GLOBAL ECONOMIC OUTLOOK - AUGUST

2019

Monetary Department
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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 Refinitiv 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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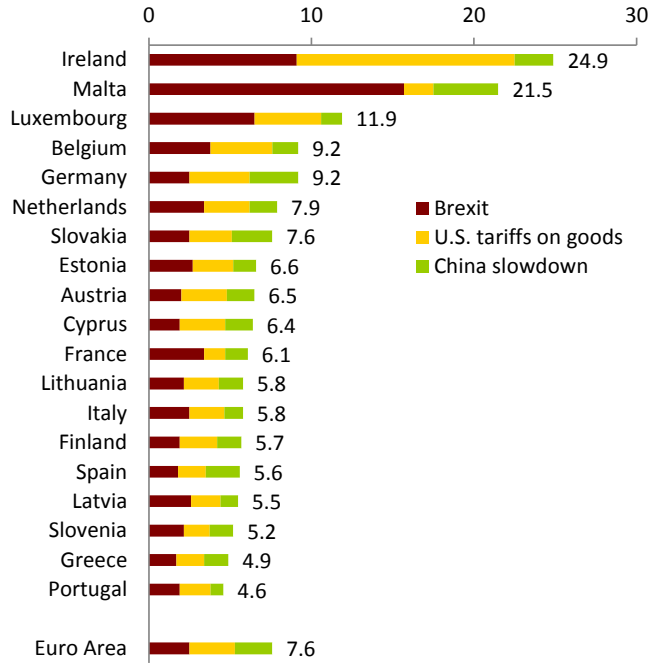
I. Introduction

August saw a rise in geopolitical risks overall, but the rhetoric in one of the most important – the US-China trade dispute – changed markedly. The US President first declared that the USA was not prepared to sign a deal with China but then decided to put off new tariffs on some Chinese goods until mid-December. China added fuel to the flames by calling the US approach contradictory to earlier agreements reached at the G20 summit and announced necessary countermeasures. However, it later softened its statements and expressed its belief in renewed dialogue and a compromise. Growing unrest in Hong Kong was added to the geopolitical risks in August. The Brexit situation is doing nothing for market optimism either. Michael Gove, the UK minister in charge of planning Brexit, said the EU had no interest in negotiating a new Brexit deal with the UK.

Share of value added jeopardised by foreign trade risks (in %)



Source: OECD TiVA, Bloomberg

The chart in the August issue shows the countries most jeopardised by the biggest current risks stemming from foreign trade. Bloomberg analysts have tried to estimate the potential impact of those risks (Brexit, the introduction of US tariffs and a bigger slowdown in China) on the euro area countries. Overall, these risks directly jeopardise 7.6% of value added in the euro area. The most vulnerable countries are Ireland and, perhaps surprisingly, Malta, both with shares of more than 20%. As for Germany, its share of value added at risk is just above 9%, the impacts of the various risks being roughly equal.

The GDP growth outlooks have mostly shifted lower since last month, the exception being Japan, whose outlooks for this year have been raised slightly. The economic outlook for the euro area remains growth of just above 1%, reflecting a particularly weak outlook for this year for its strongest economy, Germany. According to CF, German GDP will grow by just 0.6%, one of the lowest rates among the countries under review. It thus seems that the uncertainty stemming from the above risks is affecting the euro area even more than the Brexit-battered UK.

The inflation outlooks for this year are slightly lower than last month for the USA and Russia and higher for Japan and China. Next year, inflation in the advanced economies we monitor should thus stay above the levels expected for this year. The dollar will weaken slightly against the euro, sterling, the renminbi and the rouble at the one-year horizon and will be stable against the yen. The CF outlook for the Brent crude oil price 12 months ahead moved only slightly lower to USD 63.1/bbl (highest estimate down to USD 73.2/bbl, lowest estimate flat at USD 55/bbl) relative to the previous month. The outlook for 3M USD LIBOR market rates is still slightly falling, while 3M EURIBOR rates will remain negative and keep falling according to the August outlooks.

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

GDP	EA	DE	US	UK	JP	CN	RU
2019	1.1 →	0.6 ↘	2.3 ↘	1.2 ↘	0.9 ↗	6.2 →	1.1 ↘
2020	1.2 →	1.2 ↘	1.9 →	1.2 ↘	0.3 →	6.0 →	1.9 →

Inflation	EA	DE	US	UK	JP	CN	RU
2019	1.3 →	1.5 →	1.8 ↘	1.9 →	0.7 ↗	2.4 ↗	4.4 ↘
2020	1.4 →	1.6 →	2.1 →	2.0 →	0.8 →	2.3 →	4.0 →

Source: Consensus Forecasts (CF)
Note: The arrows indicate the direction of revisions compared with the last GEO.

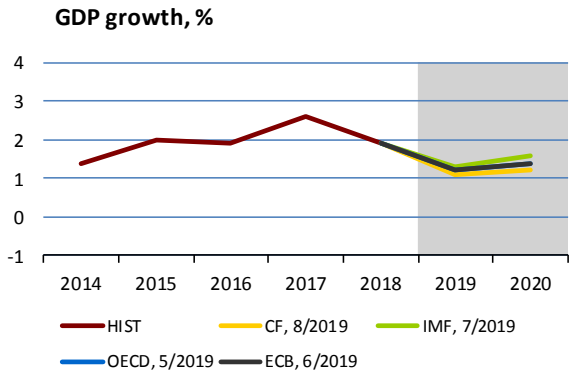
The August issue also contains an analysis: What changes in financial intermediation are to be expected from fintech? As the title suggests, the article explains the often used abbreviation fintech. This term encompasses a very diverse range of projects and applications, some of which represent genuine innovation, be it financial or technological. As the article notes, the effects on the financial sector depend not just on the quality of the technical solution, but also on the existence of stable, rationally justified demand.

II.1 Euro area

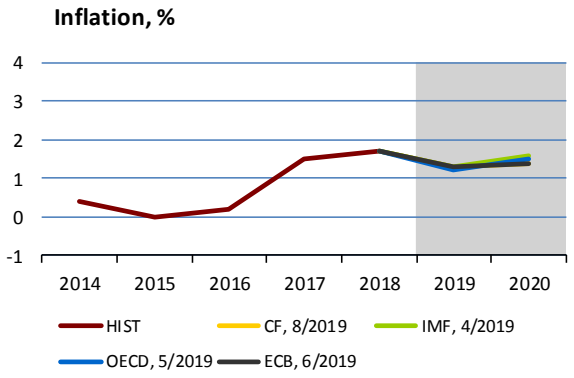
According to a preliminary estimate, GDP growth in the euro area slowed in Q2. The persisting factors of lower growth still include uncertainty linked with rising protectionism and Brexit. These factors are negatively affecting foreign trade, on which the Germany economy is especially dependent. Euro area GDP growth stood at 0.2% in quarter-on-quarter terms in Q2. Of the large economies, Spain and France contributed to the expansion, recording growth of 0.5% and 0.2% respectively, while Germany contracted by 0.1% and Italy stagnated.

The available indicators suggest only slightly faster economic growth in Q3. The international trade situation is weighing mainly on manufacturing so far. The July PMI in manufacturing (46.5) dropped and stayed in the contraction band. The index indicated the largest drop in new export orders since November 2011. Industrial production also contracted significantly in June compared with the previous month, falling by 1.6% (in year-on-year terms the decline deepened to 2.6%). CF expects industrial production in the euro area to stagnate this year, mainly due to a negative contribution from Germany, where industry is expected to decline by 1.6% (this figure was revised markedly downwards relative to the previous month). By contrast, labour market developments remain favourable.

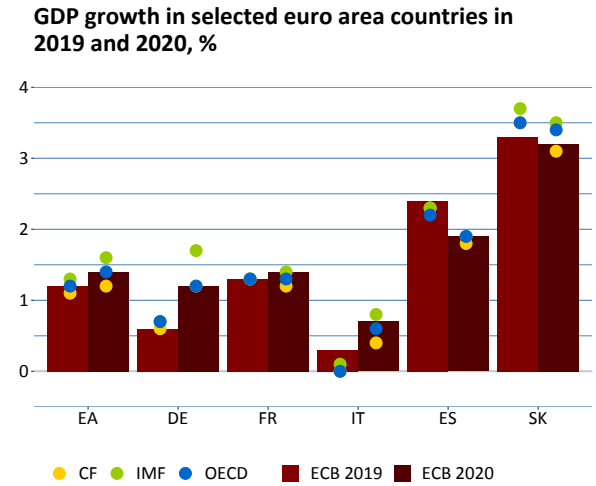
Euro area economic growth is expected to slow this year compared with last year and pick up slightly next year. The monitored institutions are forecasting growth of 1.1%–1.3% for this year and 1.2%–1.6% for next year. Compared with the previous month, CF left its outlook for both years unchanged. However, the outlook for Germany worsened both for this year (to 0.6%) and the next (to 1.2%). Of the large euro area economies, the expected growth of France was revised slightly downwards further (for next year only; see the annex).

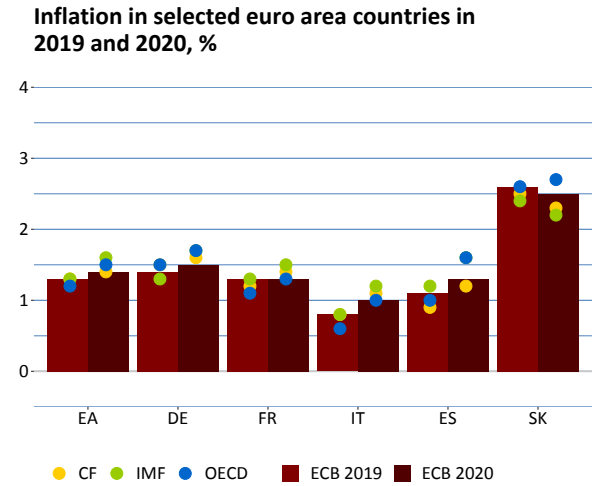


	CF	IMF	OECD	ECB
2019	1.1	1.3	1.2	1.2
2020	1.2	1.6	1.4	1.4



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





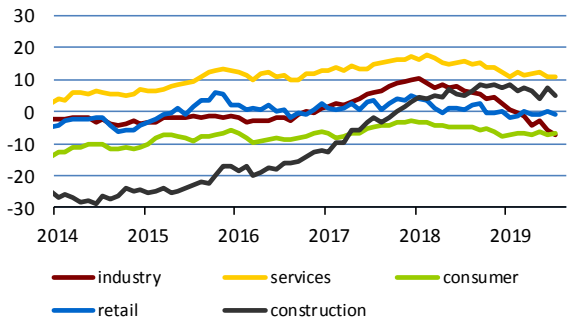
Note: Charts show institutions' latest available outlooks of for the given economy.

II. ECONOMIC OUTLOOK IN SELECTED TERRITORIES

Inflation in the euro area remains low. Headline HICP inflation slowed to 1.1% in July, mainly reflecting a further drop in the contribution of energy prices. However, the contribution of services prices also fell, while that of food prices rose slightly. Core inflation thus slowed by 0.2 pp to 0.9%. Similarly low inflation levels can be expected in the months ahead due to the absence of upward pressures on oil and energy prices. The path of core inflation is uncertain. While wages are rising at a solid rate, uncertainty regarding the economic growth outlook and lower external demand are having an anti-inflationary effect. The monitored institutions expect inflation of 1.2%–1.3% this year, rising to around 1.5% next year. Compared with the previous month, CF revised the outlooks for consumer inflation in the large euro area economies for Italy and Spain only (downward).

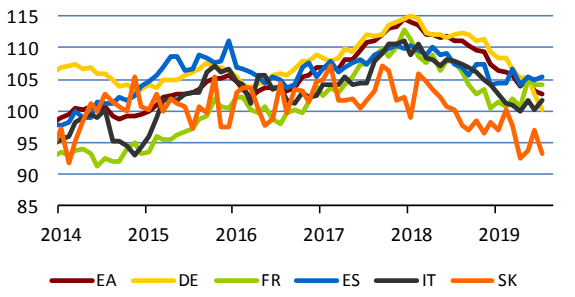
The uncertainty regarding the economic growth outlook and the subdued inflation outlook are increasing the likelihood of the ECB further easing monetary policy. In July, the Governing Council left interest rates unchanged and reiterated that it did not expect to raise them until at least mid-2020. However, financial markets expect a deposit rate cut of 0.1–0.2 pp at the September meeting. This will probably be accompanied by the announcement of further asset purchases at a pace of EUR 45 billion per month. Five-year swap-based inflation expectations have declined gradually during the year, reaching historical lows in August (see the chart below). Government bond yields have also fallen markedly. The ten-year German government bond yield hit a new historical low of -0.6% in August. CF expects the yield to remain negative over the entire one-year outlook horizon. However, yields on government bonds have also declined in other euro area countries, including Italy, despite the government crisis there. In mid-August, the Italian ten-year yield stood at 1.7% with only a modestly rising outlook (to 2.3% one year ahead).

Leading indicators



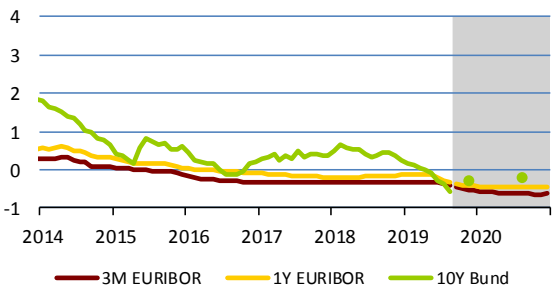
	industry	services	consum.	retail	constr.
5/19	-2.9	12.1	-6.5	-0.9	4.1
6/19	-5.6	11.0	-7.2	0.1	7.6
7/19	-7.4	10.6	-6.6	-0.7	5

Leading indicators



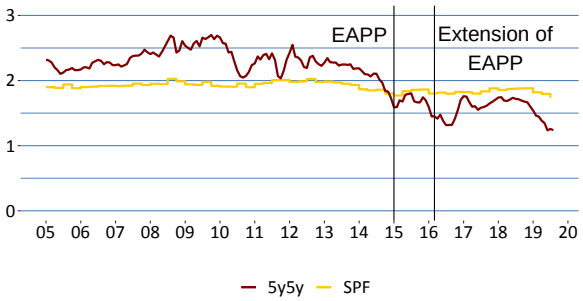
	EA	DE	FR	ES	IT	SK
5/19	105.2	105.5	104.9	105.4	101.7	93.7
6/19	103.3	102.6	104.1	104.8	100.2	97.0
7/19	102.7	100.2	104.1	105.4	101.6	93.4

Interest Rates, %



	7/19	8/19	11/19	8/20
3M EURIBOR	-0.36	-0.39	-0.52	-0.63
1Y EURIBOR	-0.28	-0.33	-0.41	-0.45
10Y Bund	-0.37	-0.56	-0.30	-0.20

Inflation expectations in the euro area, %



Note: Inflation expectations based on 5year inflation swap and SPF

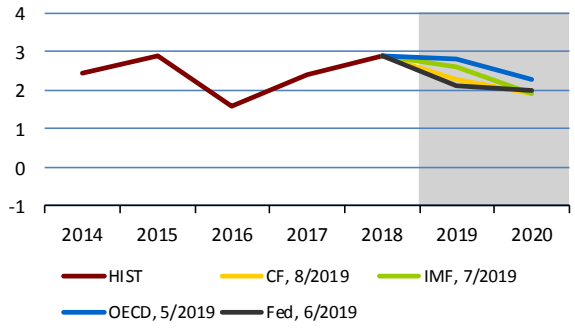
II.2 United States

Tensions in trade relations between the USA and China escalated again after President Trump announced new tariffs on Chinese goods. As from September, an additional 10% tariff was to be levied on Chinese goods whose annual imports to the USA amount to USD 300 billion. Almost all imports from China would thus be subject to tariffs from then on. In response, the Chinese side stopped buying agricultural products from the USA. The growth in protectionism negatively affected financial markets, causing US government bond yields to fall sharply. The tensions on financial markets eased only after the USA announced it would put off new tariffs on some goods (mobile phones and laptops) until 15 December.

The escalation of trade disputes may push the US economy towards a recession, although it is currently continuing to expand. According to a Reuters poll, the median probability of the USA slipping into recession in the next two years is 45%. The August CF also lowered its US GDP growth outlook for this year by 0.2 pp and its inflation outlook by 0.1 pp. However, the latest data indicate robust economic growth in Q3, which the Atlanta Fed expects to reach 2.2% (in quarter-on-quarter annualised terms). The news from the labour market was particularly positive, as non-farm payrolls rose by 164,000 in July. As in many other economies, sentiment in manufacturing is worsening, with the ISM PMI leading indicator staying close to the 50-point threshold for the third month in a row. Orders from abroad are falling. This was reflected in a drop in employment for the first time in July. Industrial production even fell by 0.5% year on year in July.

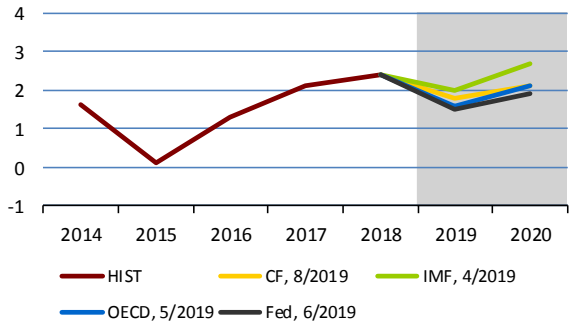
As expected, the Fed cut the range for benchmark rates by 25 bp at its July meeting and stopped reducing its balance sheet with effect from early August. In its accompanying statement it said this step was not the start of a new rate-cutting cycle. However, it will closely monitor incoming economic data. Risks from abroad, weak business investment and muted inflation pressures are giving rise to concerns. Financial markets expect another cut in the rate range at the next FOMC meeting in September.

GDP growth, %



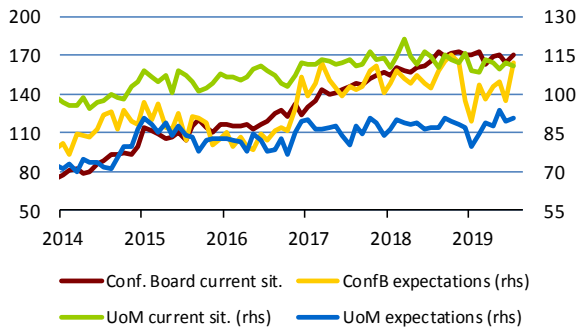
	CF	IMF	OECD	Fed
2019	2.3	2.6	2.8	2.1
2020	1.9	1.9	2.3	2.0

Inflation, %



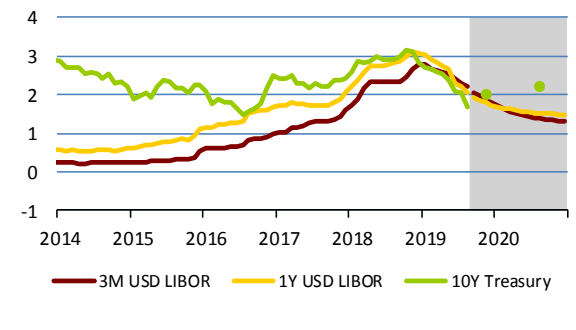
	CF	IMF	OECD	Fed
2019	1.8	2.0	1.6	1.5
2020	2.1	2.7	2.1	1.9

Leading indicators



	ConfB curr.	ConfB exp.	UoM curr.	UoM exp.
5/19	170.7	105.0	110.0	93.5
6/19	164.3	97.6	111.9	89.3
7/19	170.9	112.2	110.7	90.5

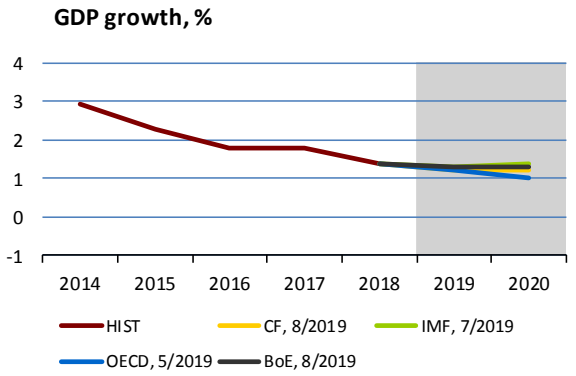
Interest Rates, %



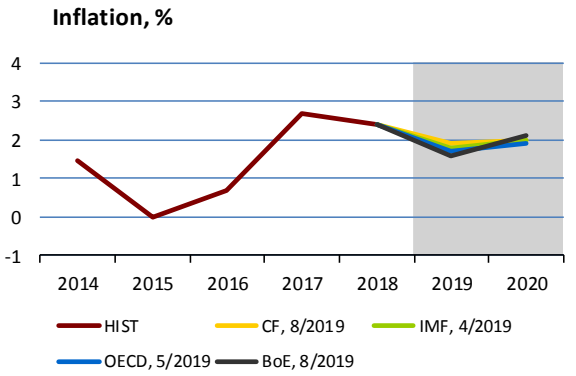
	7/19	8/19	11/19	8/20
USD LIBOR 3M	2.29	2.20	1.85	1.38
USD LIBOR 1R	2.20	2.20	1.78	1.52
Treasury 10R	2.05	1.69	2.00	2.20

II.3 United Kingdom

The UK economy is reaping what the political uncertainty has sown: GDP declined by 0.2% in Q2. The first negative growth in almost seven years is partly the price paid for the surprisingly strong growth recorded in Q1, when the economy frontloaded ahead of the original Brexit date. In Q2, by contrast, some factories brought forward their "summer" shutdowns. On the output side, the GDP drop was due to almost zero growth in services coupled with a sizeable drop in industrial output and construction. As for demand, the UK economy is being buoyed, albeit just below the surface, by consumption of government and households, the latter benefiting from low unemployment and accelerating real wage growth. By contrast, the economy is being dragged down by falling investment. That said, it has received some support from a sharp drop in the trade deficit.[1] In Q3, however, the economy is expected to return to slight growth of 0.2% (NIESR). Still, the forecasts for both this year and the next were mostly lowered (to 1.3% on



	CF	IMF	OECD	BoE
2019	1.2	1.3	1.2	1.3
2020	1.2	1.4	1.0	1.3

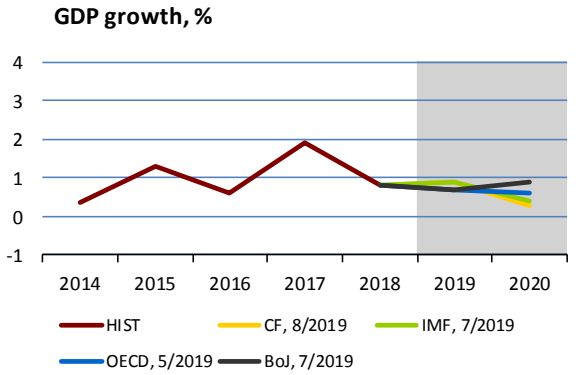


	CF	IMF	OECD	BoE
2019	1.9	1.8	1.7	1.6
2020	2.0	2.0	1.9	2.1

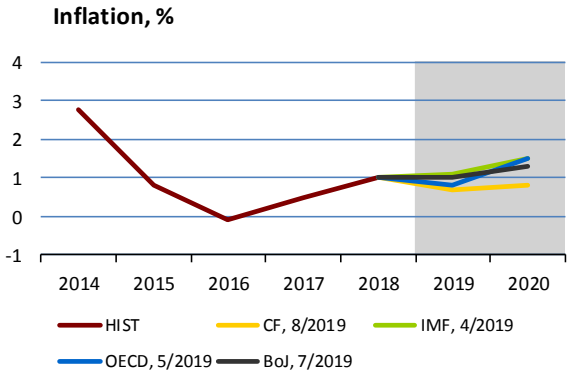
average).

II.4 Japan

The final Japanese growth estimates for Q1 show a better result, while Q2 saw a slowdown. According to a preliminary estimate, GDP grew by 0.4% in Q2. Although quarter-on-quarter growth slowed from the previous 0.7% (revised figure), the result is better than originally expected. The economy is still being affected by adverse global demand. Exports recorded a further fall (of 6.7%) in June, the seventh in a row; imports dropped by 5.2% in the same month. The trade war between the USA and China contributed to faster appreciation of the Japanese currency (towards JPY 105 to the dollar) in the first half of August. The August CF raised the GDP growth outlook for this year by 0.2 pp to 0.9%. The growth outlooks of all the monitored institutions for this year are below 1%.



	CF	IMF	OECD	BoJ
2019	0.9	0.9	0.7	0.7
2020	0.3	0.4	0.6	0.9

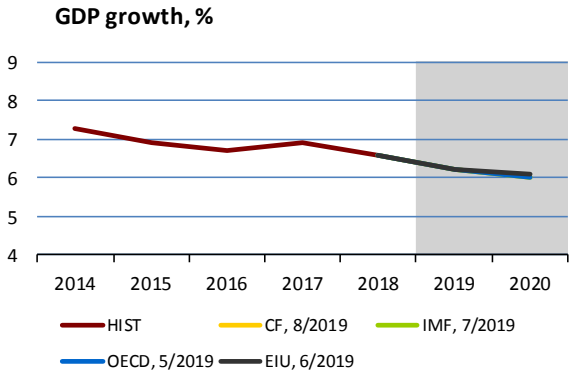


	CF	IMF	OECD	BoJ
2019	0.7	1.1	0.8	1.0
2020	0.8	1.5	1.5	1.3

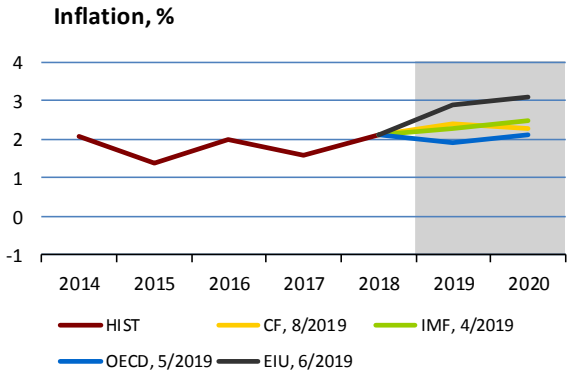
[1] Foreign trade surprisingly recorded a surplus in June (the first since 2011 and the highest since the 1980s), as exports (especially to China) rose sharply while imports fell.

II.5 China

The escalation of the trade disputes with the USA may seriously jeopardise the Chinese government's growth target for this year, but a larger stimulus package for the domestic economy remains in the drawer. The leading Caixin PMI indicator for manufacturing stayed in the contraction band in July, while corporate profits have been falling for more than a year now. Only state-owned companies, whose funding improved thanks to government support measures, are showing slightly better results. Industrial output dropped to a 17-year low and car sales in China fell again year on year in July (by 4.3%). Government representatives repeated that they were ready to boost the economy with further measures (tax and fee cuts), but these would no longer apply to the property market. Financial markets are speculating that the central bank might cut rates. It has so far preferred stronger depreciation of the Chinese currency against the dollar, which the USA has interpreted as currency manipulation.



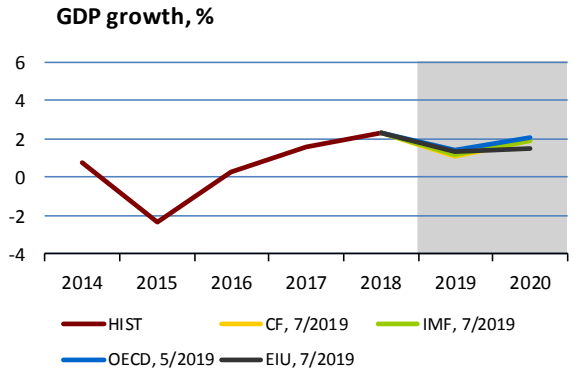
	CF	IMF	OECD	EIU
2019	6.2	6.2	6.2	6.2
2020	6.0	6.0	6.0	6.1



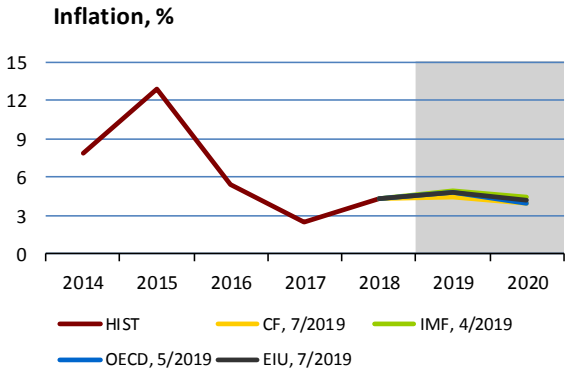
	CF	IMF	OECD	EIU
2019	2.4	2.3	1.9	2.9
2020	2.3	2.5	2.1	3.1

II.6 Russia

Despite faster growth in Q2, the Russian economic outlook for this year has been significantly revised. According to a preliminary estimate, GDP growth rose to 0.9% year on year (from the previous 0.5%) in Q2. The better result was due to industrial production and agriculture. By contrast, construction, retail sales and freight transport slowed. Goods exports (under the balance-of-payments methodology) fell by 8.3% year on year in Q2 due to a drop in trade with non-CIS countries. The rouble has mostly been weakening since the end of July (to around RUB 66 to the dollar in mid-August). The central bank cut its key rate by a further 0.25 pp to 7.25% at the end of July. Although economic growth accelerated in Q2, the probability of it reaching at least 1.5% in full-year terms is decreasing. CF lowered both its GDP growth and inflation outlooks for this year for the second time in a row. This time, however, the growth was revised by a full 0.3 pp. The outlook for next year is unchanged.



	CF	IMF	OECD	EIU
2019	1.1	1.2	1.4	1.3
2020	1.9	1.9	2.1	1.5



	CF	IMF	OECD	EIU
2019	4.4	5.0	4.8	4.8
2020	4.0	4.5	4.0	4.2

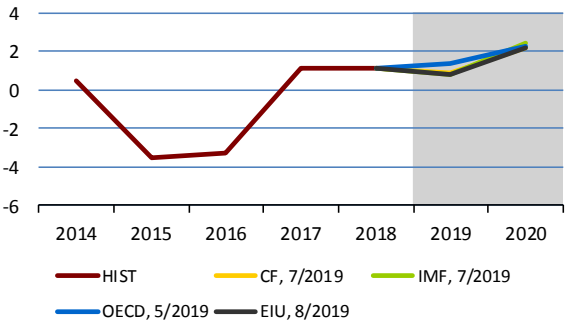
II.7 Developing countries in the spotlight

The Brazilian economy recorded a 0.2% quarterly GDP contraction early this year and the monthly data for Q2 are signalling a further decline. Overall confidence in the economy remains low. Consumer inflation has been slowing in recent months (to 3.2% in July), due mainly to falling food and fuel prices. Inflation thus remains well below the target of the Brazilian central bank (BCB; 4.25% ± 1.5 pp). The Brazilian real (now at BRL 4.01 to the dollar) lost its gains of recent months following a 50 bp cut in the key rate to a new record low of 6% at the end of July. Lower rates are being supported by low inflation, anaemic economic growth, the dovish tone of major central banks and ongoing reforms.

The pension reform currently under debate offers hope of a cure to some of the chronic problems afflicting the Brazilian economy. The reform has passed two rounds of voting in the Congress and is now awaiting review in the lower house. Final approval is expected in September or October. The reform will raise the retirement age and reduce pension spending. The government expects the changes to save it USD 230 billion over the next ten years. Brazil will thus be able to invest more and no longer rely on tax hikes to finance the running of the state. The current public debt is close to 80% of GDP, although most of it is denominated in the Brazilian currency. Financial markets welcome these steps but remain sceptical. Foreign investors are waiting for the final approval of the reform and have mostly been withdrawing from the Brazilian market in recent months.

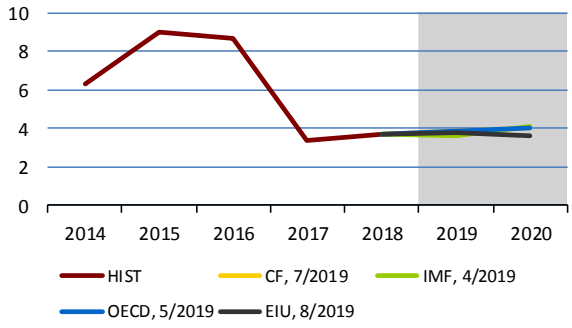
The near-term outlook does not offer strong grounds for optimism. GDP growth will not exceed 1% this year according to the EIU, the IMF and CF. Only next year will it climb above 2%. Inflation pressures will remain moderate in the quarters ahead. CF projects the benchmark interest rate at 5.8% at the end of this year and 5.5% in mid-2020. The EIU predicts 5.9% until next year. The BCB has indicated that the current situation requires further monetary easing. The Brazilian real is expected to appreciate only slightly.

GDP growth, %



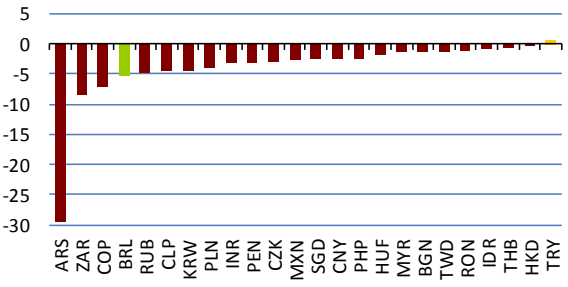
	CF	IMF	OECD	EIU
2019	0.9	0.8	1.4	0.8
2020	2.2	2.4	2.3	2.2

Inflation, %



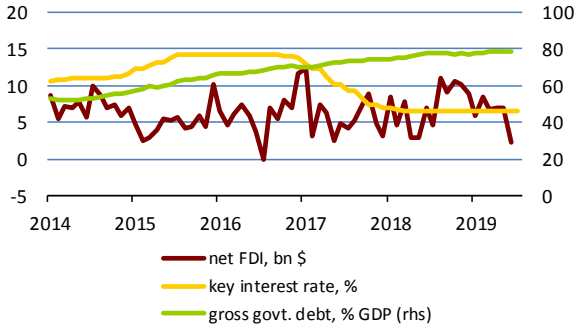
	CF	IMF	OECD	EIU
2019	3.9	3.6	3.9	3.8
2020	4.0	4.1	4.0	3.6

Currency performance vis-à-vis USD



% change over 1/6/2019 to 14/8/2019 period

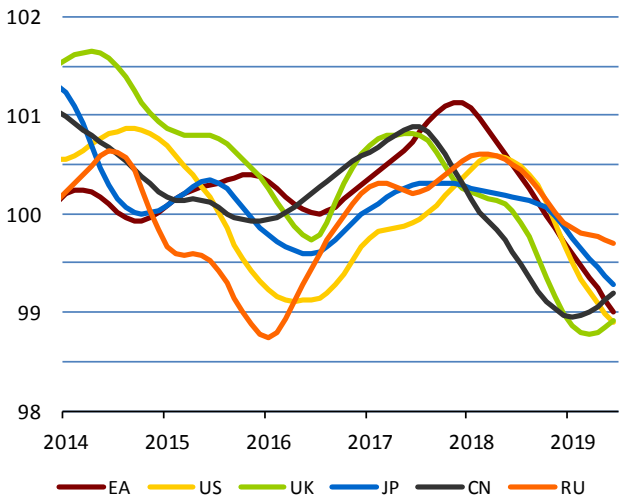
Selected indicators



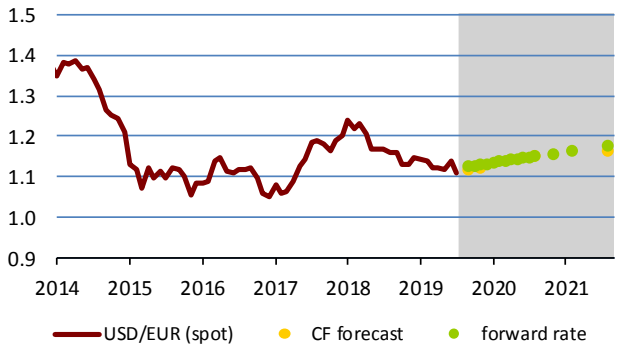
	net FDI	interest rate	govt. debt
5/2019	7.07	6.50	78.71
6/2019	2.19	6.50	78.68
7/2019		6.50	

III. Leading indicators and outlook of exchange rates

OECD Composite Leading Indicator

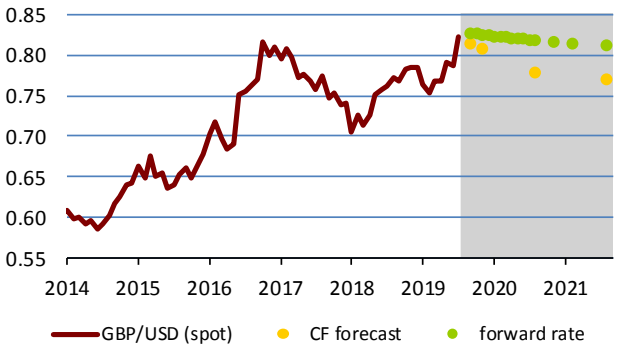


The US dollar (USD/EUR)



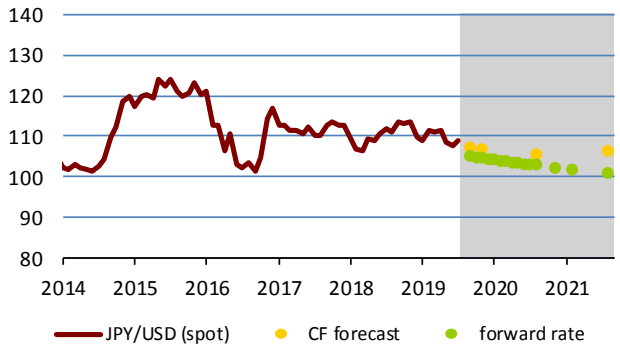
	12/8/19	9/19	11/19	8/20	8/21
spot rate	1.122				
CF forecast		1.118	1.123	1.151	1.165
forward rate		1.124	1.129	1.150	1.175

The British pound (GBP/USD)



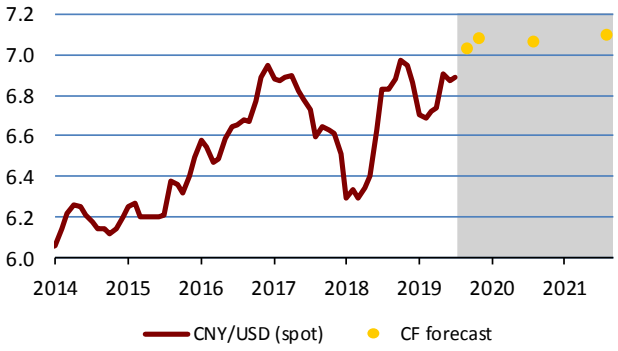
	12/8/19	9/19	11/19	8/20	8/21
spot rate	0.828				
CF forecast		0.815	0.808	0.779	0.769
forward rate		0.827	0.825	0.818	0.811

The Japanese yen (JPY/USD)



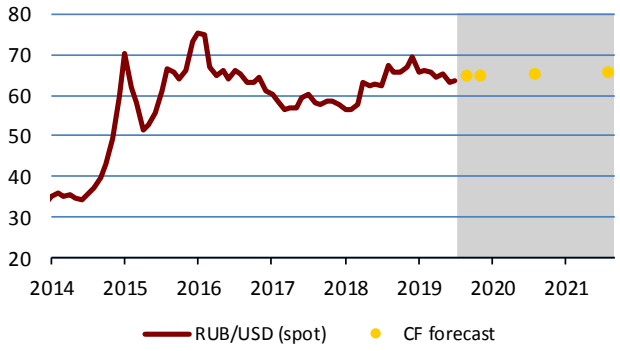
	12/8/19	9/19	11/19	8/20	8/21
spot rate	105.3				
CF forecast		107.3	106.8	105.7	106.4
forward rate		105.0	104.6	102.9	100.8

The Chinese renminbi (CNY/USD)



	12/8/19	9/19	11/19	8/20	8/21
spot rate	7.068				
CF forecast		7.033	7.082	7.063	7.100

The Russian rouble (RUB/USD)



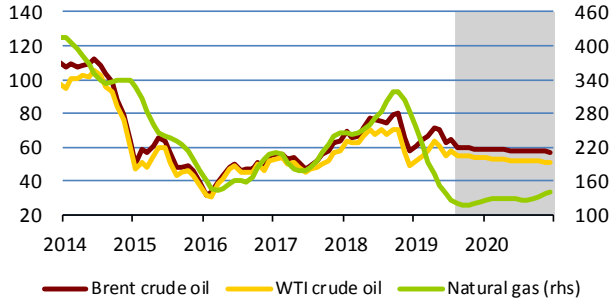
	12/8/19	9/19	11/19	8/20	8/21
spot rate	65.59				
CF forecast		64.68	64.71	65.40	65.86

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

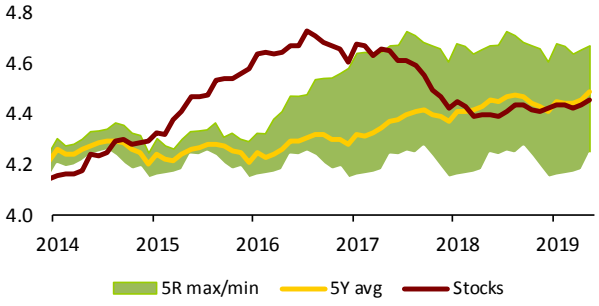
The Brent crude oil price has been highly volatile since mid-June. It fell sharply in early August, dropping below USD 60/bbl for the first time since January, and its premium with respect to WTI oil decreased significantly. Reports of a worsening global economic outlook due to the US-Chinese trade war are having an ever-increasing effect, raising concerns about slower growth in oil demand amid continued strong output growth, especially in the USA. Only the potential escalation of the situation in the Persian Gulf and the hope of renewed US-Chinese trade talks are temporarily supporting prices. By contrast, the firming dollar is pushing prices of oil (and other commodities) even lower. The price drop in early August was triggered by President Trump's statement that he would impose further tariffs on goods imports from China in September due to the slow progress in mutual talks. In retaliation, the Chinese central bank let the Chinese currency weaken above CNY 7 to the dollar, prompting concerns that the global economy would face a currency war in addition to the trade war. The Fed's statement that its rate cut was not the start of a new rate-cutting cycle also aided the decline. The price rebounded from its seven-month low only after Saudi Arabia declared it would keep oil output and exports low in September despite seasonally higher demand. Prices then climbed sharply in response to the decision of Trump administration to put off new tariffs on some Chinese goods by three and a half months. However, this impulse was soon outweighed again by bad news: surprising renewed growth in US oil and petrol stocks, negative Chinese and German economic data and signals of a possible recession in the USA from the bond market. Moreover, oil prices may drop substantially further if China stops complying with the sanctions against Iran. The market curve for future Brent oil prices is slightly falling, with an average price of USD 58/bbl in 2020.

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

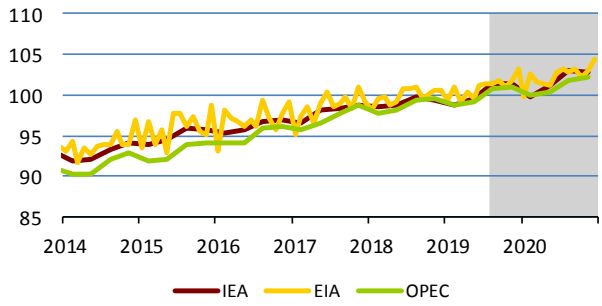


	Brent	WTI	Natural gas
2019	63.18	56.13	154.75
2020	58.00	52.20	130.28

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

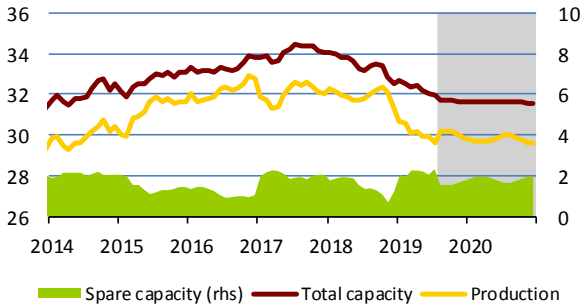


Global consumption of oil and oil products (mil. barrel / day)



	IEA	EIA	OPEC
2019	100.28	100.91	99.91
2020	101.67	102.34	101.04

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



	Production	Total capacity	Spare capacity
2019	30.13	32.06	1.93
2020	29.79	31.63	1.84

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.

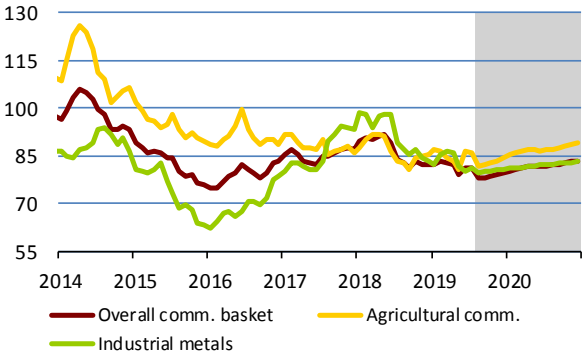
IV.2 Other commodities

The aggregate non-energy commodity price index maintained its elevated June level in July but declined in the first half of August, with both its components contributing to the fall. The food commodity price sub-index, which has been fluctuating sharply with no visible trend since the start of 2018, recorded a bigger drop. The industrial metals price index conversely continued to follow the downward trend lasting more than a year. The outlooks for both sub-indices are rising.

Prices of soy, corn and especially wheat started to fall in early July after previous growth; only the price of rice maintained an upward trend until the end of July. Prices of sugar, coffee and especially cocoa recorded declines. Pork prices are expected to drop gradually from a seasonal high. Beef prices were broadly flat.

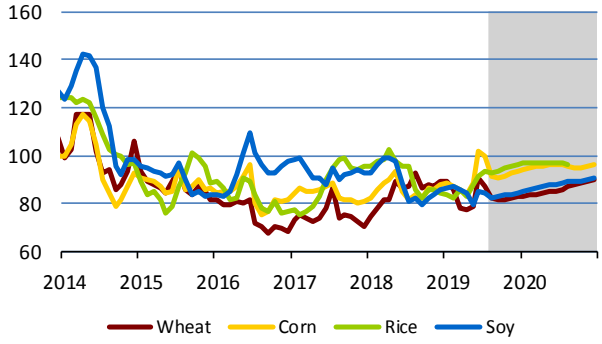
The threat of additional tariffs on Chinese goods and the less accommodative outlook for Fed monetary policy caused not only oil prices, but also copper and iron ore prices to go down in early August. Prices of other metals showed mixed trends. The aluminium price went up in the first half of July but then started to fall. However, its outlook is strongly rising. Tin and zinc prices continued to follow the downward trend that has been going on for more than a year now. By contrast, nickel and lead prices have been rising for several months now. Before falling in August, the iron ore price was rising sharply due to high imports to China in July. The J.P.Morgan Global Manufacturing PMI kept falling in July, albeit at a slower rate (from 49.4 to 49.3). Exports and export orders are being hit the worst. Firms are losing the strength to raise prices and the decline in the workforce is accelerating. Prices of metals (especially copper) were partially boosted by better-than-expected industrial production in China in June.

Non-energy commodities price indicies



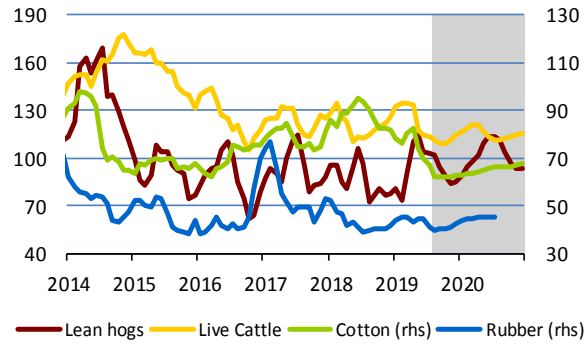
	Overall	Agricultural	Industrial
2019	80.5	84.1	82.0
2020	81.9	87.0	82.1

Food commodities



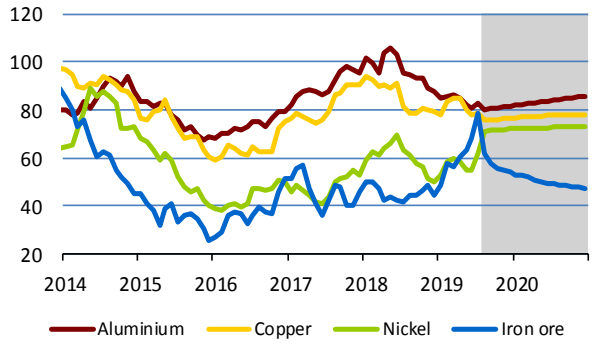
	Wheat	Corn	Rice	Soy
2019	83.1	91.3	90.1	84.1
2020	86.2	95.6	96.9	88.1

Meat, non-food agricultural commodities



	Lean hogs	Live Cattle	Cotton	Rubber
2019	94.2	119.6	69.9	42.6
2020	101.6	115.6	65.5	44.9

Basic metals and iron ore



	Aluminium	Copper	Nickel	Iron ore
2019	82.7	79.0	63.4	59.8
2020	83.8	77.6	72.7	49.8

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.

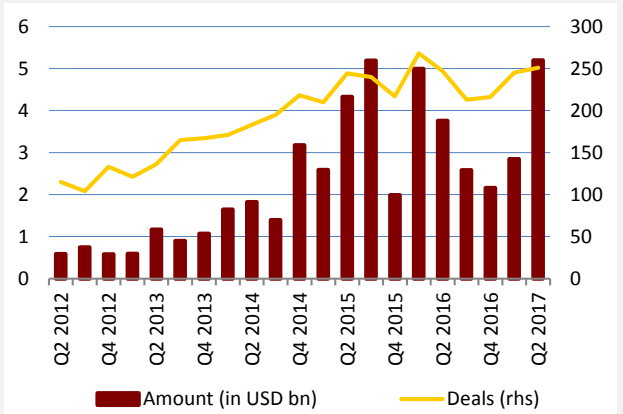
What changes in financial intermediation are to be expected from fintech?[2]

The term fintech encompasses a very diverse range of projects and applications, only some of which represent genuine innovation, be it financial or technological. The effects on the financial sector depend not just on the quality of the technical solution, but also on the existence of stable, rationally justified demand. Paradoxically, it is the latter condition that makes traditional financial institutions – and not their rivals inhabiting the cyberspace – the ones to guarantee successful fintech projects a long life.

Introduction

The term "Financial Technology", or fintech, in its current sense refers to any application of an innovative technology to financial services. Venture capital (VC) investment in these projects worldwide is substantial (see Figure 1). The presence of financial innovation alongside cutting-edge technology is usually assumed, although not always correctly. This means fintech products can be sorted along two dimensions: traditional vs. digital financial instruments and conventional vs. innovative markets and transaction mechanisms. For instance, innovation has created the crypto asset class (for which ownership is determined by exclusive access to a unique encrypted entry in a digital ledger) and digital currencies sponsored by central banks (CBDC). Alternatively, digital technologies are being used to enhance the efficiency of existing bank activities (lending, security issuance, risk assessment, transactions in the secondary market).

Figure 1 – Quarterly global trends in financing of VC-backed fintech companies



Source: CB Insights

It is rare to find a digital financial product or service that is simultaneously transacted by means of a frontline technology. In other words, only three out of the four corners of the rectangle in Figure 2 are currently occupied. Crypto assets usually change hands with the aid of a cumbersome mining procedure based on cryptography dating back to WWII. The most advanced techniques in the areas of big data analysis, machine learning and robotics are applied in the same mortgage and consumer credit markets that existed in essentially the same form as today back in the mid-20th century.

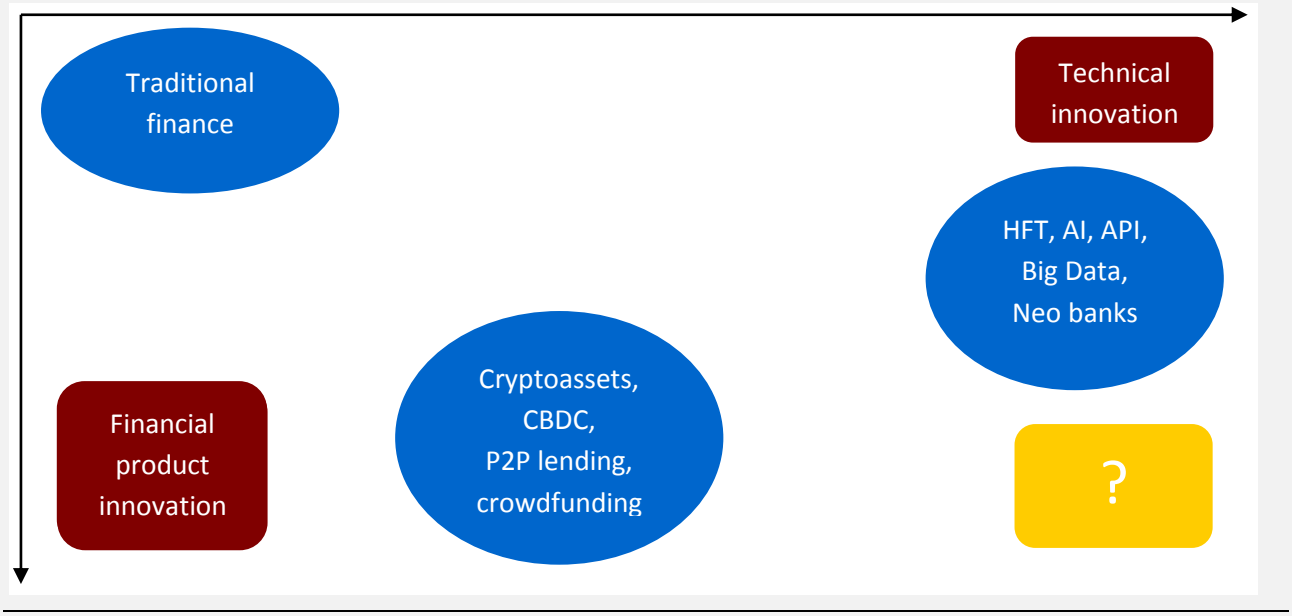
Accordingly, the universe of innovative financial technologies can be roughly divided between those that were developed specifically for financial applications and adaptations of existing products by the financial industry. In the first group, one finds Distributed Ledger Technology (DLT), specifically blockchain, and countless specialised software applications. In the second, the obvious first example is the internet itself. Later advances include application programming interfaces (APIs) in smartphones and high-capacity fibre optic cables, which became essential for high-frequency trading (HFT) in securities markets. The key disciplines for the credit-related parts of fintech appear to be artificial intelligence (AI) and big data analysis. In what follows we present an overview of the best known and most significant fintech products from the perspective of their ability to disrupt and reshape the function of a particular branch of the financial industry.

High-frequency trading

It would be too limiting to associate fintech just with the products developed in the last 4–5 years. There are also areas that developed earlier and, among them, several whose glory years are already in the past. High-frequency trading (HFT) is one such example. Advances in transmission techniques and related software engineering at the turn of the 2010s enabled a number of nimble Wall Street brokers to exploit their initial advantage with regard to connection to electronic trading platforms and skim substantial rents by capturing the most attractive client orders on their way to public exchanges (Lewis, 2014). With time, however, the practice became sufficiently well known among investors and prompted counter-measures. This reaction, along with the mass entry of newcomers aspiring to make a quick buck in the HFT business, has naturally led to a decline in the profitability of HFT firms (Osipovich, 2017). As a result, the HFT industry is currently at a crossroads. Either it will leave equity markets for new areas, such as crypto assets, to try to repeat the 10-year-old trick of rerouting lucrative client orders to its platforms, or it will adopt new technologies that are more sophisticated than fibre optic cable transmission (for example

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

Figure 2 – Fintech application areas



something in the AI-field, such as neural networks) to better exploit current markets (Akioyamen, 2018; Meyer et al., 2018).

HFT is just one, although the most notorious, of a wide range of activities known as algorithmic trading. The latter area has still to reveal its true potential. Whereas HFT concentrated on those operations which were the easiest to automate (rerouting and processing of captured client orders), AI-applications focused on analysing large volumes of market data, uncovering the underlying patterns of investor behaviour and designing appropriate trading strategies, currently look a lot more promising. Once the fast gains from HFT had been exhausted, many algorithmic trading firms took that road (Meyer et al., 2018).

Crowdfunding – competition or a complement to equity markets?

Crowdfunding is routinely presented by its fans as a road to truly democratic entrepreneurship. This modern form of fundraising for innovative technical and commercial ideas will supposedly one day fully liberate beginner entrepreneurs from dependence on asset markets. It is true that this start-up financing mechanism, similarly to P2P lending (see later), could only have emerged in the internet era. Unlike P2P, crowdfunding is used not only for commercial initiatives, but also for non-profit ones. In addition, the position of the capital provider vis-à-vis the entrepreneur is that of a shareholder, not a lender. This implies the existence of similar access barriers: the entrepreneur must not only convince a sufficient number of supporters at the start of the development phase, but also solve the same problems as extensively described by the economic asymmetric information literature (costly state verification, agency, moral hazard) over the life of the project, just like any other firm receiving external finance. Not surprisingly, the majority of crowdfunding initiatives never attract enough capital. After rapid growth of funds invested in crowdfunding globally in the first half of the current decade, investment volumes have been stagnating or, in some key regions such as North America, even falling since 2016 (Chervyakov and Rocholl, 2019). Although there are those who argue that crowdfunding – alongside block chain – is the most important example of fintech (Cai, 2018), the long-term validity of such claims is doubtful given the rapid development of other applications with much greater economic relevance.

Fintech credit in traditional banks

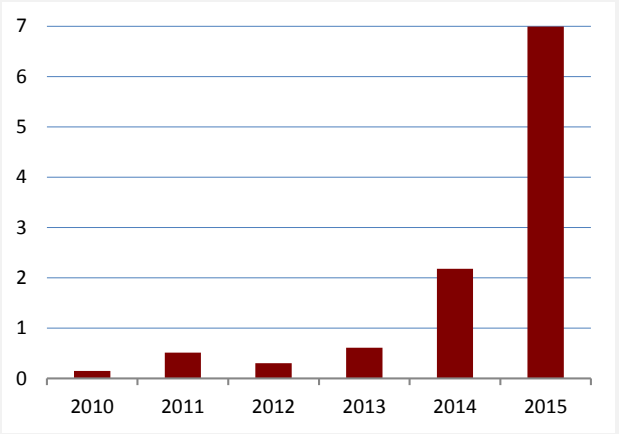
Traditional banks (often disparagingly called brick-and-mortar banks by cyberspace geeks) are naturally interested in fintech, as they expect it to reduce their lending costs. For this reason, AI is now being widely used in banking not only for overall market analysis, but also for the evaluation of individual loan applications. In the latter area, alongside big data analysis, robots are nowadays starting to be employed to automate paperwork and interaction with clients. The result is a radical transformation of the customer environment. In addition, side effects impacting third parties often emerge, some of which are gradually gaining macroeconomic significance. For instance, as robots do not receive wages, there is a tangible fall in demand for client zone outsourcing to low-wage countries.

AI-implementation does not always bring about mutually advantageous changes. For instance, robotisation of the loan application process would usually mean a substantial cost reduction for the lender, be it a bank or non-bank, brick-and-mortar or "new" (KPMG, 2016). On the other hand, for some clients the need to adapt to impersonal algorithmic procedures when applying for a loan may result in significant

discomfort. Others, if they are able to detect weak spots in the innovated system, may jump at the opportunity to use it for their own benefit and to the detriment of the lender. A blind alley in the application of AI to financial services can also be seen in the uncritical belief that artificial intelligence is truly intelligent. Experience teaches us otherwise. Moreover, with growing algorithm complexity, errors become ever harder to detect. Until recently, AI-idiocy was most conspicuous in machine translations and spell checkers. For the user, other than being a source of amusement, this rarely meant much more than a loss of time, so hardly anyone viewed it as life-threatening. By contrast, unpredictable glitches in supposedly savvy systems making credit and investment decisions can result in measurable, and considerable, losses.

Figure 3 – Global investment in digital-banking startups

(USD billions)



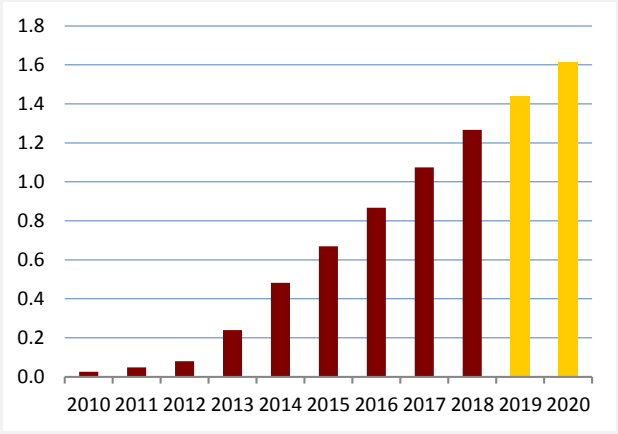
Source: CB Insights

P2P lending and its pitfalls

Fintech is an indispensable enabler of peer-to-peer (P2P) lending. The terms P2P- and fintech-lending are therefore starting to be used interchangeably. Although most fintech credit companies are already owned by banks, originally it was independent P2P platforms that began to use big data analysis, machine learning and robots to provide loans. Their advantage was the ability and preparedness to draw on information sources (such as social networks) beyond those used by traditional banks for client scoring. Studies show that these advanced methods can indeed squeeze a somewhat higher number of quality clients out of the population of loan applicants than conventional loan officers (Jagtiani and Lemieux, 2018). Not surprisingly, there has been a global boom in P2P start-ups since the beginning of the millennium (see Figure 4). Still, the improvements in loan portfolio performance compared with conventional banks are both moderate and unsteady, with the fintech segment not being immune to downturns (Claessens and Frost, 2018).

Figure 4 – Development of P2P lending

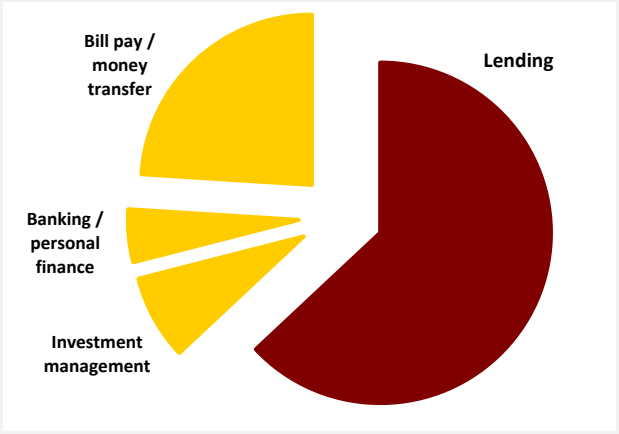
(USD billions)



Source: Ibis World
Note: Trade turnover generated by P2P lending platforms. Figures for 2019 and 2020 represent outlook.

Figure 5 – Investment in digital-banking startups

(%)



Source: CB Insight
Note: Data for 2015.

There is clearly a problem with data protection and privacy. In addition, as the use of big data methods for assessing applicants' solvency expands, there is a risk of creating a virtual standardised "ideal borrower" template with regard not only to income and debt service discipline, but also to overall behaviour and lifestyle. That is, on the robot's display, applicants themselves will have to look like robots with ideal parameters. It is easy to imagine a dystopian social levelling-out – of the kind depicted in the horror sci-fi genre – occurring if this approach is taken seriously. On the other hand, if it is not taken seriously, tools for circumventing the robotic criteria are bound to be developed, making the whole innovation worthless. One is therefore tempted to conjecture that enthusiasm for algorithmically advanced fintech lending is to be expected in societies where cultural stereotypes hold sway and there is an abundance of naïve individuals who have uncritical trust in public and media authorities, as opposed to societies dominated by suspicious individuals with a historically engrained mistrust of the powers-that-be and a talent for pretence.

It would be over-optimistic to expect P2P lending to be able to deliver credit to (nearly) everyone who lacks access to traditional bank lending. Technology alone cannot achieve this goal. Being a successful lender requires specific expertise, just like any other risky activity dependent on the human factor does. Building up such expertise is a long and arduous process. It is unclear who else besides traditional banks may be up to the task, and for what reasons. Even before the current fintech boom started, there were a number of microfinance initiatives in developing countries driven by pipe-dreams about the existence of multitudes of unserved potential borrowers from the lowest strata of society, to whom "evil banks" are unwilling to lend notwithstanding promising returns. The outcomes were, at best, ambiguous (Lützenkirchen and Weistroffer, 2012). Although microcredit without bank assistance did help many individuals in emerging markets escape poverty and start up their own enterprises, there was no miraculous per capita income improvement in poor agricultural societies on a macroeconomically relevant scale. What did grow was credit-related fraud. So, the recent hype around P2P should not obscure the fact that this industry is very prone to abuse and con schemes (Bloomberg, 2018; Orca, 2018; Xu, Lu and Chao, 2015). Of course, the authorities can and do take counter-measures, again with the help of big data analysis tools, among other things. As a result, however, every P2P platform operator faces additional costs and a need for additional capital, both technological and human. This reduces the set of such operators closer to that of traditional and sufficiently capital- and expertise-equipped financial firms. The much heralded P2P-induced revolution in financial intermediation has yet to arrive.

There is often a gap in perceptions of how fintech lending impacts on clients' interests between developed countries and emerging markets (EMEs). For EMEs, the main issue appears to be financial inclusion (IMF, 2018) and related extensive credit market growth, whereas in mature economies, winning new (unproblematic) clients by means of innovative solvency evaluation techniques can only bring about a marginal expansion. In developed countries, new technologies are expected to secure cost savings mainly in the credit risk management area. There are studies suggesting that fintech credit growth is positively related to per capita income in the economy (and, at the same time, negatively related to the market power of brick-and-mortar banks; Claessens and Frost, 2018). So, it cannot be ruled out that, once the initial euphoria about the chance of finding multitudes of quality borrowers in EMEs is over, we will instead see the usual small steps towards improved methods of client evaluation and sober assessment of existing borrower behaviour in those economies as well. Fintech credit there is then likely to revert to what we are familiar with in many developed countries, with a small group of big bank players controlling the most advanced technologies and dominating the credit market.

Neo banks

For some analysts, neo (or challenger) banks are the answer to the doubts concerning the viability of P2P credit. These are greenfield establishments, in the form of mere websites, offering the usual bank services, such as deposits, payments, insurance, small consumer and business loans and access to securities trading, online only (Finsia, 2018). In some cases, these firms do not have a bank licence and need a partner bank to carry on their business. Others do apply for their own bank licence, in which case the legal requirements gradually force them to become more similar to brick-and-mortar banks. After all, the latter are nowadays equally capable of servicing willing customers online or by phone. Although we keep reading that neo banks are disrupting traditional banking due to their ability to save on branches and workforce in client zones, we are still waiting for representative data on their true expenditure on IT experts, software and equipment maintenance. Most importantly, the enthusiasts owe the public an explanation of the essential difference between the services offered by neo banks and those provided by their brick-and-mortar competitors, other than a different company culture arising from their recent origin and the STEM-dominated professional backgrounds of their founders. A number of neo banks are already under the tacit control of traditional banks, while the latter are often starting up neo branches of their own.

The aforementioned DLT applications will probably be necessary to ensure that neo banks' activities comply with the usual accounting standards and regulatory requirements. As a consequence, a knowledge of blockchain basics may be required not just of neo banks' personnel, but also of their customers. This will naturally reduce the potential market for their services, at least until DLT foundations become part of school curricula.

Credit and crypto assets

At the moment, it does not seem that the much-acclaimed proliferation of crypto assets is the principal defining feature of the possible fintech revolution. To start with, cryptocurrencies are not very suitable for creating money by means of credit. They were invented precisely to reduce the power of banks to create money, not to make it easier for them to do so. As a result, in spite of the futuristic vernacular used by their fans, cryptocurrencies functionally more closely resemble the money that was used in ancient Egypt and Sumer than a means of exchange for the 21st century.

The role of crypto assets in general in credit markets remains peripheral. The reason for this relates to what was said above about cryptocurrencies. Institutionalisation of this market segment, which is being recommended by several agile international consultancy firms with the clear intention of securing a market share in these services in advance (KPMG, 2018), looks a lot like a *contradictio in adjecto*. Indeed, once the

natural legal, regulatory and technical requirements of institutionalisation have been met, crypto will become just another financial asset category, albeit one that is too IT-intensive for the average investor looking for portfolio diversification opportunities. Crypto came into being to meet the demand of those who shun the mainstream, not those who are loyal to it. So, what is currently available in the area of crypto asset participation in credit markets is either conventional loans with crypto assets as collateral or some bizarre attempts to lend cryptocurrencies proper, but on price and collateralisation terms incomparably worse than those available for fiat currencies in traditional banks.

Still, there is one asset category in which blockchain has the potential to make a breakthrough: securitisation. As we know, the Great Financial Crisis of 2008 first erupted in the segment of securitised loan packages containing loans of dubious quality invisible to most investors. This segment turned out to be opaque and incomprehensible even to otherwise sophisticated market participants. Could the crisis, and the subprime panic that preceded it, have been prevented if suitable DLT tools had been available at the time those loans and credit derivatives were created? After all, with chain analysis it would hypothetically have been possible to look up the key parameters of every underlying loan and lower-level securitised instrument in any such derivative, so that the transparency problem should not have arisen at all. Naturally, one cannot be sure that, with blockchain around, mass securitisation would have been equally attractive to the same actors who unleashed it at the start of the millennium. At the time, the benefits of nontransparent securitisation were sufficiently well-known to both hazardous borrowers and careless lenders, with the only party to lose being unsuspecting secondary market investors.

More generally, DLT – and blockchain in particular – is primarily an accounting, not a market structure, innovation. The leading accounting and auditing firms have already grasped this and are starting to launch corresponding proprietary products (ICAEW, 2018). The ability of DLT to assist in uncovering fraud and market manipulation will certainly also be attractive to fiscal and regulatory authorities.

Conclusion: the long and winding road to the banker's door?

Fintech financing, and especially lending, is largely following the same development path as traditional banking, though at a much faster pace. From its origins in the spontaneous intermediation of free funds among individuals, fintech moved on to efforts to make this process cheaper and more efficient, first by aggregating the funds on intermediaries' balance sheets, then by shifting from 100% to fractional reserve coverage and so on. This was soon followed by a financial boom-bust cycle, accompanied by moral hazard, adverse selection and criminality, until regulation, institutionalisation and flight under the wings of traditional banks took place. This all looks like history repeating itself, except with the side effect of swifter implementation of new technologies in traditional financial institutions coming under pressure from (temporary?) competition.

References

Akioyamen, P. (2018) Neural networks & deep learning – The revival of HFT? (22 July) https://towardsdatascience.com/neural-networks-deep-learning-the-revival-of-hft-2bc2c271fba2

Bloomberg (2018) How China's peer-to-peer lending crash is destroying lives. (2 October) https://www.bloomberg.com/news/articles/2018-10-02/peer-to-peer-lending-crash-in-china-leads-to-suicide-and-protest

Cai, C. (2018) Disruption of financial intermediation by Fintech: A review on crowdfunding and blockchain. Accounting and Finance. doi: 10.1111/acfi.12405

Chervyakov, D., and J. Rocholl (2019) How to make crowdfunding work in Europe. Bruegel (27 March) http://bruegel.org/reader/How-to-make-crowdfunding-work-in-Europe#recent-developments-in-crowdfunding

Claessens, S., and J. Frost (2018) Fintech credit markets around the world: Size, drivers and policy issues. BIS Quarterly Review, September.

Finsia (2018) What are neo banks and what's their role in the banking system? https://finsia.com/insights/news/news-article/2018/09/14/what-are-neo-banks-and-what-s-their-role-in-the-banking-system

ICAEW (2018) Blockchain and the future of accountancy. https://www.icaew.com/-/media/corporate/files/technical/information-technology/technology/blockchain-and-the-future-of-accountancy.ashx

International Monetary Fund (2018) The Bali Fintech Agenda (October) https://www.imf.org/en/Publications/Policy-Papers/Issues/2018/10/11/pp101118-bali-fintech-agenda

Jagtiani, J., and C. Lemieux (2018) The roles of alternative data and machine learning in Fintech lending: Evidence from the LendingClub consumer platform. Federal Reserve Bank of Philadelphia, Research Dept. WP 18-15 (April).

KPMG (2016) Rise of the robots. https://assets.kpmg/content/dam/kpmg/pdf/2016/04/rise-of-the-robots.pdf

KPMG (2018) Institutionalization of cryptoassets. A White Paper (November) https://assets.kpmg/content/dam/kpmg/tr/pdf/2019/02/institutionalization-cryptoassets.pdf.

Lützenkirchen, C., and C. Weistroffer (2012) Microfinance in evolution. DB Research (September).

Meyer, G., N. Bullock and J. Rennison (2018) How high-frequency trading hit a speed bump. Financial Times, 1 January 2018 https://www.ft.com/content/d81f96ea-d43c-11e7-a303-9060cb1e5f44

Orca (2018) P2P risks: Professional analysis of the safety of peer-to-peer lending https://www.orcamoney.com/p2p-lending-risks/

Osipovich, A. (2017) High-frequency traders fall on hard times. WSJ (21 March), https://www.wsj.com/articles/high-frequency-traders-fall-on-hard-times-1490092200

Xu, J., Y. Lu and M. Chau (2015) P2P lending fraud detection: A big data approach. Pacific-Asia Workshop on Intelligence and Security Informatics. doi: 10.1007/978-3-319-18455-5_5, https://www.researchgate.net/publication/300898726_P2P_Lending_Fraud_Detection_A_Big_Data_Approach

Keywords

fintech lending, big data, blockchain, crypto assets

JEL Classification

G22, G23, G29

A1. Change in predictions for 2019

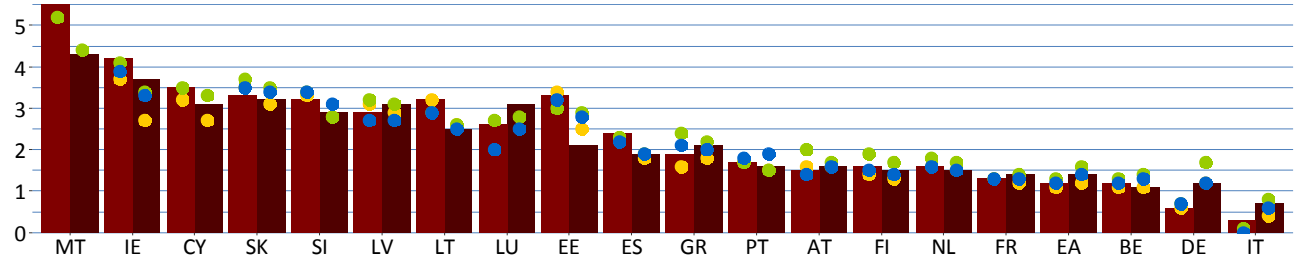
	GDP growth, %								Inflation, %							
	CF		IMF		OECD		CB / EIU		CF		IMF		OECD		CB / EIU	
EA	0	2019/8 2019/7	0	2019/7 2019/4	+0.2	2019/5 2019/3	+0.1	2019/6 2019/3	0	2019/8 2019/7	-0.4	2019/4 2018/10	-0.7	2019/5 2018/11	+0.1	2019/6 2019/3
US	-0.2	2019/8 2019/7	+0.3	2019/7 2019/4	+0.2	2019/5 2019/3	0	2019/6 2019/3	-0.1	2019/8 2019/7	-0.1	2019/4 2018/10	-0.7	2019/5 2018/11	-0.3	2019/6 2019/3
UK	-0.1	2019/8 2019/7	+0.1	2019/7 2019/4	+0.4	2019/5 2019/3	-0.2	2019/8 2019/5	0	2019/8 2019/7	-0.4	2019/4 2018/10	-0.6	2019/5 2018/11	0	2019/8 2019/5
JP	+0.2	2019/8 2019/7	-0.1	2019/7 2019/4	-0.1	2019/5 2019/3	-0.1	2019/7 2019/4	+0.1	2019/8 2019/7	-0.2	2019/4 2018/10	-0.6	2019/5 2018/11	-0.1	2019/7 2019/4
CN	0	2019/8 2019/7	-0.1	2019/7 2019/4	0	2019/5 2019/3	-0.1	2019/6 2019/6	+0.1	2019/8 2019/7	-0.1	2019/4 2018/10	-1.1	2019/5 2018/11	0	2019/6 2019/6
RU	-0.3	2019/7 2019/6	-0.4	2019/7 2019/4	0	2019/5 2019/3	+0.1	2019/7 2019/7	-0.1	2019/7 2019/6	-0.1	2019/4 2018/10	-0.2	2019/5 2018/11	-0.1	2019/7 2019/7

A2. Change in predictions for 2020

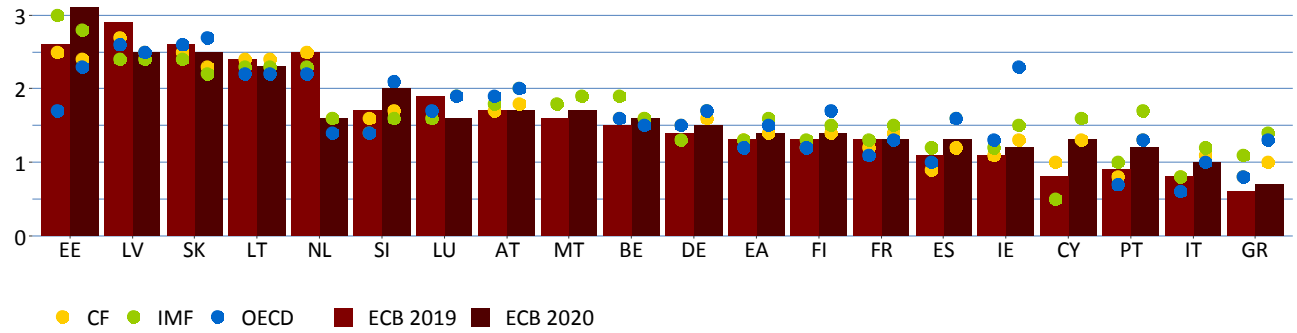
	GDP growth, %								Inflation, %							
	CF		IMF		OECD		CB / EIU		CF		IMF		OECD		CB / EIU	
EA	0	2019/8 2019/7	+0.1	2019/7 2019/4	+0.2	2019/5 2019/3	-0.2	2019/6 2019/3	0	2019/8 2019/7	-0.2	2019/4 2018/10	-0.4	2019/5 2018/11	-0.1	2019/6 2019/3
US	0	2019/8 2019/7	0	2019/7 2019/4	+0.1	2019/5 2019/3	+0.1	2019/6 2019/3	0	2019/8 2019/7	+0.4	2019/4 2018/10	-0.3	2019/5 2018/11	-0.1	2019/6 2019/3
UK	-0.1	2019/8 2019/7	0	2019/7 2019/4	+0.1	2019/5 2019/3	-0.3	2019/8 2019/5	0	2019/8 2019/7	0	2019/4 2018/10	-0.2	2019/5 2018/11	+0.1	2019/8 2019/5
JP	0	2019/8 2019/7	-0.1	2019/7 2019/4	-0.1	2019/5 2019/3	0	2019/7 2019/4	0	2019/8 2019/7	-0.2	2019/4 2018/10	-0.4	2019/5 2018/11	-0.1	2019/7 2019/4
CN	0	2019/8 2019/7	-0.1	2019/7 2019/4	0	2019/5 2019/3	0	2019/6 2019/6	0	2019/8 2019/7	-0.2	2019/4 2018/10	-0.9	2019/5 2018/11	0	2019/6 2019/6
RU	0	2019/7 2019/6	+0.2	2019/7 2019/4	+0.6	2019/5 2019/3	0	2019/7 2019/7	0	2019/7 2019/6	-0.3	2019/4 2018/10	0	2019/5 2018/11	-0.1	2019/7 2019/7

A3. GDP growth and inflation outlooks in the euro area countries

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



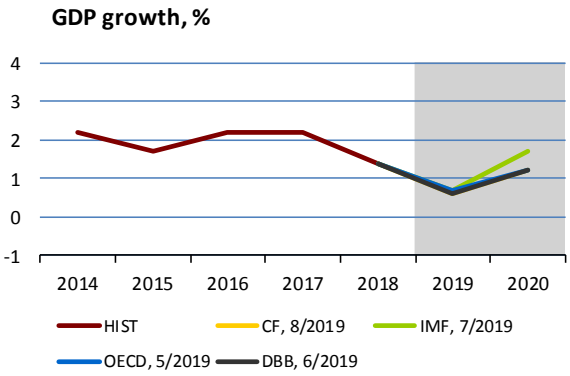
Inflation in the euro area countries in 2019 and 2020, %



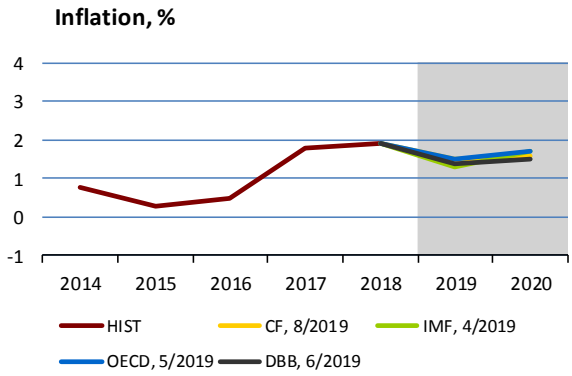
Note: Charts show institutions' latest available outlooks of for the given country.

A4. GDP growth and inflation in the individual euro area countries

Germany



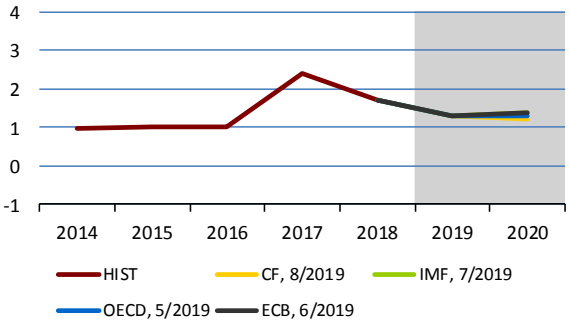
	CF	IMF	OECD	DBB
2019	0.6	0.7	0.7	0.6
2020	1.2	1.7	1.2	1.2



	CF	IMF	OECD	DBB
2019	1.5	1.3	1.5	1.4
2020	1.6	1.7	1.7	1.5

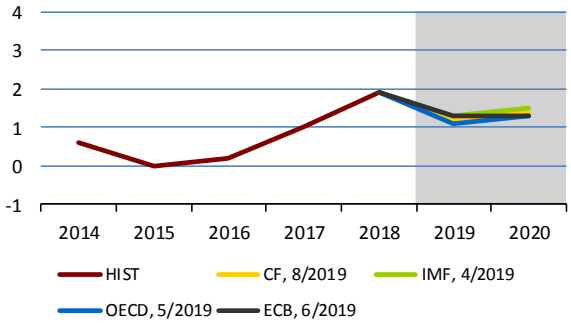
France

GDP growth, %



	CF	IMF	OECD	ECB
2019	1.3	1.3	1.3	1.3
2020	1.2	1.4	1.3	1.4

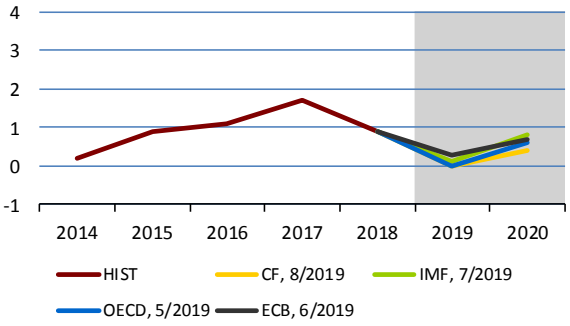
Inflation, %



	CF	IMF	OECD	ECB
2019	1.2	1.3	1.1	1.3
2020	1.4	1.5	1.3	1.3

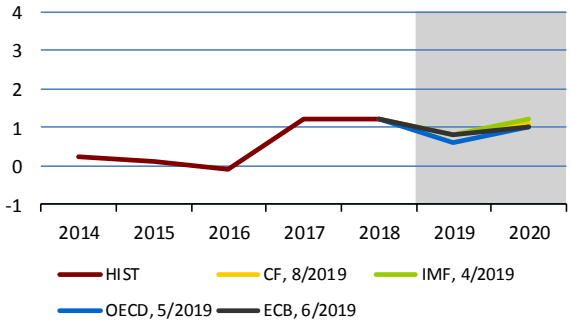
Italy

GDP growth, %



	CF	IMF	OECD	ECB
2019	0.0	0.1	0.0	0.3
2020	0.4	0.8	0.6	0.7

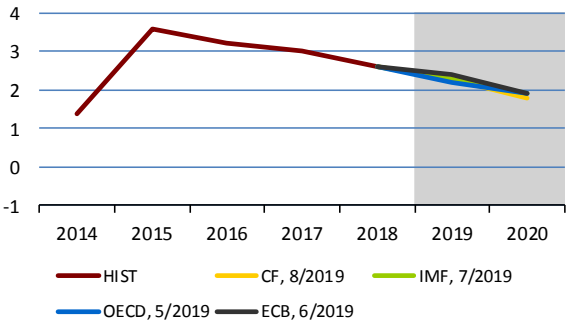
Inflation, %



	CF	IMF	OECD	ECB
2019	0.8	0.8	0.6	0.8
2020	1.1	1.2	1.0	1.0

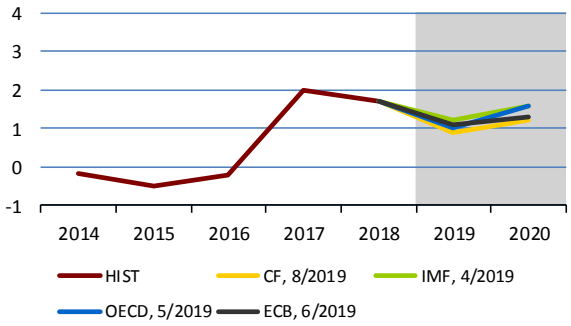
Spain

GDP growth, %



	CF	IMF	OECD	ECB
2019	2.3	2.3	2.2	2.4
2020	1.8	1.9	1.9	1.9

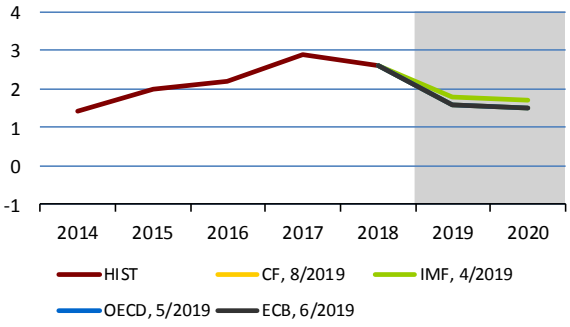
Inflation, %



	CF	IMF	OECD	ECB
2019	0.9	1.2	1.0	1.1
2020	1.2	1.6	1.6	1.3

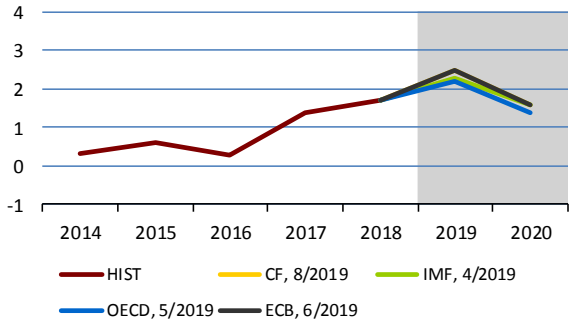
Netherlands

GDP growth, %



	CF	IMF	OECD	ECB
2019	1.6	1.8	1.6	1.6
2020	1.5	1.7	1.5	1.5

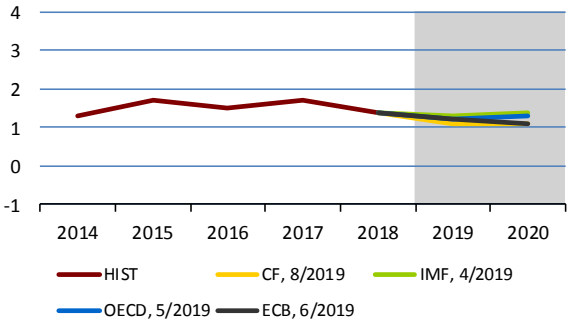
Inflation, %



	CF	IMF	OECD	ECB
2019	2.5	2.3	2.2	2.5
2020	1.6	1.6	1.4	1.6

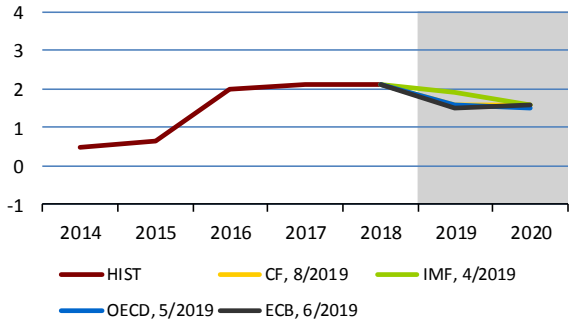
Belgium

GDP growth, %



	CF	IMF	OECD	ECB
2019	1.1	1.3	1.2	1.2
2020	1.1	1.4	1.3	1.1

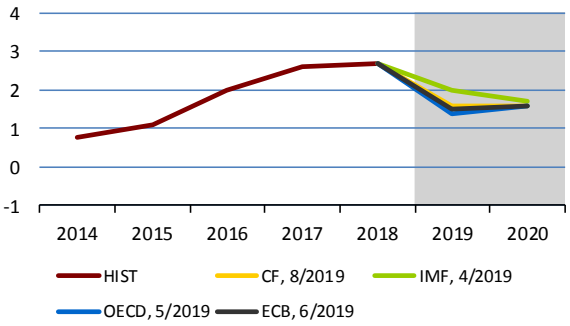
Inflation, %



	CF	IMF	OECD	ECB
2019	1.6	1.9	1.6	1.5
2020	1.6	1.6	1.5	1.6

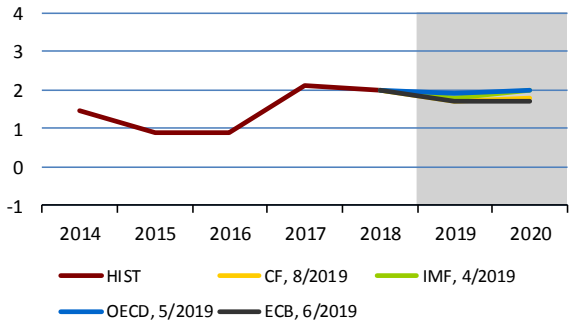
Austria

GDP growth, %



	CF	IMF	OECD	ECB
2019	1.6	2.0	1.4	1.5
2020	1.6	1.7	1.6	1.6

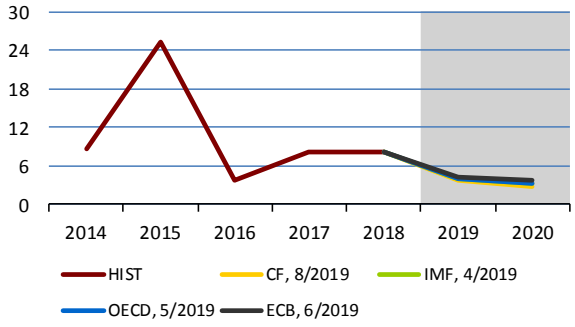
Inflation, %



	CF	IMF	OECD	ECB
2019	1.7	1.8	1.9	1.7
2020	1.8	2.0	2.0	1.7

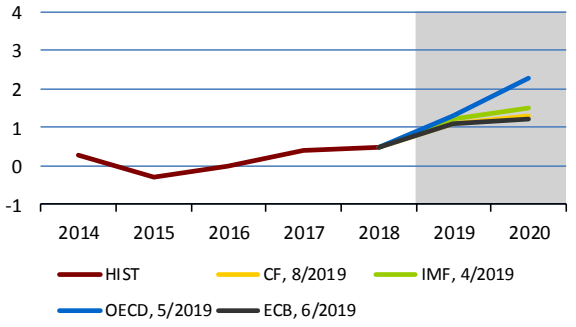
Ireland

GDP growth, %



	CF	IMF	OECD	ECB
2019	3.7	4.1	3.9	4.2
2020	2.7	3.4	3.3	3.7

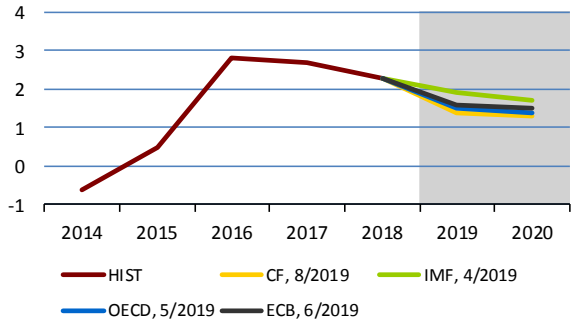
Inflation, %



	CF	IMF	OECD	ECB
2019	1.1	1.2	1.3	1.1
2020	1.3	1.5	2.3	1.2

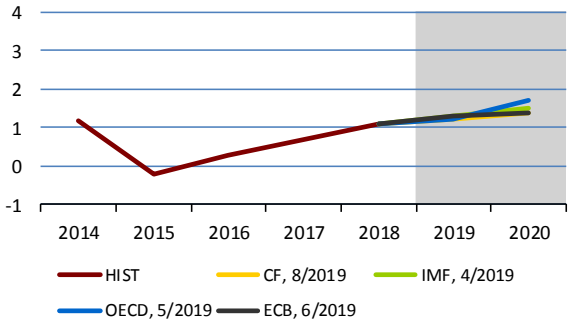
Finland

GDP growth, %



	CF	IMF	OECD	ECB
2019	1.4	1.9	1.5	1.6
2020	1.3	1.7	1.4	1.5

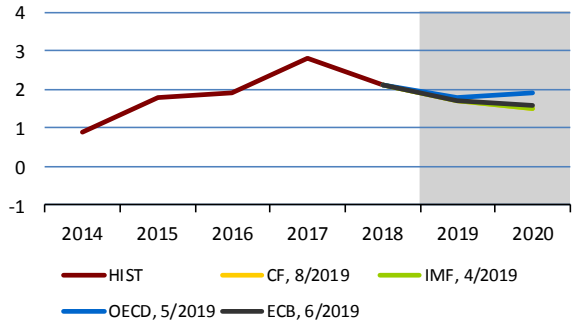
Inflation, %



	CF	IMF	OECD	ECB
2019	1.2	1.3	1.2	1.3
2020	1.4	1.5	1.7	1.4

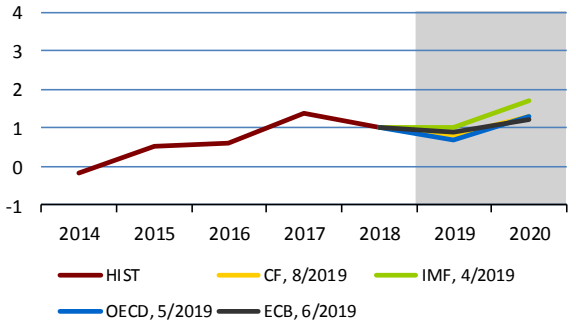
Portugal

GDP growth, %



	CF	IMF	OECD	ECB
2019	1.7	1.7	1.8	1.7
2020	1.5	1.5	1.9	1.6

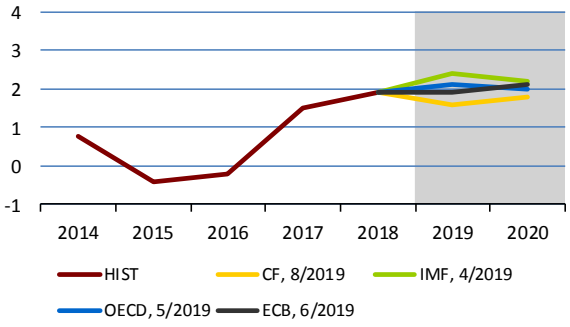
Inflation, %



	CF	IMF	OECD	ECB
2019	0.8	1.0	0.7	0.9
2020	1.3	1.7	1.3	1.2

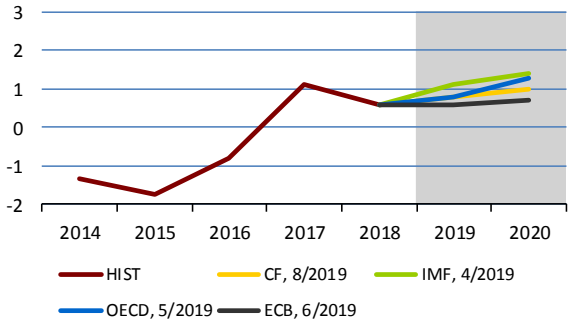
Greece

GDP growth, %



	CF	IMF	OECD	ECB
2019	1.6	2.4	2.1	1.9
2020	1.8	2.2	2.0	2.1

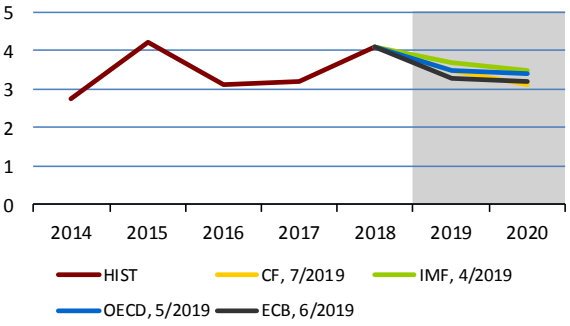
Inflation, %



	CF	IMF	OECD	ECB
2019	0.8	1.1	0.8	0.6
2020	1.0	1.4	1.3	0.7

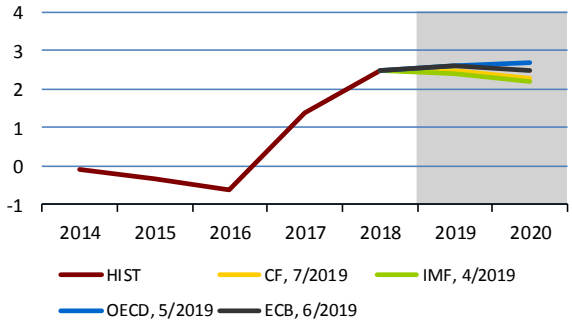
Slovakia

GDP growth, %



	CF	IMF	OECD	ECB
2019	3.5	3.7	3.5	3.3
2020	3.1	3.5	3.4	3.2

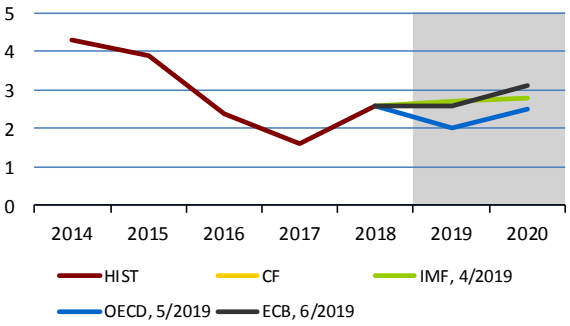
Inflation, %



	CF	IMF	OECD	ECB
2019	2.5	2.4	2.6	2.6
2020	2.3	2.2	2.7	2.5

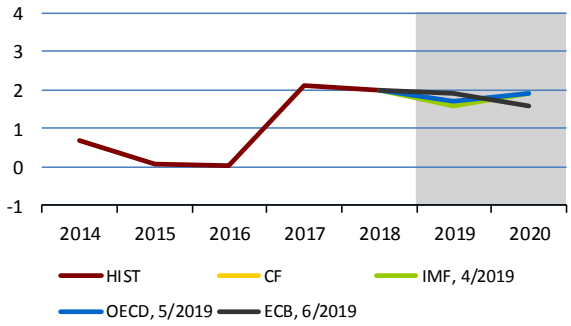
Luxembourg

GDP growth, %



	CF	IMF	OECD	ECB
2019	n. a.	2.7	2.0	2.6
2020	n. a.	2.8	2.5	3.1

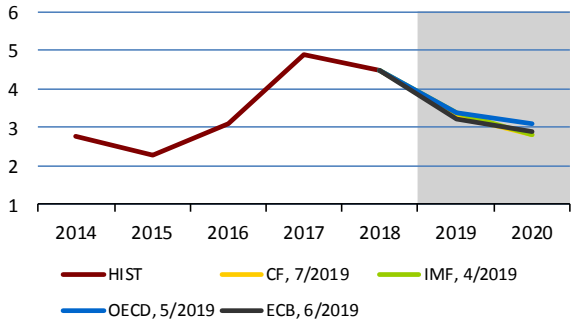
Inflation, %



	CF	IMF	OECD	ECB
2019	n. a.	1.6	1.7	1.9
2020	n. a.	1.9	1.9	1.6

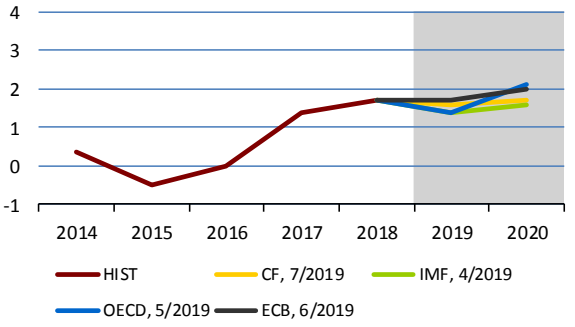
Slovenia

GDP growth, %



	CF	IMF	OECD	ECB
2019	3.3	3.4	3.4	3.2
2020	2.8	2.8	3.1	2.9

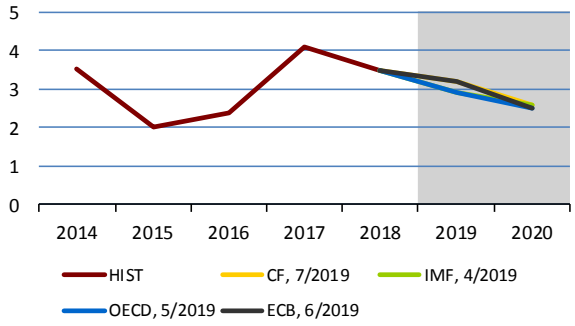
Inflation, %



	CF	IMF	OECD	ECB
2019	1.6	1.4	1.4	1.7
2020	1.7	1.6	2.1	2.0

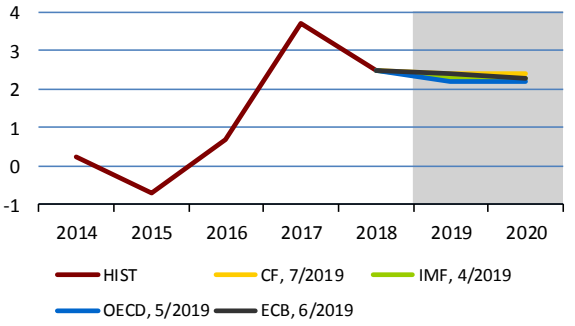
Lithuania

GDP growth, %



	CF	IMF	OECD	ECB
2019	3.2	2.9	2.9	3.2
2020	2.6	2.6	2.5	2.5

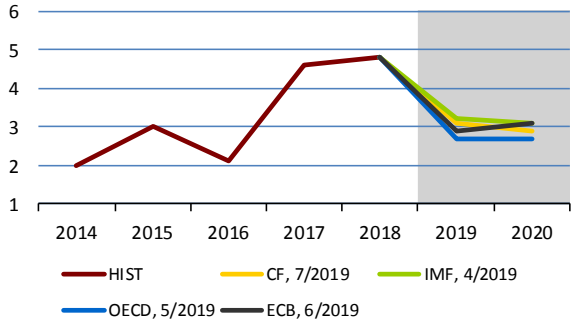
Inflation, %



	CF	IMF	OECD	ECB
2019	2.4	2.3	2.2	2.4
2020	2.4	2.3	2.2	2.3

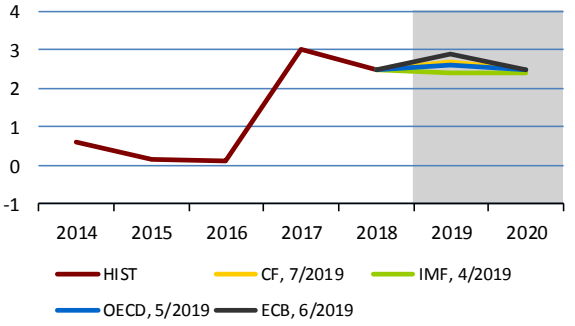
Latvia

GDP growth, %



	CF	IMF	OECD	ECB
2019	3.1	3.2	2.7	2.9
2020	2.9	3.1	2.7	3.1

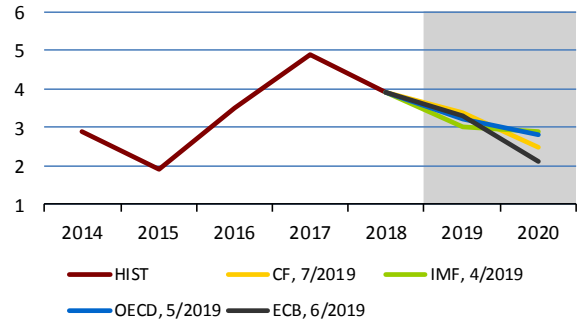
Inflation, %



	CF	IMF	OECD	ECB
2019	2.7	2.4	2.6	2.9
2020	2.5	2.4	2.5	2.5

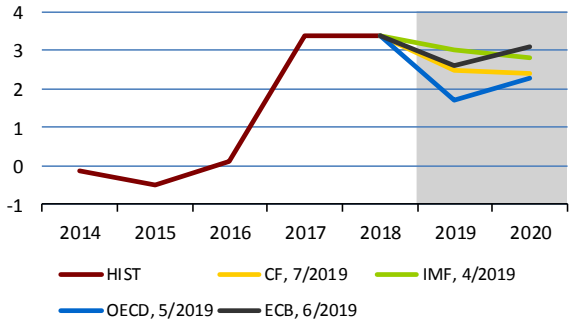
Estonia

GDP growth, %



	CF	IMF	OECD	ECB
2019	3.4	3.0	3.2	3.3
2020	2.5	2.9	2.8	2.1

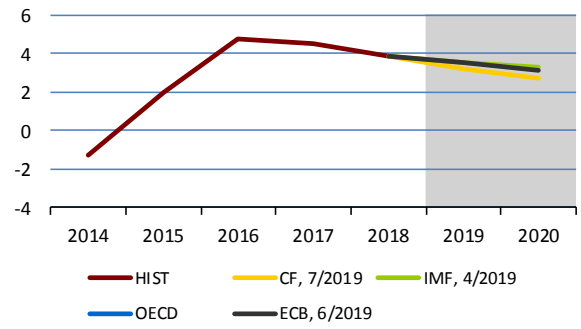
Inflation, %



	CF	IMF	OECD	ECB
2019	2.5	3.0	1.7	2.6
2020	2.4	2.8	2.3	3.1

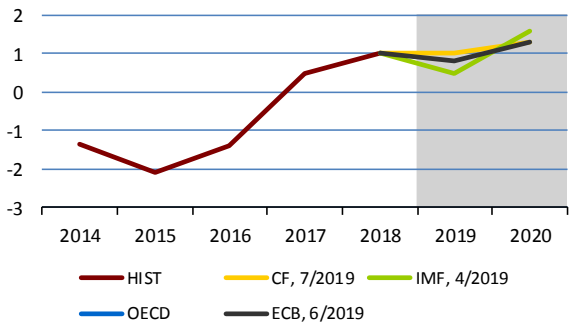
Cyprus

GDP growth, %



	CF	IMF	OECD	ECB
2019	3.2	3.5	n. a.	3.5
2020	2.7	3.3	n. a.	3.1

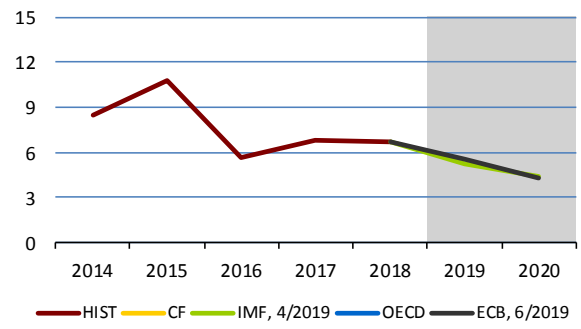
Inflation, %



	CF	IMF	OECD	ECB
2019	1.0	0.5	n. a.	0.8
2020	1.3	1.6	n. a.	1.3

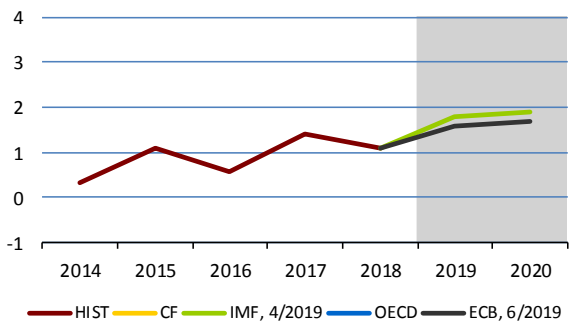
Malta

GDP growth, %



	CF	IMF	OECD	ECB
2019	n. a.	5.2	n. a.	5.5
2020	n. a.	4.4	n. a.	4.3

Inflation, %



	CF	IMF	OECD	ECB
2019	n. a.	1.8	n. a.	1.6
2020	n. a.	1.9	n. a.	1.7

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