GLOBAL ECONOMIC OUTLOOK - JUNE

2016

Monetary Department
External Economic Relations Division

CNB CZECH NATIONAL BANK

Cut-off date for data
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CF survey date
13 June 2016

GEO publication date
24 June 2016

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.
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. SUMMARY

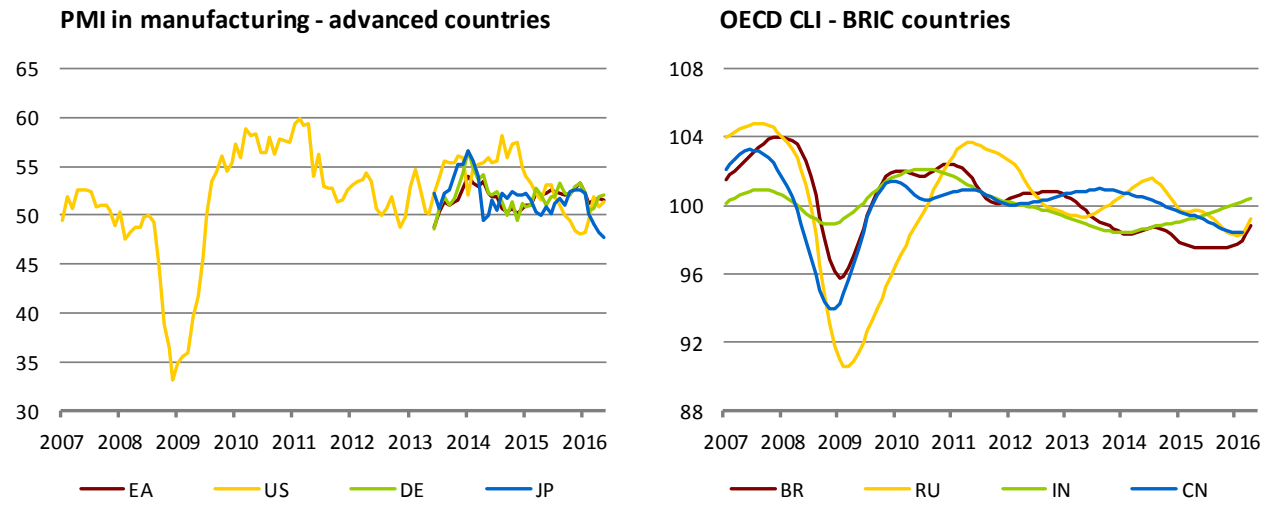
The June issue of Global Economic Outlook presents the regular monthly overview of recent and expected developments in selected territories, focusing on key economic variables: inflation, GDP growth, leading indicators, interest rates, exchange rates and commodity prices. In this issue, we also assess the accuracy of the forecasts for 2015 published in Global Economic Outlook in 2015 and 2014. The institutions under comparison forecasted GDP growth relatively accurately (except for an unexpectedly deep GDP contraction in Brazil and Russia) and overestimated their inflation forecasts and consequently also their interest rate forecasts (again with the exception of Brazil and Russia).

The economic growth outlooks for the advanced countries monitored were unchanged from the previous month in June. The performance of the world's strongest economy, the USA, is expected to increase gradually to almost 2.5% by the end of 2017. It will thus grow faster than the euro area and its economically strongest member, i.e. Germany. New data for Germany brought a slight improvement in the GDP outlooks for this year, as confirmed by leading indicators (see the chart below), giving hope to economies tied to that of Germany. However, the UK's potential exit from the EU could pose a risk to the euro area's growth outlooks. By contrast, the Japanese economy is still short of achieving the goals of "Abenomics" and its growth outlooks for this year remain at just 0.5%, although for next year they have been increased moderately. New data on inflation indicate that the euro area will narrowly avoid deflation this year, but in the case of Japan a drift into deflationary waters cannot be prevented. Of the economies under review, only the USA is thus expected to record inflation visibly above the "magic" level of 2% at the end of 2017.

The GDP growth outlooks for the BRIC countries were mixed in June as usual. On the one hand, the fast-growing Indian economy is expected to maintain growth of just above 7.5% until the end of next year. The outlooks for the Chinese economy are similar; however, its GDP is expected to grow at about a 1 percentage point slower rate than that of India. The inflation path in both countries was unchanged last month, i.e. consumer price inflation in China is slowly heading below 2% and that in India is also expected to slow, although from levels several percentage points higher. On the other hand, the economies of Russia and particularly Brazil will be unable to avoid slumpflation (an economic slump accompanied by relatively high inflation) this year. However, the outlooks for next year bring hope of renewed economic growth and a visible drop in inflation for both countries.

The outlooks for euro area interest rates remain very low, staying in negative territory at the shorter end of the yield curve, with de facto no sign of visible growth until the end of 2017. In the case of the USA, it can be expected that the Fed will increase interest rates only once this year. According to CF, the US dollar will appreciate with varying intensity against all the monitored currencies at the one-year horizon except for the Russian rouble, against which it will remain relatively stable. The market outlook for the oil price moved slightly upwards again compared to the previous month and remains slightly rising along its entire path. The Brent crude oil price is expected to reach approximately USD 50 a barrel at the one-year horizon. Natural gas prices based on long-term contracts, which are indexed to oil prices usually with a lag of 6 to 9 months, are not expected to rise until the final quarter of this year.

Leading indicators for countries monitored in the GEO



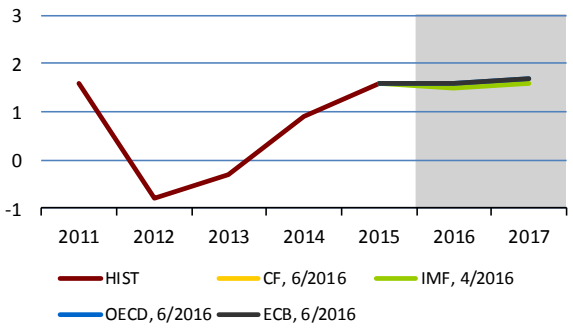
Zdroj: Bloomberg, Datastream

II.1 Euro area

The euro area economy recorded quarter-on-quarter growth of 0.6% in 2016 Q1, driven mainly by private consumption and investment. By contrast, year-on-year GDP growth slowed slightly to 1.5%. The fastest growth was recorded by Malta (over 5%), Spain and Slovakia (both 3.4%). On the other hand, Greece saw a year-on-year contraction for the third consecutive quarter (this time of 1.3%). Short-term data brought mixed news. Industrial production rose by 2% in year-on-year terms in April. In month-on-month terms, it recorded a 1.1% rise after two months of decline. The growth was due mainly to an increase in output of non-durable and durable goods and also capital goods. The PMI leading indicator in manufacturing dropped from 51.7 points to 51.5 points in May owing to slower growth in new contracts, weaker output and slower growth in employment. The unemployment rate remains at 10.2%. Business and consumer confidence improved in May thanks to increased optimism among consumers and managers in the retail and construction sectors. Retail sales growth fell to 1.4% in April owing to a decline in purchases, particularly in Germany and Belgium, after the attacks in Brussels. The ECB increased its growth outlook for this year by 0.2 pp to 1.6% and expects the euro area economy to continue recovering. The OECD increased its growth prediction for 2016 by the same amount. The ECB and OECD left their growth estimates for 2017 unchanged, as did CF for both periods.

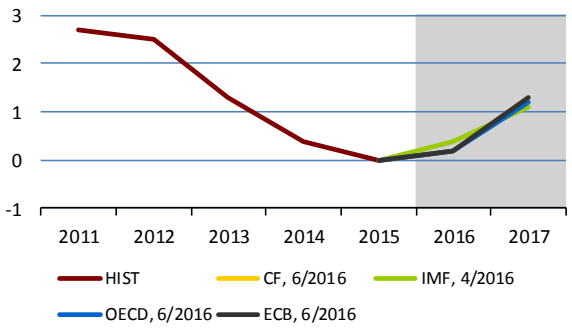
The euro area remained in deflation in May, with consumer prices falling by 0.1% year on year. Energy prices remain the main reason behind the fall, although their decline has started to slow. Core inflation rose by 0.1 pp to 0.8%. Annual M3 growth decreased to 4.6% in April. The yield on the ten-year German government bond fell to negative values in mid-June for the first time ever, due mainly to high demand and uncertainty on other markets. However, CF expects it to rise at the one-year horizon. The outlooks for short-term interest rates remain negative. The ECB left its monetary policy unchanged, allowing time for the policy measures it has already implemented to take full effect. Moreover, other, previously announced unconventional tools will be launched in June. Inflation will be 0.2% this year according to the monitored institutions. The OECD revised its inflation forecast for 2017 downwards by 0.1 pp.

GDP growth, %



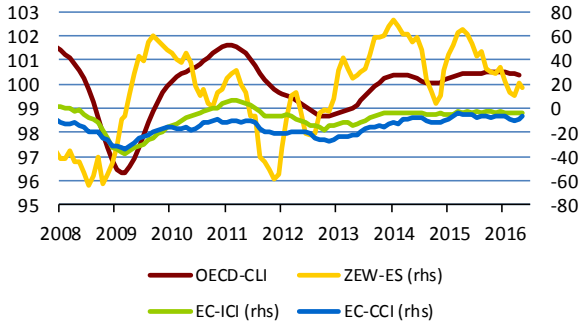
	CF	IMF	OECD	ECB
2016	1.6	1.5	1.6	1.6
2017	1.6	1.6	1.7	1.7

Inflation, %



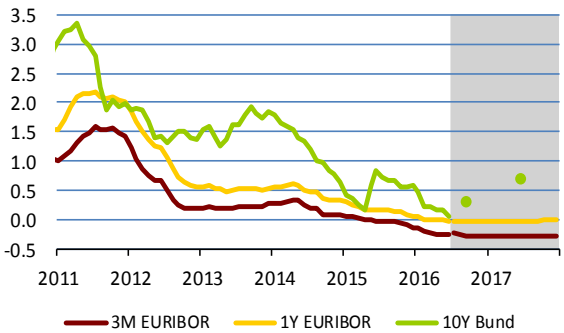
	CF	IMF	OECD	ECB
2016	0.2	0.4	0.2	0.2
2017	1.3	1.1	1.2	1.3

Leading indicators



	OECD-CLI	EC-ICI	EC-CCI	ZEW-ES
3/16	100.4	-4.1	-9.7	10.6
4/16	100.4	-3.6	-9.3	21.5
5/16		-3.6	-7.0	16.8

Interest Rates, %



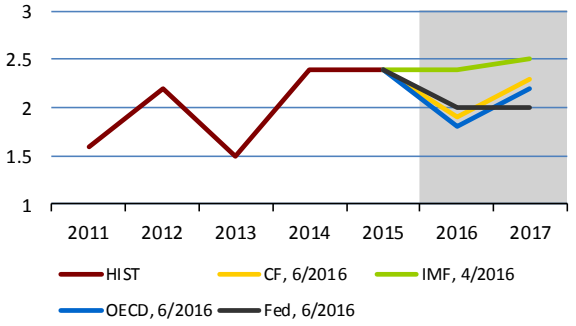
	05/16	06/16	09/16	06/17
3M EURIBOR	-0.26	-0.26	-0.27	-0.29
1Y EURIBOR	-0.01	-0.02	-0.03	-0.03
10Y Bund	0.16	0.06	0.30	0.70

II.2 United States

According to the second estimate, the US economy slowed less in the first quarter than the first data had indicated. GDP growth in the USA reached 0.8% (in annualised quarterly terms), with a drop in corporate investment being offset by higher inventories and investment in construction. Consumer demand also recorded a moderate upward revision. The data available for the second quarter so far are mixed. Industrial production declined again month on month in May, while the ISM's PMI leading indicator remained just inside the expansion band (51.3) for the third consecutive month. The labour market recorded a surprise sharp deterioration. Growth in non-farm payrolls in May (just 38,000) again lagged far behind expectations (160,000). The data for the previous month were also revised downwards (by 37,000). The unemployment rate went down (to 4.7%), mainly as a result of a decrease in the participation rate (from 62.8% to 62.6%). Consumer confidence was little changed, while retail sales rose year on year in both April and May. Growth in the second quarter will thus probably be driven by household demand.

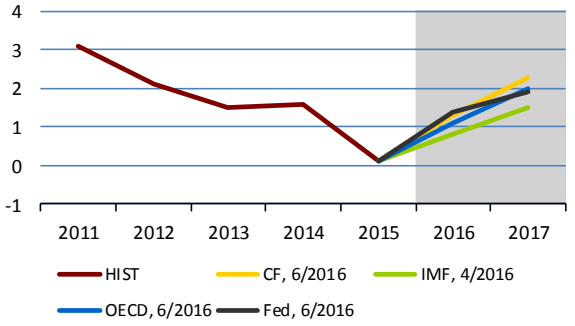
Inflation pressures remain contained, with annual consumer price inflation reaching 1.1% and core inflation slowing to 2.1%. The FOMC meeting in June left the target range for the key rate unchanged, and the number of members who expect only one rate hike this year increased markedly compared to March (now 6 out of 17). In the June survey, which was conducted before the FOMC meeting, almost 65% of CF panellists believed that rates would not be raised at the July meeting. The implied rate path shifted downwards compared with the previous month and the US dollar weakened against other currencies. The June CF raised its GDP growth and inflation forecasts for 2016. The OECD is predicting lower growth and inflation than CF for both years. According to the Fed's new forecast, the US economy will grow at a lower, 2% rate in 2016 and 2017. The inflation outlook for 2016 was revised upwards slightly.

GDP growth, %



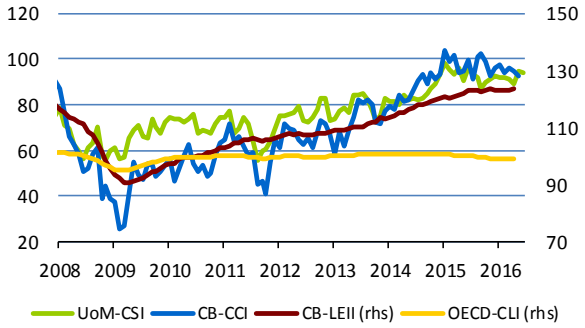
	CF	IMF	OECD	Fed
2016	1.9	2.4	1.8	2.0
2017	2.3	2.5	2.2	2.0

Inflation, %



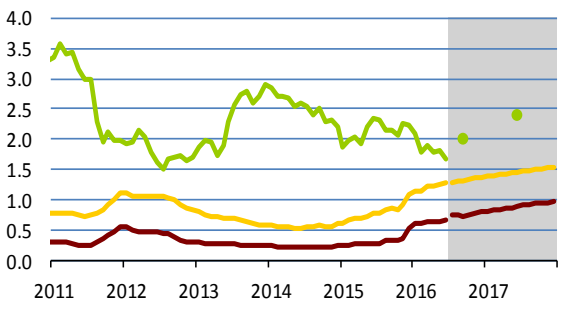
	CF	IMF	OECD	Fed
2016	1.3	0.8	1.1	1.4
2017	2.3	1.5	2.0	1.9

Leading indicators



	CB-LEII	OECD-CLI	UoM-CSI	CB-CCI
3/16	123.1	99.0	91.0	96.1
4/16	123.9	99.0	89.0	94.7
5/16			94.7	92.6

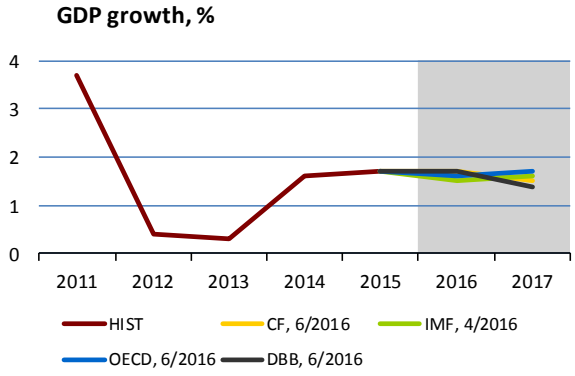
Interest Rates, %



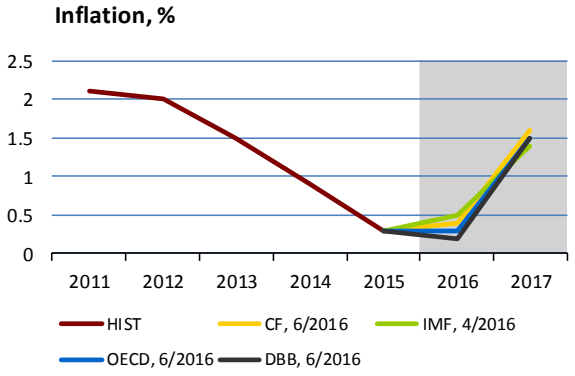
	05/16	06/16	09/16	06/17
USD LIBOR 3M	0.65	0.66	0.72	0.89
USD LIBOR 1R	1.27	1.27	1.32	1.46
Treasury 10R	1.81	1.67	2.00	2.40

II.3 Germany

Economic growth in Germany strengthened considerably in 2016 Q1. The quarterly GDP growth rate increased by 0.4 pp compared to the previous quarter to 0.7%. Annual economic growth also rose in this period, from 1.3% to 1.6%. According to the June CF, the strong economic growth will continue into Q2, though probably at a rather lower level than in Q1. CF increased its economic growth estimate to 1.7% for 2016 as a whole and left it unchanged at 1.5% for next year. Leading indicators, which, with the exception of the ZEW economic sentiment indicator, mostly increased in April, also suggest continued strong economic growth. German inflation returned to very modest growth of 0.1% in May after a similar fall in April. Energy prices remain the primary reason for the low consumer price inflation. The June CF predicts inflation at 0.4% in 2016 as a whole, rising to 1.6% next year.



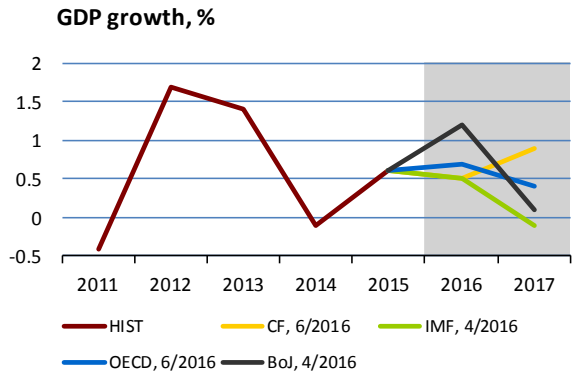
	CF	IMF	OECD	DBB
2016	1.7	1.5	1.6	1.7
2017	1.5	1.6	1.7	1.4



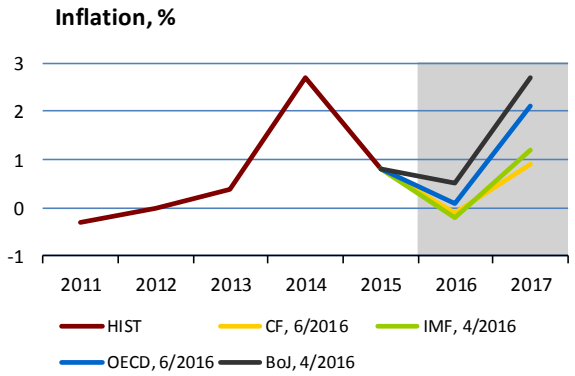
	CF	IMF	OECD	DBB
2016	0.4	0.5	0.3	0.2
2017	1.6	1.4	1.5	1.5

II.4 Japan

Contrary to expectations, the Japanese economy grew in Q1, showing annual GDP growth of 0.5%. Economic growth was revised upwards slightly compared with the initial estimate, mainly because of higher capital expenditure. However, there are still concerns of weak consumer demand and exports. This is confirmed by new data on retail sales, which declined year on year again in April. To support domestic demand, Prime Minister Abe decided to postpone the planned increase in turnover tax (from 8% to 10%) by two and half years. A further stimulus package will also be unveiled in the autumn. This is the second time the tax increase has been postponed, giving rise to doubts about Japan meeting its fiscal consolidation plans. Fitch downgraded its rating outlook for Japan from stable to negative but left its overall rating unchanged (A). Headline inflation turned negative again in April, mainly due to low commodity prices. Activity in industry (PMI) recorded its largest decrease in three years in May, mainly because of a lower number of new orders. The June CF outlook revised its growth forecast for 2017 upwards significantly (by 0.4 pp). On the other hand, inflation is expected to be 0.6 pp lower in 2017 and deflation is expected for this year. The OECD outlook was revised downwards in both years for both inflation and GDP growth.



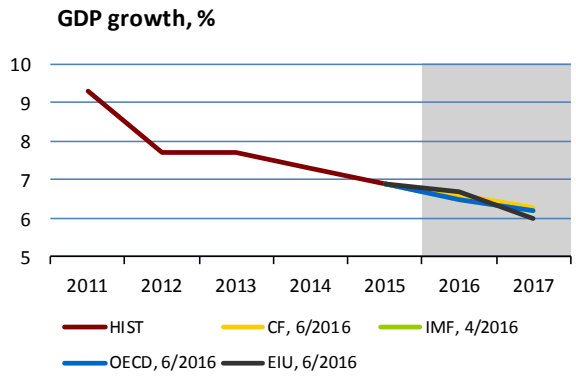
	CF	IMF	OECD	BoJ
2016	0.5	0.5	0.7	1.2
2017	0.9	-0.1	0.4	0.1



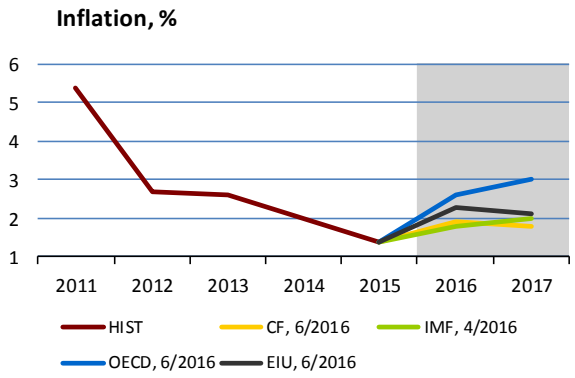
	CF	IMF	OECD	BoJ
2016	-0.1	-0.2	0.1	0.5
2017	0.9	1.2	2.1	2.7

III.1 China

A continued gradual downward trend in Chinese GDP growth is expected this year and the next (6.7% in 2016 Q1). Spare production capacity – a consequence of previous relaxed lending policy – is visible in the economy. The economy can no longer rely on credit-driven growth, as was the case in 2009–2013. The PMI in manufacturing fell slightly further in May and has long been in the contractionary band. Moreover, the tightening of monetary policy by the Fed is a factor which would lead, or is leading, to an outflow of short-term capital from China. The renminbi has depreciated by 8% against the dollar since the start of 2014 and is expected to weaken slightly further at the one-year horizon. By contrast, it has appreciated by more than 10% against the euro. Consumer price inflation probably bottomed out in 2015 and is expected to rise in the years ahead. Inflation reached 2.0% in May.



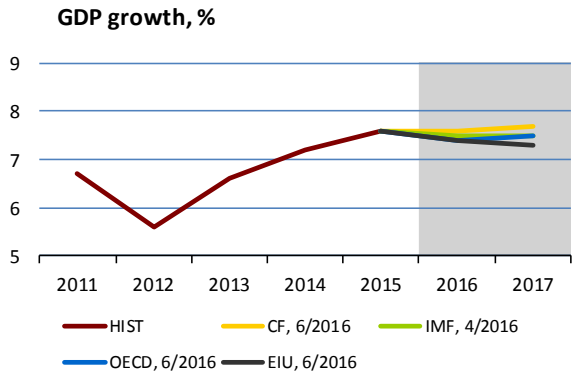
	CF	IMF	OECD	EIU
2016	6.6	6.5	6.5	6.7
2017	6.3	6.2	6.2	6.0



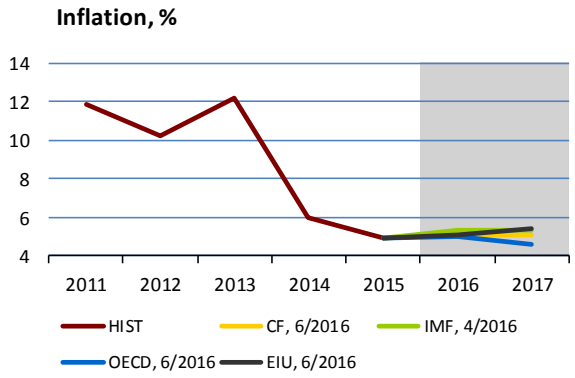
	CF	IMF	OECD	EIU
2016	1.9	1.8	2.6	2.3
2017	1.8	2.0	3.0	2.1

III.2 India

The high economic growth observed in 2015 is expected to continue over the next two years. Annual GDP growth exceeded expectations in 2016 Q1, reaching 7.9%. India is thus currently one of the most dynamically developing markets. The PMI in manufacturing edged up in May and was in the expansionary band. However, industrial production has been decreasing year on year since November 2015. Consumer price inflation rose to 5.8% in May, the highest level since August 2014. The outlooks for 2016 and 2017 predict inflation of just above 5%. At its June meeting, the Reserve Bank of India left key interest rates unchanged at a five-year low (6.5%). Raghuram Rajan, former chief economist at the IMF, decided to quit the post of central bank governor shortly before the end of his three-year mandate. He was unlikely to be appointed for another term of office because of his disagreements with the government. The year-on-year depreciation of the rupee against the dollar and the euro was 4.9% and 6.3% respectively in May. A further slight depreciation is expected at the one-year horizon.



	CF	IMF	OECD	EIU
2016	7.6	7.5	7.4	7.4
2017	7.7	7.5	7.5	7.3

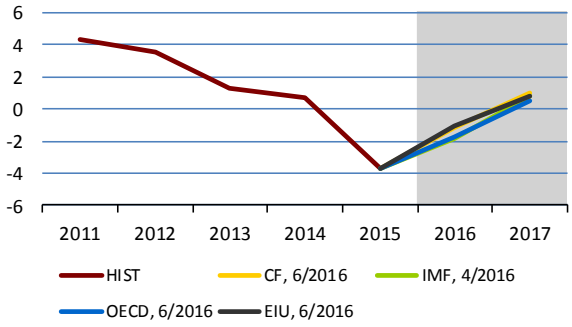


	CF	IMF	OECD	EIU
2016	5.1	5.3	5.0	5.1
2017	5.1	5.3	4.6	5.4

III.3 Russia

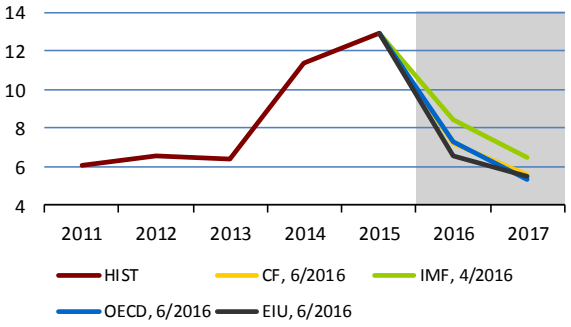
The latest macroeconomic indicators suggest that the recession in Russia is easing. The GDP decline dropped to 1.2% year on year (the first estimate for 2016 Q1). Short-term indicators are also improving: industrial production recorded slightly higher growth in May, the unemployment rate fell in April and the decline in retail turnover slowed. The Markit PMI in manufacturing rose to a four-month high in May, close to 50 points. According to Markit, the improvement in the PMI was due to the first increase in employment in 35 months and the fastest growth in input purchases since November 2014, even though new orders declined. Overall, the economy remains vulnerable. One of the hampering factors is a persisting decline in real disposable income, which deepened to 7.1% year on year in April. According to the June CF, EIU and OECD forecasts, Russian GDP will decline by 1.1%–1.7% this year, but the economy will return to positive growth next year. Nevertheless, the outlooks of the monitored institutions deteriorated and are now no higher than 1%. Inflation will gradually go down, slowing to 5.3%–5.6% by the end of 2017.

GDP growth, %



	CF	IMF	OECD	EIU
2016	-1.2	-1.8	-1.7	-1.1
2017	1.0	0.8	0.5	0.8

Inflation, %

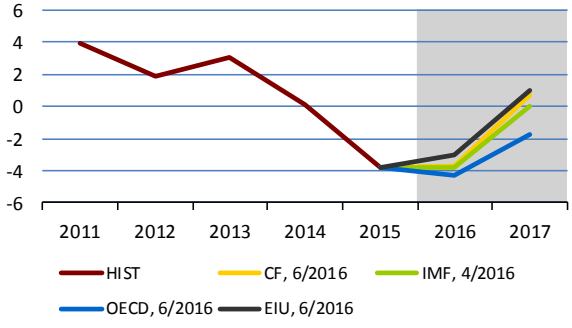


	CF	IMF	OECD	EIU
2016	7.2	8.4	7.3	6.6
2017	5.6	6.5	5.3	5.5

III.4 Brazil

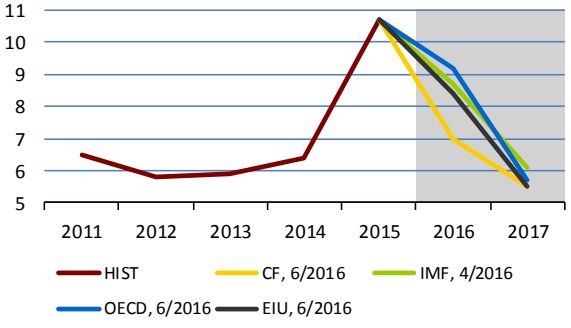
The economic contraction in Brazil moderated to 5.1% year on year in 2016 Q1 (compared to 5.9% at the end of last year). For almost a year, imports at both constant and current prices have been falling the most. However, their decline has slowed significantly this year (from 39% in January to 21% in May) and the current account recorded a surplus for the first time in April. Annual inflation slowed slightly in April and May, fluctuating around 9.3%. Uncertainty and risks remain significant. The Brazilian central bank left its monetary policy rate at 14.25% at its meeting in June. The SELIC has been at this level – the highest since 2006 – for almost a year now. According to the latest CF, EIU and OECD outlooks, GDP growth will be well below zero this year. The contraction in GDP may reach 3.0%–4.3%. The OECD currently has the most pessimistic outlook; it expects GDP to decrease next year, too. The other outlooks expect zero or slightly positive growth.

GDP growth, %



	CF	IMF	OECD	EIU
2016	-3.7	-3.8	-4.3	-3.0
2017	0.7	0.0	-1.7	1.0

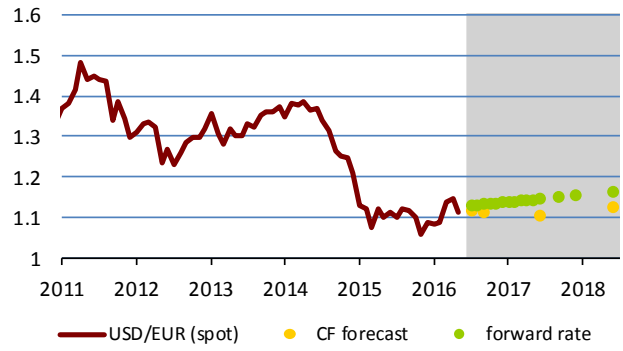
Inflation, %



	CF	IMF	OECD	EIU
2016	7.0	8.7	9.2	8.4
2017	5.5	6.1	5.7	5.5

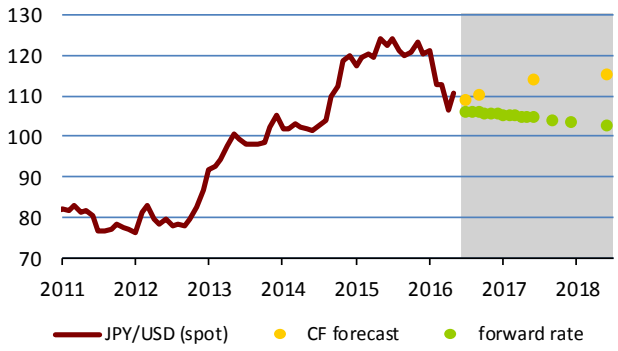
IV. Outlook of exchange rates

The US dollar (USD/EUR)



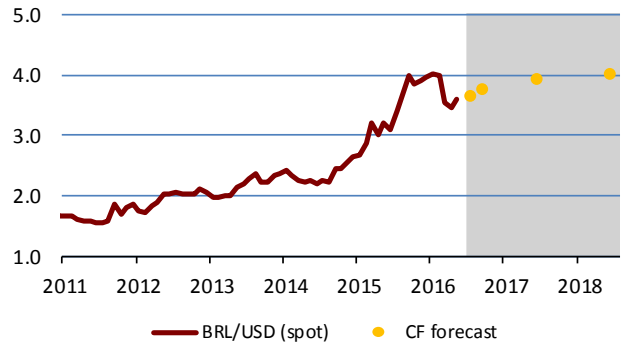
	13/6/16	07/16	09/16	06/17	06/18
spot rate	1.130				
CF forecast		1.117	1.112	1.106	1.127
forward rate		1.130	1.133	1.145	1.164

The Japanese yen (JPY/USD)



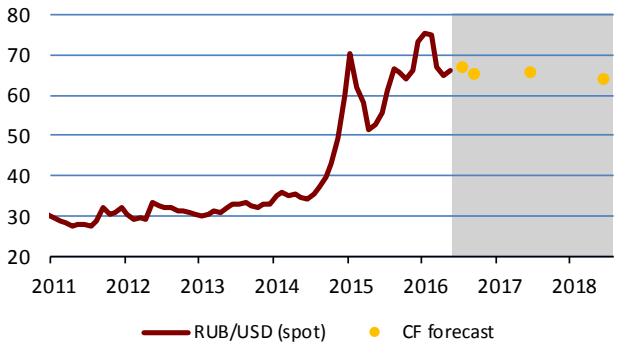
	13/6/16	07/16	09/16	06/17	06/18
spot rate	106.3				
CF forecast		109.0	110.1	114.0	115.1
forward rate		106.1	105.9	104.6	102.5

The Brazilian real (BRL/USD)



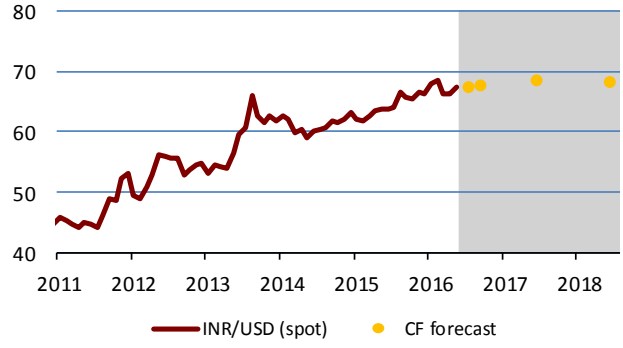
	13/6/16	07/16	09/16	06/17	06/18
spot rate	3.451				
CF forecast		3.655	3.779	3.940	4.031

The Russian rouble (RUB/USD)



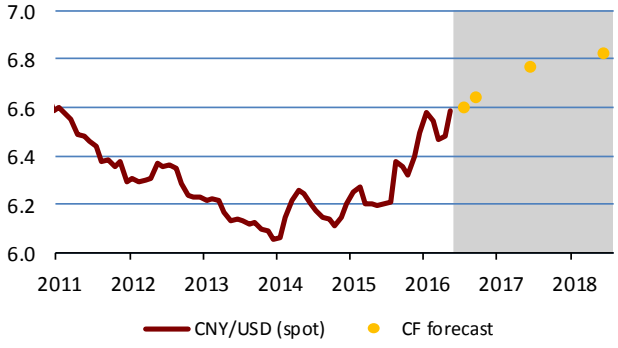
	13/6/16	07/16	09/16	06/17	06/18
spot rate	65.80				
CF forecast		66.82	65.36	65.53	63.81

The Indian rupie (INR/USD)



	13/6/16	07/16	09/16	06/17	06/18
spot rate	67.11				
CF forecast		67.37	67.78	68.58	68.25

The Chinese renminbi (CNY/USD)



	13/6/16	07/16	09/16	06/17	06/18
spot rate	6.586				
CF forecast		6.601	6.643	6.768	6.825

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.

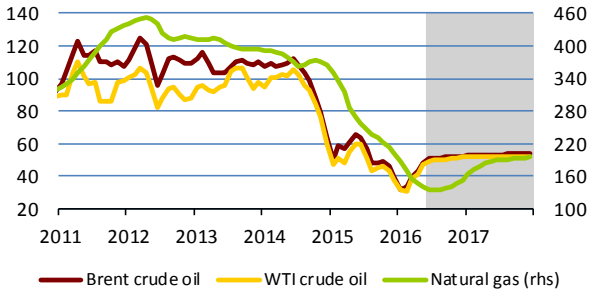
V.1 Oil and natural gas

The oil price continues to be supported by sizeable production shortfalls in both OPEC and non-OPEC countries, an accelerating decrease in shale extraction in the USA and fast-growing demand for petrol (especially in India, China and the USA). The Brent oil price maintained its now five-month-long upward trend in May and the first half of June. However, the price growth started to slow as the price neared USD 50/bbl in the second half of May. This was due, among other things, to an appreciating dollar and weakening speculative activity by investors. The fundamental surplus in the oil market remains, but is diminishing gradually. The EIA and now also the IEA expect the market to become balanced in the second half of 2017 and global oil stocks to drop. The IEA is also expecting temporary equilibrium in the market in the second half of 2016. It is assumed that a price over USD 50/bbl will prompt a recovery in investment activity in the USA and thus slow the decline in shale extraction, which has a very short investment horizon. The room for further rapid price growth is virtually exhausted, while a calming of the situation in Africa might lead to a renewed decline in oil prices.

According to the market futures curve of 13 June, the average Brent oil price will be USD 46.4/bbl this year and USD 53.3/bbl next year. The June CF one-year forecast is almost identical (USD 53.1/bbl). The market curve is currently relatively flat (though still rising), as its shorter end is elevated in response to the current production shortfalls. The EIA forecast expects slightly lower prices both this year and the next (USD 43/bbl and USD 52/bbl respectively) but faster growth in prices in the second half of 2017.

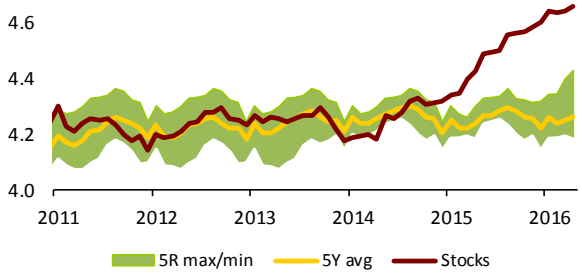
Natural gas prices increased slightly in the USA due to slower filling of underground storages, while decreasing in Europe as previous low oil prices passed through to prices of long-term contracts with a lag.

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

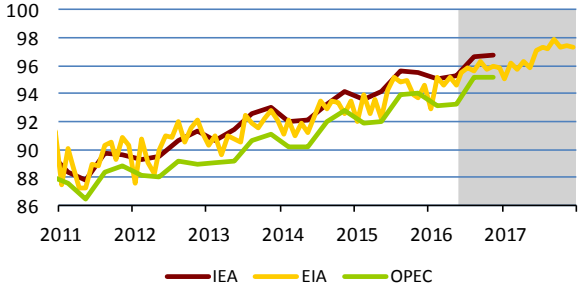


	Brent	WTI	Natural gas
2016	46.39 ↗	45.12 ↗	148.16 ↗
2017	53.29 ↗	52.08 ↗	186.09 ↗

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

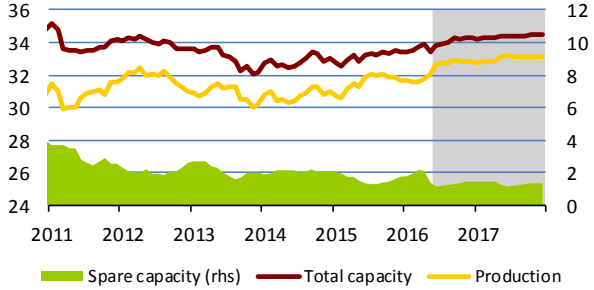


Global consumption of oil and oil products (mil. barrel / day)



	IEA	EIA	OPEC
2016	95.94 ↗	95.27 ↗	94.20 →
2017		96.74 ↘	

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



	Production	Total capacity	Spare capacity
2016	32.35 ↘	33.89 ↘	1.55 ↗
2017	33.04 ↘	34.37 ↘	1.33 →

Note: Oil price in USD/barrel, price of Russian natural gas at German border in USD / 1,000 m³ (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 including average, maximum and minimum in past five years in billions of barrels. Global consumption of oil and oil products in millions of barrels a day. Production and extraction capacity of OPEC in million barrels a day (EIA estimate).
Source: Bloomberg, IEA, EIA, OPEC, CNB calculation

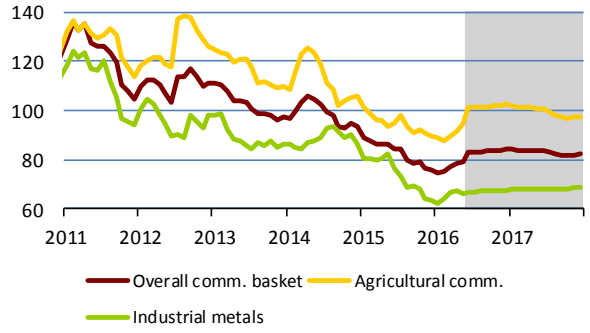
V.2 Other commodities

The average monthly non-energy commodity price index kept rising in May and accelerated even further in the first half of June. The food commodity index showed a similar trend. It is expected to stagnate this year and move downwards slightly next year. The industrial metals price index has been broadly flat since April, close to the March level. Its outlook is only slightly rising.

Agricultural commodity prices rose in May, mainly because of bad weather. The harvest in Argentina, the largest soy exporter, is under threat from heavy rain, to which the soy price responded with a further sharp increase. Rain in Brazil is delaying the sugar cane harvest, causing the price of sugar to keep rising. Conversely, drought in Thailand caused rice prices to increase. The price of corn also increased, probably due to rising petrol prices, and the price of wheat also rose modestly even though the USDA increased its forecast for final stocks in the next trading year. Meat prices alone were broadly flat last month (the price of lean hogs is close to a one and a half-year high), with a falling outlook. Prices of soy and sugar are also expected to decline following previous strong growth.

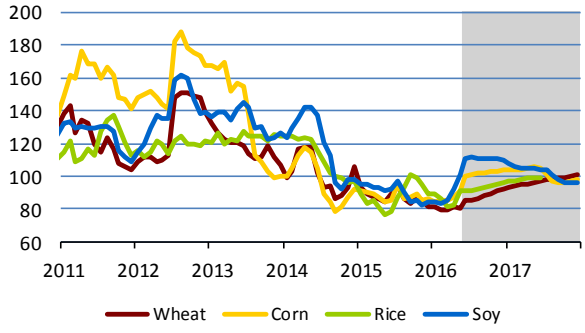
Industrial metals prices were affected by contrary information. The industrial PMI rose in the USA but fell in China (from 49.4 to 49.2). Expectations of another rate hike in the USA led to appreciation of the dollar in May, which also squeezed metal prices. Conversely, higher prices of new homes in China supported metal prices. The only major price movements were thus recorded for zinc, where an expected cut in production resulted in a price rise, and for steel and iron ore, where prices dropped in response to administrative measures taken by commodity exchanges to lower the risk of trading in Chinese commodity futures.

Non-energy commodities price indicies



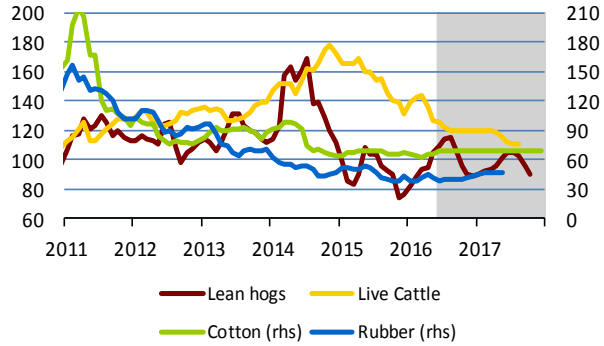
	Overall	Agricultural	Industrial
2016	80.8	97.0	66.5
2017	83.2	99.6	68.2

Food commodities



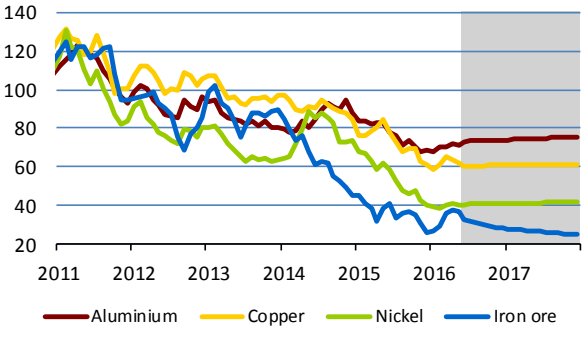
	Wheat	Corn	Rice	Soy
2016	85.0	95.7	90.5	101.8
2017	97.2	101.3	98.2	102.0

Meat, non-food agricultural commodities



	Lean hogs	Live Cattle	Cotton	Rubber
2016	98.8	128.2	67.0	41.0
2017	97.2	115.8	69.5	46.2

Basic metals and iron ore



	Aluminium	Copper	Nickel	Iron ore
2016	72.2	61.1	40.2	31.4
2017	74.7	61.3	41.3	26.1

Note: Structure of non-energy commodity price indices corresponds to composition of The Economist commodity indices. All prices are given as indices, 2010 = 100 (charts) and percentage changes (tables).
Source: Bloomberg, CNB calculations.

Annual assessment of the forecasts included in GEO[1]

The biggest surprise of 2015 was an unexpected economic contraction in Brazil and Russia. The forecasts for GDP growth in 2015 for all the other remaining countries were relatively accurate on average. The smallest forecast errors were made by CF, followed by the IMF and the OECD. The inflation forecasts for 2015 were overestimated on average (except those for Brazil and Russia). Nonetheless, CF again produced the most accurate forecasts. 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. Forecasters were also surprised (as in last year's assessment) by a stronger exchange rate of the dollar against the monitored currencies and by a lower-than-expected oil price.

1 Introduction

The aim of this article is to assess the accuracy of the forecasts of the economic variables regularly monitored in Global Economic Outlook (GEO) and to provide readers with feedback on how well the individual monitored institutions, including Consensus Forecasts (CF), and the outlooks derived from market contracts reflected the ex post known outcomes.

In the case of the forecasts for GDP growth and CPI inflation (fixed-event forecasts), this assessment is conducted annually for the previous calendar year i.e. we are now assessing the past forecasts for 2015. In the case of the three-month and one-year outlooks (rolling-event forecasts) for foreign interest rates, exchange rates against the dollar (USD) and oil prices, the assessment starts with the April 2014 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.

The text is structured as follows. Section 2 assesses the forecasts for GDP growth and CPI inflation for the individual foreign economies monitored. Section 3 goes on to assess the accuracy of the forecasts for foreign interest rates. Section 4 assesses the accuracy of the forecasts for the exchange rate of the dollar against the currencies under review. Section 5 assesses the Brent crude oil price forecast. This is followed by a section summarising the results.

2 Assessment of the accuracy of the GDP growth and CPI inflation forecasts for 2015

GEO regularly monitors actual and predicted GDP growth and CPI inflation in the euro area, the USA, Germany and Japan and also in the BRIC countries (Brazil, Russia, India and China). The forecasts for their GDP growth and inflation are taken primarily from Consensus Forecasts (CF) and also from the International Monetary Fund (IMF) and the Organisation for Economic Cooperation and Development (OECD). These three institutions also cover all the countries monitored. In addition, we monitor the European Central Bank's (ECB) forecast for the euro area, the Federal Reserve's forecast for the USA. Deutsche Bundesbank's (DBB) forecast for Germany and the Bank of Japan's (BoJ) forecast for Japan. The forecasts of the Economist Intelligence Unit (EIU) are used for the BRIC countries.

These institutions differ in the frequency and date of publication of their forecasts. The forecast updates range from monthly (CF) and quarterly through to half-yearly. For presentational reasons, only the half-yearly forecasts (i.e. the spring forecasts and the autumn forecasts) are assessed.

The deviations of the GDP growth forecasts from the actual outcomes are provided in Figures 9 to 16 in the Appendix. The biggest surprise of 2015 was an unexpected economic contraction in Brazil and Russia, for which the oldest forecasts from spring 2014 markedly overestimated the actual outcomes in 2015, when GDP fell by almost 4% in both countries. To a lesser degree, the initial GDP growth forecasts for the USA and Japan also overestimated the actual outcomes, while the growth forecasts for the euro area and Germany were relatively sober and forecasted the subsequent developments well on average. Actual growth in the euro area and Germany was in fact underestimated in the autumn 2014 forecast. Chinese GDP growth was forecasted with minimal deviations. In the case of India, the actual growth was higher than forecasted.

[1] Written by Filip Novotný (filip.novotny@cnb.cz). The views expressed in this article are those of the author and do not necessarily reflect the official position of the Czech National Bank.

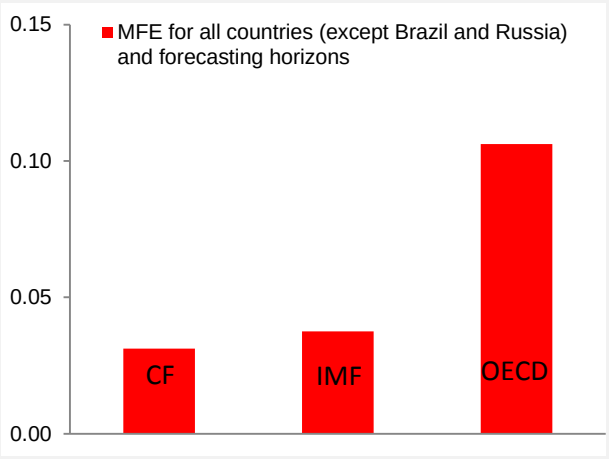


Figure 1 Comparison of the accuracy of institutions forecasting GDP for all countries

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

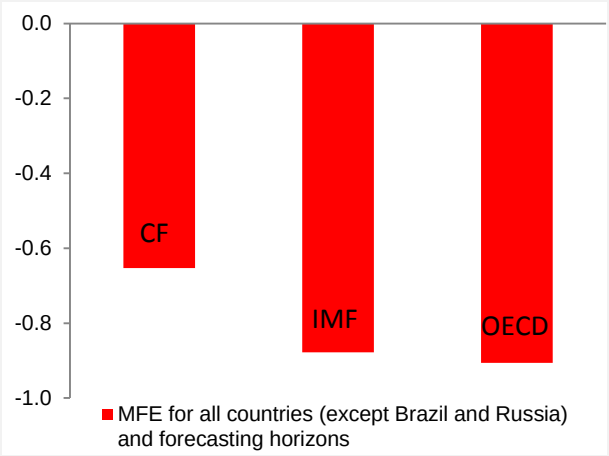


Figure 2 Comparison of the accuracy of institutions forecasting CPI inflation for all countries

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

As for Brazil and Russia, the growth forecasts were already relatively strongly overestimated in last year's assessment of the accuracy of the forecasts for 2014. This was related to an unexpected drop in oil prices in the second half of 2014. However, the forecasts for Brazil's economic growth showed relatively high variability (uncertainty) due to domestic economic and political problems, too. As in the case of the 2008–2009 crisis, this points, among other things, to a poor ability (or willingness) of economists to predict economic contractions. According to Ahir and Loungani (2014),[2] one reason may be an asymmetrically perceived greater loss for incorrectly calling a recession than benefits from correctly calling one. As the above study says, this applies to the forecasts of both the private institutions grouped in CF and the monitored international institutions. Figures 9 to 16 in the Appendix also show that in most cases the forecasts gradually became more accurate as the forecast horizon became shorter.

Turning to the individual institutions providing forecasts for all the countries under review, namely CF, the IMF and the OECD, the best performer on average for all countries except Brazil and Russia[3] and for all forecast horizons was CF, followed by the IMF (see Figure 1). This figure also shows that the GDP forecasts for 2015 were relatively accurate on average (the biggest deviation was only 0.1 pp). If we included Brazil and Russia in the calculation, the deviation would be many times higher and would have a negative sign. However, the accuracy ranking of the institutions would be unchanged.[4]

While the GDP growth forecasts were relatively accurate, the inflation forecasts for all countries except Brazil and Russia and for all forecast horizons were markedly overestimated on average (see Figure 2). As with the GDP growth forecasts, the most accurate forecasts were those of CF, followed some way behind by the IMF and the OECD. These results confirm the nature of the current low-inflation economic growth, which is being driven largely by an unexpected fall in energy commodity prices (see section 5).

The figures depicting the deviations of the inflation forecasts from the actual outcomes (Figures 17 to 24; see the Appendix) show that in the case of advanced countries and India and China, forecasters mainly overestimated the forecasts for one year ahead (i.e. the forecasts for 2015 published in 2014). Such large deviations from the actual outcomes did not occur in the forecasts for the current year.

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.[5]

[2] *There will be growth in the spring: How well do economists predict turning points?* http://www.voxeu.org/article/predicting-economic-turning-points

[3] We deliberately omit Brazil and Russia, which significantly distort the overall results.

[4] 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 (2015), because in last year's assessment, for example, the accuracy ranking of the institutions was OECD, CF, IMF.

[5] Developments in these countries in the period under review were characterised by the launch of QE policy in the euro area in March 2015 and by the start of the normalisation of interest rates in the USA through the first rate increase in December 2015. QE monetary policy is leading to a further easing of the monetary conditions. However,

In line with the overestimated inflation outlooks for the euro area, the outlooks for interest rates were also overestimated in the period under review (see Figures 3 and 4). The one-year outlooks were naturally more overestimated (less accurate) than the shorter three-month ones.

Figure 3 Three-month outlooks

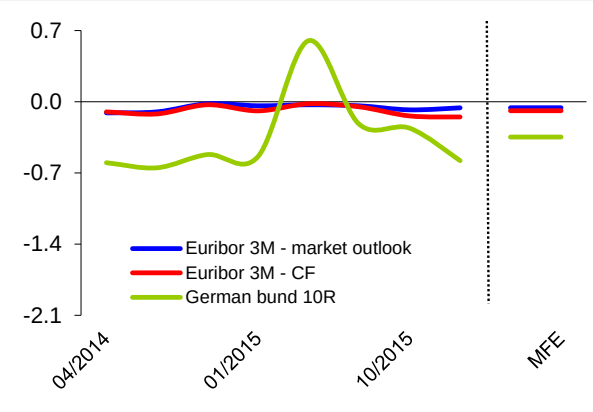
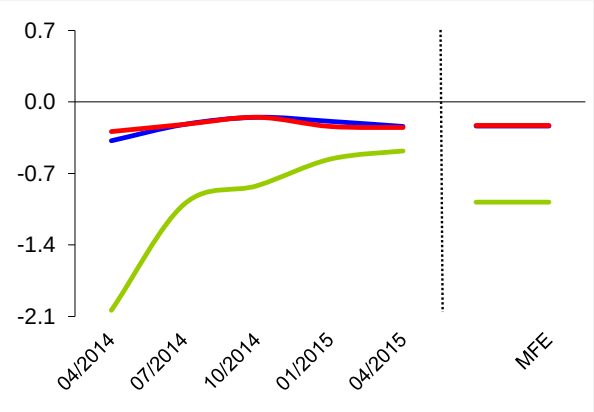


Figure 4 One-year outlooks



Figures 3 and 4 Forecast errors for interest rates for the euro area (pp)

Note: The source of the actual data is Datastream. MFE is the mean forecast error for the monitored period.

The smaller deviations of the forecasts for short-term interest rates (3M Euribor) were due to the relatively low levels of these rates in advanced countries. The 3M Euribor was 0.1% on average in 2015 and 2016. Nevertheless, its projection at the one-year horizon was about 0.2 pp higher over the whole period under review. A comparison of the forecasts for the 3M Euribor according to CF and according to market outlooks shows no clear preference for one source over the other.

The forecasts for the ten-year German government bond were also overestimated on average. The exception in the case of the three-month outlooks was mid-2015, when the actual yield increased temporarily while its three-month outlook responded to this rise with a lag. In the case of the one-year outlook for the ten-year yield, the deviation was significant in April 2014 but decreased over time.

The one-year interest rate outlooks for the USA were overestimated, as were those for the euro area (see Figure 6). Similar errors occurred in the forecasts for the ten-year US bond. This similarity in the deviations of the forecasts for long-term yields is due to a high correlation between US and German ten-year government bond rates.

Figure 5 Three-month outlooks

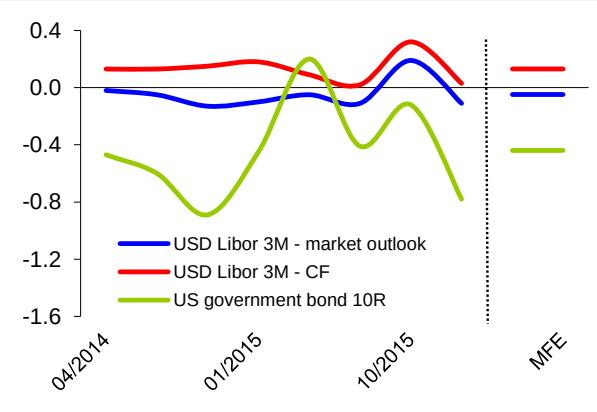
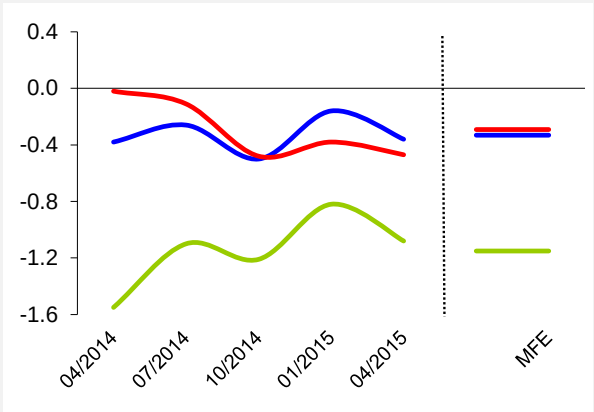


Figure 6 One-year outlooks



Figures 5 and 6 Forecast errors for interest rates for the USA (pp)

Note: The source of the actual data is Datastream. MFE is the mean forecast error for the monitored period.

The situation was slightly different for the three-month CF outlooks for short-term interest rates, as three-month money market interest rates had been expected to be lower by comparison with the subsequent outcome.

having fallen to zero, money market interest rates can no longer reflect this. Imaginary variables (shadow rates) can be used for this purpose.

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

GEO provides 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 rate parity and represent the current ability to hedge the future exchange rate rather than the outlook.

In the period under review, the one-year outlooks in particular predicted a weaker dollar than the subsequent outcome. The dollar thus surprised forecasters with its stronger-than-expected level (see Figures 25 to 36 in the Appendix). This is a similar picture as in the previous assessment, when the dollar exchange rate had also surprised forecasters with its stronger level. The CF outlooks for the USD/EUR exchange rate were more accurate by comparison with forward rates.

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

The market outlooks derived from both futures contracts and the CF outlooks overestimated the actual price of oil at both the three-month and one-year horizons. Again, this is a very similar situation to that identified in last year's assessment. The curves of the forecast errors (see Figures 7 and 8) show that this was due mainly to a sharp fall in the price of oil in the second half of 2014. A comparison of the accuracy of the market outlooks and CF outlooks reveals that the market outlooks were more accurate. The average deviation of the one-year outlooks in the period under review was a sizeable USD 40 a barrel.

Figure 7 Three-month outlooks

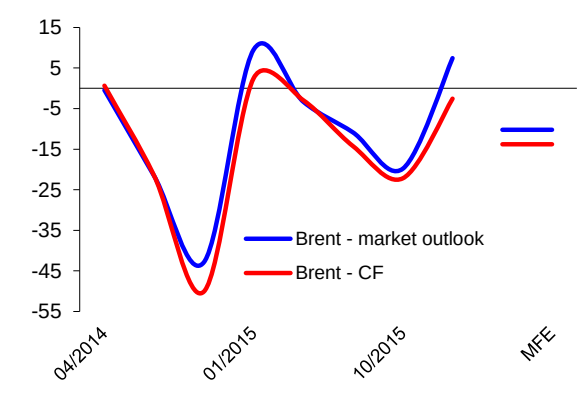
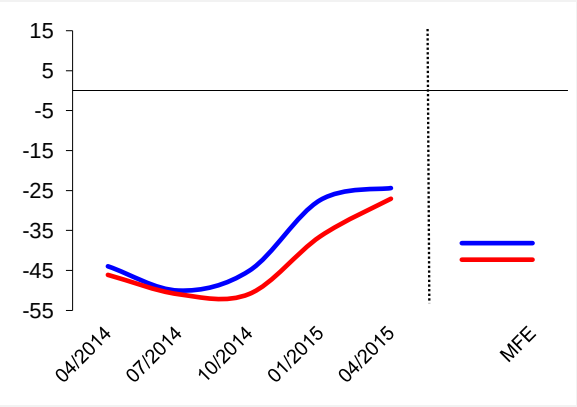


Figure 8 One-year outlooks



Figures 7 and 8 Forecast errors for the Brent oil price (USD a barrel)

Note: The source of the actual data is Datastream. MFE is the mean forecast error for the monitored period.

6 Conclusion

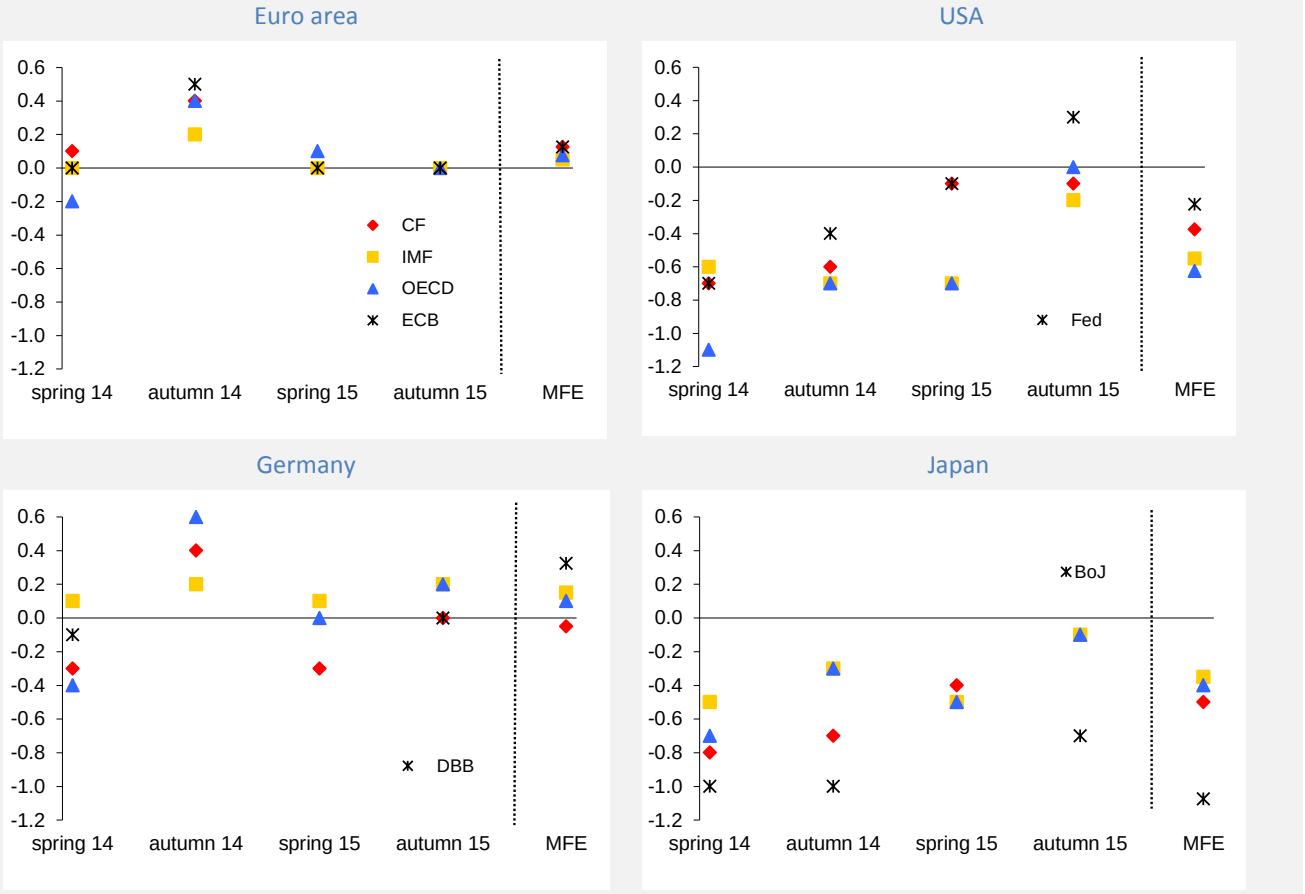
This *Focus* presents the results of an assessment of the accuracy of the forecasts for key economic variables regularly monitored in GEO. From this perspective, the biggest surprise of 2015 was an unexpected economic contraction in Brazil and Russia, where in particular the older forecasts from spring 2014 markedly overestimated the later outcomes. GDP fell by almost 4% in both countries in 2015. To a lesser degree, the initial GDP growth forecasts also overestimated the actual outcomes in the USA and Japan, while the growth forecasts for the euro area and Germany were relatively sober and forecasted the subsequent developments well on average. Chinese GDP growth was also forecasted with minimal deviations. In the case of India, the actual growth was higher than forecasted. The CF forecasts were more accurate than those of the IMF and the OECD.

While the GDP growth forecasts (except those for Brazil and Russia) were relatively accurate, the inflation forecasts were overestimated on average. The most accurate forecasts were those of CF, followed some way behind by the IMF and the OECD. These results confirm the nature of the current low-inflation economic growth, which is being driven largely by an unexpected fall in energy commodity prices. In line with the overestimated inflation outlooks, the outlooks for interest rates for the euro area and the USA were also overestimated in the period under review.

As in last year's assessment, forecasters were surprised by a stronger exchange rate of the dollar against the monitored currencies and by a lower-than-expected oil price. In the case of the Brent crude oil price, this was due mainly to its unexpected fall in the second half of 2014. This confirms the negative relationship between the oil price and the dollar exchange rate (Novotný, 2012)[6] observed since at least 2005.

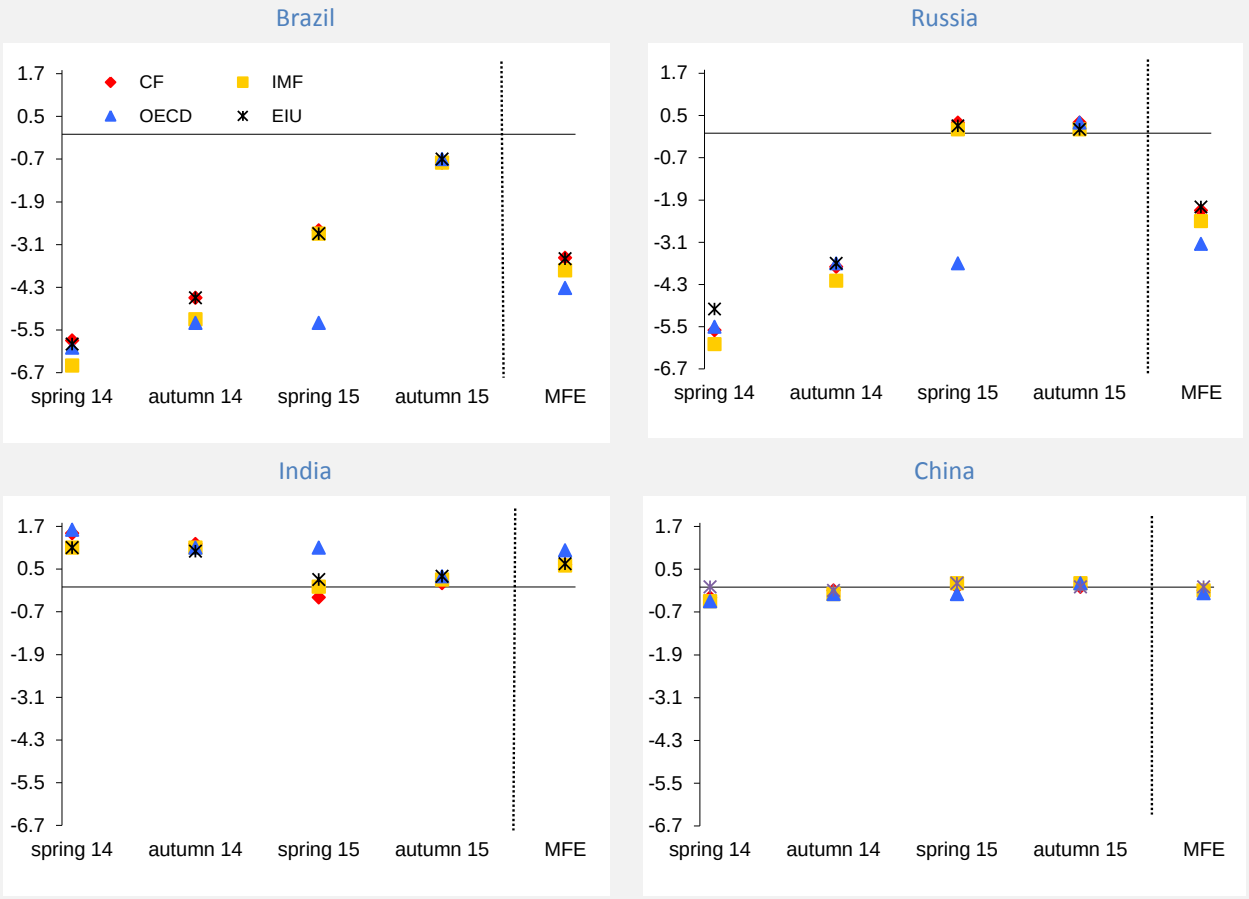
[6] *The link between the Brent crude oil price and the US dollar exchange rate*, Prague Economic Papers 2/2012.

7 Appendix



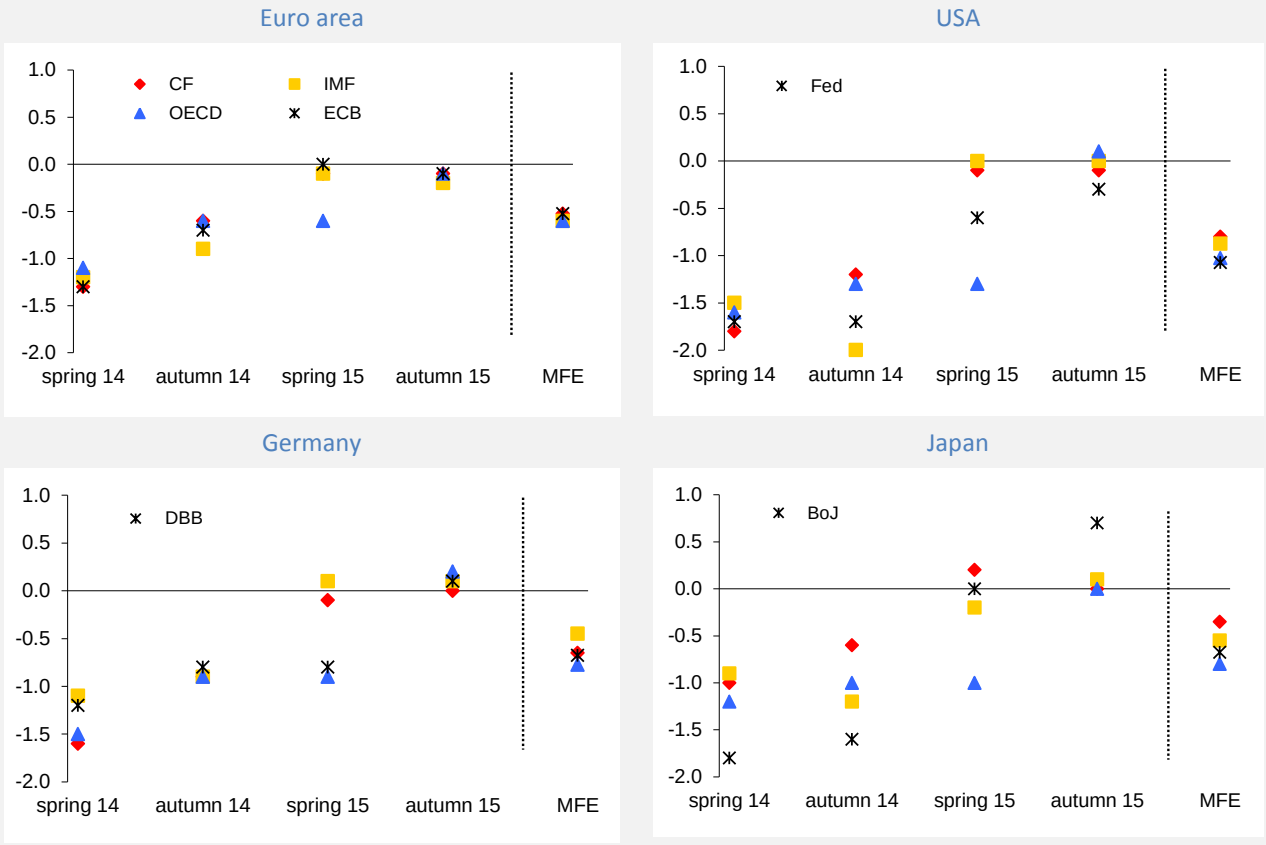
Figures 9 to 12 Forecast errors for GDP growth in advanced countries for 2015 (pp)

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 2015 is the April CF. MFE is the mean forecast error for the given year.



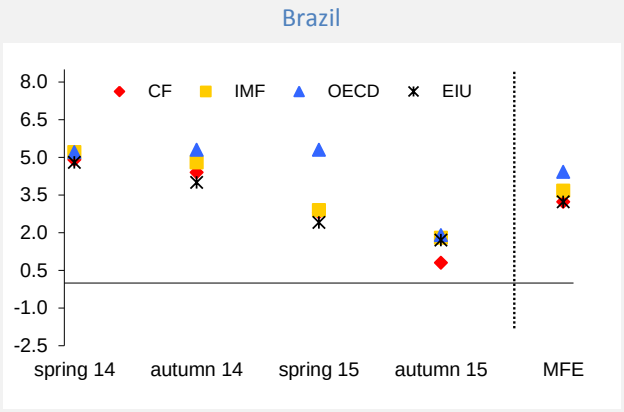
Figures 13 to 16 Forecast errors for GDP growth in BRIC countries for 2015 (pp)

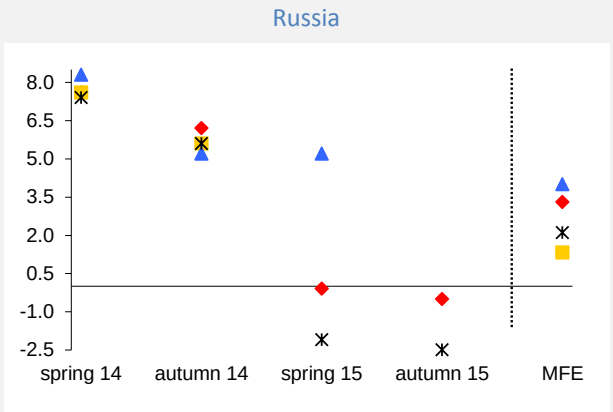
Note: CF – Consensus Forecasts, IMF – International Monetary Fund, OECD – Organisation for Economic Cooperation and Development, EIU-Economist Intelligence Unit. The source of the historical figures for 2015 is the April CF. MFE is the mean forecast error for the given year.

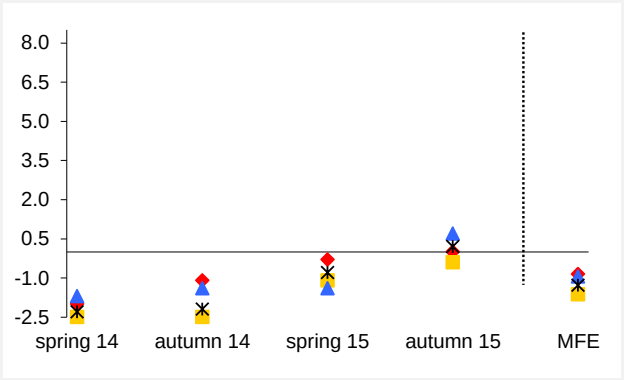


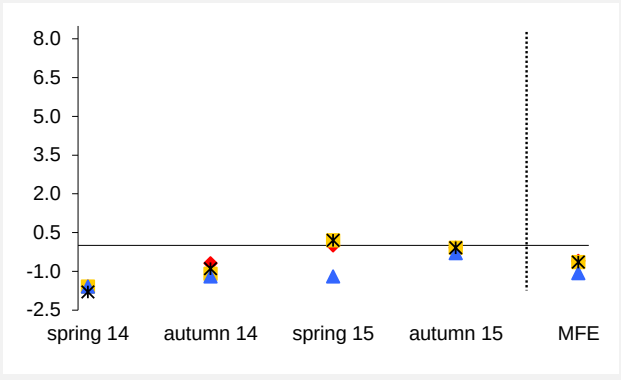
Figures 17 to 20 Forecast errors for consumer price inflation in advanced countries for 2015 (pp)

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 2015 is the April CF. MFE is the mean forecast error for the given year.





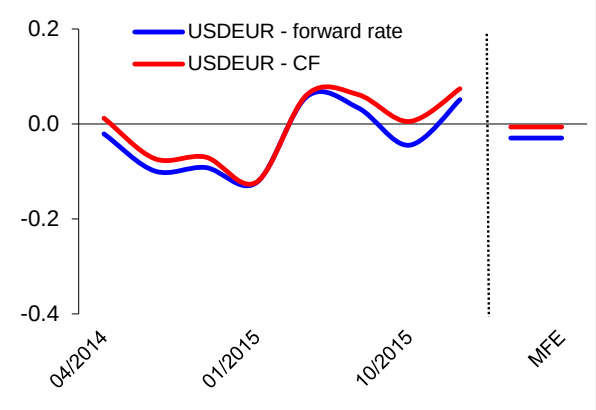




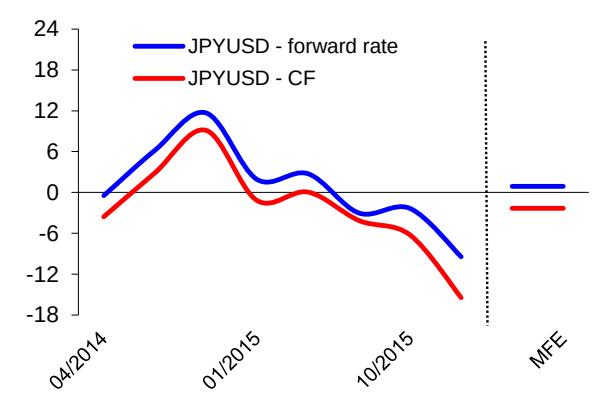
Figures 21 to 24 Forecast errors for consumer price inflation in BRIC countries for 2015 (pp)

Note: CF – Consensus Forecasts, IMF – International Monetary Fund, OECD – Organisation for Economic Cooperation and Development, EIU-Economist Intelligence Unit. The source of the historical figures for 2015 is the April CF. MFE is the mean forecast error for the given year.

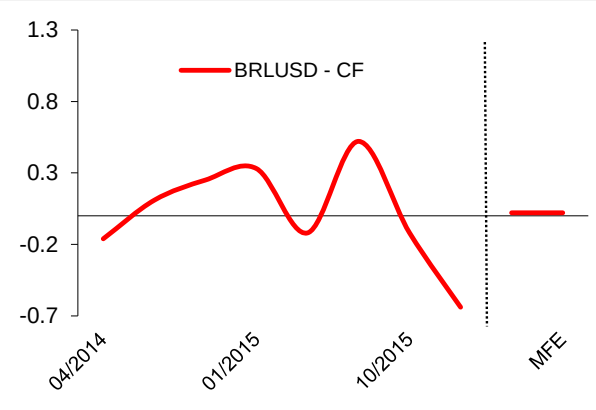
Euro (USD/EUR).



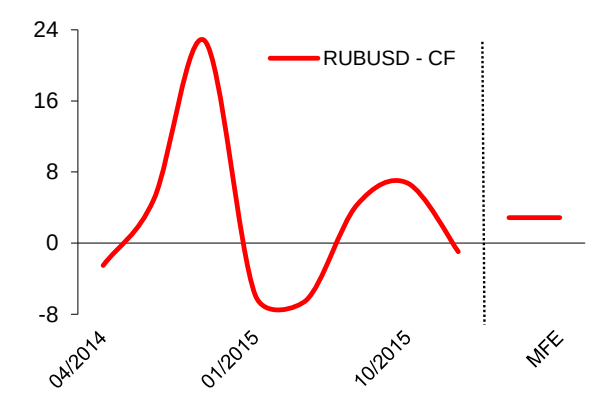
Japanese yen (JPY/USD)



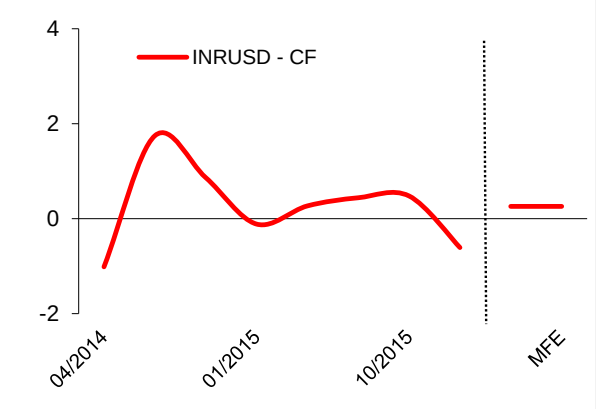
Brazilian real (BRL/USD)



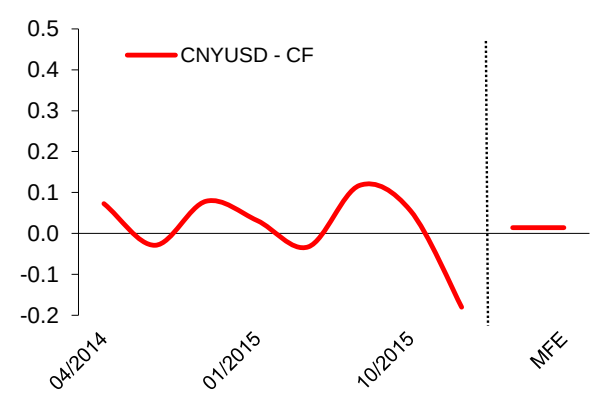
Russian rouble (RUB/USD)



Indian rupee (INR/USD)



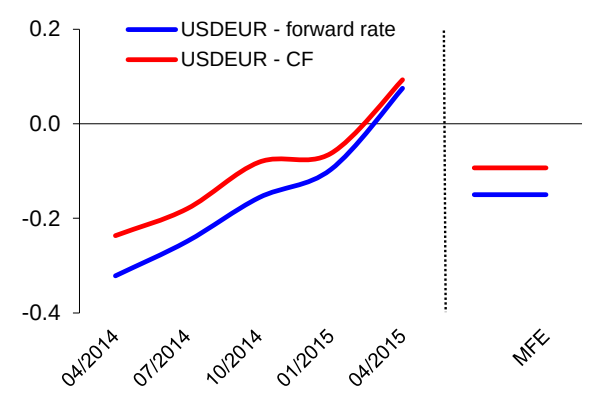
Chinese renminbi (CNY/USD)



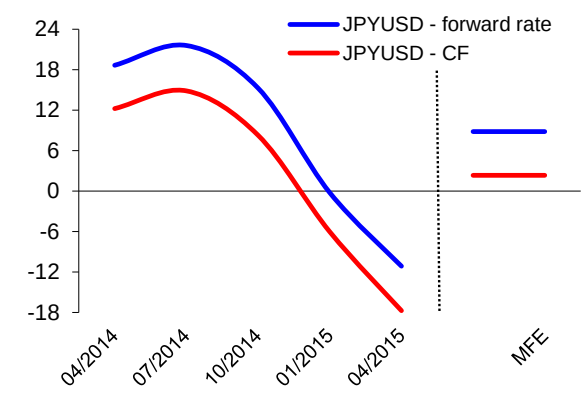
Figures 25 to 30 Three-month outlooks for exchange rates (deviations from reality)

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

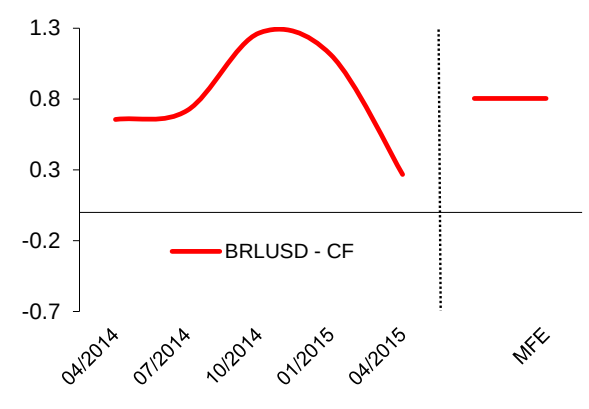
Euro (USD/EUR).



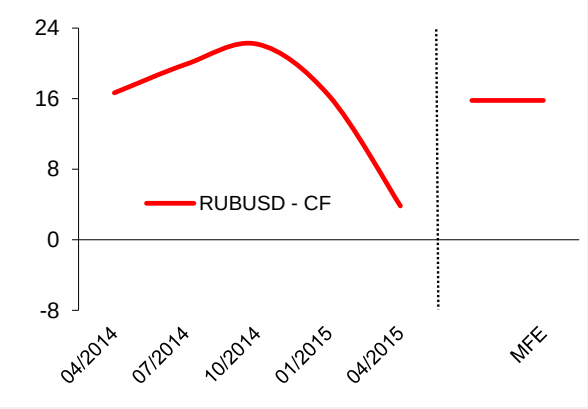
Japanese yen (JPY/USD)



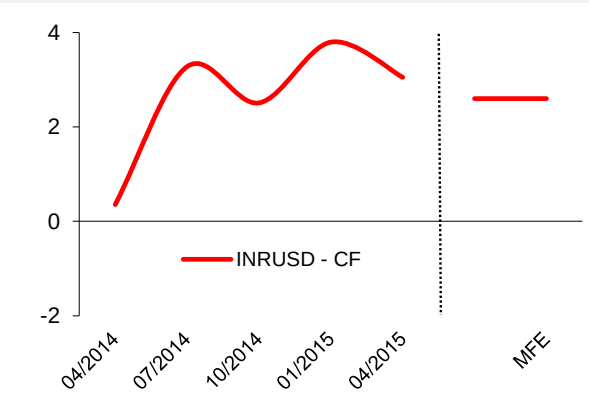
Brazilian real (BRL/USD)



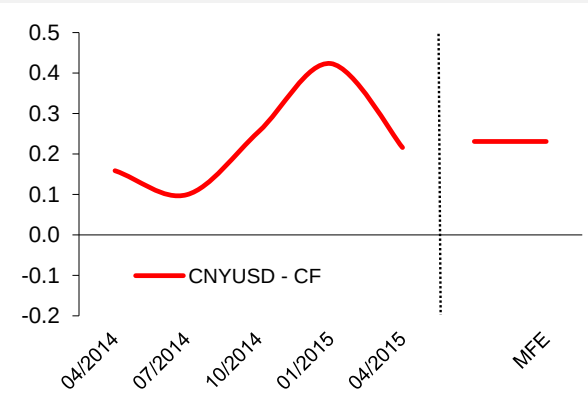
Russian rouble (RUB/USD)



Indian rupee (INR/USD)



Chinese renminbi (CNY/USD)



Figures 31 to 36 One-year outlooks for exchange rates (deviations from reality)

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

A1. Change in GDP predictions for 2016

	CF		IMF		OECD		CB / EIU	
EA	0	2016/6 2016/5	-0.2	2016/4 2016/1	+0.2	2016/6 2016/2	+0.2	2016/6 2016/3
US	+0.1	2016/6 2016/5	-0.2	2016/4 2016/1	-0.2	2016/6 2016/2	-0.2	2016/6 2016/3
DE	+0.1	2016/6 2016/5	-0.2	2016/4 2016/1	+0.3	2016/6 2016/2	-0.1	2016/6 2015/12
JP	0	2016/6 2016/5	-0.5	2016/4 2016/1	-0.1	2016/6 2016/2	-0.3	2016/4 2016/1
BR	+0.1	2016/6 2016/5	-0.3	2016/4 2016/1	-0.3	2016/6 2016/2	+0.7	2016/6 2016/5
RU	+0.1	2016/6 2016/5	-0.8	2016/4 2016/1	-1.3	2016/6 2015/11	+0.2	2016/6 2016/5
IN	0	2016/6 2016/5	0	2016/4 2016/1	0	2016/6 2016/2	0	2016/6 2016/5
CN	+0.1	2016/6 2016/5	+0.2	2016/4 2016/1	0	2016/6 2016/2	0	2016/6 2016/5

A2. Change in inflation predictions for 2016

	CF		IMF		OECD		CB / EIU	
EA	0	2016/6 2016/5	-0.6	2016/4 2015/9	-0.7	2016/6 2015/11	+0.1	2016/6 2016/3
US	+0.1	2016/6 2016/5	-0.3	2016/4 2015/9	+0.1	2016/6 2015/11	+0.2	2016/6 2016/3
DE	0	2016/6 2016/5	-0.7	2016/4 2015/9	-0.7	2016/6 2015/11	-0.9	2016/6 2015/12
JP	-0.1	2016/6 2016/5	-0.6	2016/4 2015/9	-0.6	2016/6 2015/11	-0.3	2016/4 2016/1
BR	-0.1	2016/6 2016/5	+2.4	2016/4 2015/9	+3.4	2016/6 2015/11	+1.1	2016/6 2016/5
RU	-0.3	2016/6 2016/5	-0.2	2016/4 2015/9	-2.2	2016/6 2015/11	+0.4	2016/6 2016/5
IN	0	2016/6 2016/5	-0.2	2016/4 2015/9	+0.1	2016/6 2015/11	0	2016/6 2016/5
CN	0	2016/6 2016/5	0	2016/4 2015/9	+0.1	2016/6 2015/11	-0.1	2016/6 2016/5

A3. List of abbreviations

ABS	asset-backed securities
bbl	barrel
BoJ	Bank of Japan
BR	Brazil
BRIC	countries of Brazil, Russia, India and China
BRL	Brazilian real
CB	central bank
CB-CCI	Conference Board Consumer Confidence Index
CB-LEII	Conference Board Leading Economic Indicator Index
CBOT	Chicago Board of Trade
CBR	Central Bank of Russia
CF	Consensus Forecasts
CN	China
CNB	Czech National Bank
CNY	Chinese renminbi
DBB	Deutsche Bundesbank
DE	Germany
EA	euro area
EBRD	European Bank for Reconstruction and Development
EC	European Commission
ECB	European Central Bank
EC-CCI	European Commission Consumer Confidence Indicator
EC-ICI	European Commission Industrial Confidence Indicator
EIA	Energy Information Administration
EIU	Economist Intelligence Unit
EU	European Union
EUR	euro
EURIBOR	Euro Interbank Offered Rate
Fed	Federal Reserve System (the US central bank)
FOMC	Federal Open Market Committee
FRA	forward rate agreement
FY	fiscal year
GBP	pound sterling
GDP	gross domestic product
HICP	harmonised index of consumer prices
CHF	Swiss franc
ICE	Intercontinental Exchange
IEA	International Energy Agency
IFO	Institute for Economic Research
IFO-BE	IFO Business Expectations
IMF	International Monetary Fund
IN	India
INR	Indian rupee
IRS	Interest Rate swap
ISM	Institute for Supply Management
JP	Japan
JPY	Japanese yen
LI	leading indicators
LIBOR	London Interbank Offered Rate
MER	Ministry of Economic Development (of Russia)
MMBtu	million of British Thermal Units
OECD	Organisation for Economic Co-operation and Development
OECD-CLI	OECD Composite Leading Indicator
PMI	Purchasing Managers' Index
PPI	producer price index
QE	quantitative easing
RU	Russia
RUB	Russian rouble
TLTRO	targeted longer-term refinancing operations
UoM	University of Michigan
UoM-CSI	University of Michigan Consumer Sentiment Index
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-ES	ZEW Economic Sentiment

A4. List of thematic articles published in the GEO

2016

	Issue
Annual assessment of the forecasts included in GEO (Filip Novotný)	2016-6
International comparison of competitiveness using composite indicators (Iveta Polášková)	2016-5
How global inventory levels affect commodity prices (Jan Hošek)	2016-4
The Europe 2020 strategy: Will it be fulfilled? (Pavla Břízová)	2016-3
Changes in global imbalances in the world economy (Luboš Komárek and Vladimír Žďárský)	2016-2
The FDI life cycle on the example of the Czech Republic (Filip Novotný)	2016-1

2015

	Issue
The role of China in the slowdown in international trade (Oxana Babecká Kucharčuková)	2015-12
Central banks' gold reserves (Iveta Polášková)	2015-11
Shadow policy rates – alternative quantification of unconventional monetary policy (Soňa Benecká, Luboš Komárek and Filip Novotný)	2015-10
The economic reforms of Indian Prime Minister Narendra Modi (Pavla Břízová)	2015-9
The Chinese renminbi in the SDR basket: A realistic prospect? (Soňa Benecká)	2015-8
Annual assessment of the forecasts included in GEO (Filip Novoný)	2015-7
Seasonal price movements in the commodity markets (Martin Motl)	2015-6
Assessment of the effects of quantitative easing in the USA (Filip Novoný)	2015-5
How consensus has evolved in Consensus Forecasts (Tomáš Adam and Jan Hošek)	2015-4
The US dollar's position in the global financial system	2015-3
The crisis and post-crisis experience with Swiss franc loans outside Switzerland (Alexis Derviz)	2015-2
The effect of oil prices on inflation from a GVAR model perspective (Soňa Benecká and Jan Hošek)	2015-1

2014

	Issue
Applicability of Okun's law to OECD countries and other economies (Oxana Babecká Kucharčuková and Luboš Komárek)	2014-12
Monetary policy normalisation in the USA (Soňa Benecká)	2014-11
Changes in FDI inflows and FDI returns in the Czech Republic and Central European countries (Vladimír Žďárský)	2014-10

	Issue
Competitiveness and export growth in selected Central European countries (Oxana Babecká Kucharčuková)	2014-9
Developments and the structure of part-time employment by European comparison (Eva Hromádková)	2014-8
The future of natural gas (Jan Hošek)	2014-7
Annual assessment of the forecasts included in GEO (Filip Novoný)	2014-6
How far the V4 countries are from Austria: A detailed look using CPLs (Václav Žďárek)	2014-5
Heterogeneity of financial conditions in euro area countries (Tomáš Adam)	2014-4
The impacts of the financial crisis on price levels in Visegrad Group countries (Václav Žďárek)	2014-3
Is the threat of deflation real? (Soňa Benecká and Luboš Komárek)	2014-2
Forward guidance – another central bank instrument? (Milan Klíma and Luboš Komárek)	2014-1

2013

	Issue
Financialisation of commodities and the structure of participants on commodity futures markets (Martin Motl)	2013-12
The internationalisation of the renminbi (Soňa Benecká)	2013-11
Unemployment during the crisis (Oxana Babecká and Luboš Komárek)	2013-10
Drought and its impact on food prices and headline inflation (Viktor Zeisel)	2013-9
The effect of globalisation on deviations between GDP and GNP in selected countries over the last two decades (Vladimír Žďárský)	2013-8
Competitiveness and determinants of travel and tourism (Oxana Babecká)	2013-7
Annual assessment of the forecasts included in GEO (Filip Novotný)	2013-6
Apartment price trends in selected CESEE countries and cities (Michal Hlaváček and Luboš Komárek)	2013-5
Selected leading indicators for the euro area, Germany and the United States (Filip Novotný)	2013-4
Financial stress in advanced economies (Tomáš Adam and Soňa Benecká)	2013-3
Natural gas market developments (Jan Hošek)	2013-2
Economic potential of the BRIC countries (Luboš Komárek and Viktor Zeisel)	2013-1

2012

	Issue
Global trends in the services balance 2005–2011 (Ladislav Prokop)	2012-12
A look back at the 2012 IIF annual membership meeting (Luboš Komárek)	2012-11

	Issue
The relationship between the oil price and key macroeconomic variables (Jan Hošek, Luboš Komárek and Martin Motl)	2012-10
US holdings of foreign securities versus foreign holdings of securities in the US: What is the trend? (Narcisa Kadlčáková)	2012-9
Changes in the Czech Republic's balance of payments caused by the global financial crisis (Vladimír Žďárský)	2012-8
Annual assessment of the forecasts included in the GEO (Filip Novotný)	2012-7
A look back at the IIF spring membership meeting (Filip Novotný)	2012-6
An overview of the world's most frequently used commodity indices (Jan Hošek)	2012-5
Property price misalignment around the world (Michal Hlaváček and Luboš Komárek)	2012-4
A macrofinancial view of asset price misalignment (Luboš Komárek)	2012-3
The euro area bond market during the debt crisis (Tomáš Adam and Soňa Benecká)	2012-2
Liquidity risk in the euro area money market and ECB operations (Soňa Benecká)	2012-1

2011

	Issue
An empirical analysis of monetary policy transmission in the Russian Federation (Oxana Babecká)	2011-12
The widening spread between prices of North Sea Brent crude oil and US WTI crude oil (Jan Hošek and Filip Novotný)	2011-11
A look back at the IIF annual membership meeting (Luboš Komárek)	2011-10
Where to look for a safe haven currency (Soňa Benecká)	2011-9
Monetary policy of the central bank of the Russian Federation (Oxana Babecká)	2011-9
Increased uncertainty in euro area financial markets (Tomáš Adam and Soňa Benecká)	2011-8
Eurodollar markets (Narcisa Kadlčáková)	2011-8
Assessment of the forecasts monitored in the GEO (Filip Novotný)	2011-7
How have global imbalances changed during the crisis? (Vladimír Žďárský)	2011-6
Winners and losers of the economic crisis in the eyes of European investors (Alexis Derviz)	2011-5
Monetary policy of the People's Bank of China (Soňa Benecká)	2011-4
A look back at the IIF spring membership meeting (Jan Hošek)	2011-3
The link between the Brent crude oil price and the US dollar exchange rate (Filip Novotný)	2011-2
International integration of the Chinese stock market (Jan Babecký, Luboš Komárek and Zlatuše Komárková)	2011-1