GLOBAL ECONOMIC OUTLOOK - JANUARY

2018

Monetary Department
External Economic Relations Division

CZECH NATIONAL BANK

Cut-off date for data
12 January 2018

CF survey date
8 January 2018

GEO publication date
19 January 2018

Notes to charts

ECB and Fed: midpoint of the range of forecasts.
The arrows in the GDP and inflation outlooks indicate the direction of revisions compared to the last GEO. If no arrow is shown, no new forecast is available. Asterisks indicate first published forecasts for given year. Historical data are taken from CF, with exception of MT and LU, for which they come from EIU.
Leading indicators are taken from Bloomberg and Datastream.
Forecasts for EURIBOR and LIBOR rates are based on implied rates from interbank market yield curve (FRA rates are used from 4M to 15M and adjusted IRS rates for longer horizons). Forecasts for German and US government bond yields (10Y Bund and 10Y Treasury) are taken from CF.

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Editor-in-chief I. Summary	Editor II.4 United Kingdom	II.1 Euro area VI. Focus	II.2 Germany	II.3 United States III.1 China

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II.5 Japan III.2 India	III.3 Russia III.4 Brazil	V.1 Oil and natural gas V.2 Other commodities

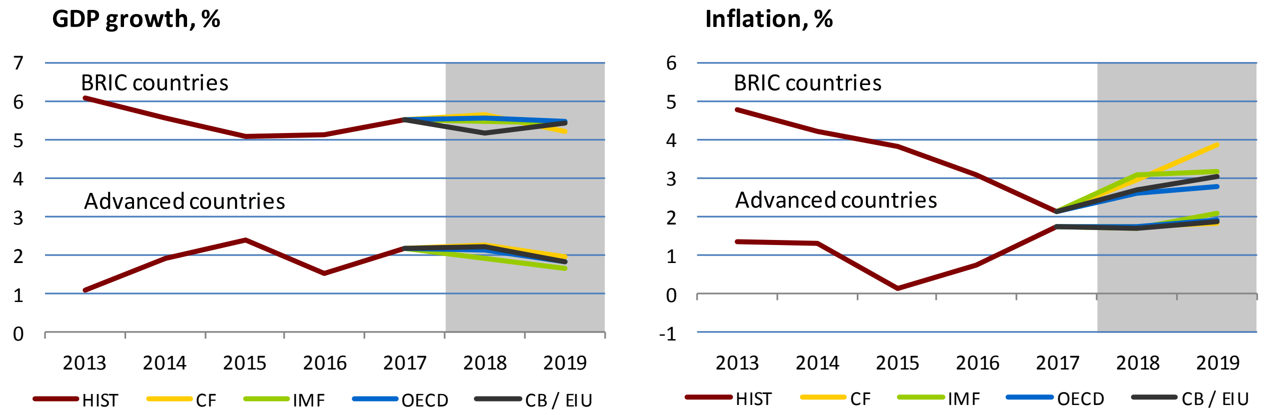
This year's first issue of Global Economic Outlook presents the regular monthly overview of recent and expected developments in selected territories, focusing on key economic variables: inflation, GDP growth, leading indicators, interest rates, exchange rates and commodity prices. The article in this issue focuses on widely discussed central banking phenomena of the day – the relationship between the ECB's unconventional monetary policy and the developments in monetary aggregates in the euro area. The article shows that the ECB, like other central banks, influences the quantity of money only indirectly. The popular theory that quantitative easing is "printing money" and ultimately leads to high inflation is therefore not confirmed.

The global economic outlooks for 2018 and 2019 can be assessed as optimistic. According to the January CF, the global economy is expected to grow by 3.3% this year (thanks mainly to the Asian-Pacific region) and slow slightly to 3.2% in 2019. Looking at the advanced economies, the US economy will grow at a robust pace of over 2% despite expected further monetary policy tightening. The growth of the euro area economy should also exceed the 2% mark this year (2.2%), although next year it will probably only reach 1.8%. The economic driver of the euro area will be again its strongest economy, Germany, especially this year (with growth of 2.3%). Among the G7 countries, Canada should also maintain robust growth. By contrast, the UK is apparently being negatively affected by Brexit, which has lowered its growth outlooks to 1.5%. The Japanese economy continues to show a modest downward trend and its growth will gradually approach 1%. Inflation is still expected to be below the general reference level of 2% in the vast majority of advanced countries this year. Only a handful of countries are expected to reach that level in 2018 (the USA, Canada and the UK). Inflation in the euro area also remains at visibly lower levels than the ideal 2% in the outlooks until 2019. This will have significant implications for the process of normalisation of the ECB's monetary policy.

As in many previous years, the outlooks for emerging economies – here represented by the BRIC group – remain mixed. On the one hand, China and India are showing strong economic growth. However, China will gradually slow to 6%. Growth in India has also been faltering recently, but remains high at around 7.5%. The current estimates predict inflation of just above 2% for China and 5% for India. The economic situation of the remaining two BRIC economies, Russia and Brazil, is improving after their recent emergence from recession. The Russian economy will maintain growth of slightly below 2% and the Brazilian economy will probably show 3% GDP growth at the end of 2019. The good news for these countries is that they should succeed in keeping inflation no higher than 4%.

The outlooks for euro area interest rates remain very low, with no sign of them rising markedly before the end of 2018. In the USA, by contrast, up to three rate increases of the standard amount of 0.25 pp can be expected this year. According to CF, the US dollar will appreciate slightly at the one-year horizon against all the monitored currencies. The price of Brent crude oil is expected to average about USD 66 a barrel this year and gradually fall to USD 62 a barrel on average in 2019. Industrial metals prices are expected to be flat over the forecast horizon despite their current strong growth. By contrast, the food commodity price index is rising over the outlook horizon, mainly on the back of wheat and corn prices.

GDP growth and inflation development and outlook in monitored countries



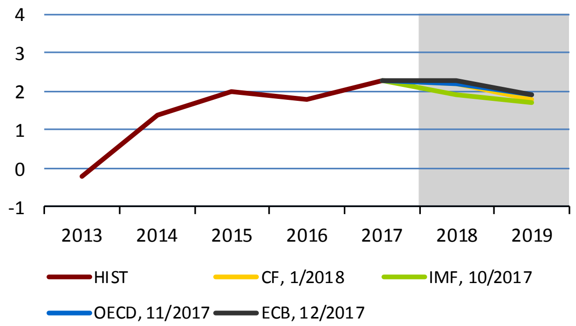
Note: The figures represent the weighted averages of historical series / outlooks in individual countries. The weights are based on nominal GDP measured in USD during 2013–2016 (source: EIU). Advanced countries: euro area, United States, United Kingdom, Japan. BRIC countries: China, India, Russia, Brazil.

II.1 Euro area

At the end of 2017, the euro area economy continued to grow at the robust rate recorded in Q3, when GDP grew by 0.6% quarter on quarter (2.6% year on year). The growth in the euro area is being supported by easy monetary policy, a global economic recovery and favourable developments on the labour market, where unemployment dropped to 8.7% in November. Rising disposable household income is being reflected in private consumption, as signalled by retail sales growth (of 2.7% year on year in November) and by leading indicators (see the chart below). Companies' output is also rising swiftly, as evidenced by, for example, the PMI in manufacturing, which reached a historical high (60.6) in December. The monitored outlooks expect continued solid growth both this year and the next. The economy is expected to grow at a similar pace as in 2017 this year (about 2.2%) and slow slightly next year.

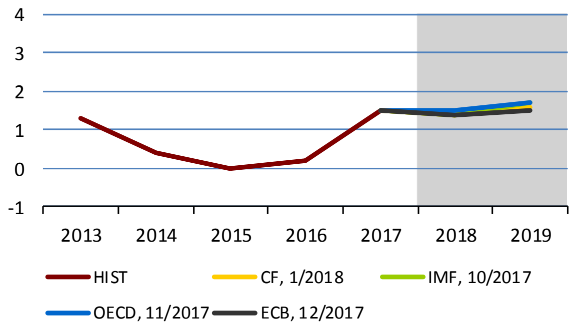
Inflationary pressures showed no major increase at the end of last year despite the faster economic growth. On the contrary, the headline inflation rate fell to 1.4% in December according to Eurostat's flash estimate. The growth in core components was flat at 0.9%. The possibility of an upswing in consumer price inflation is surrounded by considerable uncertainty. On the one hand, inflation is being supported by a continued robust recovery and growth in input prices related to a drop in economic slack, as signalled by PMI surveys. On the other hand, this is being counteracted by relatively low wage growth, persistence of low inflation and subdued inflation expectations, which the monitored outlooks also reflect. According to those outlooks, average inflation will be just below 1.5% this year and rise very slightly next year. Given the subdued inflation outlook, the ECB will continue its asset purchases at least until the end of September 2018 at a lowered monthly pace of EUR 30 billion. At its December meeting, the ECB reiterated its commitment to keep the key rates at the current levels for an extended period of time and past the horizon of the net asset purchases. Financial markets expect the first rate increase to occur in the second half of 2019.

GDP growth, %



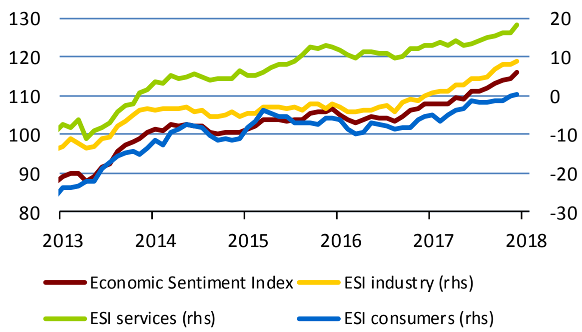
	CF	IMF	OECD	ECB
2018	2.2	1.9	2.2	2.3
2019	1.8	1.7	1.9	1.9

Inflation, %



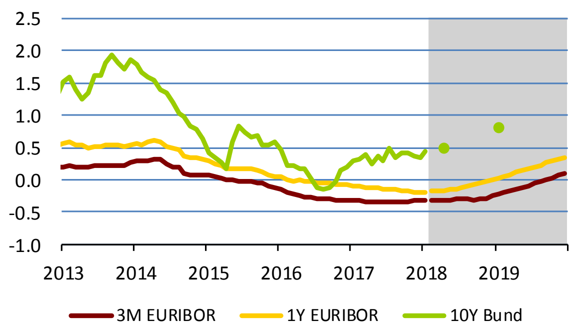
	CF	IMF	OECD	ECB
2018	1.4	1.4	1.5	1.4
2019	1.6	1.7	1.7	1.5

Leading indicators



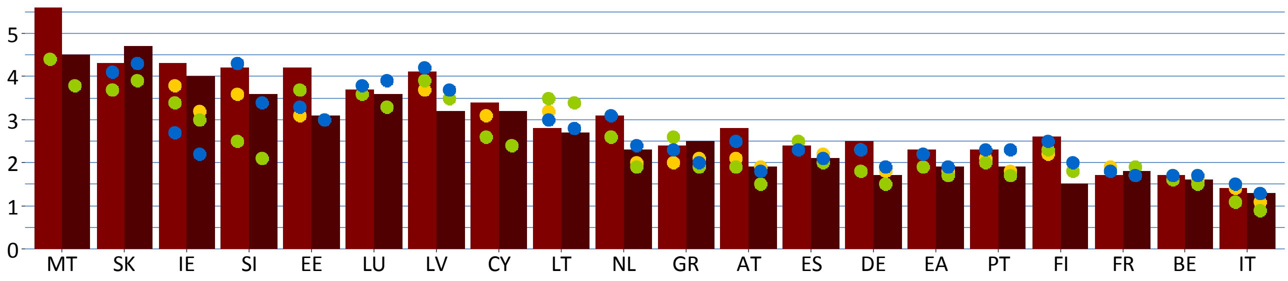
	ESI	industry	services	consumers
10/17	114.1	8.0	16.2	-1.1
11/17	114.6	8.1	16.4	0.0
12/17	116.0	9.1	18.4	0.5

Interest Rates, %



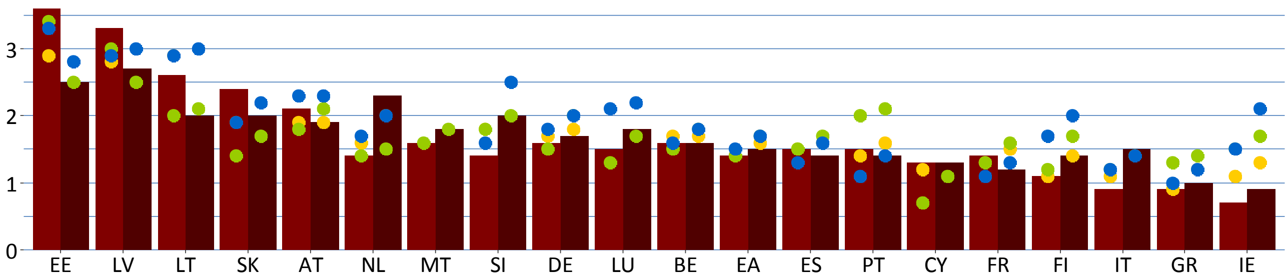
	12/17	01/18	04/18	01/19
3M EURIBOR	-0.33	-0.33	-0.32	-0.23
1Y EURIBOR	-0.19	-0.19	-0.16	0.03
10Y Bund	0.35	0.44	0.50	0.80

GDP growth outlooks in the euro area countries in 2018 and 2019, %



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

Inflation outlooks in the euro area countries in 2018 and 2019, %

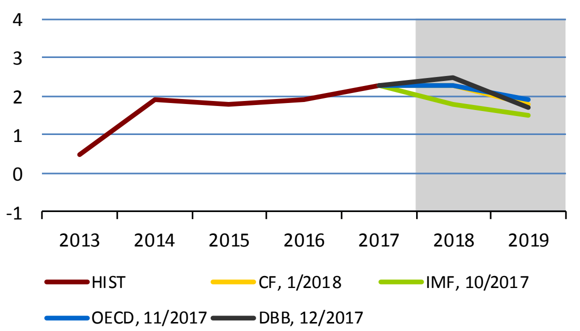


Note: The chart shows institutions' latest available outlooks of for the given country.

II.2 Germany

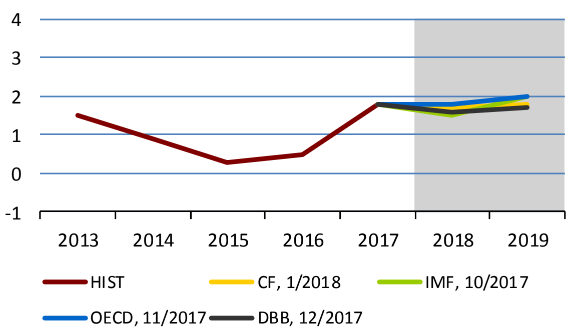
Germany's economic growth outlooks for the coming years have been raised (CF, DBB). This mainly reflects the high GDP growth recorded in 2017 Q3, when the economy accelerated both year on year (to 2.8%) and quarter on quarter (to 0.8%). Industrial production showed very good progress. A further rise in the PMI leading indicator in manufacturing in December is also indicating a continuation of the previous trend. The other leading indicators (IFO, ZEW) were also favourable despite persisting political uncertainty, with attempts to form a government coalition following the September elections having been unsuccessful so far. The unemployment rate remained at a historical low in December. Annual consumer price inflation slowed slightly in the same month. Inflation pressures thus remain low. Inflation is not expected to exceed the 2% level this year either.

GDP growth, %



	CF	IMF	OECD	DBB
2018	2.3	1.8	2.3	2.5
2019	1.8	1.5	1.9	1.7

Inflation, %



	CF	IMF	OECD	DBB
2018	1.7	1.5	1.8	1.6
2019	1.8	2.0	2.0	1.7

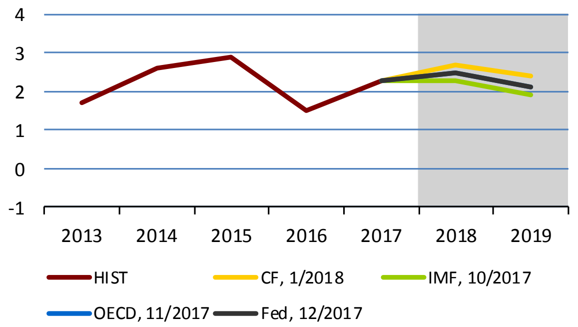
II.3 United States

President Donald Trump in December succeeded in pushing through the largest tax reform in the USA in more than 30 years. Its centrepiece is a cut in corporate tax from 35% to 21%. However, the tax burden on small and mid-sized firms and the self-employed will also decrease thanks to higher write-offs. Employees will gain from the reform too, although analyses reveal that the wealthiest Americans will enjoy the greatest benefits (due both to a lower tax rate and a doubling of the inheritance tax threshold). According to the Tax Policy Center, taxes will drop for 95% of Americans and the total tax cuts will amount to about USD 1.5 trillion over ten years. According to the reform's proponents, the budget shortfall due to the lower rate will be offset by higher total revenues thanks to faster economic growth fostered by the reform. However, analysts outside the White House estimate the US state deficit to grow by up to USD 1 trillion.

The FOMC members' new outlooks also take the reform into account, as the minutes of their last meeting reveal. According to them, the drop in the tax burden will boost both corporate and household spending. However, they also expressed uncertainty about other impacts of the reform (especially on the labour market and investment). Most of them, though, revised the US economic growth outlook upwards. The more optimistic outlook then supported the FOMC's decision to raise the target range for its policy rate by 25 basis points to 1.25%–1.50%. A further three 25 bp hikes can be expected in 2018 (according to the FOMC members' median estimates). The assessment of the current economic situation saw no major change, i.e. economic activity is growing at a solid pace.

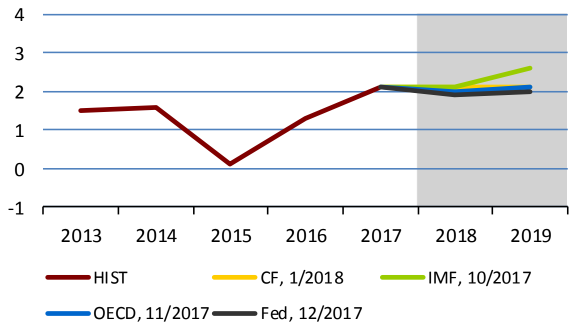
Labour market data confirm this. Unemployment is flat at 4.1% amid average hourly wage growth of 2.5% year on year. Non-farm payrolls reached 148,000 in December. According to the Conference Board survey, consumer confidence remains at an all-time high (122.1). By contrast, inflation pressures remain muted, with headline inflation at 2.2% and core inflation at 1.7% in November. The new CF and Fed outlooks therefore made no changes to the inflation forecasts, whereas the growth outlooks were revised upwards.

GDP growth, %



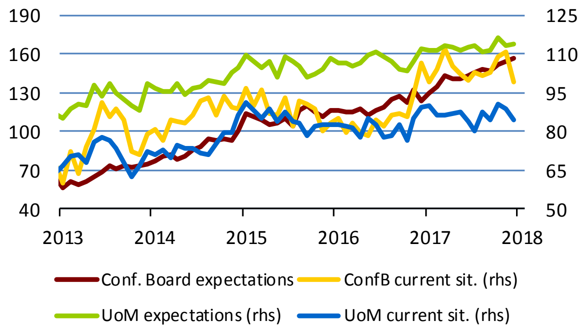
	CF	IMF	OECD	Fed
2018	2.7	2.3	2.5	2.5
2019	2.4	1.9	2.1	2.1

Inflation, %



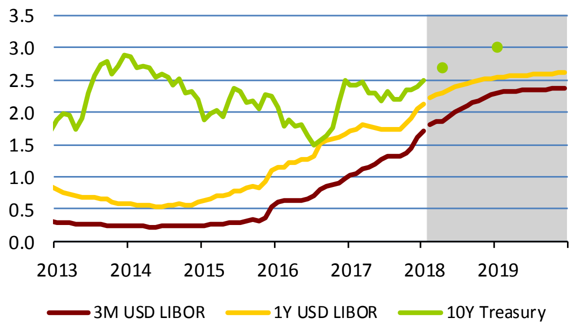
	CF	IMF	OECD	Fed
2018	2.1	2.1	2.0	1.9
2019	2.1	2.6	2.1	2.0

Leading indicators



	ConfB exp.	ConfB curr.	UoM exp.	UoM curr.
10/17	152.0	109.0	116.5	90.5
11/17	154.9	111.0	113.5	88.9
12/17	156.6	99.1	113.8	84.3

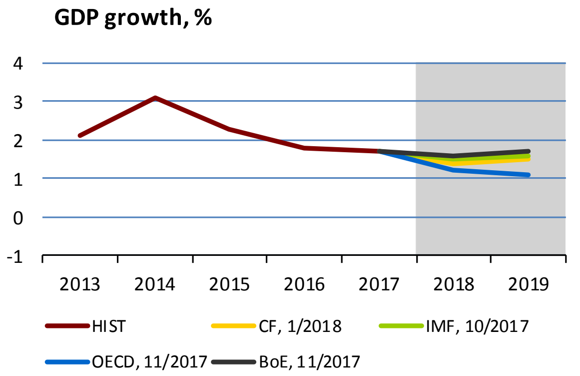
Interest Rates, %



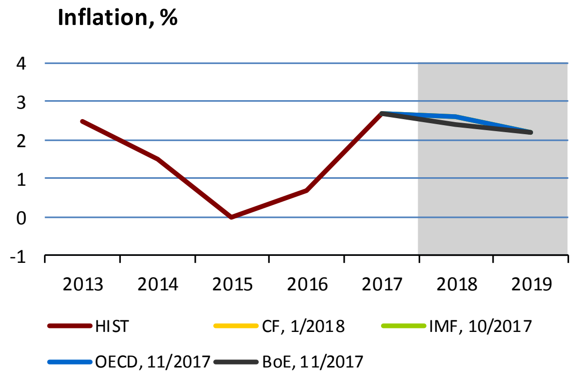
	12/17	01/18	04/18	01/19
USD LIBOR 3M	1.61	1.70	1.87	2.29
USD LIBOR 1R	2.05	2.05	2.30	2.54
Treasury 10R	2.41	2.49	2.70	3.00

II.4 United Kingdom

UK inflation rose to 3.1% in November. It was driven mainly by growth in prices of transport, leisure activities, restaurant and hotel services, and housing and food. Core inflation was flat at 2.7%. Nonetheless, the UK central bank left its policy rate unchanged at its December meeting after having raised it at the previous one. However, the process of gradual monetary policy tightening will continue in the coming years if the economic situation permits. The London-based NIESR expects this to occur at a frequency of two 25 bp hikes a year. It is more optimistic about the current economic situation than the BoE. According to its estimates, UK economic growth will accelerate to 0.6% quarter on quarter in 2017 Q4, whereas the BoE currently expects it to slow slightly (from 0.4% in Q3). CF predicts annual GDP growth not exceeding 1.5% for the next two years amid inflation returning only gradually to the 2% level from above.



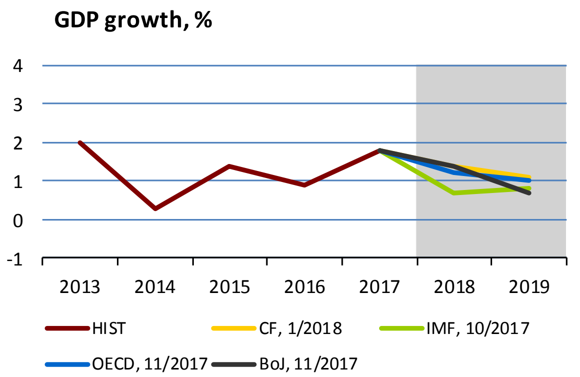
	CF	IMF	OECD	BoE
2018	1.4	1.5	1.2	1.6
2019	1.5	1.6	1.1	1.7



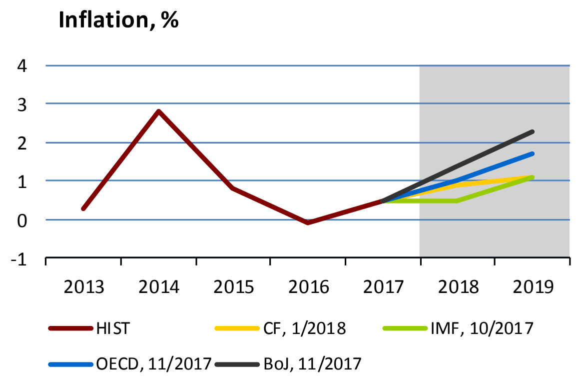
	CF	IMF	OECD	BoE
2018	2.6	2.6	2.6	2.4
2019	2.2	2.2	2.2	2.2

II.5 Japan

The situation in Japan is very favourable. Retail sales growth increased again in November after slowing in October, as did wage growth and household spending. Unemployment meanwhile dropped further, to 2.7%. Annual industrial production growth slowed slightly compared to October, but its pace remains solid. The PMI in manufacturing rose again in December, reaching 52 points. According to purchasing managers, all the monitored items increased. Inflation rose to 0.6% in November due to an upswing in transport prices and a more moderate decline in food prices. The BoJ left its monetary policy stance unchanged at its December meeting. The monitored institutions' predictions suggest that the Japanese economy will slow in 2018 and 2019. By contrast, inflation will rise further. The BoJ even expects it to climb above the 2% inflation target in 2019.



	CF	IMF	OECD	BoJ
2018	1.4	0.7	1.2	1.4
2019	1.1	0.8	1.0	0.7

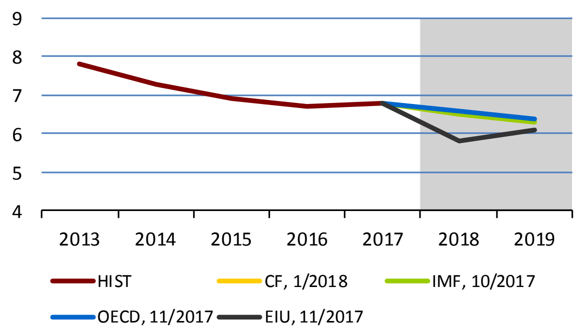


	CF	IMF	OECD	BoJ
2018	0.9	0.5	1.0	1.4
2019	1.1	1.1	1.7	2.3

III.1 China

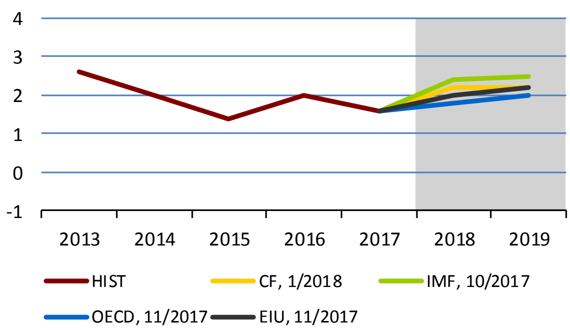
According to Chinese Prime Minister Li Keqiang, the Chinese economy expanded by about 6.9% in 2017. CF estimates the figure to be 0.1 pp lower. The official growth target (6.5%) was exceeded due mainly to growth in construction and robust demand for Chinese exports abroad. According to the latest data, however, the rate of growth slowed slightly at the end of the year. Besides a cooling of the housing market, the economy will be strongly affected by company shutdowns, as measures to improve air in cities include a drive towards the use of natural gas instead of coal for heating in households and firms. However, growth in demand and inadequate infrastructure led to substantial gas supply shortages at the year-end, and this will have a negative impact on industrial activity. No significant improvement can be expected in the coming months. The growth of the Chinese economy is thus expected to slow gradually this year and the next.

GDP growth, %



	CF	IMF	OECD	EIU
2018	6.5	6.5	6.6	5.8
2019	6.3	6.3	6.4	6.1

Inflation, %

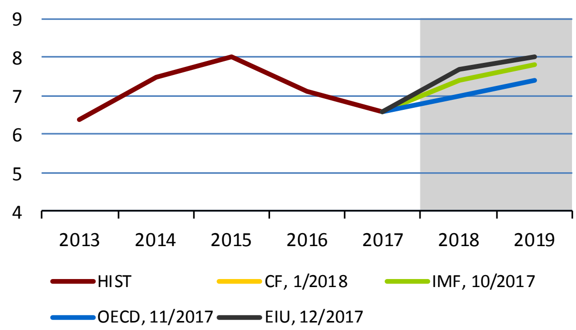


	CF	IMF	OECD	EIU
2018	2.2	2.4	1.8	2.0
2019	2.2	2.5	2.0	2.2

III.2 India

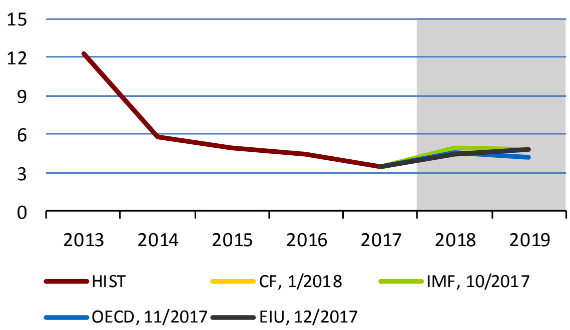
Industrial production growth slowed in September and October due to a drop in mining and manufacturing output. In November, though, it rose sharply thanks to growth in manufacturing. A turnaround had earlier been flagged by the relevant sector index of the PMI leading indicator, which had been rising since October and hit a five-year high in December (54.7 points). According to purchasing managers, this was driven by growth in output, employment and new orders. Following a slowdown in the current year, the Indian economy is expected to accelerate above 7% in fiscal year 2018/2019. Inflation rose by 1.3 pp to 4.9% in November and to as high as 5.2% in December, mainly on the back of faster growth in food prices. This was reflected in an upward revision of the CF forecast. According to the monitored institutions, inflation next fiscal year will be above the 4% target but within the tolerance band (±2%).

GDP growth, %



	CF	IMF	OECD	EIU
2018	7.4	7.4	7.0	7.7
2019		7.8	7.4	8.0

Inflation, %

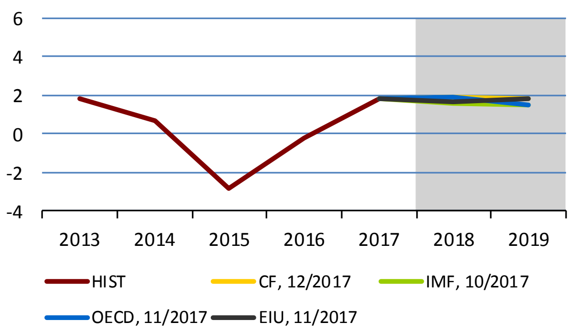


	CF	IMF	OECD	EIU
2018	4.7	4.9	4.6	4.4
2019		4.8	4.2	4.8

III.3 Russia

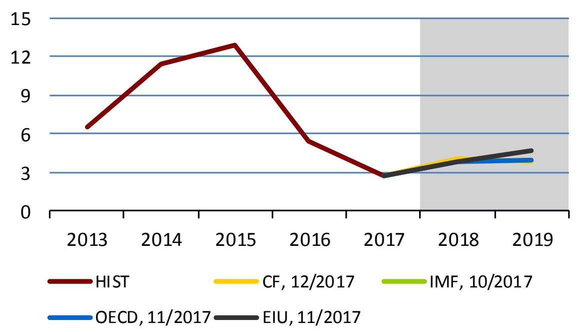
Russian industrial production dropped unexpectedly by 3.6% year on year in November, the worst result since October 2009. Overall monthly output fell by 0.2%. The short-term growth of other key macroeconomic indicators showed no major changes. Consumer price inflation remained at the previous level in December (2.5% year on year), while core inflation slowed to 2.1%. By contrast, producer price inflation accelerated for the fourth month in a row, reaching 8% in November, mainly due to a rise in producer prices in manufacturing. In month-on-month terms, producer prices went up by 0.9%. The Russian central bank announced a further cut in its monetary policy rate at the end of the year. The key rate was set at 7.75% as from 15 December (a reduction of 0.5 pp). A further cut is expected in the first half of this year. The new CF expects economic growth of just below 2% this year, with fixed investment rising by 3.4%. According to CF, consumer price inflation will increase to 4.1% in December.

GDP growth, %



	CF	IMF	OECD	EIU
2018	1.9	1.6	1.9	1.7
2019	1.8	1.5	1.5	1.8

Inflation, %

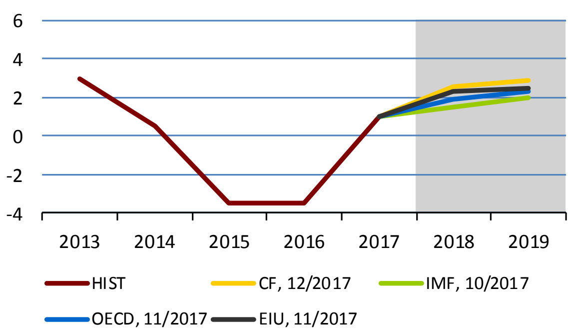


	CF	IMF	OECD	EIU
2018	4.1	3.9	3.8	3.9
2019	3.9	4.0	4.0	4.7

III.4 Brazil

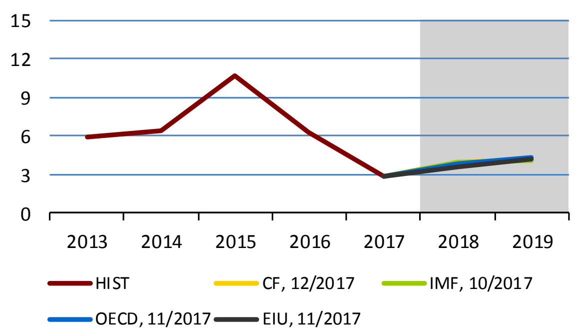
Annual growth in industrial production in the Brazilian economy slowed to 4.7% in November (from the previous 5.5%). Despite this distinct slowdown, the pace of growth is still at an all-time high. The PMI in manufacturing, published in early December, also dropped (to 52.4), confirming weaker performance in this sector. By contrast, the PMI in services rose (to 47.4). As a result, the overall PMI was almost unchanged and remained in the economic contraction band (48.8). By contrast, business confidence in industry increased. A further drop in unemployment (to 12%) was also good news. Annual consumer price inflation neared the 3% level. It accelerated slightly compared to November due to higher growth in housing and transport prices. By contrast, growth in food prices slowed. The latest CF raised the growth outlook for this year by 0.2 pp (to 2.6%) and lowered the inflation outlook by 0.1 pp (to 4.0% as of December 2018).

GDP growth, %



	CF	IMF	OECD	EIU
2018	2.6	1.5	1.9	2.3
2019	2.9	2.0	2.3	2.5

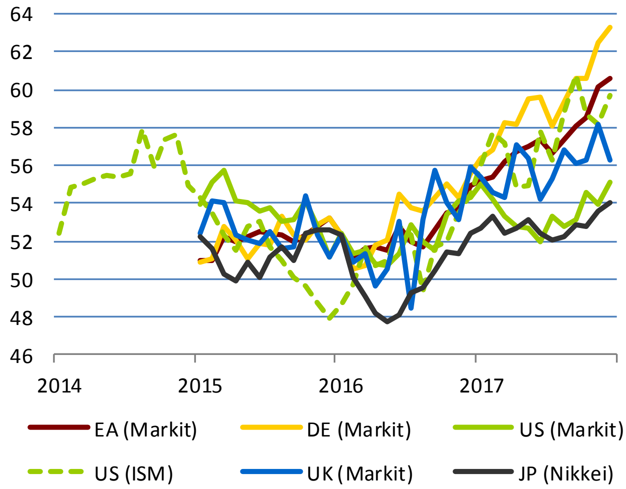
Inflation, %



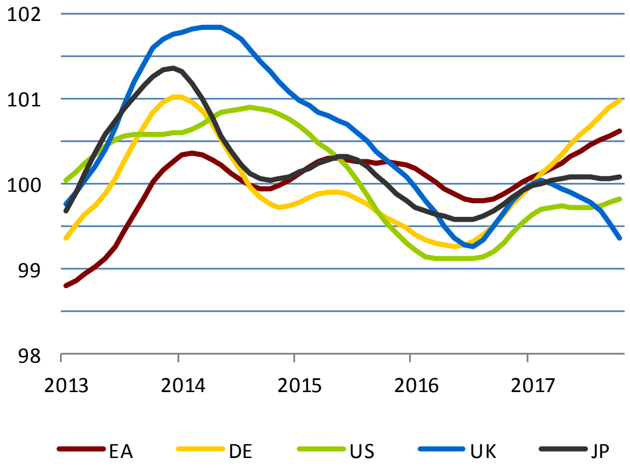
	CF	IMF	OECD	EIU
2018	4.0	4.0	3.9	3.6
2019	4.2	4.1	4.3	4.2

IV.1 Advanced economies

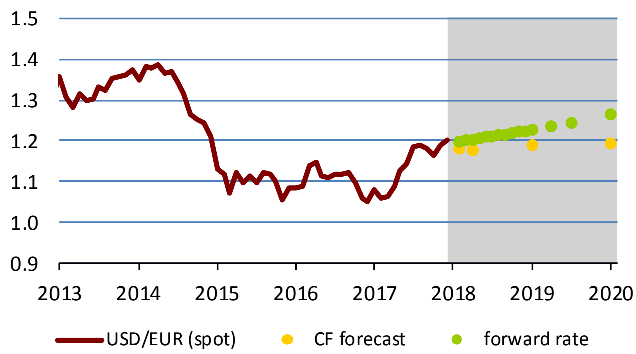
PMI in manufacturing



OECD Composite Leading Indicator

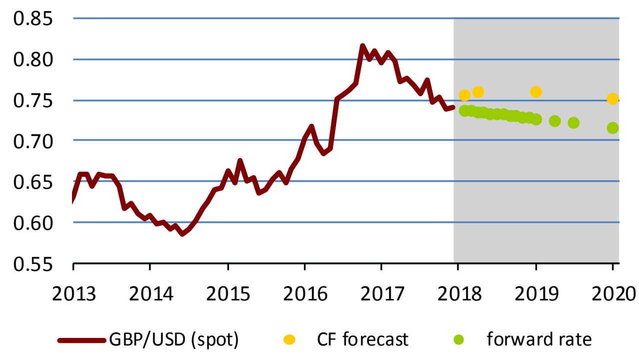


The US dollar (USD/EUR)



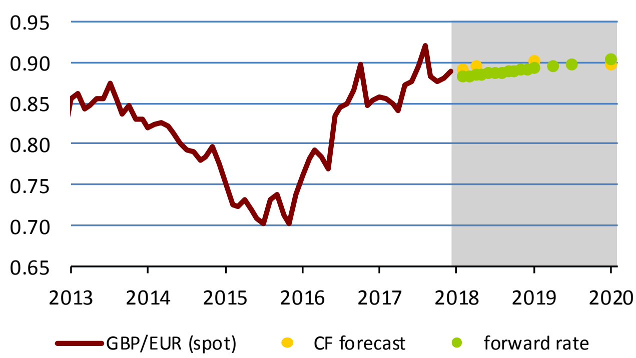
	8/1/18	02/18	04/18	01/19	01/20
spot rate	1.198				
CF forecast		1.181	1.178	1.188	1.195
forward rate		1.199	1.204	1.228	1.262

The British pound (GBP/USD)



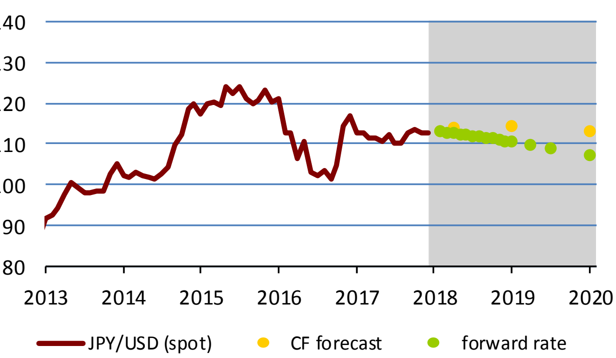
	8/1/18	02/18	04/18	01/19	01/20
spot rate	0.736				
CF forecast		0.755	0.759	0.759	0.751
forward rate		0.736	0.735	0.727	0.716

The British pound (GBP/EUR)



	8/1/18	02/18	04/18	01/19	01/20
spot rate	0.882				
CF forecast		0.892	0.894	0.902	0.897
forward rate		0.883	0.884	0.892	0.904

The Japanese yen (JPY/USD)

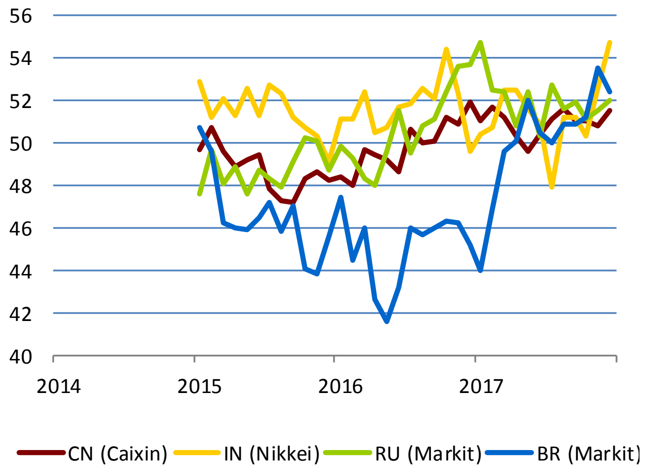


	8/1/18	02/18	04/18	01/19	01/20
spot rate	113.0				
CF forecast		113.3	113.8	114.2	113.2
forward rate		112.9	112.5	110.5	107.4

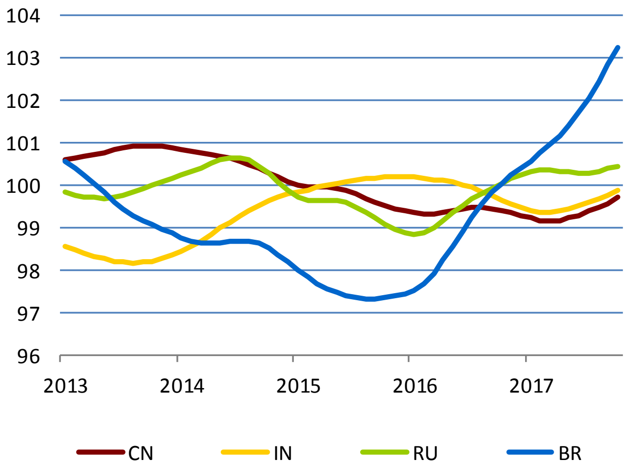
Note: Exchange rates as of last day of month. Forward rate does not represent outlook; it is based on covered interest parity, i.e. currency of country with higher interest rate is depreciating. Forward rate represents current (as of cut-off date) possibility of hedging future exchange rate.

IV.2 BRIC countries

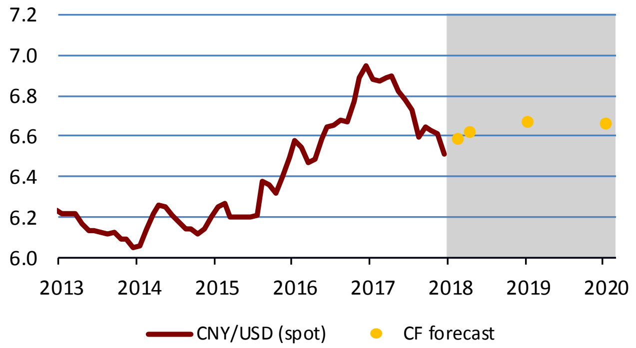
PMI in manufacturing



OECD Composite Leading Indicator

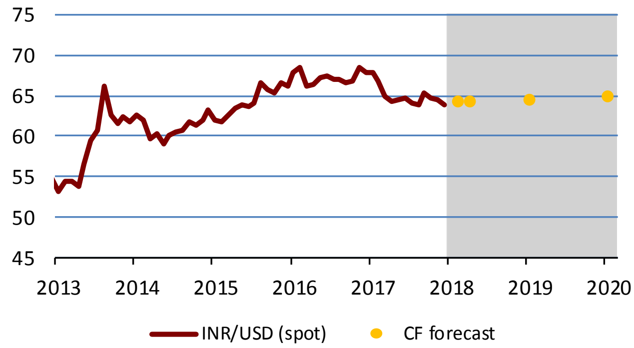


The Chinese renminbi (CNY/USD)



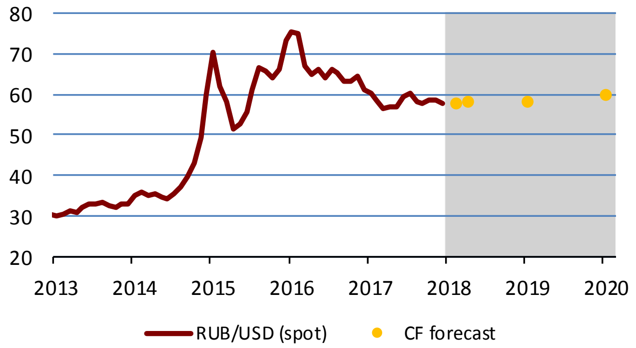
	8/1/18	02/18	04/18	01/19	01/20
spot rate	6.495				
CF forecast		6.587	6.620	6.670	6.666

The Indian rupie (INR/USD)



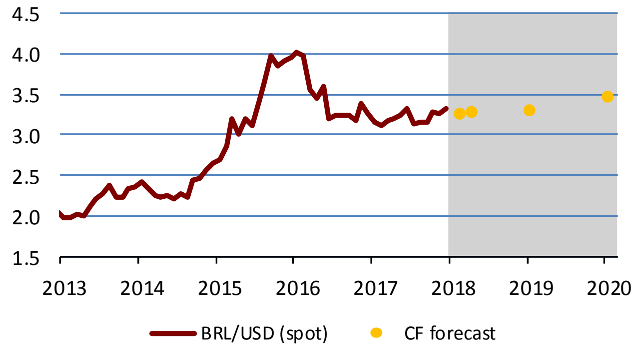
	8/1/18	02/18	04/18	01/19	01/20
spot rate	63.39				
CF forecast		64.24	64.18	64.40	64.94

The Russian rouble (RUB/USD)



	8/1/18	02/18	04/18	01/19	01/20
spot rate	57.07				
CF forecast		57.85	58.31	58.07	59.67

The Brazilian real (BRL/USD)



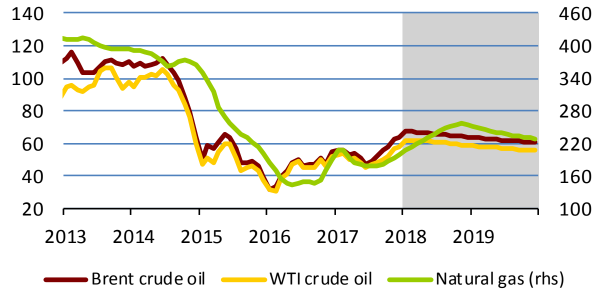
	8/1/18	02/18	04/18	01/19	01/20
spot rate	3.228				
CF forecast		3.265	3.277	3.311	3.474

Note: Exchange rates as of last day of month.

V.1 Oil and natural gas

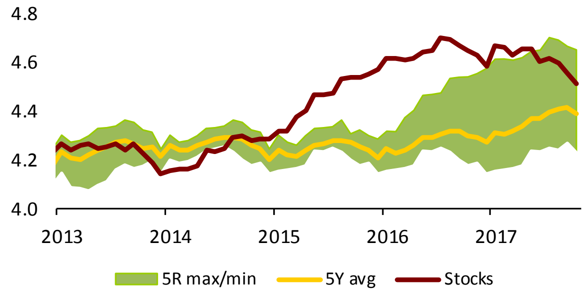
The oil price started rising again in December after OPEC and Russia confirmed their intention to continue to limit output until the end of 2018. In the second half of the month, the price growth was supported by Brent crude oil supply shortages due to the shutdown of a key oil pipeline in the North Sea, the closure of an oil pipeline in Libya, growth in political tensions in the Middle East (demonstrations in Iran, which, however, have not yet affected local oil output and exports) and depreciation of the dollar. An increase in hedge funds' net long positions also played a role. The WTI price was bolstered by the shutdown of a pipeline from Canada to the USA. Nevertheless, the Brent-WTI spread remains high, supporting oil exports from the USA to Europe and Asia. The only factor acting against faster growth in oil prices is robust growth in production in the USA. Going forward, however, it is subject to many uncertainties, such as whether oil companies will again respond to the current price growth by investing heavily in output expansion or will instead satisfy shareholders' wishes for increased dividends. There is also a debate about whether the EIA's model, whose forecast of further rapid growth in US shale extraction is based on an assumption of continued technological progress, is over-optimistic, as some academics and investors are suggesting. However, the rising amount of output hedged by US producers indicates that US production will continue to rise regardless. According to a survey conducted by the Dallas Fed, 42% of firms would raise investment in drilling activity at a WTI price of USD 61–65/bbl and a further 31% at a price of over USD 66/bbl. The market futures curve shifted markedly higher compared to the previous month, implying a Brent oil price of USD 65.7/bbl on average in 2018, falling to USD 62.0/bbl in 2019.

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

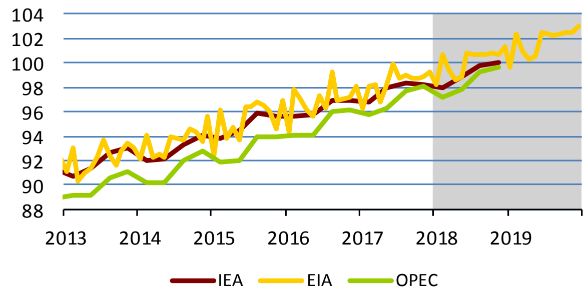


	Brent	WTI	Natural gas
2018	65.74	60.58	236.31
2019	62.04	57.01	238.56

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

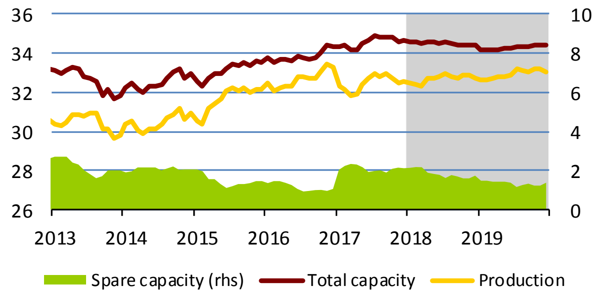


Global consumption of oil and oil products (mil. barrel / day)



	IEA	EIA	OPEC
2018	99.13	100.11	98.45
2019		101.77	

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



	Production	Total capacity	Spare capacity
2018	32.68	34.51	1.83
2019	32.94	34.28	1.34

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

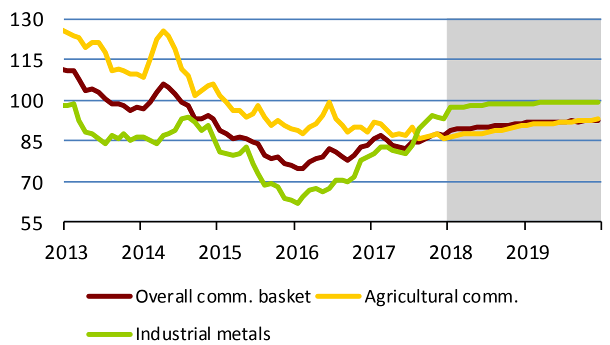
V.2 Other commodities

After a moderate fall in December, the aggregate non-energy commodity price index returned to an upward trend in January, recording a three-year high. This was fostered by both sub-indices in January. However, the food commodity price sub-index remains close to its lowest level since 2010. Nevertheless, its outlook is rising, and this is also contributing in large part to a growing outlook for the overall index. By contrast, the industrial metals price sub-index recorded strong growth in January after a temporary swing in December, reaching its highest level since February 2013. However, its outlook is more or less flat.

Prices of industrial metals continue to be supported by a weakening dollar and a favourable outlook for manufacturing, as indicated by further growth in the global JPMorgan PMI. It ended 2017 at 54.5, the highest level in almost seven years. The growth of the overall index was driven mainly by the euro area, where the PMI reached an all-time high, although it was also supported by most other advanced countries. However, the sub-indices in China, India and Russia also recorded growth. The structure of the index is also favourable, with new orders recording the biggest improvement. Growth in industrial metals prices was strong across the entire index in December, and the price of iron ore has also been rising for two months now. The coal price also continued to go up. However, as with iron ore, its outlook is falling due to uncertainty about future demand in China, which is trying to redirect its economic growth more into services and private consumption.

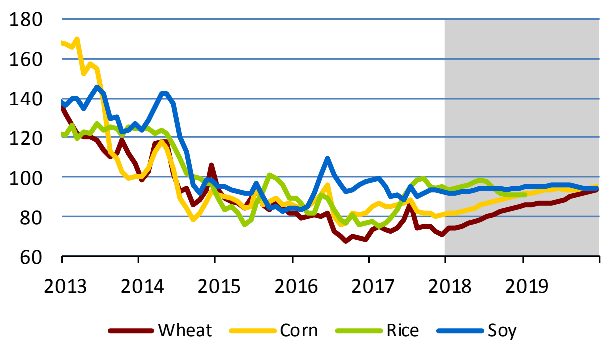
Grain prices are currently mostly flat due to high stocks and a favourable harvest outlook, although corn and especially wheat are expected to switch to growth. As regards industrial crops, price growth was recorded mainly for cotton.

Non-energy commodities price indicies



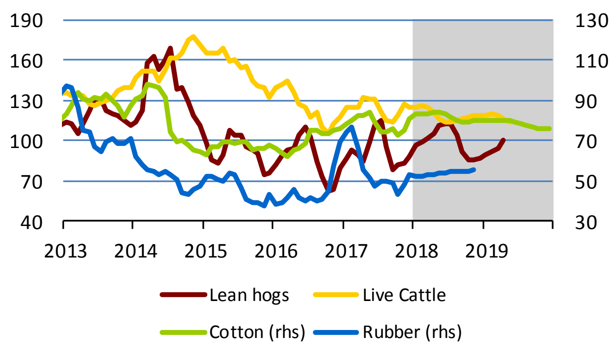
	Overall	Agricultural	Industrial
2018	90.2	88.4	98.3
2019	92.1	91.9	99.1

Food commodities



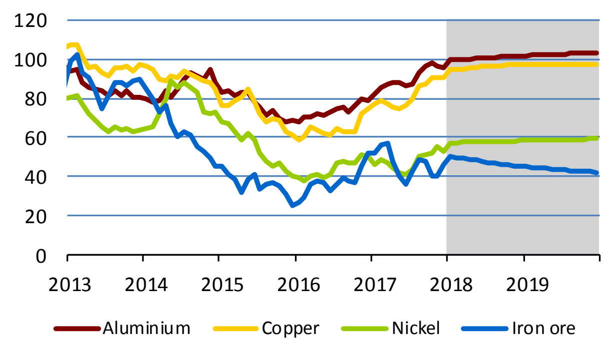
	Wheat	Corn	Rice	Soy
2018	79.4	86.1	94.3	93.4
2019	89.0	93.4	90.9	95.2

Meat, non-food agricultural commodities



	Lean hogs	Live Cattle	Cotton	Rubber
2018	99.6	119.0	81.9	54.0
2019	94.1	117.6	78.3	

Basic metals and iron ore



	Aluminium	Copper	Nickel	Iron ore
2018	100.6	96.0	57.7	47.5
2019	102.6	97.0	58.8	43.5

Source: Bloomberg, CNB calculations.

Note: Structure of non-energy commodity price indices corresponds to composition of The Economist commodity indices. Prices of individual commodities are expressed as indices 2010 = 100.

The ECB's unconventional monetary policy and euro area monetary aggregates[1]

Economists have come to the consensus that in the long run, inflation goes hand in hand with growth in the quantity of money in the economy. Many people are therefore concerned about the inflationary effects of central banks' quantitative easing (QE) programmes, especially given that QE is often misleadingly referred to as "printing money". As this article shows, however, money growth in the euro area is still below pre-crisis levels even almost three years after the QE programme was launched. The moderate growth of money supply stems from the predominantly endogenous nature of money, which means that the ECB, like other central banks, influences the quantity of money only indirectly. The main indirect channel is the portfolio rebalancing channel, which leads to easier monetary conditions in most sectors of the economy. However, new lending is determined by many other factors in addition to the price of credit, factors which monetary policy and its unconventional instruments cannot influence.

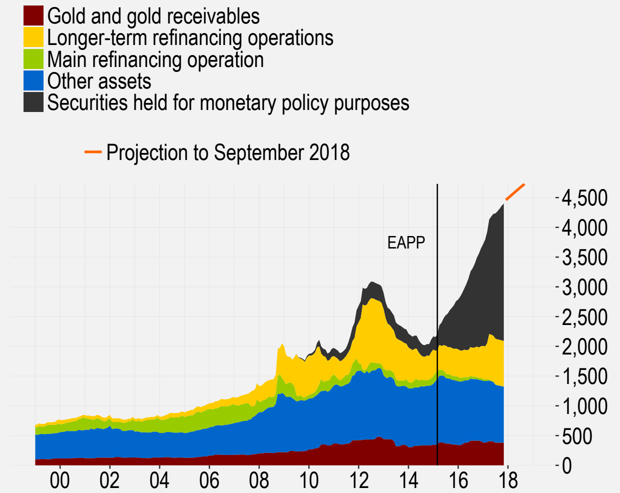
Quantitative easing and the ECB's balance sheet

The ECB's Governing Council decided in January 2015 to launch an expanded asset purchase programme (EAPP). Under the EAPP, the ECB and national central banks of the Eurosystem purchase private and public sector assets on the secondary market into their balance sheets in exchange for new bank reserves (i.e., the market value of the assets purchased is credited to commercial banks' accounts with the central bank). The EAPP was launched in March 2015, and the central banks purchased assets at a net monthly pace of EUR 60 billion until March 2016. The monthly purchased volumes were increased to EUR 80 billion in April 2016 and then lowered back to EUR 60 billion in March 2017 until the year-end. In October 2017, the ECB decided to extend the EAPP to September 2018 at a monthly pace of EUR 30 billion.

The consolidated balance sheet of the Eurosystem will therefore more than double in size relative to the start of 2015 (see Chart 1) due to the asset purchase programme (also known as quantitative easing, or QE). Securities held for monetary policy purposes, which reflect the securities purchases, currently account for more than half of the asset side of the balance sheet. The assets purchased include asset-backed securities (ABS, purchases of which started back in November 2014), public sector bonds, bonds of non-bank corporations and covered bonds of banks. Government bonds made up around 82% of total securities holdings in October 2017.[2]

Chart 1 The ECB's balance sheet – main asset items

(EUR billions)



Source: ECB SDW, CNB calculations
Note: The outlook for total assets was constructed assuming monthly purchases of EUR 60 billion until the end of 2017 and EUR 30 billion from January to September 2018.

The unprecedented growth in the ECB's balance sheet is naturally giving rise to public concerns of high inflation and erosion of the value of savings. These worries are being exacerbated by the incorrect term "money printing" that the media often uses for QE. Such concerns would be warranted if central banks' unconventional instruments were leading to substantial growth in money not justified by economic fundamentals. Economic theory has reached a consensus that in the medium to long run, inflation goes hand in hand with growth in the amount of money in the economy. This consensus has resulted, among others, in the introduction of a pillar of ECB's strategy which rests on the analysis of monetary aggregates, specifically M3. That being said, money growth is not influenced directly by QE, because the quantity of money is determined primarily by a set of factors other than base money (see below). The result of this endogeneity of money is that central banks are only indirectly able to affect the quantity of money in the economy with their conventional and unconventional instruments.

The effects of QE on base money

The EAPP directly affects only base money in the euro area. Base money consists of currency in circulation (including cash in banks' vaults and ATMs) and commercial banks' current accounts with the central bank. These accounts contain banks' minimum required reserves plus their excess reserves (used to

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

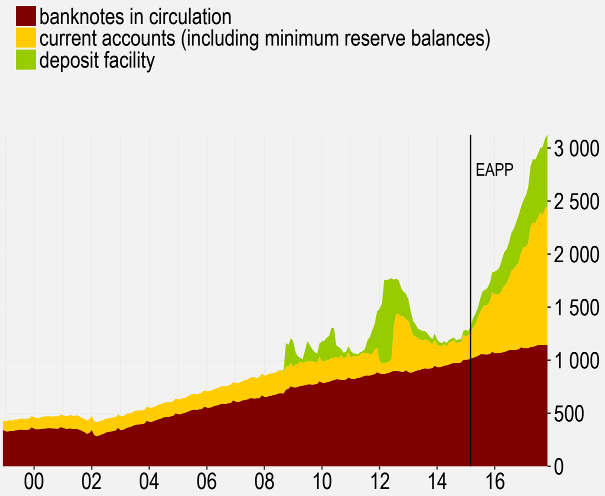
[2] See https://www.ecb.europa.eu/mopo/implement/omt/html/index.en.html

secure smooth functioning of the payment system and to ensure compliance with regulatory measures). As mentioned at the start of the article, central banks purchase assets in exchange for new bank reserves, so the securities purchases in the euro area are performed exclusively through commercial banks, which serve as transaction intermediaries (ECB Economic Bulletin 6/2017).

The QE programme has increased base money roughly three times in less than three years. Chart 2 shows its composition and total size, which has grown in line with the assets of Eurosystem central banks (see Chart 1). The gradual upward trend in currency in circulation has remained stable, reflecting transaction needs in the economy. Banks' reserves, by contrast, have expanded significantly in parallel with the accumulated asset purchases.

Chart 2 Base money in the euro area

(EUR billions)



Source: ECB SDW

Compared to earlier liquidity operations, the QE programme is having a different effect on commercial banks' excess reserves. In 2012, banks from several northern euro area countries held large amounts of excess liquidity resulting from two liquidity operation programmes (LTRO1 and LTRO2; see Chart 2). At the time, interest on the deposit facility (overnight deposits of excess reserves at the central bank) was positive, while reserves on current accounts earned no interest. Before QE was launched, however, outstanding amounts of excess reserves on the deposit facility and reserve accounts started to be remunerated at a negative rate (currently -0.4%), so the growth in volumes on the deposit facility is now less pronounced. Another difference from previous programmes is that the commercial bank sector as a whole cannot reduce the total excess reserves. This was possible under the previous programmes upon repayment of liquid loans (see the end of 2013 in Chart 2). The total reserves created by the QE programme will not decrease until the amount of bonds held in the balance sheets of Eurosystem central banks starts to fall. This is unlikely to happen straight after the QE programme is officially ended, as the ECB can be expected to reinvest the maturing bonds for some time afterwards in order to keep the size of its balance sheet constant. The decrease will thus occur only after a decision is made to stop buying bonds to replace the redeemed bonds.[3] Another possible way of reducing bank reserves would be for central banks to start actively selling the bonds to the banking sector. However, this scenario is highly unlikely in the current situation.

The effects of QE on the money stock

Unlike its impact on base money, the effect of QE on broad money – M3 – is neither mechanical nor automatic. Broad money comprises currency in circulation held by non-banks, deposits on current and term accounts at commercial banks, repurchase agreements, money market fund shares/units and debt securities with maturities of up to two years. New bank reserves are thus recorded directly in broad money only when purchases are made from the money-holding sector, i.e. households, firms and non-bank financial corporations in the euro area. The seller's commercial bank again acts as a transaction intermediary; deposits are credited to the customer's current account and new reserves are credited against these deposits to the commercial bank itself on its balance sheet. By contrast, deposits of non-residents, credit institutions and money market funds are not recorded in M3, so the asset purchases made by these sectors have no direct effect on M3.

However, QE can also affect the money stock indirectly, primarily by easing the financial conditions and supporting new lending. New loans in commercial banks usually arise through the crediting of new deposits to borrowers' accounts, and those deposits are included in broad money. Central banks' purchases foster easier financial conditions by compressing the long end of the government bond yield curve. The entire yield curve serves as a benchmark for the valuation of various credit instruments. QE thus leads to a reduction in lending rates, thereby supporting demand for loans in the economy and subsequently fostering an increase in the money supply.

Portfolio rebalancing is another transmission channel leading to easier financial conditions. As central banks purchase large amounts of safe assets, the prices of those assets go up and their yields go down. Holding such assets may thus not be profitable for private investors, who may opt to buy riskier, higher-yield assets instead. This causes their prices to rise and yields to fall. Newly issued bonds can also be expected to command lower yields, leading to easier monetary conditions. Higher-price assets may also

[3] For example, the Fed decided to take this step only this year despite having ended its net purchases in 2014.

be used as collateral for secured loans. Such assets include bank bonds, which then have a lower cost of finance, allowing banks to charge their customers less interest.

Besides easing monetary conditions, portfolio rebalancing may have more direct effects on broad money. ECB Economic Bulletin 7/2015 gives the following two examples:

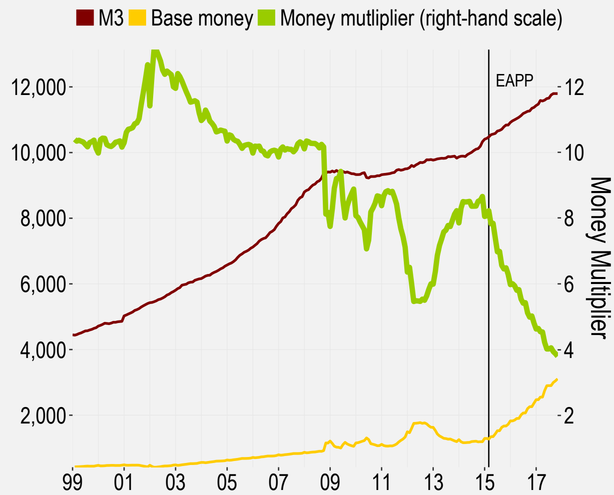
- Because of the higher price, the money-holding sector (households and firms) sells bonds to the central bank via credit institutions. Initially, deposits are credited to commercial banks, i.e. M3 increases. Given the lower returns on other domestic assets, however, the original sellers may choose to purchase foreign assets. This reduces domestic deposits, thereby also reducing M3.
- Similarly, instead of investing abroad, households or firms may choose to acquire long-term bank bonds or bank equity in order to earn higher returns. The liabilities of the banking sector do not change, but their composition shifts and the quantity of money shrinks.
- On the other hand, money may be created if banks use the new reserves to acquire assets (bonds and equity) from the money-holding sector. In this case, deposits are credited and M3 thus rises.

In line with the above discussion, broad money has recorded much lower growth than base money in the euro area (see Chart 3). M3 has increased by around EUR 2,000 billion during QE. In percentage terms, this is a far lower pace than that of base money. This mismatch has been reflected in a decline in the money multiplier – the ratio of broad money to base money – to around 4, around 50% lower than at the start of 2015.

The direct effect of QE on broad money in the euro area is very limited. The precise figure is difficult to pinpoint for two reasons. First, bonds are not sold directly to central banks by their holders. Rather, they are sold by banks, which act as transaction intermediaries. Consequently, it is not clear who the original bond owner is. We can get some indication by looking at the sectoral accounts, where we can see how individual sectors' holdings of general government bonds have changed. According to ECB Economic Bulletin 4/2017, the largest declines in government bond holdings have been recorded by MFIs and non-residents, i.e. sectors in which money is not created when bonds are sold to the central bank. Second, it is unclear how transaction participants would have behaved in the absence of QE (i.e. whether they would also have sold the bonds, all other things being equal). Based on a counterfactual analysis (see Chart 4), the ECB finds that the ultimate sources of bonds for the ECB's QE purchases between March 2015 and March 2017 were primarily non-residents and commercial banks, whose deposits are not reflected in broad money. It can thus be assumed that the direct effect of QE on M3 is low.

Chart 3 M3, base money and the money multiplier

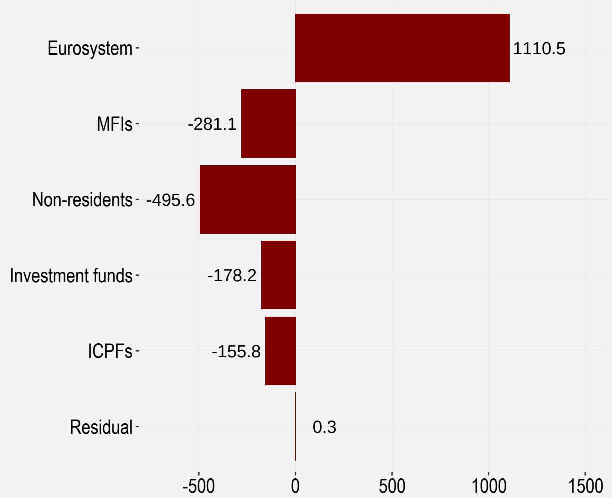
(left-hand scale: EUR billions; right-hand scale: ratio)



Source: ECB SDW

Chart 4 Estimated change in bond holdings due to QE between March 2015 and March 2017

(EUR billions)



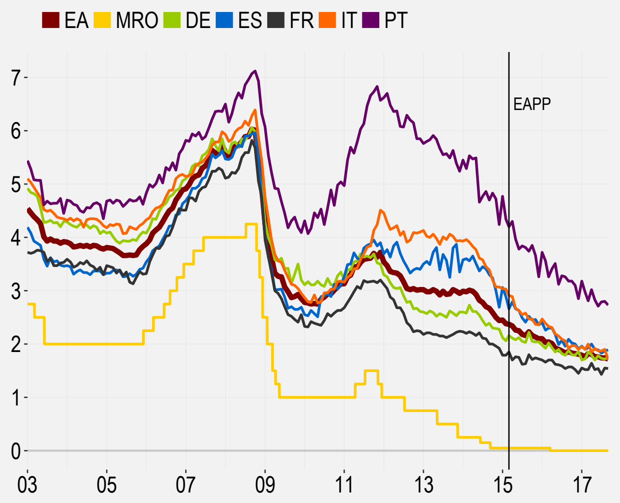
Source: ECB Economic Bulletin (4/2017)
Note: Estimates based on a counterfactual analysis conducted by the ECB.

The indirect channel is even more difficult to quantify. As stated above, various supply- and demand-side effects interact in the creation of new loans. What is certain is that the asset purchase programme has helped squeeze bond yields and hence reduce financing costs across sectors in the euro area. For example, the cost of financing loans to non-financial corporations has dropped in all countries during QE, the largest declines having been recorded in countries hit by debt problems (see Chart 5). In these countries, refinancing of existing loans at lower interest rates has helped accelerate the deleveraging process. As signalled by the bank lending survey, QE has fostered faster money growth on the supply side as banks have found cheaper sources of financing and gradually relaxed their credit standards.

However, lower interest costs do not automatically imply higher credit growth. On the demand side, credit growth is driven by the availability of investment opportunities, the outlook for economic growth and other factors beyond reach of monetary policy. In some countries, moreover, households and firms still have high levels of debt, which they accumulated before the financial crisis, and are unwilling (or unable) to increase them further. Economic growth in these countries is – or at least was until recently – also low. This again is having a negative effect on investment.

Chart 5 Cost of finance of non-financial corporations

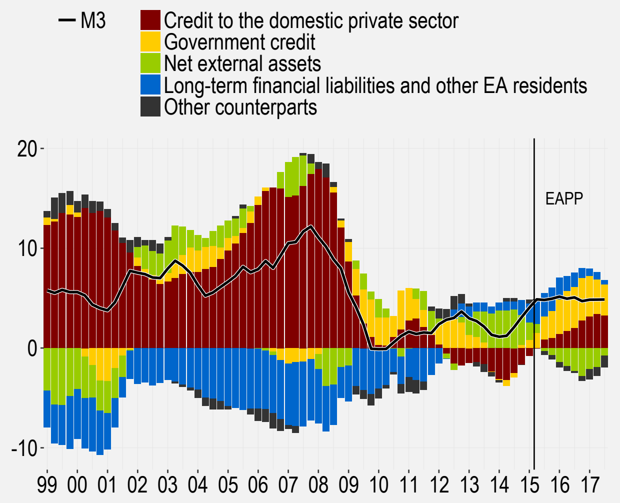
(%)



Source: ECB SDW
Note: MRO – rate on main refinancing operations (one of the ECB's key rates)

Chart 6 Growth in M3 and its counterparts

(year-on-year changes in %; contributions to year-on-year changes in p.p.)



Source: ECB SDW

The QE channels combined have yet to generate stronger M3 growth. In September 2017, annual M3 growth stood at 5.1% year on year (see Chart 6), similar to the level observed over the entire period since 2015. Money grew at much the same rate after the euro area was created. At the same time, the QE programme is affecting most money counterparts. Credit to central government is showing sizeable growth. This is related directly to the ECB's bond purchases. Growth in credit to the private sector (brown columns) is also contributing positively to M3 growth, either directly through purchases of corporate bonds or indirectly through the channels mentioned earlier. Despite these effects, though, the contribution of credit growth remains far below the levels observed after the euro area was created and the volume of credit is continuing to fall in some countries. The contribution of net external assets has been negative since the QE programme began. This is linked with the sale of bonds by non-residents to central banks. On the other hand, this negative contribution has gradually been falling as non-residents purchase more assets in the euro area.

Conclusion

The effects of the ECB's QE programme on the real economy and inflation in the euro area are impossible to determine precisely given the interaction of many transmission channels and the parallel occurrence of several economic events during the QE period. For example, the euro weakened significantly against the dollar even before the QE programme was announced. Oil prices have also dropped sharply during the period of asset purchases, on the one hand reducing inflation but on the other increasing the disposable income of euro area households and firms. The recent political uncertainty and Brexit are also certainly having macroeconomic impacts, further complicating the analysis of the effects of QE.

This article has illustrated that even a partial analysis of the effect of QE on money growth is very complex. Base money is affected directly by QE and rises hand in hand with asset purchases, as the assets are acquired exclusively in exchange for newly created reserves, which are included in base money. By contrast, the money stock is, for the most part, affected indirectly. The direct effect, i.e. purchases from residents in the money-holding sector (households and non-bank corporations), appears to be small. A squeeze on interest and yields on many assets in the economy can be observed in the case of the indirect channel. This has helped accelerate the deleveraging process in some euro area countries and has probably also boosted credit growth in some segments of the economy. This indirect channel is entirely intentional and is being used to return inflation from below to the ECB's definition of price stability (inflation below, but close to, 2%). However, credit growth generally depends on many other factors, so it is hard to determine the exact effect of QE on credit growth. Nevertheless, looking at M3 growth, the fears of a rise in euro area inflation due to growth in the amount of money in the economy have not been borne out.

References

ECB Economic Bulletin (7/2015). The transmission of the ECB's recent non-standard monetary policy measures.

ECB Economic Bulletin (4/2017). Which sectors sold the government securities purchased by the Eurosystem?

ECB Economic Bulletin (6/2017). Base money, broad money and the APP.

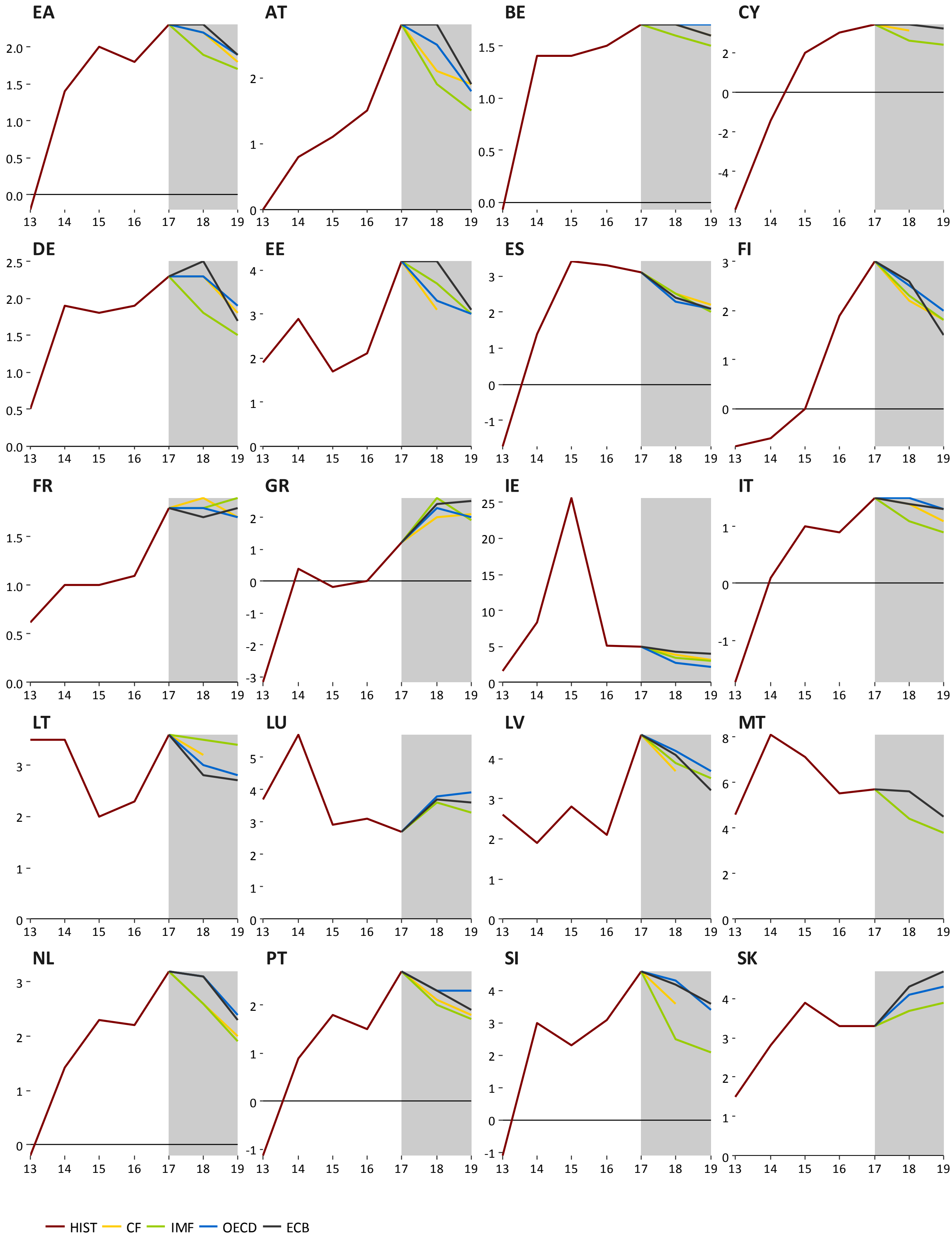
A1. Change in GDP predictions for 2018

	CF		IMF		OECD		CB / EIU	
EA	+0.1	2018/1 2017/12	+0.2	2017/10 2017/7	+0.3	2017/11 2017/9	+0.5	2017/12 2017/9
DE	+0.1	2018/1 2017/12	+0.2	2017/10 2017/7	+0.2	2017/11 2017/9	+0.8	2017/12 2017/6
US	+0.2	2018/1 2017/12	+0.2	2017/10 2017/7	+0.1	2017/11 2017/9	+0.4	2017/12 2017/9
UK	-0.1	2018/1 2017/12	0	2017/10 2017/7	+0.2	2017/11 2017/9	0	2017/11 2017/8
JP	+0.1	2018/1 2017/12	+0.1	2017/10 2017/7	0	2017/11 2017/9	0	2017/11 2017/7
CN	+0.1	2018/1 2017/12	+0.1	2017/10 2017/7	0	2017/11 2017/9	0	2017/11 2017/11
IN	0	2018/1 2017/12	-0.3	2017/10 2017/7	-0.2	2017/11 2017/9	0	2017/12 2017/11
RU	0	2017/12 2017/11	+0.2	2017/10 2017/7	-0.2	2017/11 2017/9	0	2017/11 2017/11
BR	+0.2	2017/12 2017/11	+0.2	2017/10 2017/7	+0.3	2017/11 2017/9	0	2017/11 2017/9

A2. Change in inflation predictions for 2018

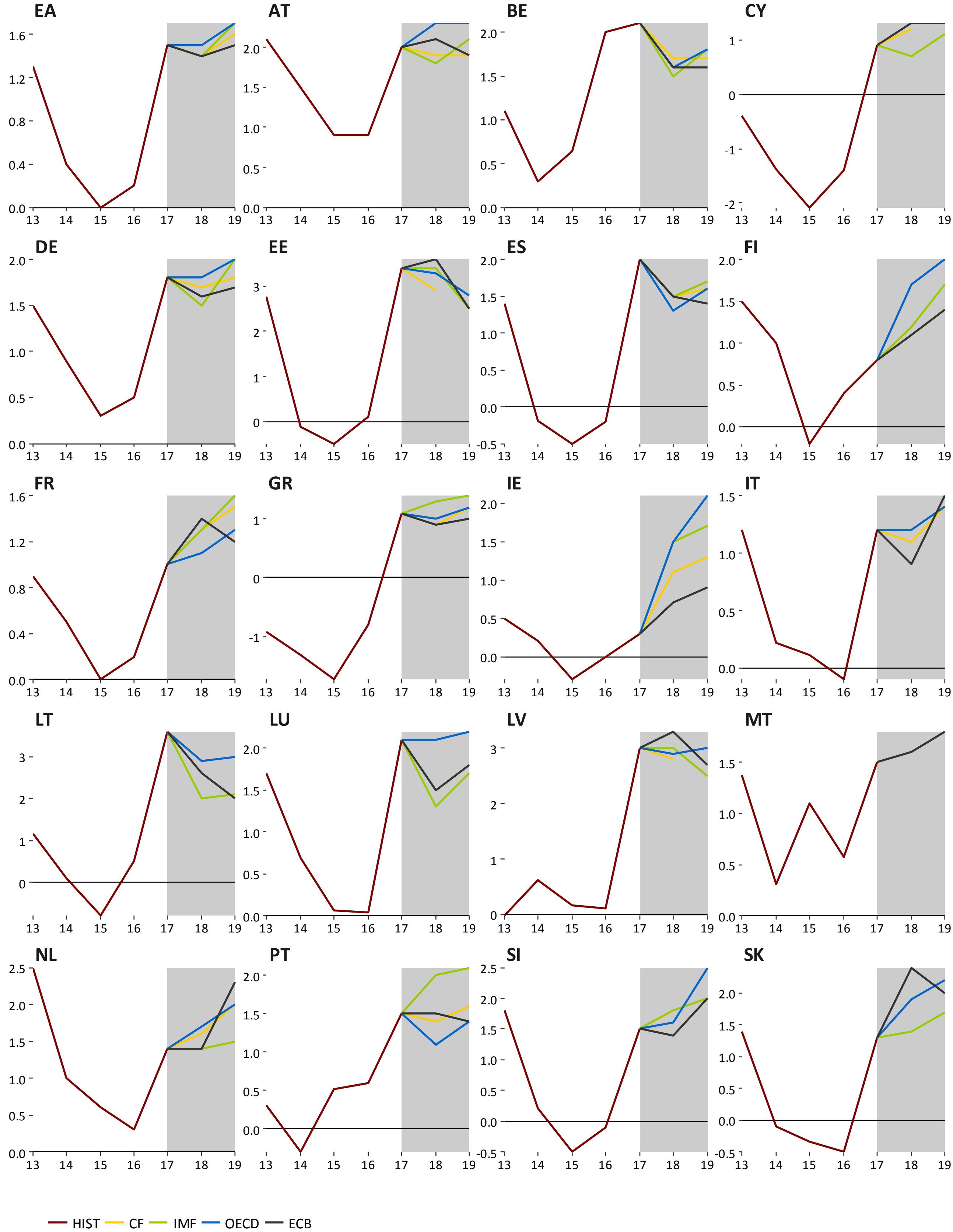
	CF		IMF		OECD		CB / EIU	
EA	0	2018/1 2017/12	-0.1	2017/10 2017/4	+0.1	2017/11 2017/6	+0.2	2017/12 2017/9
DE	0	2018/1 2017/12	-0.2	2017/10 2017/4	+0.2	2017/11 2017/6	+0.2	2017/12 2017/6
US	0	2018/1 2017/12	-0.3	2017/10 2017/4	-0.2	2017/11 2017/6	0	2017/12 2017/9
UK	0	2018/1 2017/12	0	2017/10 2017/4	-0.1	2017/11 2017/6	-0.1	2017/11 2017/8
JP	+0.1	2018/1 2017/12	-0.1	2017/10 2017/4	0	2017/11 2017/6	-0.1	2017/11 2017/7
CN	0	2018/1 2017/12	+0.1	2017/10 2017/4	-0.2	2017/11 2017/6	+0.2	2017/11 2017/11
IN	+0.1	2018/1 2017/12	-0.2	2017/10 2017/4	0	2017/11 2017/6	0	2017/12 2017/11
RU	0	2017/12 2017/11	-0.3	2017/10 2017/4	-0.2	2017/11 2017/6	0	2017/11 2017/11
BR	-0.1	2017/12 2017/11	-0.3	2017/10 2017/4	-0.6	2017/11 2017/6	0	2017/11 2017/9

A3. GDP growth in the euro area countries



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

A4. Inflation in the euro area countries



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

A5. List of abbreviations

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