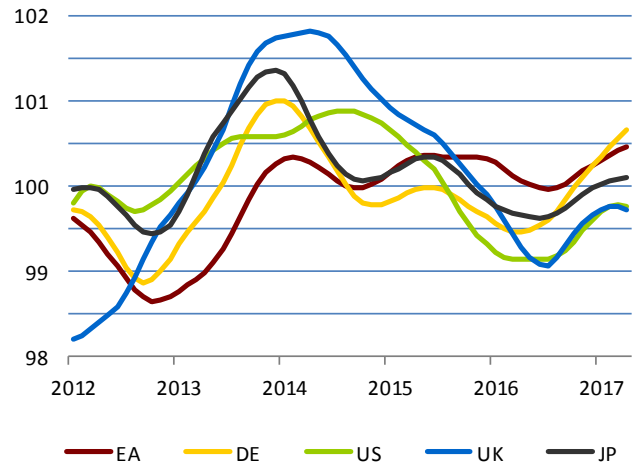


IV.1 Advanced economies

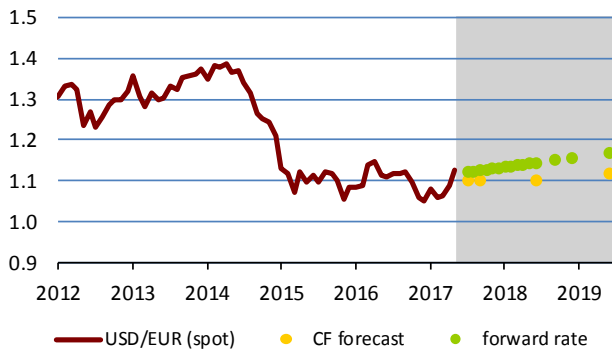
PMI in manufacturing



OECD Composite Leading Indicator



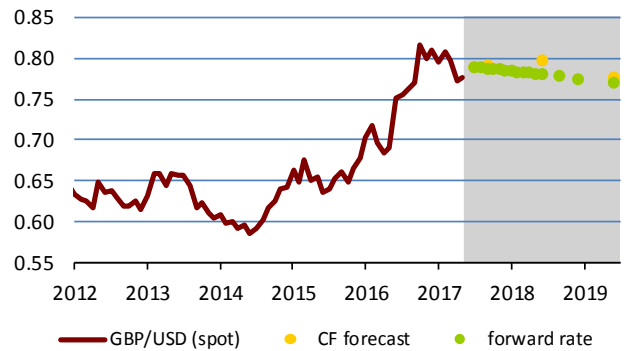
The US dollar (USD/EUR)



12/6/17 07/17 09/17 06/18 06/19

spot rate	1.120				
CF forecast		1.102	1.102	1.103	1.117
forward rate		1.122	1.126	1.144	1.170

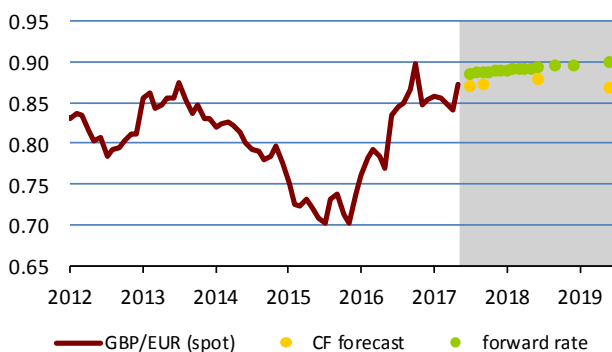
The British pound (GBP/USD)



12/6/17 07/17 09/17 06/18 06/19

spot rate	0.789				
CF forecast		0.790	0.791	0.797	0.776
forward rate		0.789	0.788	0.780	0.769

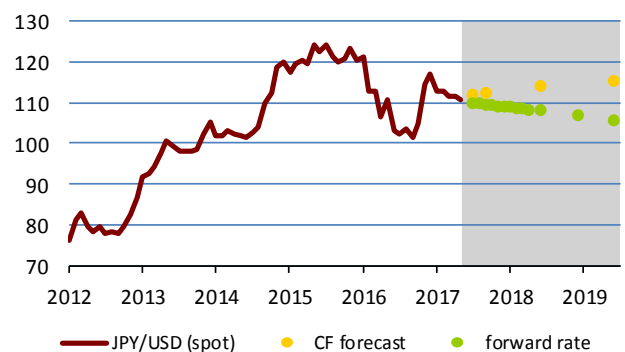
The British pound (GBP/EUR)



12/6/17 07/17 09/17 06/18 06/19

spot rate	0.884				
CF forecast		0.870	0.872	0.879	0.867
forward rate		0.886	0.887	0.892	0.900

The Japanese yen (JPY/USD)



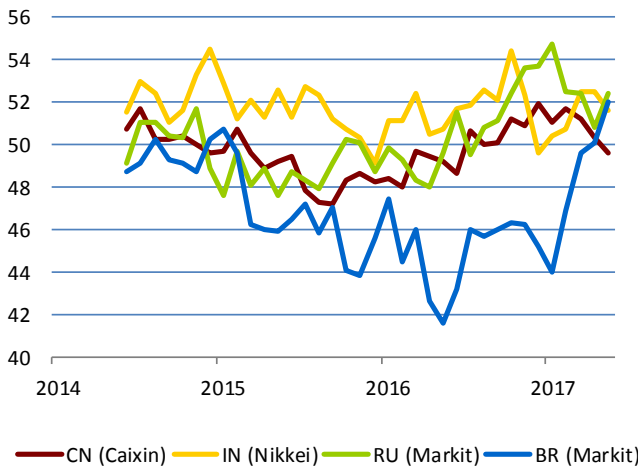
12/6/17 07/17 09/17 06/18 06/19

spot rate	109.8				
CF forecast		111.8	112.5	113.9	115.1
forward rate		109.8	109.5	107.9	105.5

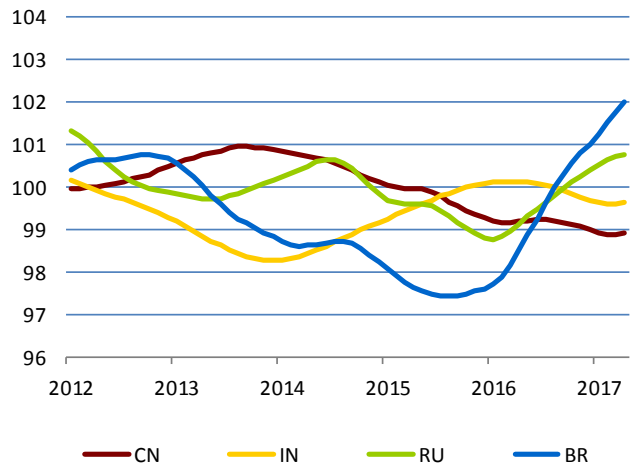
Note: Exchange rates as of last day of month. Forward rate does not represent outlook; it is based on covered interest parity, i.e. currency of country with higher interest rate is depreciating. Forward rate represents current (as of cut-off date) possibility of hedging future exchange rate.

IV.2 BRIC countries

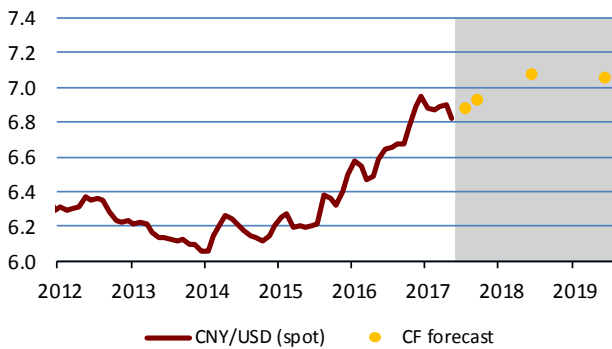
PMI in manufacturing



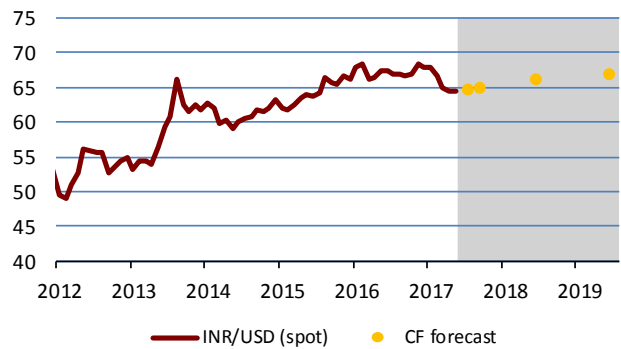
OECD Composite Leading Indicator



The Chinese renminbi (CNY/USD)



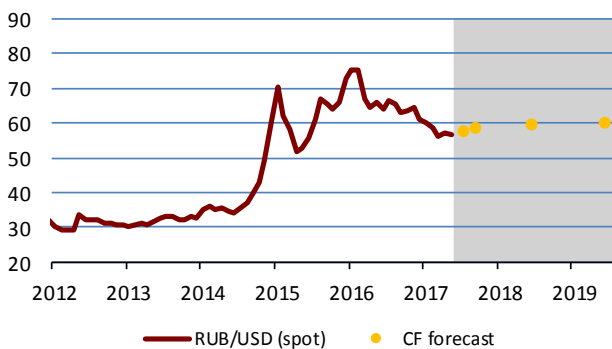
The Indian rupee (INR/USD)



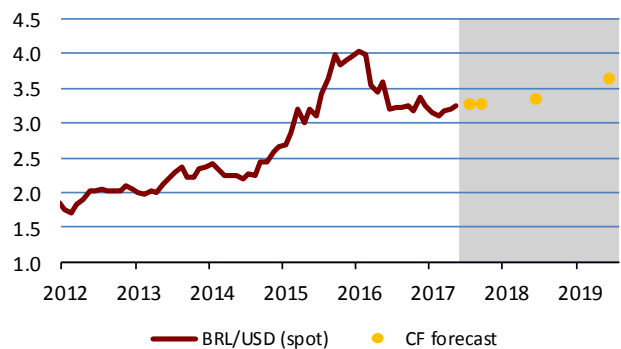
	12/6/17	07/17	09/17	06/18	06/19
spot rate	6.798				
CF forecast		6.878	6.926	7.079	7.053

	12/6/17	07/17	09/17	06/18	06/19
spot rate	64.45				
CF forecast		64.59	64.89	66.05	66.84

The Russian rouble (RUB/USD)



The Brazilian real (BRL/USD)



	12/6/17	07/17	09/17	06/18	06/19
spot rate	56.98				
CF forecast		57.45	58.45	59.57	59.85

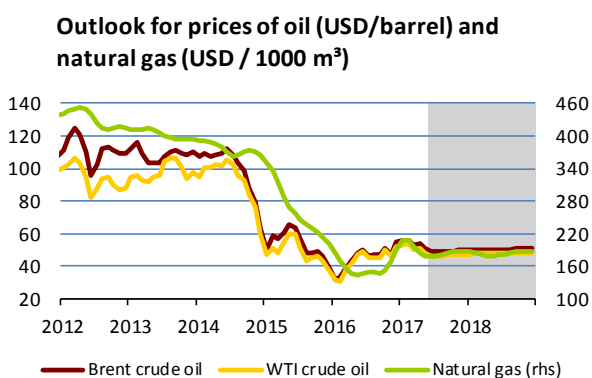
	12/6/17	07/17	09/17	06/18	06/19
spot rate	3.296				
CF forecast		3.27	3.267	3.354	3.629

Note: Exchange rates as of last day of month.

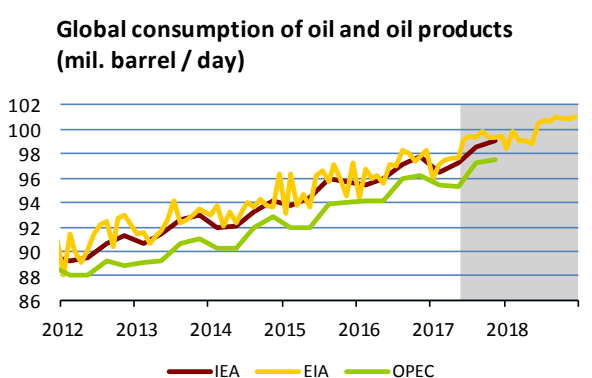
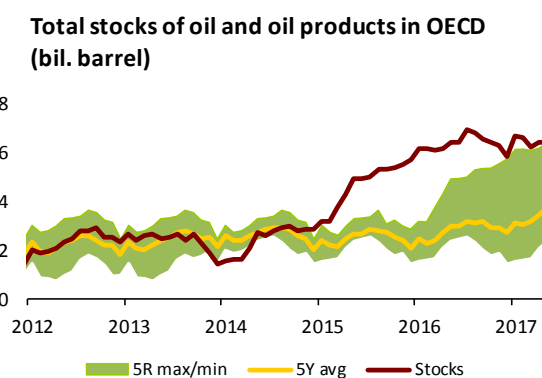
V.1 Oil and natural gas

The Brent crude oil price dropped below USD 50/bbl in early May for the first time in five months. This was due mainly to rising extraction in the USA, Libya and Canada. The oil price went up again in the following two weeks (by USD 4/bbl in total) on growing optimism that OPEC and Russia would maintain reduced output for the rest of this year. However, when the agreement to cut output was extended on 25 May until the end of March 2018 the oil price started falling sharply again, as some traders had expected output to be reduced even more. Brent thus reached USD 47/bbl in mid-June, a level last recorded at the end of November just before OPEC announced the original agreement to limit production. The price drop would probably have been even stronger had it not been counteracted by marked depreciation of the [dollar](#) from April onwards. Demand for oil is regularly higher in the second half of the year. This should lead to a faster fall in global stocks and support the oil price. The weaker growth in demand in India caused by [demonetisation](#) of the local economy is also expected to fade.

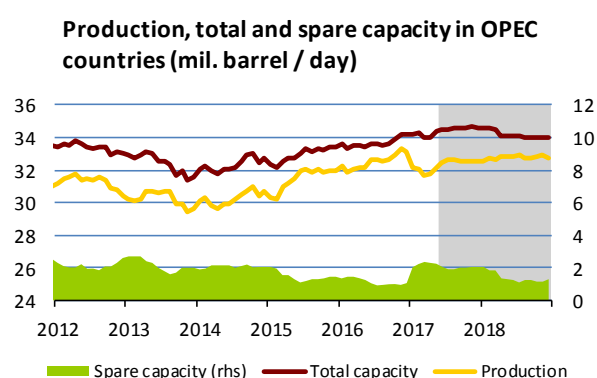
The market futures curve as of the June CF survey date was only slightly rising and implied an average Brent price of USD 49.3/bbl in 2017 H2 and USD 50.4/bbl in 2018. The June CF forecast is more than USD 3/bbl above the curve at the one-year horizon. The EIA expects Brent to rise as high as USD 54/bbl in 2017 Q3 due to strong demand but weaken in the following two quarters and return to growth again for the rest of the next year. The average price in 2018 will thus be USD 56/bbl according to the EIA.



	Brent	WTI	Natural gas
2017	51.15 ↘	48.58 ↘	188.40 ↘
2018	50.41 ↘	47.86 ↘	183.78 ↘



	IEA	EIA	OPEC
2017	97.86 ↘	98.45 ↗	96.38 ↗
2018		100.08 ↗	



	Production	Total capacity	Spare capacity
2017	32.30 ↘	34.40 ↗	2.10 ↗
2018	32.77 ↘	34.17 ↘	1.40 ↗

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

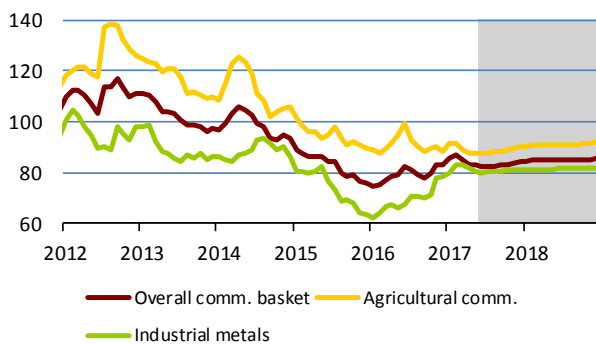
Note: Oil price at ICE, price of Russian natural gas at German border – IMF data, smoothed by the HP filter. Future oil prices (grey area) are derived from futures and future gas prices are derived from oil prices using model. Total oil stocks (commercial and strategic) in OECD countries – IEA estimate. Production and extraction capacity of OPEC – EIA estimate.

V.2 Other commodities

Prices of agricultural commodities rose slightly, mainly due to grain prices, which responded to worse weather at the end of April and in May. The first USDA estimates expect wheat stocks in the USA to drop by 9% year on year after this year's harvest due to snow and frosts on the US Central Plains at the end of April. Futures thus imply strong growth in the wheat price in the months ahead. At the global level, however, a moderate increase in wheat stocks is still expected, offering little scope for further price growth. Moderate growth is also expected for corn prices. Corn stocks are expected to decline in the USA and China and reach their lowest level at the global level since the 2013/2014 season after this year's harvest. The rice harvest in Bangladesh was lower than expected due to floods in March and April. This led to sharp growth in rice prices. By contrast, sugar and coffee prices fell on account of a sharp depreciation of the [Brazilian real](#) in response to political instability in the country. Pork prices surged, but a seasonal decline is expected to follow.

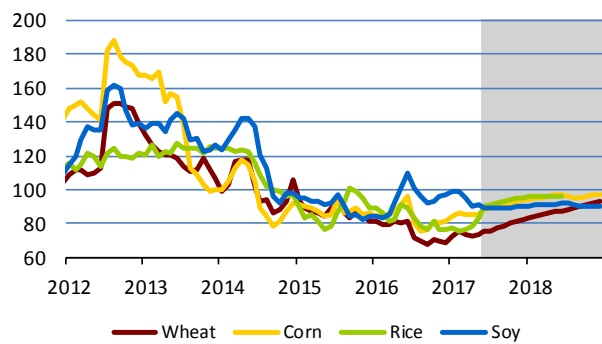
Metals prices mostly went down, due to a deteriorating manufacturing outlook and monetary tightening in China. The JP Morgan global manufacturing PMI dropped to a six-month low of 52.6 in May and the Chinese [PMI](#) fell below 50 for the first time in eleven months. Copper prices were affected by a sharp rise in stocks at the LME in early May but have been creeping up since then. Nickel prices continued to fall on expectations of growth in supplies from the Philippines and Indonesia, where the government has reached an agreement with mining firms to renew exports. Iron ore prices followed steel prices and continued to fall sharply, partly because of growth in stocks in Chinese ports. Steel prices declined on account of year-on-year growth in steel output, which reached about 5% both in China and globally in April.

Non-energy commodities price indices



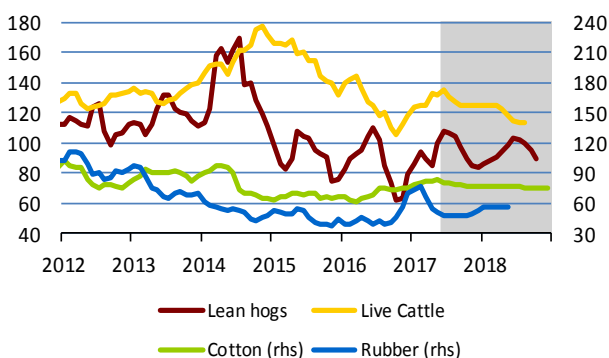
	Overall	Agricultural	Industrial
2017	83.8 ↘	89.0 ↗	81.1 ↗
2018	85.0 ↗	91.2 ↗	81.5 ↗

Food commodities



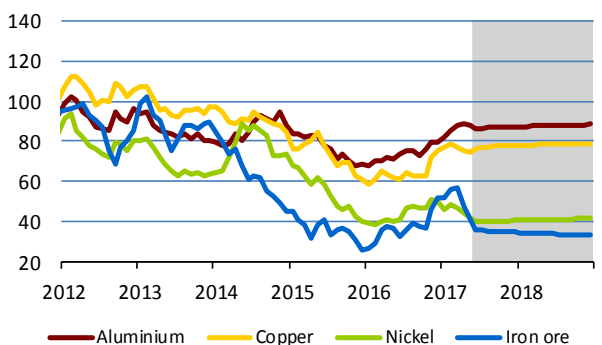
	Wheat	Corn	Rice	Soy
2017	76.8 ↗	88.8 ↗	87.0 ↗	91.7 ↘
2018	88.4 ↗	96.1 ↗	96.0 ↗	90.9 ↘

Meat, non-food agricultural commodities



	Lean hogs	Live Cattle	Cotton	Rubber
2017	94.1 ↗	127.7 ↗	79.9 ↘	55.5 ↘
2018	94.9 ↘	119.9 ↗	76.6 ↘	56.7 ↘

Basic metals and iron ore



	Aluminium	Copper	Nickel	Iron ore
2017	86.5 ↗	77.0 ↗	42.5 ↘	41.6 ↘
2018	87.8 ↗	78.3 ↗	41.1 ↘	33.8 ↘

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 GEO¹

Every month, *Global Economic Outlook (GEO)* provides an overview of the latest economic forecasts issued by international institutions, selected central banks and Consensus Economics. This article focuses on retrospectively assessing the accuracy of the forecasts for 2016. To sum up, the monitored institutions were moderately optimistic with their economic outlooks. Their forecasts for GDP growth and inflation expected higher GDP growth and higher inflation for 2016 on average than the subsequent outcomes. In line with the overestimated inflation outlooks, the outlooks for interest rates in the euro area and the USA were also overestimated in the period under review. As regards exchange rates, forecasters expected a stronger dollar for most currency pairs compared to what eventually transpired. The crude oil price was also overestimated in the forecasts on average over the entire assessment period. The forecasts were revised after the oil price reached its trough at the start of 2016. However, the monitored institutions overshot slightly with their revisions, conversely expecting a lower oil price compared to that subsequently recorded.

1 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 2016. 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 2015. From the outlooks regularly published in GEO, this category of rolling forecasts contains, for example, the three-month and one-year outlooks for foreign interest rates and oil prices and the exchange rate outlooks.

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.

2 Assessment of the accuracy of the GDP growth and CPI inflation forecasts for 2016

As regards geographical coverage, GEO regularly monitors 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).² 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 (ECB), the Federal Reserve, Deutsche Bundesbank (DBB) and the Bank of Japan (BoJ). For the BRIC countries, the forecasts of 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.

Chart 1 shows the deviations of the GDP growth forecasts for the eight monitored countries from reality. In terms of the size of the forecast errors, the biggest surprise of 2016 was clearly the recession in Brazil. By contrast, the stagnation in Russia was more or less correctly expected. Turning to the advanced countries, the forecasts for the USA were the least accurate, having originally expected higher GDP growth. However, the USA was eventually slightly overtaken in terms of economic performance by the euro area, whose forecasts for 2016 were very close to the subsequent outcomes from spring 2015 onwards. Besides growth in the euro area, GDP growth in China was also forecasted with minimal deviations. The outlooks for the remaining countries also mostly estimated the future developments correctly. In the case of Germany, the actual economic growth was even slightly underestimated.

¹ 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.

² The set of countries monitored was extended to include the United Kingdom in January 2017. Since this article assesses the accuracy of the forecasts for 2016, which for the UK were not published in GEO, it does not cover the forecasts for the UK.

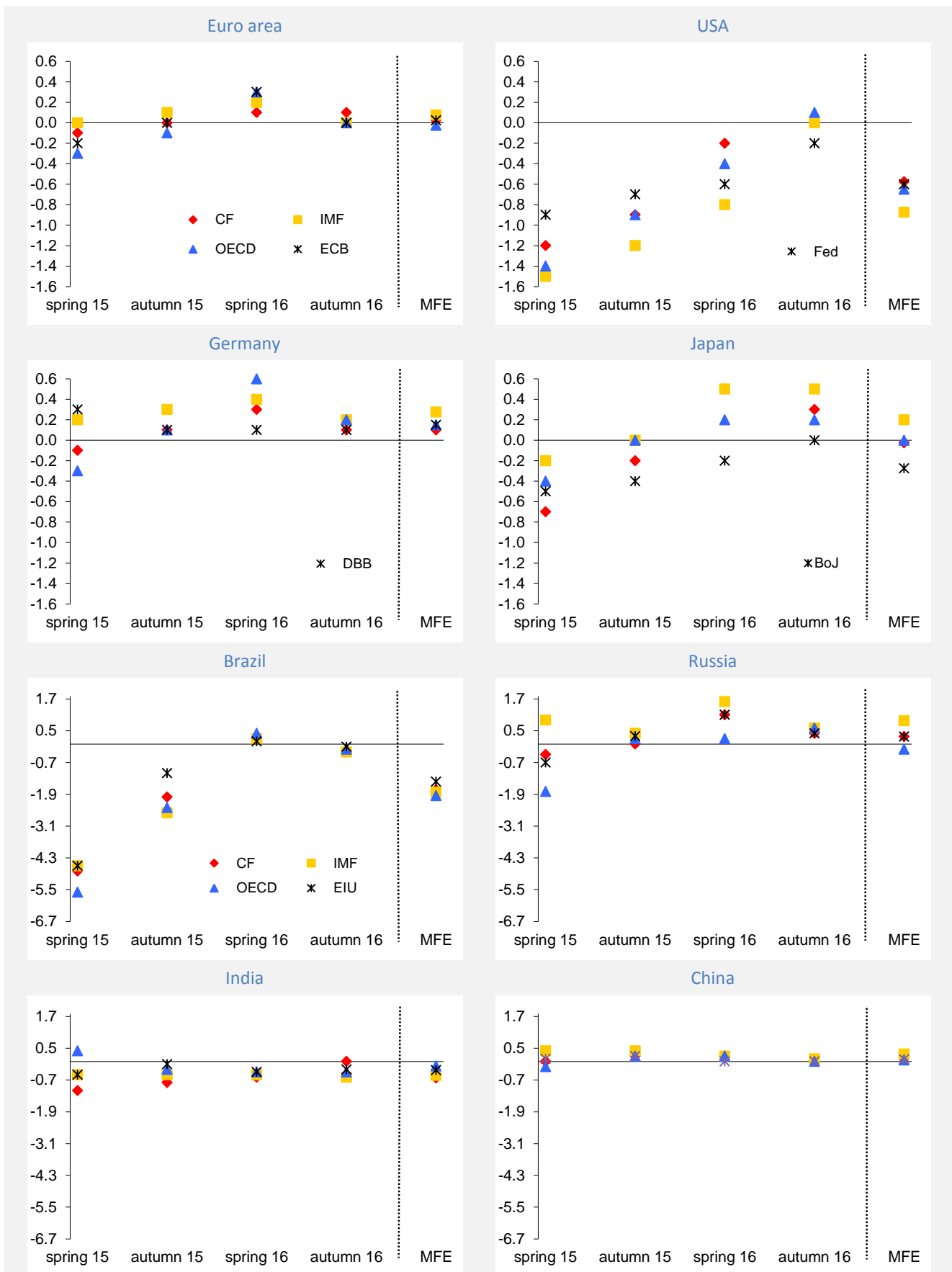


Chart 1 Forecast errors for GDP growth for 2016 (pp)

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. The source of the historical figures for 2016 is the May CF. MFE is the mean forecast error for the given year.



Chart 2 Forecast errors for consumer price inflation for 2016 (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. The source of the historical figures for 2016 is the May CF. MFE is the mean forecast error for the given year.

Chart 1 also shows that most of the over-optimistic forecasts gradually became more accurate over the assessment period (spring 2015 to autumn 2016). The smallest average growth forecast error in 2016 was recorded by the IMF, followed by CF (Chart 3).³ The central banks' forecasts were in line with those of the other institutions. The only exception was the BoJ, which constantly forecasted higher growth than CF, the IMF and the OECD during the assessment period. However, these institutions steadily revised their forecasts downwards during 2015 and 2016 and all of them eventually underestimated the final growth of the Japanese economy, whereas the BoJ converged to a correct estimate in autumn 2015. The biggest uncertainty (as measured by the variability of the forecasts across institutions) pertained to the GDP growth forecasts for Brazil and Russia, or, in the case of the advanced countries, the USA followed by Japan.

As with the GDP growth forecasts, the monitored institutions mostly expected higher inflation in 2016 than the subsequent outcomes (see Chart 2). For most countries (Brazil and Russia excepted), the GDP growth and inflation forecast errors were thus positively correlated in the sense that higher GDP growth was reflected in higher inflation. This is consistent with the concept of demand-pull inflation. However, the inflation forecasts were less accurate overall than the GDP growth forecasts.

Turning to the advanced countries, the forecasters overestimated the earlier forecasts produced more than one year ahead (the forecasts for 2016 published during 2015). Such deviations from reality did not occur in the forecasts for the current year. Overall, the best inflation forecaster on average for all countries and forecast horizons was CF (see Chart 4). The central banks' outlooks were again close to those of other institutions. Only the BoJ recorded a significant average deviation. However, this was due solely to its 2015 predictions. It then lowered its over-optimistic consumer price inflation estimates to the level predicted by the other institutions. The greatest forecast variability across institutions was recorded again for Brazil and Russia, and for Japan from the set of advanced countries.

3 Assessment of the accuracy of the forecasts for foreign interest rates

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

In line with the overestimated inflation outlooks, the outlooks for interest rates were also overestimated in the period under review (see Charts 5 and 6), above all at the longer (one-year) forecast horizon. In the case of the three-month outlooks, the accuracy of the predictions was affected mainly by central banks' communications. As regards the three-month 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). By contrast, increased uncertainty about interest rates at the short horizon (the three-month outlooks) was apparent in the USA, as at that time the US Fed was just preparing to bring its monetary policy back to normal by increasing its key monetary policy rate for the first time since the end of the financial crisis. This rate had been at the zero lower bound since the end of 2008. However, considerable uncertainty

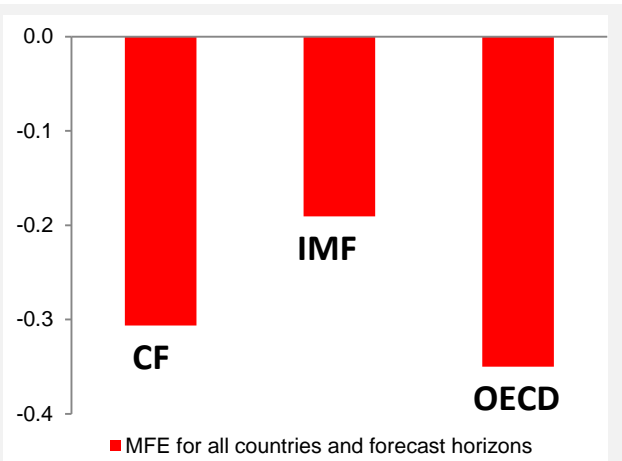


Chart 3 Comparison of the accuracy of institutions forecasting GDP for all countries

Note: CF – Consensus Forecasts, IMF – International Monetary Fund, OECD – Organisation for Economic Cooperation and Development

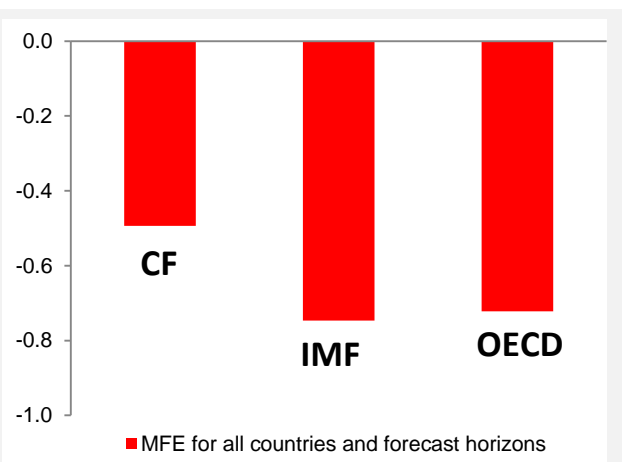
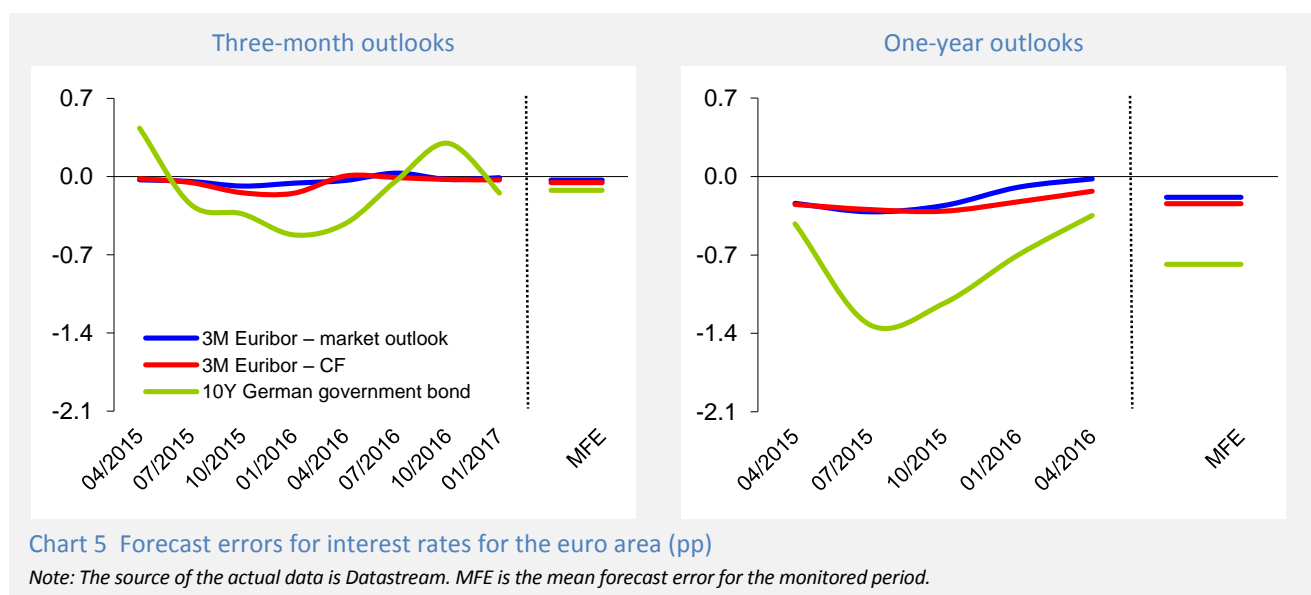


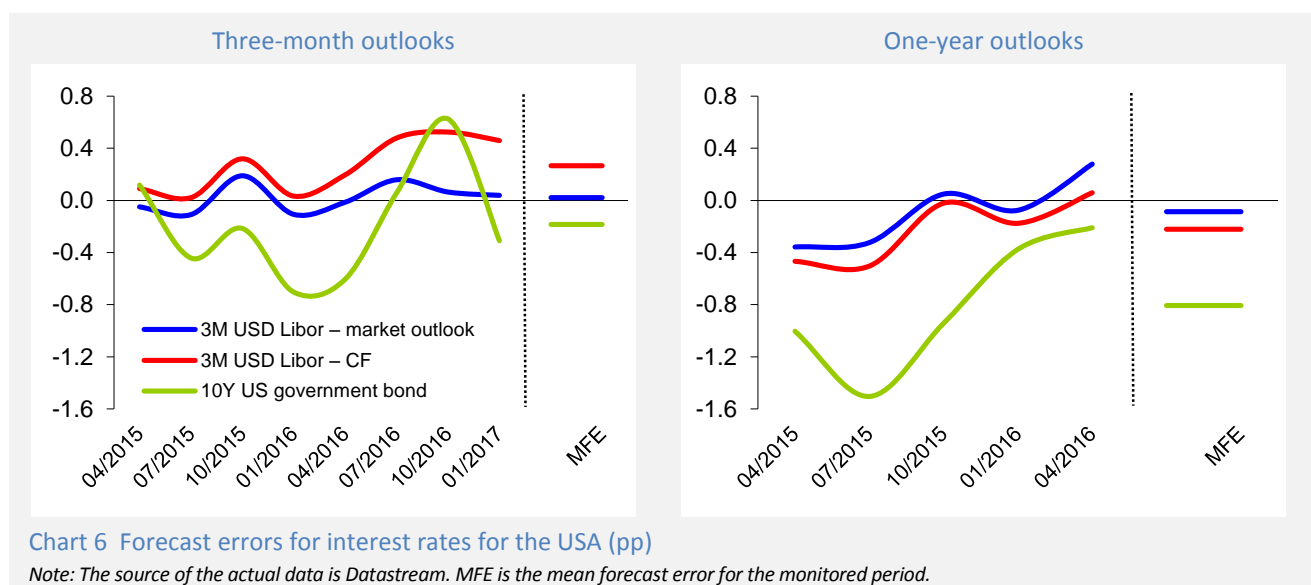
Chart 4 Comparison of the accuracy of institutions forecasting CPI growth for all countries

Note: CF – Consensus Forecasts, IMF – International Monetary Fund, OECD – Organisation for Economic Cooperation and Development

³ However, to perform a comprehensive assessment of the accuracy of the individual institutions' forecasts, we would have to assess them over a longer period of time and not just for one selected year. The accuracy ranking of the institutions' forecasts last year, for example, was CF, IMF, OECD.



surrounded the date of the first hike. The individual predictions thus often took account mainly of the latest data on the US economy, along with any major international economic and political changes that seemed to have the potential to influence the FOMC's decisions. The first monetary policy rate increase (the first in seven years) eventually happened in December 2015. However, this did not eliminate uncertainty from the prediction process, as the second post-crisis increase did not come until a full year later. It is therefore not very surprising that the error in the CF forecast for dollar rates at the three-month horizon was even higher 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.



The forecasts for ten-year government bond yields were also overestimated on average. In the case of the one-year outlooks for ten-year yields, the deviation of the forecasts from the subsequent outcomes was strongly negative in July 2015, but decreased over time. The forecasts made in the first months of last year were thus substantially more accurate. As for the short-term (three-month) outlooks, they were furthest from reality in spring 2016, when they predicted higher yields than those eventually generated. The deviation of the short-term forecast then turned positive for both German Bunds and US government bonds. The three-month forecasts for government bonds were the most underestimated in October 2016. The similarity in the deviations of the forecasts for long-term yields is due to the high correlation between US and German ten-year government bond rates.

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

GEO provides information about the outlooks for the exchange rates of selected currencies against the US dollar based on CF forecasts. In addition, forward rates are provided for the euro and the Japanese yen. They are based on covered interest parity and represent the current ability to hedge the future exchange rate rather than the outlook.

Both the three-month outlooks (see Chart 7) and the one-year outlooks (see Chart 8) predicted a stronger dollar than the subsequent outcomes for most currency pairs. This might have been related to the overestimation of the outlooks for interest rates in the USA described above. The outlooks derived from market contracts were more accurate than the CF outlooks except for the one-year outlook for the dollar-

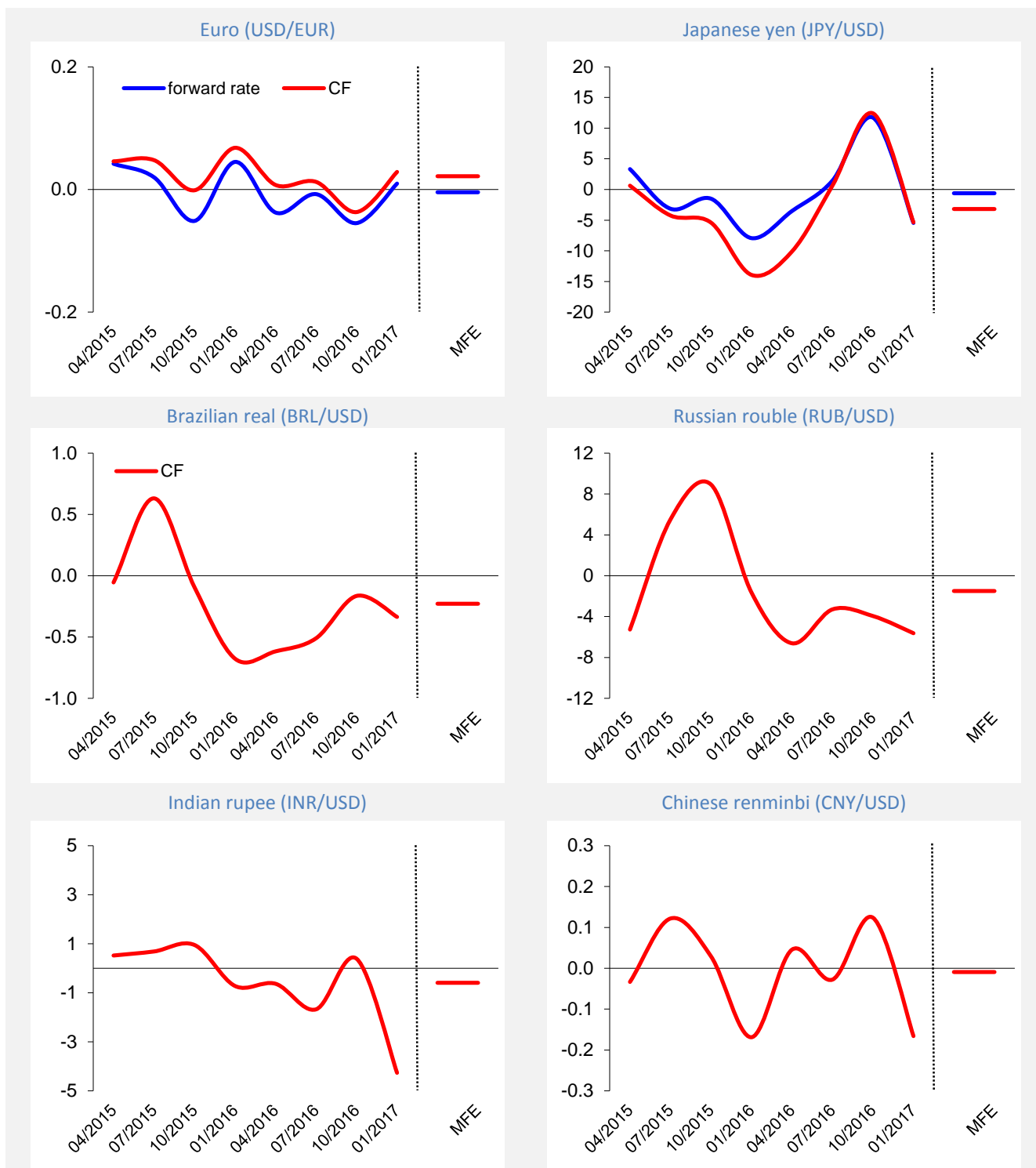


Chart 7 Three-month outlooks for exchange rates (deviations from reality)

Note: CF – Consensus Forecasts. MFE is the mean forecast error for the given year.

euro exchange rate, where CF recorded a lower forecast error.

Moreover, the charts show relative equality of the forecast errors in the case of the dollar-euro rate compared to the yen-dollar rate. This is to some extent due to the yen being regarded as a safe haven. The yen exchange rate thus reacts strongly to swings in risk perceptions, making its changes hard to predict.

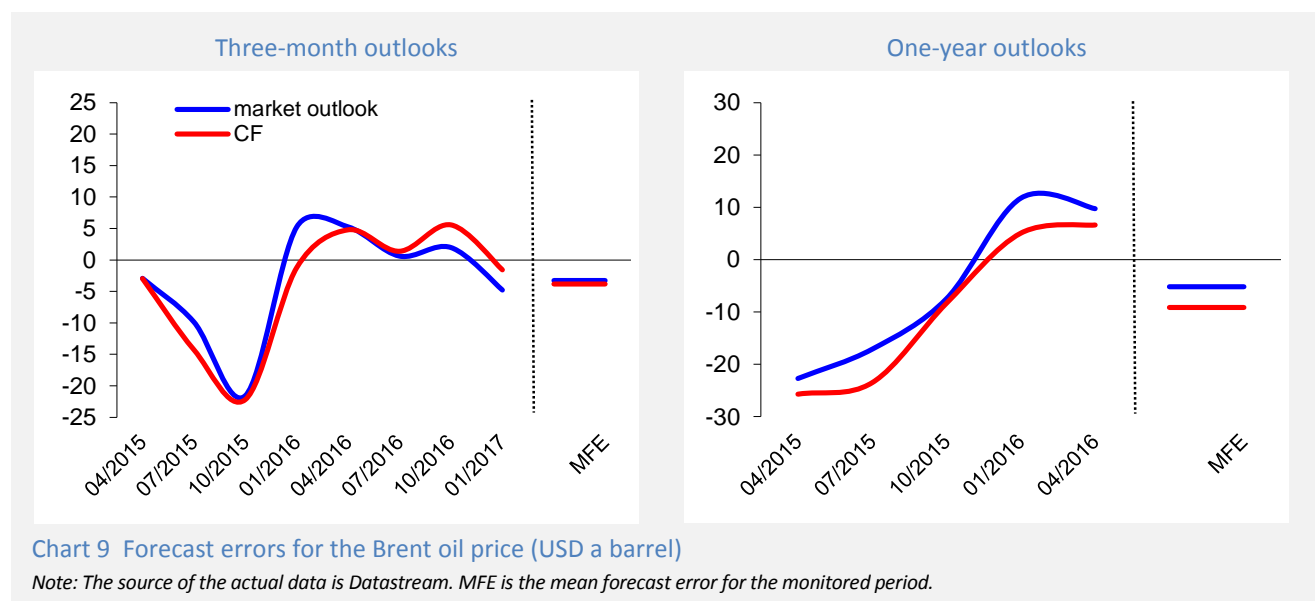
The profiles of the deviations of the outlooks for the BRIC currencies are very similar, as evidenced by the common nature of these currencies as regards investment preferences. The forecasts initially tended to undershoot the subsequent exchange rate paths, but then started to deviate mostly in the opposite direction. The resulting average forecast errors were thus mostly negative (meaning a weaker outlook for the currency's exchange rate against the dollar than the one actually subsequently recorded). The exception was the one-year outlooks for the Chinese renminbi, which expected its rate against the dollar to be



stronger than the subsequent outcome over the entire assessment period. The three-month outlooks were accurate on average.

5 Assessment of the accuracy of the Brent crude oil price forecasts

The market outlooks derived from both futures contracts and CF outlooks overestimated the actual oil price at both the three-month and one-year horizons. This is a very similar picture to that identified in the 2016 and 2015 assessments. The curves of the forecast errors (see Chart 9) show that this was due mainly to a sharp fall in the price of oil at the start of the assessment period. Conversely, after the trend in oil prices reversed in early 2016, the future path of the Brent crude price was underestimated, albeit to a much lesser extent. A comparison of the accuracy of the market outlooks and CF outlooks reveals that the market outlooks were slightly more accurate. GEO regularly describes both types of outlooks.



6 Conclusion

This article uses a simple method 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. This is one of the reasons why several institutions' forecasts are monitored in GEO. However, more time would be needed to assess them more accurately.⁴ The accuracy of the CF forecasts, which are a key input into the CNB's own forecast for the Czech economy, is comparable with, and in many cases even better than, the available alternative forecasts. In addition, CF has the advantage of being published monthly and covering a relatively wide range of economic variables. The accuracy of CF stems from its defining characteristic, namely that it is the simple average of the forecasts from the contributing private institutions.⁵

In terms of the size of the errors in the GDP growth forecasts for 2016, the biggest surprise was the recession in Brazil. By contrast, the stagnation in Russia was more or less correctly expected. Turning to the advanced countries, the forecasts for the USA were the least accurate, with the expected GDP growth being higher than what this economy actually achieved in 2016. The forecasts for the remaining countries mostly estimated the future developments correctly. In the case of Germany, the actual economic growth was even slightly underestimated. GDP growth in China was forecasted with minimal deviations. The monitored institutions that forecast GDP growth for all countries (CF, IMF, OECD) were over-optimistic in their GDP growth outlooks for 2016 on average for all countries and forecast horizons. The smallest average forecast error was recorded for the IMF, followed by CF.

As with the GDP growth forecasts, the monitored institutions expected higher inflation in 2016 than the subsequent outcomes. For most countries (Brazil and Russia excepted), the GDP growth and inflation forecast errors were thus positively correlated in the sense that higher GDP growth was reflected in higher inflation, i.e. in the sense of demand-pull inflation. The inflation forecasts were also less accurate than the GDP growth forecasts. In the case of the advanced countries, the forecasters overestimated the forecasts for one year ahead (the forecasts for 2016 published during 2015). Such deviations from reality did not

⁴ One such assessment relevant to the CNB is Novotný and Raková (2010) *Assessment of Consensus Forecasts Accuracy: The Czech National Bank Perspective*. CNB WP 14/2010.

⁵ 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.

occur in the forecasts for the current year. The best inflation forecaster on average for all countries and forecast horizons was CF.

In line with the overestimated inflation outlooks, the one-year outlooks for interest rates were also overestimated in the period under review. A stronger dollar was expected in both the three-month and one-year outlooks in most cases. This might have been related to the expectations of higher rates compared to reality in the USA. The market outlooks derived from both futures contracts and CF outlooks overestimated the actual oil price at both the three-month and one-year horizons. The curves of the forecast errors show that this was due mainly to a sharp fall in the price of oil at the start of the assessment period. Conversely, after the trend in oil prices reversed in early 2016, the future path of the Brent crude price was underestimated.

For interest rates, the exchange rates of the euro and the yen against the dollar, and the Brent oil price, the market outlooks turned out to be a better source of forecasts than the CF-based outlooks. From this point of view, the monitoring of market outlooks in GEO thus seems to be the right choice.

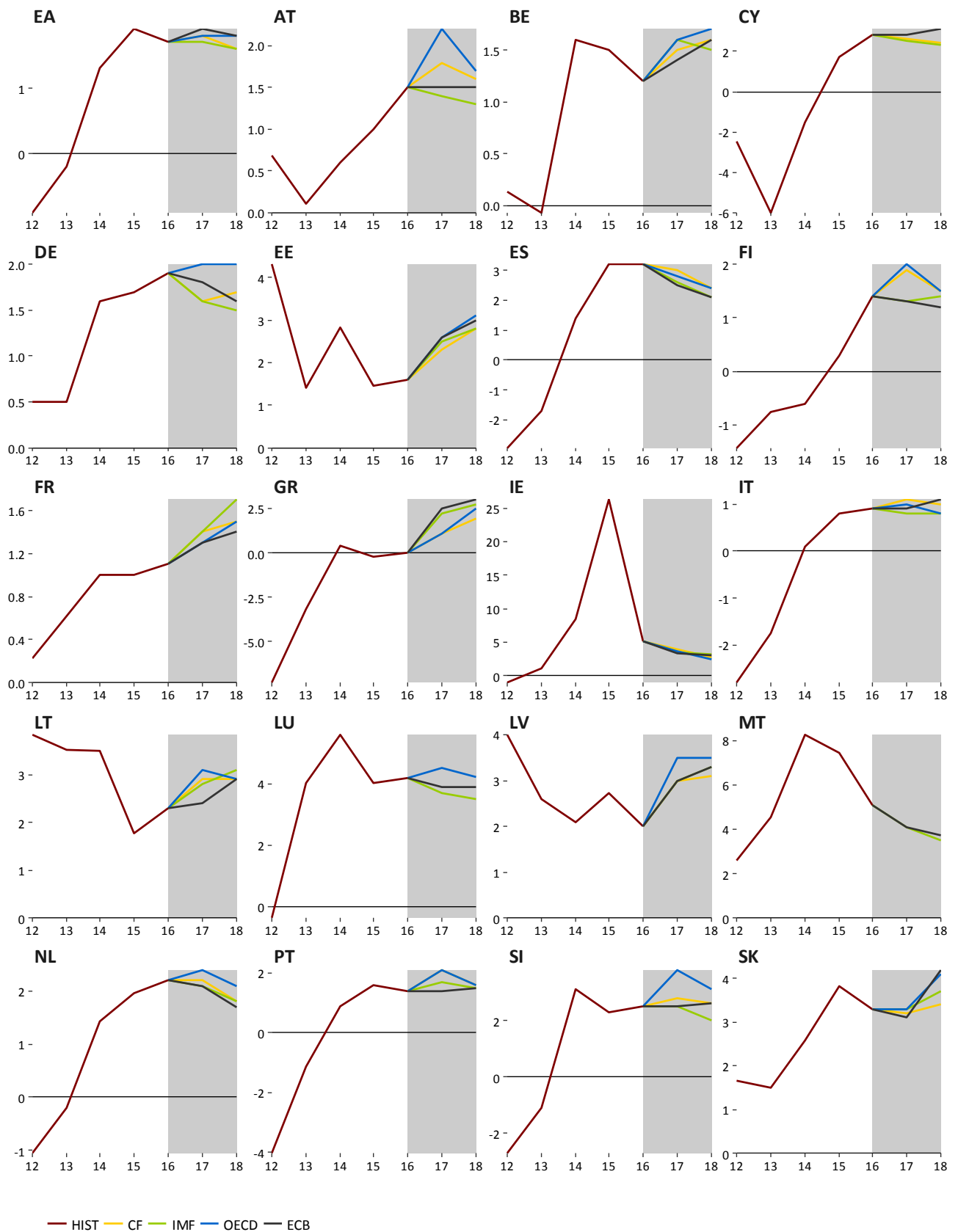
A1. Change in GDP predictions for 2017

	CF		IMF		OECD		CB / EIU	
EA	+0.1	2017/6	+0.1	2017/4	+0.2	2017/6	+0.1	2017/6
		2017/5				2017/1		
DE	0	2017/6	+0.1	2017/4	+0.2	2017/6	+0.1	2017/6
				2017/5				2017/1
US	+0.1	2017/6	0	2017/4	-0.3	2017/6	+0.1	2017/6
				2017/5				2017/1
UK	-0.1	2017/6	+0.5	2017/4	0	2017/6	-0.1	2017/5
				2017/5				2017/1
JP	0	2017/6	+0.4	2017/4	+0.2	2017/6	+0.1	2017/4
				2017/5				2017/1
CN	0	2017/6	+0.1	2017/4	+0.1	2017/6	0	2017/6
				2017/5				2017/1
IN	0	2017/6	0	2017/4	0	2017/6	0	2017/5
				2017/5				2017/1
RU	+0.1	2017/5	+0.3	2017/4	+0.6	2017/6	-0.2	2017/6
				2017/4				2017/1
BR	0	2017/5	0	2017/4	+0.7	2017/6	0	2017/5
				2017/4				2017/1

A2. Change in inflation predictions for 2017

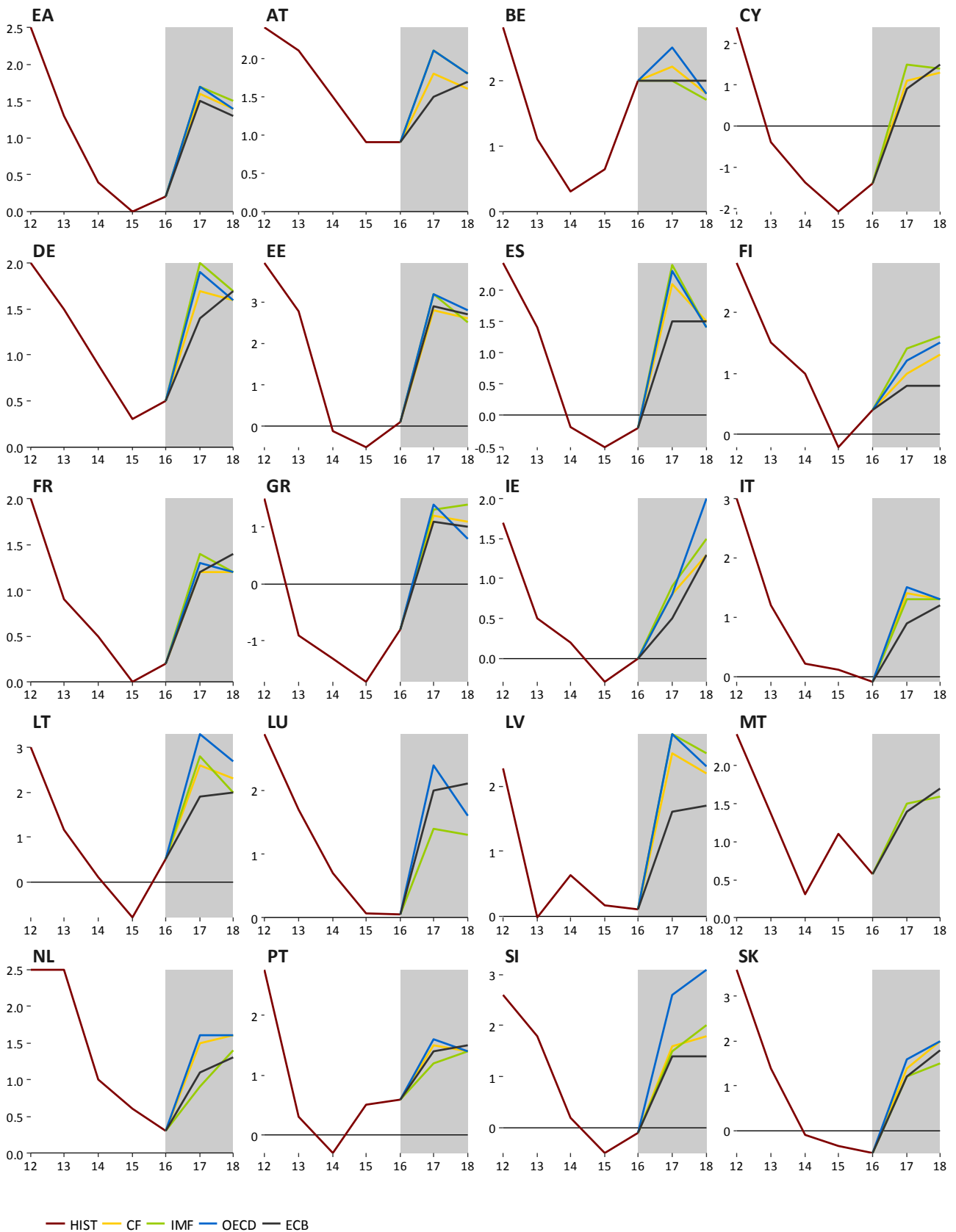
	CF		IMF		OECD		CB / EIU	
EA	0	2017/6	+0.6	2017/4	+0.5	2017/6	-0.2	2017/6
				2017/5				2016/10
DE	-0.1	2017/6	+0.5	2017/4	+0.5	2017/6	+0.1	2017/6
				2017/5				2016/10
US	-0.1	2017/6	+0.4	2017/4	+0.6	2017/6	-0.3	2017/6
				2017/5				2016/10
UK	+0.1	2017/6	0	2017/4	+0.4	2017/6	+0.1	2017/5
				2017/5				2016/10
JP	-0.1	2017/6	+0.5	2017/4	+0.3	2017/6	-0.1	2017/4
				2017/5				2016/10
CN	-0.2	2017/6	+0.1	2017/4	-0.7	2017/6	-0.5	2017/6
				2017/5				2016/10
IN	-0.4	2017/6	-0.4	2017/4	-0.4	2017/6	-0.2	2017/5
				2017/5				2016/10
RU	0	2017/5	-0.5	2017/4	-1.7	2017/6	+0.1	2017/6
				2017/4				2016/10
BR	-0.2	2017/5	-1.0	2017/4	-1.8	2017/6	-0.3	2017/5
				2017/4				2016/10

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	GDP	gross domestic product
bbl	barrel	GR	Greece
BE	Belgium	ICE	Intercontinental Exchange
BoE	Bank of England	IE	Ireland
BoJ	Bank of Japan	IEA	International Energy Agency
bp	basis point (one hundredth of a percentage point)	IMF	International Monetary Fund
BR	Brazil	IN	India
BRIC	countries of Brazil, Russia, India and China	INR	Indian rupee
BRL	Brazilian real	IRS	Interest Rate swap
CB	central bank	ISM	Institute for Supply Management
CB-CCI	Conference Board Consumer Confidence Index	IT	Italy
CB-LEII	Conference Board Leading Economic Indicator Index	JP	Japan
CBR	Central Bank of Russia	JPY	Japanese yen
CF	Consensus Forecasts	LIBOR	London Interbank Offered Rate
CN	China	LME	London Metal Exchange
CNB	Czech National Bank	LT	Lithuania
CNY	Chinese renminbi	LU	Luxembourg
CY	Cyprus	LV	Latvia
DBB	Deutsche Bundesbank	MT	Malta
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
EC-CCI	European Commission Consumer Confidence Indicator	PMI	Purchasing Managers' Index
EC-ICI	European Commission Industrial Confidence Indicator	PP	percentage point
EE	Estonia	PT	Portugal
EIA	Energy Information Administration	QE	quantitative easing
EIU	Economist Intelligence Unit	RU	Russia
ES	Spain	RUB	Russian rouble
EU	European Union	SI	Slovenia
EUR	euro	SK	Slovakia
EURIBOR	Euro Interbank Offered Rate	TLTRO	targeted longer-term refinancing operations
Fed	Federal Reserve System (the US central bank)	UK	United Kingdom
FI	Finland	UoM-CSI	University of Michigan Consumer Sentiment Index
FOMC	Federal Open Market Committee	US	United States
FR	France	USD	US dollar
FRA	forward rate agreement	USDA	United States Department of Agriculture
FY	fiscal year	WEO	World Economic Outlook
GBP	pound sterling	WTI	West Texas Intermediate (crude oil used as a benchmark in oil pricing)
		ZEW-ES	ZEW Economic Sentiment

