

# GLOBAL ECONOMIC OUTLOOK - SEPTEMBER

Monetary Department  
External Economic Relations Division

2017



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**Cut-off date for data**

15 September 2017

**CF survey date**

11 September 2017

**GEO publication date**

22 September 2017

**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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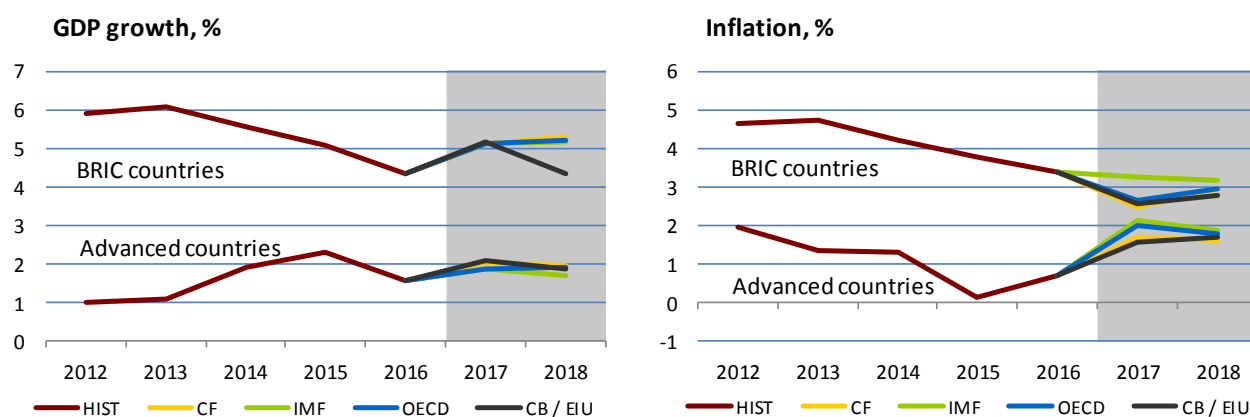
The September issue of Global Economic Outlook presents the regular monthly overview of recent and expected developments in selected territories, focusing on key economic variables: inflation, GDP growth, leading indicators, interest rates, exchange rates and commodity prices. In this issue, we also look at the real exchange rate phenomenon from the perspective of what it tells us about EU countries. The real exchange rate reflects movements in both the nominal exchange rate and relative price levels. This means it can be used, for example, to assess a country's convergence efforts (towards the core euro area countries), to discuss the central bank's effect on the distribution of real appreciation (between the nominal exchange rate and the inflation differential channels) and to track the external competitiveness of an EU economy, and hence also the euro area. This is the line followed by our article, which examines the period from the establishment of the euro area in 1999 to the present.

The current economic outlooks for the advanced countries we monitor confirm a clear message of a pick-up in expected economic growth (especially in the euro area, due mainly to growth in household consumption), yet with inflation outlooks still visibly below the notional 2% ideal. Annual GDP growth in the euro area economy improved again, slightly outpacing the USA. The only fly in the ointment is that the strongest European economies (Italy, France and Germany) are at the very bottom of the euro area ranking as regards GDP growth outlooks – this has not usually been the case in the recent past, especially as far as the German economy is concerned. However, even the German economy improved in August, which, given its economic strength, is sending further positive signals to its trading partners and the wider world. The US economy grew at its fastest rate in two years in 2017 Q2 and, according to outlooks, is heading for 2.5% growth at the end of 2018. The GDP growth outlooks for the UK and Japan are visibly lower. The UK economy is trading water because of Brexit and other factors, while the Japanese economy saw a substantial increase in growth based on data revisions. Of all the advanced countries under review, only the UK will see inflation exceeding the 2% level in the period up to the end of 2018. This is related to the ongoing Brexit. As usual, the Japanese economy recorded the lowest inflation outlooks.

The September forecasts brought a decline in the growth prospects for the Indian economy, probably due to the effects of demonetisation. However, the growth outlook remains above 7% amid relatively low inflation. Although China's growth outlook for 2018 was increased slightly, the risks associated with economic developments in China persist. The outlooks for the less dynamic BRIC countries (Russia and Brazil) diverged considerably last month. The Russian economy continues to grow and is expected to get close to 2% with inflation just above 4%. The Brazilian economy saw no major changes from the previous month. GDP is expected to grow by a mere 0.4% amid inflation close to 4%. Some – albeit weakening – optimism is still expected for next year, when the Brazilian economy should see a visible recovery accompanied by a drop in inflation pressures.

The outlooks for short-term euro area interest rates declined slightly and will thus remain very low and negative at the one-year horizon. In the case of the USA, the upward pressures on interest rates can be expected to ease and will probably not re-emerge until the end of this year. According to CF, the US dollar will appreciate slightly against all the monitored currencies at the one-year horizon. The outlook for the average Brent oil price edged up to USD 53.5/bbl at the one-year horizon compared to the August outlooks. Prices of non-energy commodities are expected to rise slightly over the coming 12 months, due mainly to food commodity prices.

## GDP growth and inflation development and outlook in monitored countries

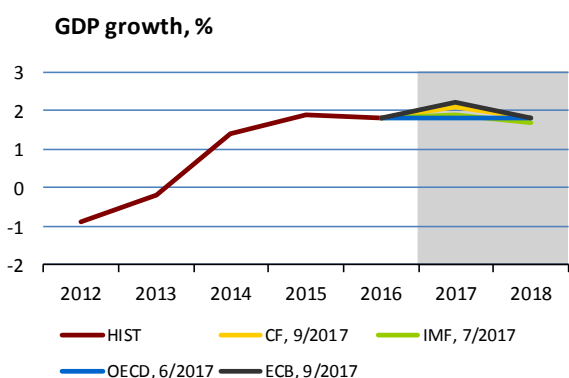


Note: The figures represent the weighted averages of historical series / outlooks in individual countries. The weights are based on nominal GDP measured in USD during 2011–2015 (source: EIU). Advanced countries: euro area, United States, United Kingdom, Japan. BRIC countries: China, India, Russia, Brazil.

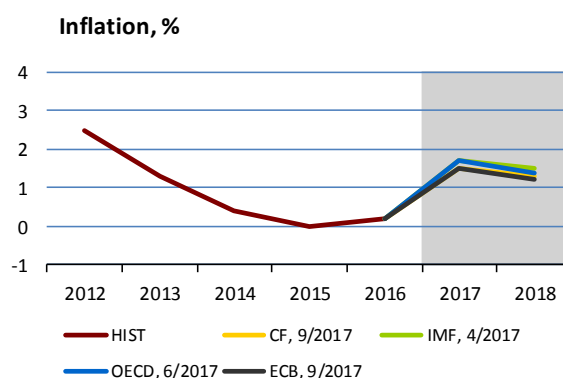
II.1 Euro area

Economic growth in the euro area picked up in 2017 Q2, still driven by household consumption. The euro area grew at its fastest year-on-year rate in five years (2.3%), even slightly outpacing the USA. The current figures for Q3 are also positive. The PMI in manufacturing, for example, reached a five-year high in August and industrial production rose by 3.2% year on year. The labour market situation is favourable – unemployment is at its lowest level since February 2009 (9.1%) and annual wage growth rose from 1.3% to 2% in Q2. In line with the better-than-expected output, the ECB and CF revised their GDP growth outlooks for 2017 upwards (to 2.2% and 2.1% respectively). In 2018, the euro area is expected to slow to 1.8%.

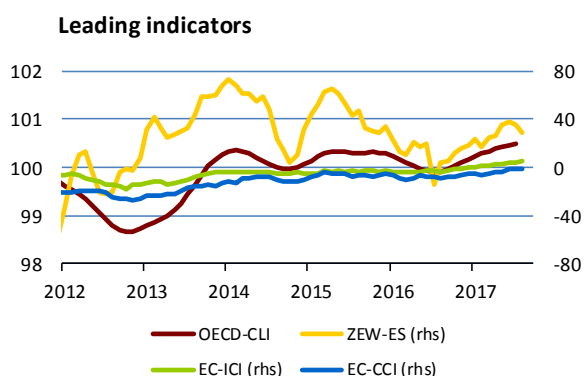
Euro area HICP inflation rose by 0.2 pp to 1.5% in August, mainly on the back of a higher contribution of energy prices. Core inflation stayed at 1.2%, similar to previous months. Over the outlook period, inflation will be affected by its core components as the positive contribution of energy prices fades away. However, these components are not trending upwards yet. According to CF and the new ECB forecast, average inflation will reach 1.5% this year but decline by around 0.3 pp next year. The uncertainty surrounding the outlook for inflation, growth and the ECB’s future monetary policy stance is heightened by the exchange rate of the euro. It appreciated by more than 5% in effective terms between the start of the year and the end of August. The ECB confirmed its monetary policy settings at its September meeting. Its net asset purchases will thus continue at a monthly pace of EUR 60 billion at least until the end of December, and it repeated its commitment to leave rates at the current level at least for the duration of the asset purchase programme. ECB President Mario Draghi said at a press conference that the bulk of decisions about the QE programme might be taken in October. The outlook for market rates shifted downwards slightly compared to the previous GEO, remaining negative at both monitored maturities (3M, 1Y) until the end of 2018.



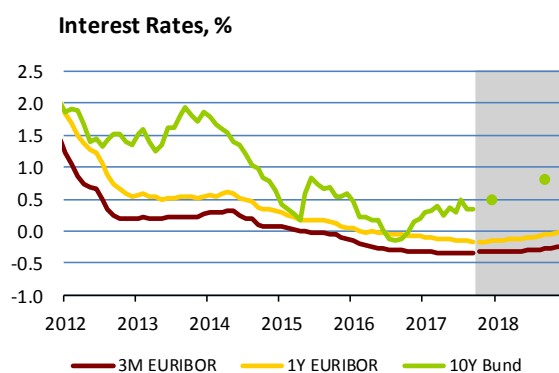
	CF	IMF	OECD	ECB
2017	2.1 ↗	1.9	1.8	2.2 ↗
2018	1.8 ↘	1.7	1.8	1.8 ↘



	CF	IMF	OECD	ECB
2017	1.5 ↗	1.7	1.7	1.5 ↗
2018	1.3 ↘	1.5	1.4	1.2 ↘



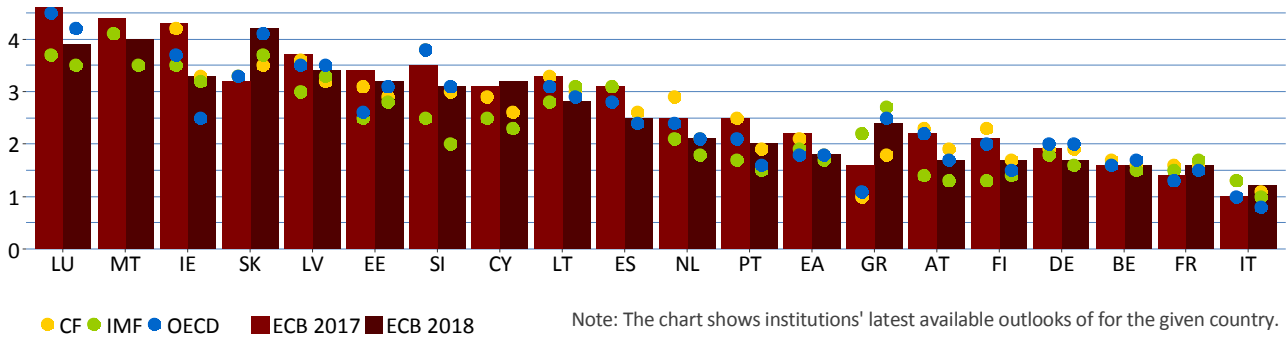
	OECD-CLI	ZEW-ES	EC-ICI	EC-CCI
6/17	100.5	37.7	4.5	-1.3
7/17	100.5	35.6	4.5	-1.7
8/17		29.3	5.1	-1.5



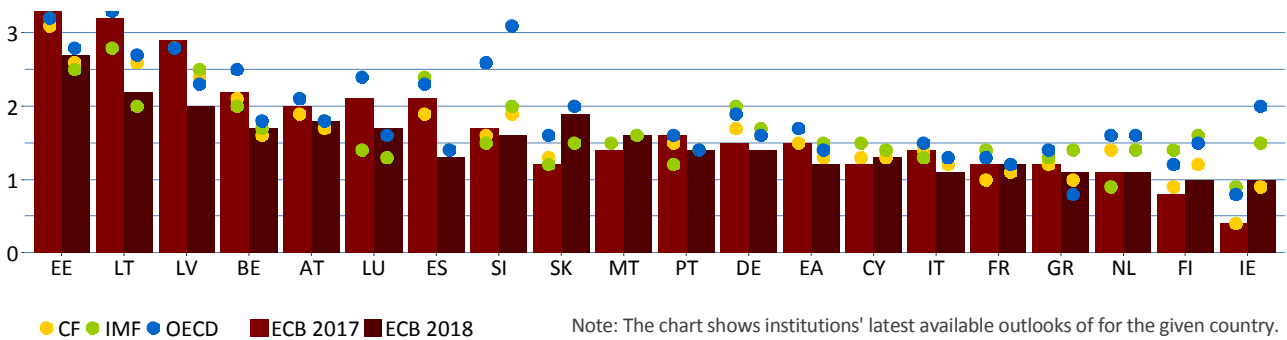
	08/17	09/17	12/17	09/18
3M EURIBOR	-0.33	-0.33	-0.32	-0.28
1Y EURIBOR	-0.16	-0.16	-0.15	-0.06
10Y Bund	0.35	0.35	0.50	0.80

## II. ECONOMIC OUTLOOK IN ADVANCED ECONOMIES

### GDP growth outlooks in the euro area countries in 2017 and 2018, %

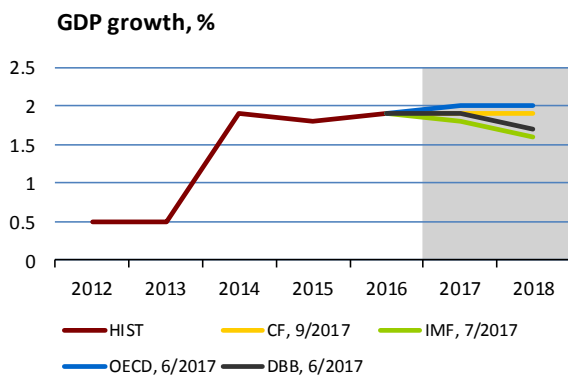


### Inflation outlooks in the euro area countries in 2017 and 2018, %

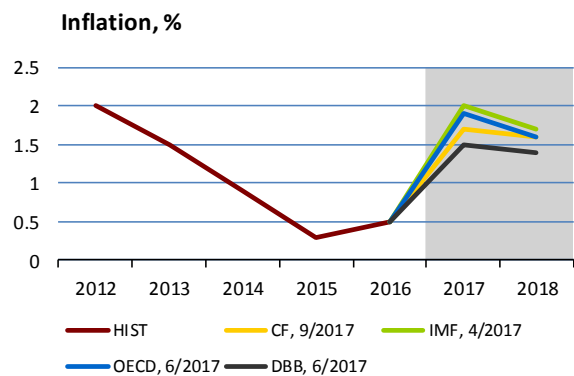


## II.2 Germany

Germany's growth outlooks were raised slightly again (CF). The revision was due to very favourable results for Q2 (annual GDP growth of 2.1% and quarterly growth of 0.6%). Moreover, Q1 was also revised upwards. The growth was driven by household consumption, reflecting a favourable labour market situation (higher wage growth in Q2) associated with growing consumer confidence. Growth in fixed investment was also favourable. Industry likewise performed well. The leading [PMI](#) indicator in manufacturing rose again in August. The German economy is thus in an upward phase of the business cycle. CF expects wages to grow by 2.4% in the production sector. Consumer price inflation rose slightly to 1.8% in August. The current outlook for this year is at roughly the same level. In 2018, however, inflation is expected to fall slightly.



	CF	IMF	OECD	DBB
2017	1.9	1.8	2.0	1.9
2018	1.9	1.6	2.0	1.7



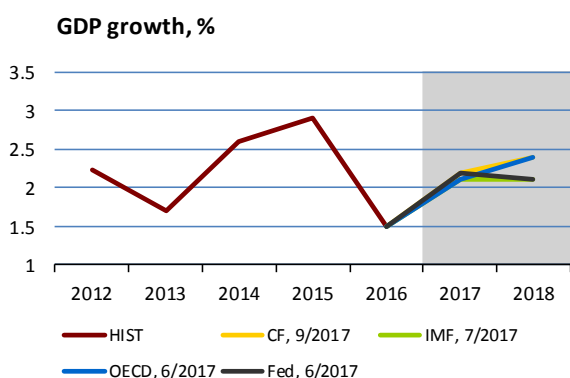
	CF	IMF	OECD	DBB
2017	1.7	2.0	1.9	1.5
2018	1.6	1.7	1.6	1.4

### II.3 United States

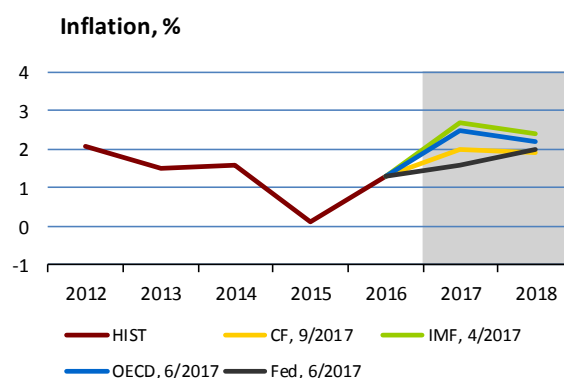
The US economy grew at its fastest pace in two years in 2017 Q2. The second GDP growth estimate was revised upwards to 3.0% (in quarter-on-quarter annualised terms). This was due mainly to a rise in growth in private consumption to 3.3% and corporate investment to 6.9% (in quarter-on-quarter annualised terms). Residential investment and, to a lesser extent, government expenditure fell year on year. Numerous indicators are suggesting that the US economy will record similar performance in Q3. On the other hand, the impacts of Hurricanes Harvey and Irma, which hit the US coast with record intensity, are still hard to estimate. According to a number of financial analysts, growth might be as much as 0.8 pp lower than expected.

Labour market developments fell short of financial market expectations. According to the US employment figures, non-farm payrolls rose by 156,000 in August, as against market expectations of 180,000. The unemployment rate rose to 4.4% amid an unchanged participation rate (62.9%). The average hourly wage was flat year on year for the third consecutive month. However, firms and consumers remain optimistic. The leading [ISM](#) indicator for US manufacturing rose again in all its components in August (to 58.8). According to the Conference Board survey, consumer confidence reached a five-month high. The assessment of the current situation was particularly positive. Retail sales growth edged up in July (to 4.2%).

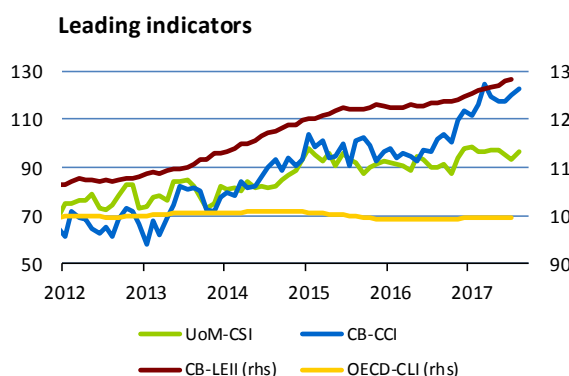
Annual headline inflation rose to 1.9% in August, while core inflation was flat at 1.7% for the fourth consecutive quarter. In addition to higher rents, inflation pressures were fostered by growth in petrol prices after Hurricane Harvey shut down Gulf of Mexico refineries. The uncertain scope of the impact of the storms and the negligible wage growth reduce probability of the central bank raising its rates in September. However, financial markets expect a balance sheet-reduction plan to be announced. The September CF raised the GDP growth outlook for 2017 and lowered the inflation forecast for 2018.



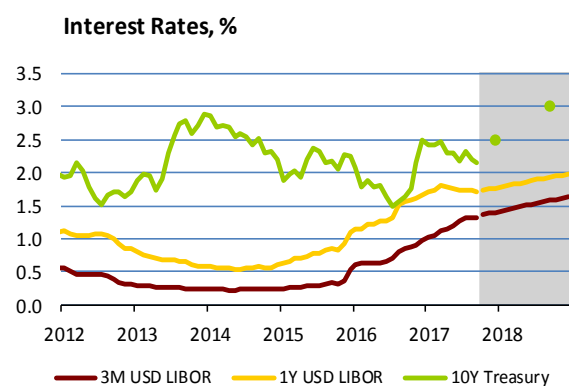
	CF	IMF	OECD	Fed
2017	2.2 ↗	2.1	2.1	2.2
2018	2.4 ↘	2.1	2.4	2.1



	CF	IMF	OECD	Fed
2017	2.0 ↘	2.7	2.5	1.6
2018	1.9 ↘	2.4	2.2	2.0



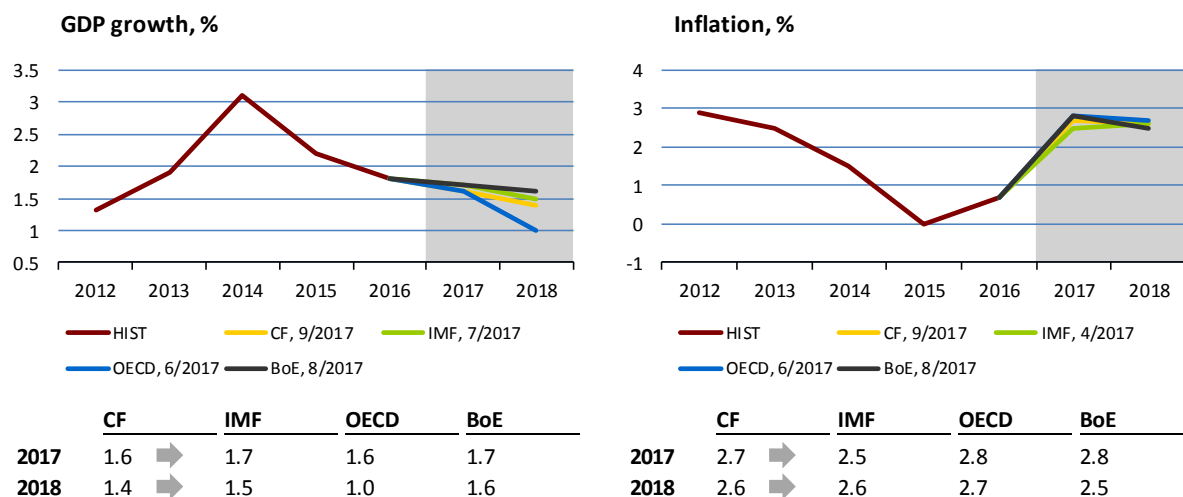
	UoM-CSI	CB-CCI	CB-LEII	OECD-CLI
6/17	95.1	117.3	127.9	99.7
7/17	93.4	120.0	128.3	99.7
8/17	96.8	122.9		



	08/17	09/17	12/17	09/18
USD LIBOR 3M	1.31	1.32	1.40	1.58
USD LIBOR 1R	1.73	1.73	1.77	1.93
Treasury 10R	2.21	2.15	2.50	3.00

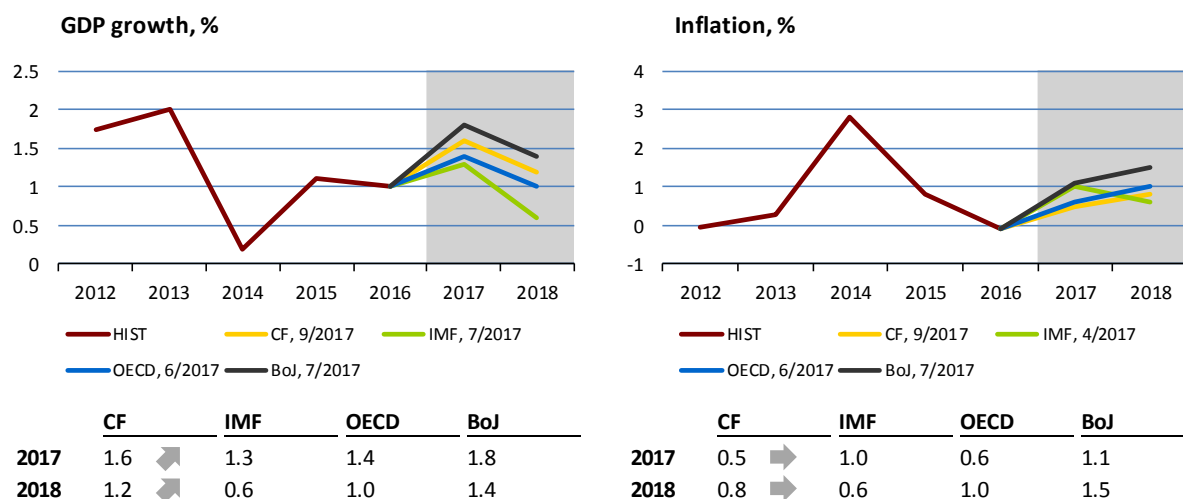
## II.4 United Kingdom

The UK monetary policy dilemma persists. Inflation jumped again to 2.9% in August (after having been at 2.6% for two months). The BoE nonetheless left its policy rate at 0.25% after only two Monetary Policy Committee members again voted for a rate hike at the September meeting. The asset purchase programme also remained unchanged. The bank acknowledged that it expected inflation to continue to rise in the near future and exceed 3% in October. Weak economic growth (0.3% quarter on quarter) still speaks against rate increases. Corporate investment was flat in Q2 (in both annual and quarterly terms) and the current data for Q3 do not signal any major improvement. At the same time, tensions are intensifying on the labour market. Unemployment hit a new low in July (4.3%), but average wage growth (2.1%) is lagging behind inflation. The only positive news is the recent turnaround in the exchange rate of the [pound](#), which has appreciated against the dollar and the euro in recent weeks.



## II.5 Japan

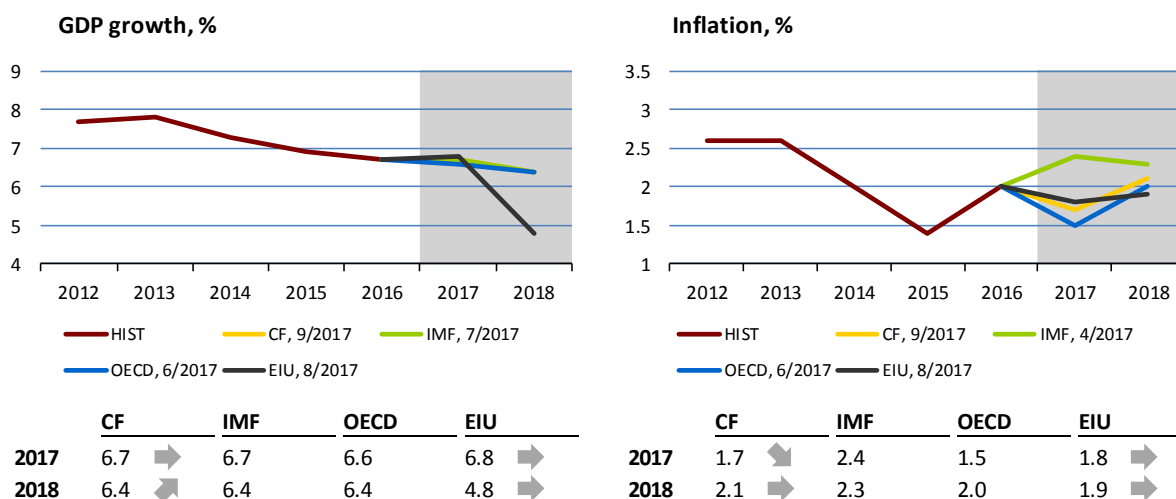
The Japanese economy grew by 2.5% in 2017 Q2 (in annualised quarter-on-quarter terms). The growth was driven by capital expenditure and private consumption and rose by 1 pp compared to the revised value for the previous quarter. Retail sales growth slowed slightly in July. Although unemployment remains at 2.8%, household expenditure fell again and wage growth declined further. On the other hand, industrial production is showing solid growth this year. The [PMI](#) in manufacturing rose to 52.2 points in August and has been in the expansion band for a year now. According to purchasing managers, all monitored items grew at a faster pace in August. The September CF increased the GDP growth outlooks for both years by 0.2 pp and 0.1 pp respectively. Inflation stayed at 0.4% for the fourth consecutive month. The inflation forecasts were thus not revised.





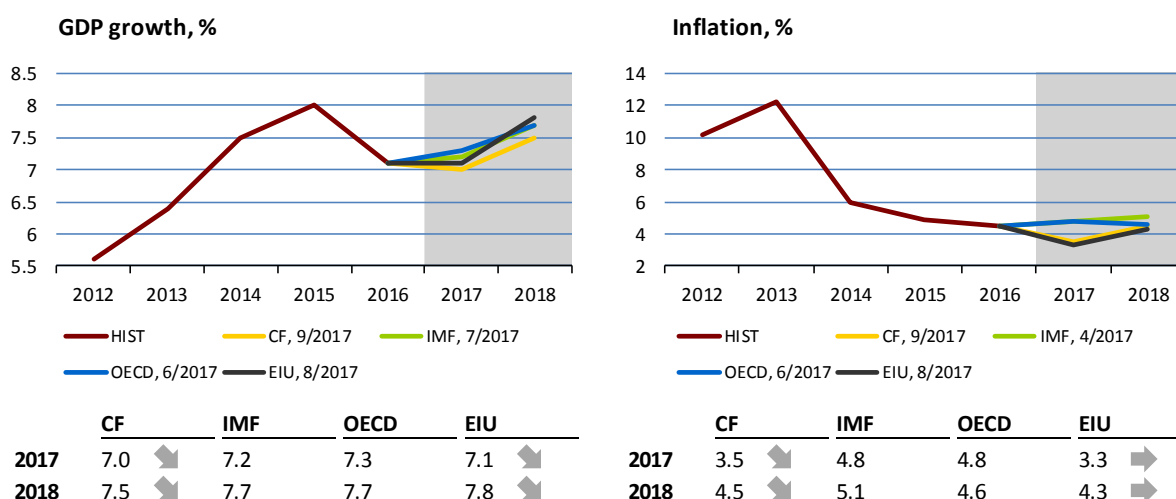
### III.1 China

Despite growing funding costs and a visible cooling on the real estate market, Chinese industrial production continued to expand in August according to the leading [PMI](#) indicator. Infrastructure spending and fixed investment remained robust. This, combined with cuts in production at inefficient plants, fostered renewed growth in prices of commodities (e.g. [steel](#)). The Chinese economy can be expected to slow in the months ahead as the rise in financial costs for firms and property owners manifests itself fully. The central bank is refraining from providing liquidity through open market operations. This resulted in the key rate (the 14-day repo) rising to a five-month high at the start of September. The bank's objective is to strengthen financial stability in the banking sector, i.e. to reduce debt and speculative capital, and to introduce quarterly monitoring of banks. The September CF revised the growth outlook for 2018 upwards and lowered the inflation forecast for 2017.



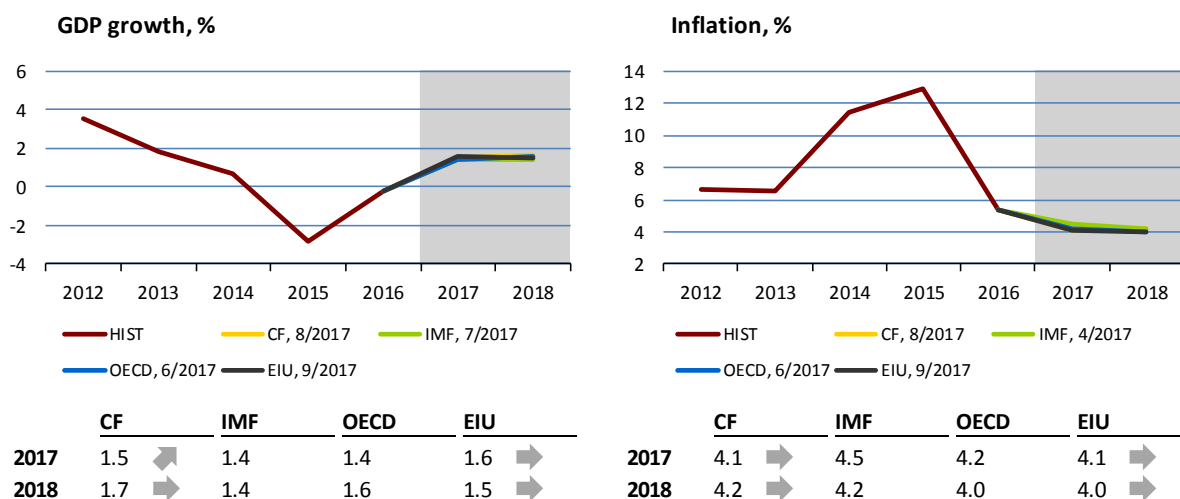
### III.2 India

The Indian economy grew by 5.7% in the first quarter of fiscal year 2017/18. Growth unexpectedly declined by 0.4 pp compared to the previous quarter, mainly due to a slowdown in private consumption and exports. It suggests that the economy has still not recovered from the November demonetisation, which, moreover, has proved highly unsuccessful (its aim was to combat corruption and tax evasion), as 99% of the cancelled banknotes have been replaced. CF and EIU revised their growth outlooks for India downwards. Industrial production growth increased year on year in July, due to a rise in electricity production and mining. The [PMI](#) in manufacturing rose to 51.2 points in August, returning to the expansion band after the negative effect of tax measures faded away. According to purchasing managers, all the monitored components contributed to that. Inflation rose for the second month in a row in August (this time by 1 pp to 3.4%) on the back of rising food prices. The CF nonetheless reduced its inflation forecasts for both fiscal years by 0.1 pp.



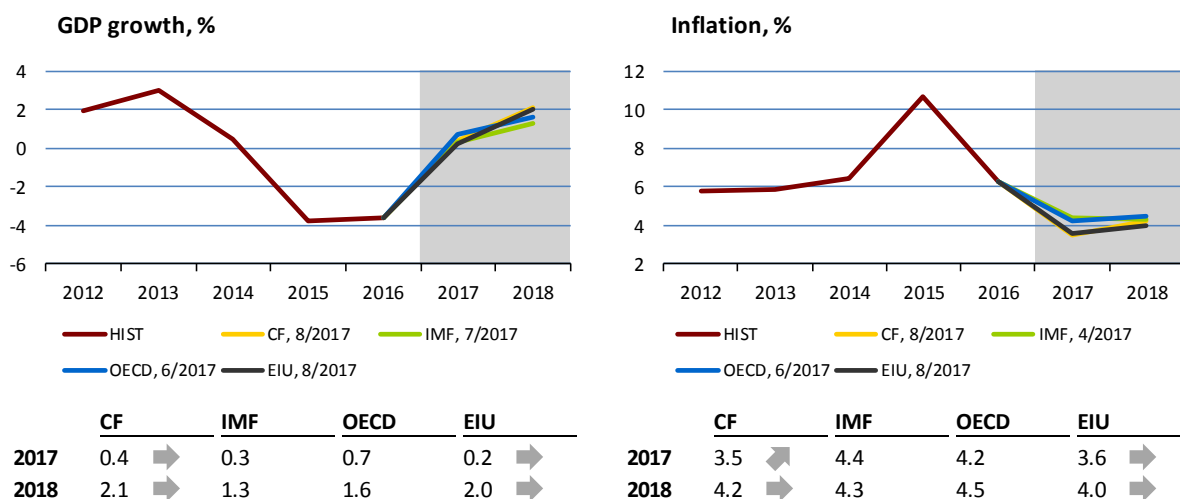
### III.3 Russia

The first estimate of GDP growth estimate confirmed the previously indicated high level (2.5% year on year). In terms of components, the growth was mostly due to mining and quarrying (4.6%) and services, in particular wholesale and retail trade and repair of motor vehicles and motorcycles (4.7%), transport and storage (3.7%) and also information and communication activities (4.1%). Given the slower growth at the start of the year, the new CF and EIU outlooks still expect overall growth of around 1.5% in 2017. Inflation in August unexpectedly fell to its lowest level since the establishment of the Russian Federation (3.3%). Food price inflation slowed the most, but the other categories also contributed to the overall decrease in inflation. Owing to the disinflationary process, which is proceeding faster than originally expected, the Russian central bank lowered its key rate by a further 0.5 pp to 8.5% in mid-September. The September CF and EIU for now expect inflation of just above 4% at the year-end.



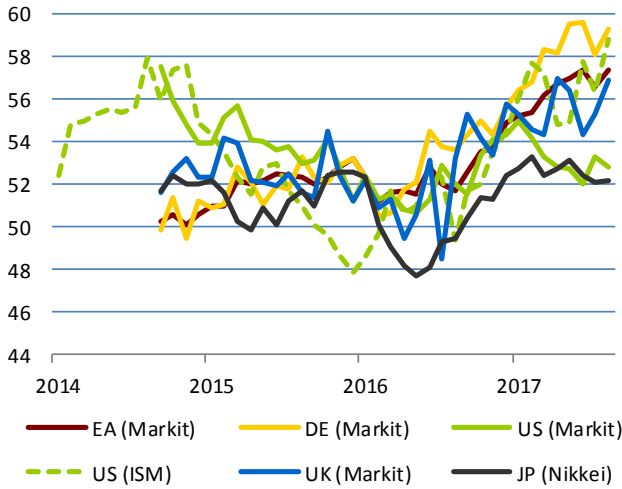
### III.4 Brazil

Following three years of decline, the Brazilian economy recorded positive annual growth of 0.4% in Q2. The GDP growth was fostered mainly by renewed growth in household consumption (0.7%), which had also long been negative, and also by export growth of 2.5% combined with a decline in imports of 3.3%. Conversely, government consumption and fixed investment fell even more markedly than in the previous quarter. CF and EIU expect growth of 0.2%–0.4% in 2017. Brazilian inflation hit a long-term low in August, with consumer price inflation dropping to less than 2.5%. The lower inflation was fostered primarily by food, whose prices dropped by 2% year on year (the largest fall since 1990), due mainly to a record-high harvest. The central bank lowered the key monetary policy rate (SELIC) by 1 pp to 8.25% in early September. The current CF and EIU outlooks expect inflation of around 3.5% at the end of this year.

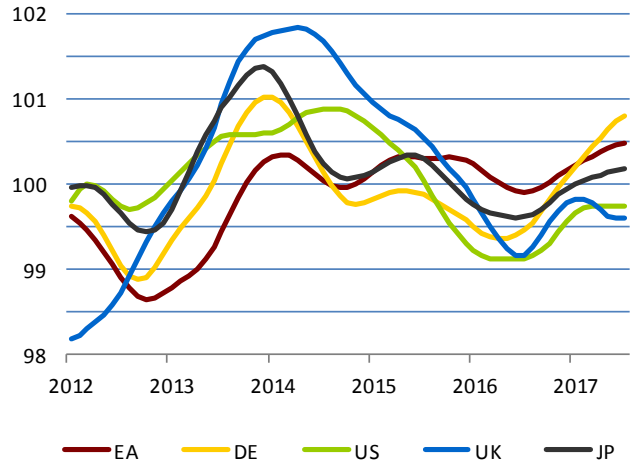


IV.1 Advanced economies

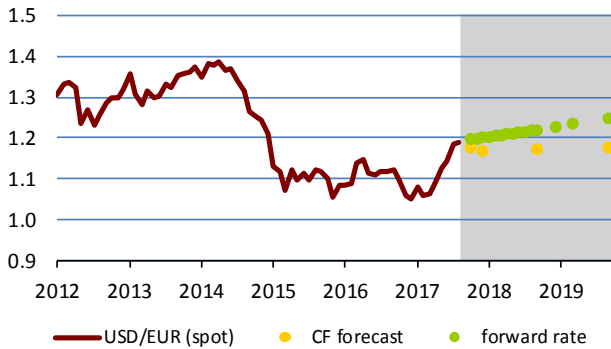
PMI in manufacturing



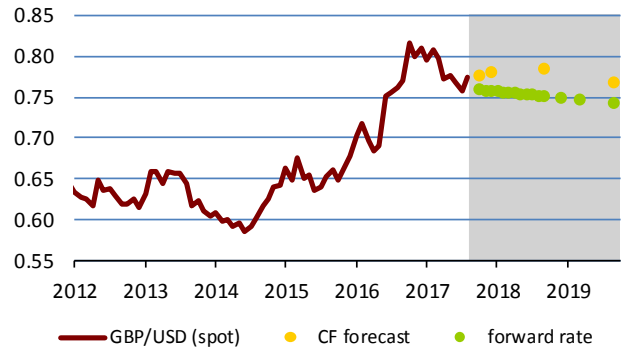
OECD Composite Leading Indicator



The US dollar (USD/EUR)



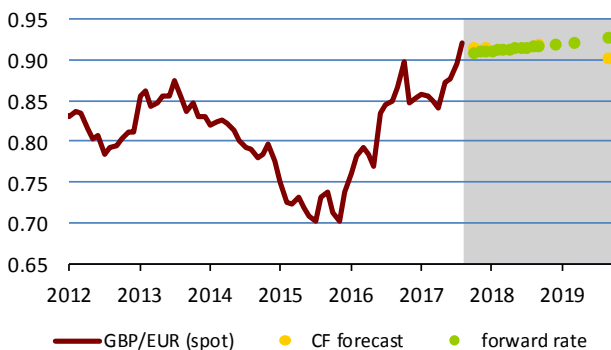
The British pound (GBP/USD)



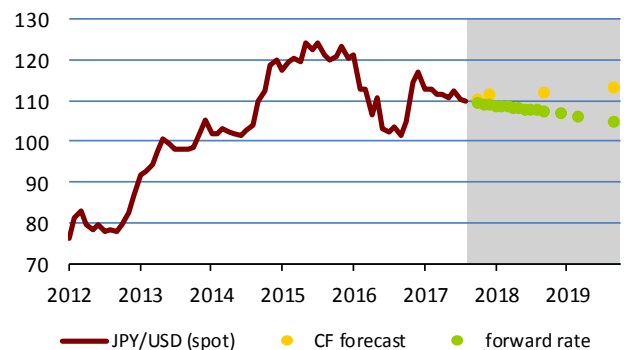
	11/9/17	10/17	12/17	09/18	09/19
spot rate	1.198				
CF forecast		1.177	1.170	1.172	1.175
forward rate		1.197	1.201	1.220	1.247

	11/9/17	10/17	12/17	09/18	09/19
spot rate	0.758				
CF forecast		0.776	0.781	0.784	0.767
forward rate		0.759	0.758	0.751	0.742

The British pound (GBP/EUR)



The Japanese yen (JPY/USD)



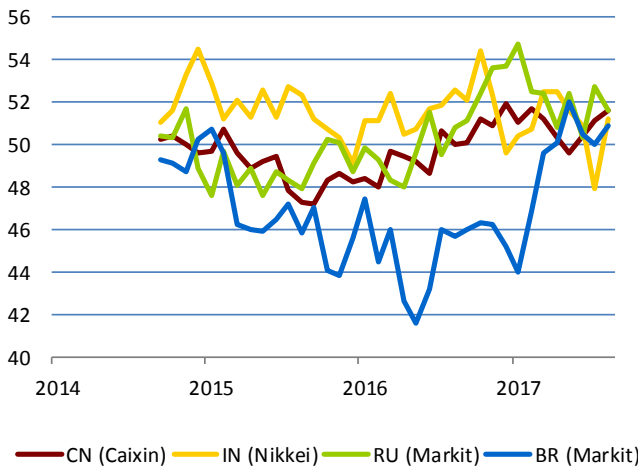
	11/9/17	10/17	12/17	09/18	09/19
spot rate	0.908				
CF forecast		0.913	0.914	0.918	0.901
forward rate		0.909	0.910	0.916	0.926

	11/9/17	10/17	12/17	09/18	09/19
spot rate	108.9				
CF forecast		110.2	111.4	112.0	113.3
forward rate		109.2	108.9	107.3	105.0

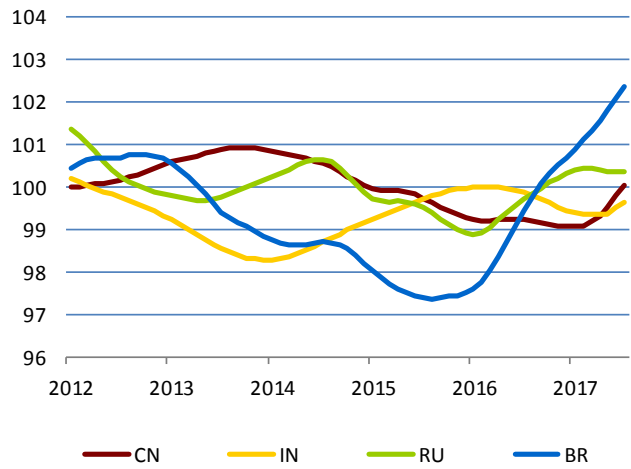
Note: Exchange rates as of last day of month. Forward rate does not represent outlook; it is based on covered interest parity, i.e. currency of country with higher interest rate is depreciating. Forward rate represents current (as of cut-off date) possibility of hedging future exchange rate.

IV.2 BRIC countries

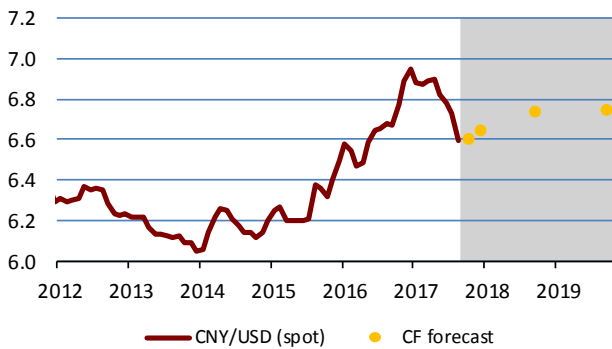
PMI in manufacturing



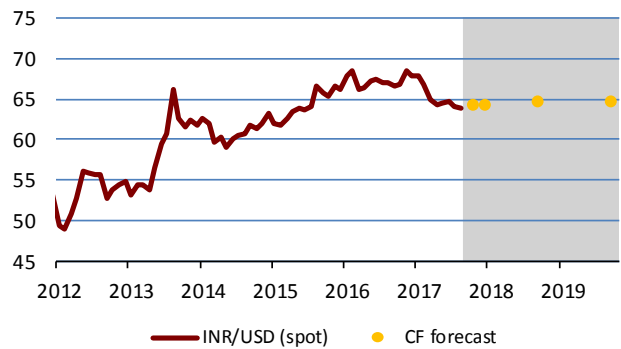
OECD Composite Leading Indicator



The Chinese renminbi (CNY/USD)



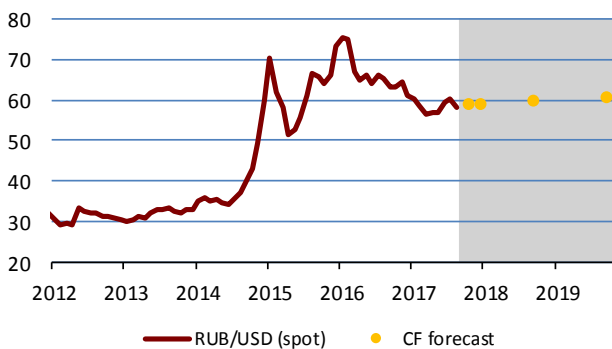
The Indian rupee (INR/USD)



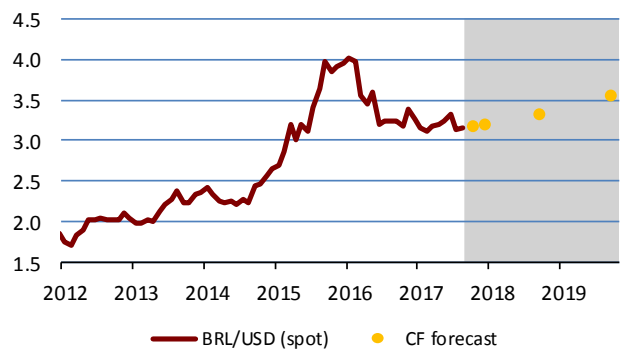
	11/9/17	10/17	12/17	09/18	09/19
spot rate	6.524				
CF forecast		6.602	6.643	6.736	6.746

	11/9/17	10/17	12/17	09/18	09/19
spot rate	63.92				
CF forecast		64.17	64.35	64.64	64.75

The Russian rouble (RUB/USD)



The Brazilian real (BRL/USD)



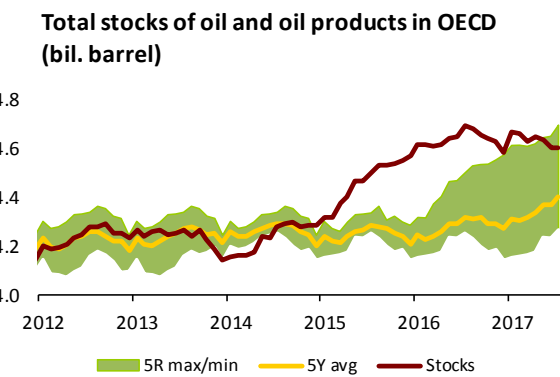
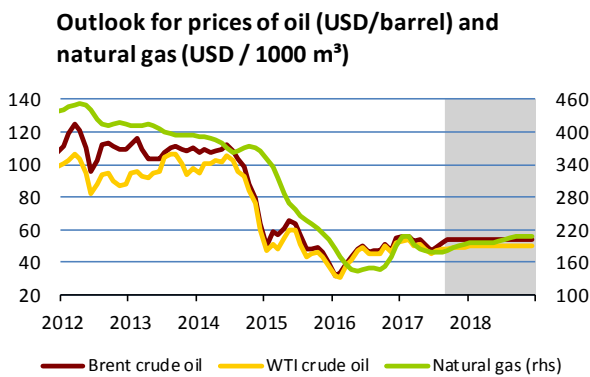
	11/9/17	10/17	12/17	09/18	09/19
spot rate	57.16				
CF forecast		58.86	58.94	59.97	60.7

	11/9/17	10/17	12/17	09/18	09/19
spot rate	3.083				
CF forecast		3.171	3.195	3.314	3.563

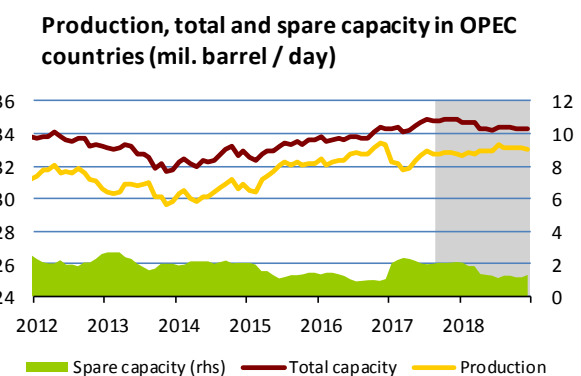
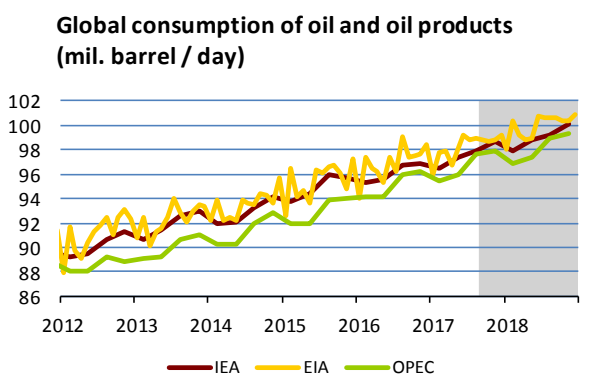
Note: Exchange rates as of last day of month.

### V.1 Oil and natural gas

The Brent crude oil price stayed just above USD 50/bbl in August, the level it had reached at the end of July after the St Petersburg meeting of oil producers. Oil prices rebounded in September and Brent moved above USD 55/bbl in the middle of the month. The Brent and WTI prices are currently showing different patterns due to the hurricanes in the Gulf of Mexico. The hurricanes shut down a large proportion of refining capacity on the coast, resulting in a surge in petrol prices and refinery margins around the world. Subsequently, fuel consumption in the southern US states have also been disrupted, while refineries are gradually coming back online. Petrol prices have thus started to return to normal. However, there is an oil surplus on the US market, as production was disrupted minimally by the hurricanes, while the operations of port terminals for oil exports from the USA were greatly reduced. The Brent-WTI spread thus exceeded USD 5/bbl at the end of August, where it last stood in August 2015. The WTI futures curve thus remains in contango, while the Brent curve is in backwardation until the year-end and increases only gradually thereafter. This situation signals some tensions on the oil market, reflecting still strong demand for fuels due to continued growth of the global economy (and hence strong refinery activity) and, on the supply side, an (expected) weakening of production in the USA, production shortfalls in Libya and reduced oil supplies from other OPEC countries and Russia. The market curve implies an expected Brent crude oil price of USD 53.7/bbl for the rest of the year and virtually the same price in 2018. The EIA expects an average Brent crude oil price of USD 52/bbl next year and the September CF a price of USD 53.5/bbl at the 12-month horizon.



	Brent	WTI	Natural gas
2017	52.71 ↘	49.24 ↘	188.51 ↘
2018	53.95 ↗	50.17 ↘	201.26 ↗



	IEA	EIA	OPEC
2017	97.63 ↘	98.26 ↘	96.75 ↗
2018	98.99 ↘	99.96 ↘	98.13 ↗

	Production	Total capacity	Spare capacity
2017	32.49 ↘	34.60 ↘	2.12 ↗
2018	32.99 ↗	34.41 ↗	1.42 ↗

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

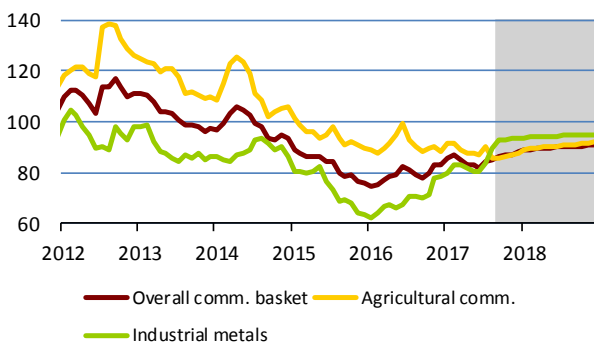
Note: Oil price at ICE, price of Russian natural gas at German border – IMF data, smoothed by the HP filter. Future oil prices (grey area) are derived from futures and future gas prices are derived from oil prices using model. Total oil stocks (commercial and strategic) in OECD countries – IEA estimate.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

## V.2 Other commodities

Following growth in July, the aggregate non-energy commodity price index was flat in August but returned to growth in the first half of September. This was due mainly to strong growth in the industrial metals sub-index, although this was offset in August by a similarly strong decline in the food commodity price sub-index. It dropped to its lowest level since March 2009 and stayed there in the first half of September. The outlook for all three indices is rising, although only very slightly in the case of metals.

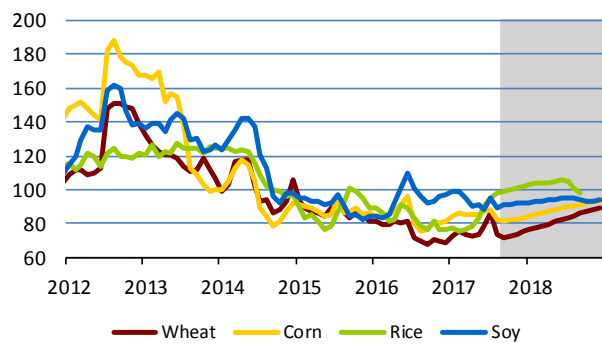
The food commodity price index was driven downwards by wheat and corn prices in August as the USDA increased its estimate of stocks after the 2017/2018 harvest. The estimate of the damage caused by the drought in the US Plains turned out to be exaggerated. The estimates of wheat production in Russia and Ukraine were also increased. Prices of meat also fell, although for pork the drop was seasonal. Prices of orange concentrate and cotton surged at the end of August on concerns about hurricane damage to crops in the southern US states (Texas and Florida). Prices of basic metals rose across the index on an improving global manufacturing outlook (the JPMorgan PMI rose to its highest level in 75 months – from 52.6 to 53.1) and continued growth in infrastructure investment in China. Prices were also affected by shortfalls in the production of some commodities due to strikes, mine closures due to government regulations (nickel in the Philippines) and adverse weather. Prices were also supported by the depreciating [dollar](#). The metal price index thus grew to its highest level since August 2014. Strong growth was recorded by demand for steel in China and also by steel production in that country. This led to growth in prices of iron ore. The rise in steel production also fostered growth in prices of nickel and zinc. The price of copper responded among other things to a decline in stocks at the LME in August.

### Non-energy commodities price indices



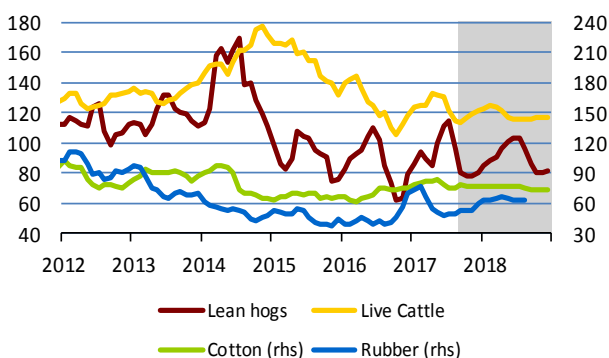
	Overall	Agricultural	Industrial
2017	85.4 ↗	88.0 ↘	86.3 ↗
2018	90.0 ↗	90.6 ↘	94.5 ↗

### Food commodities



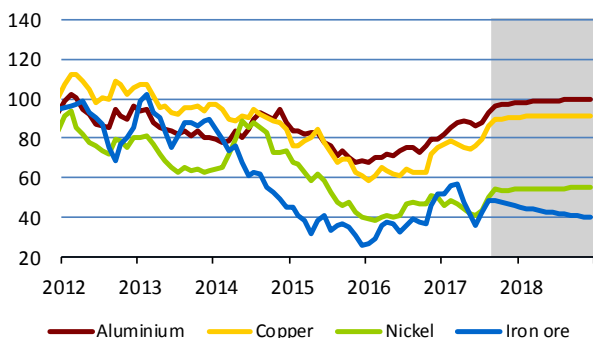
	Wheat	Corn	Rice	Soy
2017	75.0 ↘	84.6 ↘	89.8 ↗	92.8 ↘
2018	82.9 ↘	89.4 ↘	103.3 ↗	94.0 ↘

### Meat, non-food agricultural commodities



	Lean hogs	Live Cattle	Cotton	Rubber
2017	91.2 ↘	123.0 ↘	78.9 ↗	57.4 ↗
2018	91.1 ↘	118.8 ↗	75.6 ↗	64.2 ↗

### Basic metals and iron ore



	Aluminium	Copper	Nickel	Iron ore
2017	90.5 ↗	82.0 ↗	48.1 ↗	47.3 ↘
2018	99.0 ↗	91.3 ↗	54.6 ↗	42.3 ↘

Source: Bloomberg, CNB calculations.

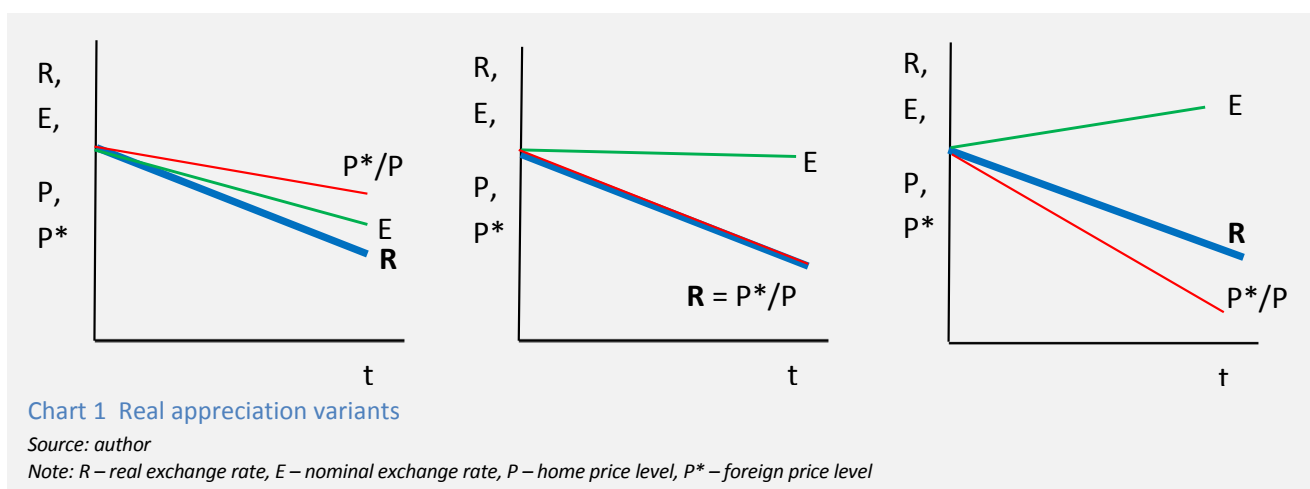
Note: Structure of non-energy commodity price indices corresponds to composition of The Economist commodity indices. Prices of individual commodities are expressed as indices 2010 = 100.

## The real exchange rate phenomenon: What does it tell us about EU countries?<sup>1</sup>

The real exchange rate – one of the most complex economic categories – is a true reflection of economic developments in a country. It reflects movements in both the nominal exchange rate and relative price levels. This means it can be used to analyse many economic issues, for example to assess a country's convergence efforts (e.g. towards the euro area core countries),<sup>2</sup> to discuss the central bank's effect on the distribution of real appreciation (between the nominal exchange rate and inflation differential channels) and to track an economy's external competitiveness. The real exchange rate is also a starting point for estimating the equilibrium real exchange rate, which underscores the importance of this macroeconomic variable. This article opens up the "door of knowledge" to these issues. It monitors the real bilateral and effective exchange rates of all 28 EU countries since the establishment of the euro area in 1999. It shows that: (i) higher rates of real appreciation are not surprising in countries catching up to the euro area core, as they reflect the convergence results of those economies, (ii) the choice of the exchange rate regime had an impact on the spread of real appreciation in catching-up countries between the exchange rate channel and the channel of relative prices, (iii) external devaluation, where possible, would help some euro area countries solve their equilibrium issues, (iv) competitiveness in EU countries may also be linked with the process of creeping deindustrialisation.

### 1 Decomposition of the real exchange rate

The path of the real exchange rate ( $R$ ) is determined by the movements of its three components: the nominal exchange rate ( $E$ ), the foreign price level ( $P^*$ ) and the home price level ( $P$ ). If home prices go up faster than foreign prices (the ratio of price levels  $P^*/P$  falls) and the nominal exchange rate remains unchanged, the real exchange rate falls (the home currency appreciates in real terms). Conversely, if home prices go up slower than foreign prices (the ratio of price levels  $P^*/P$  rises) and the nominal exchange rate stays unchanged, the real exchange rate rises (the home currency depreciates in real terms). In reality, of course, the nominal exchange rate also changes,<sup>3</sup> and depending on how those changes are accompanied by price level changes, the real rate also changes in various ways.<sup>4</sup>



Possible variants of movements of the components of the real exchange rate for the real appreciation case are shown in Chart 1. It contains three schemes that divide countries in simplified terms into three groups. The middle part shows the **first group**: countries with a fixed exchange rate or countries in the monetary union (the euro area), whose currencies were permanently fixed to the euro through a conversion rate. By

<sup>1</sup> Author: Luboš Komárek. The views expressed in this article are those of the author and do not necessarily reflect the official position of the Czech National Bank. The author wishes to thank Jan Frait, Pavla Břízová, Tomáš Holub and Tomáš Adam for valuable discussions and comments and Tomáš Adam and Iveta Polášková for data support.

<sup>2</sup> The CNB has been issuing a position document entitled "Analyses of the Czech Republic's Current Economic Alignment with the Euro Area" since 2005.

<sup>3</sup> Unless the economy applies a fixed exchange rate system, where the rate is maintained at a selected level by the central bank. Even then, though, the currency moves against currencies other than the reference currency.

<sup>4</sup> Skořepa and Komárek (2015) viewed the real exchange rate from a different perspective than the nominal exchange rate and inflation differential channels. The authors quantified the causes of asymmetric shocks (fundamental factors) showing up as medium-term real exchange rate changes using a sample of 21 advanced and late-transition economies. The application of Bayesian model averaging to the 22 factors under consideration revealed that the following four types of dissimilarities within a given pair of economies can be considered the most important: (i) financial development, (ii) per capita income growth, (iii) central bank independence and (iv) the structure of the economy. A regression based on these four factors indicated that these factors explain about one-third of the three-year real exchange rate variability for the whole sample and almost half for the real exchange rates involving specifically the euro.

definition, the nominal rate cannot change in such countries, so real exchange rate movements are due solely to movements in relative prices in the home and foreign economies. The left-hand scheme in Chart 1 shows the **second group**: the catching-up economies, which were not converging to the euro area through relative prices alone. Their real appreciation was supported by nominal appreciation. In reality, there are a number of other possible variants of exchange rate appreciation and falling relative prices that lead to such real appreciation. Here we describe the case where it was fostered more by the nominal rate than by relative prices. The right-hand scheme adds a **third group** to the mosaic of real appreciation variants: countries whose convergence occurred through relative prices, while the nominal exchange rate depreciated. The individual catching-up economies moved between these groups over time. There were also periods of time, albeit shorter ones, when relative prices did not contribute to the convergence process, i.e. there were situations where home prices rose more slowly than prices in the reference territory (the euro area).

The real exchange rate can be calculated in several ways using various indices to capture price level movements. The foreign and home price levels are ambiguous terms, as the price level, unlike the exchange rate, can be defined in many ways. The various approaches to calculating the real exchange rate are explained briefly in the Box. The real exchange rate can be viewed in both bilateral terms (the exchange rate between two countries; see section 2) and effective terms (the exchange rate vis-à-vis a basket of currencies, whose weights are calculated on the basis, for example, of the share of exports of the home country to the foreign country; see section 3). The bilateral level is suitable, for example, for examining an economy's convergence to the reference country or monetary union. The effective level is useful for discussing the competitiveness of an economy with respect to its major trading partners.

If the real rate deviates from the equilibrium rate,<sup>5</sup> overvaluation or undervaluation occurs. This causes a change in resource allocation between the tradables and non-tradables sectors. Substantial currency overvaluation slows economic growth, whereas the growth implications of exchange rate undervaluation are ambiguous. Considerable overvaluation of the exchange rate may lead, for example, to sub-optimality and unsustainability of the current account balance, to rising external debt and to a risk of speculative attacks. However, an analysis of these potential phenomena goes beyond the scope of this text.

## 2 The real bilateral exchange rate and convergence of the economy

A converging economy should experience real appreciation of its currency. For countries outside the monetary union, the distribution of real appreciation between the inflation differential channel (the ratio of relative prices between the foreign and home economies) and the nominal exchange rate channel depends on the choice of monetary policy regime. This choice usually falls within the central bank's powers, often with a consultation duty to the government. However, economic theory does not offer a simple answer to what exchange rate regime is universally the most suitable, not even from the broad perspective, i.e. for the choice between the fixed and floating regimes. This choice is considered one of the general monetary policy challenges for countries lying outside the monetary union in the 21st century.<sup>6</sup>

Generally, if the central bank targets the exchange rate, the inflation channel is "relaxed" and the exchange rate channel is "frozen", hence equilibrium real appreciation must be reflected in growth in the price level.<sup>7</sup> This choice might foster a substantial increase in the wage level in a sufficiently fast converging economy due to pressures stemming from home inflation. When the inflation targeting regime is applied, the nominal exchange rate is able to move, in addition to natural movement of prices. This can result in real appreciation through both channels (see Chart 1). The choice of inflation targeting combined with a floating exchange rate gives home economic agents an increase in their relative wealth abroad, as more goods can be bought for the same amount of home currency in the event of nominal appreciation.

The central banks of catching-up economies, especially those that joined the EU in 2004, chose different exchange rate regime strategies, thereby de facto affecting the distribution of the real appreciation of their currencies. Chart 2 shows the decomposition of the bilateral real exchange rate movements (blue dots) into the nominal exchange rate channel (E; green columns) and the relative price channel ( $P^*/P$ ; red columns) for all 28 EU Member States (Chart 6 in the appendix gives a more detailed breakdown for the countries that joined the EU in 2004) using the harmonised index of consumer prices (HICP). It illustrates the real exchange rate decompositions from the establishment of the euro area in 1999 to the end of 2016, broken down into two sub-periods (1999–2005 and 2005–2016). Based on the evolution of their bilateral exchange rates in the period 1999–2005, the EU countries can be divided into several groups:

- **Countries with significant real appreciation supported by nominal depreciation.** This group contains Slovakia, the Czech Republic and Lithuania, with Slovakia having shown the largest real appreciation of its currency of all the EU countries in 1999–2016.

<sup>5</sup> The equilibrium real exchange rate can generally be defined as the real exchange rate consistent with internal and external balance of the economy. For transition economies, see e.g. Frait and Komárek (2003), where a more detailed discussion of the transformation period can be found, and Horváth and Komárek (2007). Example estimations of equilibrium exchange rate models can be found in e.g. Komárek and Melecký (2008) and Komárek and Motl (2012).

<sup>6</sup> See e.g. the Federal Reserve Bank of Kansas City's Jackson Hole symposium proceedings (1999).

<sup>7</sup> For details, see Komárek, Koprnická and Král (2010).



**Box: The real exchange rate**

The real exchange rate (R) is defined as the nominal exchange rate (E) adjusted for the evolution of the foreign price level ( $P^*$ ) and the home price level (P), i.e.  $R = E \cdot P^* / P$ . Different price level definitions may be used for calculating the real exchange rate (RER) depending on the intended analysis (see Table 1).

The **first RER concept** differentiates between goods (goods and services) traded internationally (tradables) and those produced and consumed directly in the home economy (non-tradables). This differentiation is important because the former category is subject to international competition, whereas the latter is not. The product of the nominal exchange rate (E) and the foreign tradables price level ( $P_T^*$ ) gives the home tradables price level ( $P_T$ ), i.e. the foreign tradables price level expressed in the home currency, which expresses the real exchange rate in relation to the home non-tradables price level as the internal terms of trade [ $R = P_T / P_N$ ]. They describe how resources are allocated in the economy between the tradables and non-tradables sectors. Growth in the real exchange rate defined in this way means that home non-tradables become relatively cheaper and consumer demand for them increases. The disadvantage of this concept is that it treats all tradables as identical regardless of where they are produced.

The **second RER concept** divides goods according to whether they are exported (X) or imported (M). It is obtained as the nominal exchange rate (E) multiplied by prices of import goods in the foreign currency ( $P_M^*$ ) and divided by prices of export goods in the home currency ( $P_X$ ), i.e. [ $R = E \cdot P_M^* / P_X$ ]. In simplified terms, the external terms of trade are the inverse of the real exchange rate expressed in this way [ $P_X / P_M$ ] and measure how many foreign goods can be purchased for a unit of home goods. When the terms of trade improve (increase), the currency appreciates in real terms, as home entities receive a larger amount of imported goods for the same amount of exported goods. A complication here is determining what the category of export goods actually contains.

The **third RER concept**, which is used to measure the competitiveness of home producers, is the real

exchange rate defined as the ratio of home prices to foreign prices in manufacturing, with both price levels expressed in the home currency. The disadvantage of this index is that it measures competitiveness on the export side while ignoring the import side. In addition, manufacturing has different structures in different countries and is only one part of the tradables sector.

The **fourth RER concept** substitutes the foreign and home price levels with the GDP price deflator, which, by its nature, reflects price developments most closely, as it captures the price movements of all goods produced in the economy. Its disadvantages are that it is unavailable at higher-than-annual frequency and it has a variable weight structure and hence does not represent the evolution of prices of comparable goods over time. For these reasons, it is more appropriate to use the GDP deflator for analyses of long time periods than for operational analyses.

The **fifth RER concept** is based on real unit labour costs (RULC). They are usually defined as the ratio of compensation per employee (wages, salaries and net taxes, including social security contributions paid directly by the employer) to labour productivity per employee. A decline in the growth rate of this indicator means that growth in labour productivity is outpacing growth in costs.

Nevertheless, analytical calculations of the real exchange rate most often use the **sixth concept** (using the producer price index, PPI) and the **seventh concept** (using the consumer price index, the CPI, or its harmonised variant, the HICP), due mainly to their statistical availability. Other advantages of these indices include their relatively stable basket structure and monthly reporting.

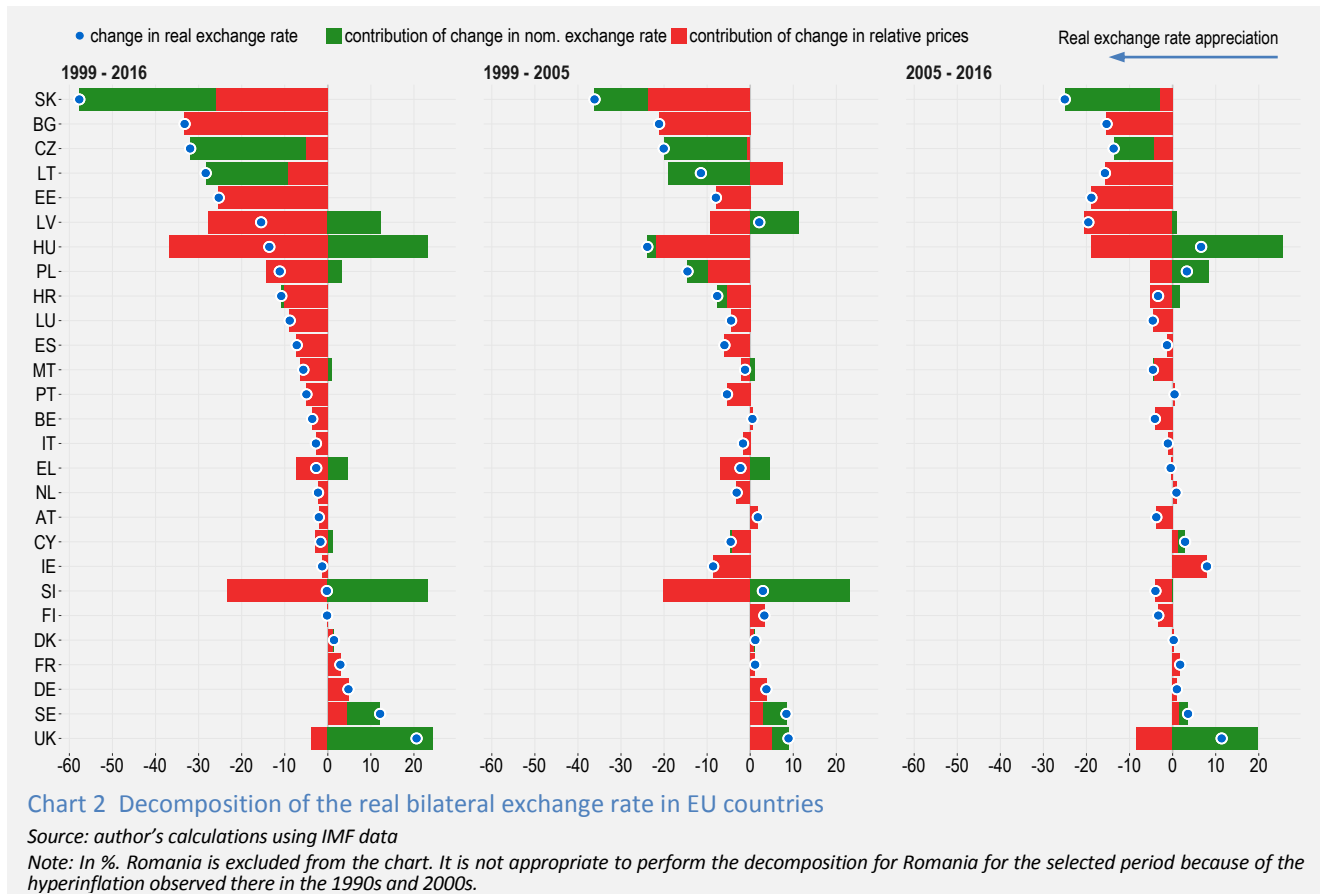
To sum up, none of the above ways of measuring the real exchange rate is an ideal, generally preferred or recommended measure. Each index is suitable for a different sort of analysis. Combining them can help us get a better picture of the evolution of this key economic variable. This picture can be further enhanced by monitoring the real exchange rate in effective terms, i.e. by taking into account the significance of individual trading partners (with weights in the index based, for example, on export shares).

Price index	Real exchange rate definition
Prices of tradables ( $P_T$ ) and non-tradables ( $P_N$ )	$R = E \cdot P_T^* / P_N$
Prices of imported ( $P_M$ ) and exported goods ( $P_X$ )	$R = E \cdot P_M^* / P_X$
Price index in manufacturing ( $P_{PI}$ )	$R = E \cdot P_{PI}^* / P_{PI}$
GDP price deflator ( $P_{GDPdefl}$ )	$R = E \cdot P_{GDPdefl}^* / P_{GDPdefl}$
Real unit labour costs ( $P_{RULC}$ )	$R = E \cdot P_{RULC}^* / P_{RULC}$
Producer price index ( $P_{PPI}$ )	$R = E \cdot P_{PPI}^* / P_{PPI}$
Consumer price index ( $P_{CPI}$ )	$R = E \cdot P_{CPI}^* / P_{CPI}$

Table 1 Real exchange rate calculation methods

- **Countries with real appreciation reduced by nominal depreciation.** This group contains Hungary, Latvia and Poland and also, albeit with much lower rates of real appreciation Slovenia, Greece, Malta and Cyprus.
- **Countries with real appreciation achieved solely through the relative price channel.** This group contains countries with fixed exchange rate systems (Bulgaria and Estonia) and also, for example, one of the most advanced euro area countries, Luxembourg.
- **Countries with visible real depreciation.** This group consists of advanced EU countries such as Denmark, France, Germany, Sweden and the UK, whose currency showed the largest real depreciation due mainly to events following the victory of the leave campaign in the Brexit referendum.

Based on the evolution of the real bilateral exchange rates and their components, we can conclude that Slovakia was converging the fastest to the euro area core countries in the period under review. It was followed by Bulgaria and, just behind it, the Czech Republic.



### 3 The real effective exchange rate and the competitiveness of the economy

The evolution of the real exchange rate affects the structure of spending and the intertemporal smoothing of consumption through saving and dissaving, with impacts on the current account, and is regarded as a key indicator of an economy's external competitiveness. Real appreciation is often interpreted as a potential loss of price competitiveness. This raises the concern that catching-up economies (countries entering the EU after 2004 and countries on the southern periphery of the euro area) may be exposed to constant problems with external equilibrium due to real appreciation of their currencies.<sup>8</sup> However, the relationship between the real exchange rate and competitiveness is not that simple. On the one hand, real appreciation may imply a drop in competitiveness if the real exchange rate becomes overvalued relative to the equilibrium level. On the other hand, however, it may conversely reflect growing competitiveness due to factors such as productivity growth or growth in the capitalisation of the economy. This implies a need to study changes in the real exchange rate from the perspective of fundamental determinants. Only then can one say whether real appreciation is the cause of falling competitiveness or a consequence of rising competitiveness.

<sup>8</sup> Frait and Komárek (2002) applied the concept of the debt-adjusted real exchange rate (DARER) to the Visegrad countries (the Czech Republic, Hungary, Poland and Slovakia). Rather than being an equilibrium real exchange rate, DARER is a "truer" real exchange rate taking into account the current account trend and foreign direct investment. The motivation for constructing DARER was the fact that many transition economies financed their long-term current account deficits with capital flows, which often led to real overvaluation of their currencies.

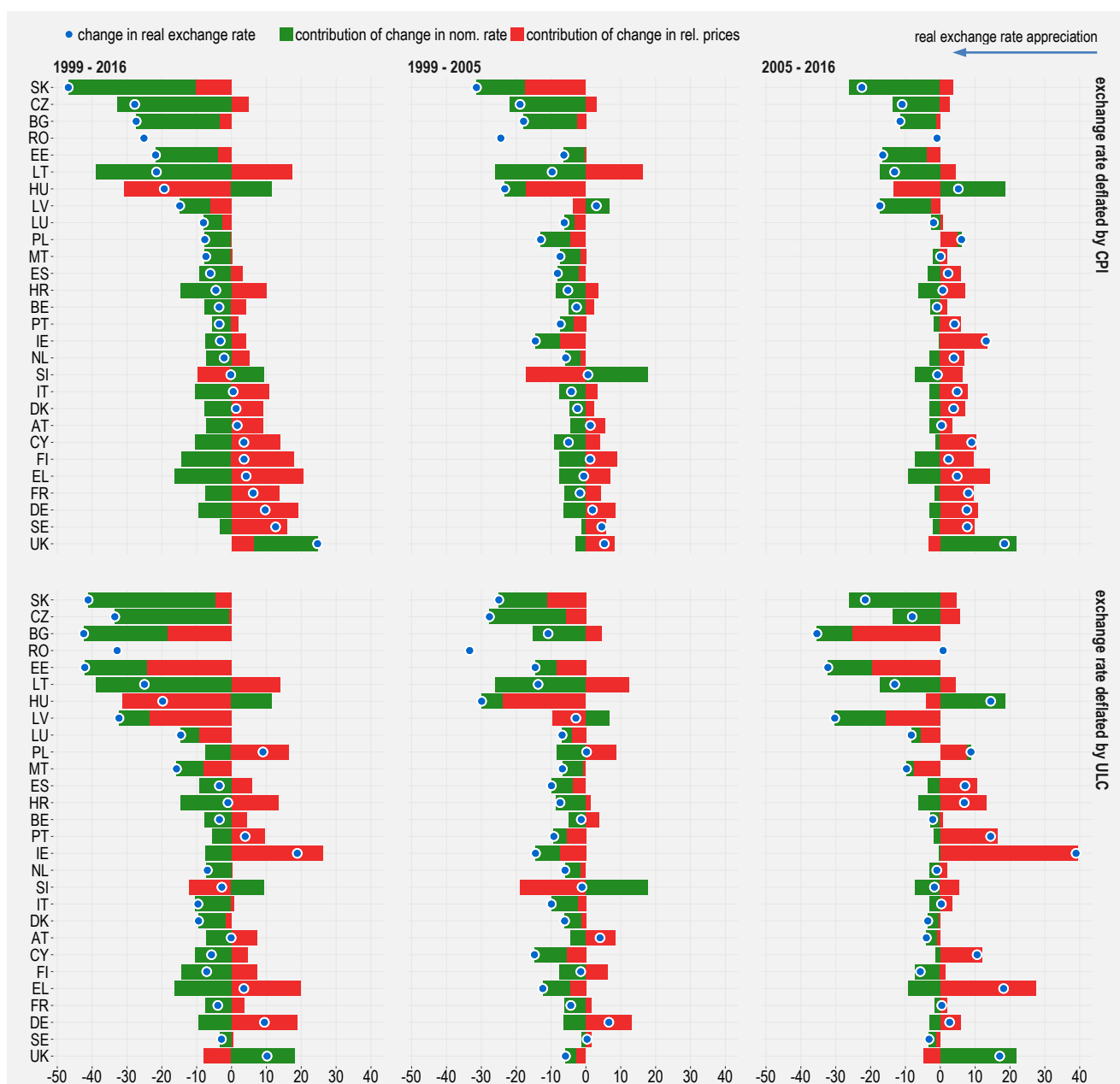


Chart 3 Decomposition of the real effective exchange rate

Source: author's calculations using IMF data

Note: In %. The three upper charts were obtained using CPI and the three bottom ones using ULC. For Romania, only the change in the real effective exchange rate is shown to achieve better clarity of results for the other countries. The decomposition values for Romania are as follows: 1999–2016 contribution of change in nominal effective exchange rate 132% and contribution of change in relative prices based on CPI -157% (based on ULC -165%), 1999–2005 103% and -127% (-136%), 2005–2016 14% and -15% (-14%).

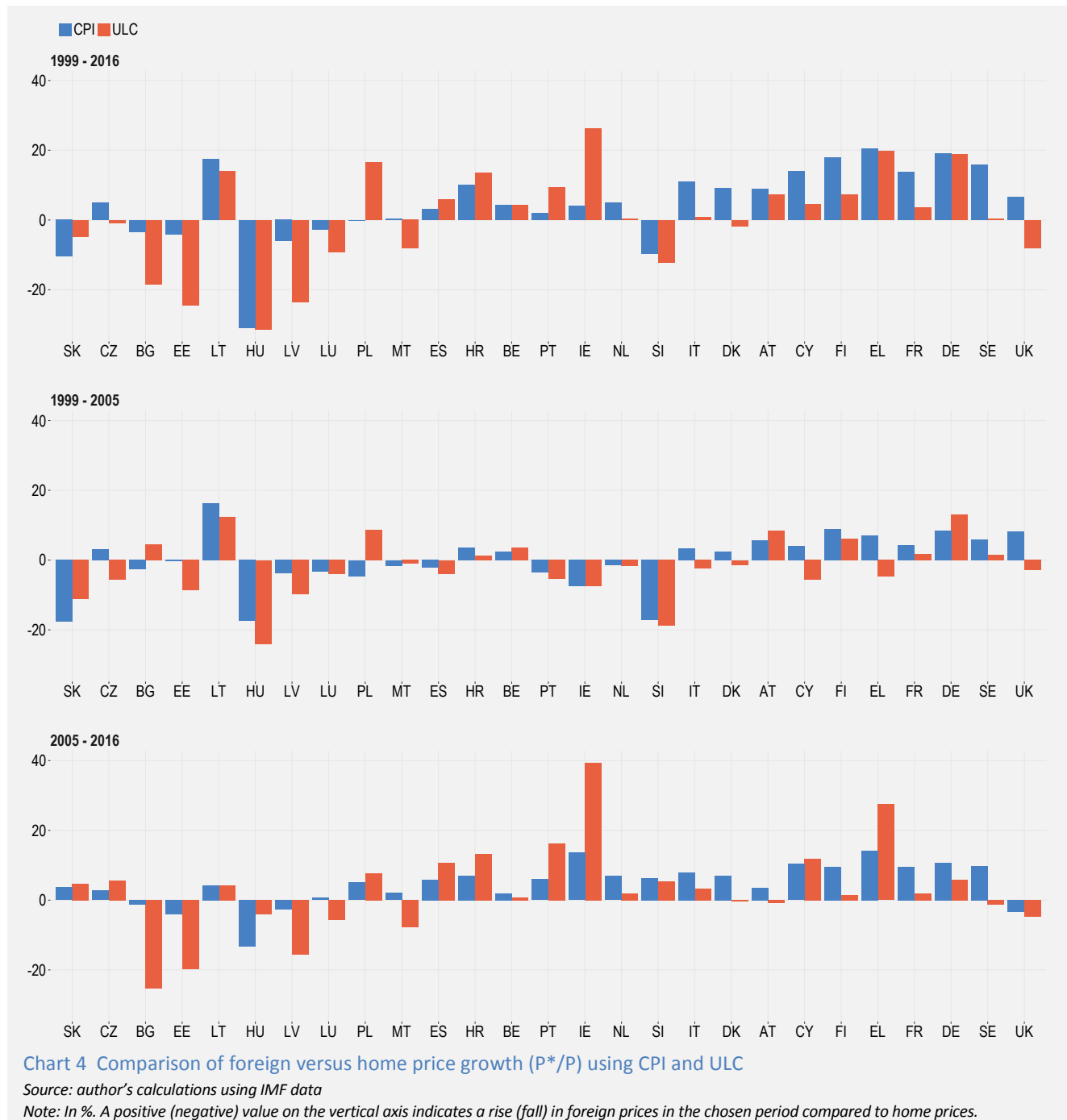
The evaluation of the impact of changes in the real exchange rate on competitiveness is complicated by the fact that tradable goods are not homogeneous. If they were, their origin and intended use would not matter. However, most tradables are heterogeneous. This implies a need to explore the competitiveness of home commodities relative to major trading partners (i.e. using effective indicators), different regions and different groups of producers. An economy's competitiveness in a segment "depends" not only on the real rate itself (if exogenous to the segment), but also on variables such as cross-country differences in productivity in that segment, the structure of tariffs, and relative prices in individual economies.<sup>9</sup>

Chart 3 shows the decomposition of the real exchange rate movements for the 28 EU Member States similar to Chart 2, but here in effective form, and Chart 7 in the appendix shows the same for the catching-up

<sup>9</sup> Frait and Komárek (2001) pointed out another problem faced by economies converging to the euro area core: a switch of production to more sophisticated and competitive commodity groups due to productivity growth. Here, higher productivity may not automatically mean higher competitiveness and may not justify real appreciation, as the country is competing at a completely different level than before. It is, of course, easier to penetrate higher commodity groups with a relatively weak exchange rate than with a relatively strong one. For this and other reasons, central banks monitor how fast the real rate is appreciating and whether this appreciation is limiting the competitiveness of up-and-coming or traditional industries.

economies in more detail. The use of effective indices instead of bilateral ones better reflects the real trend compared to the country's trading partners. Chart 3 presents a cross-country comparison using consumer price indices (CPI) in its upper half and unit labour costs (ULC) in its lower half. The differences in these two alternative real exchange rate calculations are due solely to movements in relative prices obtained using CPI and ULC; the nominal component of the real exchange rate is the same in both parts of Chart 3.

For the competitiveness debate it may be useful to compare relative prices in the home and foreign economies using CPI and ULC, as shown in Chart 4. It is clear from the comparison that their movements differed markedly, particularly in Bulgaria, Estonia and Latvia (where ULC-based relative prices rose more sharply than CPI-based ones in 2005–2016). In the founder euro area members, we see a drop in these relative prices, i.e. growth in prices according to both the CPI and ULC, which was larger in these economies than in the euro area as a whole.

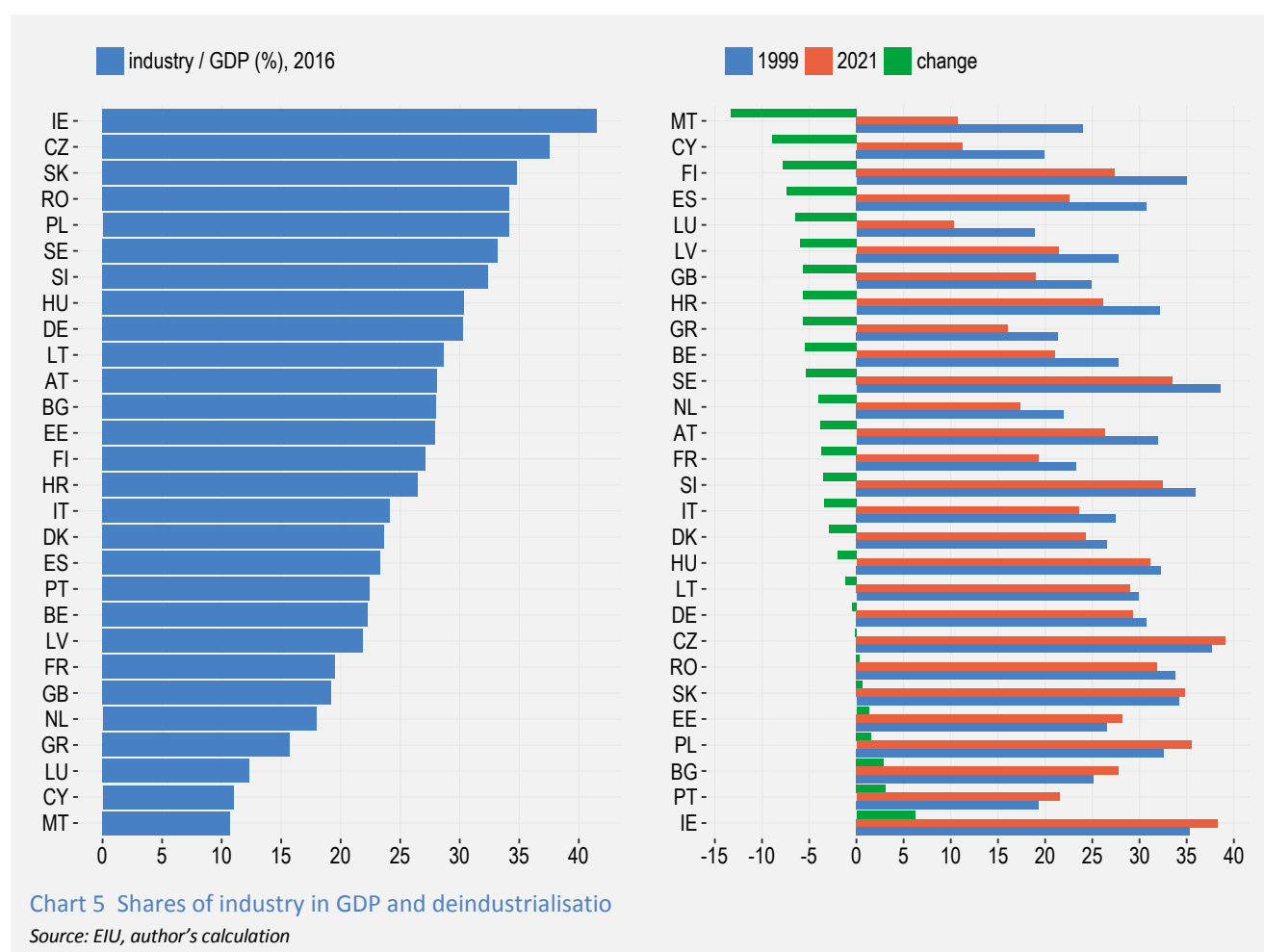


#### 4 The real exchange rate and deindustrialisation of the economy

The evolution of the real exchange rate and the competitiveness of an economy may be linked with the process of deindustrialisation.<sup>10</sup> This process has been going on for decades (maybe since the peak of the industrial revolution), particularly in advanced market economies which first went through industrialisation (e.g. the UK) or which experienced rapid industrialisation and achieved a high level of national income (e.g. the USA). The deindustrialisation process is also relevant to catching-up economies, as their traditional industries may disappear or be streamlined and their services sectors may develop.

Some economists are watching deindustrialisation with concern, as they associate it with a risk of declining international competitiveness. Economic theories tell us that deindustrialisation and real currency appreciation are usually both determined by faster productivity growth in industry than in services (see, for example, Rowthorn and Ramaswamy, 1998, and Tatom, 1992). However, the empirical evidence is far less convincing in this regard. The author believes that deindustrialisation below a certain percentage level of GDP could be harmful to an advanced country's economic performance in the long run. In other words, it may be suboptimal for a country to have its GDP created almost exclusively by the services sector (even though that sector will certainly and appropriately be dominant in advanced countries) and to only a negligible extent by agriculture and to a shrinking extent by industry. It is important to preserve high-value-added industrial production in advanced countries, as a shift of production to seemingly advantageous territories may ultimately be disadvantageous to an advanced industrial economy. Examples can be found in the UK, French and Italian economies, which have been hit by deindustrialisation the most (in that order) among the large advanced economies (see Chart 5).

Chart 5 illustrates the current importance of industry for the individual EU countries (left part) and the change therein over two decades based on historical data for 1999 and the medium-term EIU predictions up to 2021 (right part). In 2016, Ireland recorded the highest share of industry in real terms in GDP. However, the author believes that this is a case of statistical overestimation, as many industrial companies have their registered offices (but not their production plants) in Ireland. The Czech Republic and Slovakia have long ranked second and third; both are well-known superpowers in per capital car production. The chart to the



<sup>10</sup> By deindustrialisation we mean a drop in the share of industry in overall output. The extent of deindustrialisation is usually measured by the decline in the share of employment in industry in total employment or, more approximately, by the share of industry in total GDP.

right might be more useful for identifying the degree of deindustrialisation. It shows that the largest drops in the industry-to-GDP ratio are generally recorded by the most advanced countries, with the exception of Cyprus and Malta, where the situation is again specific. However, it is also interesting that the Czech Republic, Slovakia and Romania have not been through deindustrialisation and are not expected to in the years ahead either. In some of these countries, the share of industry in GDP has even increased. This is related to the above-mentioned per capita car production (and the expansion of companies tied to the car industry), which is the highest in the world in Slovakia and the Czech Republic (in that order).

It is not easy to verify empirically whether the ongoing deindustrialisation stems from a natural trend determined by productivity growth in the given economies or, on the contrary, from excessive and unsustainable real appreciation (viewed particularly in ULC terms) lowering the competitiveness of relatively viable companies. One possible guide is the labour market situation and the unemployment rate, because if the latter has long been low (close to the NAIRU, for example), it is clearly impossible to argue that the country is losing competitiveness. Moreover, achieving higher competitiveness “automatically” pushes an economy towards equilibrium, as it drives up wages (and hence puts the currency under real appreciation pressure). This mechanism should also work the other way round. However, the problem can be grasped in a far more complex manner and can therefore be challenging for policy-makers, especially for the monetary union countries, because they cannot apply external currency devaluation (as they use the single currency of the monetary union) to help them solve some of their problems, at least temporarily. This is illustrated by euro area countries such as Italy, Greece and Spain. In the monetary union, however, external devaluation is not an option and, to increase their competitiveness, countries are left “only” with internal devaluation, i.e. a drop in unit labour costs. This implies downward pressure on wages, which is impossible to satisfy from the social point of view in the vast majority of cases.<sup>11</sup> On the other hand, monetary union membership offers a country other benefits, the existence of which we abstract from here.

## 5 Conclusion

Our real bilateral exchange rate decompositions revealed that the trends have been quite diverse across EU Member States since the establishment of the monetary union. Higher rates of real appreciation are not surprising in countries with a history of transformation, as they reflect the convergence of their economies. The nature of this convergence path in the form of real appreciation has also been affected by the choice of exchange rate regime, which, in the case of a fixed exchange rate, deliberately switches off the exchange rate convergence channel; adjustment thus occurs solely through changes in relative prices. The flip side of the coin is that the real exchange rates of the strongest European economies have depreciated. The real exchange rate paths also reveal the weakness of euro area countries burdened with structural problems and negative impacts of the debt crisis. This can be observed by comparison of the real effective exchange rates (taking account of the importance of trade partners for the given economy) obtained through the unit labour cost index. This way the real exchange rate better evaluates the development of countries, including those in the euro area. We also discussed the phenomenon of changes in competitiveness viewed from the real exchange rate perspective, as illustrated by the evolution of unit labour costs. In conclusion, we showed that a creeping process of deindustrialisation, i.e. a decline in the share of industry in GDP, is continuing in most EU countries. However, it is beyond the scope of this text to say more exactly whether this was driven fundamentally by changes in the real exchange rate in the economies concerned.

## References

- Frait, J. and Komárek, L. (2001). On the Way to European Union: Nominal and Real Convergence in Transition Countries. *Finance a úvěr (Czech Journal of Economics and Finance)*, 6, pp. 314–330.
- Frait, J. and Komárek, L. (2002). Theoretical and empirical analysis of the debt adjusted real exchange rate in selected transition economies during 1994–2001. *Warwick Economic Research Papers No. 646*, Department of Economics, The University of Warwick.
- Frait, J. and Komárek, L. (2003). Exchange rate and monetary developments in accession countries. In: Polouček, S. et al.: *Reforming the financial sector in Central European countries*. Palgrave Macmillan Publishers Ltd. (Studies in Economic Transition), Houndmills, etc, UK; December 2003, pp. 169–210.
- Horváth, R. and Komárek, L. (2007). Equilibrium exchange rates in the EU new members: Methodology, estimation and applicability to ERM II. *Prague Economic Papers*, 1, pp. 24–27.
- Jackson Hole (1999). New challenges for monetary policy. *Economic Policy Symposium Proceedings*. <https://www.kansascityfed.org/publications/research/escp/symposiums/escp-1999>
- Komárek, L., Koprnická, K. and Král, P. (2010).: A Long-Term Real Appreciation as the Phenomenon of Economic Convergence. *Politická ekonomie*, LVIII(1), pp. 70–91.
- Komárek, L. and Melecký, M. (2008). Transitional appreciation of equilibrium exchange rates and the ERM II, *Transition Studies Review*, 15(1), pp. 95–110.

<sup>11</sup> One example of internal adjustment of an economy was the decline in wages in the Baltic States, and particularly in Lithuania, in the post-Lehman period.

Komárek, L. and Motl, M. (2012). Behavioral and Fundamental Real Equilibrium Exchange Rate. *Politická ekonomie*, 2, pp. 147–166.

Rowthorn, R. and Ramaswamy, R. (1998). Growth, trade, and deindustrialization. IMF Working Paper WP/98/60, April 1998.

Skořepa, M. and Komárek, L. (2015). Sources of asymmetric shocks: The exchange rate or other culprits? *Economic Systems* 6.

Tatom, J. (1992). Currency appreciation and deindustrialization: A European perspective. Federal Reserve Bank of St. Louis, Working Paper, August 1992, no. 92-006A.

## Appendix



Chart 6 Decomposition of the real bilateral exchange rate path in EU countries

Source: own calculations using IMF data

Note: The value 100 marks the start of the period (1999). Real and nominal bilateral exchange rate values above (below) 100 express depreciation (appreciation) compared to the base year. The range of values on the vertical axis for the data on Romania is wider.

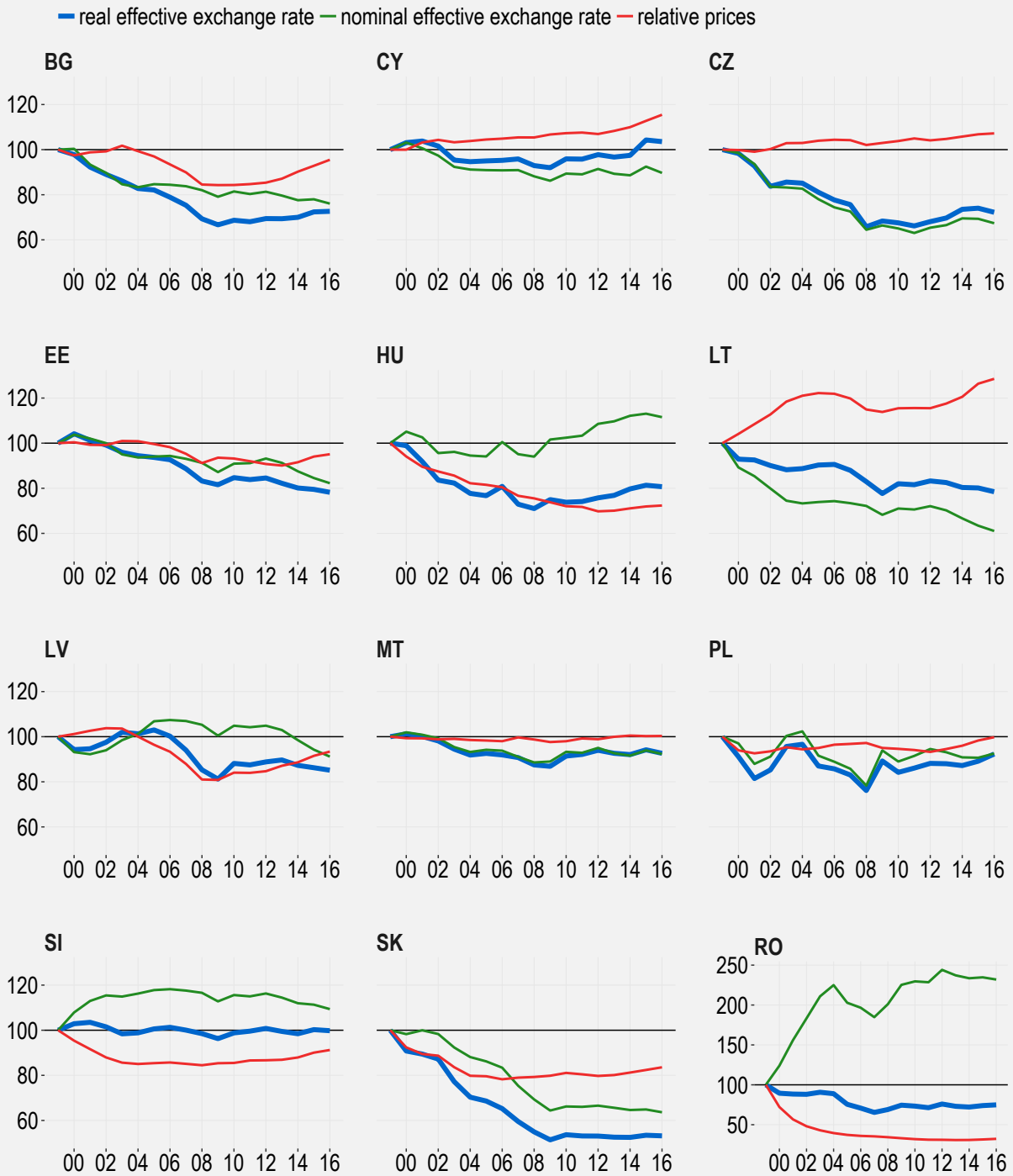


Chart 7 Decomposition of the real effective exchange rate path in selected EU countries

Source: own calculations using IMF data

Note: The value 100 marks the start of the period (1999). Real effective and nominal exchange rate values above (below) 100 express depreciation (appreciation) compared to the base year. The range of values on the vertical axis for the data on Romania is wider.



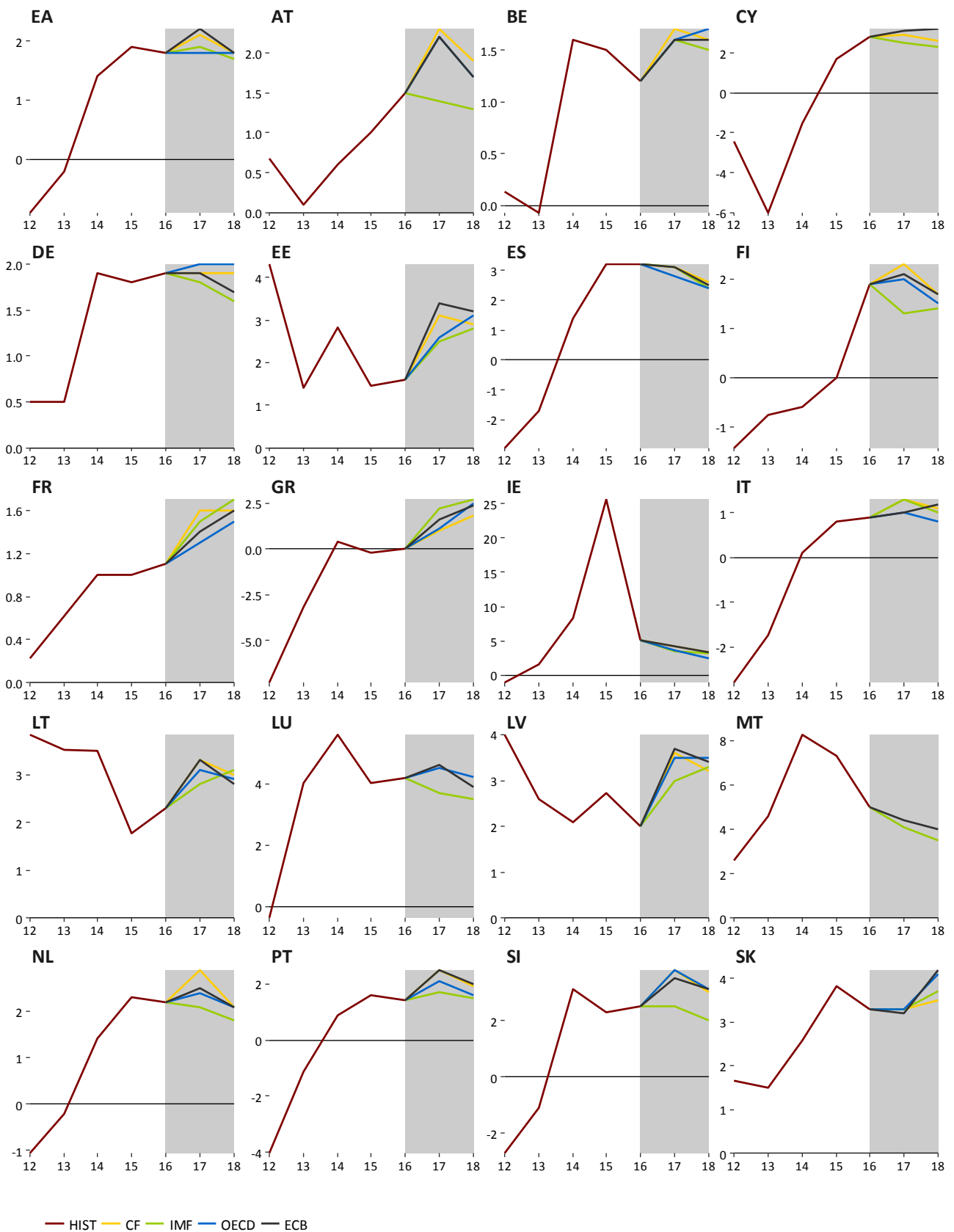
## A1. Change in GDP predictions for 2017

	CF		IMF		OECD		CB / EIU	
EA	<b>+0.1</b>	2017/9	<b>+0.2</b>	2017/7	<b>+0.2</b>	2017/6	<b>+0.3</b>	2017/9
		2017/8				2017/4		
DE	<b>+0.1</b>	2017/9	<b>+0.2</b>	2017/7	<b>+0.2</b>	2017/6	<b>+0.1</b>	2017/6
		2017/8				2017/4		
US	<b>+0.1</b>	2017/9	<b>-0.2</b>	2017/7	<b>-0.3</b>	2017/6	<b>+0.1</b>	2017/6
		2017/8				2017/4		
UK	<b>0</b>	2017/9	<b>-0.3</b>	2017/7	<b>0</b>	2017/6	<b>-0.2</b>	2017/8
		2017/8				2017/4		
JP	<b>+0.2</b>	2017/9	<b>+0.1</b>	2017/7	<b>+0.2</b>	2017/6	<b>+0.2</b>	2017/7
		2017/8				2017/4		
CN	<b>0</b>	2017/9	<b>+0.1</b>	2017/7	<b>+0.1</b>	2017/6	<b>0</b>	2017/8
		2017/8				2017/4		
IN	<b>-0.3</b>	2017/9	<b>0</b>	2017/7	<b>0</b>	2017/6	<b>-0.2</b>	2017/8
		2017/8				2017/4		
RU	<b>+0.1</b>	2017/8	<b>0</b>	2017/7	<b>+0.6</b>	2017/6	<b>0</b>	2017/9
		2017/7				2017/4		
BR	<b>0</b>	2017/8	<b>+0.1</b>	2017/7	<b>+0.7</b>	2017/6	<b>0</b>	2017/8
		2017/7				2017/4		

## A2. Change in inflation predictions for 2017

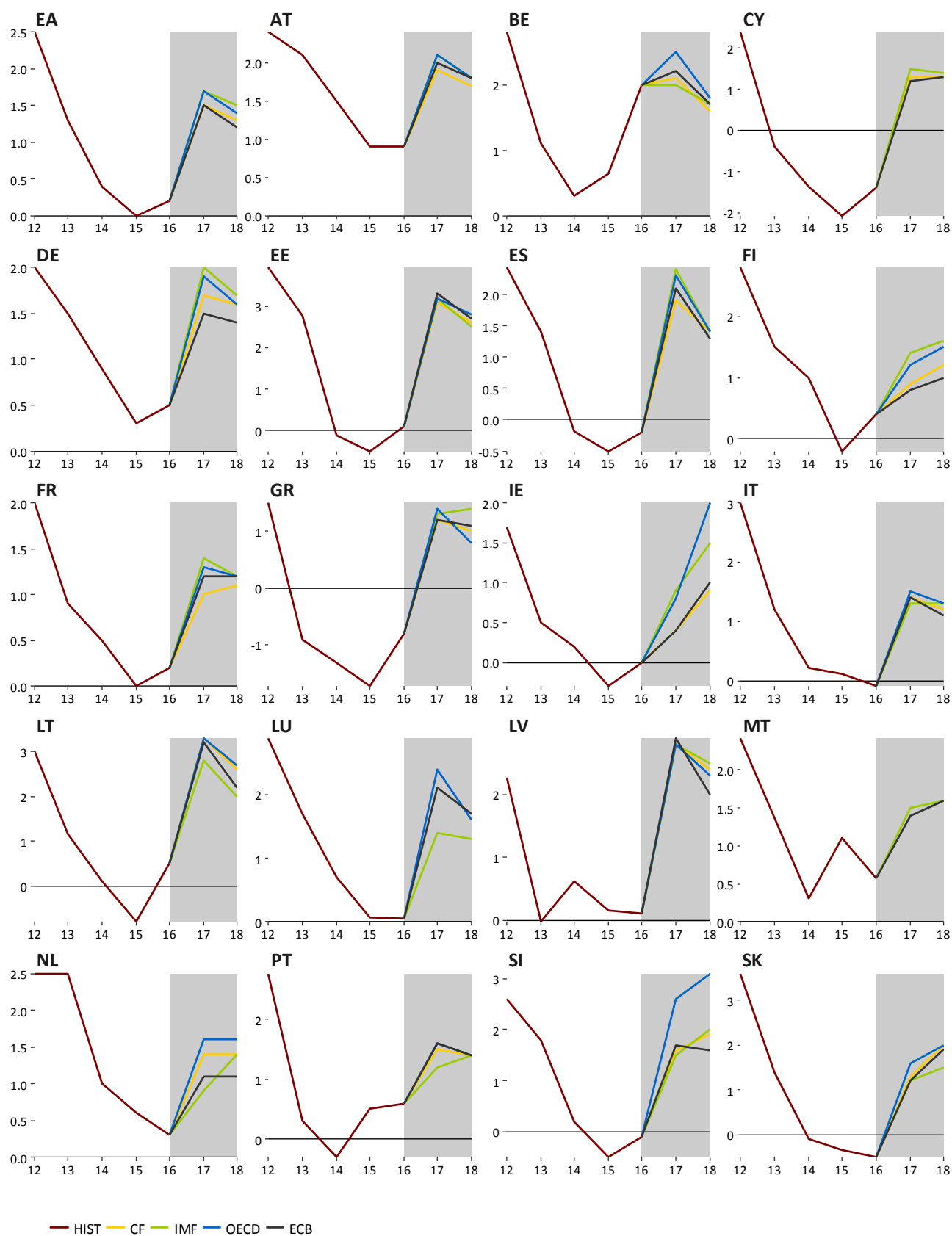
	CF		IMF		OECD		CB / EIU	
EA	<b>0</b>	2017/9	<b>+0.6</b>	2017/4	<b>+0.5</b>	2017/6	<b>0</b>	2017/9
		2017/8				2016/10		
DE	<b>0</b>	2017/9	<b>+0.5</b>	2017/4	<b>+0.5</b>	2017/6	<b>+0.1</b>	2017/6
		2017/8				2016/10		
US	<b>0</b>	2017/9	<b>+0.4</b>	2017/4	<b>+0.6</b>	2017/6	<b>-0.3</b>	2017/6
		2017/8				2016/10		
UK	<b>0</b>	2017/9	<b>0</b>	2017/4	<b>+0.4</b>	2017/6	<b>0</b>	2017/8
		2017/8				2016/10		
JP	<b>0</b>	2017/9	<b>+0.5</b>	2017/4	<b>+0.3</b>	2017/6	<b>-0.3</b>	2017/7
		2017/8				2016/10		
CN	<b>-0.1</b>	2017/9	<b>+0.1</b>	2017/4	<b>-0.7</b>	2017/6	<b>0</b>	2017/8
		2017/8				2016/10		
IN	<b>-0.1</b>	2017/9	<b>-0.4</b>	2017/4	<b>-0.4</b>	2017/6	<b>0</b>	2017/8
		2017/8				2016/10		
RU	<b>0</b>	2017/8	<b>-0.5</b>	2017/4	<b>-1.7</b>	2017/6	<b>0</b>	2017/9
		2017/7				2016/10		
BR	<b>+0.1</b>	2017/8	<b>-1.0</b>	2017/4	<b>-1.8</b>	2017/6	<b>0</b>	2017/8
		2017/7				2016/10		

### 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

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



