GLOBAL ECONOMIC OUTLOOK - MAY

Monetary Department
External Economic Relations Division

2019

CNB CZECH NATIONAL BANK

Cut-off date for data
17 May 2019

CF survey date
13 May 2019

GEO publication date
24 May 2019

Notes to charts

ECB, Fed, BoE and BoJ: 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.

Contact
gev@cnb.cz

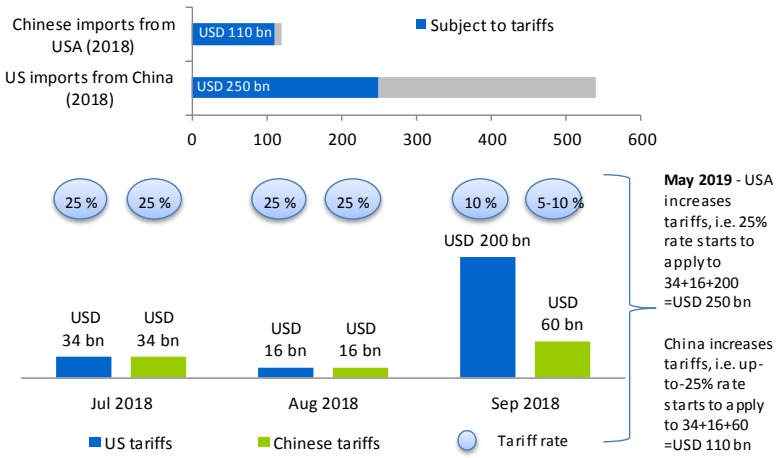
Authors

Luboš Komárek	Editor-in-chief, I. Introduction
Pavla Růžičková	Editor, II.3 United Kingdom
Filip Novotný	II.1 Euro area
Soňa Benecká	II.2 United States, II.5 China
Oxana Babecká	II.4 Japan, II.6 Russia
Milan Frydrych	II.7 Developing countries in the spotlight
Jan Hošek	IV.1 Oil and natural gas, IV.2 Other commodities
Martin Motl	V. Focus

I. Introduction

The level of uncertainty in the global economy defied expectations by rising in May. The main event was a surprising turnaround and further escalation of the trade dispute between the USA and China. First, the USA announced a rise in tariffs to 25%. All items on which the 10% tariff was imposed last year are subject to this rate. It thus applies to USD 250 billion of imports from China as from 10 May. China reacted similarly, raising tariffs on selected products (e.g. meat, vegetables and household appliances) to 10%–25%. However, the original 5% tariff was kept for some items. Almost all China's imports from the US are thus now subject to tariffs. The USA also announced its intention to impose a 25% tariff on other items worth USD 300 billion (including mobile phones and notebooks). Despite this escalation, representatives of both countries expressed their readiness to continue negotiating. The G20 summit in Japan in June may help calm trade relations between the USA and the EU as well. The planned introduction of US tariffs on imports of European cars and auto parts to the USA has been postponed by 6 months, but the EU nonetheless announced it was finalising the list of US products that it would potentially subject to tariffs if the USA were indeed to introduce car tariffs.

Trade war between the USA and China, USD billions



Source: USA Census Bureau, BBC

The 2019 GDP growth outlooks for the USA, the UK and China have been increased since last month. Nevertheless, the 2020 outlooks for the USA and the UK have both deteriorated. This may reflect the potential effects of trade wars and the continued lack of clarity about Brexit, which has been postponed to the autumn. The economic outlooks for the euro area have not improved. They still reflect the lacklustre outlooks for its strongest member, Germany, which is projected to grow by just over 0.5%, a similarly low GDP rate to Japan, for example.

May GDP growth and inflation outlooks for monitored countries, in %

GDP	EA	DE	US	UK	JP	CN	RU
2019	1.1 →	0.8 →	2.6 ↗	1.4 ↗	0.6 →	6.3 ↗	1.5 →
2020	1.3 →	1.5 →	1.9 ↘	1.4 ↘	0.4 ↘	6.1 →	1.8 →

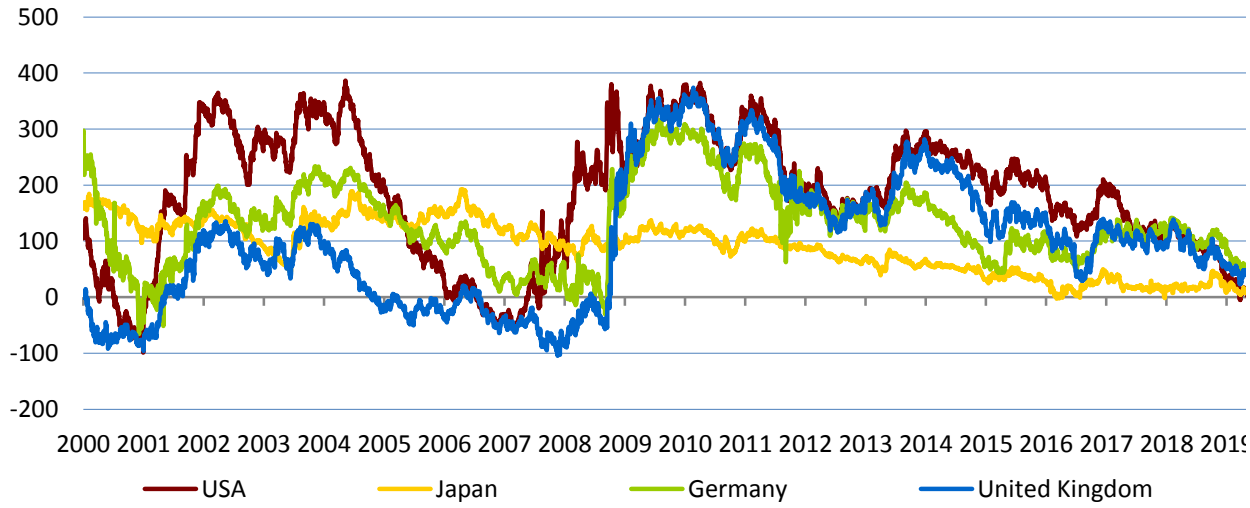
Inflation	EA	DE	US	UK	JP	CN	RU
2019	1.4 ↗	1.5 ↗	1.9 →	2.0 →	0.6 →	2.3 ↗	4.6 ↘
2020	1.4 →	1.6 →	2.1 ↘	2.0 ↘	0.9 ↘	2.2 ↗	4.1 ↘

Source: Consensus Forecasts (CF)
Note: The arrows in the GDP and inflation outlooks indicate the direction of revisions compared to the last GEO.

The inflation outlooks for this year have been revised up for the euro area and China and down for Russia. In none of the advanced countries we monitor is inflation expected to be below the figures expected for this year in 2020. The dollar will depreciate at the one-year horizon against the currencies we monitor, except for a slight appreciation against the rouble. According to the May CF, the Brent crude oil price outlook moved only slightly higher at the 12-month horizon to just above USD 67/bbl (highest estimate USD 79/bbl, lowest estimate USD 50/bbl). The outlook for 3M USD Libor market rates is still slightly falling. 3M Euribor rates will remain negative at the end of 2020. The expected path of short-term rates is affecting the entire message contained in the yield curve slopes, as discussed in more detail in our May issue.

The chart in the May issue illustrates the paths followed by yield curve slopes in selected advanced countries. A comparison of the differences between the 10-year government bond yield and the 3-month Treasury bill yield reveals similar patterns in the USA, Germany and the UK, largely copying the business cycle. The yield curves have been flattening over the last ten years or so, implying that the business cycle has reached its late growth phase, with the probability of recession growing. In the USA, the difference between the 10-year and 3-month yields turned negative in March (for the first time since August 2007). In other countries, it is very close to zero, which means an almost horizontal yield curve. In Japan, where the yield curve has long followed a flattening trend (since around 2006), the yield curve became inverted for the first time in March 2016. Until then, the 3-month yield had always been lower than the 10-year bond yield. This reflects the Japanese central bank's more than 20 year long policy of low interest rates, which among other things is dampening growth of the short end of the yield curve.

Difference between the 10Y government bond yield and the 3M Treasury bill yield (bp)



Source: Bloomberg

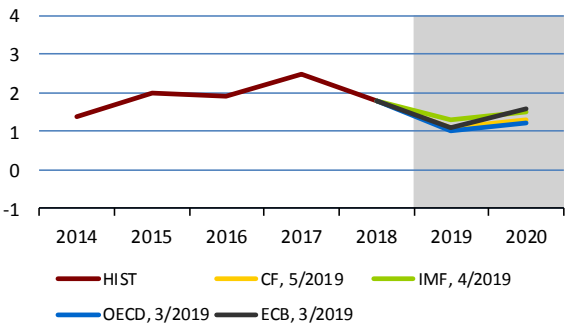
The May issue also contains a related analysis *The inverted yield curve in the USA: How much time is left until a recession?* This article contains a summary of the reasons that lead to the yield curve for fixed-income instruments having a negative slope. This situation – where shorter maturity debt instruments are generating higher returns than longer maturity ones – is unusual from the perspective of the liquidity preference theory. Given that in the past an inverted yield curve has reliably foreshadowed a recession in the USA, including a stock market correction, this article discusses whether similar developments can be expected again this time. It reveals whether the slope of the yield curve and the level of sentiment on stock markets can be used to identify the phases of the business cycle and hence also to estimate the timing of the next US economic recession.

II.1 Euro area

Economic growth in the euro area went up in 2019 Q1, but the outlook for the coming quarters remains uncertain. The euro area economy benefited in Q4 from a rebound in Germany (supported in particular by household expenditure and construction growth) and from the end of the recession in Italy. Germany grew by 0.4% quarter on quarter and Spain by a strong 0.7%. Overall, euro area GDP grew by 0.4% quarter on quarter. The fast growth unfolded amid relatively weak industrial production data, which in March recorded a month-on-month drop (and a year-on-year decrease of 0.5%). Based on leading indicators in manufacturing, no improvement can be expected in the near term. Despite improving slightly in April, the PMI in this sector has been in the contraction band since February. Nonetheless, manufacturing has recorded a cyclical downturn worldwide due to the tensions in trade relations between the USA and China. However, the labour market situation remains favourable. The seasonally adjusted unemployment rate in the euro area dropped again in March to 7.7%. This is having a positive impact on household consumption, as evidenced by, among other things, a 2.2% year-on-year rise in retail sales in Q1.

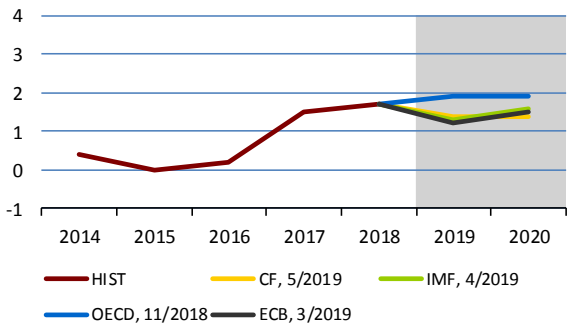
GDP growth is expected to slow this year and pick up slightly in 2020. The largest downward revisions by comparison with the first GDP growth estimates for this year, issued in January 2018 (see the chart on the next page), concern Germany and Italy. The revisions for the remaining euro area countries were not so large. CF expects full-year growth of only 0.8% in Germany, while the outlooks of the German government and the European Commission are even more pessimistic (0.5%). Soft leading indicators are not signalling any upswing in Germany either – the high level of uncertainty was confirmed in May by a drop in the ZEW economic sentiment indicator. The euro area economy is being negatively affected by the slowdown of the world economy, reflected in falling export growth due to the long-running disputes between the USA and China. The monitored institutions expect only slightly faster growth next year.

GDP growth, %



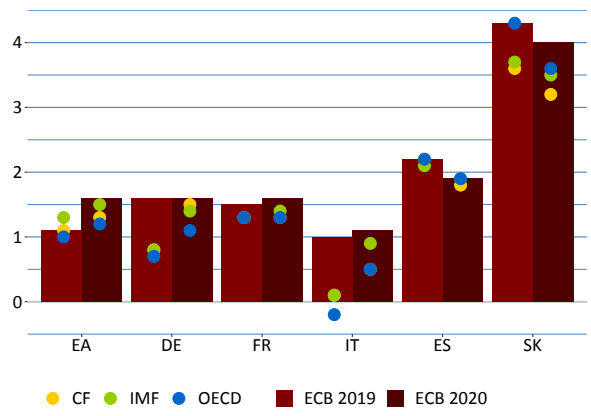
	CF	IMF	OECD	ECB
2019	1.1	1.3	1.0	1.1
2020	1.3	1.5	1.2	1.6

Inflation, %

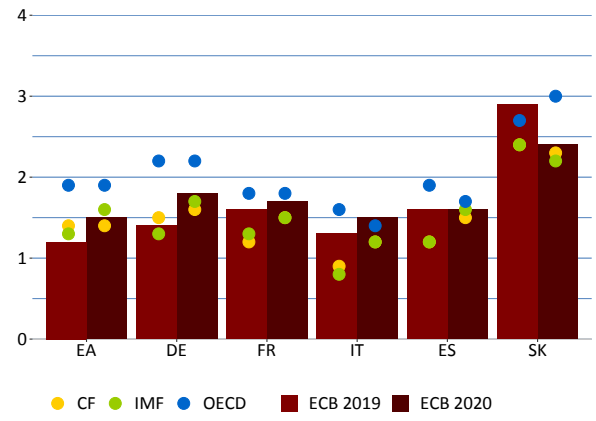


	CF	IMF	OECD	ECB
2019	1.4	1.3	1.9	1.2
2020	1.4	1.6	1.9	1.5

GDP growth in selected euro area countries in 2019 and 2020, %



Inflation in selected euro area countries in 2019 and 2020, %

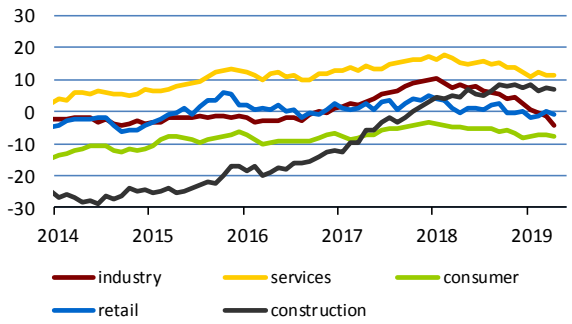


Note: Charts show institutions' latest available outlooks of for the given economy.

Inflation expectations in the euro area remain subdued. CF expects inflation of 1.4% this year and the next, in line with the European Commission's outlook and, in the case of this year, rather higher than the ECB's projection. Slightly higher growth is expected for Germany alone, although this is offset by lower inflation outlooks for France, Italy and Spain. Inflation in Slovakia is expected to reach 2.4% this year. Inflation rose to 1.7% in April, mainly on the back of energy prices. However, its other components went up as well. Core inflation therefore increased as well, from 0.8% in March to 1.3% in April. Many analysts nonetheless put this into context with the later Easter this year compared with 2018, which was reflected in lower inflation in March and higher inflation in April. Despite a tight labour market, wage growth remained subdued in 2018 Q4 and is not affecting inflation too much for the time being. Wage growth in the euro area was flat at 2.3%, while falling from 2.6% in Q3 to 2.1% in Germany.

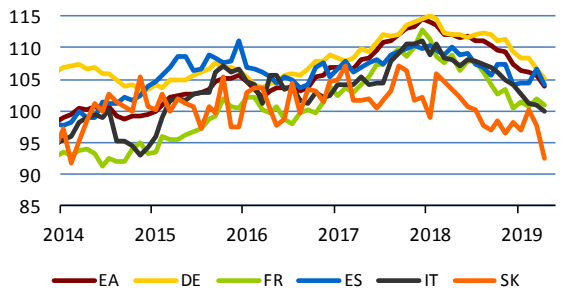
The 3M Euribor will stay at its current very low level at the one-year horizon. The outlook for 10-year government bond yields was little changed from the previous month as well. The long-term German government bond yield turned negative in early May, while CF expects it to rise to 0.2% at the three-month horizon and 0.4% at the one-year horizon. Monetary policy will remain accommodative. The ECB confirmed its monetary policy stance at its April meeting. Key interest rates will thus remain at the current level at least until the end of 2019. At the same time, the Board of Governors reiterated its commitment to reinvest the principal payments from maturing bonds for an extended period of time after the ECB starts to raise its key interest rates. At future meetings, the governors will also consider introducing measures to mitigate the possible side-effects of negative interest rates on banks' profitability. The ECB's next monetary policy meeting will take place on 6 June and will be hosted by the Lithuanian central bank.

Leading indicators



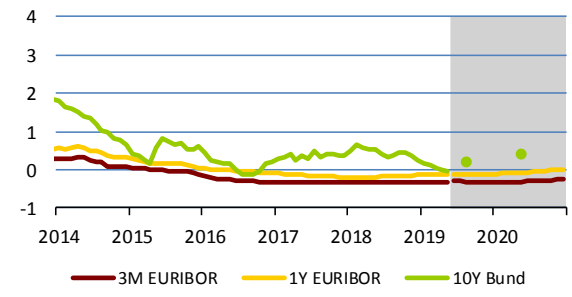
	industry	services	consum.	retail	constr.
2/19	-0.4	12.1	-7.4	-1.3	6.6
3/19	-1.6	11.5	-7.2	0.3	7.5
4/19	-4.1	11.5	-7.9	-1.1	6.7

Leading indicators



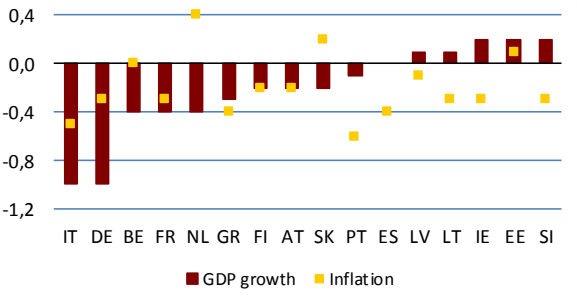
	EA	DE	FR	ES	IT	SK
2/19	106.2	108.4	100.8	104.4	101.2	100.1
3/19	105.6	106.6	102.0	106.7	101.0	97.7
4/19	104.0	105.1	101.0	104.1	100.0	92.5

Interest Rates, %



	04/19	05/19	08/19	05/20
3M EURIBOR	-0.31	-0.31	-0.31	-0.31
1Y EURIBOR	-0.11	-0.12	-0.12	-0.07
10Y Bund	0.01	-0.04	0.20	0.40

Reassessment of GDP growth and inflation outlooks for 2019 by CF since 1/2018, pp



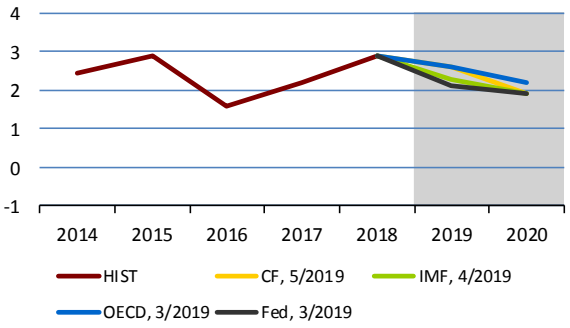
II.2 United States

Any hopes of a swift end to the trade dispute between the USA and China were snuffed out by another round of tariff hikes in early May. The USA increased tariffs on Chinese imports totalling USD 200 billion a year from 10% to 25% at the start of May. It is also considering imposing new tariffs on more Chinese imports worth USD 300 billion a year. The tariffs would thus apply to all imports from China to the USA. China responded by announcing it would impose additional tariffs on USD 60 billion in US imports as of June. According to President Trump, however, this is just "a little squabble" and an agreement is still not ruled out. The US has also threatened to introduce tariffs on EU car and auto-part imports, but the decision has been postponed again. The escalated trade disputes weighed heavily on financial markets.

Incoming economic data reduced concerns about a possible sharp slowdown in the USA this year. Financial markets were gripped by concerns about a possible recession in Q1, but the performance of the economy (GDP growth of 3.2% in quarter-on-quarter annualised terms) far exceeded expectations. The upswing was due mainly to a lower trade deficit and an increase in inventories. The labour market is also surprisingly robust. Non-farm payrolls rose by 263,000 in April and unemployment dropped to its lowest level since 1969 (3.6%). However, neither domestic demand nor industry looks so optimistic. Growth in industrial production has been slowing since September 2018 and leading indicators are also signalling a deterioration. After dropping previously, consumer confidence improved only a little, as did retail sales.

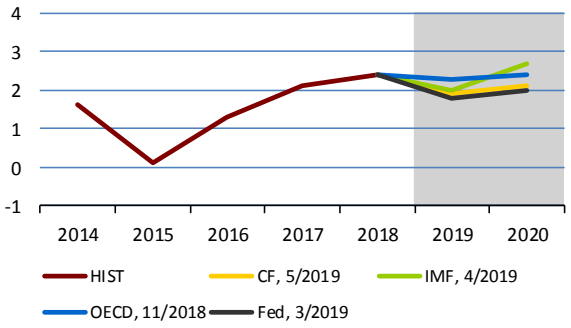
The May CF revised its GDP growth outlook for this year upwards. By contrast, the GDP growth and inflation outlooks for 2020 were lowered. The main uncertainties for next year concern continued US trade disputes and the robustness of domestic demand, while the inflation pressures close to the central bank's target are allowing it to leave monetary policy unchanged. The financial markets even expect monetary policy to be eased in 2020, while the US dollar will weaken slightly against the euro.

GDP growth, %



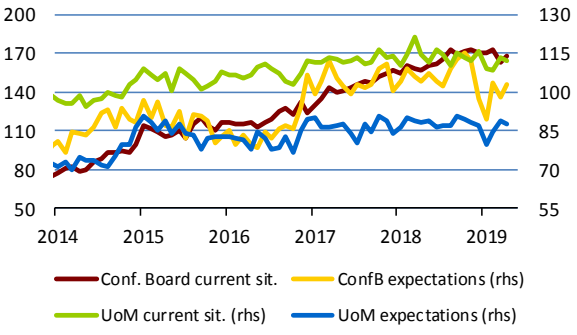
	CF	IMF	OECD	Fed
2019	2.6	2.3	2.6	2.1
2020	1.9	1.9	2.2	1.9

Inflation, %



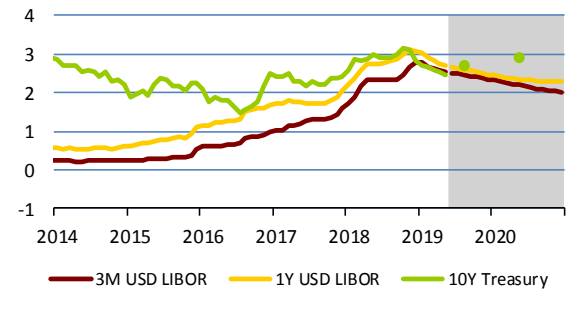
	CF	IMF	OECD	Fed
2019	1.9	2.0	2.3	1.8
2020	2.1	2.7	2.4	2.0

Leading indicators



	ConfB curr.	ConfB exp.	UoM curr.	UoM exp.
2/19	172.8	103.8	108.5	84.4
3/19	163.0	98.3	113.3	88.8
4/19	168.3	103.0	112.3	87.4

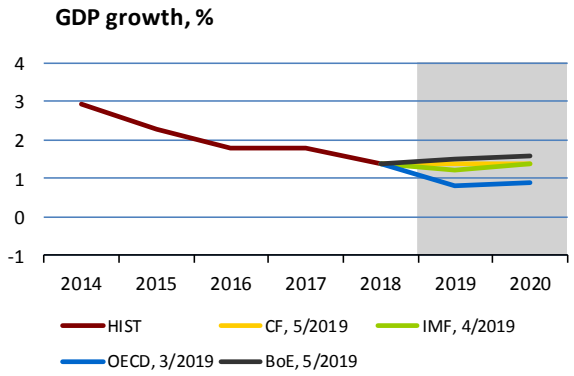
Interest Rates, %



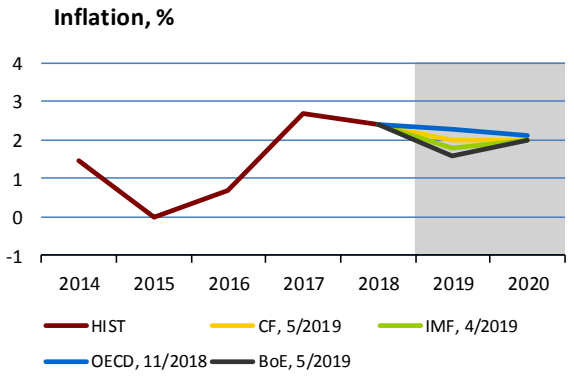
	04/19	05/19	08/19	05/20
USD LIBOR 3M	2.59	2.55	2.44	2.19
USD LIBOR 1R	2.74	2.74	2.59	2.35
Treasury 10R	2.53	2.45	2.70	2.90

II.3 United Kingdom

The British economy picked up as a panic attack hit just before the original Brexit date. GDP grew by 0.5% in Q1 (as against 0.2% in Q4) due to peaking efforts to stockpile in the face of a lack of clarity about the form and date of Brexit right up to the last minute. Stocks were built up on both sides of the Channel. British pharmaceutical production went up by 9.4% in Q1 as other EU countries tried to secure sufficient supplies of medicine in time. While total UK exports were unchanged (amid a drop in services exports and a rise in goods exports), imports rose by 6.8%. The trade deficit amounted to a record GBP 18 billion in Q1. A renewed drop in economic growth to 0.3% quarter on quarter is expected in Q2 (NIESR). The CF and BoE outlooks have been revised upwards for this year as a whole. According to the BoE, inflation will fall well below the target this year due to lower retail gas prices.



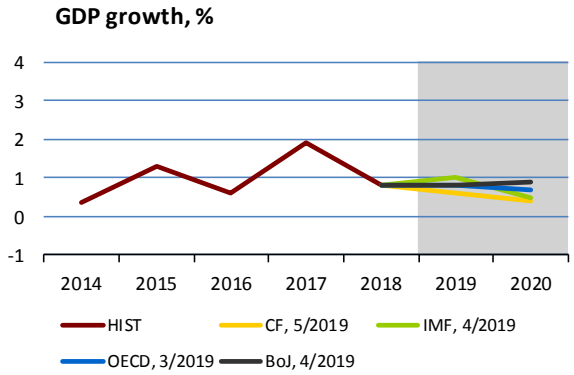
	CF	IMF	OECD	BoE
2019	1.4	1.2	0.8	1.5
2020	1.4	1.4	0.9	1.6



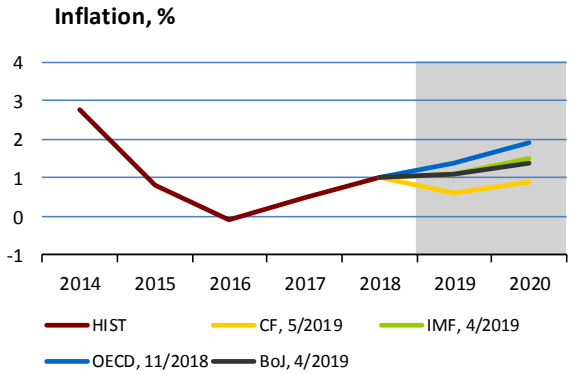
	CF	IMF	OECD	BoE
2019	2.0	1.8	2.3	1.6
2020	2.0	2.0	2.1	2.0

II.4 Japan

Short-term indicators in Japan worsened further in March. Industrial output dropped by 4.6% year on year (the largest fall since 2015) and also in month on month terms due to a decrease in production of cars and manufacturing equipment. New orders also fell. Japanese exports have been declining for four months now due to the slowing global growth and the ongoing trade war between the USA and China. The new CF and BoJ outlooks expect subdued GDP growth. The central bank forecasts a gradual rise in inflation from its current very low level (0.5% in March after 0.2% in January and February). This should be aided by an increase in consumption tax rate from 8% to 10% planned for October 2019. However, not even the BoJ believes inflation will return to the 2% target before the end of fiscal year 2021 (March 2022). Monetary policy will thus remain extremely accommodative at least through around spring 2020.



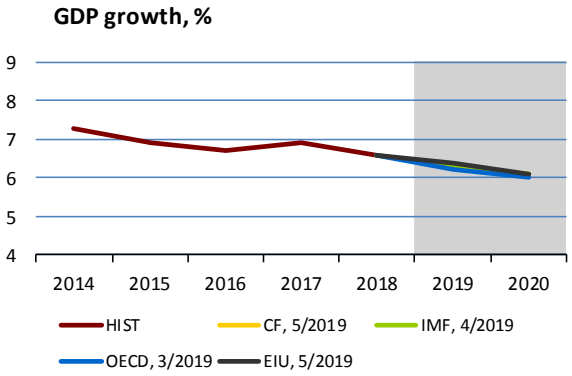
	CF	IMF	OECD	BoJ
2019	0.6	1.0	0.8	0.8
2020	0.4	0.5	0.7	0.9



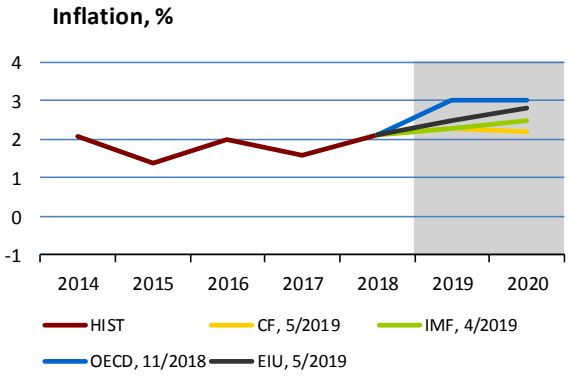
	CF	IMF	OECD	BoJ
2019	0.6	1.1	1.4	1.1
2020	0.9	1.5	1.9	1.4

II.5 China

The Chinese economy has so far proved resilient to the impacts of the trade disputes with the USA, but a further escalation of tensions may hinder continued economic expansion. The Chinese economy grew at the expected pace in 2019 Q1 (6.4% year on year), supported by a raft of government measures. Incoming data surprised on the negative side (weaker growth in retail sales and manufacturing in April). The question is whether there are still reserves to further ease fiscal and monetary policy to offset the potential introduction of tariffs on all China's exports to the USA. One option would be to let the Chinese currency weaken against the dollar, but this carries a risk of increased market volatility and capital outflows. The CF outlook for this year has been revised upwards for both growth and inflation; the new EIU forecast has increased the growth outlook.



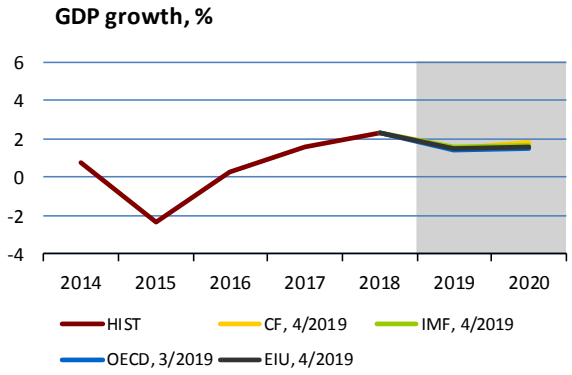
	CF	IMF	OECD	EIU
2019	6.3	6.3	6.2	6.4
2020	6.1	6.1	6.0	6.1



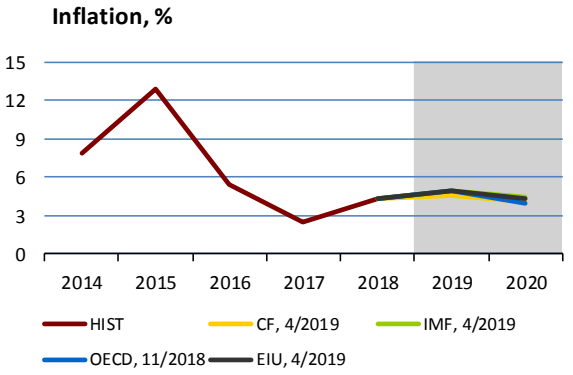
	CF	IMF	OECD	EIU
2019	2.3	2.3	3.0	2.5
2020	2.2	2.5	3.0	2.8

II.6 Russia

The Russian economy slowed sharply at the start of this year. Annual GDP growth decreased to a mere 0.5% in Q1 (from 2.7% at the end of 2018) according to the flash estimate. Year-on-year growth in industrial production fell from more than 4% in February to 1.2% in March, returning broadly to its January level. The April PMI dropped slightly but remains in the expansion band in both manufacturing and services. Inflation slowed slightly in April (to 5.2% year on year). The central bank is keeping the key rate at 7.75% but does not rule out a cut in 2019 Q2 or Q3. According to the RCB forecast, inflation will return to the 4% target in 2020 H1. This is broadly in line with the April CF, which lowered its inflation outlook. The GDP outlook remained unchanged.



	CF	IMF	OECD	EIU
2019	1.5	1.6	1.4	1.5
2020	1.8	1.7	1.5	1.6



	CF	IMF	OECD	EIU
2019	4.6	5.0	5.0	4.9
2020	4.1	4.5	4.0	4.3

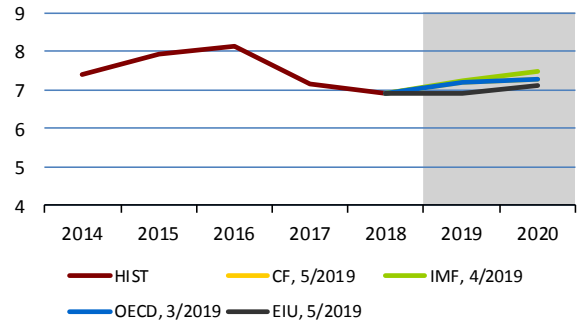
II.7 Developing countries in the spotlight

The Indian economy continues to slow. In 2018 Q4, it slowed by 0.4 pp to 6.6% year on year due to weaker private and government consumption. Higher oil prices and tighter financial conditions are also playing a role. In 2018 as a whole, the Indian economy grew by 7.4%.[1] The trade deficit, which is strongly affected by dependence on energy imports, increased further last month due to seasonal factors, contributing considerably negatively to GDP. Consumer price inflation remained at 2.9% year on year in April despite a shift of the Indian central bank's (RBI) monetary policy to a more accommodative stance. In April, the RBI cut its key interest rate by 25 bp for the second time in a row to the current 6.0%.

The Prime Minister Modi secured his second consecutive single-party parliamentary majority. The markets took the results of the election positively because India would not avoid complicated negotiations to form a government otherwise. The re-elected government will face the challenge of dispersing doubts about the independence of the Indian central bank and the reliability of the official economic data. It will also have to think of ways to boost private investment, which has been weakening for some time. The indebtedness of state banks and a lack of liquidity are equally important issues. Despite the 50 bp reduction of the key interest rate this year, mortgage prices and deposit rates are almost unchanged. The RBI is thus trying to inject liquidity into the Indian economy, for example by means of forex swaps.

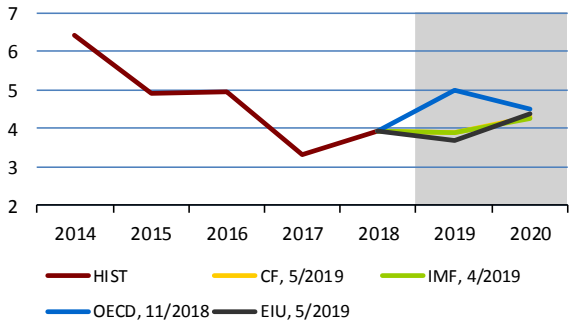
According to many international organisations, GDP growth will drop slightly in 2019 Q1. The same is suggested by weak monthly statistics for industry and the high trade deficit. Consumer price inflation should gradually rise and fluctuate around the RBI's 4% target for the rest of this year. CF estimates that the exchange rate will stay below 70 INF/USD due to trade wars and a further expected cut in domestic interest rates at the RBI's June meeting. An escalation of the conflict between the USA and China would hit India primarily via an outflow of foreign capital, which could worsen the already poor situation of a lack of liquidity and access to financing.

GDP growth, %



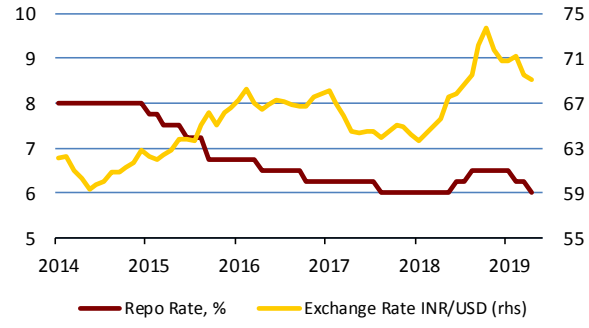
	CF	IMF	OECD	EIU
2019	7.2	7.3	7.2	6.9
2020	7.3	7.5	7.3	7.1

Inflation, %



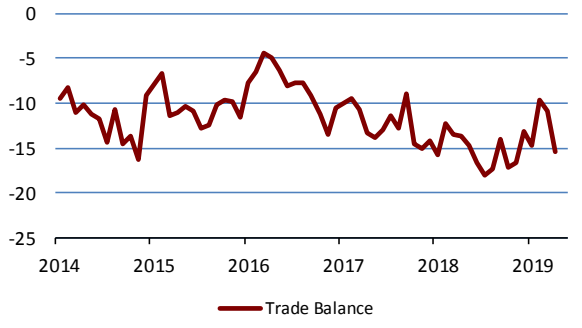
	CF	IMF	OECD	EIU
2019	3.9	3.9	5.0	3.7
2020	4.3	4.2	4.5	4.4

Key Interest Rate and Exchange Rate



	Repo Rate, %	Exchange Rate INR/USD
2/2019	6.3	71.22
3/2019	6.3	69.48
4/2019	6.0	69.12

Trade Balance, $ bn

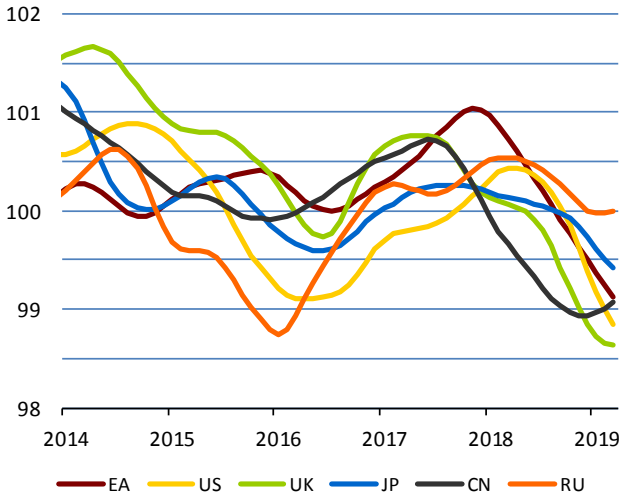


	Trade Balance
2/2019	-9.60
3/2019	-10.89
4/2019	-15.33

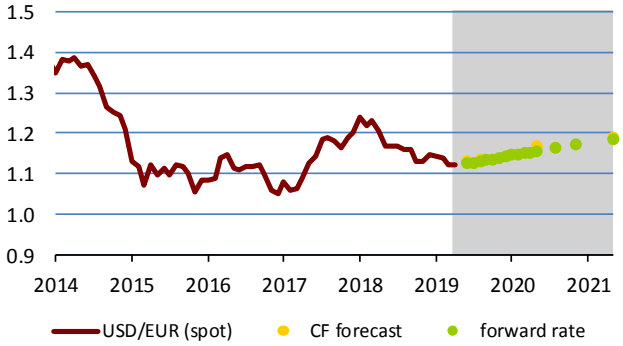
[1] Outcome for the calendar year (in the chart: the data and outlooks for the fiscal years beginning in April)

III. Leading indicators and outlook of exchange rates

OECD Composite Leading Indicator

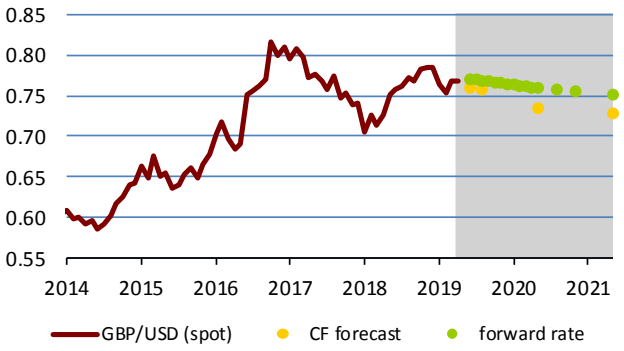


The US dollar (USD/EUR)



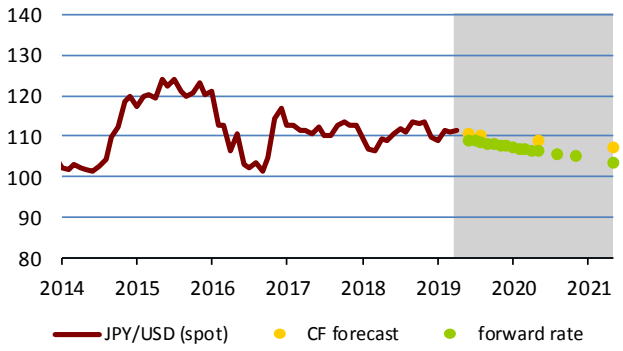
	13/5/19	06/19	08/19	05/20	05/21
spot rate	1.124				
CF forecast		1.131	1.136	1.167	1.189
forward rate		1.125	1.131	1.155	1.185

The British pound (GBP/USD)



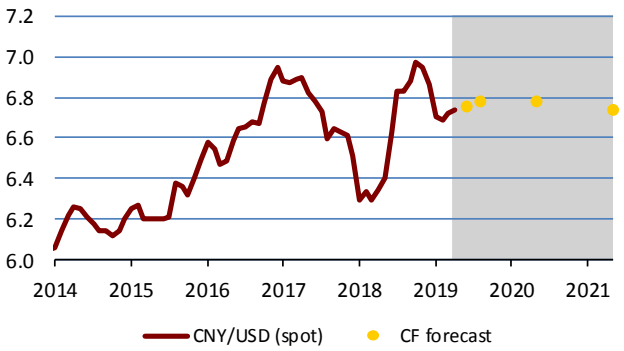
	13/5/19	06/19	08/19	05/20	05/21
spot rate	0.770				
CF forecast		0.759	0.756	0.734	0.729
forward rate		0.770	0.768	0.760	0.751

The Japanese yen (JPY/USD)



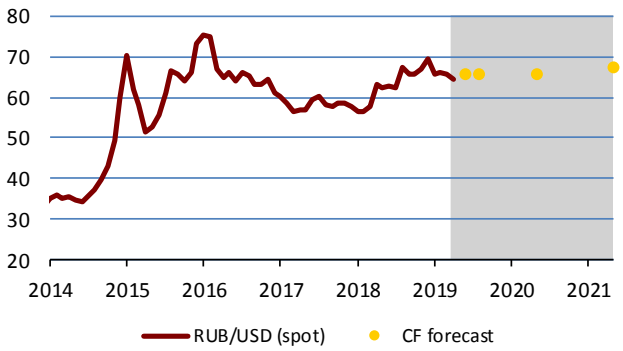
	13/5/19	06/19	08/19	05/20	05/21
spot rate	109.1				
CF forecast		110.5	110.0	108.7	107.3
forward rate		109.0	108.5	106.3	103.6

The Chinese renminbi (CNY/USD)



	13/5/19	06/19	08/19	05/20	05/21
spot rate	6.872				
CF forecast		6.757	6.779	6.778	6.736

The Russian rouble (RUB/USD)



	13/5/19	06/19	08/19	05/20	05/21
spot rate	65.41				
CF forecast		65.63	65.60	65.79	67.16

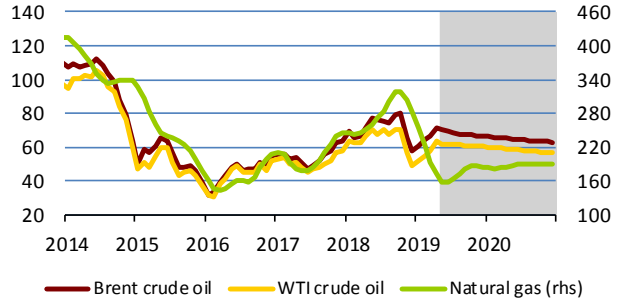
Note: Exchange rates as of last day of month. Forward rate does not represent outlook; it is based on covered interest parity, i.e. currency of country with higher interest rate is depreciating. Forward rate represents current (as of cut-off date) possibility of hedging future exchange rate.

IV.1 Oil and natural gas

The Brent crude oil price has been above USD 70/bbl since the start of April. It rose briefly to USD 75/bbl in late April after the US administration announced a plan to cancel all exemptions from the sanctions on Iranian oil imports. In retaliation, Iran threatened to block the Strait of Hormuz. The tense oil market situation was further complicated by a drop in supplies to Europe through the Russian Druzhba pipeline. The situation then calmed and the Brent price returned to USD 70/bbl. President Trump is pressing Saudi Arabia to up production, but OPEC intends to wait for the time being (partly due to strong growth in oil stocks in the USA). Nevertheless, Saudi Arabia has promised to satisfy all its customers' bids so as to make up for the shortfall in supplies from Iran. The trade war between the USA and China escalated in mid-May when both sides announced increases in tariffs on mutual imports. However, President Trump is optimistic and expects the negotiations to continue at the June G20 Summit in Japan. Moreover, concerns about a slowdown in global oil demand are being assuaged by a further escalation of the political situation in the Middle East, in particular attacks on Saudi oil infrastructure and tankers. In late April, hedge funds ended a long series of building net long oil positions and are starting to speculate on a fall in oil prices.

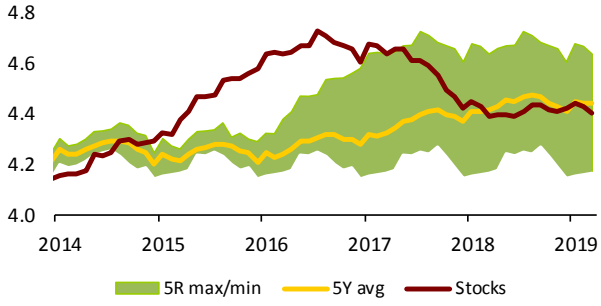
The EIA raised its forecast for the Brent crude oil price by USD 5/bbl. The price should thus average USD 70/bbl this year and USD 67/bbl next year. The increase reflects the tighter market since mid-2019 and bigger risks of supply disruptions. According to the EIA, global oil stocks will on average drop by 0.2 million barrels a day this year and rise by only 0.1 million barrels a day next year. The market curve for Brent oil futures became more negative at its short end, signalling an average price of USD 67.3/bbl and USD 64.6/bbl for this year and the next respectively.

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

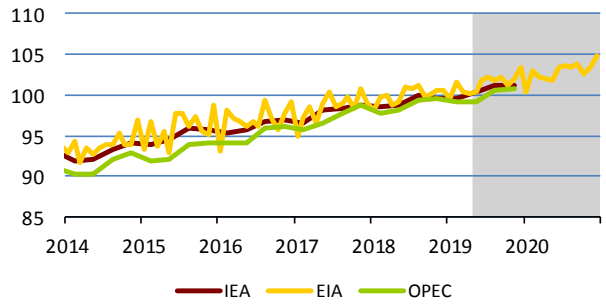


	Brent	WTI	Natural gas
2019	67.26	59.77	186.28
2020	64.56	58.36	188.07

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

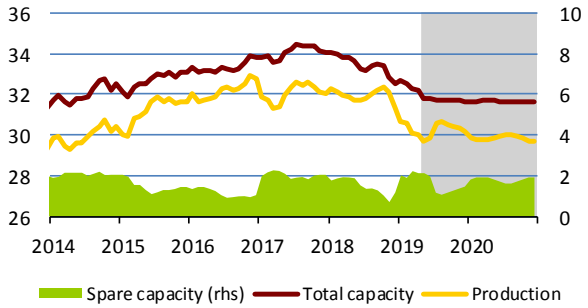


Global consumption of oil and oil products (mil. barrel / day)



	IEA	EIA	OPEC
2019	100.58	101.37	99.93
2020		102.89	

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



	Production	Total capacity	Spare capacity
2019	30.30	31.96	1.66
2020	29.85	31.66	1.81

Source: Bloomberg, IEA, EIA, OPEC, CNB calculation

Note: Oil price at ICE, average gas price in Europe – World Bank 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.

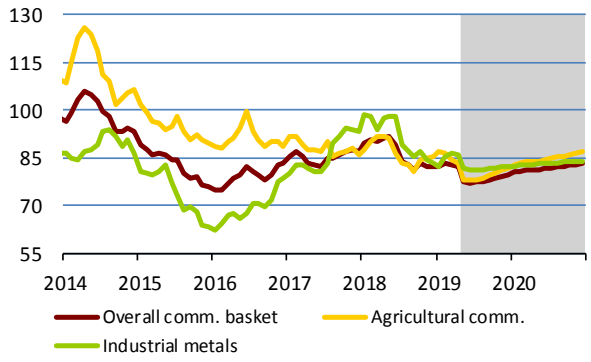
IV.2 Other commodities

After having fluctuated along a horizontal trend for ten months, the aggregate non-energy commodity price index dropped sharply in the first half of May, with both its components contributing. The contribution of the food commodity price sub-index to the drop in May was slightly bigger. On the other hand, this sub-index is the main contributor to the rising outlook for the overall index.

Prices of most base metals started to fall in early April, but the decline gathered pace at the end of the month. Optimism about a temporary stabilisation of Chinese industry as a result of the government's stimulation measures gradually ebbed. Moreover, the global manufacturing outlook deteriorated again in April, as signalled by the J.P.Morgan PMI, which fell from 50.5 to 50.3. Its new exports component improved slightly, but it remains in the contraction band with a figure of 49.0. A rise in stocks of some metals (such as copper) on the LME pushed their prices down. The downward pressure on metal prices increased in late April due to unsatisfactory progress in the trade negotiations between the USA and China. Only the price of iron ore moved in the other direction, rising sharply again in early April after a temporary consolidation during February and March. This was due to continued supply disruptions caused by tragedies and subsequent safety checks in Brazilian mines.

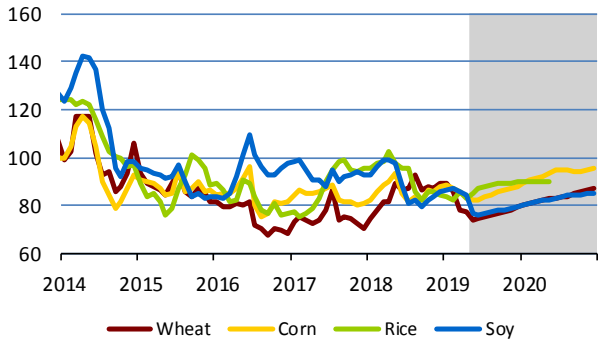
Prices of wheat and particularly soy also started to fall rapidly in mid-April. The soy price reached its lowest level since June 2007. The price of coffee also continued to trend downwards to its lowest level in many years. The price of pork climbed towards a seasonal high in April, while the price of beef recorded a sharp fall. The price of cotton dropped as well.

Non-energy commodities price indicies



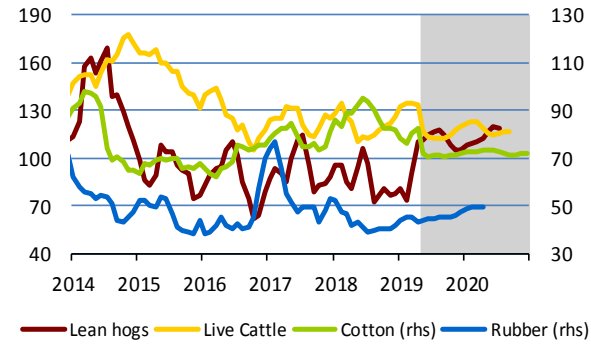
	Overall	Agricultural	Industrial
2019	79.7	81.4	82.8
2020	81.8	84.8	83.3

Food commodities



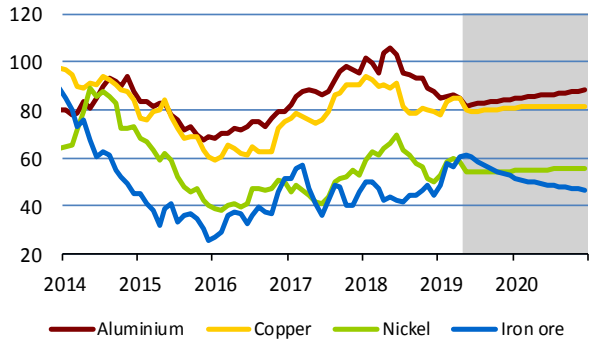
	Wheat	Corn	Rice	Soy
2019	78.6	85.5	86.8	80.4
2020	83.6	93.3	90.0	83.1

Meat, non-food agricultural commodities



	Lean hogs	Live Cattle	Cotton	Rubber
2019	104.1	121.1	74.0	44.9
2020	113.6	118.3	72.4	49.3

Basic metals and iron ore



	Aluminium	Copper	Nickel	Iron ore
2019	84.0	80.9	55.2	56.3
2020	86.5	81.3	55.2	48.8

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 inverted yield curve in the USA: How much time is left until a recession?[2]

Something unusual happened on the US bond market on 22 March this year, something that attracted a lot of interest and sparked concerns among many economists and investors worldwide. For the first time in a long time, the yield on 3-month US Treasury bills exceeded that on 10-year US government bonds. The slope of the yield curve for fixed-income US government instruments thus turned negative, with shorter maturity debt instruments generating higher returns than longer maturity bonds. In the past (the last time in August 2007) this has quite reliably signalled a recession in the USA, including a stock market correction. Can similar developments be expected again this time? This article sets out to identify the phases of the business cycle using the slope of the yield curve and the level of sentiment on stock market. It also attempts to estimate the timing of the next recession in the USA.

The slope of the yield curve

The yield curve describes the relationship between interest income and bond maturity. The slope of the curve is determined by supply and demand for bonds. The supply-side agent in the case of US government debt instruments is the Department of the Treasury, which regularly announces auctions for such instruments. The instruments are broken down by maturity into 3- to 6-month Treasury bills and 2-, 5-, 10- and 30-year government bonds. On the demand side are a whole range of agents. Debt instruments with shorter maturities are purchased mainly by commercial banks and conservative retail investors. Instruments with longer maturities, i.e. bonds with a maturity of ten years or more, are bought mostly by foreign central banks, governments and insurance companies. The yield curve is normally upward sloping, with longer maturity bonds generating higher interest income than shorter maturity ones. This phenomenon can be explained by the liquidity preference theory, according to which investors demand higher interest income (premium) on securities with longer maturities to reflect their higher risk. However, the opposite situation arises in some periods – often accompanied by higher inflation and higher interest rates – when shorter maturity bond yields are higher than longer maturity ones. In such cases, when the yield curve is falling, we speak of an inverted yield curve.

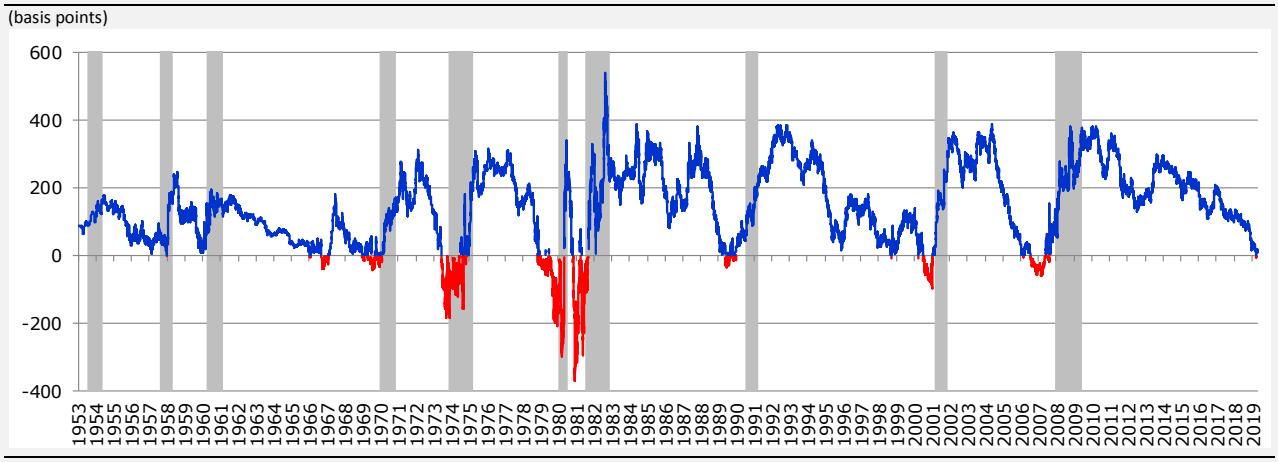
An inverted yield curve and the investor behaviour that leads to such an extreme situation can be explained using the expectations hypothesis of the term structure of interest rates. This hypothesis says that the current yield curve slope is determined by expected future interest rates. So, if short-term rates are above long-term ones, the market for some reason expects a future economic downturn and hence assumes that long-term rates will fall. Investors' decision-making in an environment of uncertainty and elevated risk leads to capital being transferred from more risky assets (shares) to less risky ones (government bonds). As demand for bonds rises, bond prices increase and bond yields conversely fall. To some extent, the yield curve slope thus reflects market sentiment, which is forward-looking.

The slope of the yield curve is often mentioned in the literature in the context of the forecasting of phases of the business cycle and the evolution of other economic variables. The ability to predict phases of the business cycle using the yield curve slope was first mentioned in Laurent (1988) and Estrella and Hardouvelis (1991). Moreover, Harvey (1988) and Estrella and Hardouvelis (1991) state that differences in yields across yield curve maturities can also be used to forecast other economic variables (such as consumption and investment growth). Estrella and Mishkin (1998) confirm that the yield differential is a strong predictor of recessions one year ahead in the long run. Internationally, however, the ability of the yield curve slope to predict future recessions has not been clearly confirmed (unlike in the case of the USA). Chinn and Kucko (2015) conclude that the yield differential has relatively good predictive power for forecasting recessions in the cases of Canada and Germany, but worse power for Japan and Italy. Michl (2018) also mentions the negative slope of the US yield curve as a warning sign of an approaching recession. Michl notes that the last seven recessions in the USA were preceded by an inverted yield curve, i.e. a negative difference between the interest rates on the 10-year US government bond and the 3-month T-bill. Brainard (2018) shows that a flat or inverted yield curve on the bond market can signal that short-term interest rates are too high relative to the current position of the economy in the cycle and may thus represent a risk of it being dragged into a recession. However, Yellen (2019), for example, takes the view that the current negative slope of the US yield curve is signalling only an economic slowdown, not an imminent recession. According to Yellen, the current inverted yield curve may signal the need for the US central bank (the Fed) to cut its key interest rates. Moreover, Yellen believes that there is now a tendency for the yield curve to be very flat. A study by Rizzi and Mueller-Glissmann (2019) contains a similar conclusion. Based on the proportion of the yield curve inverted since 1975 across all maturities, they argue that the current degree of US yield curve inversion has not yet reached parameters comparable with those which preceded past recessions.

[2] Author: Martin Motl (Martin.Motl@cnb.cz). The views expressed in this article are those of the author and do not necessarily reflect the official position of the Czech National Bank.

The difference between the yields on the 10-year US government bond and the 3-month Treasury bill is commonly used in the literature to illustrate the yield differential between long and short maturity instruments. Chart 1, containing daily data running from 1953 to the end of April 2019, shows that past recessions (grey areas) have often been preceded by negative values of this difference, with the 3-month T-bill yield higher than the 10-year bond yield. This situation has occurred in the US economy less than 10% of the time over the past 65 years. However, it arose again on 22 March 2019. Despite lasting just five consecutive trading days (the slope of the yield curve then turned positive again), it was the first time this had happened since 9 August 2007.

Chart 1 – Difference between the 10-year US government bond yield and the 3-month Treasury bill yield

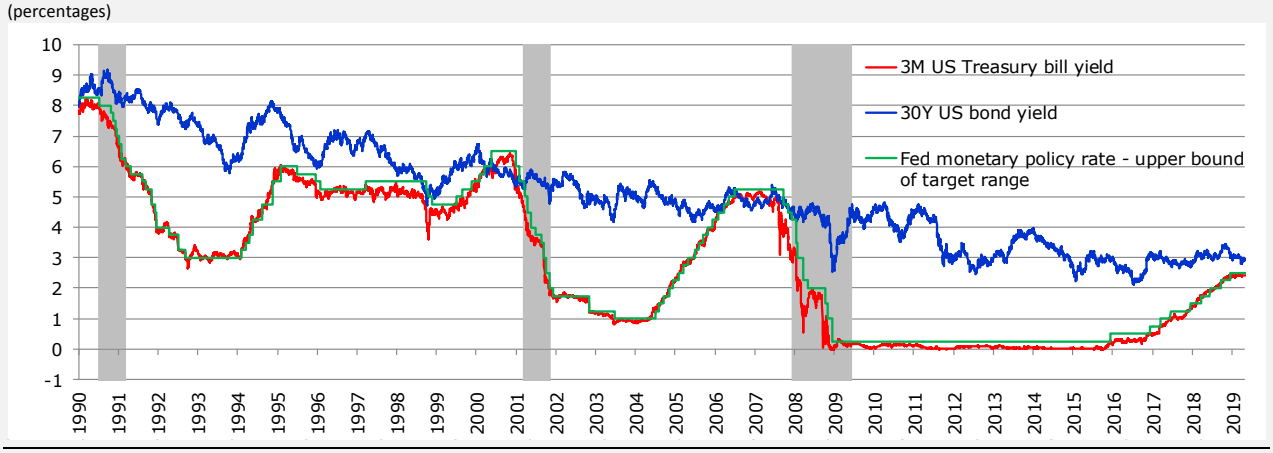


Source: Federal Reserve Bank of St. Louis (FRED Database), National Bureau of Economic Research, Bloomberg, CNB calculations.
Note: Grey areas show periods of recession in the USA according to data from the National Bureau of Economic Research (NBER). The blue line represents periods when the yield curve was rising and the red line periods when the difference between 10Y and 3M yields was negative and the yield curve was falling.

Volatility on the US stock market

A significant inverse statistical relationship between future stock market volatility and the yield curve slope, which is strongly affected by Fed monetary policy, can be observed in the historical data. The Fed directly affects the short end of the yield curve using short-term interest rates as its main instrument (see Chart 2). It also indirectly affects the yield curve at its longer end through market agents' inflation expectations, formed on their perceptions of the central bank's actions.[3] A period of a steeply rising yield curve thus reflects accommodative Fed monetary policy (a falling short-term interest rate). In such periods, stock markets are optimistic, share prices are set for long-term growth and volatility is low. By contrast, periods of a very flat or inverted yield curve reflect tight monetary policy (a rising short-term interest rate), which negatively affects firms' profits. This then manifests in growing stock market volatility.

Chart 2 – The Fed's key short-term interest rate and 3-month and 30-year US Treasury yields



Source: Bloomberg.

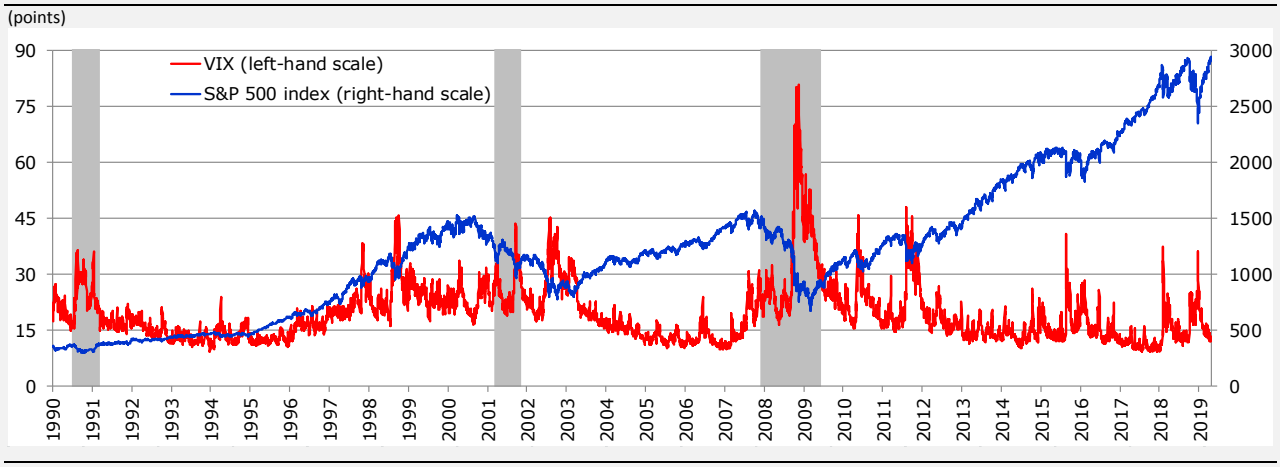
[3] Central bank credibility is another important factor affecting the longer end of the yield curve – see Smets and Tsatsaronis (1997).

Stock market volatility can be measured using the volatility index (VIX), which is calculated in real time and represents the expected price volatility of the S&P 500 stock index over the next 30 days. The VIX was unveiled in 1993[4] and initially only measured the implied volatility of at-the-money S&P 100 options.[5] In 2003, however, the Chicago Board Options Exchange (CBOE) started to publish this index based on the broader S&P 500,[6] which reflects the dynamics of the US stock market as a whole. It simultaneously changed the calculation method, which now includes out-of-the-money options, i.e. options at strike prices with a delta of less than 50, in addition to the implied volatility of call and put at-the-money option prices. As regards the time to expiration of the index components, the VIX only contains call and put options with more than 23 days and less than 37 days to expiration. Moreover, the time series since 1990 was consistently recalculated when the new calculation method was introduced.

In terms of technical construction, the VIX is unique in that it approximates the level of future stock market volatility based on the implied volatility derived from call and put option prices. It thus does not measure the same type of volatility as most other indicators, which derive it solely from historical data. The VIX rises in times of expected greater uncertainty (and hence greater stock price volatility), while staying low in calm times. It thus represents a measure of market risk and investor sentiment across all sectors of the economy and is therefore often referred to as the "Fear Index".

There is an inverse relationship between the S&P 500 and the VIX most of the time. Using daily data from 1990 to 30 April 2019, Chart 3 shows that this negative relationship applies about 80% of the time. The VIX tends to rise when the stock market is falling. Conversely, implied volatility levels are stable or falling when stock prices are rising. This is due to the construction of the VIX, which is derived from the implied volatility of option prices. The VIX goes up when demand for options on the market is strong. This usually happens during stock market corrections as investors, who mostly hold long positions, rapidly buy put options to hedge their portfolios. By contrast, demand for put options goes down when the stock market is rising and the VIX falls.

Chart 3 – The VIX and the S&P 500



Source: Bloomberg.

Relationship between the yield curve slope and US stock market volatility

The relationship between the yield curve slope and the volatility level on the US stock market (VIX) can be illustrated using a specifically modified scatter plot taking the rate of US economic growth into account. The x-axis shows the value of the VIX, which represents the level of investor sentiment on the US stock market. A movement to the right along the x-axis means growth in volatility. The y-axis shows the difference between the yields on the 30-year US government bond and the 3-month Treasury bill. This difference between the two most distant maturities thus captures the behaviour of the yield curve as a whole. Growth in this difference (an upward movement along the y-axis) means that the growth in the long-term yield is increasing relative to the short-term one, i.e. the slope of the yield curve is rising more steeply. Conversely, a decrease in this difference represents growth in the short-term yield relative to the long-term one, which leads to a flattening of the yield curve (a downward movement along the y-axis). The third dimension of this chart is a colour map depicting quarter-on-quarter US real GDP

[4] See Whaley 1993.

[5] The index calculated using the original methodology, measuring the implied volatility of the S&P 100, is published to this day as the VXO index.

[6] It also includes sectoral sub-indices which show the condition of various market sectors and branches. The weights for the individual shares and sectors are regularly revised on the basis of their current market shares.

growth for each observation on the x- and y-axes of the scatter plot. As economic growth starts to rise from the low levels recorded during a recession, the dots in the chart gradually change colour from blue-green to orange-purple, which represents the peak of the business cycle, when the economy is above its potential.

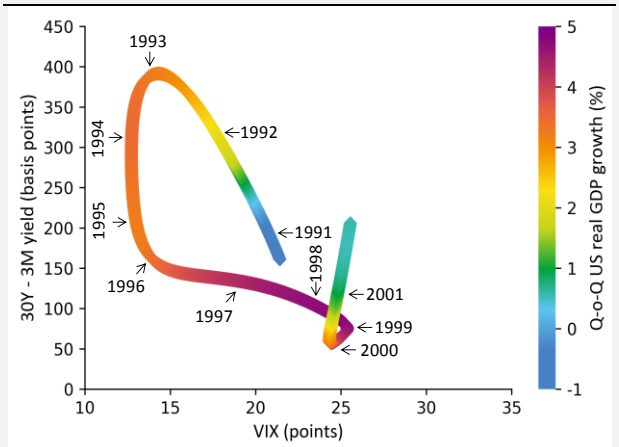
The following scatter plots show the course of the three most recent business cycles in the USA, including the current, still ongoing one. Daily data from November 1990 to the end of March 2019 were used to show the volatility levels and yield curve slope. Due to the very high volatility of the daily data, particularly in the case of the VIX, which reflects day-to-day changes in investor sentiment, all the input time series were smoothed using the Hodrick-Prescott filter, as were the quarter-on-quarter US GDP growth data, which are available at quarterly frequency. The diagrams generated in this way, describing the relationship between the yield curve slope and volatility levels on the stock market, at first glance form distinct, regularly repeating cycles going anticlockwise (see Charts 4–6).

This model of behaviour, reflecting the business cycle, can be divided into four phases:

- **Recession** – economic growth falls, inflation slows, short-term interest rates decrease and the slope of the yield curve rises steeply amid very high stock market volatility.
- **Early growth phase/recovery** – economic growth starts to pick up amid a gradual rise in inflation and stable interest rates, the slope of the yield curve rises and stock market volatility starts to fall.
- **Middle growth phase** – both inflation and interest rates rise amid stable economic growth, the yield curve starts to flatten and stock market volatility is low.
- **Late growth phase** – the rate of economic growth reaches its peak, both inflation and interest rates are high, the slope of the yield curve is zero to negative and stock market volatility rises on concerns of a slowdown in economic growth and an approaching recession; investors therefore move their investments into less risky assets, causing the stock market to correct from its highs.

The first cycle describes the period from November 1990 to July 2001, which was characterised by the burst of the dotcom tech bubble at its end (see Chart 4). The 1990s went down in the history of the US economy as a time of strong economic growth, steady job creation, low inflation, rising productivity and a surging stock market. The US economy also proved resilient to negative external shocks in the second half of the 1990s, when several financial crises occurred around the world.[7] The increasing risk in the global economy was reflected on the US stock market in the form of several minor corrections, including a sharp rise in volatility and a flattening of the yield curve. At the end of the 1990s, the US stock market experienced a surge in technology stock prices, even though tech firms' revenues were rising at a much slower rate. A significant tightening of Fed monetary policy between June 1999 and May 2000, when the short-term interest rate rose from 4.75% to 6.50%, probably caused the tech bubble to burst and led to a severe stock market correction. This triggered a recession and unemployment growth in the USA, to which the Fed responded by cutting interest rates sharply. In a situation of high stock market volatility, this resulted in a rapid rise in the yield curve – see the upward vertical shift on the y-axis in the chart.

Chart 4 – First cycle: November 1990–July 2001

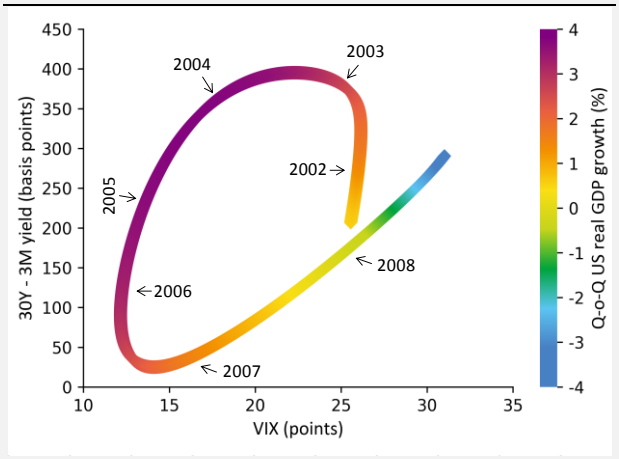


Source: Bloomberg, CNB calculations.
Note: The time series were smoothed using the Hodrick-Prescott filter.

[7] Mexico (1995), Asia (1997), Russia (1998) and Argentina (1999).

The second cycle, describing the period from August 2001 to September 2008, ended for a change with a property bubble burst (see Chart 5). This time, the recession was caused mainly by extreme price growth on the property market during the middle growth phase in 2003–2005. It was also partly due to insufficient banking regulation and supervision and to the extremely accommodative monetary policy of the Fed,[8] which cut its key interest rate to just 1% in this period. In mid-2004, the Fed started to tighten its monetary policy significantly, to 5.25% in mid-2006. This caused the yield curve to flatten rapidly – its slope turned negative that year for the first time since the previous recession in 2001. Property prices thus stopped rising and in 2007 started to fall. This also led to very fast growth in stock market volatility. The subsequent panic peaked in September 2008 with the fall of Lehman Brothers. Unlike American International Group (AIG), one of the world's biggest insurance companies, which managed to negotiate a rescue loan, Lehman Brothers failed to agree a bail-out with the US administration and the Fed. The fourth largest US investment bank in terms of market capitalisation thus became the largest bankruptcy in US history and also the first victim of the mortgage crisis, which ended in an extremely deep recession.

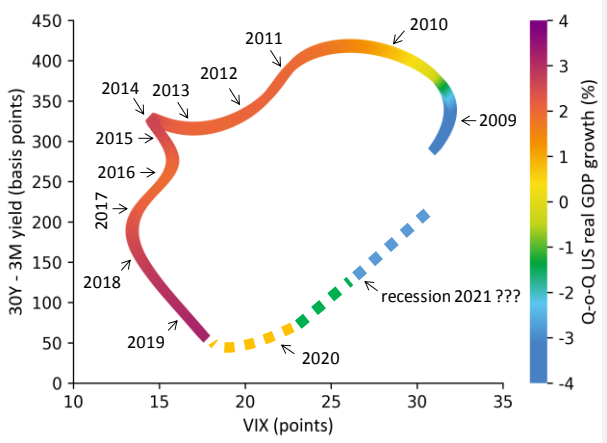
Chart 5 – Second cycle: August 2001–September 2008



Source: Bloomberg, CNB calculations.
Note: The time series were smoothed using the Hodrick-Prescott filter.

The third and last cycle, which is still ongoing, describes the period from October 2008 to the end of March 2019 (see Chart 6). The current cycle started with an economic expansion in mid-2009 and looks set to be the longest cycle in the past 170 years. A slow rate of economic growth in the recovery phase, in a situation where interest rates had reached the zero lower bound in December 2008, led the US central bank to deploy unconventional monetary policy in the form an asset purchase programme known as quantitative easing (QE). The three rounds of QE, lasting until the end of 2014, ultimately led mainly to a rise in bond prices and a drop in borrowing costs, and also to stock price growth and a fall in stock market volatility, rather than to accelerating growth and inflation. The Fed's purchases of longer maturity bonds resulted in some distortion of the yield curve. The administratively created demand artificially depressed yields at the long end of the yield curve. With the Fed's key rates stable at the zero lower bound, this led to a flattening of the yield curve. These measures thus extended the period of accommodative monetary policy, also contributing in large measure to the extension of the current cycle. The Fed made the first increase in its key interest rate in the post-crisis period in December 2015 and continued to tighten monetary policy gradually until the latest hike in December 2018. The target range for the Fed's short-term interest rate has been at 2.25%–2.50% since then. The tightening of Fed monetary policy in this period was accompanied by a reduction of the yield curve slope, which eventually turned negative.

Chart 6 – Third cycle: October 2008 – still ongoing



Source: Bloomberg, CNB calculations.
Note: The time series were smoothed using the Hodrick-Prescott filter.

The current position of the US bond and stock market in the cycle is thus very similar to a late growth phase, complete with rapid economic growth. In the past, this phase was observed in 1997–1999 and 2006–2007. This contention is supported by a recent statement made by the Fed, which, after leaving the key interest rate unchanged at its policy meeting on 1 May, said that further interest rate increases are unlikely in the months ahead. Likewise, the yield curve is now extremely flat, the difference between the yield on 10- and 30-year government bonds and that on 3-month T-bills being almost zero. The implied volatility of options in the broad S&P 500 stock index is now rising only gradually from very low levels and the stock market is currently at a historical high.

The next stage of the ongoing cycle is the recession phase, which could occur around 2021. This potential future continuation of the current cycle is shown as a dotted line in Chart 6. The chart assumes

[8] See Taylor (2009).

that the slope of the yield curve will turn more negative, even though the Fed will no longer raise its policy rate (and the short end of the yield curve will thus remain stable). This will be due to a decline in inflation expectations, reflecting the expected economic slowdown, which will lead to a drop in yields at the longer end of the yield curve through increased demand for less risky assets (longer maturity bonds). Stock market volatility will continue to rise due to a change in the behaviour of investors, who will increasingly hedge against a stock market correction (by buying put options) in expectation of an economic downturn. The big unknown at the moment is which factor will trigger the crisis this time. However, the inverted yield curve is a signal from the market that a recession may not be far off. The timing depends on how fast the combination of a flat yield curve and rising stock market volatility will tighten the credit channel in some sectors of the economy. A credit squeeze will put greater downward pressure on economic growth, forcing the Fed to start easing monetary policy again. This in turn will push the short end of the yield curve down faster than the longer end and the slope of the yield curve will start to rise again. The rate of growth of US stock market volatility will thus depend on the extent to which stock market investors fear a future recession and on the expected depth of the stock market correction.

Conclusion

The use of the yield curve to predict future recessions is a simple alternative to complex economic modelling. Information from the government bond and stock markets can be used to predict sudden events such as recessions, which are otherwise very hard to predict. There is a wealth of literature on the relationship between the yield curve and recessions. It started to emerge in the 1980s in response to the inability of complex economic models to predict sudden falls in economic activity.

An inverted yield curve may signal the risk of a recession occurring in the next 12 to 24 months, as was the case of the latest seven recessions. However, there have been periods when the yield curve has flattened significantly or become inverted without signalling an imminent recession. This happened, for example, between 1953 and 1971, a period characterised by low yields and a flat yield curve. Such a pattern in the current cycle is supported, on the one hand, by low short-term interest rates, which have been below their long-term equilibrium levels for several years now (see Komárek, 2019), and, on the other hand, by the impacts of quantitative easing, which have lowered the longer end of the yield curve in the post-crisis period. In such an environment, the yield curve can easily invert without necessarily signalling an approaching recession, as was the case in 1966.

There are therefore reasons to believe at present that the current situation may differ from previous cycles, as long-term interest rates have been affected by the Fed's unconventional monetary policy (QE). The global financial crisis and the subsequent sharp economic downturn forced the Fed to ease monetary policy rapidly. In the years following the gradual decline of its key interest rate to the zero lower bound, the Fed took the unprecedented monetary policy step of making massive purchases of longer maturity bonds. Both these factors – the zero lower bound (and the Fed's inability to further lower the short end of the yield curve) and quantitative easing (pushing down the longer end of the yield curve) – thus exerted artificial pressure for an overall flattening of the yield curve. Bonis, Ihrig and Wei (2017), for example, estimate that the three consecutive QE programmes resulted in a reduction of the US 10-year government bond yield of about 100 basis points. These measures may thus have distorted the information value of the US yield curve. By contrast, the Fed's current monetary policy may be having a neutral effect on the yield curve slope. On the one hand, the Fed is tightening monetary policy by raising its short-term monetary policy rate, which is being reflected on the market in a rise in the short end of the yield curve. On the other hand, we are simultaneously seeing a reduction in the Fed's balance sheet and a decrease in exposures of longer maturity bonds bought by the bank in the course of quantitative easing. This is conversely pushing up yields at the longer end of the yield curve. From this point of view, the nature of the current business cycle is unique by comparison with past cycles.

Despite some differences, however, similar trends to those in previous cycles have been identified in the current one. As shown by data on the difference between the yields on 30-year bonds and 3-month T-bills in conjunction with the implied volatility of S&P 500 options, the US economy can be quite clearly identified as being in a late growth phase of the business cycle using this relationship. This phase is characterised by a tightening of Fed monetary policy, reflected in a relatively steep rise in short-term yields relative to long-term ones. This is resulting in the yield curve flattening significantly and even inverting into a negative slope. Economic growth has peaked, US stock indices are at historical highs and stock market volatility is starting to increase gradually from a very low level. The very flat/inverted yield curve is indicating that investors expect economic growth to slow, and may also be signalling that the Fed has gone too far in tightening monetary policy. However, it is difficult to say how much time is left until a recession phase after the yield curve inversion.

Taking the current phase of the cycle into account, an analysis of previous economic cycles in the USA suggests that the recession is not very likely to happen either this year or the next and seems more likely to start in 2021 at the earliest.

References

Brainard, L. (2018): "Sustaining Full Employment and Inflation around Target." Speech at the Forecasters Club of New York, New York, 21 March 2018.

Bonis, B., Ihrig, J. E., Wei, M. (2017): "The Effect of the Federal Reserve's Securities Holdings on Longer-Term Interest Rates." GMU Working Paper in Economics, 20 April 2017.

Chinn, M., Kucko, K. (2015): "The Predictive Power of the Yield Curve across Countries and Time." International Finance, 18(2), pp. 129–56.

Estrella, A., Mishkin, F. (1998): "Predicting U.S. Recessions: Financial Variables As Leading Indicators." Review of Economics and Statistics, 80(1): 45–61.

Estrella, A., Hardouvelis, G. (1991): "The Term Structure As a Predictor of Real Economic Activity." Journal of Finance, 46(2): 555–576.

Harvey, C. (1988): "The Real Term Structure and Consumption Growth." Journal of Financial Economics, 22(2): 305–333.

Komárek, L. (2019): "How Heavy a Fiscal Burden Are We Carrying to Interest Rate Base Camp? The Fiscal and Monetary Space in OECD Countries." Czech National Bank, Global Economic Outlook, No. 3/2019.

Laurent, R. D. (1988): "An Interest Rate-based Indicator of Monetary Policy." Economic Perspectives, Federal Reserve Bank of Chicago, January, pp. 3–14.

Michl, A. (2018): "Americká výnosová křivka varuje." Hospodářské noviny. 17 July 2018.

Rizzi, A., Mueller-Glissmann, C. (2019): "Goldman Joins Chorus Warning Against Yield Curve Panic." Bloomberg, 26 March 2019.

Smets, F., Tsatsaronis, K. (1997): "Why Does The Yield Curve Predict Economic Activity? Dissecting the Evidence for Germany and the United States." Bank for International Settlements, Working Paper No. 49, September 1997.

Taylor, J. B. (2009): "The Financial Crisis And The Policy Responses: An Empirical Analysis Of What Went Wrong." National Bureau Of Economic Research, Working Paper 14631, NBER Working Paper Series, Cambridge.

Whaley, E. R. (1993): "Derivatives on Market Volatility: Hedging Tools Long Overdue." Journal of Derivatives, 1(1): pp. 71–84.

Yellen, J. (2019): "Yield Curve May Signal Need to Cut Rates, Not a Recession." Reuters, 25 March 2019.

Keywords:

Yield curve, bond market, stock market, VIX, business cycle

JEL Classification

B22, B26, D53, E52

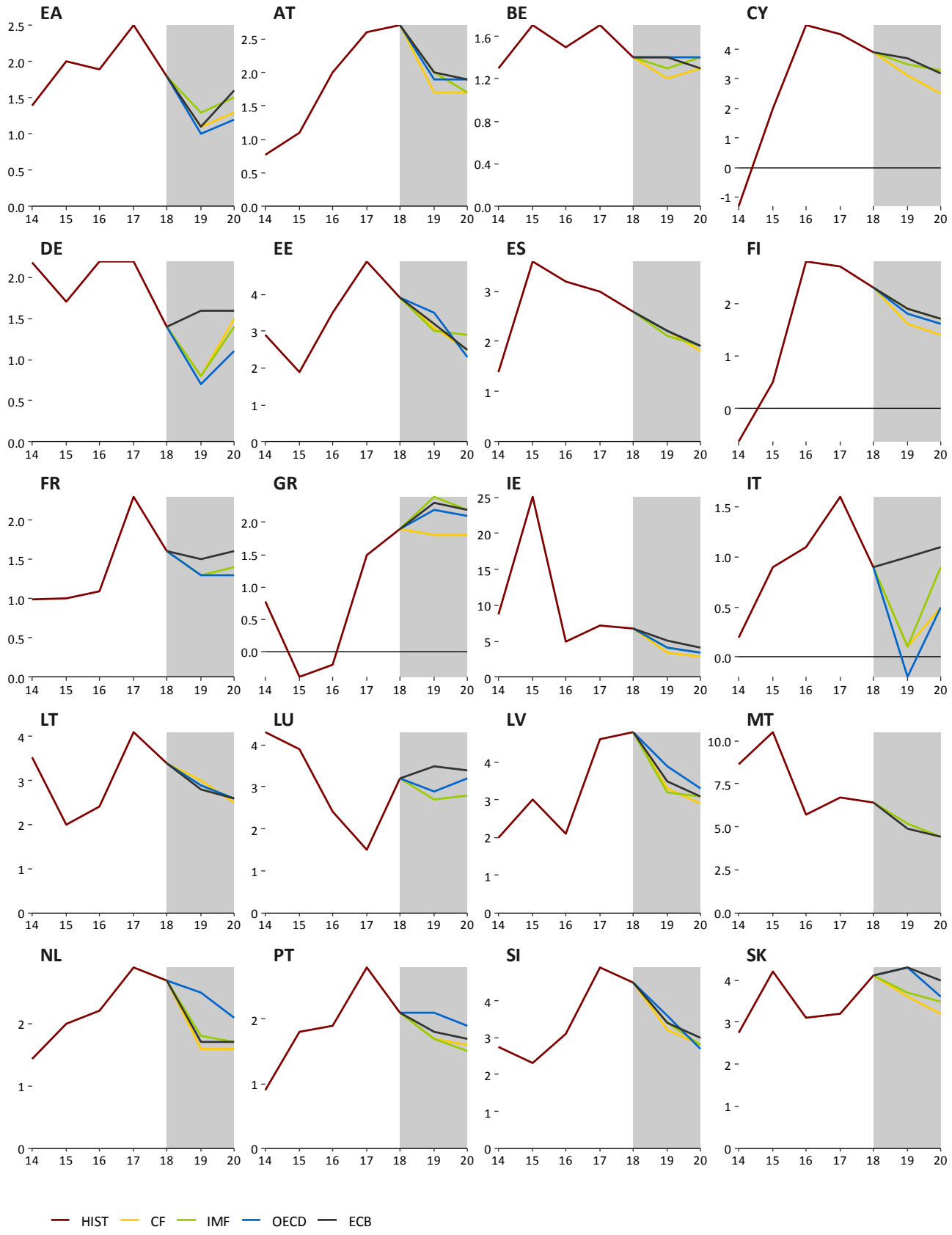
A1. Change in predictions for 2019

	GDP growth, %								Inflation, %							
	CF		IMF		OECD		CB / EIU		CF		IMF		OECD		CB / EIU	
EA	0	2019/5 2019/4	-0.3	2019/4 2019/1	-0.8	2019/3 2018/11	-0.6	2019/3 2018/12	+0.1	2019/5 2019/4	-0.4	2019/4 2018/10	+0.1	2018/11 2018/5	-0.4	2019/3 2018/12
DE	0	2019/5 2019/4	-0.5	2019/4 2019/1	-0.9	2019/3 2018/11	-0.3	2018/12 2018/6	+0.1	2019/5 2019/4	-0.5	2019/4 2018/10	+0.2	2018/11 2018/5	-0.3	2018/12 2018/6
US	+0.2	2019/5 2019/4	-0.2	2019/4 2019/1	-0.1	2019/3 2018/11	-0.2	2019/3 2018/12	0	2019/5 2019/4	-0.1	2019/4 2018/10	0	2018/11 2018/5	-0.1	2019/3 2018/12
UK	+0.1	2019/5 2019/4	-0.3	2019/4 2019/1	-0.6	2019/3 2018/11	+0.3	2019/5 2019/2	0	2019/5 2019/4	-0.4	2019/4 2018/10	+0.1	2018/11 2018/5	-0.4	2019/5 2019/2
JP	0	2019/5 2019/4	-0.1	2019/4 2019/1	-0.2	2019/3 2018/11	-0.1	2019/4 2019/1	0	2019/5 2019/4	-0.2	2019/4 2018/10	-0.1	2018/11 2018/5	0	2019/4 2019/1
CN	+0.1	2019/5 2019/4	+0.1	2019/4 2019/1	-0.1	2019/3 2018/11	+0.1	2019/5 2019/4	+0.2	2019/5 2019/4	-0.1	2019/4 2018/10	+1.0	2018/11 2018/5	0	2019/5 2019/4
RU	0	2019/4 2019/3	0	2019/4 2019/1	-0.1	2019/3 2018/11	-0.1	2019/4 2019/1	-0.1	2019/4 2019/3	-0.1	2019/4 2018/10	+1.0	2018/11 2018/5	0	2019/4 2019/1

A2. Change in predictions for 2020

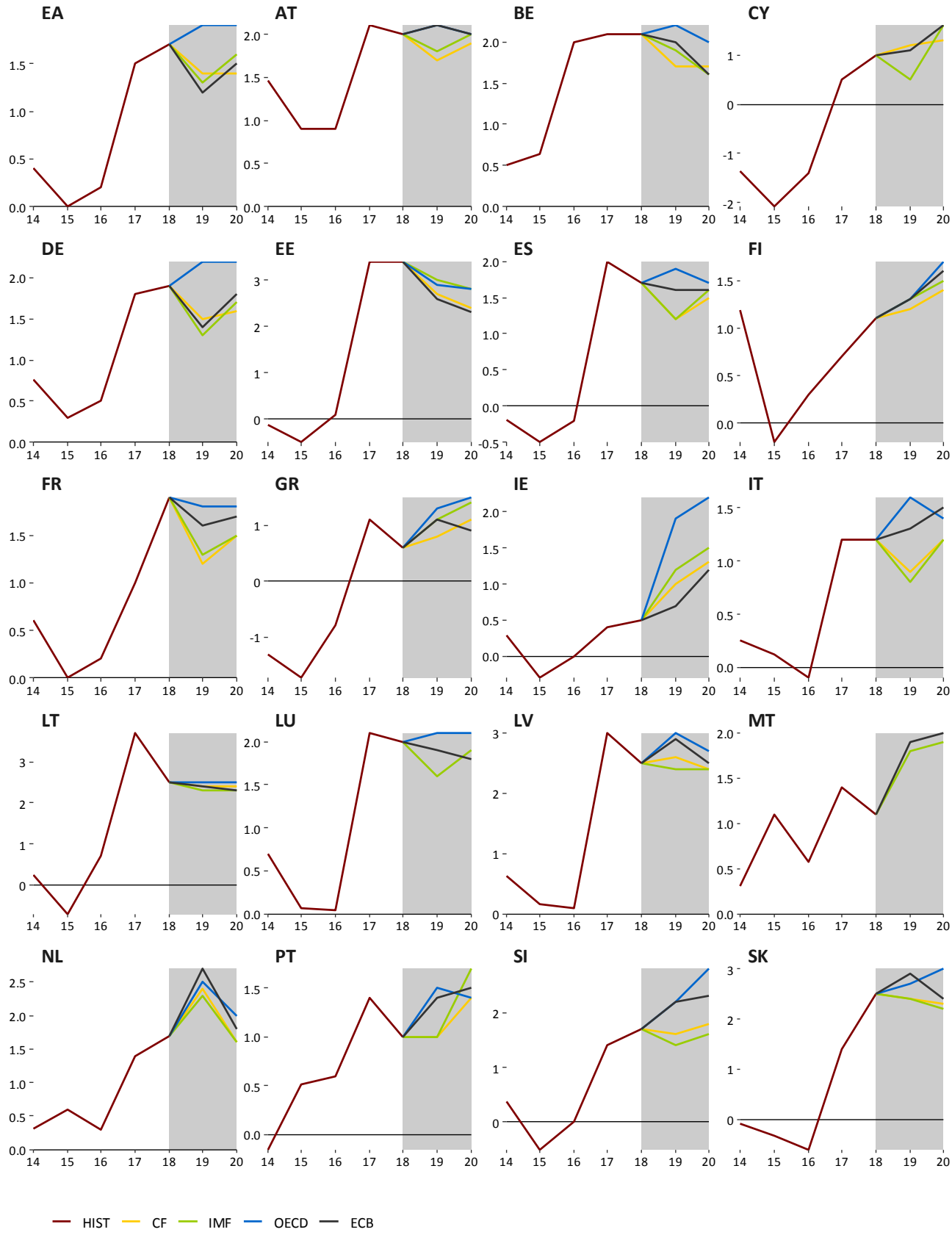
	GDP growth, %								Inflation, %							
	CF		IMF		OECD		CB / EIU		CF		IMF		OECD		CB / EIU	
EA	0	2019/5 2019/4	-0.2	2019/4 2019/1	-0.4	2019/3 2018/11	-0.1	2019/3 2018/12	0	2019/5 2019/4	-0.2	2019/4 2018/10	---	2018/11 ---	-0.2	2019/3 2018/12
DE	0	2019/5 2019/4	-0.2	2019/4 2019/1	-0.3	2019/3 2018/11	0	2018/12 2018/6	0	2019/5 2019/4	-0.4	2019/4 2018/10	---	2018/11 ---	0	2018/12 2018/6
US	-0.1	2019/5 2019/4	+0.1	2019/4 2019/1	+0.1	2019/3 2018/11	-0.1	2019/3 2018/12	-0.1	2019/5 2019/4	+0.4	2019/4 2018/10	---	2018/11 ---	-0.1	2019/3 2018/12
UK	-0.1	2019/5 2019/4	-0.2	2019/4 2019/1	-0.2	2019/3 2018/11	+0.1	2019/5 2019/2	-0.1	2019/5 2019/4	0	2019/4 2018/10	---	2018/11 ---	-0.1	2019/5 2019/2
JP	-0.1	2019/5 2019/4	0	2019/4 2019/1	0	2019/3 2018/11	-0.1	2019/4 2019/1	-0.1	2019/5 2019/4	-0.2	2019/4 2018/10	---	2018/11 ---	-0.1	2019/4 2019/1
CN	0	2019/5 2019/4	-0.1	2019/4 2019/1	0	2019/3 2018/11	0	2019/5 2019/4	+0.1	2019/5 2019/4	-0.2	2019/4 2018/10	---	2018/11 ---	+0.4	2019/5 2019/4
RU	0	2019/4 2019/3	0	2019/4 2019/1	-0.3	2019/3 2018/11	0	2019/4 2019/1	-0.1	2019/4 2019/3	-0.3	2019/4 2018/10	---	2018/11 ---	0	2019/4 2019/1

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)
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
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
OPEC+	member countries of OPEC oil cartel and 10 other oil-exporting countries (the most important of which are Russia, Mexico and Kazakhstan)
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