

GLOBAL ECONOMIC OUTLOOK - SEPTEMBER

Monetary Department
External Economic Relations Division

2018

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Cut-off date for data

14 September 2018

CF survey date

10 September 2018

GEO publication date

21 September 2018

Notes to charts

ECB and Fed: midpoint of the range of forecasts.

The arrows in the GDP and inflation outlooks indicate the direction of revisions compared to the last GEO. If no arrow is shown, no new forecast is available. Asterisks indicate first published forecasts for given year. Historical data are taken from CF, with exception of MT and LU, for which they come from EIU.

Leading indicators are taken from Bloomberg and Datastream.

Forecasts for EURIBOR and LIBOR rates are based on implied rates from interbank market yield curve (FRA rates are used from 4M to 15M and adjusted IRS rates for longer horizons). Forecasts for German and US government bond yields (10Y Bund and 10Y Treasury) are taken from CF.

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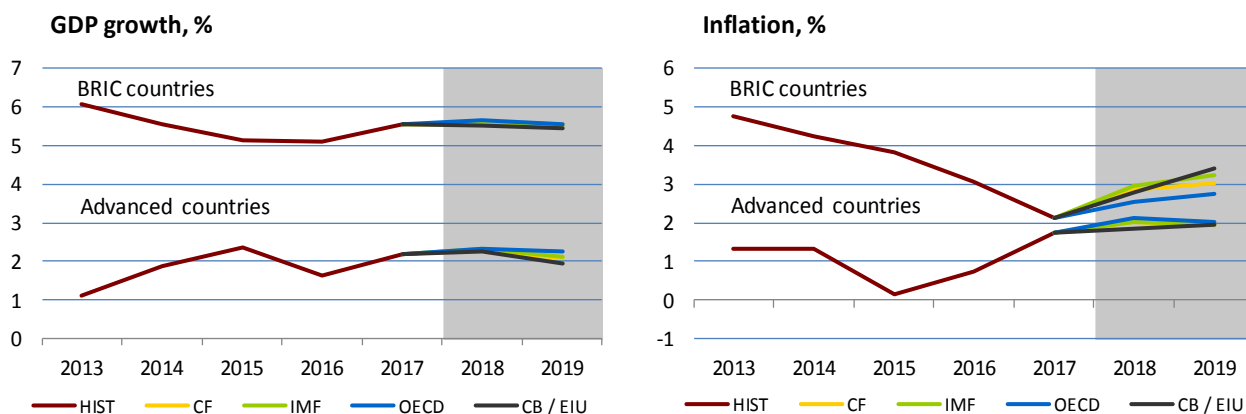
The September issue of Global Economic Outlook presents the regular monthly overview of recent and expected developments in selected territories, focusing on key economic variables: inflation, GDP growth, leading indicators, interest rates, exchange rates and commodity prices. The analytical section of this issue focuses on the liquefied natural gas (LNG) market, which is the fastest growing segment of the commodity market in terms of volume and also the most flexible one. It starts by briefly introducing the LNG market, including the largest producers and buyers. It then describes the expected development of LNG production and regasification capacity, LNG production and shipping costs and, finally, LNG pricing. It concludes that there will be a relative glut of LNG on the market roughly until 2022 due to the opening of new production plants by the main producers.

Although the September outlooks for economic growth in the advanced economies we monitor are almost unchanged from the previous month, they are still surrounded by high uncertainty. It stems mainly from still deteriorating expectations regarding world trade due to the USA's protectionist measures and retaliation by the countries affected. There is also the still unclear issue of what form of Brexit will actually take place in spring 2019. The situation in Turkey has calmed somewhat, but spillover to other countries has not been averted yet. Despite these uncertainties, the current outlooks show that the USA will continue to enjoy robust economic growth of almost 3%, despite further expected monetary policy tightening by the Fed. The outlooks for the euro area still indicate distinctly lower economic growth than in the USA. The outlook for Germany this year has dropped below 2%. The economic growth rates in the UK and Japan are still the lowest among the advanced countries we monitor, although with a slightly rising outlook at the end of next year. The consumer price inflation outlooks in advanced countries are relatively close to 2%. The outlooks for Japan lag furthest behind this notional ideal inflation rate, but inflation in the euro area and Germany will not reach the 2% level by the end of next year either, according to the latest CF. The opposite applies to the USA, where inflation outlooks of around 2.5% are indicating another interest rate hike soon.

The September outlooks for the economic performance of the BRIC countries can still be assessed as solid. Moreover, the strong growth figures for India and China have been raised slightly further. The Indian economy is expected to grow by around 7.5% and the Chinese economy by about 6.5%. In the case of China, any revision of these optimistic outlooks will depend on the degree of escalation of its trade disputes with the USA. The inflation estimates for China remain relatively low, only just above the 2% level. The expected inflation figure in India fell slightly and is now below 5%. This can be considered consistent with the robust economic growth in that country from the macroeconomic perspective. The growth outlooks for Brazil and Russia have generally worsened despite some current positive news. By the end of 2019, the Brazilian economy will be heading below the 2% level, where the Russian economy has been for several years now, amid inflation close to 4% in both countries.

According to market outlooks, euro area interest rates will remain negative until the end of 2019. By contrast, US rates can be expected to rise slightly further, probably at the Fed meeting in September. According to CF, the US dollar will weaken against all the currencies we monitor one year ahead and the Brent crude oil price will be close to USD 72 a barrel at the one-year horizon. The metal and food commodity price indices kept falling in August, but the outlook for prices of food commodities is rising.

GDP growth and inflation development and outlook in monitored countries

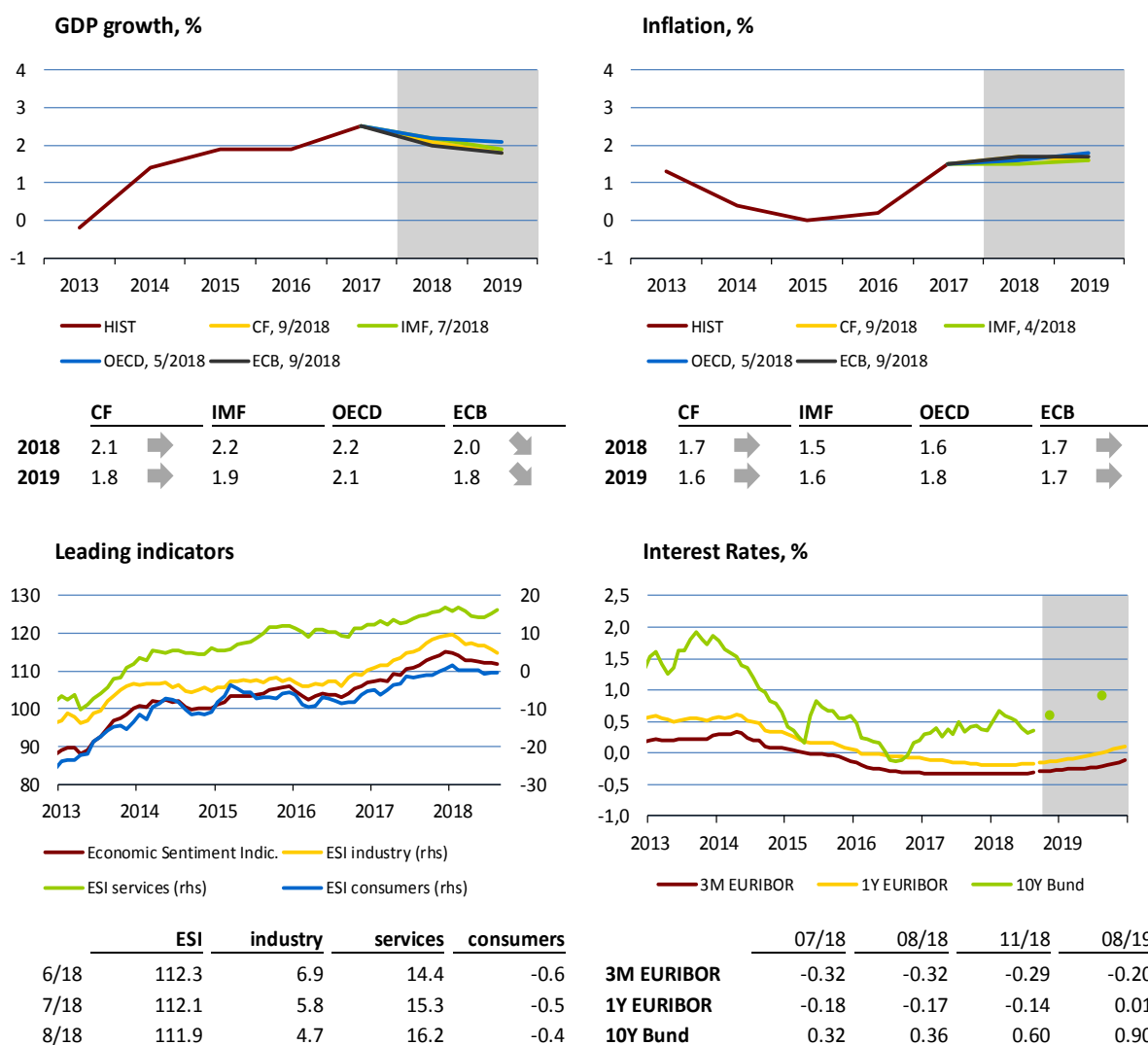


Note: The figures represent the weighted averages of historical series / outlooks in individual countries. The weights are based on nominal GDP measured in USD during 2013–2016 (source: EIU). Advanced countries: euro area, United States, United Kingdom, Japan. BRIC countries: China, India, Russia, Brazil.

II.1 Euro area

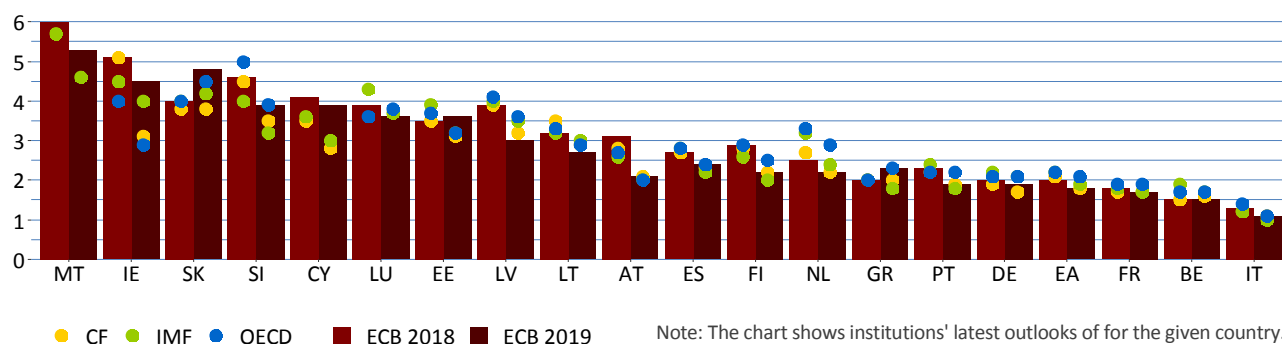
The euro area economy continued to show solid growth in Q2, although its pace was slightly lower than last year. In quarter-on-quarter terms, GDP growth stayed at 0.4%. It was driven by domestic demand (mainly fixed investment and household consumption). By contrast, as in the previous quarter, the contribution of net exports was negative. Unlike in Q1, however, goods and services exports grew. In year-on-year terms, the growth slowed by 0.3 pp to 2.1%. Available indicators for Q3 are also signalling continuing modest growth. Leading indicators mostly fell further, but remained in the expansion band. Their drop mainly reflected uncertainty connected with the global trade situation. Coincidence indicators available for Q3 are also signalling a slowdown of the euro area's economic performance, with both industrial output and retail sales falling in July (by 0.8% and 0.2% month on month respectively). Domestic demand, though, continues to be supported by a favourable labour market (unemployment was flat at 8.2% in July and annual wage growth accelerated by 0.1 pp to 1.9%). However, the growth in disposable income is being offset by higher energy prices. The monitored outlooks thus expect economic growth of around 2% in the euro area this year. Next year, the growth is expected to return to potential levels at about 1.8%.

Headline inflation declined marginally to 2% in August. Its higher level compared to last year continued to reflect a higher contribution of energy prices. By contrast, core inflation fell back to 1%, a level around which it has long hovered. The outlook expects a gradual increase in inflation pressures from the real economy connected with wage growth, which is expected to gradually offset the fade-out of the higher contribution of energy prices. Inflation should thus reach around 1.7% this year and remain at a similar level next year. The ECB confirmed its previously announced monetary policy stance at its September meeting. Net asset purchases will slow from a monthly pace of EUR 30 billion to EUR 15 billion from the start of October until the end of the year. The General Council expects them to end then. It also expects policy rates to remain at their current levels at least through the summer of 2019.

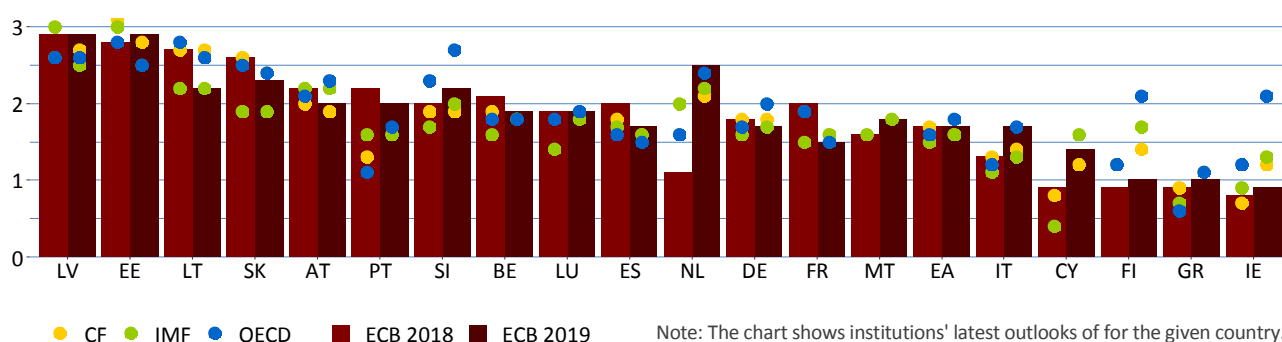


II. ECONOMIC OUTLOOK IN ADVANCED ECONOMIES

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

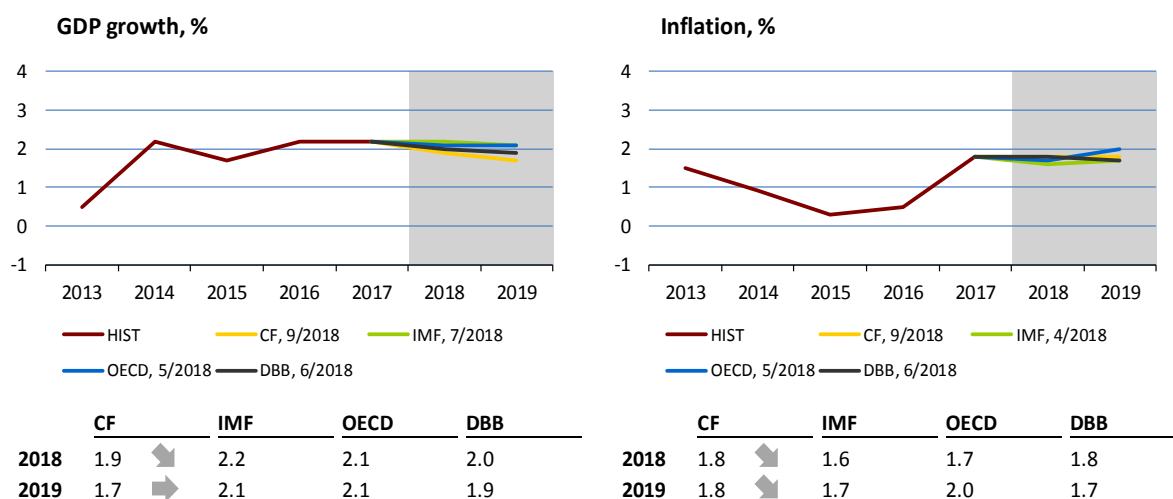


Inflation outlooks in the euro area countries in 2018 and 2019, %



II.2 Germany

The CF outlook for GDP growth this year dropped slightly in September, as did the inflation outlook for both this year and the next. According to most of the institutions monitored, inflation will not thus reach 2% by the end of the monitored horizon. The quarter-on-quarter GDP growth rate surprised on the upside and reached 0.5%, due mainly to domestic demand. By contrast, industrial production recorded a further quarter-on-quarter fall in Q2. The PMI in manufacturing edged down in August but remains at a relatively solid level in the expansion band. The other leading indicators (IFO, ZEW) improved in August and September. This could imply some stabilisation as regards the risk of protectionist trade measures by the USA, Germany's biggest export market. Consumer price inflation (HICP) stayed the same in August as in the previous month, due mainly to growth in energy prices. Core inflation remained subdued.

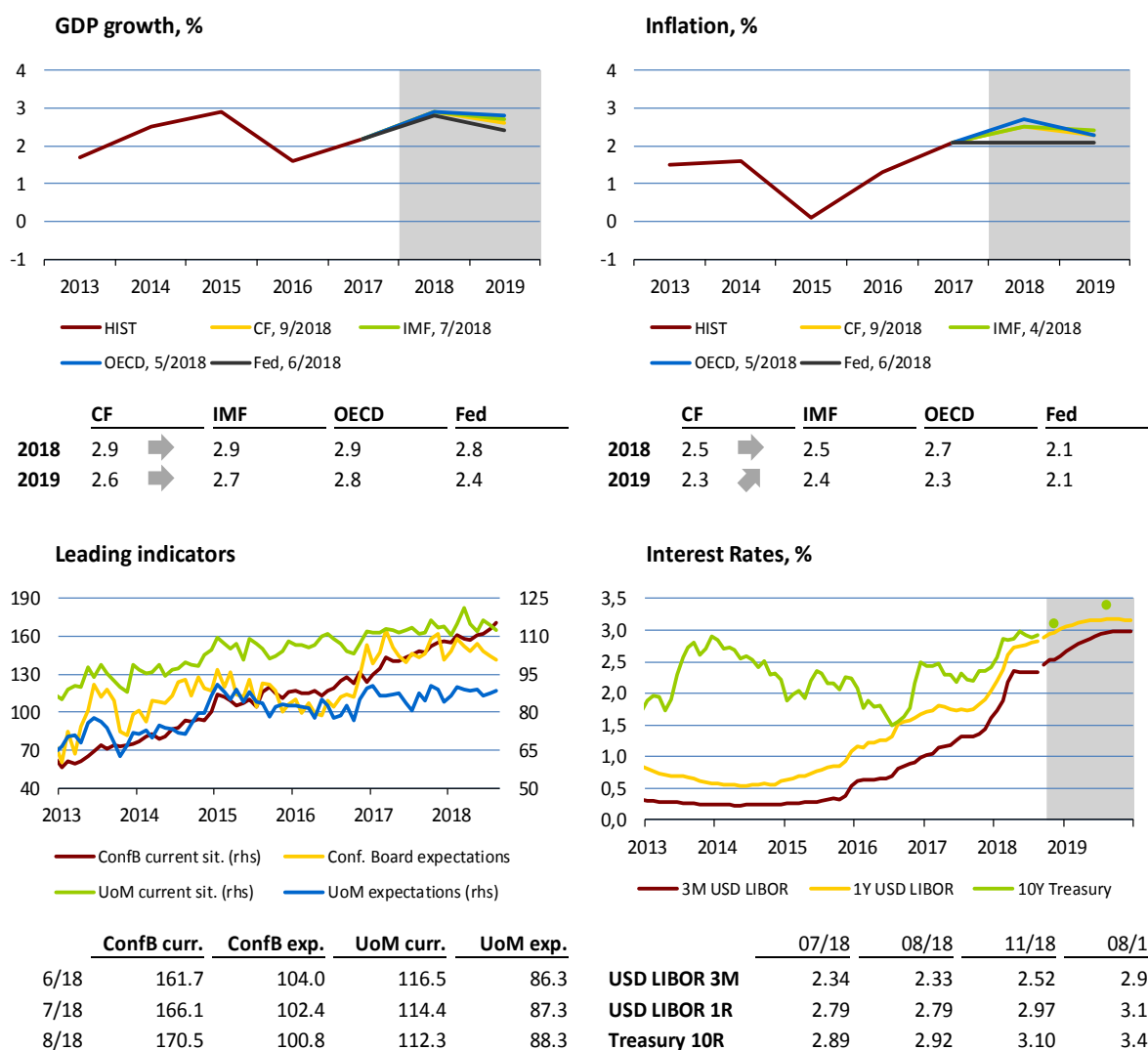


II.3 United States

President Donald Trump's declaration that he was prepared to impose tariffs on China's entire exports to the USA further escalated the US-Chinese disputes. Tariffs currently apply to imports of Chinese goods worth USD 50 billion a year and to steel and aluminium imports. According to the US Chamber of Commerce in Beijing, more than 60% of US businesses in China have already been hit by the current tariffs and one-third of them are considering relocating production facilities or have already done so. The previously flagged 25% tariffs on Chinese goods worth USD 200 billion could be introduced soon, although the USA has invited Chinese representatives to a new round of trade talks. The threatened tariffs would have a major impact on foreign trade, as the list now includes consumer goods.

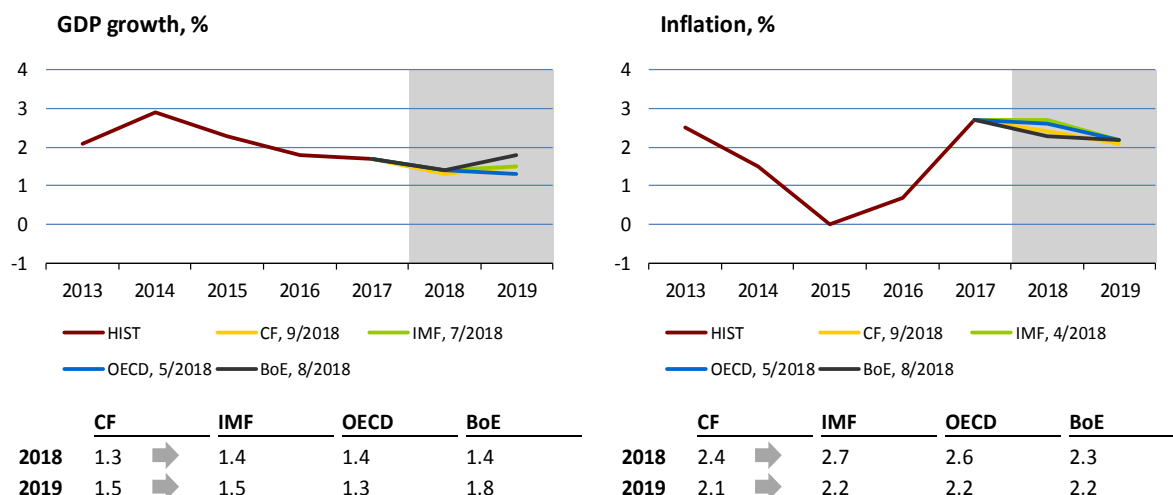
The US economy expanded by 4.2% in Q2 (in quarter on quarter annualised terms), the fastest rate since 2014 Q3. The second estimate revised the figure upwards, due mainly to higher corporate spending on software and a drop in imports, primarily of oil. The growth is expected to slow in H2 as the effect of the tax reform fades and the tariffs are felt in full. According to the Atlanta Fed, GDP will grow by 3.8% in Q3. While the current data on consumer demand are still positive, the housing market weakened further.

The tight labour market conditions are not only being reflected in wage growth, but also contributing to growth in market inflation expectations. Non-farm payrolls rose by 201,000 in August and the unemployment rate was unchanged from the previous month (3.9%). Labour cost developments came as a surprise, with the average hourly wage rising at its fastest rate in nine years in year-on-year terms (2.9%). Long-term inflation expectations derived from government bonds shifted up to 3%. Headline inflation slowed slightly to 2.7% in August. The strong economic growth, low unemployment and inflation close to the target could prolong the period of gradual monetary policy tightening to two years. The next increase is expected at the central bank's late-September meeting. The September CF only revised the inflation outlook for 2019 upwards.



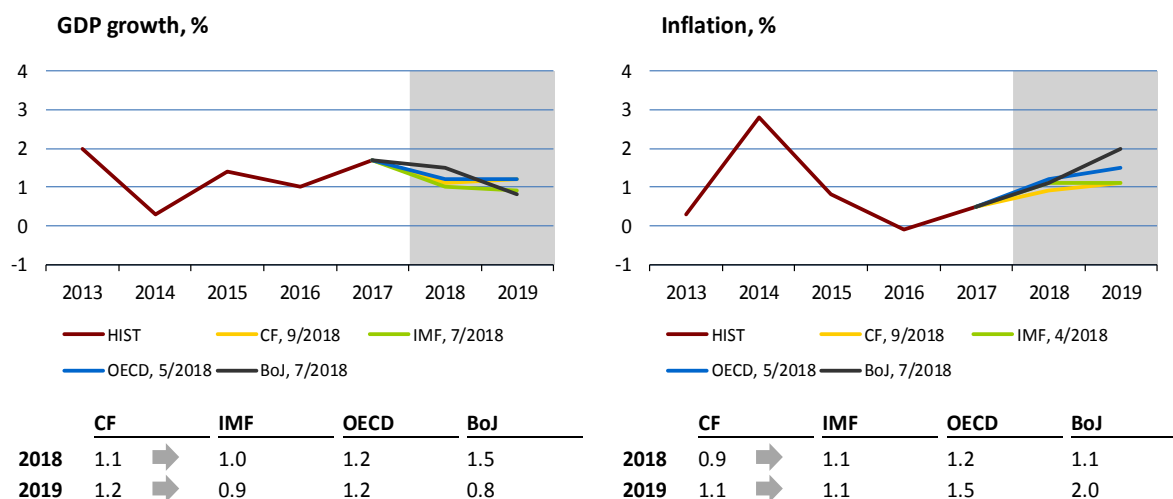
II.4 United Kingdom

Monthly indicators suggest that the UK's economic performance is continuing to improve gradually. Month-on-month GDP growth, published by the UK statistical office, accelerated to 0.3% in July. The growth was driven by the services sector, which has the greatest weight (almost 80%) in GDP and recorded a solid increase after stagnating in July. By contrast, industrial production growth slowed, with output in manufacturing dropping in July. In year-on-year terms, economic growth reached 1.6% in July, slightly exceeding the forecasts of the institutions monitored for this year as a whole. The NIESR prediction for Q3 expects quarter-on-quarter GDP growth to accelerate to 0.6%. The acceleration is implied also by the leading PMI indicator in services, which rose to 54.3 in August. Consumer confidence also improved slightly as annual average wage growth exceeded inflation by 0.1 pp in July. The BoE left rates unchanged.



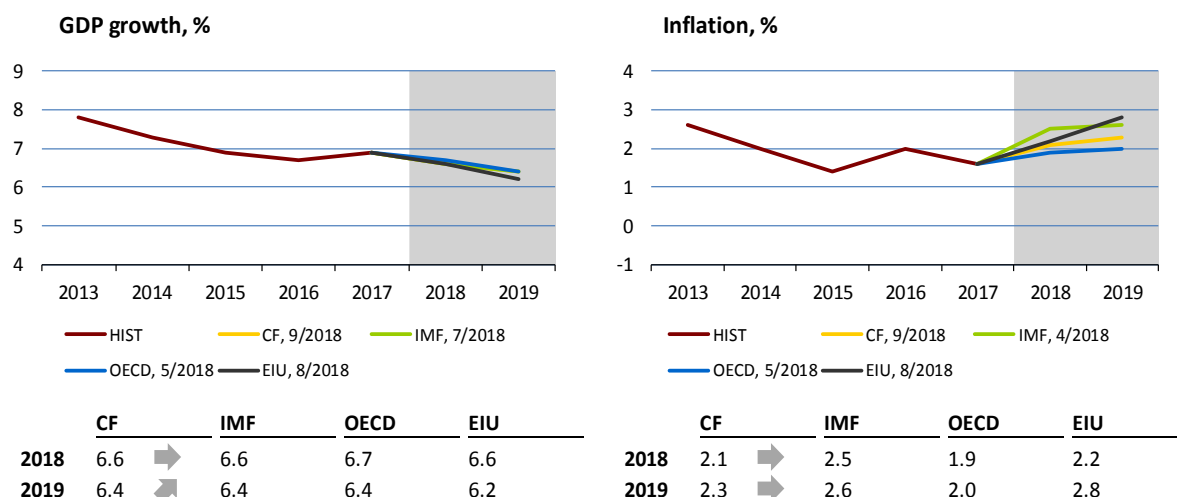
II.5 Japan

According to the final data, the Japanese economy grew faster in 2018 Q2 than preliminary information had indicated. The Japanese economy expanded by 3% (in quarter-on-quarter annualised terms), which is 3.9 pp more than in 2018 Q1. The GDP growth was supported mainly by private consumption and capital expenditure. Year-on-year retail sales growth slowed slightly in July. Household spending increased, but wage growth slackened and unemployment crept up to 2.5%. Industrial production growth rose markedly amid renewed production of most goods. The PMI in manufacturing went up to 52.5 points in August. According to purchasing managers, output and new orders grew at a faster rate. The GDP growth forecast was unchanged. Annual inflation rose by 0.2 pp to 0.9% in July. The growth was due chiefly to rising food prices. The new CF left the inflation outlooks unchanged.



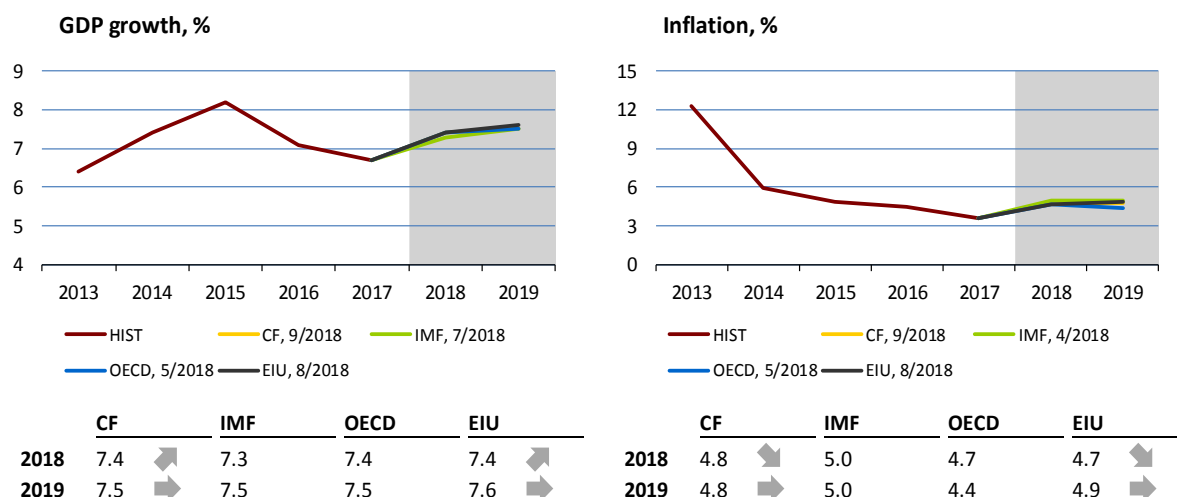
III.1 China

China cannot respond to the same extent to President Trump's threats to impose tariffs on its entire imports to the USA, but it does have a whole range of other measures at its disposal (including exchange rate manipulation). Its willingness to introduce retaliatory measures will be affected mainly by developments in the domestic economy, where a slight slowdown can be observed in 2018 Q3. The central bank responded mainly by supplying long-term liquidity with the primary aim of supporting corporate and local government bonds. It also re-introduced the countercyclical factor to stabilise the depreciation of the Chinese currency against the dollar. The renminbi weakened against the dollar to a 21-month low in early September. The September CF revised only the GDP growth outlook for 2019 upwards.



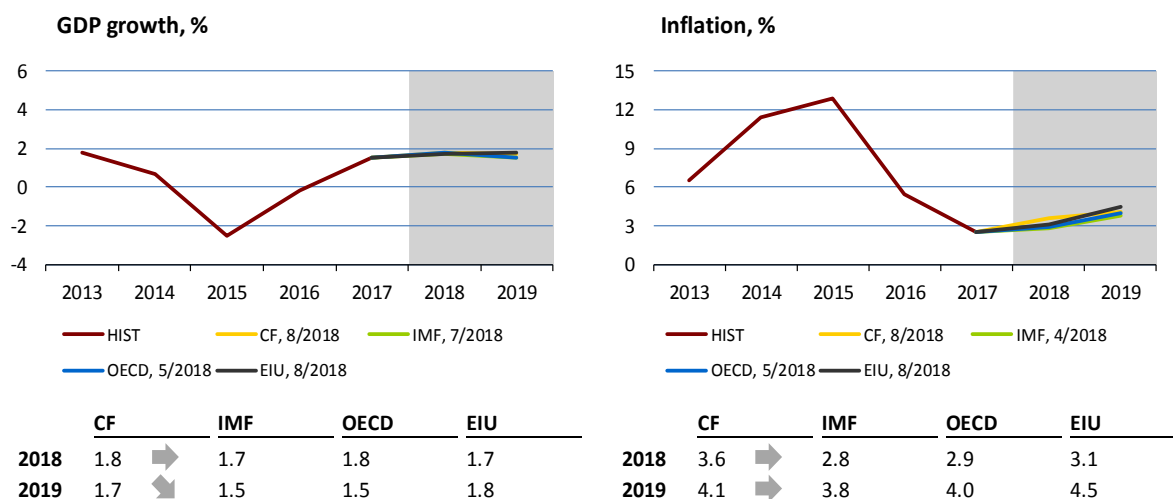
III.2 India

The Indian economy expanded by 8.2% year on year in the first quarter of fiscal year 2018/2019. The growth was 0.5 pp higher than in the previous quarter and was supported by all components of the economy, most notably investment. Year-on-year industrial production growth slowed in July despite an increase in output in manufacturing, as mining and electricity generation declined. The PMI in manufacturing went down to 51.7 points in August. According to purchasing managers, the drop was due to slower growth in output and new orders. CF and the EIU both increased their predictions for fiscal year 2018/2019 by 0.1 pp and the Indian economy is thus expected to grow by 7.4% this fiscal year. Inflation fell again in year-on-year terms in August, this time by 0.5 pp to 3.7%. This was due to slower growth in prices of food, particularly vegetables and legumes. CF and the EIU revised their inflation forecasts for this fiscal year downwards slightly. The rupee, hit by negative sentiment, depreciated to its weakest-ever level and then started to strengthen moderately.



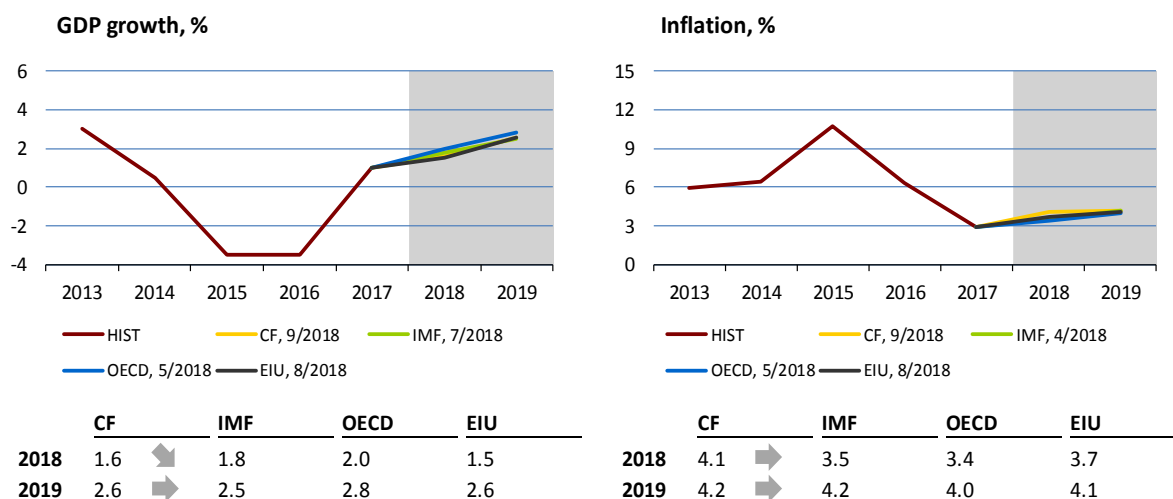
III.3 Russia

The Russian economy grew by 1.9% in Q2, 0.1 pp faster than the preliminary estimate. Leading indicators also improved slightly in August, although the PMI in manufacturing is still in the economic contraction band (48.9). The PMI in services increased to 53.3. The risk of further sanctions against Russia combined with unfavourable market sentiment towards emerging countries weakened the rouble by around 5% in the first ten days of September compared to the start of the month. The rouble briefly exceeded RUB 70 to the dollar at the time, but then started firming again and stood close to RUB 68 to the dollar in the middle of the month. The GDP outlook for this year remained unchanged. However, CF expects slightly weaker economic growth next year. Annual inflation rose to 3.1% in August, the highest level in the past year, due primarily to growth in food prices. The CF outlook until the end of 2019 is unchanged.



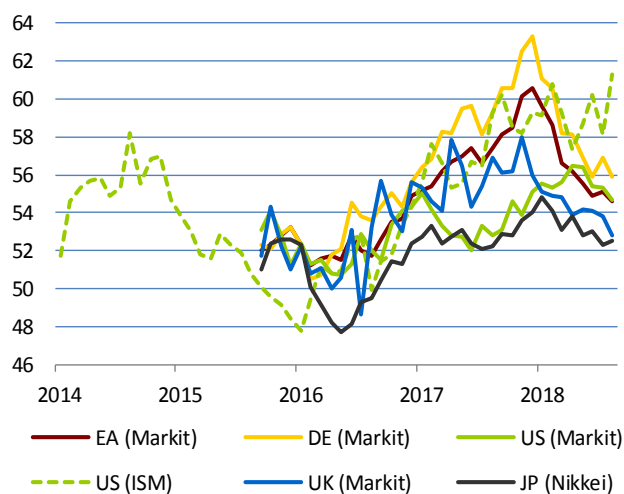
III.4 Brazil

Brazilian economic growth slowed year on year from 1.2% to 1.0% in Q2, lagging behind expectations. By contrast, industrial output in July grew more than originally expected (by 4% year on year) and the August PMI in manufacturing also rose. However, the PMI in services slumped into the contraction band, leading to a marked deterioration in the composite index (from 50.4 to 47.8). Inflation fell in year-on-year terms to 4.2% in August due to slower growth in transport and housing prices. The Brazilian currency has been weakening almost continuously over the past six months. The real fell to its weakest-ever level of BRL 4.21 to the dollar in mid-September. Besides global factors, the real's decline is due to uncertainty stemming from the approaching October presidential elections. CF lowered its GDP growth outlook for 2018 but left its outlook for 2019 unchanged. The inflation outlook also stayed the same.

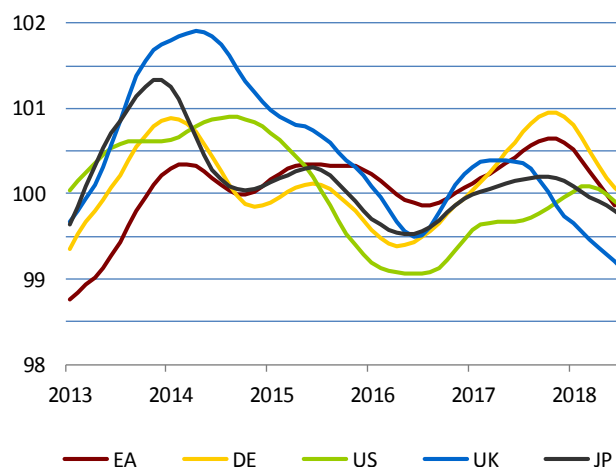


IV.1 Advanced economies

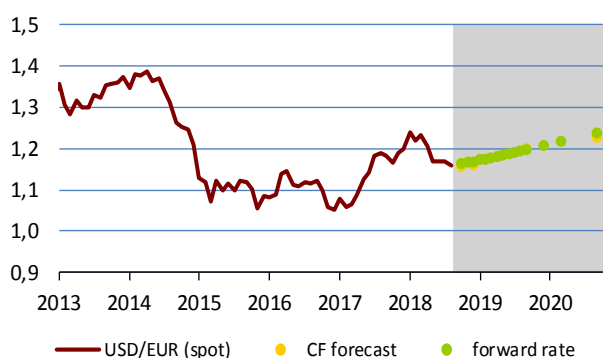
PMI in manufacturing



OECD Composite Leading Indicator

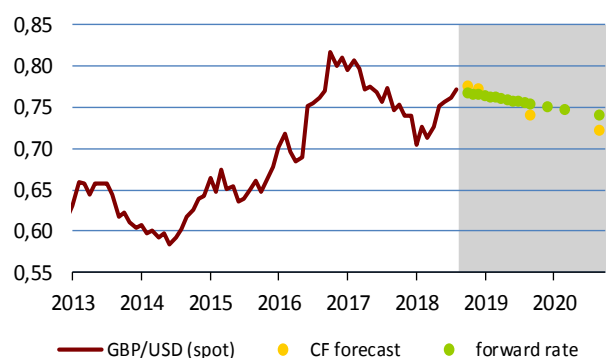


The US dollar (USD/EUR)



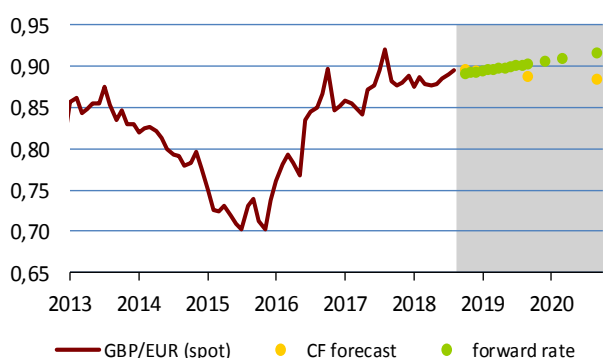
	10/9/18	10/18	12/18	09/19	09/20
spot rate	1.160				
CF forecast		1.156	1.158	1.198	1.226
forward rate		1.162	1.168	1.197	1.237

The British pound (GBP/USD)



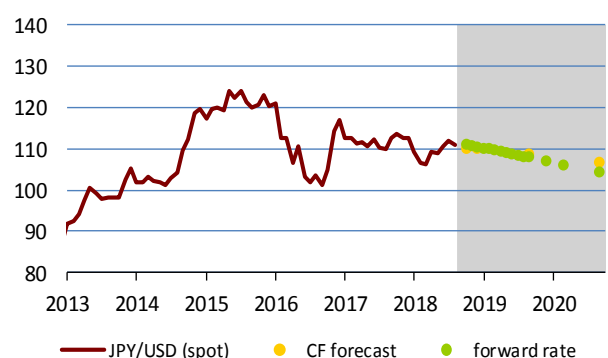
	10/9/18	10/18	12/18	09/19	09/20
spot rate	0.768				
CF forecast		0.775	0.772	0.740	0.721
forward rate		0.767	0.765	0.754	0.740

The British pound (GBP/EUR)



	10/9/18	10/18	12/18	09/19	09/20
spot rate	0.891				
CF forecast		0.895	0.894	0.887	0.884
forward rate		0.891	0.893	0.902	0.915

The Japanese yen (JPY/USD)

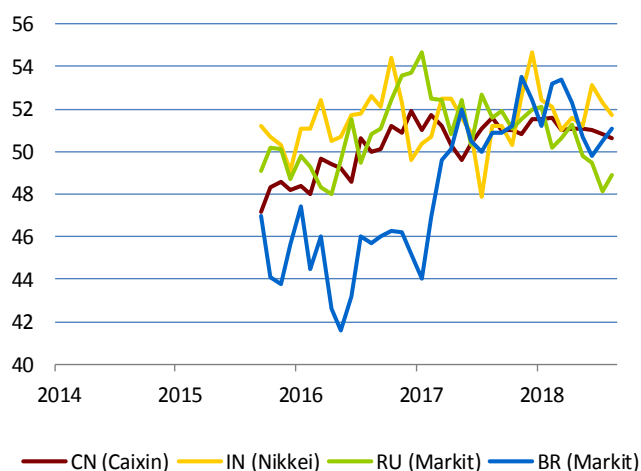


	10/9/18	10/18	12/18	09/19	09/20
spot rate	111.2				
CF forecast		110.1	109.8	108.7	106.7
forward rate		110.9	110.4	107.8	104.2

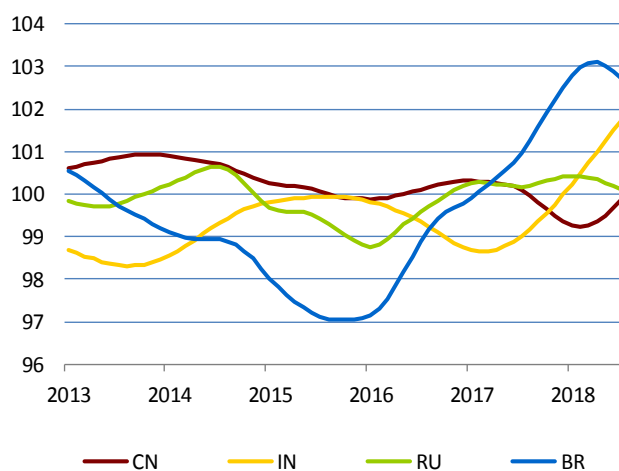
Note: Exchange rates as of last day of month. Forward rate does not represent outlook; it is based on covered interest parity, i.e. currency of country with higher interest rate is depreciating. Forward rate represents current (as of cut-off date) possibility of hedging future exchange rate.

IV.2 BRIC countries

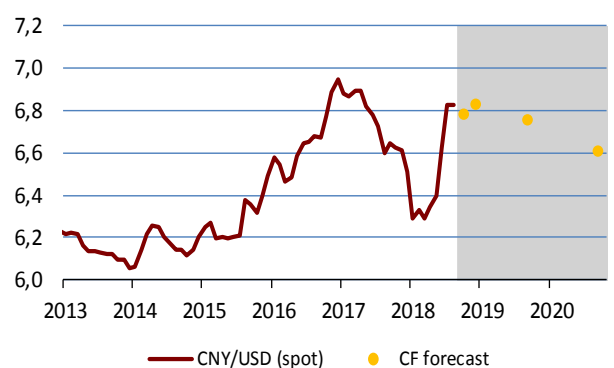
PMI in manufacturing



OECD Composite Leading Indicator

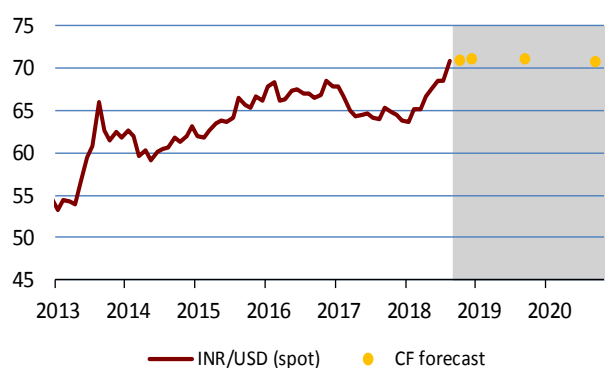


The Chinese renminbi (CNY/USD)



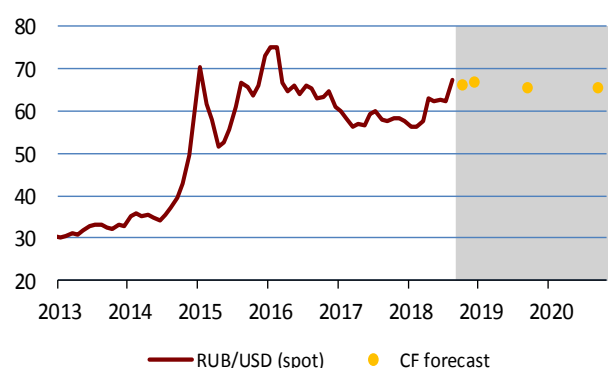
	10/9/18	10/18	12/18	09/19	09/20
spot rate	6.865				
CF forecast		6.778	6.825	6.752	6.606

The Indian rupie (INR/USD)



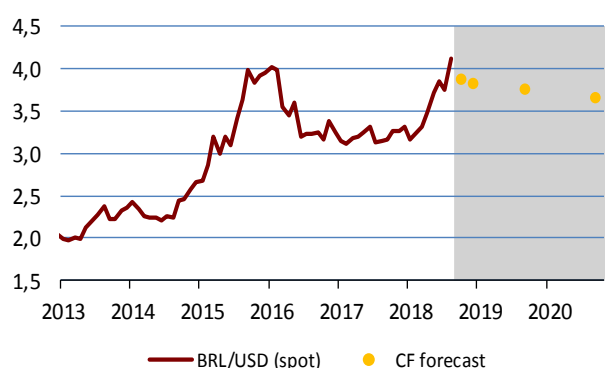
	10/9/18	10/18	12/18	09/19	09/20
spot rate	72.41				
CF forecast		70.87	71.12	71.07	70.64

The Russian rouble (RUB/USD)



	10/9/18	10/18	12/18	09/19	09/20
spot rate	70.34				
CF forecast		66.01	66.64	65.43	65.5

The Brazilian real (BRL/USD)



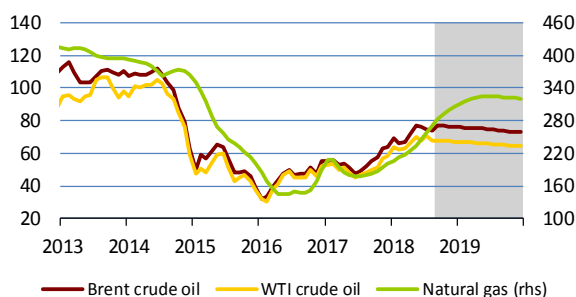
	10/9/18	10/18	12/18	09/19	09/20
spot rate	4.096				
CF forecast		3.877	3.816	3.755	3.659

Note: Exchange rates as of last day of month.

V.1 Oil and natural gas

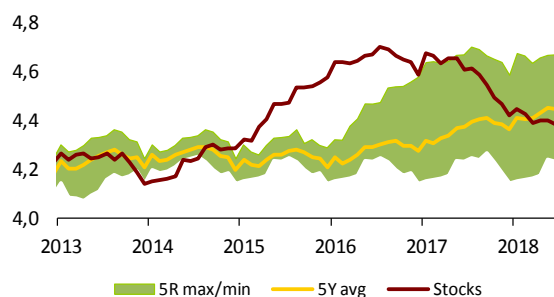
The Brent crude oil price stayed below USD 75/bbl from mid-July until mid-August, with a modest downward trend. Concerns that the US-Chinese trade disputes would reduce demand for oil prevailed on the market. A weakening of the currencies of large emerging economies also prompted concerns about lower demand for oil. Moreover, the market viewed supply as sufficient due to growth in production in Russia, Saudi Arabia and Libya. In late August, however, market sentiment reversed and the Brent price rose by almost 10%. Besides depreciation of the dollar against the euro, the growth was due to diminished concerns that the trade disputes between the USA and China would lead to a cooling of global growth after their governments opened talks. By contrast, the market turned its attention to a potential shortage of oil on the market. Iranian oil exports are already falling, as some countries are cutting purchases of Iranian oil in advance over concerns about the US sanctions on Iranian oil exports due to take effect in November. Oil output in Venezuela is also continuing to drop rapidly. However, Russia and Saudi Arabia are only cautiously raising production and the outlooks for oil production growth in the USA have been revised downwards due to insufficient pipeline capacity from wells to refineries and export terminals. The currently perceived oil supply shortage is also signalled by the market futures curve, which has been falling again at its shorter end since September. The curve implies a Brent price of around USD 77/bbl for the rest of this year, dropping to an average of USD 74.5/bbl in 2018 and USD 71/bbl in 2019. The IEA, which revised its forecast upwards by USD 3/bbl due to lower expected production growth in the USA, expects a similar price for 2019. The September CF forecast is USD 1.5/bbl lower one year ahead.

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

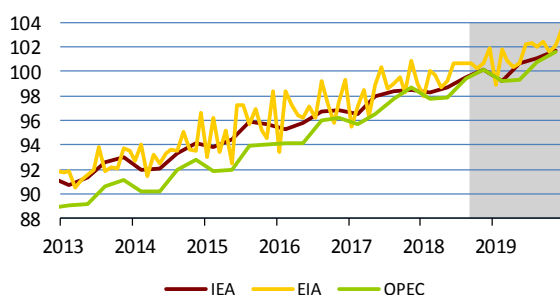


	Brent	WTI	Natural gas
2018	73.49 ↗	66.68 ↗	253.79 ↗
2019	74.48 ↗	65.71 ↗	320.88 ↗

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

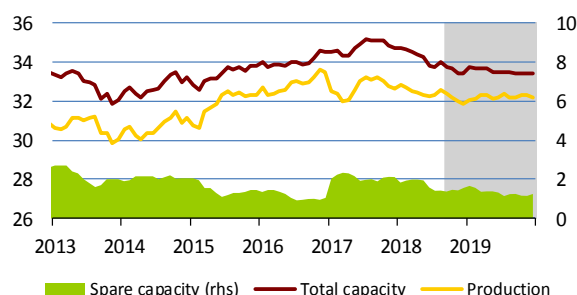


Global consumption of oil and oil products (mil. barrel / day)



	IEA	EIA	OPEC
2018	99.19 ↗	100.10 ↗	98.81 ↗
2019	100.67 ↗	101.58 ↗	100.22 ↗

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



	Production	Total capacity	Spare capacity
2018	32.35 ↗	34.01 ↗	1.66 ↗
2019	32.20 ↗	33.52 ↗	1.32 ↗

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.

V.2 Other commodities

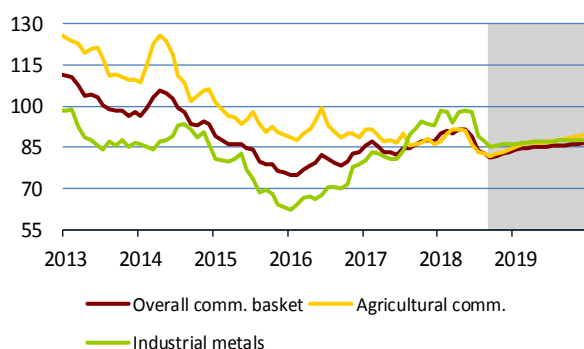
The aggregate non-energy commodity price index continued to fall in August and the first half of September, albeit at a slower pace. This was due to both sub-indices, which recorded similar developments, with the food commodity price sub-index plummeting to its lowest level since July 2007. However, the outlook expects it to rise, whereas the forecast for the industrial metals price index is flat.

Prices of industrial metals remain under pressure from the trade disputes between the USA and China and a worsening outlook for manufacturing, with the J.P.Morgan Global Manufacturing PMI hitting a 21-month low (52.5) in August. The component of new exports is dangerously close to the 50-point level. The decline in copper prices was due to a temporarily averted strike in a Chilean mine and a month-on-month drop in copper imports to China (which, however, have remained strong since the start of the year). By contrast, higher aluminium exports from China are pushing the price of that commodity down. The price of aluminium is under pressure also because the imposition of sanctions on Russian producers by the USA remains uncertain. Only the price of iron ore jumped in early August.

Prices of coal dropped in August but remain close to the five-year high recorded the previous month due to high demand from power stations in East Asia caused by extremely hot weather. Imports from Australia and Indonesia continue to rise, as coal mining in China is still subject to restrictions.

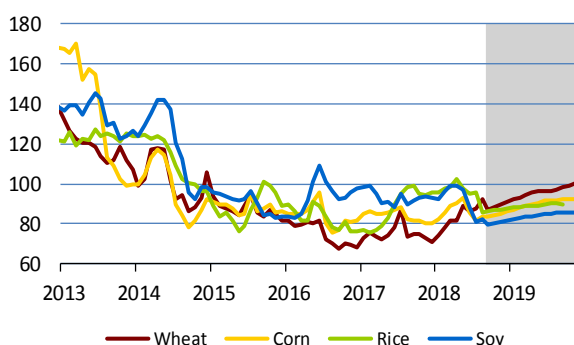
The continuing fall of the food commodity price index was due mainly to prices of grain (although wheat and corn prices merely reversed their previous growth), coffee and pork. By contrast, sugar and cocoa prices went up, partly offsetting their previous fall.

Non-energy commodities price indices



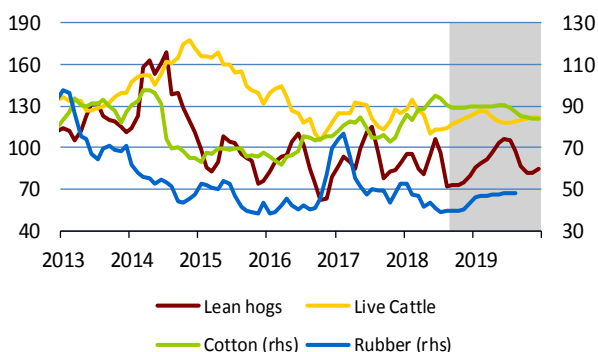
	Overall	Agricultural	Industrial
2018	86.5	86.3	91.9
2019	85.3	87.3	87.2

Food commodities



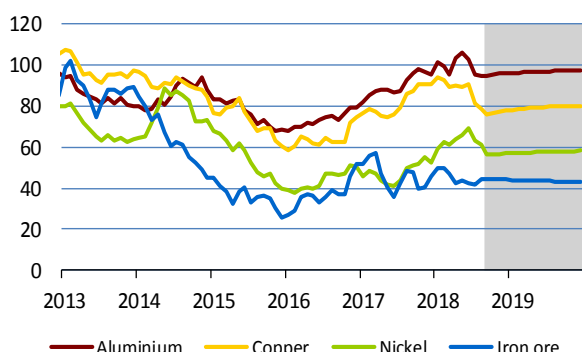
	Wheat	Corn	Rice	Soy
2018	85.7	85.9	93.0	88.2
2019	96.8	90.9	89.3	84.7

Meat, non-food agricultural commodities



	Lean hogs	Live Cattle	Cotton	Rubber
2018	85.4	120.2	89.6	42.9
2019	92.4	121.6	87.8	47.4

Basic metals and iron ore



	Aluminium	Copper	Nickel	Iron ore
2018	98.5	84.6	61.1	44.9
2019	97.0	79.4	57.7	43.6

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.

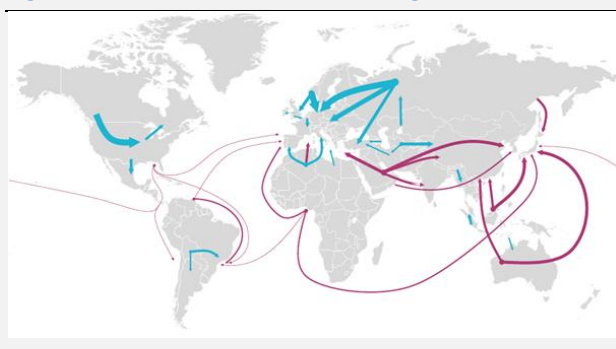
The liquefied natural gas (LNG) market ¹

The LNG market is currently the fastest growing segment of the commodity market in terms of volume and also the most flexible one as to the choice of best-price destination. As a result, LNG is gaining a growing share of global natural gas production, which itself is expanding rapidly, and is fostering greater competition among the three main and, until recently, independent markets in this commodity. LNG is easy to transport by sea and hence allows for price arbitrage among areas not connectable by pipelines. In addition, it enables gas to be shipped to countries that have no sufficient gas sources of their own and to which gas cannot be carried by pipeline. Further strong growth in the LNG market is expected before 2022 as new production facilities are launched, most notably in Australia, the USA and Russia. Those new facilities will increase the glut of LNG in the market, which is already affecting gas prices and new contract mechanisms and will attract new clients. However, the possibility itself of arbitrage has not yet resulted in noticeable convergence and stabilisation of natural gas prices across various parts of the world.

Introduction

Natural gas production hit a new high of 3,768 billion cubic metres (bcm) in 2017 according to the IEA, up 3.6% on a year earlier. The growth was largely due to Russia, Australia, Iran, Canada, Egypt, Norway, the USA and China. By contrast, output dropped the most in the Netherlands and Mexico. Most natural gas is consumed in the countries where it is produced. The rest is traded internationally. According to the IEA, its volume was close to 1,200 bcm in 2017, with liquefied natural gas (LNG) accounting for almost a third of the increase. Growth in the global LNG market has been accelerating since 2013. In 2017, it reached 12%, more than double the 2016 level. The LNG market is currently the fastest growing segment of the commodity market in terms of volume and LNG is gaining a growing share of the gas traded internationally. Overall, 19 countries exported and 40 countries imported LNG in 2017. Figure 1 shows the flows of international trade in natural gas. Traditionally, the largest volumes of natural gas flow through transit pipelines from Russia to Northwest, Central and Southeast Europe, from Norway to Northwest Europe, from Canada to the USA, from the USA to Mexico, from Algeria to Southern Europe and from the Caspian region to China. The fact that long-term contracts dominate means that flows between regions are stable for LNG as well. For example, large Asian buyers mostly import LNG from Qatar, Australia, Indonesia and Malaysia, while Southern European countries traditionally import it from Algeria, Qatar and Nigeria. Import terminals in Northern Europe are largely idle and are used only to absorb excess gas or when the gas price in Europe rises, for example due to bad weather or unexpected shortfalls.

Figure 1 – International flows of natural gas



Source: IEA Gas Market Report 2017
Note: Blue – pipeline gas, brown – LNG

Box 1 – History of LNG trade

The history of international LNG trade dates back to 1964. According to Oilprice.com, this was when the first commercial load of LNG was shipped by tanker from a new plant in Algeria to the UK. Within a few years, Algeria was exporting LNG to France, too, and Libya was sending it to Italy and Spain. Today, Japan is the largest buyer of LNG and Qatar and Australia are the largest producers. However, a liquefaction plant with a capacity of 41 million cubic metres (mcm) per year was built in Cleveland, USA as early as 1941. LNG was stored in three insulated tanks and regasified during winter demand peaks. There are now small LNG production plants like this in many locations, but they are not as well known as the large facilities built for export purposes. The first commercial transit of LNG by sea took place from the Gulf of Mexico to Chicago (for cooling purposes) in the mid-1950s. After the UK, Japan and other countries expressed interest in LNG, successful attempts at trans-ocean shipments were made in the late 1950s.

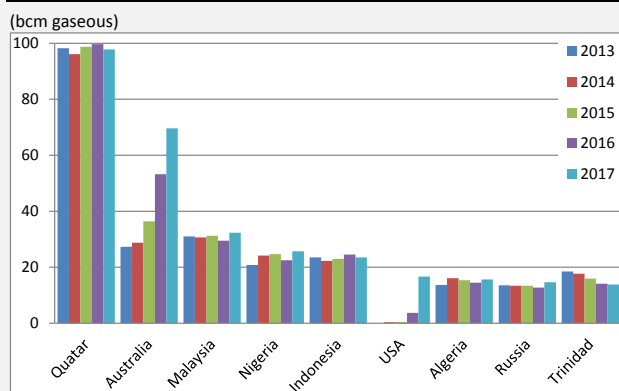
The largest LNG producers and buyers

Just nine countries supplied almost 85% of global LNG production in 2017. Although Qatar remains in first place by a large margin, its market share is gradually shrinking amid broadly constant production (see Chart 1). Australia rose to second place in 2015; its production and hence also its market share are growing very quickly (19% in 2017). Malaysia (9%) and Nigeria and Indonesia (around 7%) followed with

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

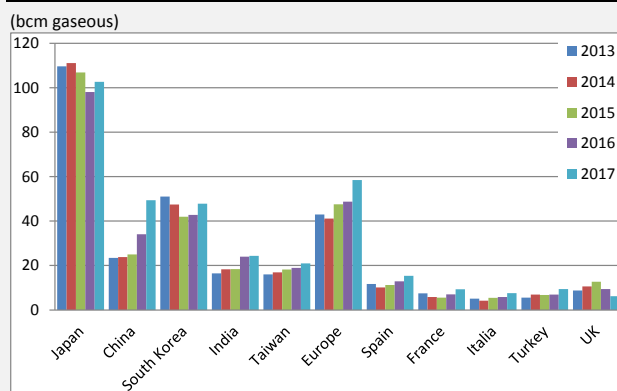
broadly constant production in 2017. Thanks to rapidly rising production, the USA moved behind them in 2017, narrowly overtaking Algeria and Russia, whose shares were above 4%. The list of large producers is completed by Trinidad and Tobago, where, however, output is gradually declining. Production is broadly flat in other LNG-producing countries, so the buoyant growth recorded in the LNG market over the last few years has been almost entirely due to Australia and increasingly also the United States.

Chart 1 – The largest LNG exporters



Source: International Group of LNG Importers (GIIGNL) Annual Reports

Chart 2 – The largest LNG importers



Source: International Group of LNG Importers (GIIGNL) Annual Reports
Note: Europe as a whole and the largest importers in Europe

The list of LNG buyers is longer and rapidly expanding. Only 15 countries imported LNG in 2005. Today there are 40 of them, and another eight are expected to join the market before 2022. Japan was the biggest buyer last year (see Chart 2), followed by China and South Korea. While consumption is tending to decline in Japan (due to nuclear power stations being recommissioned), it is growing rapidly in China (by 50% in 2017) as the country shifts its power generation from coal-fired power stations to gas power stations, which produce about one-half of the CO₂ emissions for the same output. A long way behind were India and Taiwan. It is clear from this perspective that most of the LNG produced is consumed in Asia. However, Europe as a whole is also no small buyer of LNG and imports have been rising apace in recent years. Unlike supply, growth of which has been concentrated almost solely in two countries, demand for LNG (imports) is rising substantially across countries, including smaller ones. The list of countries which are able to import LNG or are preparing to import it is expanding rapidly at the same time.

In Europe, LNG is traditionally imported mainly by southern countries under long-term contracts.

The largest volumes are taken by Spain, France, Italy and Turkey. LNG gets into the pipeline system in Northern and Western Europe from the UK (whose own consumption, however, is falling) and from terminals in continental Northwest Europe. However, they have so far been used well below their capacity most of the time, as pipeline gas from Russia is cheaper and producers thus send their excess production at spot prices mostly to Asia, where demand and prices are higher. Only at times of greatly elevated consumption (for example cold winters), when gas prices in Europe go up, does it pay to import LNG to Northwest Europe to cover extreme demand.

However, more and more European countries are considering building new terminals to diversify their suppliers. The main motive is to reduce their dependence on Russian gas, which is continuously increasing as gas sources in Europe become exhausted. The construction of a terminal for receiving LNG is currently being considered, for example, in Germany, which previously preferred to take supplies of pipeline gas solely from Russia and Norway. A large regasification terminal is to be built near Hamburg and could replace as much as 10% of pipeline gas imports from Russia. This gas could be cheaper than in the current situation where, when necessary, Germany has to buy LNG at terminals in Northwest Europe and transport gas onto its territory by pipeline. LNG from the terminal near Hamburg could be partly released into the transmission network and partly transferred to smaller ships and transported further inland along the Elbe.

In addition to supplier diversification, the motive for building an import terminal may be to gain a stronger bargaining position with the current supplier. For example, due to a launch of a new terminal and the option of importing LNG, Lithuania was able to negotiate a discount of more than 20% on the pipeline gas price with Russia's Gazprom.

Europe will continue to absorb excess LNG in the next few years. This will be facilitated by its favourable infrastructure and price elasticity of demand. The growth in natural gas consumption recorded in Europe in 2017, which was due to higher economic activity, higher coal prices, the closure of storage facilities in the UK, nuclear power shortfalls in France and low output from water power stations in Southern Europe, did not automatically imply higher LNG imports. The global LNG market was tight in 2017 due to strong demand growth in emerging economies and delays in the launch of new liquefaction plants, so the price was too high for Europe. However, this may change this year. Demand for gas in Europe is expected

to keep rising this year. In the winter, most supplies went to Asia, where China increased consumption in an effort to be more environmentally friendly. Due to the start of the summer season in Europe and falling demand in Asia, however, Europe and especially the UK may become attractive as LNG recipients again.

Box 2 – What is LNG and why is it produced?

Natural gas is easier to store and ship long distances in liquefied form. When cooled to -162°C at atmospheric pressure, natural gas (which is up to 90% methane) turns from a gas into a liquid (liquefied natural gas, LNG) and shrinks in volume about 600 times.¹ This makes it more economical to store and to ship long distances between points that cannot be connected efficiently by pipeline.²

However, LNG is less environmentally friendly than pipeline-transported natural gas.

The production and shipping of LNG are investment- and energy-intensive processes. Most of the energy consumed is covered again by natural gas. For example, 10%–15% of the input commodity is used to power liquefaction units (turbines, compressors and other machinery) in the liquefaction process. When liquefied, LNG must be kept in insulated tanks. It is shipped mainly in tanker ships, which are also fitted with insulated chambers. However, some of the gas vaporises during storage and shipping and is used to power machinery and ship engines. LNG tankers are usually built in tandem with production plants and are contracted to ship LNG from the producer to the customer. The average tanker capacity is around 90 mcm (after regasification). The customer must have a regasification terminal, where LNG is stored and revaporised as needed before entering the local pipeline system.

¹ Another way of reducing the volume of natural gas is to compress it while keeping it in gaseous form. This produces CNG (compressed natural gas), which is used as fuel for motor vehicles. Given the pressures of 180 bar or more involved, CNG must be stored in high-pressure cylinders. An alternative is LPG (liquefied petroleum gas). This mixture of propane and butane is used as fuel for vehicles, but also in households for cooking and heating. It must also be stored in pressure cylinders, but at a much lower pressure (around 10 bar).

² The costs of transporting natural gas by pipeline rise rapidly with distance. According to PetroWiki.org, LNG is competitive with pipelines for distances greater than 2,500 km.

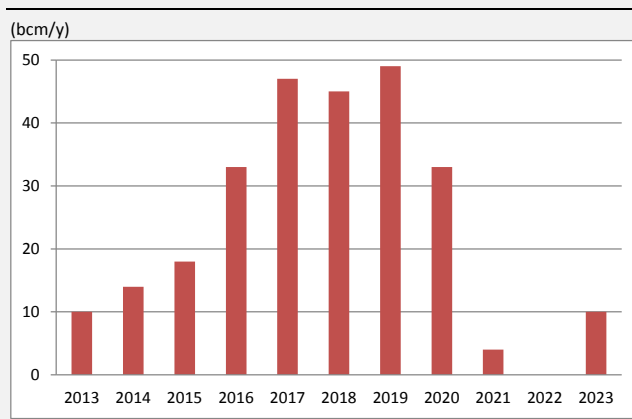
Expected development of LNG production capacity

The sharp growth in LNG production capacity will last roughly until 2020 (see Chart 3). According to the IEA, the total (nominal) capacity of LNG production plants reached 452 bcm/y at the end of 2016. Its growth is expected to peak in 2017–2019, when capacity will increase by almost 50 bcm/y on average. This pace will slow later. By 2022, Australia will have the largest nominal production capacity (118 bcm/y), with the USA in second place (107 bcm/y) and Qatar dropping to third (105 bcm/y). In 2022, these three countries will own half of the total expected LNG production capacity (650 bcm/y).

Production capacity started to rise earlier in Australia than in the USA. Large new projects were put into operation in Australia in 2015 and growth in their capacity peaked a year later. It is expected to have declined since then. In the USA, by contrast, new capacity started to emerge on a massive scale in 2016 and the growth will gradually intensify until 2019. Only two plants are currently in operation in the United States (Sabine Pass and Cove Point), with a total capacity of 36 bcm/y. However, further production capacity of 62.5 bcm/y is expected to be added by 2021 as gas production in the USA increases further.² This will make the United States the second-largest LNG producer in the world.

Russia has also big plans to expand LNG production. The Russian government has ambitions to capture a 15%–20% share of the LNG market. Since 2009 two LNG trains with the total capacity of 12.5 bcm/y have been producing at the Russian Far East (Sakhalin Island) within the framework of the Sakhalin-2 project. LNG is primarily predetermined for the Japanese market. Consortium led by the biggest Russian

Chart 3 – Growth in global LNG production capacity



Source: IEA

² The USA became a net gas exporter again in 2017 for the first time in 60 years, with exports of 4 bcm on average. In 2016, it had imported 18.6 bcm. Exports of pipeline gas to Mexico and exports of LNG from the Louisiana export terminal both increased.

nongovernmental natural gas producer – Novatek – launched the commercial operation of the first LNG train with the capacity of 7.2 bcm/y (within the framework of the Yamal project situated above the Arctic Circle) in December 2017. The second train has started operation in August 2018 and the third train is to be launched at the beginning of 2019. Expansion of the Sakhalin-2 project to three trains is being considered. Total production capacity in Russia should thus increase from 12.5 bcm/y in 2016 to 34 bcm/y in 2022.

The world's first floating liquefied natural gas (FLNG) plant was put into commercial operation in Malaysia last year. The floating plants are located on ships and process gas from offshore fields. They have lower production capacity and can simply be moved to another field once a natural gas deposit is exhausted. FLNG plants are thought to have a good future because they require less capital investment, have a simpler and faster approval process and can utilise smaller offshore natural gas fields. They can be built on new ships or be installed on older ships used to transport LNG in the past. They are planned to be deployed in offshore waters of the USA, Australia, Canada, some African countries, Russia and Iran.

Qatar is also planning to upscale its production capacity significantly. Its representatives have announced their intention to raise production capacity by up to one-third. New supplies could reach the market in 2023–2024. This is a response to the current rapid growth in global demand, and especially demand from China.

The new production capacity in the USA and Russia will be very flexible as regards buyers and destination. Other flexible suppliers include Algeria, the United Arab Emirates and Qatar, whose spare production capacity is not tied to long-term contracts either.

Box 3 – LNG production trends

LNG production is concentrated in large multinational firms. They usually have their own extraction capacity, refrigeration terminals and gigantic sea tankers. They also have better options for financing this capital-intensive sector. These firms are gradually taking over part of the trading activities of purely trading firms and will also become more involved in the spot market, which is gradually increasing in importance. On the other hand, small companies are leaving the market, as they are not sufficiently resilient to price swings in commodity markets. LNG trading will become increasingly complex and similar to oil trading. Depending on current demand, a single shipment may be resold several times before it reaches its destination terminal.

Although the LNG market is expanding from year to year, LNG export and import terminals are shrinking. Liquefaction plants and export terminals used to be mostly large-scale ones to justify the high investment costs. They also required long-term contracts for large volumes of gas from both natural gas suppliers and LNG buyers. However, new-generation projects use smaller units allowing for modular expansion if demand increases. These modular terminals can thus be expanded as the market grows and, as well as being less investment-intensive, shorten the necessary contract term for future orders (from 18 years on average in 2008 to 8 years in 2016). This is also convenient for new buyers from emerging economies (China, India and Pakistan), where the uncertain situation precludes the use of very long contracts.

Expected development of regasification capacity

China and India are expected to record the largest growth in LNG imports, but a large number of regasification projects are also being built in smaller countries that do not currently import LNG.

According to the IEA, Chinese LNG imports are expected to rise by 41 bcm/y to 77 bcm/y (as against growth of just 27 bcm/y for pipeline gas imports). The capacity of existing terminals is prepared for this growth (almost 20 terminals with a total capacity of around 88 bcm/y in 2018). China will thus overtake Japan, which is currently the largest LNG importer and is expected to record a fall in imports. At the end of 2016, India had only four regasification terminals, with a total capacity of 40 bcm/y. The country's capacity is expected to grow by 30 bcm/y by 2019. A group of new and small LNG importers has grown significantly over the last few years. This growth looks set to continue, aided by floating storage and regasification unit (FSRU) technology, which makes small-scale import terminals cheaper and faster to build. New regasification terminals with a total capacity of 117 bcm/y were under construction as of mid-2017. Europe as a region will remain the largest importer of LNG. Finland, Lithuania, Malta and Sweden have recently joined the importers club. However, the contracted volumes will peak in 2018 and then decline as current long-term contracts gradually expire, especially in Spain and France. The volume of long-term contracts will decrease from 94 bcm/y to 76 bcm/y between 2018 and 2022. Only Poland and Portugal will see significantly increased imports.

LNG production and shipping costs

LNG has significantly higher production and shipping costs than pipeline gas. The end price of LNG for buyers is increased by several items that do not apply to pipeline gas. On the other hand, LNG production plants are typically built in areas where gas extraction is cheap and the end product can be

competitive in markets where pipeline gas is available even after the additional costs are included. Engblom (2017) quantifies the typical LNG production costs as follows:

- The starting price of the natural gas extracted. In the USA, this could be the price set on the NYMEX or the ICE with delivery at the Henry Hub terminal (around 3 USD/MMBTU^{3,4}). In Australia, it is the price agreed under the long-term contract between the extraction firm and the LNG producer. To this must be added the pipeline transport costs from the terminal or deposit to the LNG producer.
- The liquefaction costs, which depend on the investment and running costs of the plant, and the costs of storing the LNG with the producer could be together about 2.6 USD/MMBTU.
- The shipping costs must also include port fees and canal fees (for example, passing through the Panama Canal can increase the price by 0.1 USD/MMBTU). However, the main shipping costs are the daily ship charter rate and the costs of the fuel used during the journey. These items depend on the ship's size and the length of the voyage. Typical shipping-related costs are estimated at around 1.1 USD/MMBTU on average.
- At the destination, the gas is unloaded to the regasification terminal. Its investment and operating costs including harbour fees can add a further 0.8 USD/MMBTU to the LNG price. On top of that, there will be 0.1 USD/MMBTU for regasification and 0.2 USD/MMBTU for pipeline transport to the consumer.
- The final price is thus around 7.8 USD/MMBTU. However, this applies only to large buyers. Mid-scale and small-scale consumers buy gas from the regasification terminal at much higher prices.

LNG prices

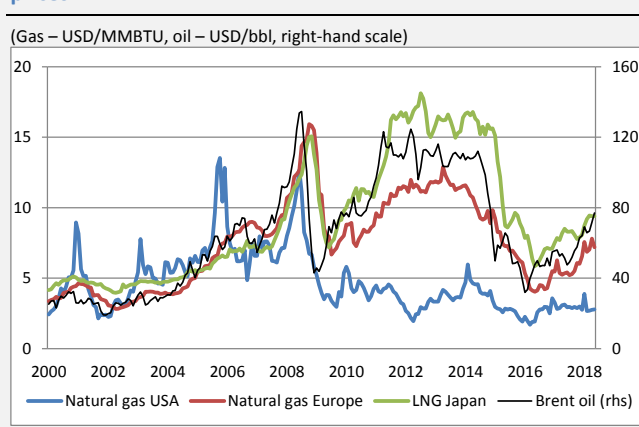
The LNG market is not very transparent yet, as most contracts are bilateral and prices are not public. LNG producers prefer long-term contracts with gas suppliers and buyers and, if possible, stable prices. Only then are they willing to invest in costly projects with long payback periods.

Prices of most LNG contracts are derived from oil prices (gas-to-oil competition) with a lag of 3–4 months. More than two-thirds of supplies to the Asian market are valued like this. Up to 90% of supplies from Australia are linked to the oil price. To a smaller extent the same applies to LNG from Qatar. Only recently has the situation started to change somewhat. There has been an increase in the number of spot transactions based on auctions for which transaction prices are published (such as the GLX, or Global LNG Exchange, in Australia). The situation is rather different for supplies to the European market, for which the effect of the oil price is lower and the effect of the spot price at import terminals (gas-to-gas competition) is higher, even under long-term contracts.

Prices in the main consumption regions have been influenced by three key events since 2000.

Until around mid-2008, natural gas prices in the USA, Europe and Japan differed little and were derived mostly from oil prices (with a lag). Since 2008, however, the shale gas revolution has led to rapid growth in extraction and a sharp decline in the natural gas price in the USA. Since then, the price there has been well below those in Europe and Japan, which still more or less copy the oil price (see Chart 4). Another milestone was the Fukushima nuclear disaster, which resulted in Japanese nuclear power stations being shut down. Power generation was redirected to gas power stations, causing a surge in demand for natural gas in Japan and a sharp rise in the LNG price across the region. The price of Asian LNG was well above the natural gas price in Europe for about four years. This was also the main reason for the huge wave of investment in LNG production, especially in Australia. In 2015, however, Japan renewed nuclear power generation and the first reactor was restarted since the Fukushima disaster. This destroyed the previously optimistic outlook for consumption growth, and the LNG price in Asia returned close to the gas price in Europe, although it is maintaining a premium of more than 2 USD/MMBTU on average. Prices of European

Chart 4 – Natural gas prices in major regions and Brent oil prices



Source: World Bank, Datastream

³ In the Permian Basin shale deposits in Texas and New Mexico, for example, gas escapes as an oil extraction by-product (known as associated gas). However, local regulations prohibit flaring it (and it is naturally also inadmissible to release it into the air), so if local producers want to increase oil production, they have to find a market for this associated gas. The gas may thus flow through pipelines into liquefaction plants on the Gulf Coast at a much lower price.

⁴ The gas price is commonly given in BTU (British Thermal Units). 1 MMBTU (million BTU) corresponds roughly to the energetic content of 24.36 cubic metres of natural gas.

and Asian gas and US gas converged most strongly in mid-2016 due to a previous fall in oil prices. Since then, however, prices have been diverging again.

Conclusion: expected future developments in the LNG market

There will be a relative glut of LNG on the market roughly until 2022. This is due to the above-mentioned rapid growth in production capacity. The IEA estimates total LNG production capacity at 650 bcm/y in 2022, while forecasted demand is just 460 bcm/y. The excess production capacity is expected to peak in 2020 (at around 15% of unused available capacity and almost 30% of nominal capacity) and then start to shrink. However, the number of planned projects declines dramatically after this date, since the currently low LNG prices are discouraging new investment in production.

Box 4 – The seasonal nature of LNG prices.

The LNG price has shown strong seasonality over the last two years. The sharp growth in prices in wintertime and decline in summertime are due to rising imports of LNG to China. China's government is combating climate deterioration by cutting coal burning, which is to be replaced by natural gas in industry and households. LNG imports to China rose by 46% last year. Unlike traditional Asian LNG importers, which buy the commodity under long-term contracts in regular monthly volumes at prices derived from the oil price, China buys large amounts of LNG on the spot market to cover fluctuations in demand caused by the weather, as it does not have the necessary storage capacity to smooth imports across seasons. Seasonality will also be fostered by Egypt, which plans to increase its own natural gas extraction and greatly reduce LNG imports. This will contribute further to the LNG glut in the summer period. On the other hand, seasonality might be reduced by greater use of LNG in the generation of electricity to power air-conditioning units in northern hemisphere countries with hot summer weather. This would offset the traditionally higher winter demand for gas for heating. The cheaper LNG is currently beneficial to southern hemisphere countries due to cheaper heating, to Southern European and Middle Eastern countries due to cheaper air-conditioning, and also to Lithuania, which is able to partly substitute imports of more expensive pipeline gas from Russia. After China builds storage capacity, only extreme winters in the USA, Asia or Europe or extremely hot summers in the USA will cause seasonal fluctuations. The increase in demand in China this winter was also fostered by shortfalls in some pipelines, whose capacity had to be replaced by extraordinary LNG supplies. In March, however, the weather warmed up and some Chinese firms started to offer surplus LNG on the market.

The response of the demand side will be important. Demand can be expected to remain buoyant,⁵ and not only in the countries that traditionally buy LNG. Demand should also emerge in smaller economies that have not previously had access to natural gas. According to Bloomberg's New Energy Finance report (March 2018), demand for LNG is expected to grow by 4%–7% year on year. Global demand for LNG might exceed supply by as much as 150 million tonnes (around 195 bcm/y of gas) in 2025 unless new projects are approved in time. However, the situation as regards new LNG production projects is also starting to improve slightly due to growth in oil prices and sharply rising demand in China. As a result, the decline in LNG prices due to surplus production capacity has not been as strong as expected. Large multinationals are thus considering new investments in LNG production capacity, and Qatar has also announced a major investment.

It is hard to predict where LNG prices will go in the near future. The dynamic growth in production capacity should squeeze spot LNG import prices. They have more or less converged between Europe and the USA. The share of spot transactions⁶ in total LNG trade should gradually increase and spot prices should thus increasingly affect prices of long-term contracts.

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⁵ Consumption is expected to grow mainly in the transport and power generation sectors. Gas power stations have other advantages over coal ones besides their previously mentioned lower emissions. They are cheaper and more flexible, which predetermines them for use as reserve sources for solar and wind power stations. They can be put into operation quickly in the event of bad weather and wind or solar power shortfalls.

⁶ As the USA is expected to become a key LNG exporter in the near future, CME Group is planning to introduce a US LNG futures contract. It will be traded on the NYMEX with physical delivery at the Louisiana export terminal (in the same way as natural gas is traded with delivery at the Henry Hub). The creation of an LNG spot market and the growth in volumes shipped by sea also calls for greater transparency regarding freight costs. This could be provided by standardised shipping contracts, as is the case with oil tankers and bulk carriers. The Baltic Exchange is therefore planning to launch an LNG shipping index. However, it will be a long time before these markets reach similar levels of liquidity and transparency as the oil market.

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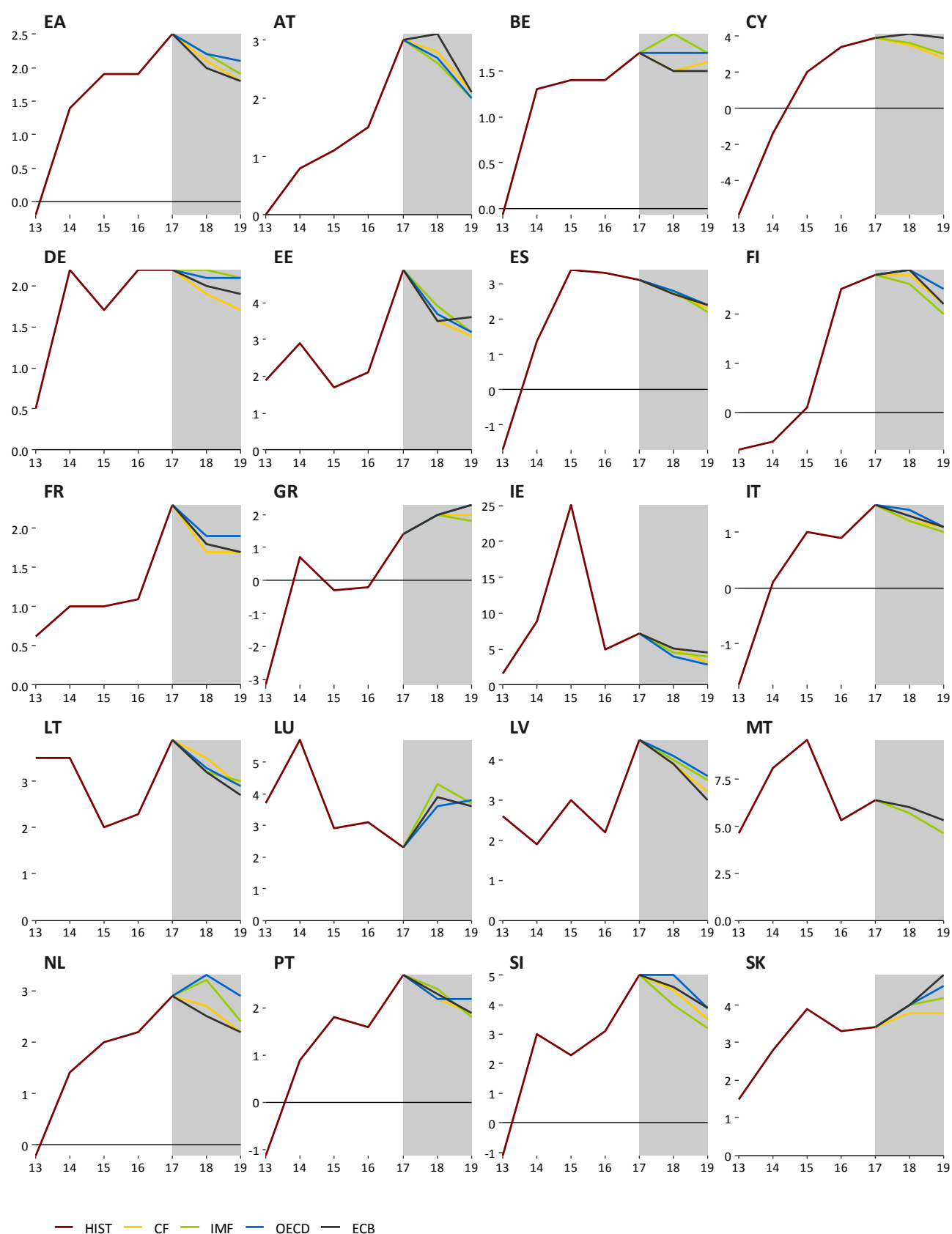
A1. Change in GDP predictions for 2018

	CF		IMF		OECD		CB / EIU	
EA	0	2018/9	-0.2	2018/7	-0.1	2018/5	-0.1	2018/9
		2018/8		2018/4		2018/3		2018/6
DE	-0.1	2018/9	-0.3	2018/7	-0.3	2018/5	-0.5	2018/6
		2018/8		2018/4		2018/3		2017/12
US	0	2018/9	0	2018/7	0	2018/5	+0.1	2018/6
		2018/8		2018/4		2018/3		2018/3
UK	0	2018/9	-0.2	2018/7	+0.1	2018/5	0	2018/8
		2018/8		2018/4		2018/3		2018/5
JP	0	2018/9	-0.2	2018/7	-0.3	2018/5	-0.1	2018/7
		2018/8		2018/4		2018/3		2018/4
CN	0	2018/9	0	2018/7	0	2018/5	-0.1	2018/8
		2018/8		2018/4		2018/3		2018/6
IN	+0.1	2018/9	-0.1	2018/7	+0.2	2018/5	+0.1	2018/8
		2018/8		2018/4		2018/3		2018/8
RU	0	2018/8	0	2018/7	0	2018/5	0	2018/8
		2018/7		2018/4		2018/3		2018/7
BR	-0.1	2018/9	-0.5	2018/7	-0.2	2018/5	-0.5	2018/8
		2018/7		2018/4		2018/3		2018/6

A2. Change in inflation predictions for 2018

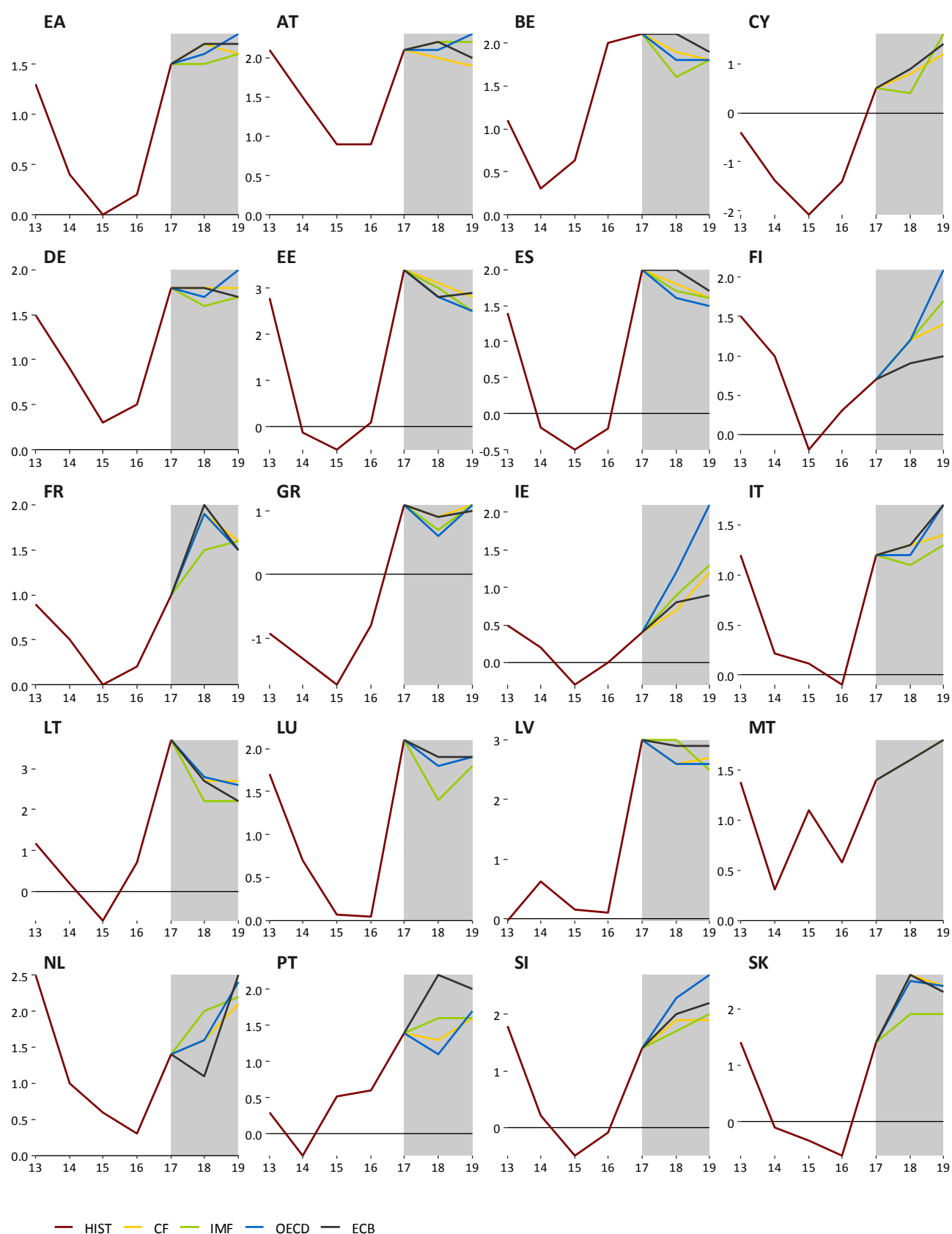
	CF		IMF		OECD		CB / EIU	
EA	0	2018/9	+0.1	2018/4	+0.1	2018/5	0	2018/9
		2018/8		2017/10		2017/11		2018/6
DE	-0.1	2018/9	+0.1	2018/4	-0.1	2018/5	+0.2	2018/6
		2018/8		2017/10		2017/11		2017/12
US	0	2018/9	+0.4	2018/4	+0.7	2018/5	+0.2	2018/6
		2018/8		2017/10		2017/11		2018/3
UK	0	2018/9	+0.1	2018/4	0	2018/5	+0.1	2018/8
		2018/8		2017/10		2017/11		2018/5
JP	0	2018/9	+0.6	2018/4	+0.2	2018/5	-0.2	2018/7
		2018/8		2017/10		2017/11		2018/4
CN	0	2018/9	+0.1	2018/4	+0.1	2018/5	0	2018/8
		2018/8		2017/10		2017/11		2018/6
IN	-0.1	2018/9	+0.1	2018/4	+0.1	2018/5	-0.1	2018/8
		2018/8		2017/10		2017/11		2018/8
RU	0	2018/8	-1.1	2018/4	-0.9	2018/5	+0.1	2018/8
		2018/7		2017/10		2017/11		2018/7
BR	0	2018/9	-0.5	2018/4	-0.5	2018/5	+0.3	2018/8
		2018/7		2017/10		2017/11		2018/6

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

