národní
úložiště
šedé
literatury

Globální ekonomický výhled - duben 2015

Česká národní banka; Sekce měnová a statistiky; Odbor vnějších ekonomických vztahů
2015

Dostupný z `http://www.nusl.cz/ntk/nusl-187378`

GLOBAL ECONOMIC OUTLOOK - April

Monetary and Statistics Department
External Economic Relations Division

2015

CNB CZECH
NATIONAL BANK

CONTENTS

Authors

Luboš Komárek	**Oxana Babecká**	**Tomáš Adam**	**Milan Klíma**	**Soňa Benecká**
lubos.komarek@cnb.cz	oxana.babecka-kucharcukova@cnb.cz	tomas.adam@cnb.cz	milan.klima@cnb.cz	sona.benecka@cnb.cz
Editor-in-chief Summary	Editor III.1 China III.3 Russia	Editor II.1 Eurozone II.2 United States Focus	II.3 Germany	II.4 Japan

Pavla Břízová	**Jan Hošek**
pavla.brizova@cnb.cz	jan2461.hosek@cnb.cz
III.2 India III.4 Brazil	V. Commodity market developments Focus

I. SUMMARY

The April issue of Global Economic Outlook presents its regular overview of recent and expected developments in selected territories, focusing on economic fundamentals: inflation, GDP growth, leading indicators, interest rates, exchange rates and commodity prices. In this issue, we also look at one of the forecasts regularly monitored in GEO: Consensus Forecasts (CF). We describe how the CF forecasts for given variables and years and the related uncertainty have changed over time. We then examine the distribution of institutions' outlooks against the CF mean and also relative to historical data. We show that for any given year there is usually an institution that forecasts more accurately than CF, but we are not able to say in advance which one. So, monitoring CF seems to be a useful strategy.

The GDP growth outlooks for advanced countries improved compared to March both for the euro area and Germany and for Japan. By contrast, the outlooks for the USA decreased slightly (see also the chart below). Even so, growth will be almost 1 pp higher in the USA than in the other advanced countries monitored. The US economy will thus remain one of the main engines of global economic growth. New data are gradually confirming that consumer price inflation in advanced countries will be very low this year and will not rise towards 2% until 2016. Consumer price inflation in the euro area will be only slightly above 1% at this horizon.

The two-year outlooks for emerging BRIC countries remain mixed. China, which was for a long period a number one among fast growing economies, will be replaced this year by India in terms of speed of economic growth. The rising growth in the Indian economy should reach 8% next year amid stable consumer price inflation just above 5%. By contrast, the Russian economy and probably also the Brazilian economy will not avoid recession this year. Moreover, the two countries will face high inflation this year (double figures in the case of Russia). The outlooks for both countries for next year bring some optimism, as economic growth should rebound and inflation should drop visibly.

The outlooks for interest rates in the euro area remain very low with no sign of growth until the end of 2016. This outlook reflects, among other things, the quantitative easing launched by the ECB in mid-March. The likely interest rate growth in the USA has shifted to the second half of 2015, mainly due to a stronger US dollar. According to CF, the dollar will appreciate slightly at the one-year horizon against the euro and against all the other monitored currencies except the Chinese renminbi.

The price of Brent crude oil has been rising steadily since mid-March. In mid-April, the growth accelerated to USD 64 a barrel in response to slackening growth in oil stocks in the USA. The outlook is slightly rising. Natural gas prices based on long-term contracts normally lag behind oil prices by 6 to 9 months and are therefore expected to decrease further in the next few months to USD 200 per 1000 m3 and to start rising again afterwards. The decline in both the non-energy commodity price index and the food commodity price index slowed further. These indices are expected to start rising gradually in the second half of the year. The industrial metals price index remained at the February level and is expected to be flat over the forecast horizon as well.

Leading indicators for countries monitored in the GEO

PMI in manufacturing - advanced countries

EA   US   DE   JP

OECD CLI - BRIC countries


BR   RU   IN   CN
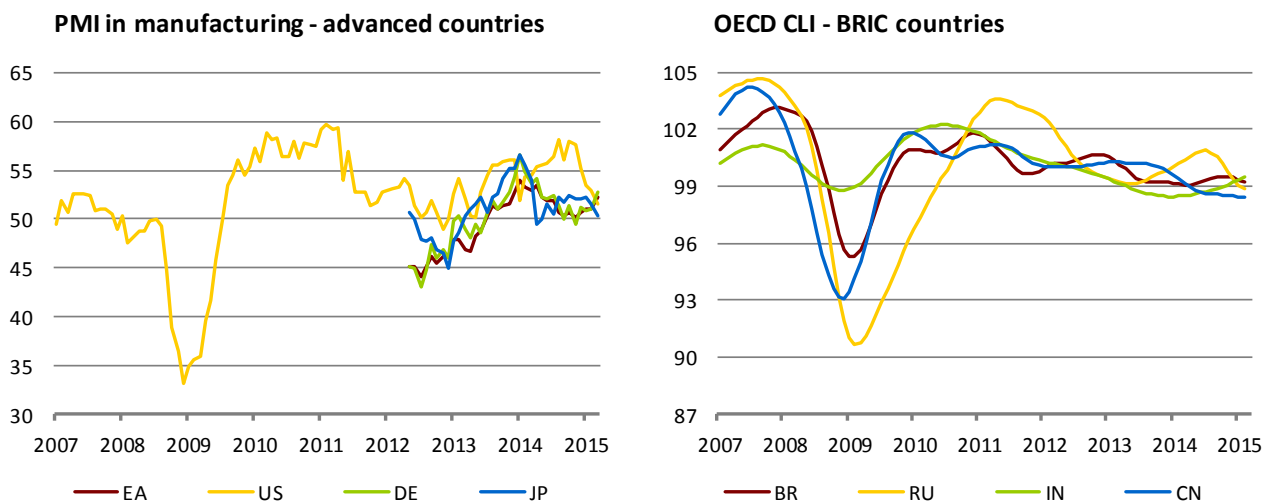
Source: Bloomberg, Datastream

II.1 Euro area

Macroeconomic indicators in the early part of the year are pointing to a pick-up in euro area growth, although this pick-up is not clearly visible and balanced across countries. The economy is being affected by the weaker euro, which is leading to greater competitiveness of euro area exports and to substitution of imports by goods produced in the monetary union. Industrial production grew at a solid pace in February (1.1% month on month), whereas retail sales dropped in the same month on negative contributions from food and petrol sales. The monitored leading indicators are signalling a faster recovery. The PMI in manufacturing reached a ten-month high of 52.2 in April and is signalling accelerating expansion mainly in Germany, Spain, Italy and the Netherlands. By contrast, industry is continuing to contract in Greece, France and Austria. The GDP growth outlook was revised slightly upwards by all the institutions. Growth is expected to be around 1.5% this year and to rise by almost 0.5 pp in 2016.

As at the start of the year, inflation will be affected over the coming months by the fall in oil prices. This fall has halted, however, and is being offset by the weaker euro. The decline in the price level was thus 0.2 pp smaller in March (-0.1%). The ECB's easy monetary policy, which is being reflected in a decline in client interest rates and – according to the April bank lending survey – in an easing of credit standards applied to loans to firms and consumer credit, is expected to have an inflationary effect over the forecast horizon. Yields on most government bonds decreased across all maturities due to ECB bond purchases. The yields on the five-year bonds of several countries turned negative. German ten-year bond yields are also approaching negative levels. However, the situation is different in Greece, as there are concerns about its ability to meet its commitments to creditors in the months ahead. In this context, Greece had its rating downgraded by S&P, and bond yields and CDS premia are rising sharply.

GDP growth, %
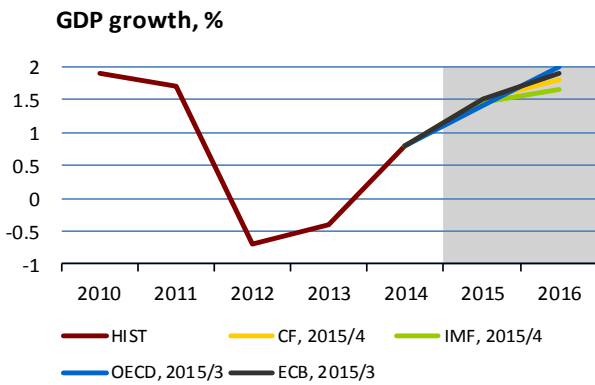
	CF		IMF		OECD		ECB	
2015	1.5		1.5		1.4		1.5	
2016	1.8		1.7		2.0		1.9	

Inflation, %
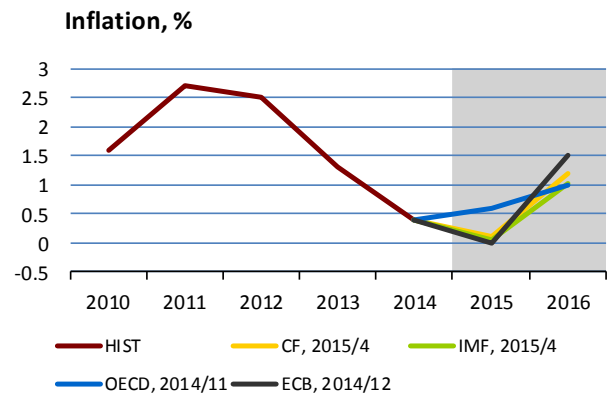
	CF		IMF		OECD		ECB	
2015	0.1		0.1		0.6		0.0	
2016	1.2		1.0		1.0		1.5	

Leading indicators
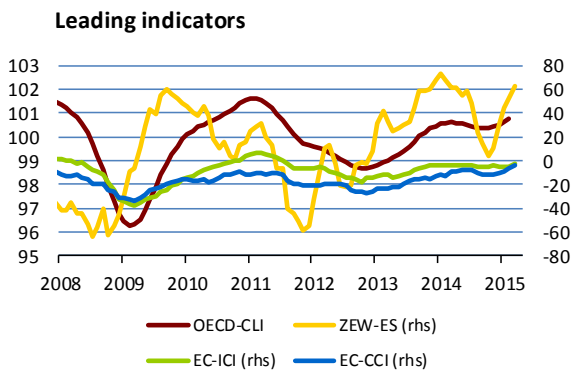
	OECD-CLI	EC-ICI	EC-CCI	ZEW-ES
1/15	100.6	-4.5	-8.5	45.2
2/15	100.8	-4.6	-6.7	52.7
3/15		-2.9	-3.7	62.4

Interest Rates
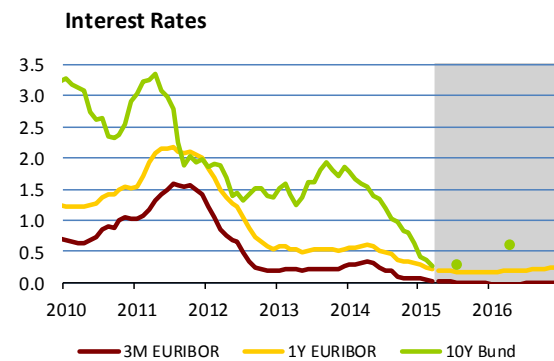
	03/15	04/15	06/15	12/15	06/16	12/16
3M EURIBOR	0.03	0.01	0.01	-0.01	-0.01	0.01
1Y EURIBOR	0.21	0.19	0.18	0.18	0.20	0.24
	03/15	07/15	04/16			
10Y Bund	0.26	0.30	0.60			

II.2 United States

Although the USA has the most favourable GDP growth outlook among the advanced countries, its recovery slowed in late 2014 and early 2015. The economy is being affected by significant appreciation of the dollar, which is undermining the competitiveness of US exports. Besides having a positive effect consisting in higher disposable income of households, the lower oil prices are negatively affecting production and investment in the energy sector. The quarter-on-quarter GDP growth rate fell by half in 2014 Q4 compared to the previous quarter, to 0.6%. Industrial production dropped in 2015 Q1 for the first time since 2009. Its March index fell by 0.6% month on month. Job creation also lagged behind expectations. Despite slackening, the leading indicators are still positive, as were March retail sales.

The GDP growth outlooks were generally revised slightly downwards. The economy is expected to grow by 2.5%–3.0% this year and at about the same rate in 2016. The price level is being affected by the fall in oil prices, the appreciating dollar and – despite a robust economic recovery – by subdued wage growth. Inflation is expected to fluctuate slightly above zero this year and rise to a level around the Fed's inflation target (CF, Fed) or about 0.5% below it (IMF) next year. The interest rate outlook is surrounded by considerable uncertainty linked with slowing economic expansion and anti-inflationary pressures. According to CF, the probability of the Fed raising rates in June has decreased and expectations of the first monetary policy tightening have shifted to the second half of the year. The dollar's appreciation against the euro halted in March (USD 1.08 to the euro in early April) and CF does not expect the exchange rate to move significantly closer to parity.

GDP growth, %
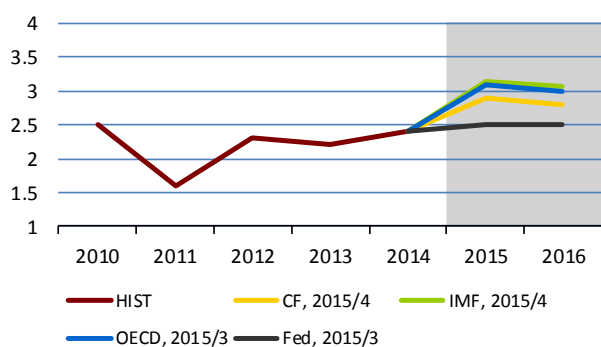
	CF		IMF		OECD		Fed	
2015	2.9	⬂	3.1	⬂	3.1	⬈	2.5	⬂
2016	2.8	⬂	3.1	⬂	3.0	⬂	2.5	⬂

Inflation, %
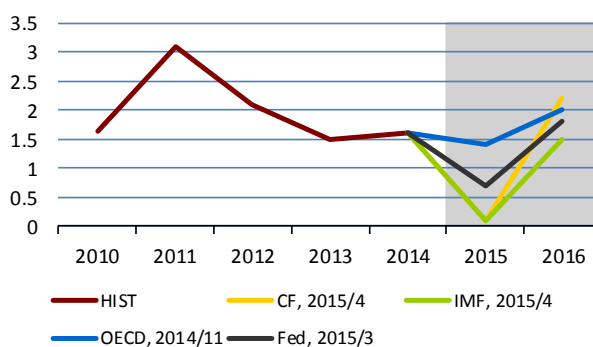
	CF		IMF		OECD		Fed	
2015	0.1	⬂	0.1	⬂	1.4		0.7	⬂
2016	2.2	⬈	1.5	⬂	2.0		1.8	⬂

Leading indicators
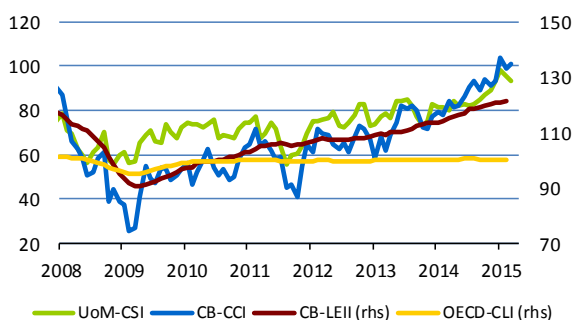
	CB-LEII	OECD-CLI	UoM-CSI	CB-CCI
1/15	121.1	100.1	98.1	103.8
2/15	121.4	100.0	95.4	98.8
3/15			93.0	101.3

Interest Rates

	03/15	04/15	06/15	12/15	06/16	12/16
3M USD LIBOR	0.27	0.27	0.34	0.64	0.99	1.35
1Y USD LIBOR	0.70	0.70	0.81	1.15	1.50	1.80
	03/15	07/15	04/16			
10Y Treasury	2.04	2.20	2.80			
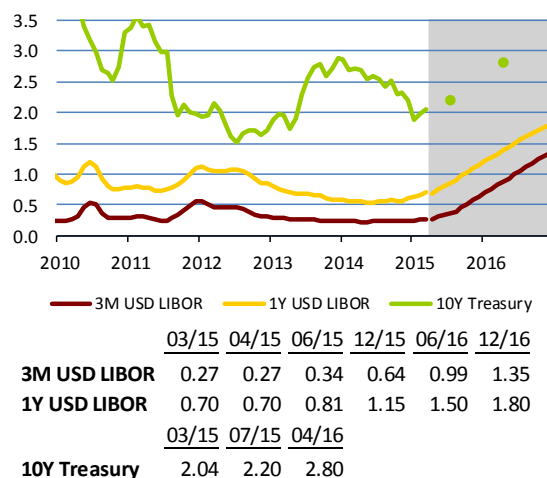
II.3 Germany

The quarterly and annual growth rates of the German economy rose to 0.7% and 1.5% respectively in 2014 Q4. The economy recorded growth of 1.6% in 2014 as a whole. The April CF expects a modest slowdown in economic growth in 2015 Q1, but this presents no threat to the favourable outlook for the year as a whole. CF has repeatedly raised its GDP growth estimates for 2015 and 2016 and the April outlook foresees 1.9% and 2% respectively. Aside from falling oil prices, a declining euro-dollar exchange rate and low interest rates, the main source of the prediction of strong growth is strengthening consumer sentiment in Germany, reflecting improving labour market conditions and rising real wages. These expectations are supported by rises in all the monitored leading indicators in March. The German economy moved further away from deflation in March, as inflation rose by 0.2 pp to 0.3%, mainly due to a slowing decline in energy prices.

GDP growth, %

Inflation, %

	CF		IMF		OECD		DBB
2015	1.9	↗	1.6	↗	1.7	↗	1.0
2016	2.0	↗	1.7	↗	2.2	↘	1.6

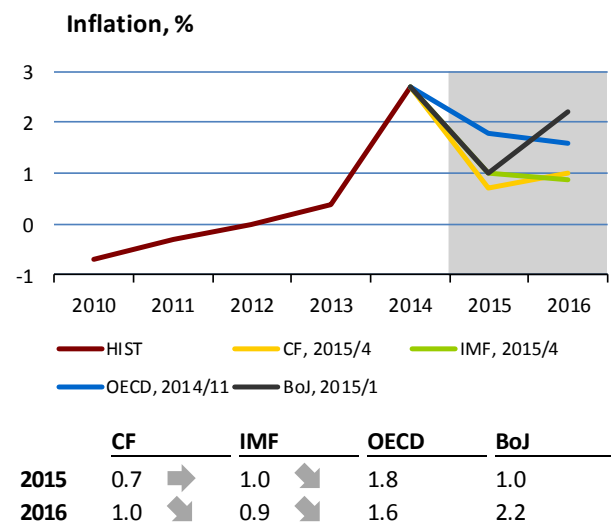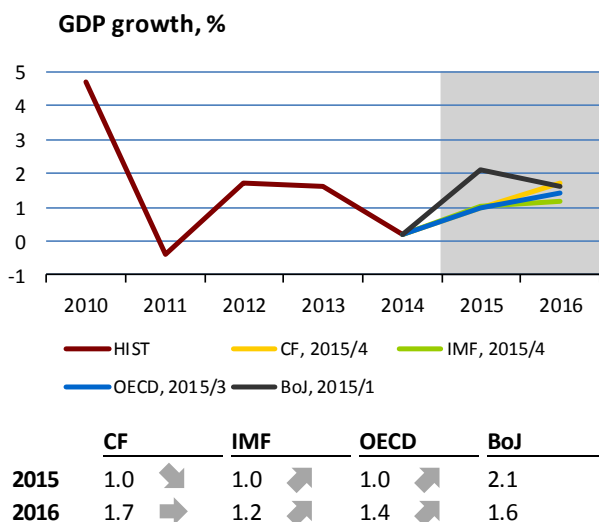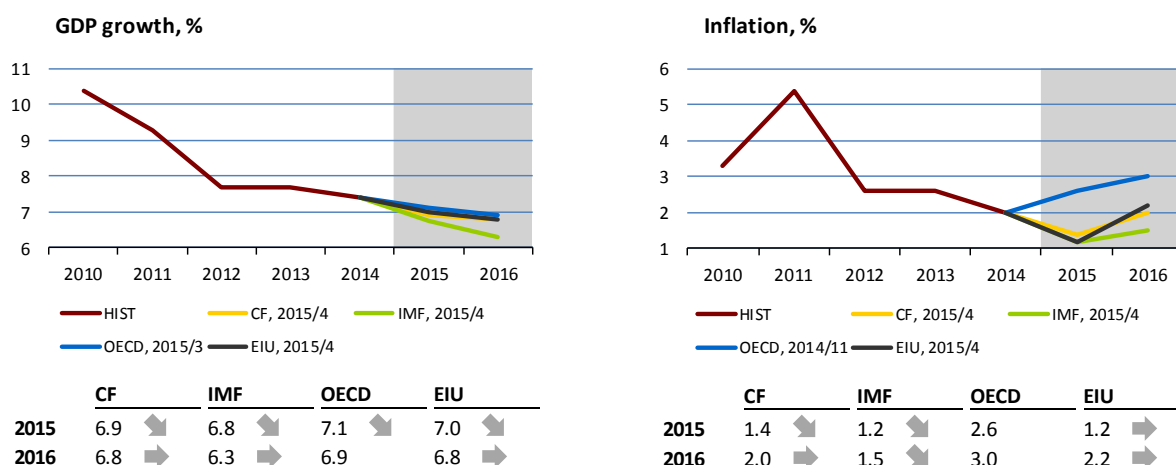|	CF		IMF		OECD	DBB
2015	0.4	➡	0.2	↘	1.2	1.1
2016	1.6	➡	1.3	↘	1.7	1.8
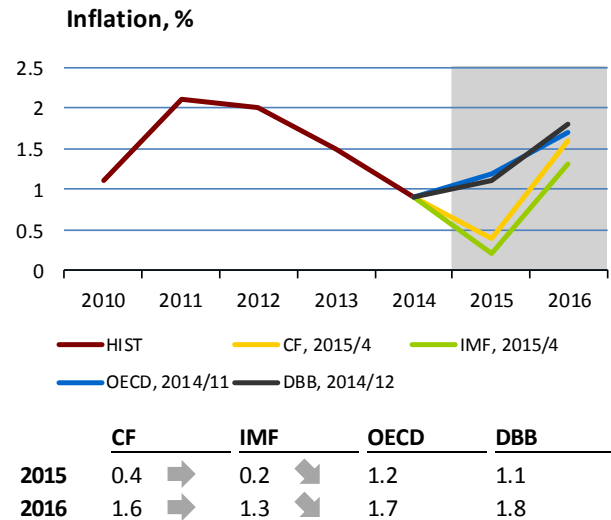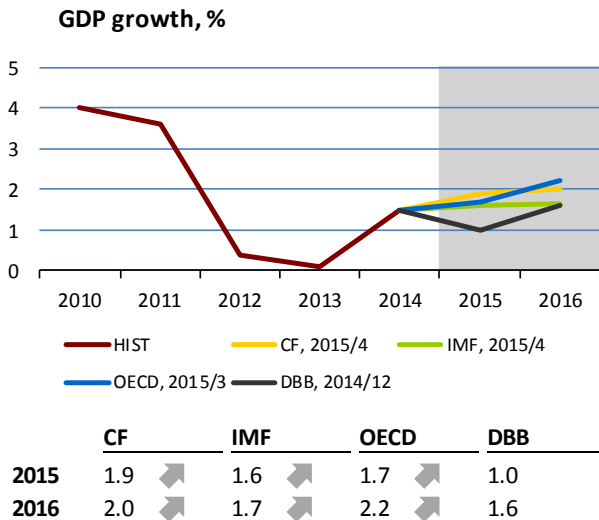
II.4 Japan

In Japan, inflation excluding volatile food prices slowed further to 2.0% in February. According to the BoJ, this was due mainly to declining fuel prices. Net of last year's tax increase, the change in the price level would have been zero. The financial markets expect adjusted inflation to fall gradually to -0.5% in July, when the trend should turn upwards. Inflation expectations (according to the Tankan survey) were unchanged in April. The central bank has not yet hinted at any next steps, but the recovery is still fragile owing to weak domestic demand. The February data on industrial production and household expenditure were generally pessimistic, but the domestic economy will be supported by an improving labour market, where the decline in real wages halted and unemployment fell to 3.5%. The April CF again revised its inflation outlook for 2016 downwards, but left its forecast for 2015 unchanged. The IMF shifted its inflation outlook for Japan downwards in both years. Following the revisions, there is a consensus among the institutions (CF, IMF, OECD) on GDP growth in 2015 (1%).

GDP growth, %

Inflation, %

	CF		IMF		OECD		BoJ
2015	1.0	↘	1.0	↗	1.0	↗	2.1
2016	1.7	➡	1.2	↗	1.4	↗	1.6

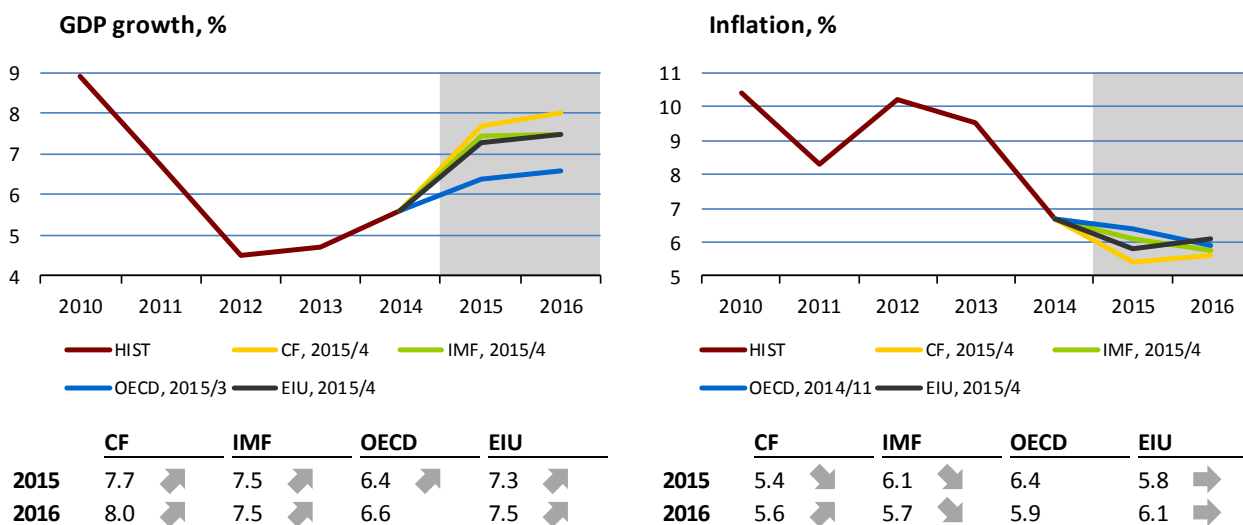|	CF		IMF		OECD	BoJ
2015	0.7	➡	1.0	↘	1.8	1.0
2016	1.0	↘	0.9	↘	1.6	2.2

III.1 China

Economic growth in China slowed to the new 7% target in Q1. Domestic demand remains weak compared to previous years, partly because of adverse developments in the property sector. The current economic growth rate is the lowest since 2009. The short-term development in industry and the HSBC PMI leading indicator, which returned below the 50-point level in April, also point to declining economic growth. Growth in services is slowing less significantly and the overall GDP structure is thus changing gradually towards services, which accounted for 51.6% of GDP in 2015 Q1 as against 48.2% in 2014. According to the new forecasts, the Chinese economy will continue to slow over the next two years. The OECD lowered its growth estimate to 7.1% this year and expects growth to be 0.2 pp weaker in 2016. The IMF and CF expect economic growth in China to remain just below 7% over the next two years.

GDP growth, %

	CF		IMF		OECD		EIU	
2015	6.9	⬊	6.8	⬊	7.1	⬊	7.0	⬊
2016	6.8	➡	6.3	➡	6.9		6.8	➡

Inflation, %

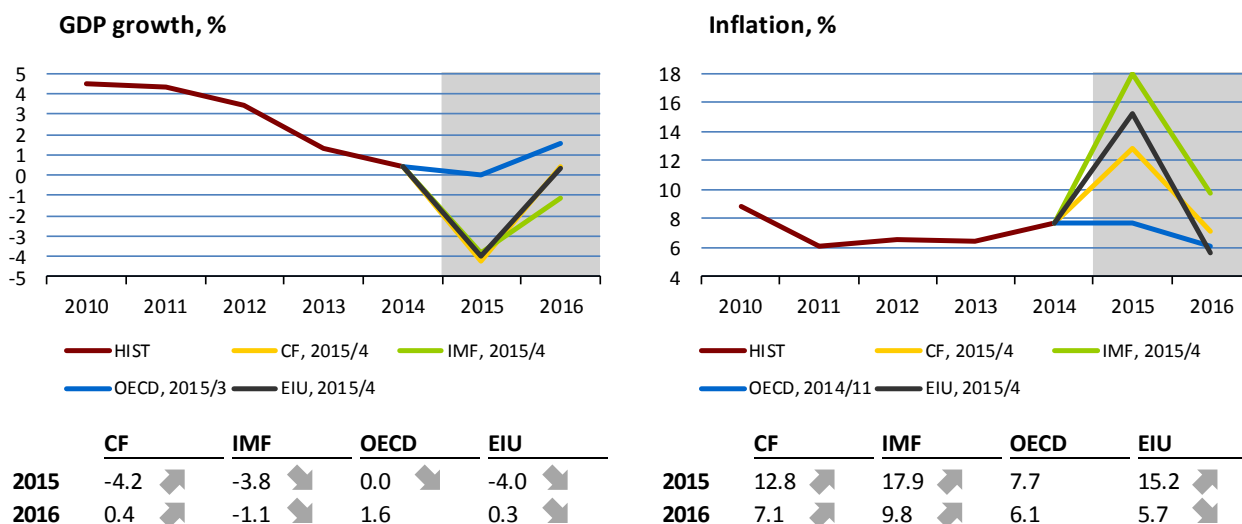|	CF		IMF		OECD		EIU	
2015	1.4	⬊	1.2	⬊	2.6		1.2	➡
2016	2.0	➡	1.5	⬊	3.0		2.2	➡

III.2 India

At its April meeting, the Indian central bank left its main policy rate unchanged at 7.5%. A further reduction after two previous cuts was prevented by concerns about growth in food prices following a wave of off-season rains. According to subsequent inflation data releases, however, annual consumer price inflation was running at its lowest level in three months in March, at 5.2% (compared to 5.4% in February). The outlook for fiscal year 2015/2016 also expects inflation to slow. CF lowered its estimate by 1 pp to 5.4%, while the EIU left its forecast at 5.8%. Inflation of between 5.6% and 6.1% is expected next year. A noticeable recovery in industrial production, which grew by 5.0% year on year in February (2.8% in January), is also good news. The PMI for manufacturing moreover indicates a further increase in industrial activity. CF and the EIU thus revised their economic growth forecasts significantly upwards. They expect a pick-up to 7.3%–7.7% this fiscal year and to 7.5%–8.0% a year later. Moody's recently also changed its outlook for the Indian economy from "stable" to "positive".

GDP growth, %

	CF		IMF		OECD		EIU	
2015	7.7	⬈	7.5	⬈	6.4	⬈	7.3	⬈
2016	8.0	⬈	7.5	⬈	6.6		7.5	⬈

Inflation, %

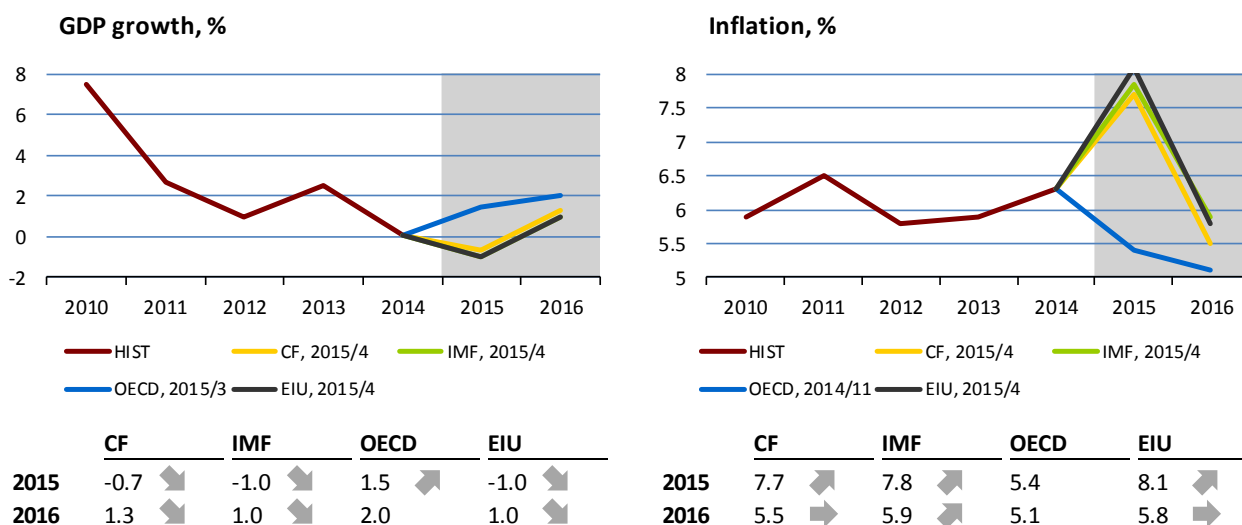|	CF		IMF		OECD		EIU	
2015	5.4	⬊	6.1	⬊	6.4		5.8	➡
2016	5.6	⬈	5.7	⬊	5.9		6.1	➡

III.3 Russia

According to the second Rosstat estimate, the Russian economy avoided recession last year and GDP growth reached 0.6%. This year, however, the economy will contract by 4.2% according to the April CF. Russia's Ministry of Economic Development has a more optimistic outlook, expecting GDP to decline by 2.5% this year. Industrial production fell for the second consecutive month and unemployment has been rising since December 2014. The CBR lowered its key rate in mid-March to boost economic growth. The rouble has been appreciating gradually since mid-March owing to non-escalation of the conflict with Ukraine and to stabilisation of oil prices. Inflation was at 16.9% in March; it is expected to reach 12.8% (CF) this year as a whole and slow to 7.1% in 2016.

GDP growth, %

Inflation, %

	CF	IMF	OECD	EIU
2015	-4.2	-3.8	0.0	-4.0
2016	0.4	-1.1	1.6	0.3

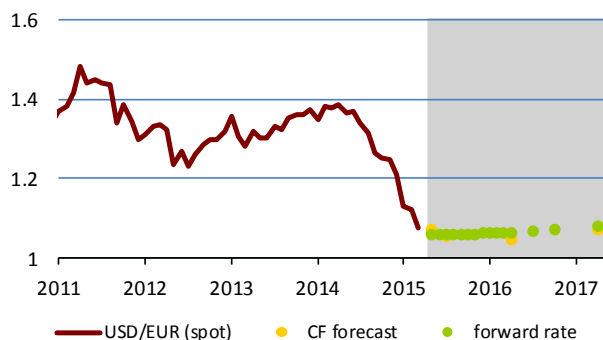|	CF	IMF	OECD	EIU
2015	12.8	17.9	7.7	15.2
2016	7.1	9.8	6.1	5.7

III.4 Brazil

The outlook for the Brazilian economy is still generally pessimistic. GDP grew by only 0.1% last year. CF and the EIU expect the economy to contract by 0.7%–1.0%. They revised their estimates downwards by about 0.5 pp compared to the previous month. They expect growth to rebound during 2016, but only to 1.0%–1.3%. Brazil is still grappling with record droughts, which are impacting strongly on the energy sector, which is around 80% dependent on hydroelectric power stations. Industrial production fell by 9.1% year on year in February (5.2% in January) and the PMI in manufacturing, which dropped to a long-term low in March, offers little hope of improvement in the near future. Protests are being held against President Dilma Rousseff not only because of the worsening economic situation, which the government is responding to with austerity measures, but also due to the recent uncovering of major corruption scandals. Inflation is also unfavourable. It reached 8.1% in March, its highest level since December 2003. The central bank rate remains at 12.75%. CF and the EIU revised their inflation outlooks upwards to 7.7%–8.1% for 2015 and left them unchanged at 5.5%–5.8% for 2016.

GDP growth, %

Inflation, %

	CF	IMF	OECD	EIU
2015	-0.7	-1.0	1.5	-1.0
2016	1.3	1.0	2.0	1.0

	CF	IMF	OECD	EIU
2015	7.7	7.8	5.4	8.1
2016	5.5	5.9	5.1	5.8

IV. Outlook of exchange rates vis-à-vis the US dollar

The euro

	13/4/15	05/15	07/15	04/16	04/17
spot rate	1.057				
CF forecast		1.069	1.054	1.047	1.072
forward rate		1.057	1.058	1.065	1.081

The Japanese yen
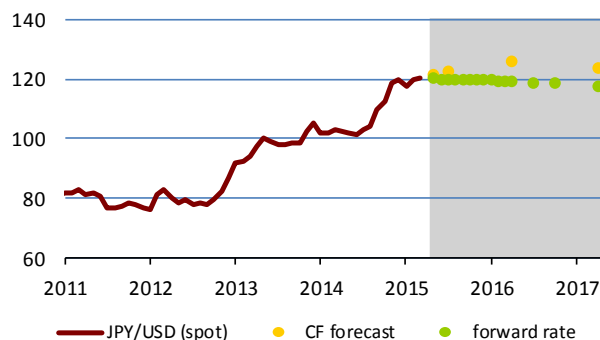
	13/4/15	05/15	07/15	04/16	04/17
spot rate	120.4				
CF forecast		121.4	122.7	125.8	123.7
forward rate		120.1	120.0	119.2	117.3

The Brazilian real
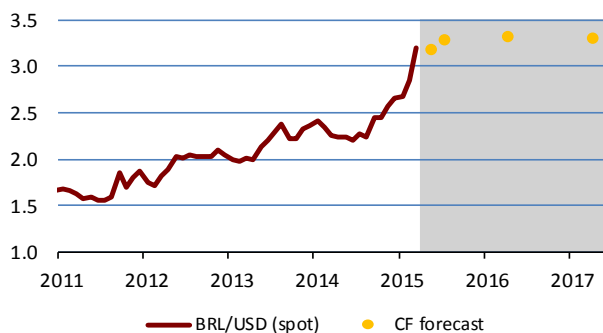
	13/4/15	05/15	07/15	04/16	04/17
spot rate	3.109				
CF forecast		3.177	3.279	3.323	3.311

The Russian rouble
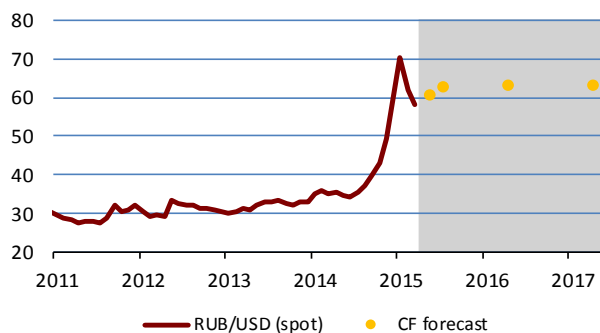
	13/4/15	05/15	07/15	04/16	04/17
spot rate	52.78				
CF forecast		60.68	62.78	63.31	63.05

The Indian rupie
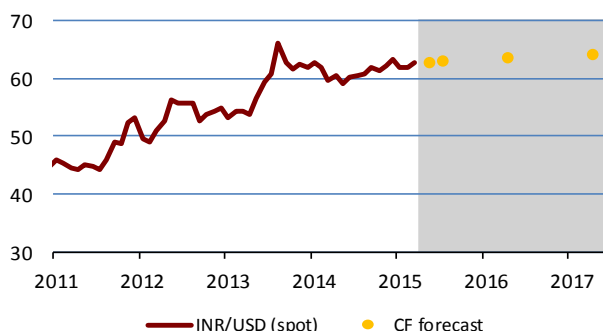
	13/4/15	05/15	07/15	04/16	04/17
spot rate	62.50				
CF forecast		62.66	63.09	63.50	64.22

The Chinese renminbi
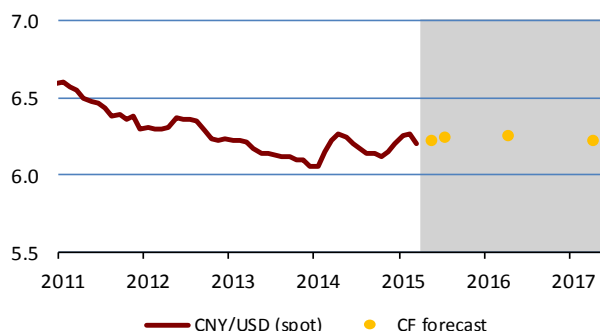
	13/4/15	05/15	07/15	04/16	04/17
spot rate	6.214				
CF forecast		6.222	6.242	6.250	6.226

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 Brent crude oil price stayed mostly above USD 60 a barrel (bbl) in the second half of February, but went down gradually to USD 53.5/bbl in the first half of March as the market again focused on the continuing excess of oil on the market amid weaker demand from refineries owing to seasonal maintenance. The price then trended upward towards USD 58/bbl on the back of a weakening dollar and political tensions in Yemen. It recorded sharp swings in reaction to the negotiations on Iran's nuclear programme. After a general agreement was reached, the market feared an increase in the supply of Iranian oil to the already oversupplied market. Later, however, the opinion started gaining ground that the sanctions would be lifted gradually and over a longer time scale. Despite renewed appreciation of the dollar, the Brent price rose to USD 64/bbl in just two days in mid-April after the EIA reported that US oil stocks had risen at their slowest pace since January. The price of WTI has been rising faster than that of Brent since mid-March, causing the Brent price premium to fall slightly. The jump in the WTI price in mid-April, however, was much smaller than that in the Brent price owing to almost full storage tanks at the Cushing terminal. The outlook for oil prices is slightly rising over the entire forecast horizon.

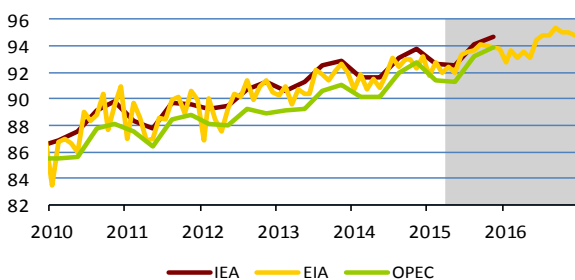**Outlook for prices of oil and natural gas (USD/1000m3)**
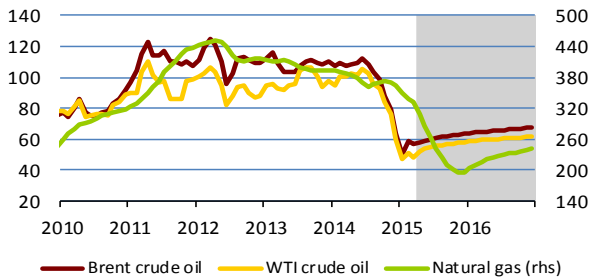
	Brent	WTI	Natural gas
2015	59.61	54.10	261.97
2016	65.81	60.21	226.25

Total stocks of oil and oil products in OECD (bil. barrel)
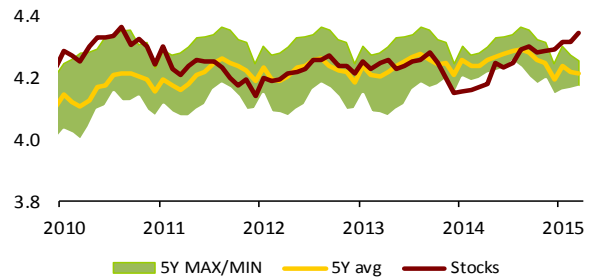
Global consumption of oil and oil products (mil. barrel / day)

	IEA	EIA	OPEC
2015	93.50	93.09	92.45
2016		94.21	

Production, total and spare capacity in OPEC countries (mil. barrel / day)
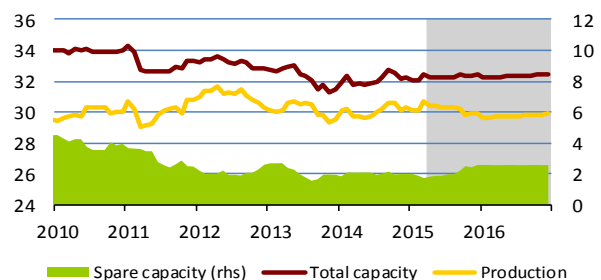
	Production	Total capacity	Spare capacity
2015	30.20	32.28	2.07
2016	29.75	32.33	2.58

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 calculations

V.2 Other commodities

The average monthly non-energy commodity price index continued to fall in March, and a modest decline was also recorded in mid-April, due mainly to a similar change in the food commodity price index. The industrial metals price index was virtually flat in this period. Both the overall index and the food commodity index are expected to decline slightly further in the next two months and to start rising very modestly in the second half of the year. The outlook for the industrial metals price index is more or less flat over the entire horizon.

The appreciating US dollar has been pushing commodity prices down since mid-March. The mostly falling prices of agricultural commodities additionally reflect high expected global stocks after this year's strong harvest (based on the USDA forecast), good weather and lower demand for biofuels (and hence for energy crops) due to the low oil prices. Industrial metals prices were generally squeezed by persisting excess extraction capacity and a slowdown in manufacturing in the USA, Japan and China, as indicated by current decreases in the PMI indices in these countries. Prices of iron ore continued to fall sharply as large mining corporations upped production further. Nickel prices dropped as a result of weakening demand for stainless steel, and aluminium prices showed a similar trend after stocks at the LME surged in March. Only copper prices bucked this trend, with heavy rains in Chile and protests by employees at one of Indonesia's largest mines depressing output.

Non-energy commodities price indicies
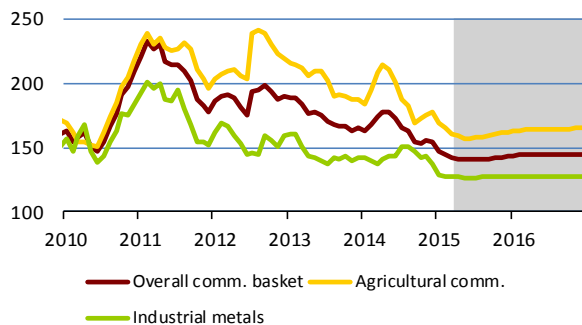
	Overall	Agricultural	Industrial
2015	142.3	160.6	127.2
2016	144.5	164.2	127.6

Food commodities
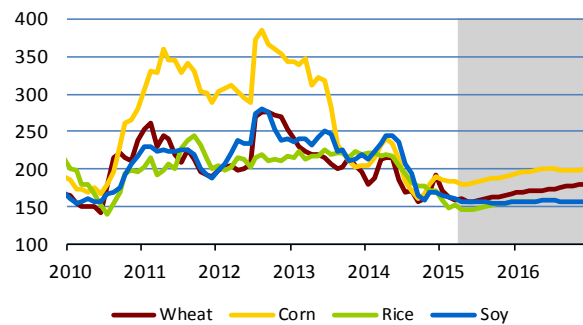
	Wheat	Corn	Rice	Soy
2015	161.8	185.1	151.1	157.8
2016	174.0	198.6	157.4	156.9

Metals
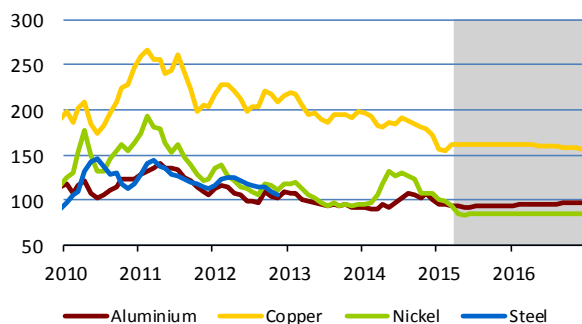
	Aluminium	Copper	Nickel
2015	93.7	160.6	87.7
2016	95.6	159.8	85.2

Meat, non-food agricultural commodities
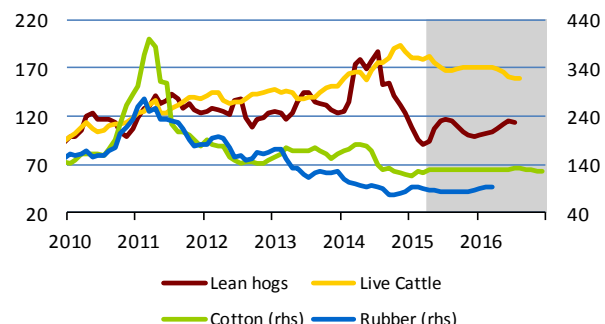
	Lean hogs	Live Cattle	Cotton	Rubber
2015	104.6	173.7	128.3	86.9
2016	107.8	165.9	129.7	

Note: Structure of non-energy commodity price indices corresponds to composition of The Economist commodity indices. All prices are given as indices, 2005 = 100 (charts) and percentage changes (tables).
Source: Bloomberg, CNB calculations.

How consensus has evolved in Consensus Forecasts[1]

This thematic article takes a closer look at one of the regularly monitored sources of forecasts used in GEO: Consensus Forecasts (CF). We describe why central banks focus on outlooks based on private sector surveys and we use simple statistics to examine the properties of those outlooks. We begin by showing how the CF forecasts for given variables and years and the related uncertainty have been changing over time. We look in more detail at the widely known persistence of forecast changes in subsequent revisions, which should not occur systematically under optimal conditions. We also analyse the distribution of institutions' outlooks against the average CF forecast and the subsequent outcomes, and in particular whether some institutions' outlooks are systematically close to CF and whether some forecast the actual outcomes systematically better than CF. We show that some institutions do indeed forecast better, but only in some years and with differing accuracy for different economic variables.

1   The use of CF forecasts in central banks

CF forecasts feature among the outlooks published regularly in GEO. These predictions reflect the average outlooks obtained in surveys conducted by the London-based Consensus Economics Inc. The survey panel is made up of the most important commercial banks and institutions operating in the given economy, hence the panel of respondents differs across countries and also changes partially over time. CF outlooks have an advantage over the other outlooks monitored in GEO in that they are compiled monthly and published for a relatively large number of countries and economic variables. Moreover, the same survey methodology and the same cut-off date allow for international comparison of the outlooks and their revisions. By contrast, the disadvantages of CF forecasts are their relatively short horizon (outlooks are published on a monthly basis usually only for the current and next year, so the forecast horizon is 24 months at the most) and the fact that they are averages for the given calendar year.[2]

Outlooks based on surveys of the private sector are generally regarded as representing the markets' view of future economic developments. For this reason, they are widely used by central banks and government institutions, among others. They can be used by central banks to acquire information on private sector expectations about economic growth, inflation and other variables, so they can serve, among other things, as an indicator of monetary policy credibility and inflation expectations. Besides CF, however, central banks draw on the results of their own surveys – for example the SPF (Survey of Professional Forecasters) at the ECB and FMIE (Financial Market Inflation Expectations) at the CNB.

CF outlooks can also be used (for example by central banks and government ministries) as input assumptions for developments abroad in forecasts for the domestic economy if an institution does not have the capacity to draw up its own prediction for the external sector. External developments are particularly important for small open economies. In addition, local institutions (in CF surveys) can be expected to predict developments in the country better than foreign central banks or ministries. The CNB takes CF's outlooks for GDP growth, inflation and interest rates in the Czech Republic's main trading partner countries when preparing its forecast for the Czech economy.

In GEO, besides the CF outlooks themselves we regularly publish assessments of their accuracy relative to the outlooks of other institutions – see, for example, Novotný (2014). In general, CF shows smaller errors than the other institutions monitored for GDP growth and inflation forecasts. However, this article deals with the general properties rather than the accuracy of CF forecasts. As we have limited access to electronic data, we focus on a narrow set of countries of most relevance to the Czech economy (the euro area, Germany and the USA). For the two main economic indicators in these countries (GDP growth and inflation), we use simple statistics to show the main properties of their outlooks published in CF in 2003–2014. We start by examining the properties of the aggregated CF outlooks and the uncertainty surrounding them. We then analyse how accurately the institutions in the panel forecasted the actual outcomes. It is also interesting to look at whether some institutions in CF surveys systematically give values closer to the mean than others and whether their outlooks tend to be above or below the mean on average. We refer the reader to Dovern et al. (2014) or Ager et al. (2009) for a deeper analysis of individual variables.

---

[1] Written by Tomáš Adam (tomas.adam@cnb.cz) and Jan Hošek (jan2461.hosek@cnb.cz). The views expressed in this article are those of the authors and do not necessarily reflect the official position of the Czech National Bank.

[2] CF also publishes long-term average annual forecasts with a roughly ten-year horizon, but these come out only two or three times a year. Its quarterly short-term forecasts are updated only four times a year.

2   Main properties of CF predictions and their evolution over time

Persistence of changes in CF outlooks

Each forecast should use all the information available at the time of its creation. The theory of rational expectations implies that the direction of subsequent forecast revisions should not be systematically the same, i.e. revisions should not be serially correlated (see Dovern et al., 2014). If the outlook changes were persistent, we could use the change in the outlook observed at time *t* to estimate the change in the outlook at time *t+1*, and the current forecast would thus not include all the available information.

CF outlooks are often criticised for displaying persistence of changes. This can be illustrated using Chart 1, which plots the changes in all the CF outlooks at time *t* against the changes at time *t-1* (the sample contains all the means of the CF forecasts mentioned in the introduction). It is clear from the chart that the changes are positively correlated (with coefficient 0.54), i.e. a positive (negative) outlook revision is followed by another positive (negative) revision on average.

Chart 1 Persistence of changes in CF outlooks

Note: The points plot the change in the CF outlook in period t (y-axis) against the change in period t-1 (x-axis). Darker colour denotes overlapping observations.

As stated by Dovern et al. (2014), the CF outlook persistence is due to rational inattention on the part of forecasters. Forecasting and data collection costs are high, so forecasts are not revised on a continuous basis. This can lead to outlook persistence. In addition, signals from the economy contain noise, hence the true information is not fully incorporated into the forecast at one moment (the guidance effect). Aggregation of forecasts can thus foster persistence of CF changes, as the forecasters do not all update their predictions at the same time and at the same frequency. When new, negative information arrives, the mean forecast shifts downwards even if only some institutions incorporate this information into their forecasts the next month while the rest make no revisions. The other respondents revise their outlooks the following month (while those who have already incorporated the new information do not revise their outlooks). This again causes the CF to move in the same direction as in the previous month.

Quantifying the individual sources of CF persistence is difficult and data intensive. It is complicated by the fact that when observing the same outlook for a particular institution we cannot identify whether the prediction is based on the new (but unchanged) forecast or on the previous one. Based on a large sample of CF outlooks, Dovern et al. (2014) conclude that CF outlooks are persistent, but relatively frequent changes are made to the forecasts at the individual level. It thus seems that the persistence in CF outlooks is due above all to the guidance effect and to the aggregation of outlooks created in different periods.

Frequency of changes

Given the aforementioned high cost of forecasting, it is clear that most institutions do not update their forecasts every month. Due to averaging and rounding, moreover, a small number of revisions will not necessarily affect the aggregate CF outlook. We can therefore assume that the CF forecast changes only if a larger number of institutions change their outlooks.

Chart 2 shows the months in which revisions are made most frequently. We can see that changes were rarely made in the first months of forecasting a given variable (except for inflation outlooks in the USA). Relatively few changes are also made towards the end of the forecasting, when most data for the relevant period are known. Interestingly, we do not observe any "seasonality", i.e. a regularly high number of revisions immediately after the publication of GDP data (although we do see some signs in the outlooks for GDP in Germany). As in the case of persistence, this may be due to the fact that some institutions incorporate new information on growth into their forecasts later than others.
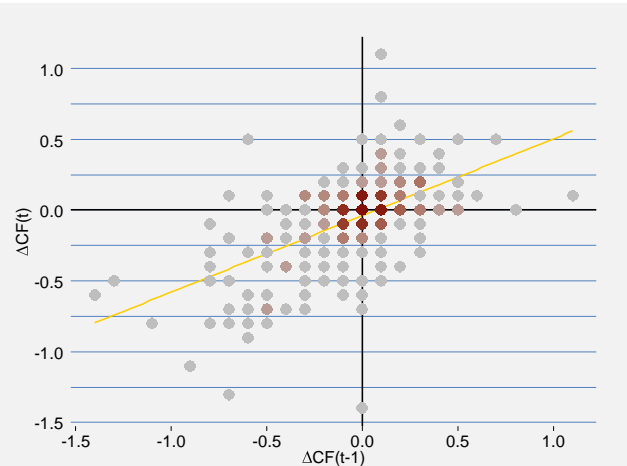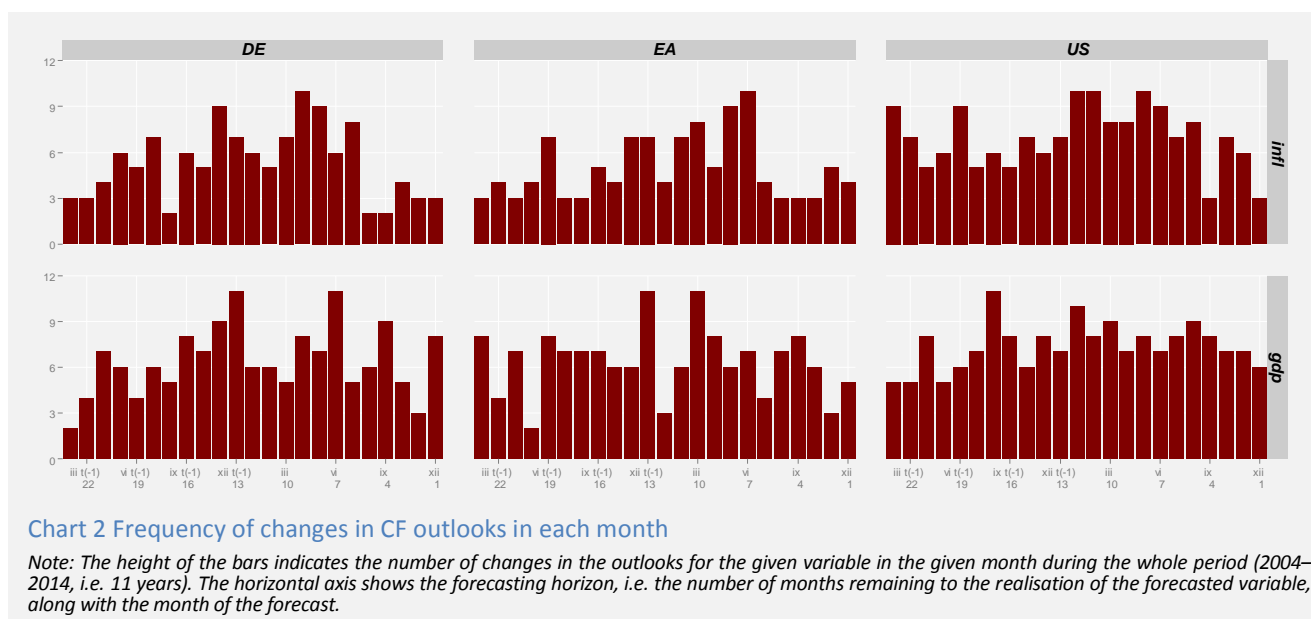
Chart 2 Frequency of changes in CF outlooks in each month

Note: The height of the bars indicates the number of changes in the outlooks for the given variable in the given month during the whole period (2004–2014, i.e. 11 years). The horizontal axis shows the forecasting horizon, i.e. the number of months remaining to the realisation of the forecasted variable, along with the month of the forecast.

Historical values and outlook uncertainties

Outlook persistence also is evident from the charts illustrating the evolution of the CF forecasts over time for given variables and years. The left-hand panels of Charts 3 and 4 show the mean of the institutions' outlooks together with the actual value of the variable. Persistence manifests itself in the outlook usually "converging" monotonously to the actual value over time from above or below.

Owing to revisions, changes in trend tend to occur at the end of the forecasting for a given year, as most the macroeconomic data for a large part of the forecasted year are known by then. Changes in trend in the course of the year were seen in only a few cases, e.g. for the inflation outlooks for all the countries under review for 2009, when strong disinflationary pressures started to prevail despite the very easy monetary policy of major central banks. The economic growth outlook for the same year was revised upwards slightly at the end of the forecast period owing to relatively optimistic data at the end of the year.

Given the strong outlook persistence, it is interesting to track the value of the first outlook for a given year. When preparing this outlook, forecasters have the least information relevant to the outlook and do not know the forecasts of the other respondents. The first outlook for GDP growth can therefore signal the respondents' opinion on the economy's position in the business cycle, taking into account the trend (or equilibrium or potential) level of growth. The first outlook for inflation can signal the credibility of the central bank's inflation target or the anchoring of inflation expectations in the economy. The dots in the left-hand part of Chart 3 show that before 2009 the first outlook forecasts usually underestimated actual inflation; after that, this relationship (underestimation/overestimation) is no longer clear. We can also see that the inflation predicted for the euro area was very close to the inflation target until the outlook for 2014 (except for the outlook for 2010). The first prediction for the USA was also very stable, fluctuating around 2% despite the absence of an explicit inflation target.

Every outlook is subject to uncertainty. Most central banks use fan charts or ranges to communicate outlook uncertainty. By contrast, commercial banks usually only comment on the uncertainty and give the upside and downside risks. Looking at the CF forecasts, we can quantify uncertainty using the dispersion of the institutions' outlooks. Interpreting the uncertainty is more difficult, however, as one has to take into account not only the above-mentioned economic uncertainty, but also the fact that the outlooks are a product of various economic models.

In times of economic calm, when no new significant risks are emerging, the uncertainty for a given year can be expected to be highest at the start of the outlook horizon (24 months) and then decline as more information on actual developments comes in. The standard deviation of the forecast panel may also decrease due to "herding". As the individual outlooks are made public, it is reasonable to assume that an institution whose outlook differs significantly from the consensus will be motivated to eliminate the difference by adjusting its forecast towards the CF average.

Looking at Charts 3 and 4, we can see that the dispersion does tend to decrease as time goes on. Turning points, i.e. changes in trend in CF forecasts, are the exception. This, however, is hardly surprising, as a change in trend is initially signalled by only a few institutions, while the rest continue to follow the old trend or keep their outlooks unchanged.

Properties of individual outlooks in CF

Aggregated CF outlooks can theoretically result in a reduction in the error (noise) of individual institutions' forecasts due to averaging. One institution may overestimate its outlook while another may underestimate it, but on average the surveys should converge on the optimal outlook. We test this property in two ways. First, we analyse whether some institutions predict the actual outcomes systematically better than others, or even better than CF as a whole.

As our measure of the accuracy of the outlook of institution j for year τ we choose the mean square error (MSE), defined as:

$$MSE_{j,\tau} = \frac{1}{T}\sum_{t}^{T}\left(f_{\tau,t} - y_\tau\right)^2,\qquad(1.1)$$

where T is the number of the outlooks of institution j, $f_{\tau,t}$ is its outlook in month t and y_τ is the actual value of the predicted variable (we opt for the final revised value in June of the following year).

It is also interesting to examine how close the individual institutions are to the CF forecast. Thanks to outlook averaging, which should eliminate noise from the forecasts, none of the outlooks should be systematically close to the mean itself. If any of the institutions were systematically close to the CF forecast, it would make sense at first glance to monitor those institutions alone.

One theoretical reason why the outlooks of some institutions might be close to the CF mean is that the CF forecast not only reflects all the available information (and is therefore an optimal forecast), but also the outlooks of institutions close to it. In such case, it would indeed make sense to monitor the outlooks of institutions that are close to the CF forecast. A second reason may be the aforementioned herding of forecasters giving past CF values in the survey or adjusting their outlooks closer to CF. In this case, it would make no sense to monitor the "best" ones, as the source of optimal information would be lost by eliminating outlying forecasts. Our chosen measure of the "proximity" of an outlook is again the mean square error (equation 1.1), where the actual value y_τ is substituted by the mean value CF_t.

Chart 5 shows that there is no clear "winner" among the panellists, i.e. no institution consistently produces the best forecasts. In addition, it turns out that an ability to predict GDP growth relatively accurately does not imply an ability to predict inflation accurately. It is also interesting that the ability to best predict GDP growth is concentrated in a smaller number of institutions in the USA than it is in the euro area and Germany (here again, however, different institutions may be more accurate in forecasting inflation). The chart also shows that almost every year there is an institution that predicts more accurately (according to the MSE criterion) than the CF average. However, it is impossible to say ex ante which particular institution that will be in any given year, so it seems to be a good strategy to monitor the average.

Chart 6 depicts the distance of the individual outlooks from the CF forecast. It shows that some institutions were very close to the CF forecast in some periods, but we cannot see any significant regularity in this indicator. As in the case of the previous indicator, proximity of the GDP outlook to the mean does not imply proximity for inflation was well. The hypothesis that institutions "copy" the CF forecast or display herd behaviour is therefore unlikely to apply.

The last indicator we will analyse is the location of the outlooks with respect to the CF forecast. We are interested in finding out whether any institutions lie systematically below or above the CF mean. Again, we do not see any systematic pattern in this measure (see Chart 7). In some years, the outlooks of some institutions are above or below the CF mean over almost the entire period, but longer such periods are rare. Of particular interest is the case of GDP growth in the USA, which for long periods was overestimated compared to CF.

Conclusion

Based on this simplified analysis we can say that CF forecasts, like other outlooks, suffer from persistence of changes. This means that new information is fully reflected in the consensus outlook with a lag. On the other hand, the positive properties of CF outlooks (such as the filtering of noise contained in individual forecasts, the good properties of the distribution of the forecasts relative to the mean, and high publication frequency) make CF a useful source of information on future economic developments.

References

Ager, P., Kappler, M., Osterloh, S. (2009). The accuracy and efficiency of the Consensus Forecasts: A further application and extension of the pooled approach. *International Journal of Forecasting*, 25(1), 167–181.

Dovern, J., Fritsche, U., Loungani, P., Tamirisa., N. (2014). How often do forecasters change their minds? New evidence from 35,000 forecasts, *VOX CEPR's Policy Portal*, 13 Nov. 2014, <http://www.voxeu.org/article/sticky-information-and-expectations-forecasters>.

Novotný, F. (2014). Annual assessment of the forecasts included in GEO, *Global Economic Outlook*, 2014/6, CNB.

Evolution of inflation outlooks

(a) Germany

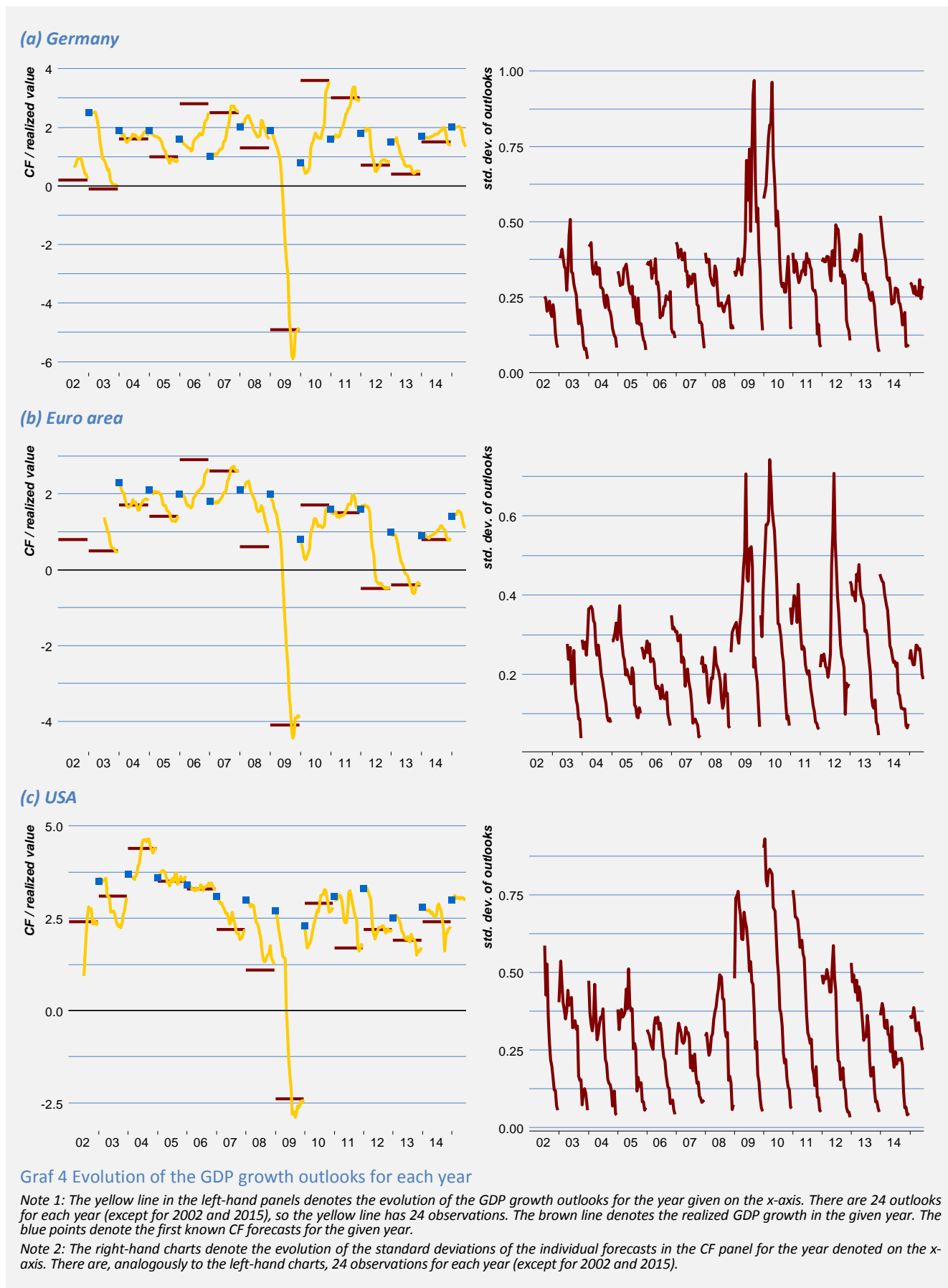

(b) Euro area

(c) USA
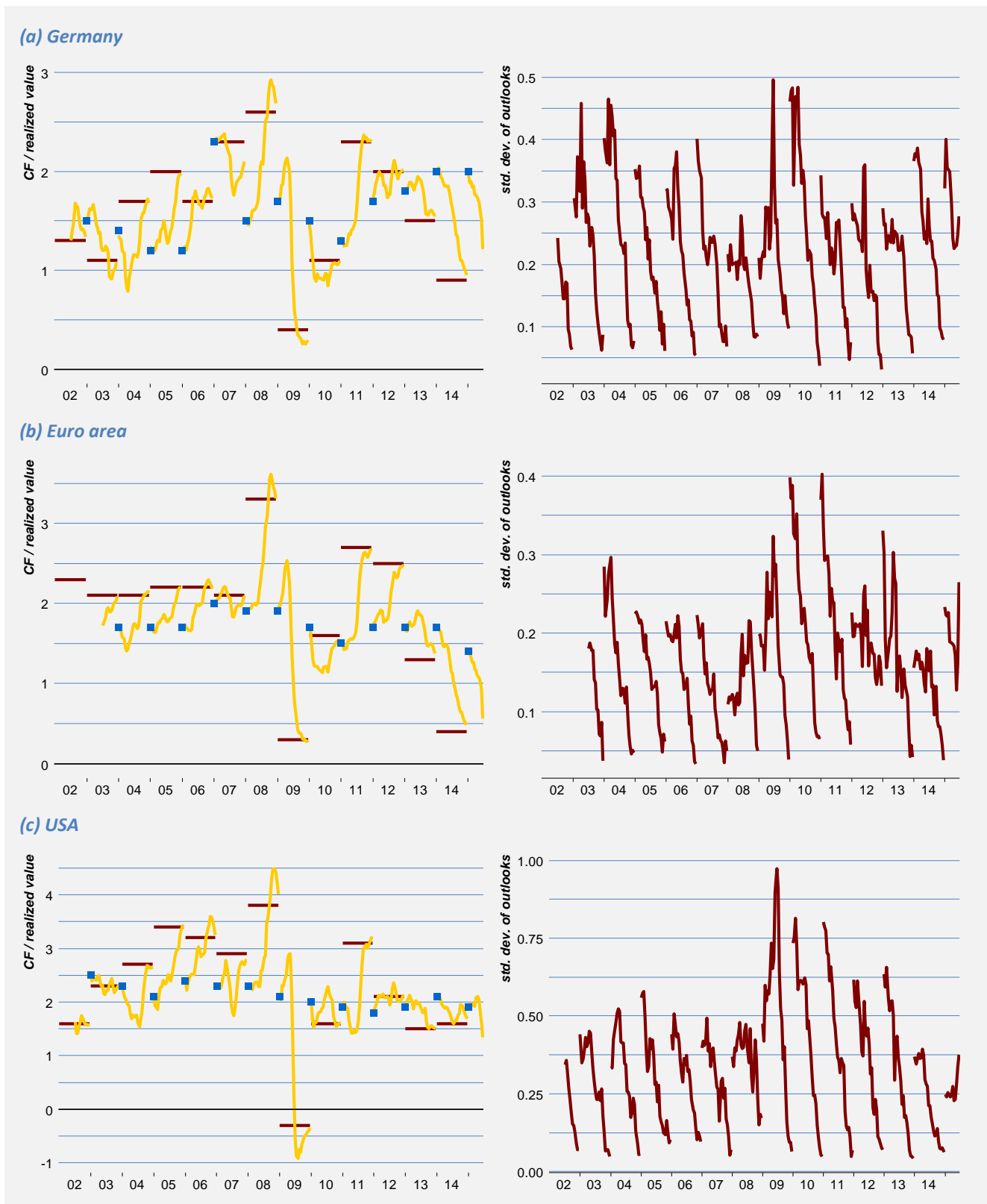
Graf 3 Evolution of the inflation outlooks for each year

Note 1: The yellow line in the left-hand panels denotes the evolution of the inflation outlooks for the year given on the x-axis. There are 24 outlooks for each year (except for 2002 and 2015), so the yellow line has 24 observations. The brown line denotes the realized average inflation rate in the given year. The blue points denote the first known CF forecasts for the given year.

Note 2: The right-hand charts denote the evolution of the standard deviations of the individual forecasts in the CF panel for the year denoted on the x-axis. There are, analogously to the left-hand charts, 24 observations for each year (except for 2002 and 2015).

Evolution of GDP growth outlooks

(a) Germany

(b) Euro area

(c) USA

Graf 4 Evolution of the GDP growth outlooks for each year

Note 1: The yellow line in the left-hand panels denotes the evolution of the GDP growth outlooks for the year given on the x-axis. There are 24 outlooks for each year (except for 2002 and 2015), so the yellow line has 24 observations. The brown line denotes the realized GDP growth in the given year. The blue points denote the first known CF forecasts for the given year.
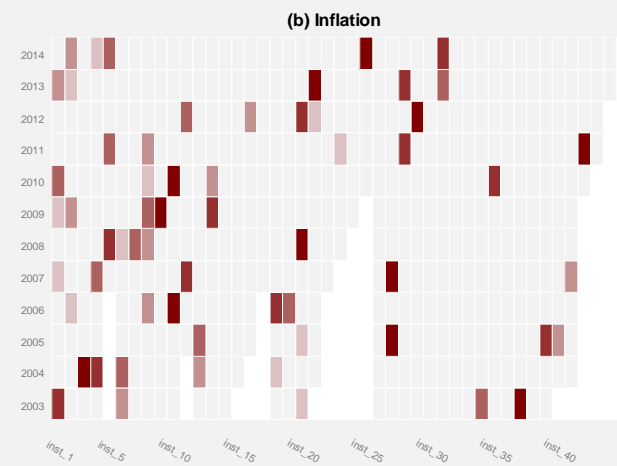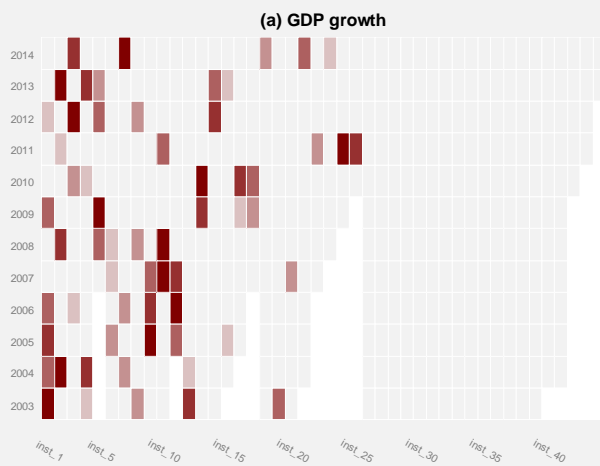
Note 2: The right-hand charts denote the evolution of the standard deviations of the individual forecasts in the CF panel for the year denoted on the x-axis. There are, analogously to the left-hand charts, 24 observations for each year (except for 2002 and 2015).
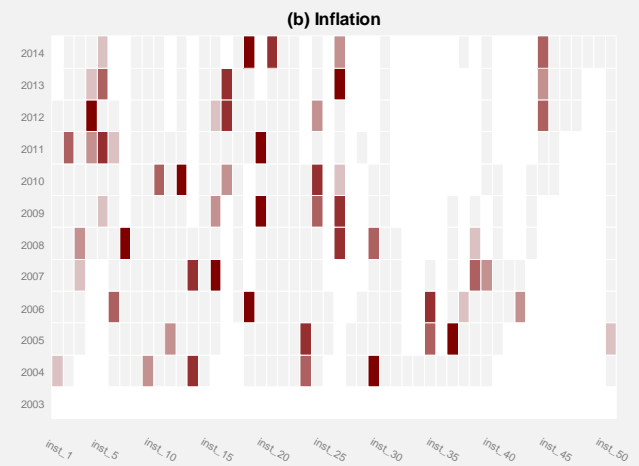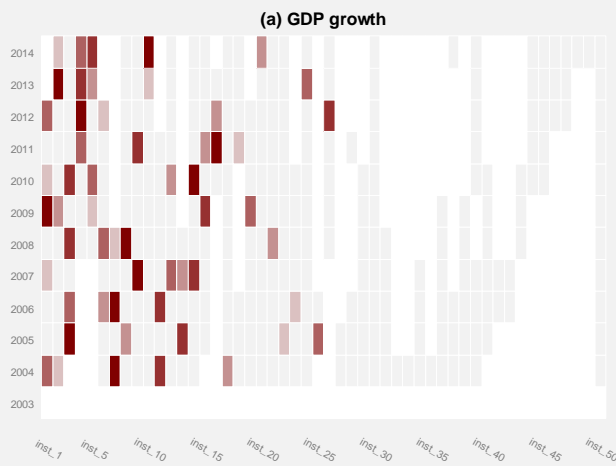
Accuracy of individual forecasts over time

(a) Germany
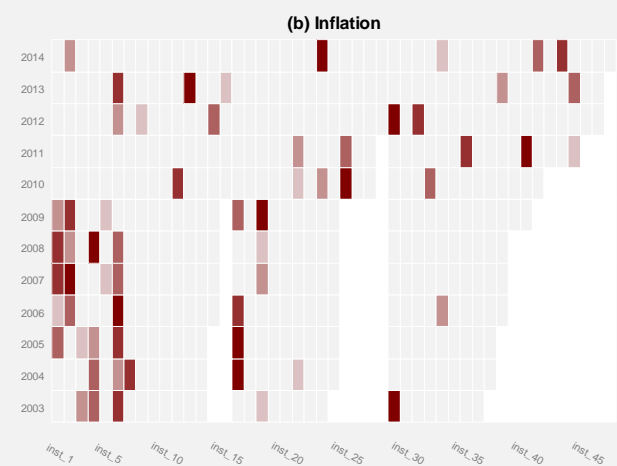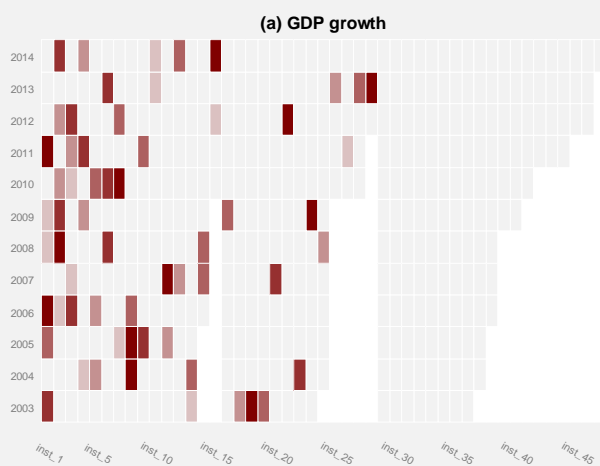
Graf 5 Accuracy of individual forecasts over time

Note: The coloured tiles denote the five most accurate forecasts in the given year (y-axis). Darker colours denote more successful institutions (according to the MSE criterion – see the main text). White tiles denote institutions which did not report a sufficient number of observations (at least 16). Institutions were sorted and renamed according to their ability to forecast GDP growth.

Proximity of individual forecasts to the CF forecast

(a) Germany
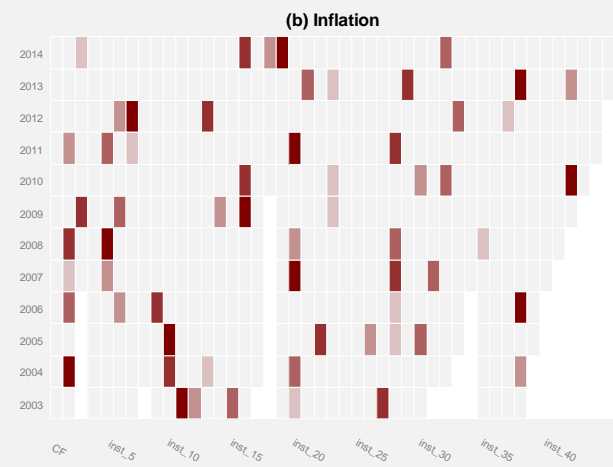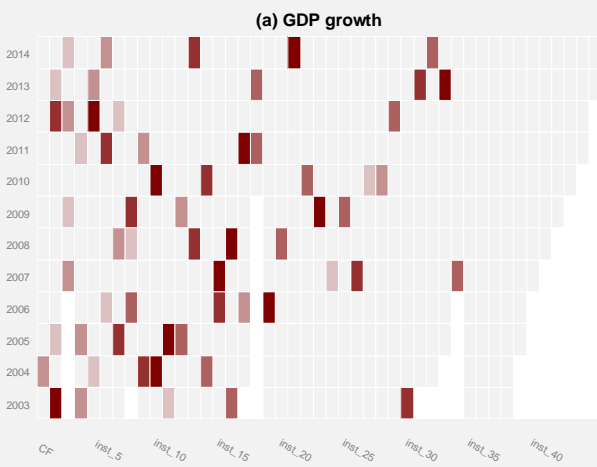
(b) Euro area
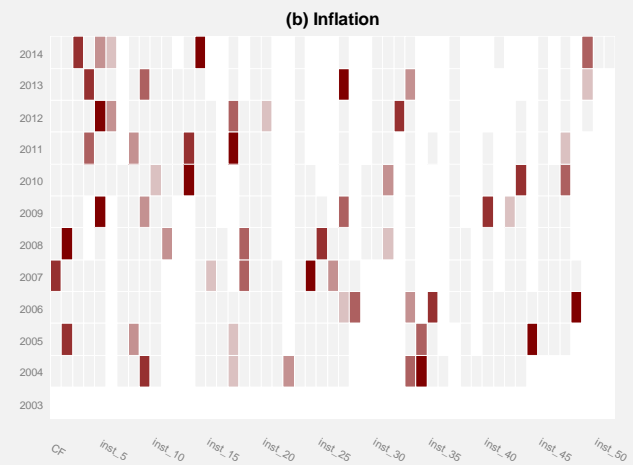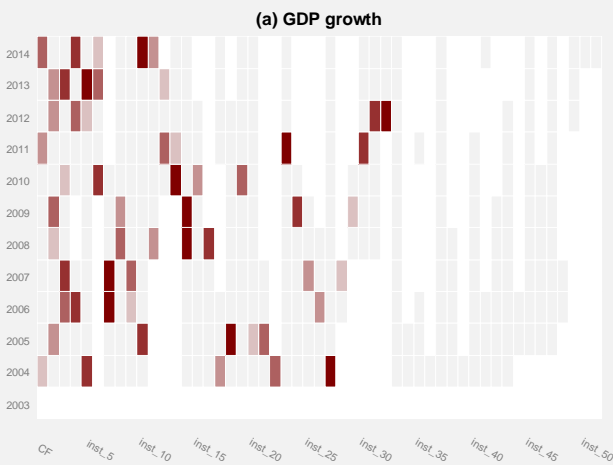
(c) USA
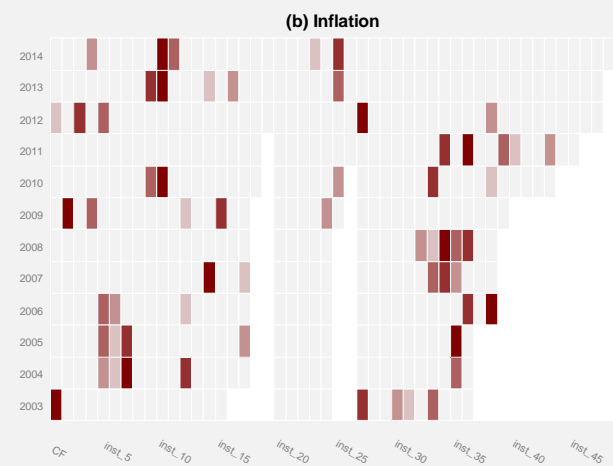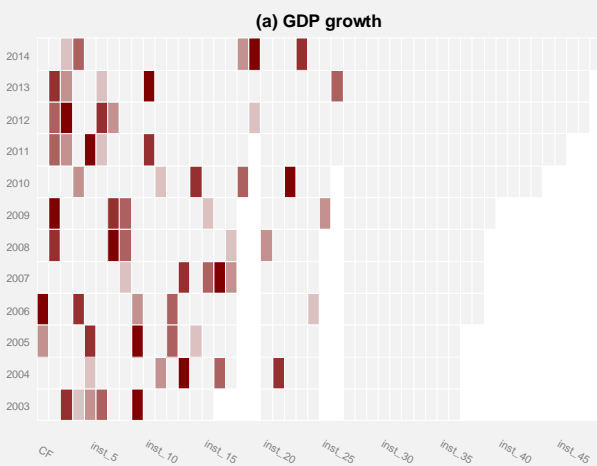
Graf 6 Proximity of individual forecasts to the CF forecast

Note: The coloured tiles denote the five institutions whose forecasts were closest to the mean value of the CF. Darker colours denote institutions whose forecasts were closer to the CF. White tiles denote institutions which did not report a sufficient number of observations (at least 16). Institutions were sorted and renamed according to the average proximity of their reported GDP growth outlooks.

Location of individual forecasts with respect to the CF forecast

(a) Germany

(a) GDP growth

(b) Inflation

(b) Euro area

(a) GDP growth

(b) Inflation

(c) USA

(a) GDP growth

(b) Inflation
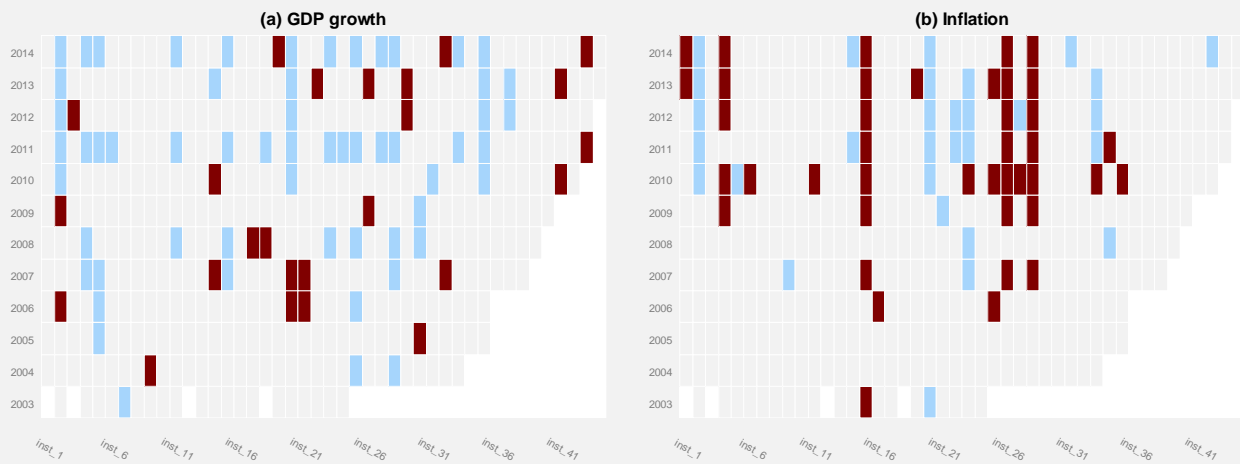
Chart 7 Location (above/below) of individual forecasts with respect to the CF forecast
Note. Brown/blue tiles denote that the given institution reported most of its forecasts (at least 20 observations) above/below the mean of the CF. White tiles denote that there are not enough observations for the given institution.

A1. Change in GDP predictions for 2015

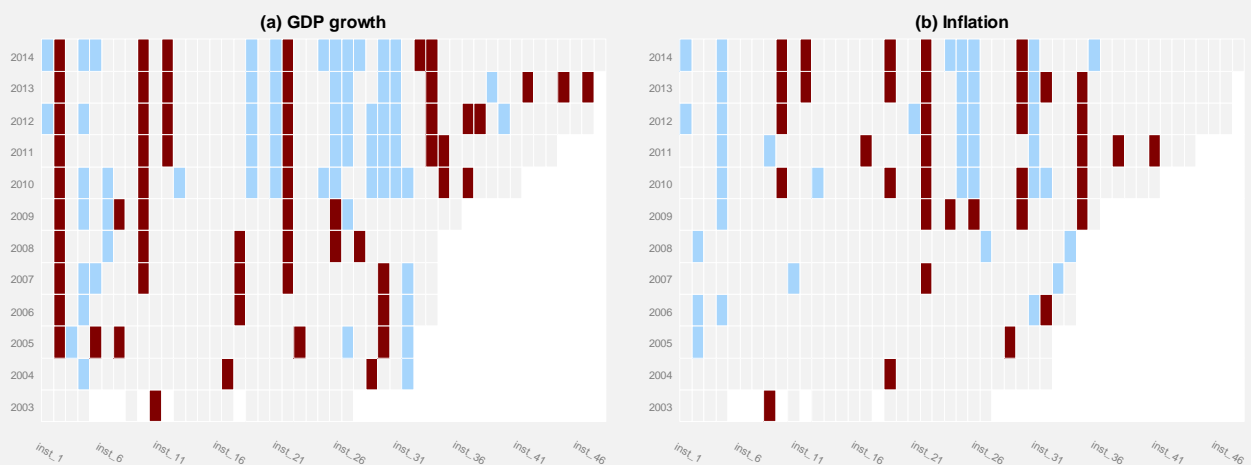|	CF		IMF		OECD		CB / EIU	
EA	0.1	2015/4	0.3	2015/4	0.3	2015/3	0.5	2015/3
		2015/3		2015/1		2014/11		2014/12
US	-0.2	2015/4	-0.5	2015/4	0.0	2015/3	-0.3	2015/3
		2015/3		2015/1		2014/11		2014/12
DE	0.1	2015/4	0.3	2015/4	0.6	2015/3	-1.0	2014/12
		2015/3		2015/1		2014/11		2014/6
JP	-0.1	2015/4	0.4	2015/4	0.2	2015/3	0.6	2015/1
		2015/3		2015/1		2014/11		2014/10
BR	-0.4	2015/4	-1.3	2015/4	0.1	2014/11	-0.5	2015/4
		2015/3		2015/1		2014/9		2015/3
RU	0.1	2015/4	-0.8	2015/4	-1.8	2014/11	-0.5	2015/4
		2015/3		2015/1		2014/5		2015/3
IN	2.2	2015/4	1.2	2015/4	0.5	2014/11	0.7	2015/4
		2015/3		2015/1		2014/9		2015/3
CN	-0.1	2015/4	0.0	2015/4	-0.2	2014/11	-0.2	2015/4
		2015/3		2015/1		2014/9		2015/3

A2. Change in inflation predictions for 2015

	CF		IMF		OECD		CB/EIU	
EA	0.1	2015/4	-0.9	2015/4	-0.5	2014/11	-0.7	2015/3
		2015/3		2014/10		2014/5		2014/12
US	-0.2	2015/4	-2.0	2015/4	-0.3	2014/11	-0.6	2015/3
		2015/3		2014/10		2014/5		2014/12
DE	0	2015/4	-1.0	2015/4	-0.6	2014/11	-0.4	2014/12
		2015/3		2014/10		2014/5		2014/6
JP	0	2015/4	-1.0	2015/4	-0.2	2014/11	-1.4	2015/1
		2015/3		2014/10		2014/5		2014/10
BR	0.7	2015/4	2.0	2015/4	-0.1	2014/11	0.5	2015/4
		2015/3		2014/10		2014/5		2015/3
RU	1.1	2015/4	10.6	2015/4	3.1	2014/11	2.1	2015/4
		2015/3		2014/10		2014/5		2015/3
IN	-1	2015/4	-1.4	2015/4	-0.3	2014/11	0.0	2015/4
		2015/3		2014/10		2014/5		2015/3
CN	-0.1	2015/4	-1.3	2015/4	-0.4	2014/11	0.0	2015/4
		2015/3		2014/10		2014/5		2015/3

A1. Change in GDP predictions for 2015

A3. List of abbreviations

ABS	asset-backed securities	**HICP**	harmonised index of consumer prices
BoJ	Bank of Japan	**CHF**	Swiss franc
BR	Brazil	**ICE**	Intercontinental Exchange
BRIC	countries of Brazil, Russia, India and China	**IFO**	Institute for Economic Research
BRL	brazilian real	**IFO-BE**	IFO Business Expectations
CB-CCI	Conference Board Consumer Confidence Index	**IMF**	International Monetary Fund
		IN	India
CB-LEII	Conference Board Leading Economic Indicator Index	**INR**	Indian rupee
		IRS	Interest Rate swap
CBOT	Chicago Board of Trade	**JP**	Japan
CBR	Central Bank of Russia	**JPY**	Japanese yen
CF	Consensus Forecasts	**LI**	leading indicators
CN	China		
CNB	Czech National Bank	**LIBOR**	London Interbank Offered Rate
CNY	Chinese renminbi		
DBB	Deutsche Bundesbank	**MER**	Ministry of Economic Development (of Russia)
DE	Germany		
EA	euro area		
EC	European Commission	**OECD**	Organisation for Economic Co-operation and Development
ECB	European Central Bank		
EC-CCI	European Commission Consumer Confidence Indicator	**OECD-CLI**	OECD Composite Leading Indicator
		PMI	Purchasing Managers' Index
EC-ICI	European Commission Industrial Confidence Indicator	**PPI**	producer price index
		RU	Russia
		RUB	Russian rouble
EIA	Energy Information Administration	**TLTRO**	targeted longer-term refinancing operations
EIU	Economist Intelligence Unit	**UoM**	University of Michigan
EIU	The Economist Intelligence Unit database	**UoM-CSI**	University of Michigan Consumer Sentiment Index
EU	European Union	**US**	United States
EUR	the euro	**USD**	US dollar
EURIBOR	Euro Interbank Offered Rate	**WEO**	World Economic Outlook
Fed	Federal Reserve System (the US central bank)	**WTI**	West Texas Intermediate (crude oil used as a benchmark in oil pricing)
FRA	forward rate agreement	**ZEW-ES**	ZEW Economic Sentiment
GBP	pound sterling		
GDP	gross domestic product		

A4. List of thematic articles published in the GEO

2015

	Issue
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
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

	Issue
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
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

	Issue
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