Globální ekonomický výhled - květen 2015

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

GLOBAL ECONOMIC OUTLOOK - MAY

2015

Monetary Department
External Economic Relations Division

CZECH NATIONAL BANK

Cut-off date for data
11 - 15 May 2015

CF survey date
11 May 2014

GEO publication date
22 May 2015

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.
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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The May 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 assess the effects of quantitative easing in the USA. We conclude that the Fed succeeded in improving the labour market situation and stimulating inflation by exerting downward pressure on long-term interest rates, and – for now at least – with none of the adverse effects that critics of quantitative easing had initially warned of.

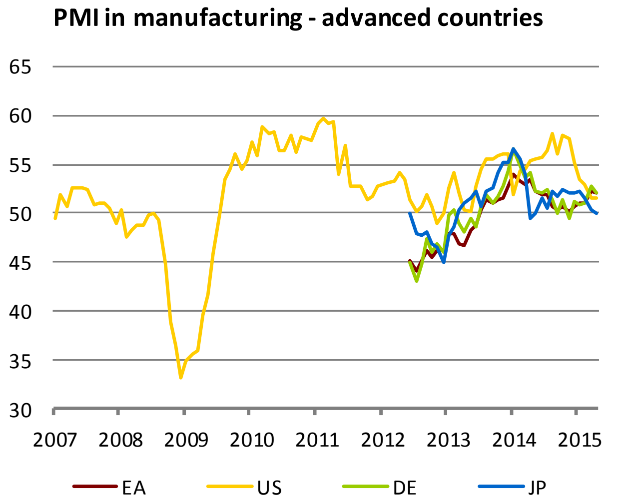
Compared to April, the growth outlooks for advanced economies increased for Germany (while remaining unchanged for the euro area) and decreased for the USA and Japan (see also the PMI chart below). However, the overall assessment of the economic growth outlooks is favourable, especially for 2016, when they will be close to 2% (and almost 1 pp higher in the USA). New data on prices continue to show that consumer price inflation in advanced countries will be very low this year. It will not rise towards 2% until 2016. However, inflation in the euro area will be only slightly above 1% at this horizon.

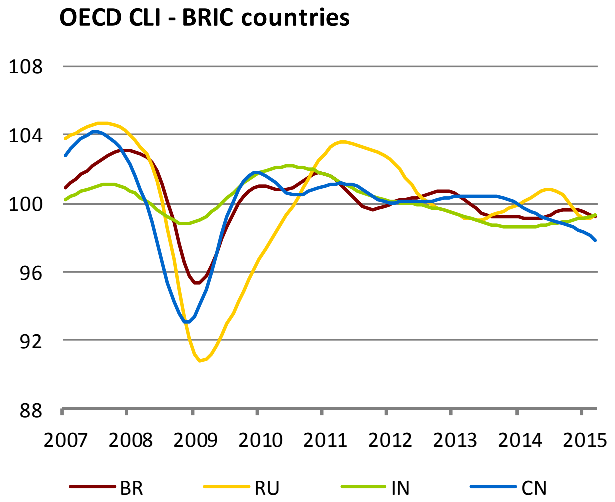
The two-year outlooks for emerging BRIC countries remain mixed. China is gradually being replaced by India as the long-term number one in terms of economic growth. The growth rate of the Indian economy will gradually increase to just above 8% amid stable consumer price inflation just above 5%. By contrast, updated outlooks confirm that 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 2016 bring some optimism, as economic growth should rebound and inflation should drop visibly.

The outlook for interest rates in the euro area remains muted, with no sign of visible growth until the end of 2016. This outlook reflects, among other things, the quantitative easing launched by the ECB in the first half of March. The likely interest rate growth in the USA has shifted roughly to the end of 2015 Q3, mainly due to weaker current economic growth in the USA. According to CF, the dollar will appreciate very slightly at the one-year horizon against the euro and is also expected to appreciate slightly against all the other monitored currencies except the Chinese renminbi and the Indian rupee, against which it should be broadly flat.

The price of Brent crude oil rose in April owing to slower growth in oil stocks and a partial correction of the USD exchange rate. The oil price outlook remains slightly rising and oil prices should reach about USD 70 a barrel at the one-year horizon. 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 below USD 200 per 1000 m3 and to start rising again afterwards. The non-energy commodity price index will rise somewhat at the one-year horizon, owing chiefly to the food commodity price index. The industrial metals index will be flat at the same horizon.

Leading indicators for countries monitored in the GEO



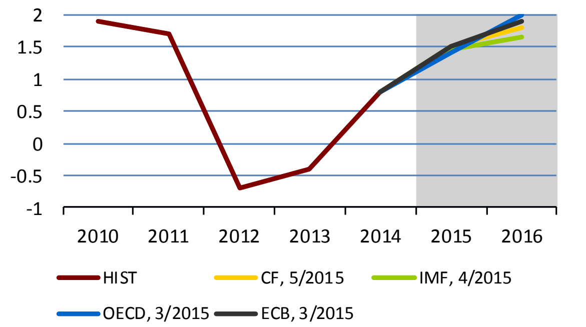


Zdroj: Bloomberg, Datastream

II.1 Eurozone

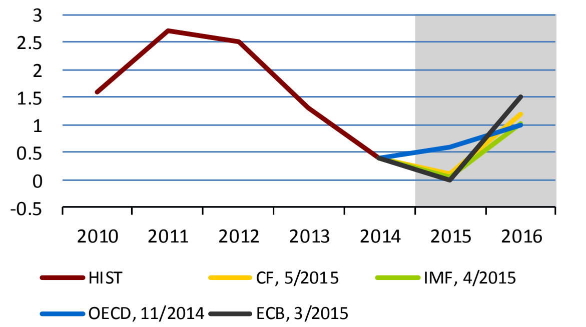
Euro area GDP growth is expected to pick up pace gradually this year and the next. Household consumption should be the main driver of the acceleration this year. In this regard, the CF outlook is unchanged from the previous month. Quarterly GDP growth accelerated to 0.7% in 2015 Q1 (1.3% year on year). Positive effects of the easing of the euro area monetary conditions are thus probably materialising. Client interest rates declined and credit standards applied to corporate loans and consumer credit were eased. In addition, the weaker euro and the still low oil prices had a favourable effect. Following sizeable growth in February, industrial production fell month on month in March, but in year-on-year terms it accelerated further to 1.8%. The PMI in manufacturing indicates a further improvement in industrial activity in April. In contrast to previous promising developments, growth in retail sales deteriorated in real terms in March. The unemployment rate has stabilised so far this year at 11.3% following declines observed last year. According to CF, the inflation outlook was also stable compared to the previous month. All the monitored institutions expect inflation to stagnate this year and pick up pace again in 2016. However, inflation will not approach the ECB's 2% inflation target. Euro area consumer prices bottomed out in January 2015 (-0.6%). A gradual rebound has been apparent since then; prices were flat year on year in April. This moderation of deflation was due to energy and food prices, as core inflation was broadly stable at 0.6% in April. The annual growth rate of M3 increased to 4.6% in March. At its April meeting, the ECB left its policy rates unchanged and decided to continue its expanded bond purchase programme (QE) until inflation hits the target. Mario Draghi confirmed this commitment in a public speech in mid-May. The ten-year Bund yield has risen markedly since late April. This may have been due partly to concerns of a premature exit from QE in the euro area. The outlook for the ten-year Bund yield increased modestly compared to the previous month. The market outlook for short-term rates remains very low.

GDP growth, %



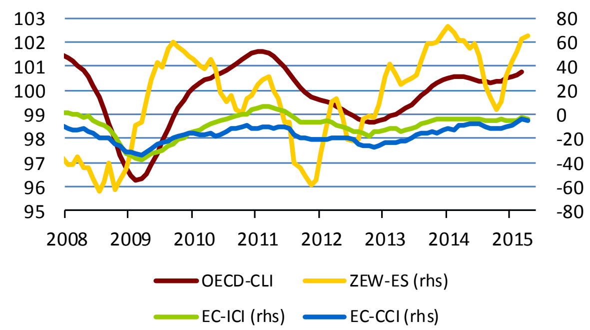
	CF	IMF	OECD	ECB
2015	1.5	1.5	1.4	1.5
2016	1.8	1.7	2.0	1.9

Inflation, %



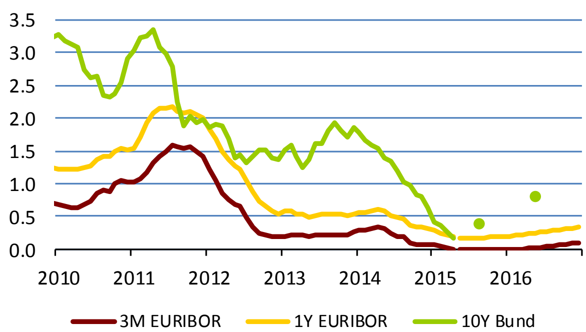
	CF	IMF	OECD	ECB
2015	0.1	0.1	0.6	0.0
2016	1.2	1.0	1.0	1.5

Leading indicators



	OECD-CLI	EC-ICI	EC-CCI	ZEW-ES
2/15	100.7	-4.6	-6.7	52.7
3/15	100.7	-2.9	-3.7	62.4
4/15		-3.2	-4.6	64.8

Interest Rates



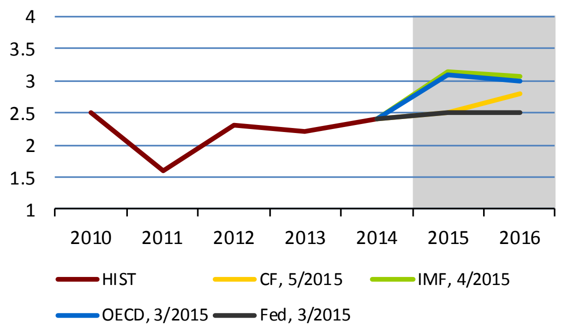
	04/15	05/15	06/15	12/15	06/16	12/16
3M EURIBOR	0.01	-0.01	0.01	0.00	0.03	0.11
1Y EURIBOR	0.18	0.17	0.17	0.19	0.26	0.34
	04/15	08/15	05/16			
10Y Bund	0.16	0.40	0.80			

II.2 United States

In line with expectations, the US economy slowed considerably in 2015 Q1. According to an advanced estimate, annualised GDP growth fell by 2 pp to 0.2% compared to the previous quarter. The economic slowdown was due to a small positive contribution of household consumption and a decrease in exports and non-residential fixed investment. US economic developments thus reflect the negative effect of the strong dollar on the trade balance, a decline in investment in the oil industry, and temporary factors (weather fluctuations and problems with supplies from West Coast ports), whose strength, however, is surrounded by high uncertainty. The April data came as an unfavourable surprise, as retail sales, for example, were flat despite lower fuel prices and an improving labour market. Most monitored leading indicators are also pointing to slower economic growth, which should nevertheless remain solid. The May CF revised its outlook for this year slightly downwards to 2.5%. Other institutions are expecting the same or slightly higher economic growth. Next year the economy should also rise at roughly the same pace.

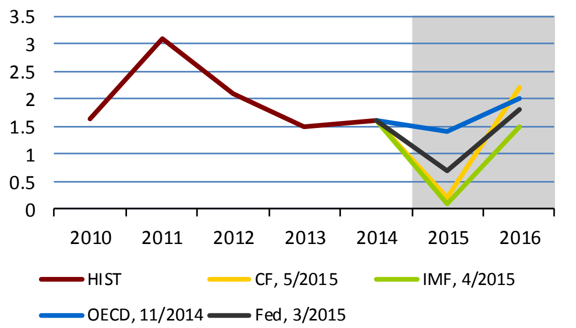
Turning to price developments, there are signs of stabilisation relating to the oil price correction. Headline (PCE) inflation and inflation adjusted for food and energy prices increased for the second consecutive month (to 0.3% and 1.8% respectively). Rising market indicators of inflation expectations are also signalling a turnaround in inflation. The May CF revised its inflation outlook for this year to 0.2%; next year inflation is expected to accelerate by about 2 pp. Government bond yields have risen in recent weeks in reaction to the shift in inflation expectations and the stabilisation of oil prices. Owing to the worse economic growth, however, the May CF does not expect the Fed to raise rates until late September 2015. The dollar has weakened in recent weeks in connection with the euro area recovery and the slowdown in the US economy.

GDP growth, %



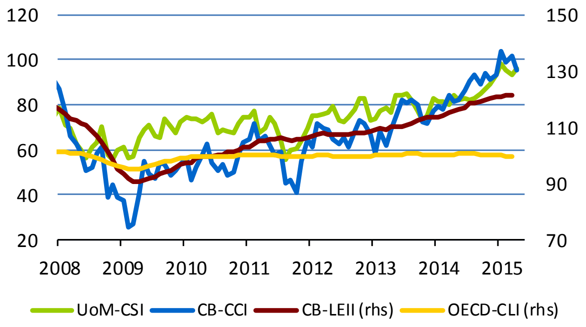
	CF	IMF	OECD	Fed
2015	2.5	3.1	3.1	2.5
2016	2.8	3.1	3.0	2.5

Inflation, %



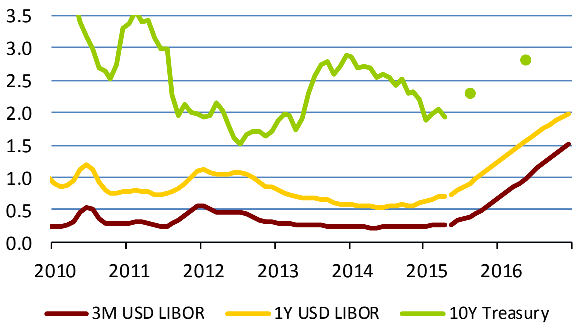
	CF	IMF	OECD	Fed
2015	0.2	0.1	1.4	0.7
2016	2.2	1.5	2.0	1.8

Leading indicators



	CB-LEII	OECD-CLI	UoM-CSI	CB-CCI
2/15	121.2	99.8	95.4	98.8
3/15	121.4	99.6	93.0	101.4
4/15			95.9	95.2

Interest Rates



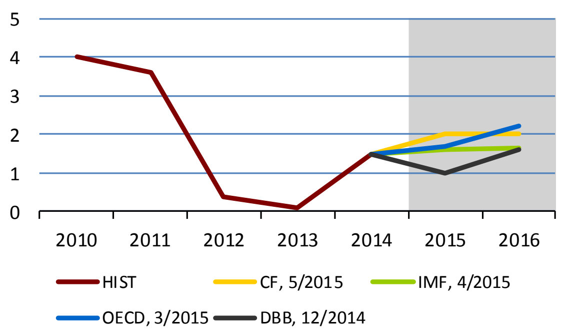
	04/15	05/15	06/15	12/15	06/16	12/16
3M USD LIBOR	0.28	0.28	0.33	0.63	1.06	1.51
1Y USD LIBOR	0.70	0.73	0.79	1.19	1.62	1.99

	04/15	08/15	05/16
10Y Treasury	1.92	2.30	2.80

II.3 Germany

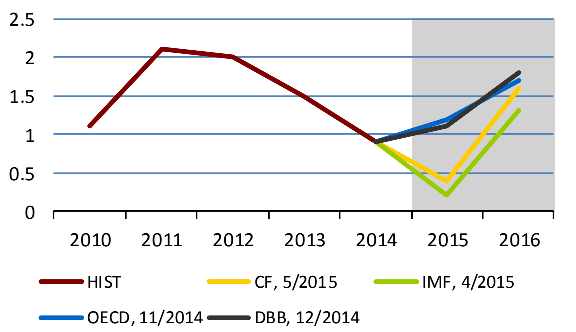
According to a preliminary estimate, German economic growth slowed markedly in both quarter-on-quarter and year-on-year terms in 2015 Q1 compared to the previous quarter (down from 0.7% to 0.3% and from 1.5% to 1% respectively). Household consumption, supported by high employment and real wage growth, made a positive contribution to the growth. Government consumption and investment also went up. Falling net exports acted in the opposite direction. According to the May CF, economic growth should rebound in Q2 and growth of 2% should be recorded in 2015 as a whole. This outlook is supported by high levels of leading indicators, which declined slightly overall in April but remain above their long-term averages. German inflation increased further to 0.5% in April owing to a slowing decline in energy prices. The decline in industrial producer prices also moderated again, to -1.7%. Inflation is expected to stand at 0.4% in 2015 as a whole and to increase to 1.6% in 2016.

GDP growth, %



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

Inflation, %

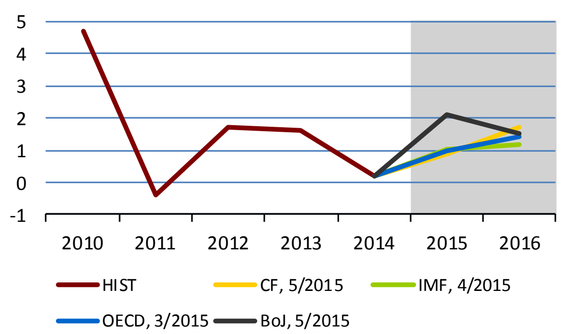


	CF	IMF	OECD	DBB
2015	0.4 →	0.2 ↘	1.2	1.1
2016	1.6 →	1.3 ↘	1.7	1.8

II.4 Japan

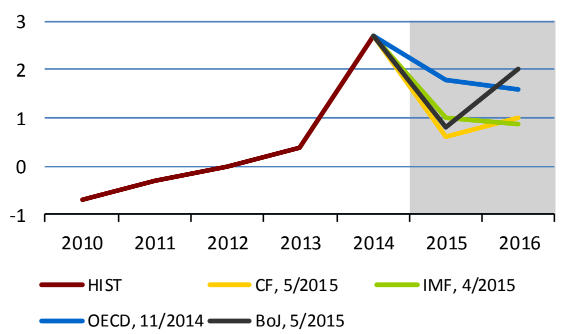
After almost a year, the decline in Japanese inflation (excluding the volatile food prices) came to a halt and inflation edged up to 2.2%. However, core inflation stayed unchanged from February (2.4%). At present, no changes can be expected in the BoJ's monetary policy settings, even though the central bank has lowered its inflation outlook for this year and the next. It is expecting inflation to rise towards the end of the year as the effect of lower oil prices drops out. However, private consumption remains a risk to the growth outlook, staying weak despite a visible improvement in the labour market. Current economic data are not signalling a robust recovery so far. The year-on-year decline in industrial production deepened in March (to -2.8%) and the year-on-year decrease in retail sales was also sharper than the financial markets had expected. The May CF revised its inflation and GDP outlooks for 2015 downwards, but left its forecast for 2016 unchanged. The new BoJ forecast is significantly more optimistic than CF with regard to growth this year and the increase in inflation next year.

GDP growth, %



	CF	IMF	OECD	BoJ
2015	0.9 ↘	1.0 ↗	1.0	2.1 →
2016	1.7 →	1.2 ↗	1.4	1.5 ↘

Inflation, %

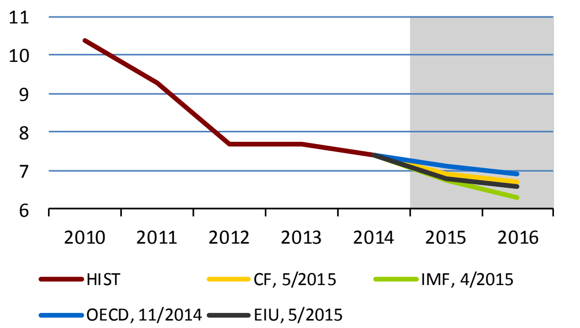


	CF	IMF	OECD	BoJ
2015	0.6 ↘	1.0 ↘	1.8	0.8 ↘
2016	1.0 →	0.9 ↘	1.6	2.0 ↘

III.1 China

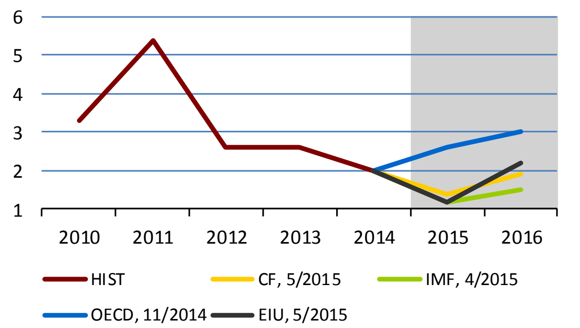
Economic growth in China showed further signs of a slowdown in April. Annual growth in industrial production reached 5.9%, staying at one of the lowest levels in recent years. The HSBC PMI in manufacturing dropped to 48.9. Trade data also surprised on the downside, with exports and imports falling by 6.4% and 16.2% respectively year on year in April. Although the Chinese economy is still showing solid growth both compared to advanced countries and with regard to the volume of GDP, its slowdown is becoming increasingly worrying. In this context, the Chinese central bank eased monetary policy further. With effect from 11 May, the one-year lending interest rate was cut by 0.25 pp to 5.1% and the deposit rate also by 0.25 pp to 2.25%. This is the third interest rate cut in six months. At the same time, the central bank lowered the minimum reserves rate by 1 pp. The Chinese government increased the budget deficit for 2015 to boost consumption and economic growth. The latest CF, IMF and EIU outlooks expect the Chinese economy to grow at a pace of almost 7% this year.

GDP growth, %



	CF	IMF	OECD	EIU
2015	6.9	6.8	7.1	6.8
2016	6.7	6.3	6.9	6.6

Inflation, %

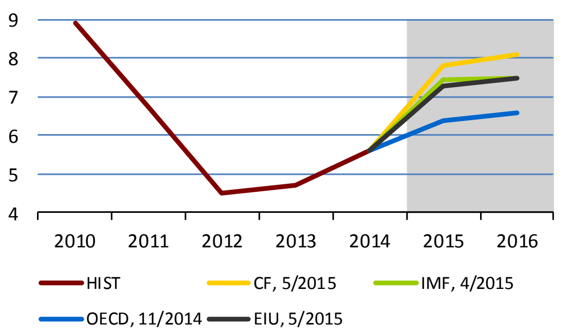


	CF	IMF	OECD	EIU
2015	1.4	1.2	2.6	1.2
2016	1.9	1.5	3.0	2.2

III.2 India

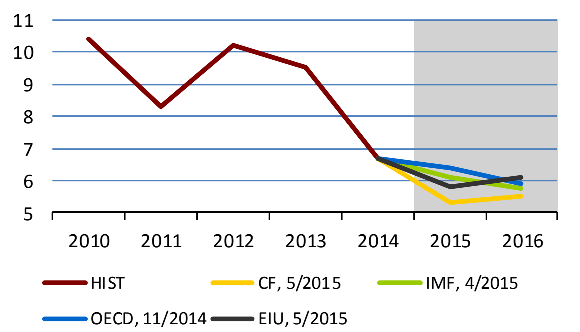
India's industrial output is slowing slightly. The cure could consist in a further monetary policy easing, enabled by favourable data on inflation. Consumer price inflation slowed to 4.9% in April, the lowest figure in five months. Inflation thus remains well below 6%, in line with the inflation target. As for the next reduction in the policy rate (currently at 7.5%) the Indian central bank is waiting for its previous cuts to transmit gradually to the economy. However, the rate change may be postponed on concerns of rising oil prices and weak rainfall related to El Niño. Industrial production growth (2.1% in March, as against 4.9% in February) may therefore continue to slow. This is suggested by the April PMI in manufacturing, which fell slightly compared to March. However, the forecast remains optimistic. CF revised its GDP growth outlook upwards by 1 pp, to 7.8% in fiscal year 2015/2016 and 8.1% a year later. The EIU's estimates remain more measured. The inflation outlooks also improved slightly. Now, they are between 5.3% and 5.8% for this year and between 5.5% and 6.1% for next year.

GDP growth, %



	CF	IMF	OECD	EIU
2015	7.8	7.5	6.4	7.3
2016	8.1	7.5	6.6	7.5

Inflation, %

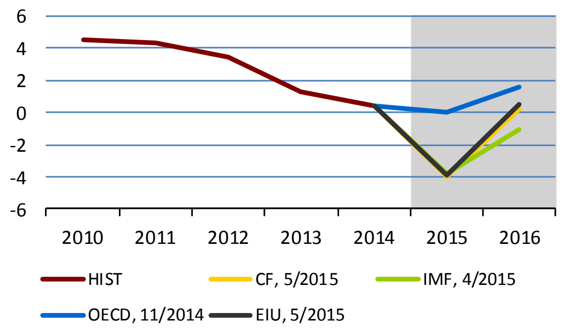


	CF	IMF	OECD	EIU
2015	5.3	6.1	6.4	5.8
2016	5.5	5.7	5.9	6.1

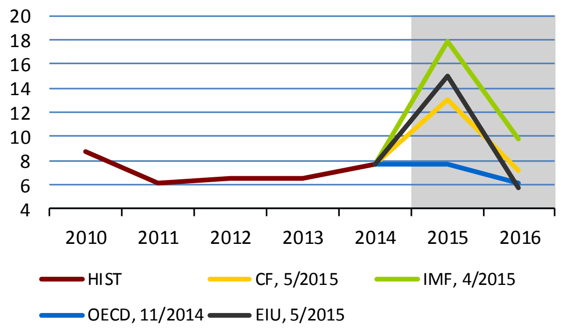
III.3 Russia

While the short-term outlook for the economic situation in Russia remains unfavourable, the recent rise in oil prices and the subsequent strengthening of the rouble (to a five-month high against USD) provided a stabilising impulse to the Russian economy. According to new estimates, however, GDP will fall by 3.8%–4.0% this year, owing partly to the impact of economic sanctions. In the first two months of 2015 alone, Russia's imports dropped by 36.4% year on year under the balance of payments methodology. Inflation climbed to 16.4% in April (prices have risen by 7.9% since the start of the year) and is expected to slow to 13% by the end of the year (CF). Overall, prices are expected to rise by 15%–17.9% in 2015. To boost economic growth, the CBR has already cut its policy rate three times this year (from 17% to 12.5%). With effect from 13 May, the central bank decided to resume regular interventions on the domestic foreign exchange market in small volumes to replenish its international reserves, which decreased by almost 25% year on year to USD 356 billion in April.

GDP growth, %



Inflation, %



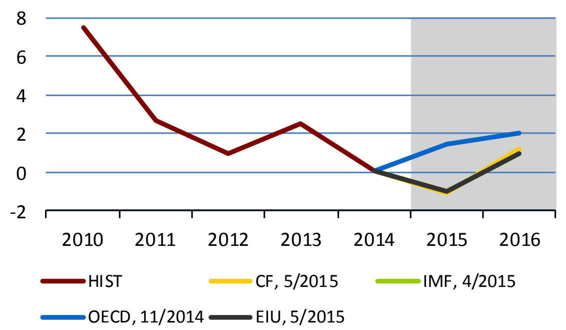
	CF	IMF	OECD	EIU
2015	-4.0	-3.8	0.0	-3.9
2016	0.2	-1.1	1.6	0.5

	CF	IMF	OECD	EIU
2015	13.0	17.9	7.7	15.0
2016	7.2	9.8	6.1	5.8

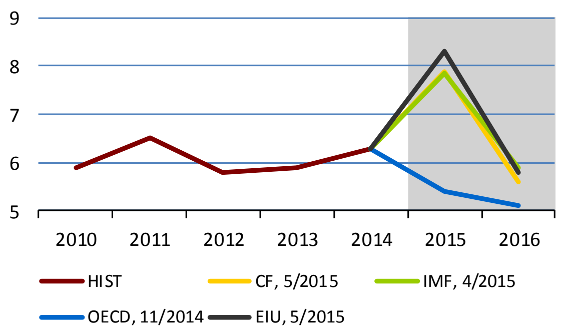
III.4 Brazil

Inflation in Brazil reached 8.2% in April (compared to 8.1% in March), remaining well above the inflation target (4.5% ± 2 pp). The central bank responded with a fifth policy rate hike (of 0.5 pp to 13.25%). The monetary policy tightening is expected to continue. The adverse developments were reflected in worse outlooks. CF and the EIU increased their inflation predictions for this year to 7.9% and 8.3% respectively. In 2016 they expect inflation to reach 5.6% and 5.8% respectively. A marked upswing in consumer price inflation has been observed since the austerity plan of the new finance minister Joaquim Levy was launched in January. Tax increases and government spending cuts should remedy the country's poor fiscal reputation and prevent capital outflows. It remains to be seen whether they will deepen the emerging recession. Industrial production fell by 3.5% year on year in March and the PMI in manufacturing is signalling a negative outlook. CF thus worsened its estimate for the GDP contraction to 1.1%, while the EIU expects a decline of 1.0%. The estimates for 2016 predict growth of 1.0%–1.2%.

GDP growth, %



Inflation, %

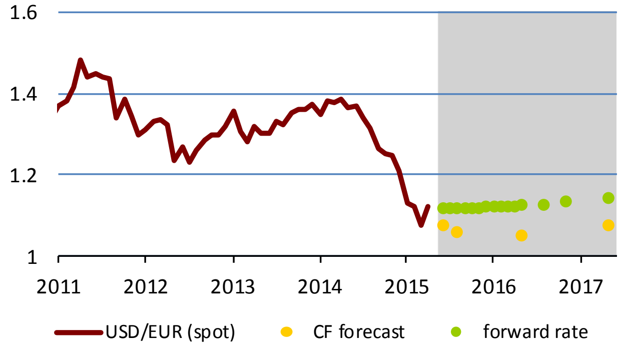


	CF	IMF	OECD	EIU
2015	-1.1	-1.0	1.5	-1.0
2016	1.2	1.0	2.0	1.0

	CF	IMF	OECD	EIU
2015	7.9	7.8	5.4	8.3
2016	5.6	5.9	5.1	5.8

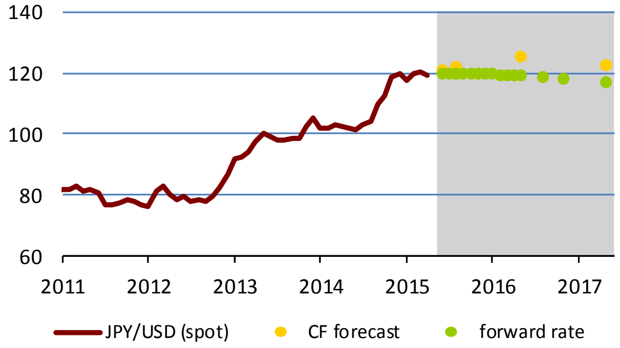
IV. IV. Outlook of exchange rates vis-à-vis the US dollar

The euro



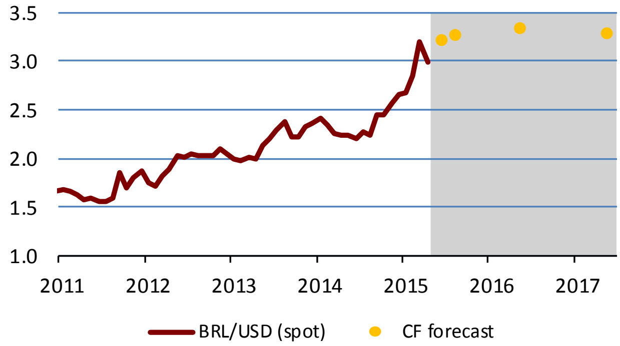
	11/5/15	06/15	08/15	05/16	05/17
spot rate	1.115				
CF forecast		1.074	1.059	1.049	1.077
forward rate		1.116	1.117	1.124	1.142

The Japanese yen



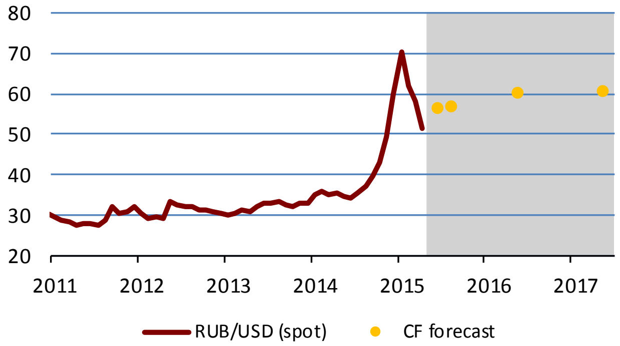
	11/5/15	06/15	08/15	05/16	05/17
spot rate	119.9				
CF forecast		120.9	122.1	125.2	122.8
forward rate		120.0	119.9	119.1	117.0

The Brazilian real



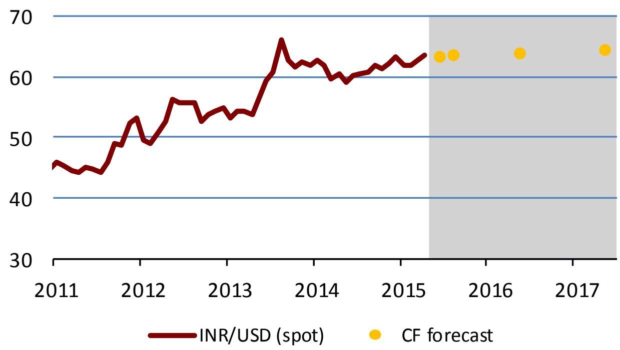
	11/5/15	06/15	08/15	05/16	05/17
spot rate	3.026				
CF forecast		3.211	3.272	3.339	3.289

The Russian rouble



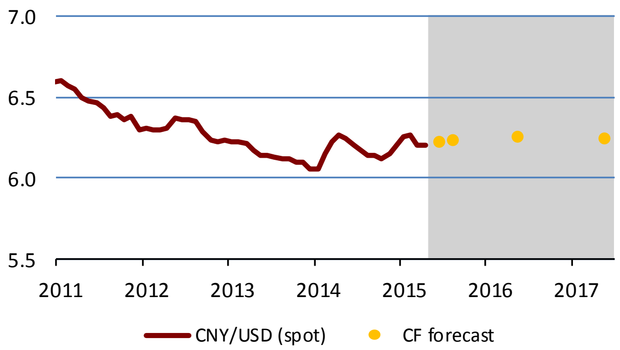
	11/5/15	06/15	08/15	05/16	05/17
spot rate	51.62				
CF forecast		56.26	56.80	60.03	60.54

The Indian rupie



	11/5/15	06/15	08/15	05/16	05/17
spot rate	63.93				
CF forecast		63.27	63.45	63.93	64.49

The Chinese renminbi



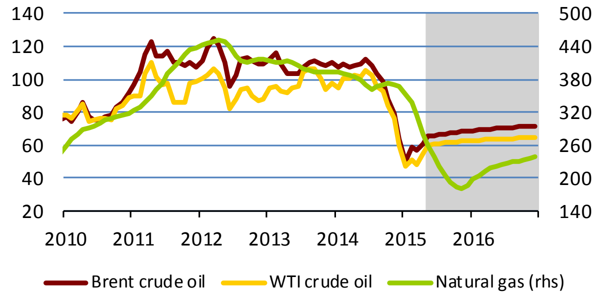
	11/5/15	06/15	08/15	05/16	05/17
spot rate	6.209				
CF forecast		6.224	6.232	6.257	6.239

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

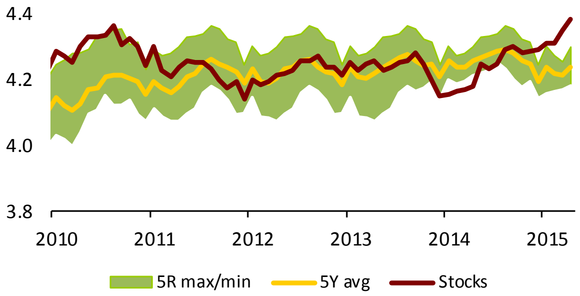
The Brent crude oil price surged by around USD 6 a barrel (bbl) in reaction to slower growth in oil stocks in the USA. It then continued to rise more gradually as a result of a weakening dollar. The average monthly Brent crude oil price climbed above USD 60/bbl in April for the first time this year, up by more than 7% compared to March. The WTI crude oil price recorded even stronger month-on-month growth (roughly double this figure) in April. OPEC attributes the rise in prices to a marked recovery in global demand and is continuing to increase extraction. By contrast, the International Energy Agency (IEA) is still warning of persisting excess supply; global growth in stocks is - according to the IEA - merely shifting from crude oil to refined products, with refineries using the currently high margins to increase their production. Strong demand for physical oil and a rise in spot prices resulted in a flatter futures curve, although the upward path (contango) persists. There is strong speculative investment activity on futures markets. According to the EIA, a plunge in the rig count should lead to a temporary decline in oil production in the USA in June–September. However, production should then start rising again. The current relatively high WTI oil price is already causing some temporarily shut wells to reopen and fostering increased completion of unfinished shale gas wells in the USA. Many producers are also using the current situation to hedge future production, which will further prolong the period of excess supply on the oil market. The EIA therefore markedly lowered its average price forecast for next year (by USD 5 to USD 70/bbl for Brent and USD 65/bbl for WTI). This is in line with the May CF, which expects a Brent price of USD 69.2/bbl one year ahead.

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

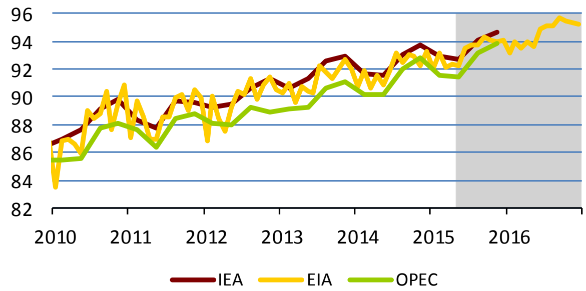


	Brent	WTI	Natural gas
2015	63.56	57.60	246.07
2016	70.34	63.79	222.96

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

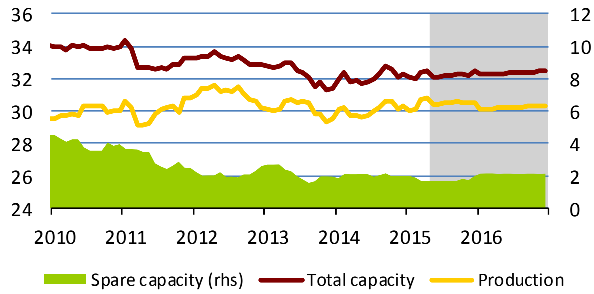


Global consumption of oil and oil products (mil. barrel / day)



	IEA	EIA	OPEC
2015	93.59	93.28	92.50
2016		94.58	

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



	Production	Total capacity	Spare capacity
2015	30.47	32.24	1.76
2016	30.22	32.35	2.13

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

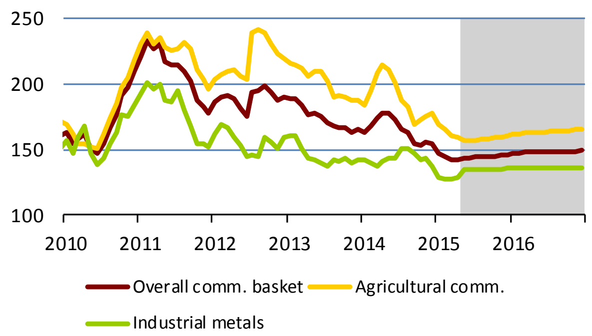
V.2 Other commodities

The average monthly non-energy commodity price index was virtually flat in April and rose moderately in the first half of May, with an increase in the industrial metals price index outweighing a decrease in the food commodity price index. The outlook for the overall index is for slight growth, but this is mostly due to only modest growth in food commodity prices, with industrial metals prices expected to be flat.

The downward trend in the food commodity price index is slowing, but prices of wheat, corn and rice declined further in April on expectations of a good harvest thanks to favourable weather so far. In addition, the USDA announced larger sown areas for corn and spring wheat in the USA. Soy prices were flat. Growth was recorded last month for prices of sugar (due to appreciation of the Brazilian currency), cocoa and pork, while beef prices fell. Owing to currently high global stocks, only very gradual growth in the food commodity price index is expected.

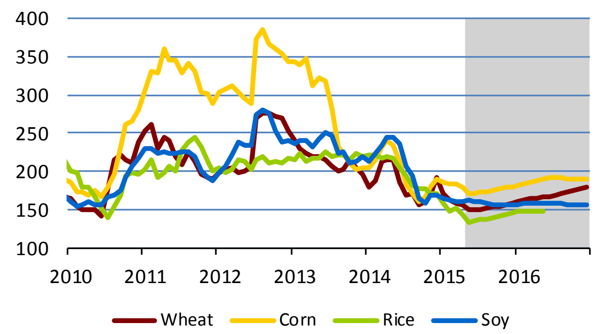
Prices of most basic metals were supported by the announcement of stimulus measures in China, which should boost lending to the manufacturing and real estate sectors. Higher prices were also fostered by a weakening of the US dollar and rising energy prices, which are pushing up extraction and processing costs. By contrast, lower growth in manufacturing in the USA, China and Japan acted against growth in metal prices. Prices of iron ore recorded a further sharp fall in April, but saw a partial reversal at the end of the month after China announced its stimulus measures and a large mining company in Australia postponed investment in extraction.

Non-energy commodities price indicies



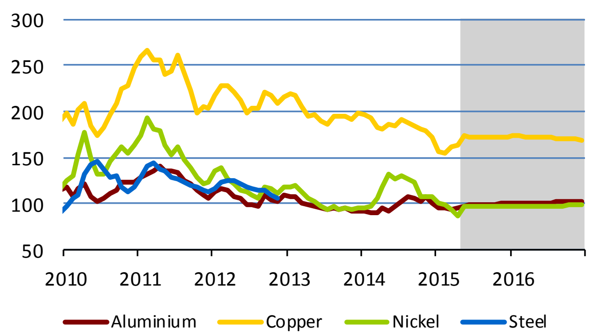
	Overall	Agricultural	Industrial
2015	144.5 ↗	160.1 ↘	132.6 ↗
2016	148.2 ↗	163.5 ↘	135.7 ↗

Food commodities



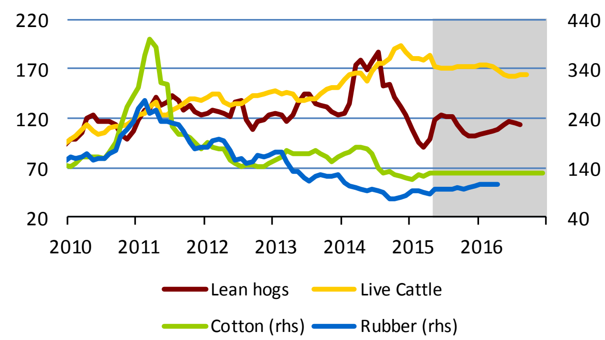
	Wheat	Corn	Rice	Soy
2015	156.4 ↘	177.9 ↘	143.3 ↘	159.8 ↗
2016	169.6 ↘	188.7 ↘	147.8 ↘	158.0 ↗

Metals



	Aluminium	Copper	Nickel
2015	97.6 ↗	168.0 ↗	96.3 ↗
2016	101.2 ↗	171.7 ↗	97.7 ↗

Meat, non-food agricultural commodities



	Lean hogs	Live Cattle	Cotton	Rubber
2015	108.5 ↗	174.7 ↗	127.9 ↘	96.0 ↗
2016	110.7 ↗	167.6 ↗	130.2 ↗	

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.

Assessment of the effects of quantitative easing in the USA[1]

The Federal Reserve discontinued its quantitative easing (QE) policy at the end of 2014. During the six-year period of QE the Fed released about USD 3.6 trillion into the economy by purchasing US government bonds and mortgage-backed securities. The motivation behind QE had initially been to quickly inject liquidity and get the financial market moving. However, from the second round onwards, after short-term interest rates were lowered to zero at the end of 2008, QE was used purely as an unconventional monetary policy tool. In line with the Fed's dual mandate, the primary goal of QE was to improve the labour market situation by exerting downward pressure on long-term interest rates and simultaneously to hit the new 2% inflation target set explicitly for the first time during this period. Although it is very difficult to separate out the effects of QE from other economic effects, QE mostly met expectations and, for now at least, none of the adverse effects that its critics initially warned of have materialised.

1 The history of quantitative easing

In October 2014, the US central bank discontinued its purchases of government bonds and mortgage-backed securities (MBS). This brought an end to the six-year policy of quantitative easing (QE), during which the Federal Reserve had used such purchases to supply liquidity to the financial system. The Fed thus returned to its standard instrument, i.e. influencing short-term money market interest rates. As a result, the financial markets began to speculate about the likely date of the first increase in key interest rates (see the *United States* section).

This analysis looks back at the period of QE policy-making in the USA and examines its impacts on key macroeconomic variables. Before the economic downturn in 2008 and 2009 the Fed's total assets were worth just under USD 900 billion (see Chart 1), i.e. about 6% of US GDP. However, the Fed's purchases of securities, dominated by MBS in the first phase, led to a rapid increase in its balance-sheet total. The MBS purchases began in December 2008 and were aimed at providing necessary liquidity to the financial sector and safeguarding the functioning of the financial market. Only in the subsequent phases, after short-term interest rates were lowered to zero (0–0.25%) in December 2008, did the Fed focus on using QE as an additional monetary policy tool.

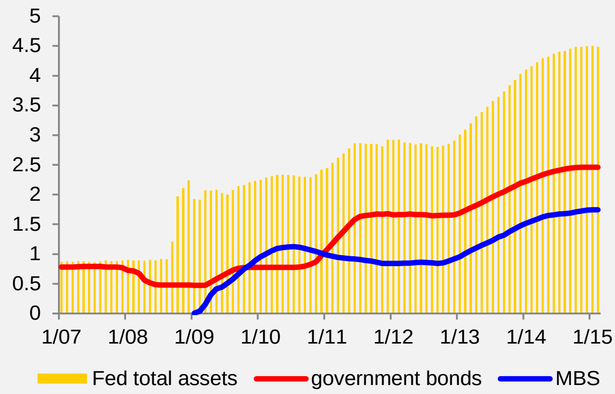


Chart 1 Government bonds and MBS held by the Fed and the Fed's total assets (USD billions)

Source: FRED

In November 2010, the Fed launched the long-awaited second round of QE, known as QE2. This involved buying USD 600 billion of long-term government bonds by June 2011. The total amount was USD 100 billion more than the financial markets had expected. On the other hand, the purchases were spread over a longer time. 5Y and 10Y bonds accounted for the largest share. The Fed also undertook to reinvest principal payments from its bond holdings. Overall, therefore, it purchased securities at a pace of USD 75 billion per month and additionally reinvested principal payments at a pace of USD 35 billion per month. QE2 was a turning point, as the central bank of the largest economy in the world started to officially use an unconventional monetary policy tool, with all its hotly debated costs and benefits.

QE2 was followed in September 2011 by Operation Twist, through which the Fed wanted to flatten the yield curve without purchasing more securities into its balance sheet. This was to be achieved by buying 6Y–30Y bonds and concurrently selling bonds with maturities shorter than three years. Operation Twist was thus intended to extend the average maturity of the Fed's debt portfolio. It continued uninterrupted during 2012.

In September 2012, the Fed announced a third, open-ended round of quantitative easing (QE3). Under QE3, the Fed purchased MBS at a pace of USD 40 billion per month. In addition, the Twist programme was replaced in December 2012 by government bond purchases of USD 45 billion per month, which increased the total amount of securities purchased to USD 85 billion per month. QE3 was meant to get the economy moving and improve the labour market situation, as the Fed – unlike other central banks – has a dual mandate, i.e. it seeks to foster both maximum employment (in other words, economic growth) and price stability (inflation of 2%).

[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.

As the economic situation improved, the Fed in June 2013 announced its intention to start tapering QE3 as from September 2013. However, subsequent statements made by Fed representatives indicated that a rapid exit from the monetary stimulus was becoming increasingly unlikely. In the end, the exit did not start in September. Worse-than-expected labour market data and a fiscal crisis in the USA in October may also have contributed to the postponement of the QE policy tapering. The tapering was not announced until December 2013. The amount of bond purchases was reduced gradually during 2014, and QE3 ended completely in October 2014. The outcome of all the rounds of QE was an increase in the Fed's balance-sheet total to USD 4.5 billion, i.e. roughly 25% of US GDP.

The Fed also published policy normalisation principles in September 2014. According to those principles, the Fed will reduce the asset holdings in its balance sheet some time after the first policy rate increase by ceasing to reinvest repayments of principal.

2 Macroeconomic effects of QE

QE was intended to affect the US economy mainly by exerting downward pressure on long-term interest rates, as the room for manoeuvre in the area of short-term rates had been exhausted when those rates reached zero. The figure below shows the effect of the QE transmission mechanism on the economy.

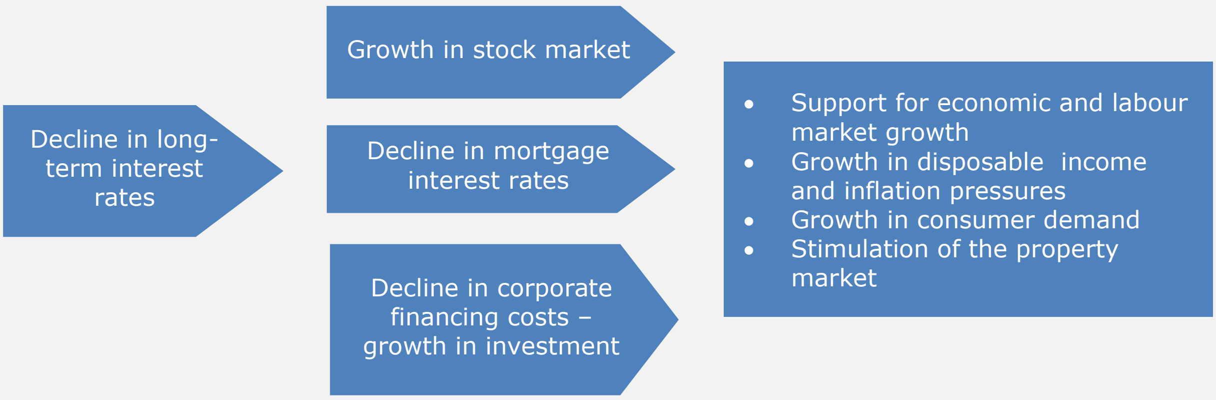


Figure 1 Effect of QE in the transmission mechanism
Source: CNB

The main objective of QE2, QE3 and Operation Twist was to put downward pressure on long-term interest rates amid zero short-term rates. Bond purchases cause bond prices to rise and, reciprocally, bond yields to fall. This gives rise to lower interest rates on loans to households (mortgage loans in particular) and corporate investment loans. The low household and corporate financing costs should then stimulate economic activity, leading to an increase in inflation pressures in the economy.

Chart 2 shows that long-term rates dropped after the announcement of QE1 and then started falling just before QE2 was announced and again immediately before Operation Twist. However, QE3 did not have such an effect on long-term rates. On the contrary, rates rose modestly as the economic situation improved, and they increased further following the first QE3 tapering announcement in June 2013. By contrast, the currently observed low inflation coupled with falling inflation expectations has resulted in a decrease in long-term rates despite the complete termination of QE.

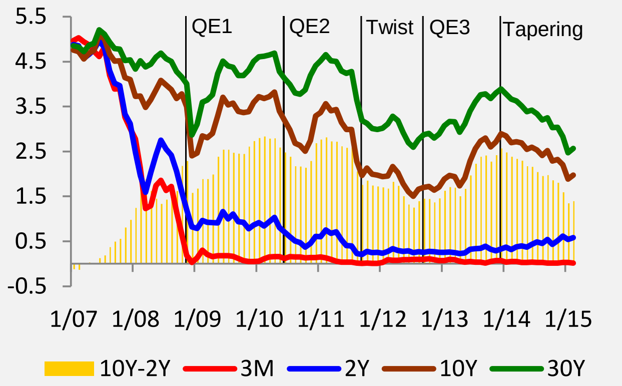


Chart 2 Interest rates of various maturities and the slope of the yield curve (in %, in pp)
Source: Datastream.
Note: As short-term interest rates were close to zero for most of the period under review, the slope of the yield curve (10Y-2Y) reflected long-term interest rates.

Other intended effects of QE included stimulation of the stock market, which plays a much more important role in consumer behaviour in the USA than it does in Europe (see Chart 3). An increase in market capitalisation (combined with a decline in mortgage servicing costs) should have an upward effect on consumer demand and household confidence, as households feel wealthier. The stock market has been trending upwards since the end of 2008 and is now above its year 2000 high. Some analysts link this with a possible overheating of the stock market, with potential risks to financial stability. Consumer confidence surged after the first announcements of the introduction of QE2. This rise was interrupted by bad economic news in mid-2011, to which the Fed responded by bringing in Operation Twist.

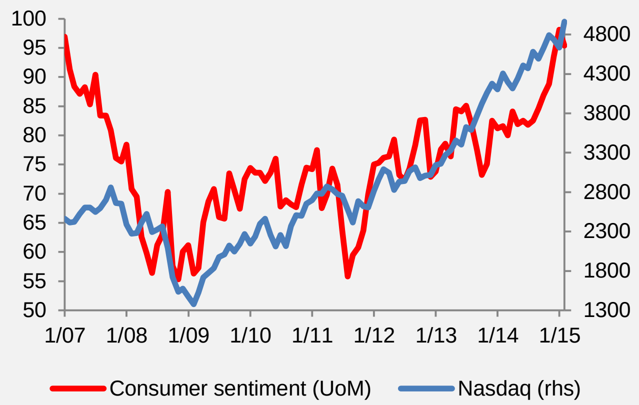


Chart 3 Consumer confidence and stock market developments in the USA

Source: Datastream.

Note: UoM – University of Michigan

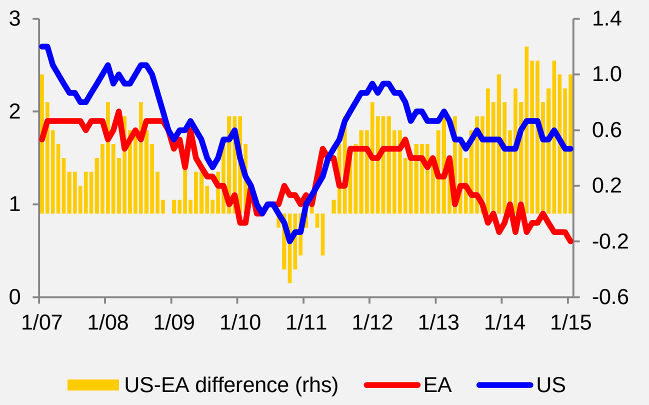


Chart 4 CPI excluding energy and food prices (in %, in pp)

Source: Datastream.

Two equally important objectives of QE were a reduction in borrowing costs for non-financial corporations and support for investment. In this case, despite gradually rising private fixed investment the Fed was faced with constraints on the transmission mechanism, because although the borrowing costs of firms decreased and firms had excess cash they did not invest those funds in the domestic economy to the full extent. The reasons for this included increased uncertainty about the domestic economy and better investment opportunities abroad. According to the IMF, however, QE helped reduce systemic risk and improve confidence in the markets and also helped the G7 countries emerge from recession in the second half of 2009.

Despite initial concerns about QE causing rapid price growth, inflation in the USA fluctuated around the 2% target level. The effects of QE thus spilled over to other countries, to a weaker exchange rate of the dollar[2] and to a rise in commodity prices. Looking at inflation excluding energy and food prices (see Chart 4), we can see divergence (especially from 2013 onwards) between the USA and the euro area, which did not launch QE until March 2015. Although it is very difficult to separate out the effects of QE from other economic effects, QE may have had some positive effect in the USA (unlike in the euro area) in terms of increasing core inflation.

3 Comparison of pre- and post-crisis developments

A comparison of the evolution of key macroeconomic variables before and after the 2008–2009 economic crisis gives us a rough idea of the changed economic conditions, including the effect of the Fed's monetary policy.

Chart 5 shows that long-term interest rates were in fact reduced by almost two percentage points after 2009. However, average inflation and average GDP and private consumption growth simultaneously went down. The average dollar-euro exchange rate was about 6% weaker after the crisis. This clearly helped the domestic economy and increased the inflation pressures. The most visible difference, however, lies in average industrial production growth, which surged in the post-crisis period despite the lower GDP growth. We should note here that the price of oil in 2010–2014 was roughly

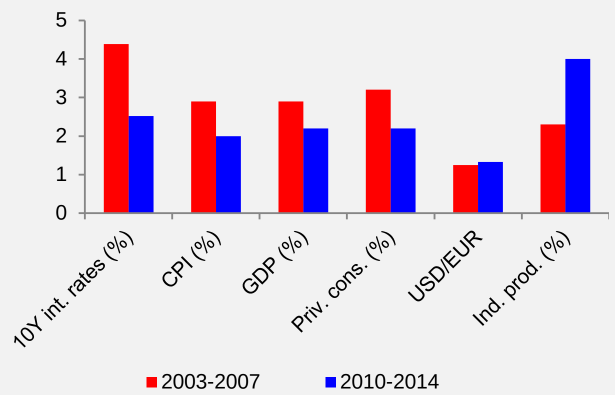


Chart 5 Comparison of economic developments in the USA before and after the crisis

Source: Datastream.

Note: CPI, GDP, private consumption and industrial production – year-on-year changes in %

[2] Money supply growth leads to depreciation of the domestic currency against other currencies through the interest rate mechanism.

double that in 2003–2007.

Annual GDP and private consumption growth dropped more significantly in the euro area than in the USA in the post-crisis period. In addition, industrial production in the euro area fell as well. The yield on the 10Y European synthetic bond dropped to a lesser extent (by about 0.9 pp) between the above-mentioned two periods despite a decline in the German 10Y government bond yield from 3.9% to 2.0%.

4 Conclusion

In October 2014, after six years of quantitative easing, the Fed returned to its standard monetary policy tool – managing short-term interest rates via open market operations. Over the course of these six years, the Fed succeeded in fostering a decrease in long-term interest rates, which stood at 2.5% on average from 2010 onwards. It is also reasonable to assume that QE had a positive effect on maintaining inflation pressures in the economy. This can be observed from 2013 onwards in the form of divergence of inflation excluding energy and food prices between the USA and the euro area. Nonetheless, average headline inflation in the USA since 2010 has remained at a lower level than before the crisis. QE also had a favourable effect on the stock market, which has a greater guidance effect in the USA than in the euro area. For this reason, growth in the stock market was accompanied by an improvement in consumer sentiment. However, household consumption growth dropped more significantly than total GDP in the post-crisis period. By contrast, a weaker dollar exchange rate had a positive effect on the domestic economy, leading, among other things, to a sizeable increase in industrial production growth in the post-crisis period.

Overall, therefore, QE met expectations and did not generate strong inflation in the USA, which its critics had initially warned of. On the other hand, the effects of QE were achieved at the cost of a marked increase in the Fed's balance-sheet total (the Fed's portfolio is now subject to substantial interest rate risk) and, despite the current low-inflation environment caused by a sharp decline in oil prices, there is still a risk of the liquidity supplied by the Fed spilling over to consumer prices and asset prices in the event of a more marked improvement in economic conditions. The Fed would have to respond forcefully to any such spillover.

A1. Change in GDP predictions for 2015

	CF		IMF		OECD		CB / EIU	
EA	0	2015/5 2015/4	+0.3	2015/4 2015/1	+0.3	2015/3 2014/11	+0.5	2015/3 2014/12
US	-0.4	2015/5 2015/4	-0.5	2015/4 2015/1	+0.0	2015/3 2014/11	-0.3	2015/3 2014/12
DE	+0.1	2015/5 2015/4	+0.3	2015/4 2015/1	+0.6	2015/3 2014/11	-1.0	2014/12 2014/6
JP	-0.1	2015/5 2015/4	+0.4	2015/4 2015/1	+0.2	2015/3 2014/11	0	2015/5 2015/1
BR	-0.4	2015/5 2015/4	-1.3	2015/4 2015/1	+0.1	2014/11 2014/9	0	2015/5 2015/4
RU	+0.2	2015/5 2015/4	-0.8	2015/4 2015/1	-1.8	2014/11 2014/5	+0.1	2015/5 2015/4
IN	+0.1	2015/5 2015/4	+1.2	2015/4 2015/1	+0.5	2014/11 2014/9	0	2015/5 2015/4
CN	0	2015/5 2015/4	-0.0	2015/4 2015/1	-0.2	2014/11 2014/9	-0.2	2015/5 2015/4

A2. Change in inflation predictions for 2015

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

A3. List of abbreviations

ABS	asset-backed securities
BoJ	Bank of Japan
BR	Brazil
BRIC	countries of Brazil, Russia, India and China
BRL	brazilian real
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
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
EIU	The Economist Intelligence Unit database
EU	European Union
EUR	the euro
EURIBOR	Euro Interbank Offered Rate
Fed	Federal Reserve System (the US central bank)
FRA	forward rate agreement
GBP	pound sterling
GDP	gross domestic product
HICP	harmonised index of consumer prices
CHF	Swiss franc
ICE	Intercontinental Exchange
IFO	Institute for Economic Research
IFO-BE	IFO Business Expectations
IMF	International Monetary Fund
IN	India
INR	Indian rupee
IRS	Interest Rate swap
JP	Japan
JPY	Japanese yen
LI	leading indicators
LIBOR	London Interbank Offered Rate
MER	Ministry of Economic Development (of Russia)
OECD	Organisation for Economic Co-operation and Development
OECD-CLI	OECD Composite Leading Indicator
PMI	Purchasing Managers' Index
PPI	producer price index
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
WEO	World Economic Outlook
WTI	West Texas Intermediate (crude oil used as a benchmark in oil pricing)
ZEW-ES	ZEW Economic Sentiment
ABS	asset-backed securities

A4. List of thematic articles published in the GEO

2015

	Issue
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
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

	Issue
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
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
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