GLOBAL ECONOMIC OUTLOOK - MARCH

Monetary Department
External Economic Relations Division

2018

CNB CZECH NATIONAL BANK

Cut-off date for data
15 March 2018

CF survey date
12 March 2018

GEO publication date
23 March 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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I. SUMMARY

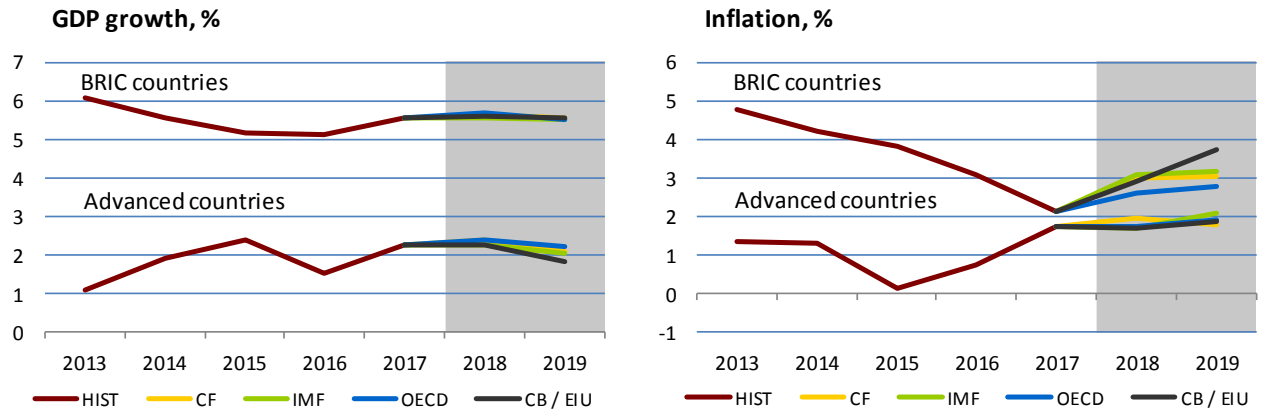
The March issue of Global Economic Outlook presents the regular monthly overview of recent and expected developments in selected territories, focusing on key economic variables: inflation, GDP growth, leading indicators, interest rates, exchange rates and commodity prices. The analytical section of this issue tries to answer the question of whether the decline in popularity of cash in Scandinavian countries is just "one swallow that does not make a summer" or the start of a future trend in advanced countries. The article presents clear evidence of persisting growth in circulating currency in the vast majority of OECD countries and sums up the reasons for this growth. It then offers a hypothesis of a concave relationship between circulating currency relative to nominal GDP and a country's relative level of economic development. Using the example of the Czech Republic, it goes on to quantify the transactions and speculative demand for cash.

The current outlooks for annual economic growth in the advanced countries we monitor have risen slightly again compared with February. The USA – the world's strongest economy – should thus record GDP growth of just under 3% this year. The euro area and its largest economy, Germany, are also expected to perform better this year. However, they both lag behind the USA by about 0.5 pp in the outlooks. The results for Japan and the UK continue to indicate distinctly lower economic growth. Expected inflation levels exceed the "ideal" 2% level only in the USA and the UK, where interest rates are expected to continue to rise this year. However, the inflation outlook for the euro area remains subdued at 1.5%. The ECB is thus failing to bring the expected inflation level up to 2%. The outlooks for Japan indicate that inflation there will hover around 1% only.

The current outlooks for annual GDP growth in the BRIC countries also provide evidence that the global economy will see solid growth in the near future. Both India and China are showing strong economic growth as usual, although the Chinese economy is still expected to gradually lose momentum to 6.3%. By contrast, the Indian economy will return to 8% growth from its current slightly weaker rates. The inflation estimates for China are just above the 2% level. Price growth of almost 5% is expected for India. However, this rate can be considered acceptable given the high economic growth in that country. The economic situation of the remaining two BRIC countries, particularly Brazil, can also be viewed as positive. The Brazilian economy will approach 3% GDP growth at the end of next year and the Russian economy will remain slightly below 2%. The good news for these countries is that they will succeed in keeping inflation close to 4%.

According to the current outlooks, euro area interest rates will remain very low, with no sign of them rising markedly at the one-year horizon. By contrast, US interest rates can be expected to keep rising gradually, with the soonest increase likely to take place at the FOMC's March meeting. According to CF, the US dollar will be stable against the euro, strengthen very slightly against the pound and the real, appreciate further against the rouble, the renminbi and the yen and depreciate slightly against the rupee at the one-year horizon. The price of Brent crude oil will fluctuate around USD 63 a barrel at the one-year horizon and gradually fall to USD 58 a barrel at the end of 2019. Prices of food commodities are rising over the outlook horizon, reflecting expected growth for most of the commodities under review (especially wheat and corn). Industrial metals prices are expected to be stable after their current slight downward correction ends.

GDP growth and inflation development and outlook in monitored countries



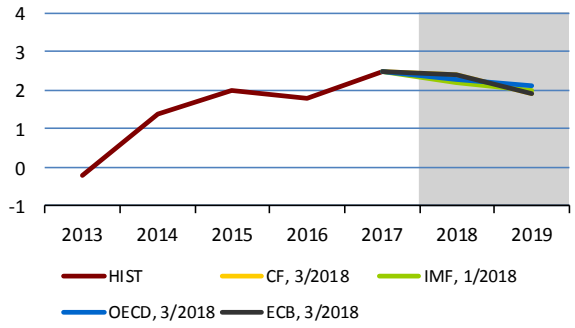
Note: The figures represent the weighted averages of historical series / outlooks in individual countries. The weights are based on nominal GDP measured in USD during 2013–2016 (source: EIU). Advanced countries: euro area, United States, United Kingdom, Japan. BRIC countries: China, India, Russia, Brazil.

II.1 Euro area

The euro area economy continued to expand robustly at the end of last year. GDP rose by 2.3% in 2017 as a whole, accelerating by 0.5 pp compared with the previous year. The growth was driven mainly by domestic demand, supported by rising business and household confidence, an improving labour market situation and accommodative monetary policy. The contribution of net exports, which were boosted by the global economic expansion, also grew in 2017 H2 despite a stronger euro. Most leading indicators at the start of this year are signalling continued solid GDP growth despite having edged down slightly in January and February. The PMI in manufacturing, for example, fell for the second month in a row to 58.6 in February, which is still well above the average. The drop in the indicator primarily reflected slower growth in export orders caused mainly by the stronger euro and in many cases also by production capacity constraints related to shortages of qualified labour on some countries' labour markets. The unemployment rate was flat at 8.6% in January, down 1 pp from January 2017. However, wage growth remains subdued – it accelerated by just 0.1 pp year on year to 1.7% in 2017 Q4. The economic growth outlooks for this year were revised upwards (CF, OECD and ECB). The growth should thus remain roughly at last year's level.

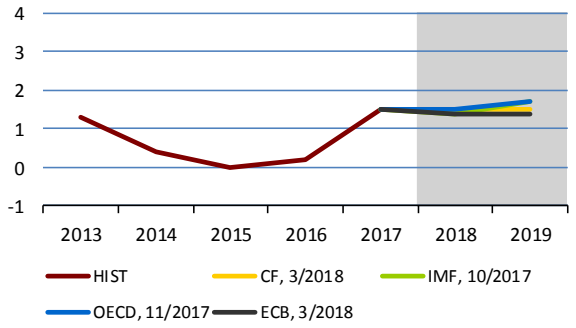
Headline HICP inflation fell for the third consecutive month to 1.1% in February, due mainly to slower growth in food prices. The growth of its core components remained at 1%. The ECB confirmed the parameters of its policy at its March meeting. Asset purchases by the ECB and Eurosystem central banks will thus continue until at least September 2018 at a monthly pace of EUR 30 billion. The ECB also reiterated its commitment to keep its key rates at the current levels for an extended period of time and past the horizon of the net asset purchases. By contrast, the option of a further increase in the monthly purchase volumes was dropped from the statement due to the convincing performance of the euro area economy. The monitored outlooks expect inflation to stay approximately at last year's level (1.5%) both this year and the next.

GDP growth, %



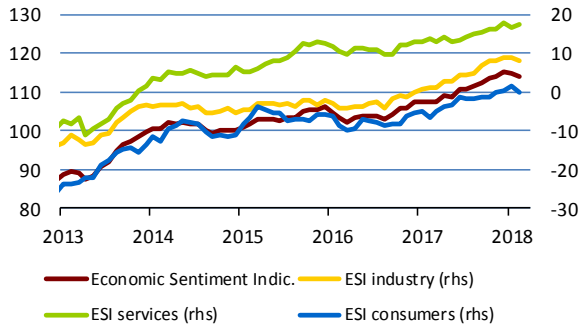
	CF	IMF	OECD	ECB
2018	2.4	2.2	2.3	2.4
2019	1.9	2.0	2.1	1.9

Inflation, %



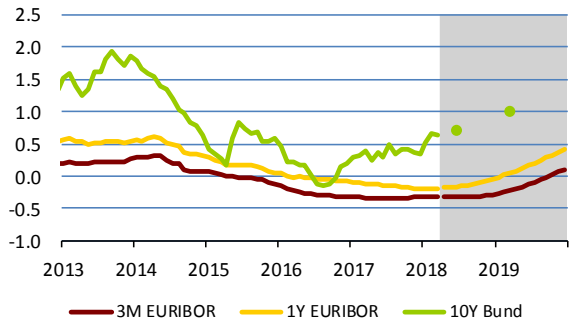
	CF	IMF	OECD	ECB
2018	1.5	1.4	1.5	1.4
2019	1.5	1.7	1.7	1.4

Leading indicators



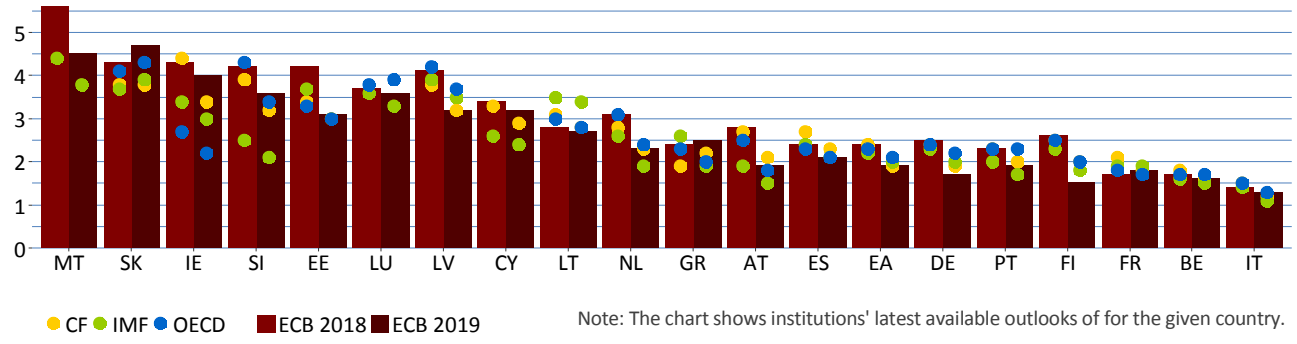
	ESI	industry	services	consumers
12/17	115.3	8.8	18.0	0.5
1/18	114.9	9.0	16.8	1.4
2/18	114.1	8.0	17.5	0.1

Interest Rates, %



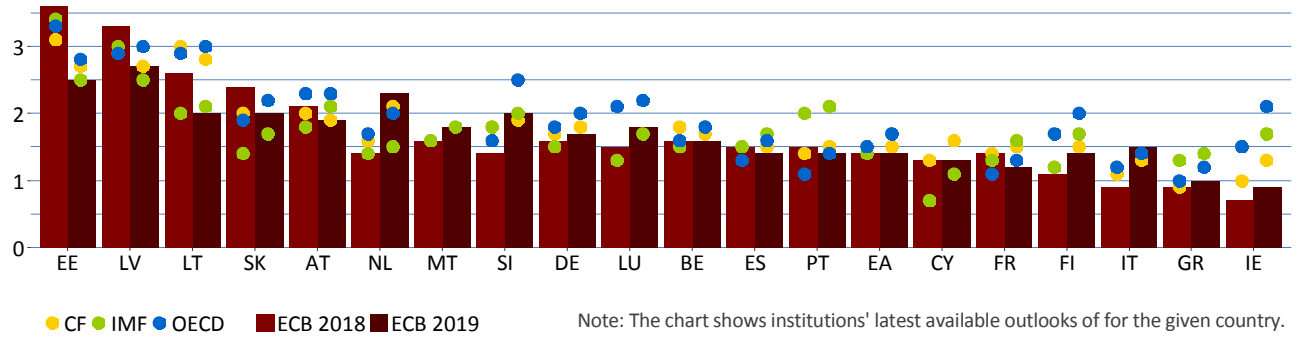
	02/18	03/18	06/18	03/19
3M EURIBOR	-0.33	-0.33	-0.32	-0.22
1Y EURIBOR	-0.19	-0.19	-0.16	0.05
10Y Bund	0.67	0.64	0.70	1.00

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, %

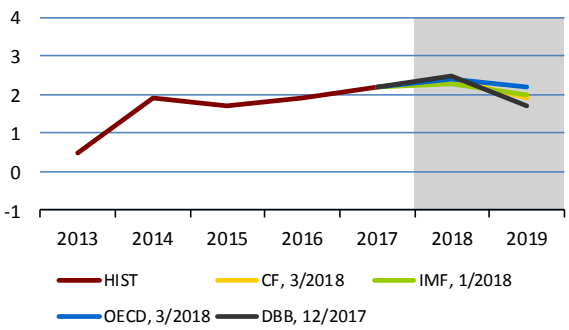


Note: The chart shows institutions' latest available outlooks of for the given country.

II.2 Germany

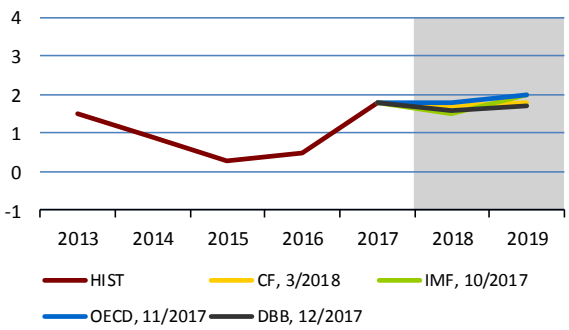
The new OECD economic growth outlook for Germany revised the previous forecast upwards for both this year and the next. It thus moved closer to the outlooks of the other monitored institutions. GDP growth is expected to approach 2.5% this year, which would mean a third consecutive year of accelerating growth. Economic growth is expected to fall back to 2% in 2019. The outlooks thus reflect the fact that German annual GDP growth picked up pace at the end of last year. The contribution of net exports to the overall growth exceeded that of household consumption, which had been dominant until then. Labour market developments were also favourable. By contrast, annual growth in wage costs dropped to 1.9% in 2017 Q4. According to the monitored institutions, consumer price inflation will not reach the 2% level until 2019. Headline inflation was running at just 1.4% in February, below the level of core inflation.

GDP growth, %



	CF	IMF	OECD	DBB
2018	2.4	2.3	2.4	2.5
2019	1.9	2.0	2.2	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

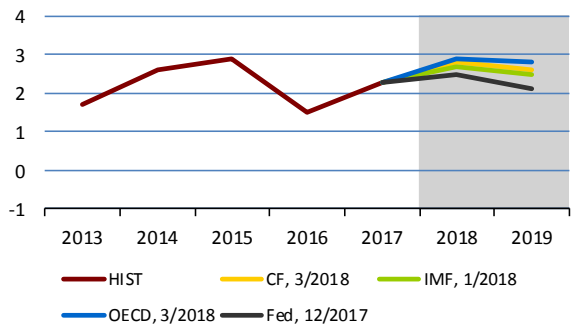
II.3 United States

Despite having recorded a slight slowdown at the end of last year, the USA is currently one of the fastest growing advanced economies. The fact that the second GDP growth estimate for 2017 Q4 revised the original figure down slightly to 2.5% (in quarter-on-quarter annualised terms) changes nothing about this. The economy grew by 2.3% in 2017 as a whole. This represented a marked increase (and catch-up with the euro area) after weaker results in 2016. A further acceleration to just under 3% is expected this year according to the new CF and OECD outlooks.

The developments so far in Q1 are consistent with this. The labour market situation is continuing to improve. The unemployment rate is just 4.1%, below the estimated long-term norm, and the participation rate has risen to 63%. The economy created 313,000 non-farm payrolls in February (well above expectations). The labour market is thus becoming quite tight. The only disappointment was average hourly wage growth, which remains low and slowed to 2.6% year on year in February. Consumer confidence continues to rise gradually. However, retail sales fell slightly for the third consecutive month.

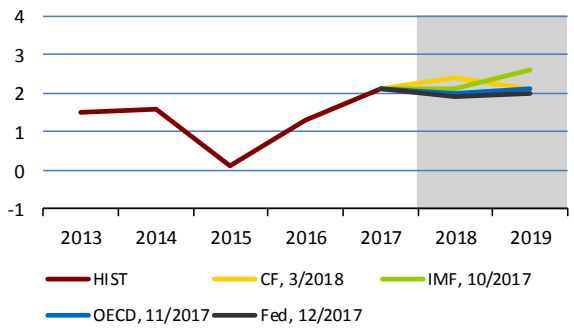
Annual inflation as measured by the consumer price index (CPI) was 2.2% in February. The Personal Consumption Expenditures (PCE) index, which is targeted by the US Fed, is showing rather lower growth (1.7% in January). Core inflation is lagging about 0.3 pp behind headline inflation for both indices. Monetary policy is thus currently balancing between its two goals: it is trying to prevent the economy (particularly the labour market) from overheating and simultaneously reach the 2% PCE inflation target. The best solution seems to be a continued gradual increase in interest rates. The FOMC is expected to raise rates further at its March meeting. Short-term interbank market rates thus increased further and their market outlooks shifted slightly higher. However, growing barriers to trade (the tariff order on steel and aluminium imports issued by President Donald Trump) are a new inflationary risk. The March CF raised the inflation forecast for this year to 2.4% in response to this.

GDP growth, %



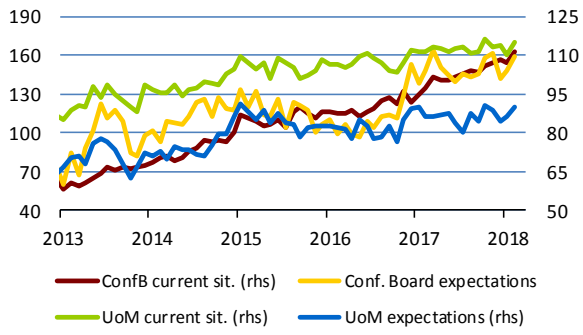
	CF	IMF	OECD	Fed
2018	2.8	2.7	2.9	2.5
2019	2.6	2.5	2.8	2.1

Inflation, %



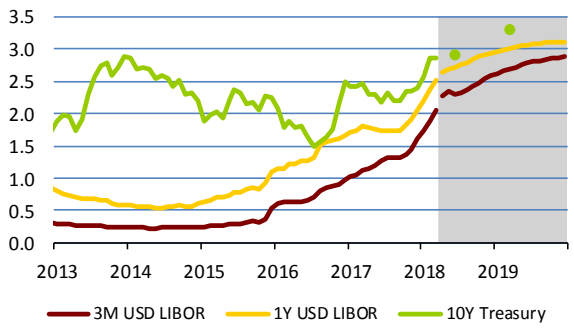
	CF	IMF	OECD	Fed
2018	2.4	2.1	2.0	1.9
2019	2.1	2.6	2.1	2.0

Leading indicators



	ConfB curr.	ConfB exp.	UoM curr.	UoM exp.
12/17	156.5	100.8	113.8	84.3
1/18	154.7	104.0	110.5	86.3
2/18	162.4	109.7	114.9	90.0

Interest Rates, %

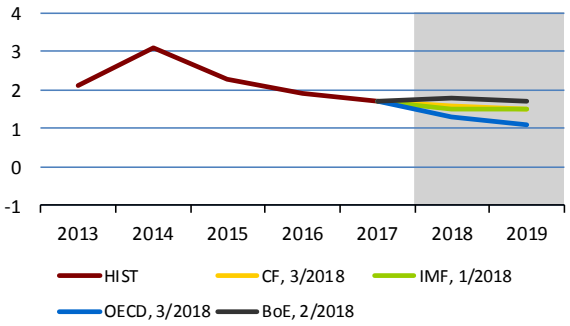


	02/18	03/18	06/18	03/19
USD LIBOR 3M	1.87	2.06	2.29	2.69
USD LIBOR 1R	2.37	2.37	2.71	3.01
Treasury 10R	2.87	2.87	2.90	3.30

II.4 United Kingdom

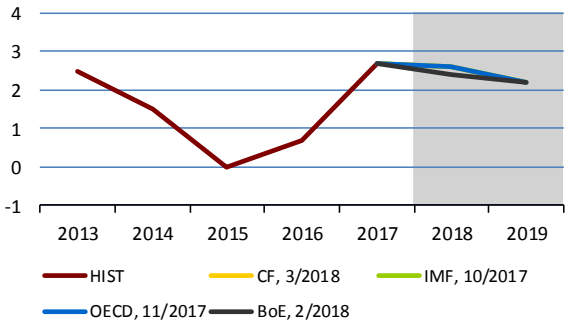
The second estimate of GDP growth at the end of last year slightly altered the view of the latest economic developments in the UK. While growth in Q3 was revised upwards (to 0.5% quarter-on-quarter), the result for Q4 was lowered to 0.4%. The UK economy thus slowed at the end of last year. This was due mainly to lower growth in household consumption and flat corporate investment. The only good news is continuation of restored labour productivity growth (0.8%, after 0.9% in Q3). Economic growth can be expected to slow further this year. The slowdown in Q1 could be due partly to the extremely bad weather recorded in the second half of February. According to the March CF, GDP growth will decline to 1.6% this year and slow further to 1.5% next year. The new OECD forecast remains much more sceptical despite an upward revision.

GDP growth, %



	CF	IMF	OECD	BoE
2018	1.6	1.5	1.3	1.8
2019	1.5	1.5	1.1	1.7

Inflation, %

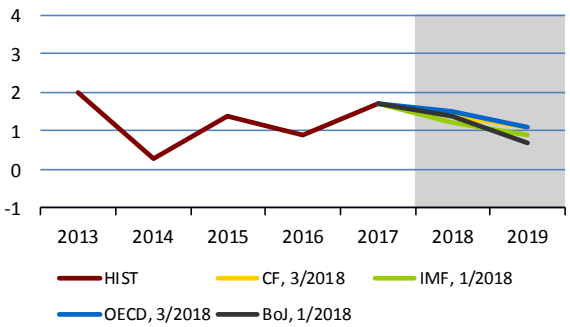


	CF	IMF	OECD	BoE
2018	2.6	2.6	2.6	2.4
2019	2.2	2.2	2.2	2.2

II.5 Japan

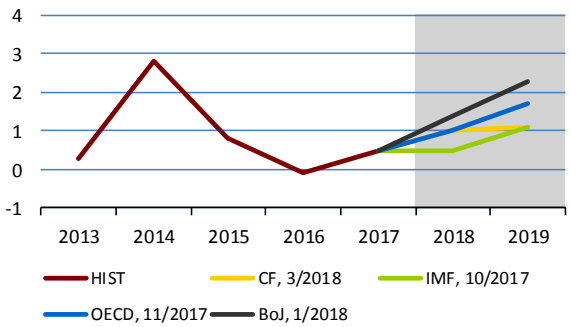
According to the final data, the Japanese economy grew by 1.6% (in quarter-on-quarter annualised terms) in 2017 Q4, slowing by 0.9 pp compared with the previous quarter. The growth was driven most of all by investment and private consumption. Annual retail sales growth dropped in January despite a significant rise in household spending, a further drop in unemployment and solid wage growth. Year-on-year growth in industrial production slowed in January. The PMI in manufacturing fell to 54.1 points in February. According to purchasing managers, this was due to slower growth in output, new orders and exports. The GDP growth forecasts were unchanged. Annual inflation rose by 0.4 pp to 1.4% in January on the back of growth in food prices. In the monitored period, however, it is expected to hover around 1% only. The BoJ thus left its key interest rate unchanged at its March meeting.

GDP growth, %



	CF	IMF	OECD	BoJ
2018	1.4	1.2	1.5	1.4
2019	1.1	0.9	1.1	0.7

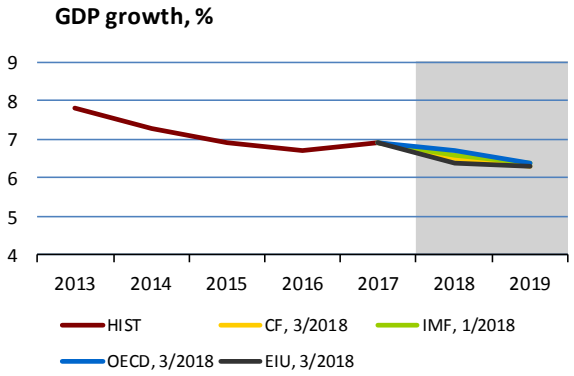
Inflation, %



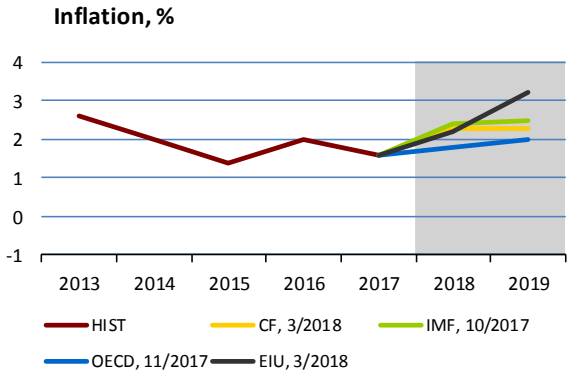
	CF	IMF	OECD	BoJ
2018	1.0	0.5	1.0	1.4
2019	1.1	1.1	1.7	2.3

III.1 China

Chinese industrial production increased at a rate of 7.2% for the second consecutive month. Moreover, its growth markedly exceeded expectations (6.1% by Reuters). The steady decline in the unemployment rate observed since mid-2016 continued in 2017 Q4, reaching 3.9%. The often disscussed slowdown in economic growth thus does not seem to be materialising, as confirmed by the latest available CF, OECD and EIU outlooks. However, due to the changing date of the start of the year in China, a more precise idea about economic growth cannot be obtained until data for the entire first quarter are published. Consumer prices were the surprise of the month. After slowing in January, inflation almost doubled in February (to 2.9%), due primarily to growth in food prices. However, non-food inflation increased as well. By contrast, producer price inflation continued to slow in February (to 3.7%).



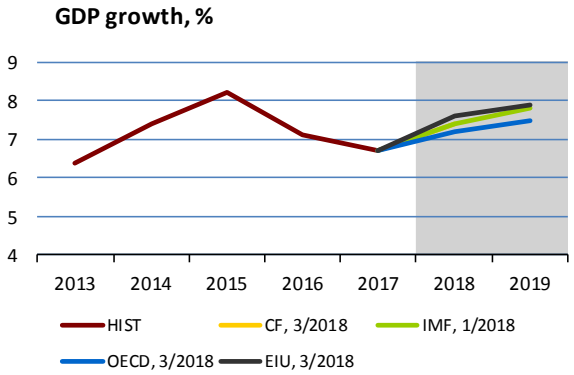
	CF	IMF	OECD	EIU
2018	6.5	6.6	6.7	6.4
2019	6.3	6.4	6.4	6.3



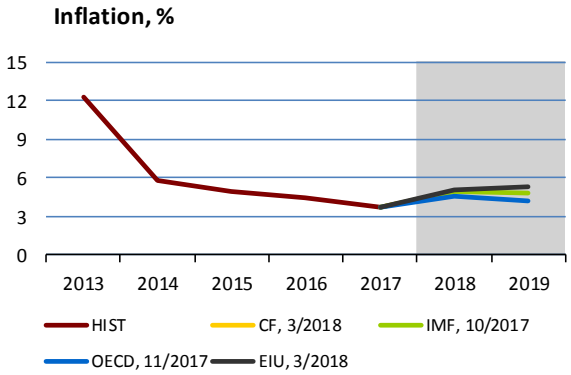
	CF	IMF	OECD	EIU
2018	2.3	2.4	1.8	2.2
2019	2.3	2.5	2.0	3.2

III.2 India

The Indian economy expanded by 7.2% year on year in 2017 Q4. Compared to the previous quarter, its growth increased by 0.7 pp, due mainly to investment and government consumption. It thus seems that the previous slowdown of the Indian economy was only temporary. Due to the slowdown, growth of just 6.7% is expected for fiscal year 2017/2018 as a whole (ending in March). In the following two fiscal years, however, it should be back above 7%. Annual industrial production growth rose further in January on the back of continued growth in manufacturing output and electricity generation. Nevertheless, the PMI in manufacturing unexpectedly fell to 52.1 points in February. According to purchasing managers, the decrease was due to lower growth in output, exports and new orders. Annual consumer price inflation fell by 0.7 pp to 4.4% in February as growth in prices of food, fuels and housing slowed. The inflation outlooks were unchanged.



	CF	IMF	OECD	EIU
2018	7.4	7.4	7.2	7.6
2019		7.8	7.5	7.9

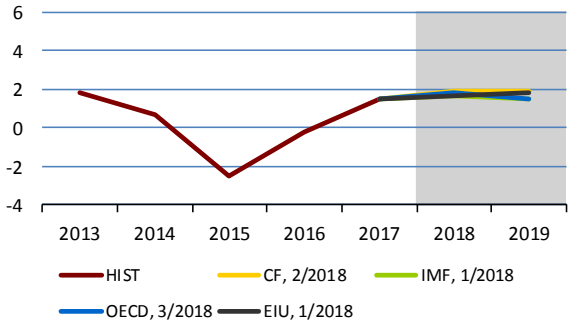


	CF	IMF	OECD	EIU
2018	4.9	4.9	4.6	5.1
2019		4.8	4.2	5.3

III.3 Russia

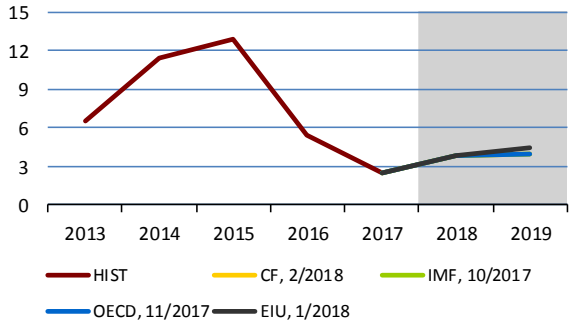
After recording year-on-year declines in the previous two months (first by 3.6% and then by 1.5%), industrial production started to rise again in January (by 2.9%). Analysts had predicted a further drop. The growth was driven by mining and manufacturing. However, the PMI in manufacturing expects a downturn in business activity in the future. The PMI for this sector fell from 52.1 in January to 50.2 in February, coming very close to the economic contraction band. This was the worst result in a year and a half. The PMI in services recorded completely the opposite trend. It continued to rise, reaching 55.1. The overall pace of economic output is likely to be unchanged over the next two years. Consumer prices increased by 2.2% in January and February. Food prices (0.9%) had an anti-inflationary effect. Inflation of other goods and services reached 2.5%. Core inflation stood at 1.9%.

GDP growth, %



	CF	IMF	OECD	EIU
2018	1.9 →	1.7	1.8 ↘	1.7
2019	1.9 ↗	1.5	1.5 →	1.8

Inflation, %

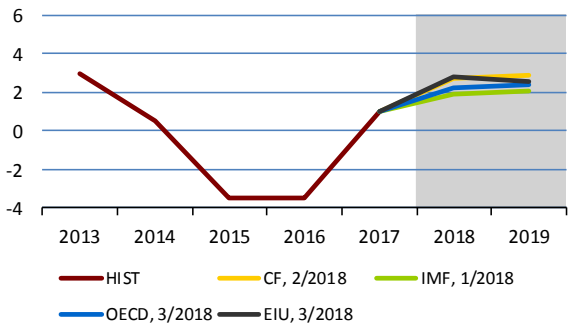


	CF	IMF	OECD	EIU
2018	3.9 ↘	3.9	3.8	3.9
2019	4.0 →	4.0	4.0	4.5

III.4 Brazil

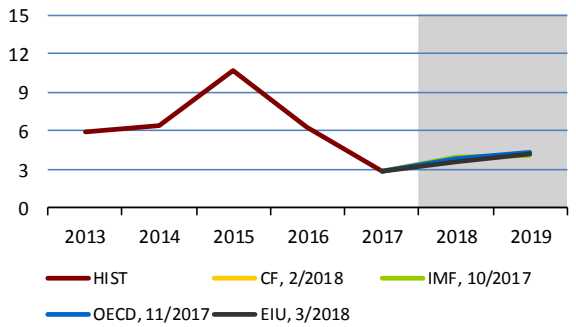
Annual economic growth in Brazil accelerated from 1.4% in 2017 Q3 to 2.1% in Q4. This was subsequently reflected in the outlooks. The GDP growth was driven by household consumption (2.6%) and a significant change in investment growth, which rose by almost 4% at the end of the year after a 0.5% drop in Q3. Exports meanwhile increased (by 9.1%), outpacing imports. By contrast, government consumption fell, although the rate of decline was slower than in the previous quarter. Overall, Brazilian GDP grew by 1% in 2017. Consumer price inflation dropped just below 3% in December and stayed close to that level in the first two months of this year. The new outlooks expect a further acceleration in economic activity but also a slight increase in inflation this year. GDP growth should reach 2.2%–2.8% and consumer price inflation is expected to rise to 3.6%–3.9% at the end of 2018.

GDP growth, %



	CF	IMF	OECD	EIU
2018	2.7 ↗	1.9	2.2 ↗	2.8 →
2019	2.9 ↗	2.1	2.4 ↗	2.6 →

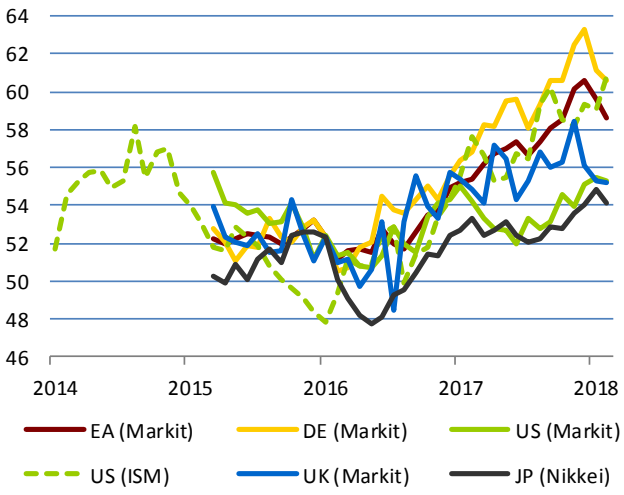
Inflation, %



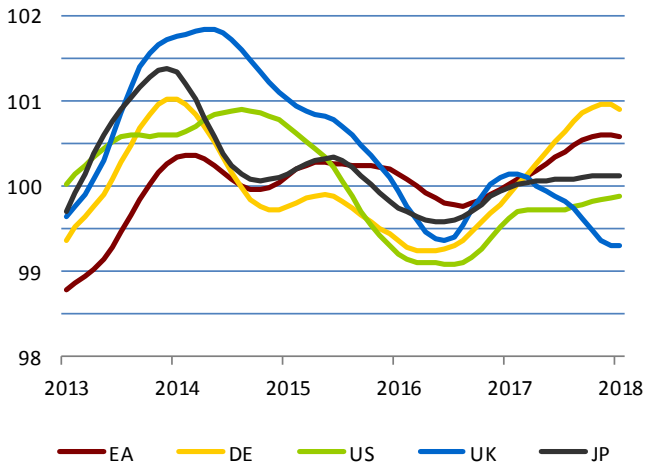
	CF	IMF	OECD	EIU
2018	3.9 ↘	4.0	3.9	3.6 →
2019	4.2 →	4.1	4.3	4.2 →

IV.1 Advanced economies

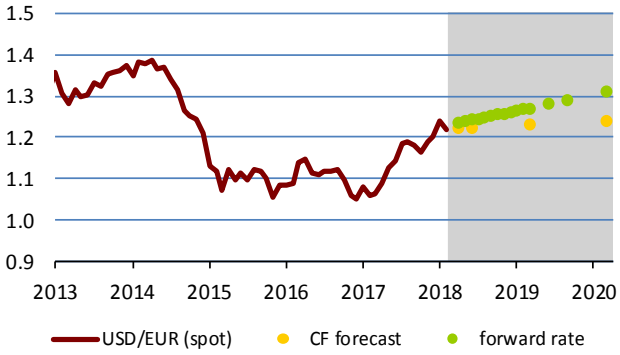
PMI in manufacturing



OECD Composite Leading Indicator

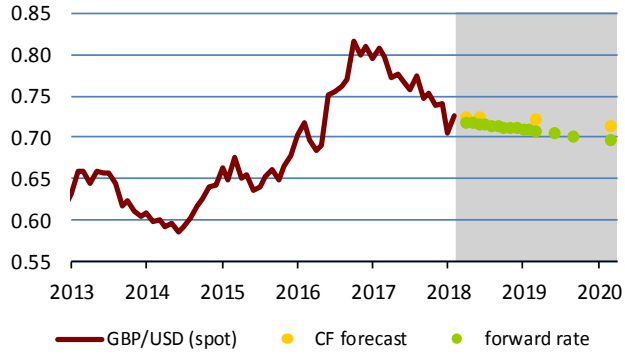


The US dollar (USD/EUR)



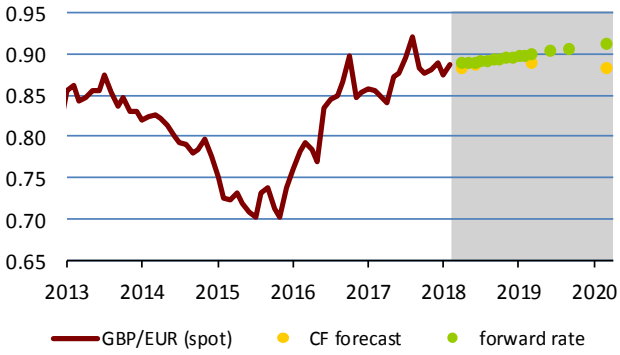
	12/3/18	04/18	06/18	03/19	03/20
spot rate	1.232				
CF forecast		1.222	1.224	1.232	1.238
forward rate		1.237	1.242	1.271	1.311

The British pound (GBP/USD)



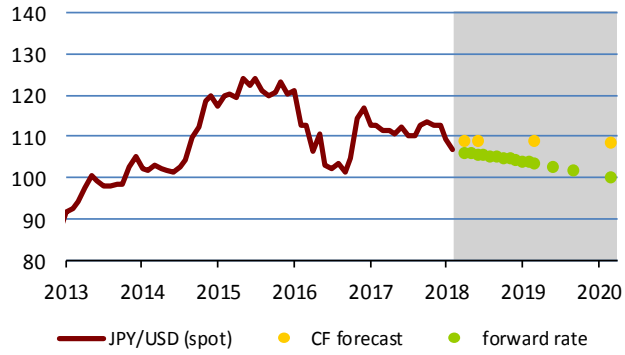
	12/3/18	04/18	06/18	03/19	03/20
spot rate	0.719				
CF forecast		0.723	0.724	0.722	0.713
forward rate		0.718	0.716	0.707	0.696

The British pound (GBP/EUR)



	12/3/18	04/18	06/18	03/19	03/20
spot rate	0.886				
CF forecast		0.884	0.886	0.890	0.882
forward rate		0.888	0.890	0.899	0.912

The Japanese yen (JPY/USD)

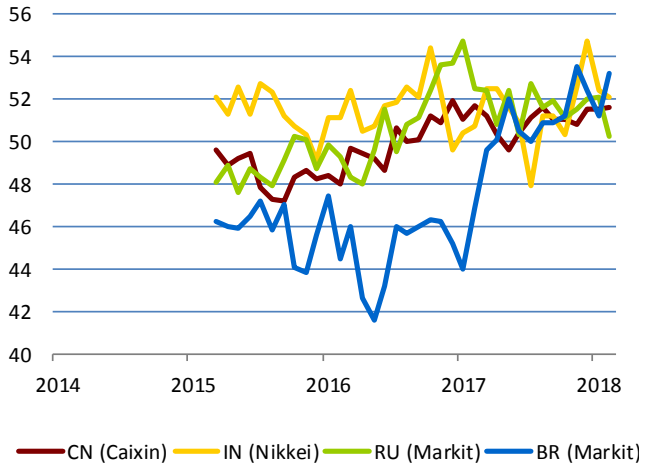


	12/3/18	04/18	06/18	03/19	03/20
spot rate	106.5				
CF forecast		108.7	108.9	109.0	108.3
forward rate		106.1	105.8	103.5	100.1

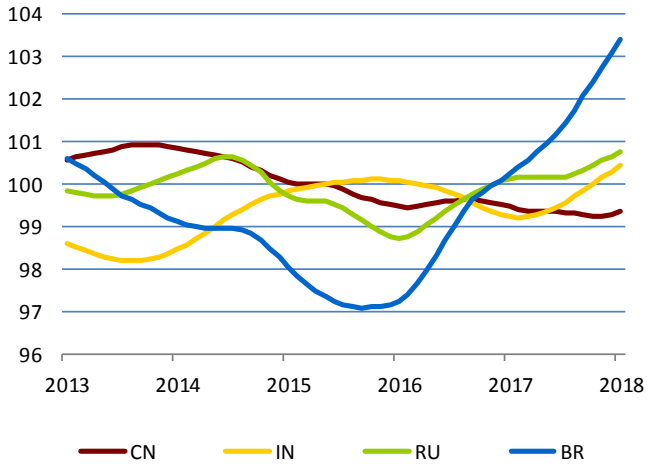
Note: Exchange rates as of last day of month. Forward rate does not represent outlook; it is based on covered interest parity, i.e. currency of country with higher interest rate is depreciating. Forward rate represents current (as of cut-off date) possibility of hedging future exchange rate.

IV.2 BRIC countries

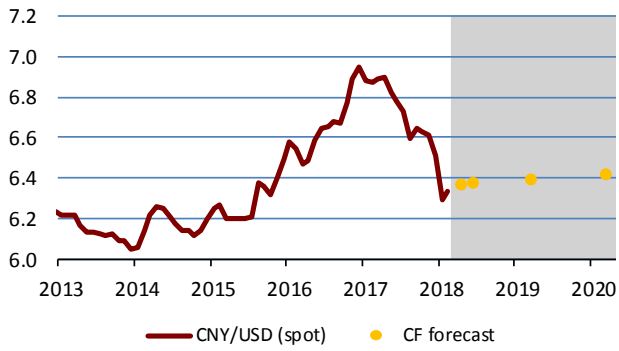
PMI in manufacturing



OECD Composite Leading Indicator

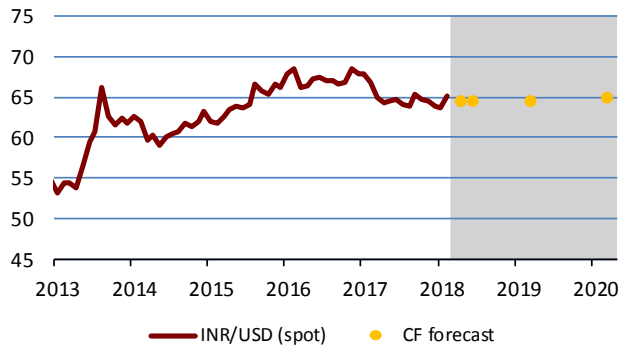


The Chinese renminbi (CNY/USD)



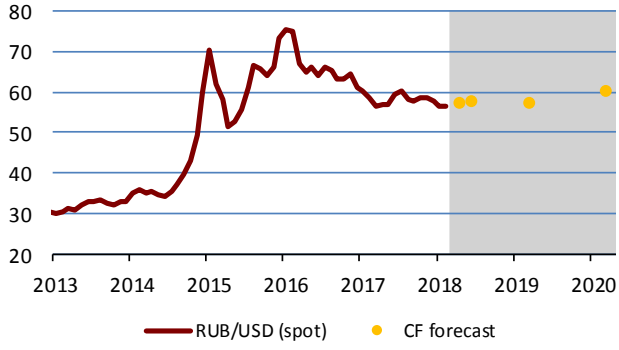
	12/3/18	04/18	06/18	03/19	03/20
spot rate	6.324				
CF forecast		6.371	6.375	6.394	6.420

The Indian rupie (INR/USD)



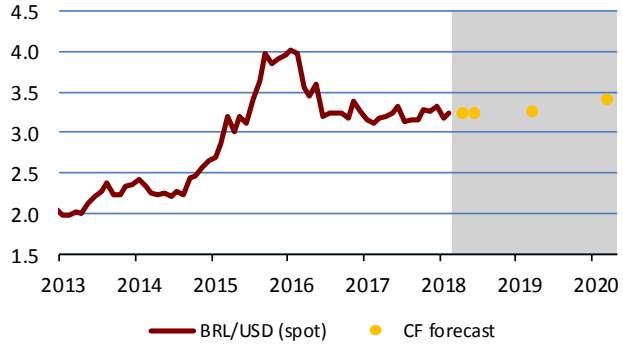
	12/3/18	04/18	06/18	03/19	03/20
spot rate	65.03				
CF forecast		64.38	64.50	64.43	64.82

The Russian rouble (RUB/USD)



	12/3/18	04/18	06/18	03/19	03/20
spot rate	56.90				
CF forecast		57.3	57.57	57.22	60.22

The Brazilian real (BRL/USD)



	12/3/18	04/18	06/18	03/19	03/20
spot rate	3.262				
CF forecast		3.237	3.229	3.264	3.414

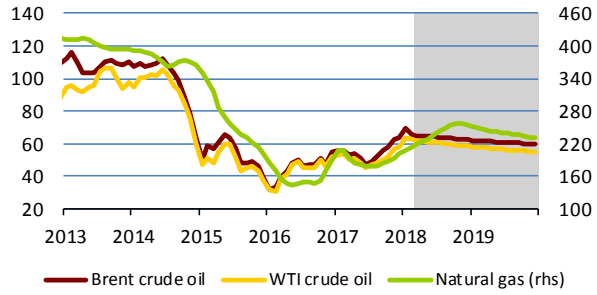
Note: Exchange rates as of last day of month.

V.1 Oil and natural gas

Although fundamental factors (leading to a fall in global stocks of oil and oil products towards their five-year average) are continuing to support relatively high oil prices, the growth in oil prices to more than three-year highs in January was due mainly to a rapid weakening of the dollar as from mid-December 2017. A strengthening of the dollar due to stock market turmoil then contributed to the subsequent oil price correction in early February. Financial markets later calmed gradually and the Brent crude oil price fluctuated only slightly, close to USD 65/bbl, in the first half of March. The Brent-WTI spread narrowed substantially due to a sharp decrease in WTI stocks at the Cushing terminal.

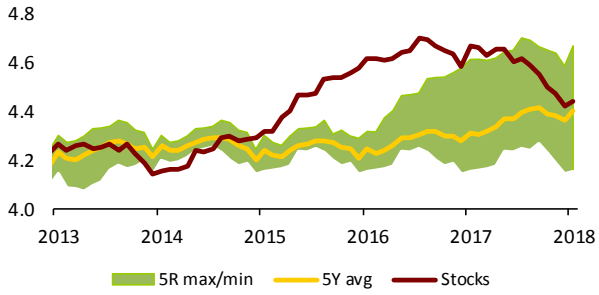
The market curve based on Brent futures shifted about USD 2.5/bbl higher compared with the previous month, implying an average price of USD 64.3/bbl and USD 60.8/bbl for this year and the next respectively. The March CF expects a rather slower fall and a price of USD 62.8/bbl one year ahead. The EIA lowered its expected average price for both years from USD 64/bbl to USD 62/bbl. This is based on an assumption that global oil stocks will return to average daily growth of 0.4 million barrels this year and 0.3 million barrels next year after a drop of 0.6 million barrels a day in 2017. Fast growth in output in the USA is undermining the efforts made by OPEC and other countries to stabilise the oil market. Following the IEA and EIA, OPEC is starting to admit that growth in output outside OPEC will outpace growth in global oil demand this year. Current lower demand from refineries due to seasonal maintenance caused the negative slope of the futures curve to moderate. If this trend were to continue, the current still high speculative positions of hedge funds could be a downward risk for oil prices in addition to the rapidly rising output in the USA.

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

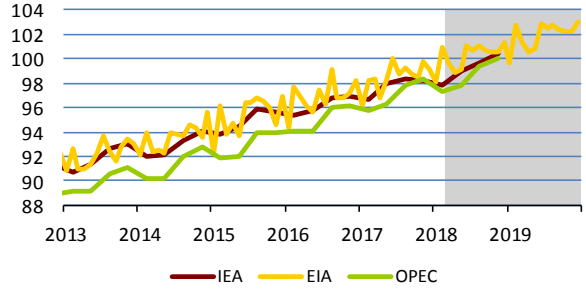


	Brent	WTI	Natural gas
2018	64.33	60.59	236.44
2019	60.84	56.47	239.90

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

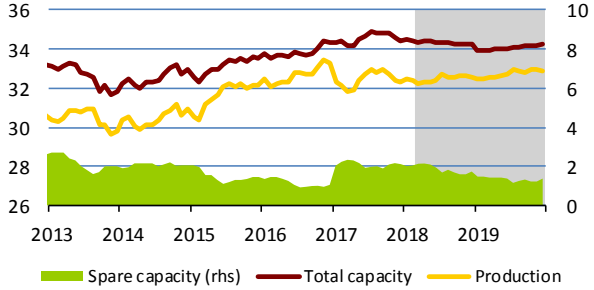


Global consumption of oil and oil products (mil. barrel / day)



	IEA	EIA	OPEC
2018	99.19	100.21	98.63
2019		101.93	

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



	Production	Total capacity	Spare capacity
2018	32.48	34.35	1.87
2019	32.73	34.07	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.

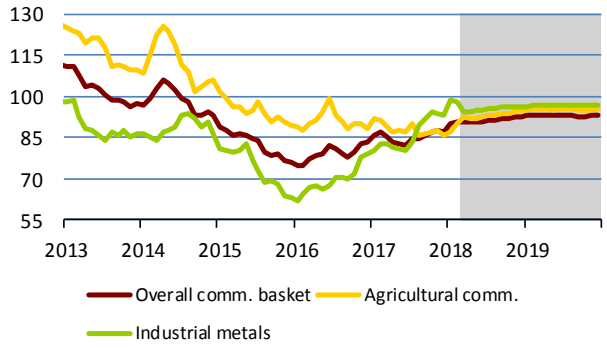
V.2 Other commodities

After a sharp rise in January, the aggregate non-energy commodity price index increased slightly again in February and was flat at roughly a three-year high in the first half of March. The food commodity price sub-index has been showing solid growth since the start of the year and its outlook is also slightly rising, while the industrial metals price sub-index followed the oil price and rose sharply but then switched to a decline, which accelerated in the first half of March. Its outlook is broadly flat.

Prices of most basic metals and iron ore responded to the appreciation of the dollar in early February by falling. A partial correction then occurred, but prices of most metals (except nickel, zinc and tin) fell further from mid-February, although they continue to be supported by a favourable outlook for global manufacturing. Its leading indicator (JPMorgan PMI) decreased slightly again in February (from 54.4 to 54.2) after a fall in January, but remains close to its December seven-year high. The EU, USA and Japan recorded slowdowns. The drop in copper and aluminium prices in February was also due to strong growth in stocks on the LME. Copper imports to China declined in February due to wintertime restrictions on copper processing. By contrast, a drop in LME stocks fostered a rise in zinc and nickel prices. Prices of iron ore and steel went up slightly, as restrictions on steel output in China are expected to be extended.

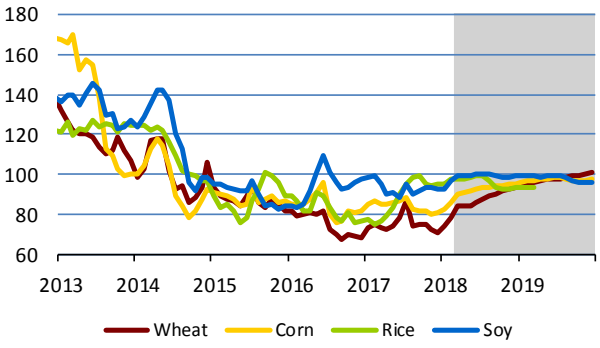
Food commodity prices were unaffected by the financial market turmoil in early February. Growth in grain prices accelerated further in late February. The outlooks for wheat and corn are rising. By contrast, the outlook for rice is falling and that for soy is flat. Turning to other commodities, the price of cocoa grew robustly. By contrast, meat prices fell. The price of sugar dropped in March after stagnating in February.

Non-energy commodities price indicies



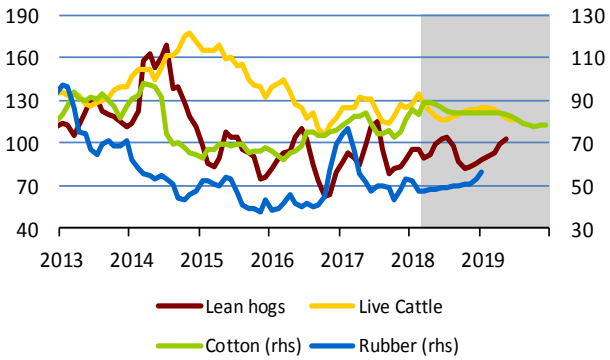
	Overall	Agricultural	Industrial
2018	91.3	92.4	96.0
2019	93.2	95.3	96.7

Food commodities



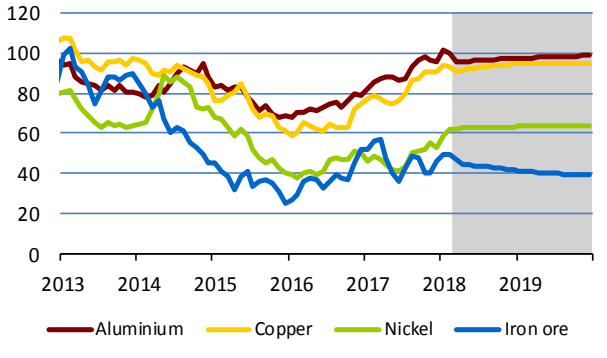
	Wheat	Corn	Rice	Soy
2018	86.4	91.6	96.1	98.6
2019	97.9	97.4	93.7	98.0

Meat, non-food agricultural commodities



	Lean hogs	Live Cattle	Cotton	Rubber
2018	93.0	122.8	85.7	49.8
2019	94.9	120.6	81.2	56.7

Basic metals and iron ore



	Aluminium	Copper	Nickel	Iron ore
2018	97.1	92.9	62.4	44.5
2019	98.0	94.7	63.7	40.1

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.

Why is cash still popular? Evidence from OECD countries[1]

Cash[2] has been with us for several thousand years now. It has been argued recently that banknotes and coins might be gradually losing their steadfast role as a means of payment, and there are even tangible trends in this direction in some countries. The same arguments have been heard from time to time in the past, but a recent decrease in cash in some countries, especially Sweden, has injected new life into the debate. In this article, we summarise current payment methods, including the much-hyped cryptocurrencies, review the reasons for the persisting growth in circulating currency in the vast majority of OECD countries and give the general reasons for the enduring popularity of cash. We also offer a hypothesis of a concave relationship between circulating currency relative to nominal GDP and a country's relative level of economic development. Using data on the composition of banknotes in the Czech Republic, we go on to quantify the transactions and speculative demand for cash in the context of both demand and supply factors. We conclude that notes and coins will continue to play a pivotal role as a means of payment.

Contemporary payment methods and the digital currency phenomenon

The 21st century has seen a steady rise in the use of digital forms of payment alongside traditional non-cash payments and cash, i.e. banknotes and coins. A specific minority role, albeit a steadily growing one, is being played by cryptocurrencies,[3] especially Bitcoin,[4] which are characterised by a decentralised payment mechanism (i.e. peer-to-peer exchange; BIS, 2015). Cryptocurrencies thus provide their users with payment anonymity, similar to that when using cash. As technology evolves, the use of electronic payment methods expands and possible trends emerge causing the use of cash to fall, experts at central banks are starting to discuss[5] the potential use of central bank digital currency (CBDC). Trailblazers include Canada, the USA, the UK, Australia,[6] Norway, Denmark and Sweden.[7] The introduction of CBDC is also being discussed by the Bank for International Settlements (Bech and Garratt, 2017) and the IMF (Kireyev, 2017). Rogoff (2016) believes cash is outdated and presents a plan for phasing it out. In his view, the use of cash is moving into the shadow economy. Some central banks are ceasing to issue high-denomination notes for the same reason.[8]

Replacing circulating currency with digital currency would bring many changes both for the central bank and for economic agents. These changes have yet to be clarified in detail. Some examples are given below. If unremunerated CBDC was introduced, the central bank would keep the seigniorage revenue. This revenue, moreover, would not be reduced by the costs of producing notes and coins.[9] Assuming that it was unremunerated when interest rates were positive and remunerated when they were negative, CBDC would allow for more effective unconventional monetary policy if negative interest rates had to be introduced, as it would prevent a flight to cash. On the other hand, the establishment of CBDC even in minimalist form would entail significant problems and risks. It would extend the central bank's mandate beyond the usual conventions, as the public's money would be deposited on accounts at the central bank. The central bank might thus indirectly crowd out the liability (deposit) transactions of commercial banks. Even a minimalist CBDC might therefore significantly affect the structure of financial intermediation for households, fostering a shift away from the two-tier banking system model. Episodes of financial turbulence would be particularly

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[1] Authors: Luboš Komárek, Iveta Polášková and Michal Hlaváček. The views expressed in this article are those of the authors and do not necessarily reflect the official position of the Czech National Bank. We would like to thank Tomáš Pekárek from the CNB's Cash and Payment Systems Department and Tomáš Holub, Petr Král and Branislav Saxa from the CNB's Monetary Department for data sources and subsequent discussions.

[2] "Cash", "circulating currency" and "M0" are treated as synonyms in this text.

[3] Cryptocurrency is one form of digital (or electronic) money. Others include virtual currency and central bank digital currency (CBDC). Virtual currency is a digital representation of value, not issued by a central bank, credit institution or e-money institution, which in some circumstances can be used as an alternative to money. Conversely, CBDC is a digital form of money issued by the central bank, which makes it legal tender in the country. There are two types of CBDC – retail (accessible to the general public; examples include Fedcoin, which is under discussion in the USA, and eKrona, whose viability is currently being determined in Sweden) and wholesale (available only to financial institutions; this type does not yet exist but has been tested in Canada; see Bech and Garratt, 2017).

[4] Other cryptocurrencies include Ether, Bitcoin Cash and Litecoin.

[5] See also Ingves (2017) and Hampl (2018).

[6] However, the Reserve Bank of Australia, fearing adverse impacts on the country's financial system, has shelved plans to issue a digital currency of its own at the end of 2017; see Reserve Bank of Australia (2017).

[7] The case of Venezuela is interesting. Cryptocurrencies are widely used for purchases in this crisis-hit country. Many cryptocurrency miners are also located there. The Venezuelan government has decided to create its own digital currency backed by assets such as oil, gold and diamonds; see Reuters (2017).

[8] One example is the ECB, which has stopped issuing €500 notes.

[9] These costs are quite substantial, amounting to CZK 250–400 million a year in the Czech Republic. For example, the cost of producing the most frequently used Czech note, the 1,000-koruna (around 140 million in circulation), is around CZK 2.5, while the most frequently used coin, the one-koruna (570 million in circulation), costs about CZK 0.8 to make.

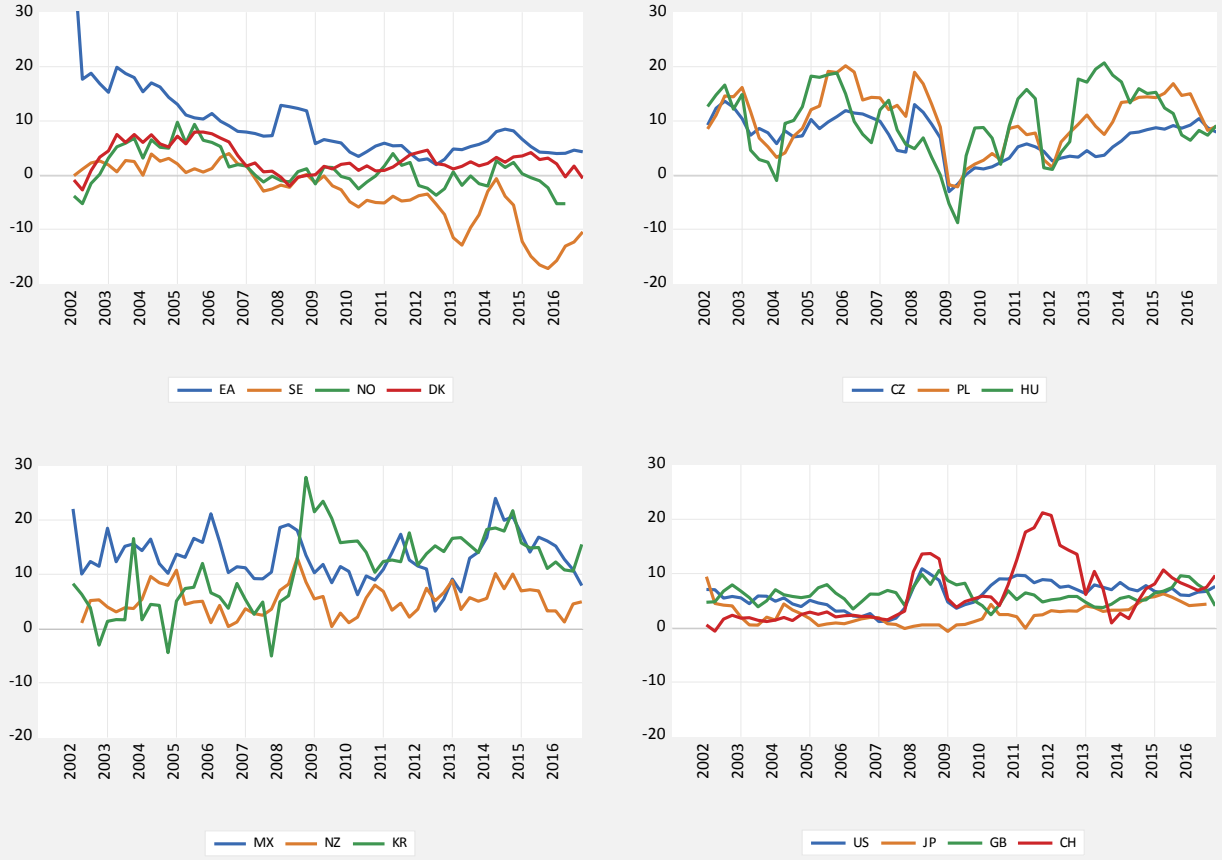
risky, as commercial banks might face a run on deposits, putting their stability in danger. Another question mark hangs over the public sector's role in financial intermediation. If commercial banks were unable to fulfil their traditional financial intermediation roles due to massive shifts of deposits to the central bank, what institutions would replace them? Another important objection to the introduction of CBDC concerns the possible change in the central bank's role in government debt financing. Furthermore, besides causing its balance sheet to expand, the introduction of CBDC would lead to the central bank incurring duties that currently fall mainly to commercial banks, such as combating money laundering and providing information to tax authorities, courts and clients. This would give rise to reputational and political risks to which a central bank operating without notes and coins would be exposed.

Scandinavia – a trailblazer?

The Swedish central bank has nonetheless launched a process that might lead to the introduction of digital money in place of cash (the "e-krona"). The reason is obvious and has been stated above – cash use in Sweden has fallen significantly over the last decade. Sweden probably holds the world's primacy in using non-cash payments. Those made by card, whether contact or non-contact, mobile phone or bank transfer account for about 85 percent of all transactions.[10] The same trend can be seen in other Scandinavian countries with their own currencies, such as Denmark and Norway, and also in some euro area countries. For instance, a downward tendency in cash euro use can be observed in Finland and Estonia (see, for example, Esselink and Hernández, 2017). Despite this, circulating currency has been steadily increasing both in the euro area as a whole and in most other countries, as Chart 1 shows.

Chart 1 – Annual growth in circulating currency in selected OECD countries

(%; quarterly data; seasonally adjusted)



Source: Datastream

Note: EA – euro area; SE – Sweden; NO – Norway; DK – Denmark; CZ – Czech Republic; PL – Poland; HU – Hungary; MX – Mexico; NZ – New Zealand; KR – South Korea; US – United States; JP – Japan; UK – United Kingdom; CH – Switzerland.

Successful implementation of the Swedish project would mean the creation of an electronic type of money. The e-krona would complement rather than replace cash for the time being.[11] In the first stage, the options for issuing an e-krona were assessed in general terms from the technological, political and

[10] In 2016, see Sveriges Riksbank (2017b). In the Czech Republic, the share of non-cash payments in all payments made is approximately one-fifth the size of that in Sweden.

[11] Sveriges Riksbank envisages supplying notes and coins as long as there is demand for them in society.

legislative perspectives.[12] The project is currently in its second stage, which covers 2018. The objective of this stage is to design a more detailed real-world framework for the e-krona system. The Riksbank is preparing legislative amendments relating to the introduction of the e-krona and the specific implementation of infrastructure and technology. After the second stage is completed, the Executive Board will make a decision[13] on whether or not to implement the e-krona project (see Sveriges Riksbank, 2017a, b, c).

What is driving the rise in demand for cash in most advanced countries?

Despite the above visions and trends, the amount of circulating currency is still rising in the vast majority of OECD countries. This is illustrated by Chart 1, which presents a view of several groups of OECD countries. The first group consists of the Scandinavian nations along with the euro area for direct comparison. A decline in demand for cash can be observed in these countries. The most prominent example is Sweden, where circulating currency has been decreasing for almost ten years. With just a few exceptions, however, no downward trend in the popularity of cash can be seen in the other selected groups of OECD countries. Cash has been rising at slightly higher rates in Central European economies, which are still converging to the euro area core countries, than in the most advanced OECD countries. Lower positive annual growth rates of circulating currency (of up to 10%) are typical of advanced and payment system-innovative countries such as New Zealand and countries with reserve currencies (the USA, the euro area, Japan and the UK). Demand for circulating currency in these countries is being fuelled in part by demand in other countries, where it is used for cash transactions (especially in the case of the dollar).

The growth in circulating currency stems mainly from the core functions of money (be it cash, which is what we are interested in here, or non-cash money). The demand underlying the observed growth in circulating currency thus reflects:

- **transactions reasons**, including the composition and shopping habits of households; the higher the proportion of small local shops, the higher the demand for cash, despite the current growth in payment systems. That said, growth in the number of payment terminals even in small shops is reducing the importance of traditional factors in explaining the rising demand for cash. The growing popularity of on-line shopping is having a similar effect, reducing the transactions demand for cash.
- **alternative costs of holding cash**; these are related to current and expected interest rate levels and the availability of other financial products; the lower the interest rate, the higher the demand for cash.
- **payment system security**; more convenient and increasingly safe non-cash payment systems should reduce the demand for cash (see, for example, Humphrey 2004). Demand for cash is also inversely proportional to the density of the ATM network and the level of cash withdrawal fees. It also depends on the composition of banknotes in ATMs, as we illustrate below with the example of the Czech Republic.
- **financial sector stability**; a sound condition of banks and other institutions, reinforced by high credibility of the central bank, leads to high public confidence in the national currency. This can have an upward effect on speculative demand for cash (with households storing part of their wealth in cash in the belief that their savings will not lose value over time). However, financial system stability seems to lead to an even greater extent to the opposite causality where confidence in the national currency and the stability of the financial system motivates households and other economic agents to deposit cash with banks, especially if the deposit insurance limit is generous.
- **demand for foreign/global reserve currencies[14] in the domestic economy**; when the national economy is highly dollarised/euroised, a preference for the reserve currency over the domestic one reduces demand for the latter, including cash (see, for example, Fischer et al., 2004).

[12] The September project report offered two possible e-krona models: "register-based" and "value-based"; however, these two variants need not rule out each other, as a combination of both might help create a much more comprehensive e-krona model. With a register-based e-krona, the balance would be stored in accounts in a central database; if the payment portal was lost, the funds would not be affected, as they are registered in the database. The value-based e-krona would behave similarly to cash (i.e. if the payment portal was lost, the funds would also be lost) and might offer the same anonymity as cash. According to the Riksbank, the value-based solution might be introduced very quickly (being a new, technology-based form of cash), but the "register-based" variant is currently deemed to have greater development potential (despite being more complex and more expensive to develop). For details, see Sveriges Riksbank (2017a).

[13] If the Executive Board decides not to continue, the e-krona project will be concluded.

[14] Krugman (1999, p. 167) defines a global/reserve currency as a currency that fulfils, in addition to the three standard functions of a medium of exchange, a unit of account and a store of value, three other functions that make it a dominant currency: (i) an intervention function, i.e. the use of the currency for foreign exchange interventions by central banks, (ii) a peg function, i.e. the use of the currency to fix (anchor) another currency, and (iii) a reserve function, i.e. the use of the currency for storing value (in the form of foreign exchange reserves or foreign-currency assets of economic agents). The dollar has maintained a dominant position among the reserve currencies since the last century, followed some way behind by the euro, the British pound, the Japanese yen and the Swiss franc.

- **the size of the shadow or illegal economy**; the bigger its share, the higher the demand for circulating currency (with a preference for high-denomination notes). See, for example, Guibourg and Segendorf, 2007. The preference for cash in the shadow economy is motivated by tax evasion.
- **other factors**, including (i) the age structure of the population (an older population tends to prefer cash to modern means of payment); (ii) the income level of the population (a poorer population tends to prefer cash to non-cash payments); (iii) the financial literacy of the population and its ability to invest its savings efficiently (lower financial literacy tends to lead to higher cash holdings); (iv) the level of urbanisation (a higher number of urban residents leads to a lower proportion of cash payments), and (v) the role of cash as a back-up option for making payments in the plausible risk scenario of a power cut or a failed internet connection.

Reasons why cash is popular

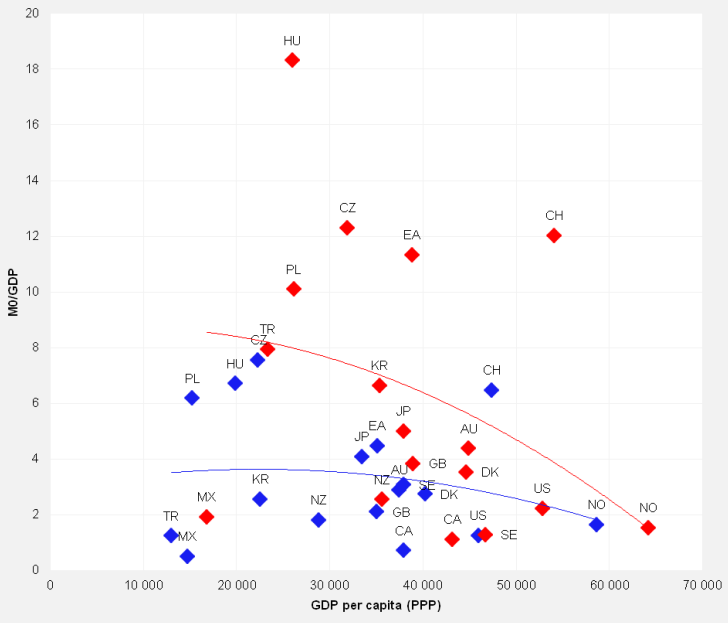
There are many economic and historical reasons why cash is popular with the public. These reasons seem not to have been reduced significantly by the use of modern types of non-cash payment or by the creation of cryptocurrencies. The main reasons for its popularity relate to how transactions (purchases or sales) are made. Cash payments are highly efficient (i.e. they occur immediately and very easily at the time of the exchange), anonymous (no third party needs to be involved) and widely accepted (the risk of a counterparty not accepting cash[15] is very small). On top of these obvious reasons for its popularity, cash has other advantages, such as indirect pressure for caution when shopping (you can't spend more banknotes and coins than you have in your wallet) and user-friendliness, including for disabled persons. Other reasons for the popularity of cash with the public are based on the possibility of storing wealth in its most liquid form, even at the cost of forgoing potential returns. Last but not least, a preference for paying in cash may be motivated by tax evasion. That said, cash is not without its drawbacks. It yields no returns (interest) and bears a risk of theft or loss, which can only be prevented at a cost.

The relationship between a country's level of development and demand for cash

A concave relationship is generally observed between a country's level of economic development and the amount of currency in circulation. The relationship between the amount of circulating currency (relative to nominal GDP) and the relative level of economic development is illustrated by Chart 2. It also aims to show how this empirical relationship changed between 2003 (the blue curve) and 2017 (the red curve). The chart shows that growth in economic performance leads at first to a rise in the share of circulating currency as people get wealthier. This is explained by a relative lack of confidence in the use of advanced financial products, investor conservatism and a decline in interest rates to near the level in advanced economies. At a certain stage of development, however, an effect where circulating currency is seen as a junk asset or means of payment dominates, and demand for cash conversely falls in the wealthiest countries.

Chart 2 – Relationship between the ratio of circulating currency to GDP and GDP per capita in 2003 and 2007

(M0/GDP – %; GDP per capita (PPP) – USD; annual data, seasonally adjusted; blue – 2003; red – 2017)



Source: Datastream

Note: M0 – circulating currency; PPP – purchasing power parity; AU – Australia; CA – Canada; CH – Switzerland; CZ – Czech Republic; EA – euro area; HU – Hungary; JP – Japan; KR – South Korea; MX – Mexico; NO – Norway; NZ – New Zealand; PL – Poland; SE – Sweden; TR – Turkey; UK – United Kingdom; US – United States; Chile, Iceland and Israel are not presented in the chart due to unavailability of some data sources.

Focus on banknotes in the Czech Republic

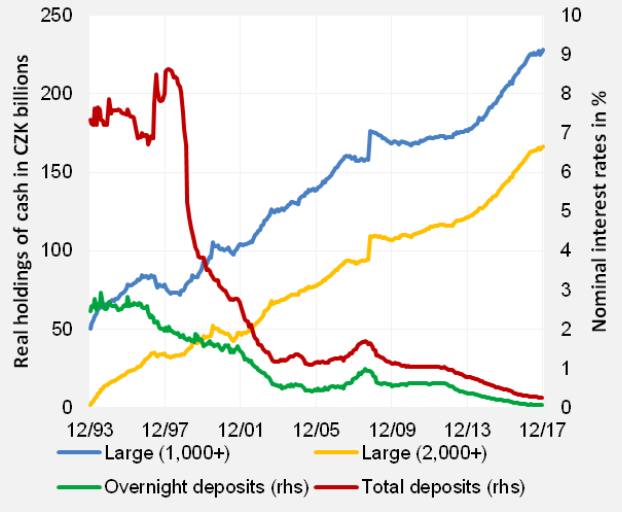
Information on the denomination structure of circulating currency can be used to explain the relatively

[15] From the international perspective, this holds true for reserve currencies (especially USD, EUR, JPY, GBP and CHF), which are often accepted outside their home territory.

high demand for cash in the Czech Republic. Although demand itself is based on the standard textbook distinction between the transactions, precautionary and speculative motives for holding money, these motives are very difficult to distinguish as regards money in a wider sense (i.e. M1, M2 and M3). It is reasonable to assume, however, that lower denominations (notes and coins up to CZK 500, or approximately €20) will tend to fulfil the transactions function, while the highest denominations (the CZK 2,000 and CZK 5,000 notes) will tend to fulfil the speculative function, abstracting from transactions in the grey and black economy. Circulating currency in the form of CZK 1,000 notes has a specific position, performing both functions successfully. CZK 2,000 and CZK 5,000 notes account for almost two-thirds (66.2%), CZK 1,000 notes for almost a quarter (24.5%) and notes and coins of lower denominations (less than or equal to CZK 500) for 9.3% of the total koruna value of circulating currency at the time of writing (the end of 2017). The shares of transactions and speculative demand for circulating currency can also be estimated using the assumed links between the types of demand for circulating currency and their macroeconomic fundamentals.

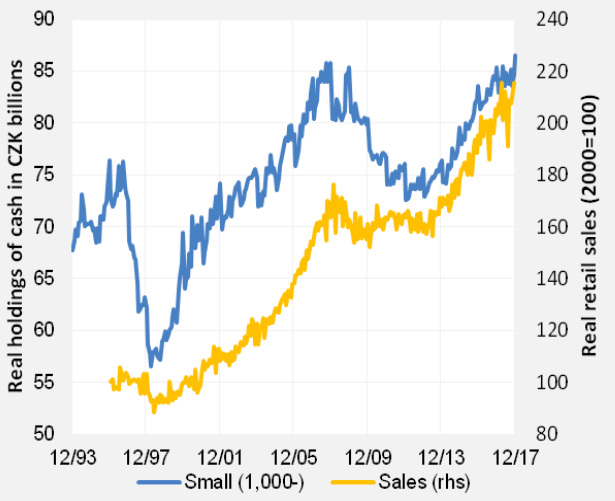
Speculative demand for cash depends mainly on the total wealth of economic agents and on the returns on alternative assets. In the Czech Republic, this mainly concerns the return on bank deposits, which make up the majority of households' financial assets. As is clear from Chart 3, growth in high-denomination notes is closely correlated with changes in deposit rates. The accelerating growth in high-denomination notes recorded between the end of 2013 and the end of 2017 Q1 was linked with the CNB's exchange rate commitment and a decline in deposit rates to zero. The growth rate of high-denomination notes slowed after the exit from the exchange rate commitment.[16] There have been periods in the past that confirm the negative relationship between speculative cash and deposit rates. For example, a rise in interest rates between June 1997 and June 1998 resulted in a 14% year-on-year decrease in denominations of over CZK 1,000 at the start of 1998. Similarly, a rise in interest rates of around 0.4 pp in the first half of 2008 was reflected in a fall in this component of circulating currency. The response of the speculative part of circulating currency to the outbreak of the financial crisis is also interesting – a one-off increase of almost CZK 40 billion was recorded in October 2008 due to a decline in public confidence in bank deposits. This effect then gradually faded.

Chart 3 – Speculative demand for circulating currency



Source: CNB, CZSO
Note: Seasonally adjusted, holdings of circulating currency in real terms (CPI-deflated), deposit rates in nominal terms

Chart 4 – Transactions demand for circulating currency



Source: CNB, CZSO
Note: Seasonally adjusted, holdings of circulating currency in real terms (CPI-deflated), retail sales at constant prices

Transactions demand for money displays a strong link to retail sales, while its correlation with interest rates is not as strong as in the case of speculative demand. A link between the quantity of lower-denomination notes and retail sales (see Chart 4) can be seen, for example, during the 2008–2009 financial crisis and during the current recovery since 2014, and also in the period of rapid economic growth immediately preceding the outbreak of the financial crisis and at the time of falling sales during the 1997 currency shock. Transactions demand for money has also been affected by technological progress in the area of non-cash payments. Lower denominations recorded average annual growth of 3.1% in real terms in

[16] This might also have been due to excess cash in commercial banks' vaults arising from precautionary behaviour when the CNB was discussing the possibility of introducing negative interest rates.

2014–2017, while real retail sales rose at twice that pace on average (6.2%) in the same period. This reflected a sizeable increase in the use of contactless payment cards.[17]

The total quantity of cash is determined primarily by demand effects, but, given the structure of circulating currency, there are also some significant supply effects. These are linked mainly with commercial banks' policies on cash in ATMs. For example, the use of CZK 2,000 notes, which were put into circulation in October 1996 and currently make up the largest part of circulating currency (40% of the total nominal value of banknotes and coins), was supported by their inclusion among the banknotes dispensed by ATMs in 2000. Holdings of CZK 500 notes, which ceased to be offered in ATMs, declined in the same year. The number of CZK 500 notes rose again in 2013 when they started to be offered again in ATMs and customers were given the option of choosing which denominations to withdraw. The range of denominations offered was also influenced by the replacement of CZK 20 and CZK 50 notes with coins and by the definitive withdrawal of these banknotes from circulation by the CNB. In addition, the number of banknotes was affected by the withdrawal of some versions of banknotes (for example, the 1993 version of the CZK 5,000 note ceased to be legal tender in mid-2001; this was reflected in a one-off year-on-year decrease of 17.3% in the number of CZK 5,000 notes).

Conclusion

The use of cash may seem anachronistic in the modern world, but it reflects still strong economic, cultural and historical factors. In our opinion, the reasons for holding cash will not change very quickly, even in the majority of advanced countries. Although we can theoretically imagine highly advanced economies functioning without cash, the transition to this state would not be at all straightforward. There is also the question of whether the advantages arising from the non-existence of cash would become apparent before a critical number of countries switched to this still futuristic scenario.

References

Bech, M. L., Garratt, R. (2017). Central bank cryptocurrencies. Bank for International Settlements, September 2017.

BIS (2015). Digital currencies. Committee on Payments and Market Infrastructures, November 2015.

Esselink, H., Hernández, L. (2017). The use of cash by households in the euro area. Occasional Paper Series No. 201, November 2017.

Fischer, B., Köhler, P., Seitz, F. (2004). The demand for euro area currencies. European Central Bank, Working Paper Series 330.

Guibourg, G., Segendorf, B. (2007). The use of cash and the size of the shadow economy in Sweden. Central Bank of Sweden, Working Paper Series 204.

Hampl, M. (2018). A digital currency useful for central banks? 7th BBVA Seminar for Public Sector Investors and Issuers, Bilbao, 27 February 2018.

Humphrey, D. B. (2004). Replacement of cash by cards in U.S. consumer payments. Journal of Economics and Business, 56, pp. 211–225.

Ingves, S. (2017). Do we need an e-krona? Swedish House of Finance, Stockholm, 8 December 2017.

Kireyev, P. A. (2017). The macroeconomics of de-cashing. International Monetary Fund, Working Paper No. 17/71, March 2017.

Krugman, P. (1999). Currencies and crises. Cambridge, The MIT Press, 1999.

Reserve Bank of Australia (2017). An eAUD? Reserve Bank of Australia, December 2017.

Reuters (2017). Venezuela oil-backed cryptocurrency to launch in days – government. Thomson Reuters, December 2017.

Rogoff, K. S. (2016). The curse of cash. Princenton: Princeton University Press.

Sveriges Riksbank (2017a). Riksbankens e-krona. Project plan, 14 March 2017.

Sveriges Riksbank (2017b). The Riksbank's e-krona project. Report 1, September 2017.

Sveriges Riksbank (2017c). The Riksbank's e-krona project (Action plan for 2018), December 2017.

[17] According to a survey conducted by Visa in September 2017, contactless transactions accounted for 91% of total transactions in the Czech Republic. This is the second-highest figure in all the countries under review.

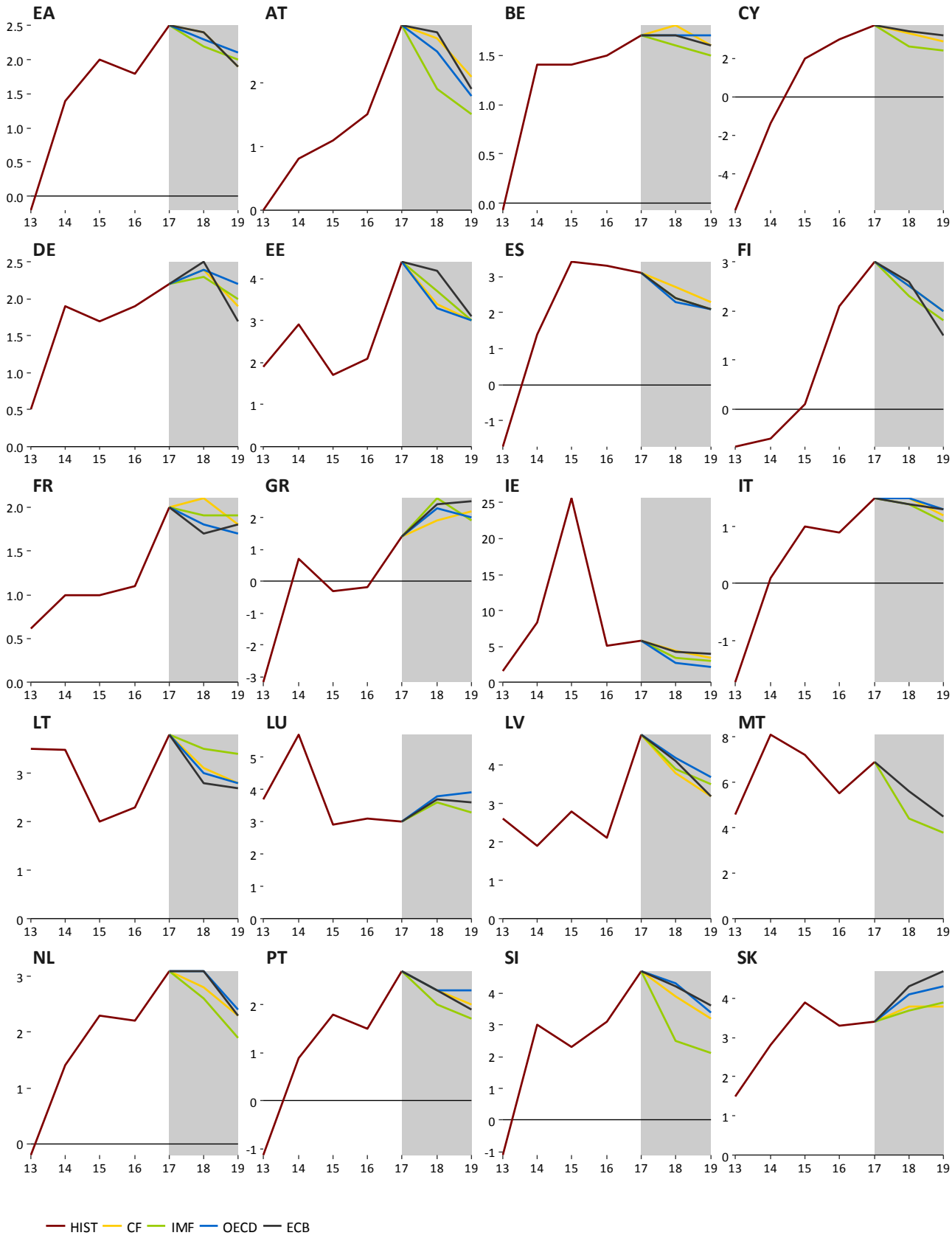
A1. Change in GDP predictions for 2018

	CF		IMF		OECD		CB / EIU	
EA	+0.1	2018/3 2018/2	+0.3	2018/1 2017/10	+0.1	2018/3 2017/11	+0.1	2018/3 2017/12
DE	0	2018/3 2018/2	+0.5	2018/1 2017/10	+0.1	2018/3 2017/11	+0.8	2017/12 2017/6
US	0	2018/3 2018/2	+0.4	2018/1 2017/10	+0.4	2018/3 2017/11	+0.4	2017/12 2017/9
UK	+0.1	2018/3 2018/2	0	2018/1 2017/10	+0.1	2018/3 2017/11	+0.2	2018/2 2017/11
JP	0	2018/3 2018/2	+0.5	2018/1 2017/10	+0.3	2018/3 2017/11	0	2018/1 2017/11
CN	0	2018/3 2018/2	+0.1	2018/1 2017/10	+0.1	2018/3 2017/11	0	2018/3 2018/1
IN	+0.1	2018/3 2018/2	0	2018/1 2017/10	+0.2	2018/3 2017/11	0	2018/3 2018/1
RU	0	2018/2 2018/1	+0.1	2018/1 2017/10	-0.1	2018/3 2017/11	0	2018/1 2017/11
BR	+0.1	2018/2 2018/1	+0.4	2018/1 2017/10	+0.3	2018/3 2017/11	0	2018/3 2018/1

A2. Change in inflation predictions for 2018

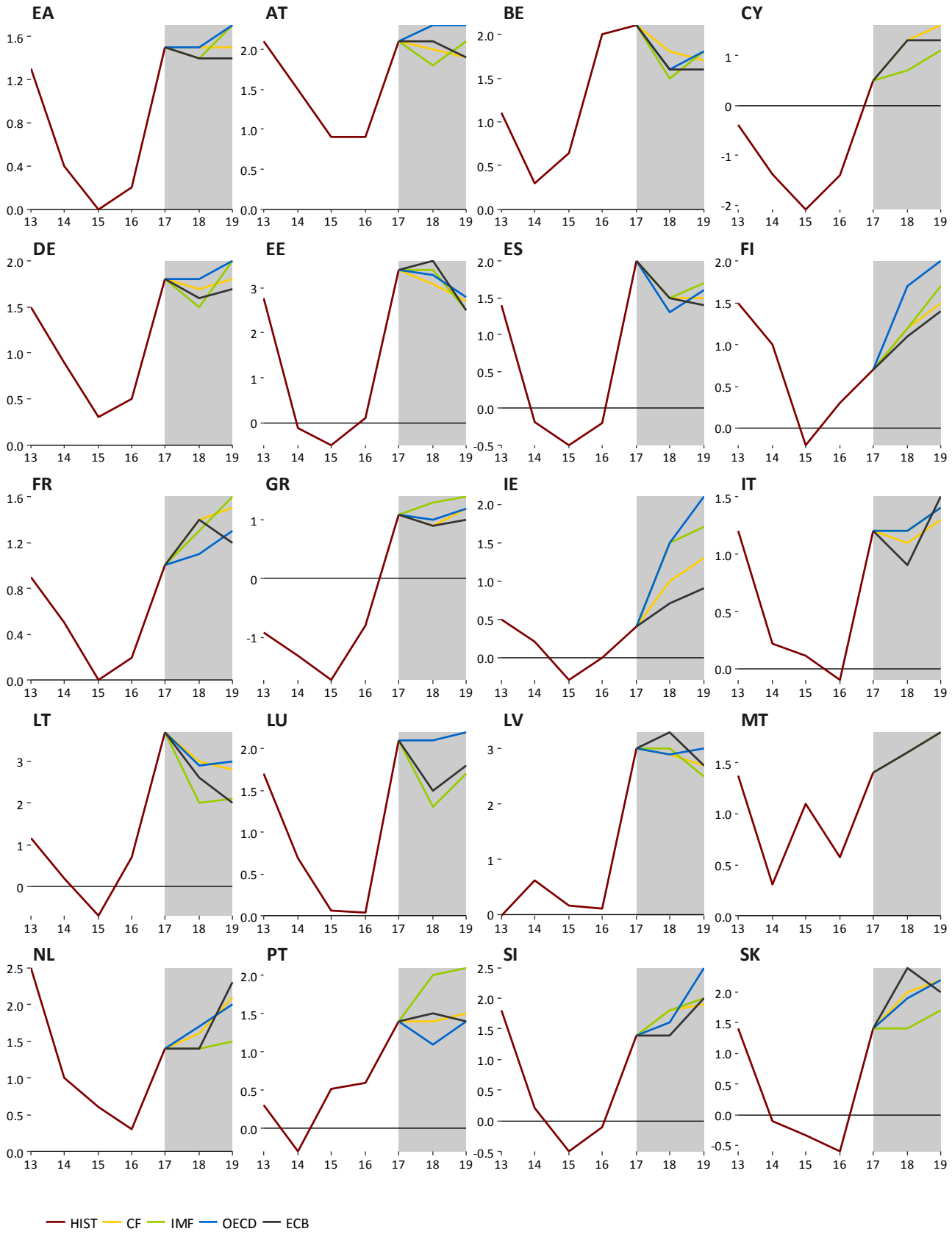
	CF		IMF		OECD		CB / EIU	
EA	0	2018/3 2018/2	-0.1	2017/10 2017/4	+0.1	2017/11 2017/6	0	2018/3 2017/12
DE	0	2018/3 2018/2	-0.2	2017/10 2017/4	+0.2	2017/11 2017/6	+0.2	2017/12 2017/6
US	+0.1	2018/3 2018/2	-0.3	2017/10 2017/4	-0.2	2017/11 2017/6	0	2017/12 2017/9
UK	0	2018/3 2018/2	0	2017/10 2017/4	-0.1	2017/11 2017/6	0	2018/2 2017/11
JP	+0.1	2018/3 2018/2	-0.1	2017/10 2017/4	0	2017/11 2017/6	0	2018/1 2017/11
CN	0	2018/3 2018/2	+0.1	2017/10 2017/4	-0.2	2017/11 2017/6	-0.3	2018/3 2018/1
IN	0	2018/3 2018/2	-0.2	2017/10 2017/4	0	2017/11 2017/6	0	2018/3 2018/1
RU	-0.2	2018/2 2018/1	-0.3	2017/10 2017/4	-0.2	2017/11 2017/6	0	2018/1 2017/11
BR	-0.2	2018/2 2018/1	-0.3	2017/10 2017/4	-0.6	2017/11 2017/6	0	2018/3 2018/1

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 (the UK central bank)
BoJ	Bank of Japan (the central 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 (the central bank of Germany)
DE	Germany
EA	euro area
ECB	European Central Bank
EE	Estonia
EIA	Energy Information Administration
EIU	Economist Intelligence Unit
ES	Spain
ESI	Economic Sentiment Indicator 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
RBI	Reserve Bank of India (central bank)
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