GLOBAL ECONOMIC OUTLOOK - APRIL

Monetary Department
External Economic Relations Division

2019

CNB CZECH
NATIONAL BANK

Authors

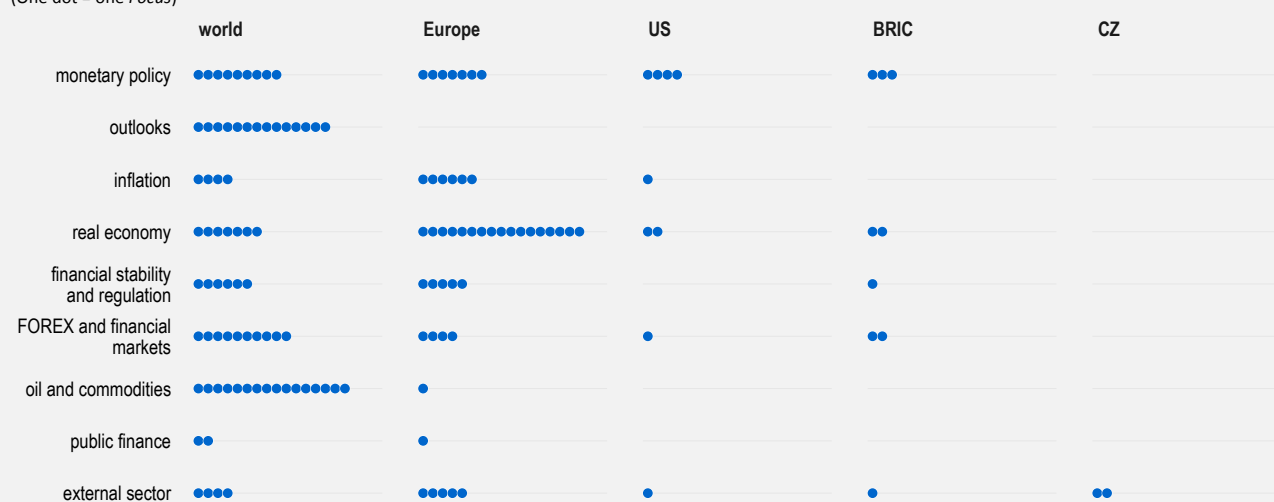|	
Luboš Komárek	Editor-in-chief, Editorial, I. Introduction, V. Focus
Pavla Růžičková	Editor, Editorial, II.3 United Kingdom
Tomáš Adam	Editorial, II.1 Euro area
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Dear Readers,

We are pleased to introduce the 100th anniversary issue of Global Economic Outlook, the monthly bulletin of the Czech National Bank's Monetary Department. This bulletin has been published regularly on the CNB website[1] since the start of 2011, as we consider useful to share information with you about the external economic environment to help you to form an opinion on developments abroad. According to download statistics and feedback from many readers, GEO has attracted a wide readership during its existence. Our readers include employees of central and commercial banks and government departments as well as students and finance professionals.

When we created GEO, we set ourselves two main goals, goals which, according to anecdotal evidence, we have succeeded in achieving. The first one is to regularly pool information on the current outlooks for selected economies (currently the euro area, the USA, the UK, Japan, China and Russia). This information is based on the outlooks of international institutions, selected central banks and Consensus Economics and on analyses conducted by our economic experts. GEO's second aim is to complement this information with a deeper analysis of a topical issue from the global economy. Chart 1 shows retrospectively that our attention has been focused the most on the real economy in Europe, followed by the market for oil and other commodities and monetary policy topics. We have also paid attention to factors underlying movements in inflation and exchange rates, financial stability topics and, of course, economic outlooks (including regular assessments of the accuracy of the sources we use).

Chart 1 – Frequency of *Focus* thematic articles on specific issues

(One dot = one *Focus*)

	world	Europe	US	BRIC	CZ
monetary policy	●●●●●●●●	●●●●●●	●●●●	●●●	
outlooks	●●●●●●●●●●●●●				
inflation	●●●●	●●●●●●	●		
real economy	●●●●●●●	●●●●●●●●●●●●●●●●	●●	●●	
financial stability and regulation	●●●●●●	●●●●●		●	
FOREX and financial markets	●●●●●●●●	●●●●	●	●●	
oil and commodities	●●●●●●●●●●●●●●	●			
public finance	●●	●			
external sector	●●●●	●●●●●	●	●	●●

Source: CNB
Note: A single article often deals with multiple topics, so the number of dots exceeds 100. BRIC – group of largest emerging economies (Brazil, Russia, India and China).

The themes of the past 100 issues of GEO can be assessed by means of text analysis, which delivers encouraging results. Looking at the relative word frequency (see Chart 2), it is clear that our readers most often read about outlooks, the economy, the countries monitored and OECD outlooks, and also very often about economic growth, inflation and oil. The frequency of the key words thus naturally reflects the topics affecting the global economy. The text analysis can be used to create a GEO "sentiment index" (see Chart 3). It captures the frequency of words indicating economic expansion relative to words indicating slowdown or recession for each issue of GEO. The high correlation between the index and the composite leading indicator for OECD countries (CLI) suggests that the message of our analyses is broadly in line with the assessment of the short-term outlooks for the main world economies. We can therefore say that GEO readers obtain balanced information about the outlook for, and situation of, the global economy.

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[1] http://www.cnb.cz/en/monetary_policy/geo/index.html

Chart 2 – Most frequent words in GEO

(size of word denotes its relative frequency)

Source: CNB

Chart 3 – GEO sentiment and the CLI index

(relative occurrence, standardised CLI index)

Source: CNB, OECD

Note: The positive sentiment line denotes the relative occurrence of words expressing economic expansion (as compared to recession). The CLI line denotes the standardised OECD leading indicator (Composite Leading Indicator).

Starting this month, GEO has several new features. The most visible is the inclusion of a new section called *Developing countries in the spotlight*, which we previously monitored only to a limited extent. The second new feature is an expanded section on the euro area. It will contain a more detailed account of the outlooks for the main euro area economies, not just Germany, which previously had its own short section. The third change is intended to make GEO more reader friendly. The text is now written in a cascading style, with the first sentences of each paragraph written in bold to give a quick overview of the main ideas it contains. Another innovation is that our analyses will be registered in RePEc, potentially generating further synergies.

To conclude, we would like to thank you once again for your loyalty. Any feedback can be sent to gev@cnb.cz and will be gratefully received.

I. Introduction

Heightened uncertainties persist in the global economy, although some of these have weakened recently. The key event in April was the postponement of the UK's exit from the EU to the end of October this year. This deal helped calm the situation significantly and stave off the threat of a disorderly Brexit. Other resonant issues – discussed at the spring IMF and World Bank meetings, for example – include the positions of economies in the business and monetary policy cycles and persisting restrictive tendencies in international trade. The notable slowdown of the Chinese economy may be stabilized by the stimuli adopted by the Chinese authorities. Meanwhile, there is still uncertainty regarding the extent of the economic weakening in the euro area and particularly its strongest member, Germany. March's Federal Reserve meeting brought a change in a dovish direction. Now, it is expected that rates will stay unchanged and the lowering of the balance sheet will gradually fall off. Central banks in many emerging economies are meanwhile under visible pressure to lower their policy rates. In advanced economies there are mixed signals. Growth of interest rates is expected in Norway and Sweden, while a fall is expected in Australia, for example. In the area of international business there is a gradual easing of concerns of a potential escalation of trade wars, although some risks remain in the protracted finalisation of the trade deal between the USA and China, the NAFTA 2.0 negotiations and recently also the threat of an increase in tariffs between the USA and the EU.

The April GDP growth and inflation outlooks for the monitored countries, %

GDP	EA	US	UK	JP	CN	RU
2019	1.1 ⬂	2.4 ➡	1.3 ➡	0.6 ⬂	6.2 ➡	1.5 ➡
2020	1.3 ⬂	2.0 ➡	1.5 ➡	0.5 ⬈	6.1 ➡	1.8 ➡

Inflation	EA	US	UK	JP	CN	RU
2019	1.3 ➡	1.9 ⬈	2.0 ➡	0.6 ⬂	2.1 ➡	4.7 ➡
2020	1.4 ⬂	2.2 ➡	2.1 ➡	1.0 ➡	2.1 ➡	4.2 ⬈

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

**The 2019 GDP growth and inflation outlooks were mostly lowered compared to the previous month.** There were worsening outlooks for the euro area (including Germany) and Japan, while those for other territories were left unchanged. The inflation outlooks were revised similarly (except for a slight rise in US inflation prediction). The dollar will appreciate slightly against the renminbi and the rouble at the one-year horizon. Conversely, it is expected to depreciate against the euro, sterling and the yen. The outlook for USD 3M LIBOR market rates is slightly falling. The interest rate for 3M EURIBOR will hover in negative territory at the end of 2020. Acccording to the April CF, the Brent crude oil price outlook moved only slightly higher at the 12-month horizon to just above USD 66/bbl.

The chart in the April issue shows the stabilization of central banks' balance sheets in the majority of selected developed nations. In comparing the size of balance sheets against GDP it is noticeable that the Swiss National Bank still has the largest balance sheet, followed by the central banks of Japan and the Czech Republic. In the Czech case, unlike the Swiss one, we can identify quite clearly when the exchange rate commitment was ended. The ECB notionally ranks in fourth place, with its balance sheet stabilised close to 40% of euro area GDP.

The April issue also contains a related analysis: [International reserves as a mirror of external effects and macroeconomic policies](#). This article contains an overview of the motives that have led central banks (especially inflation targeters) to accumulate international reserves. We also test the hypothesis that there is a concave relationship between the reserves-to-GDP ratio and economic development and we look at the current debate about the size of international reserves and the sensitivity of an economy to changes in Fed monetary policy. We also present notional "rankings" of the central banks with the highest reserve levels with respect to various criteria.

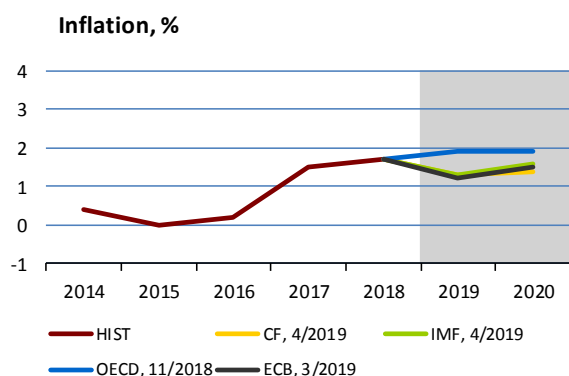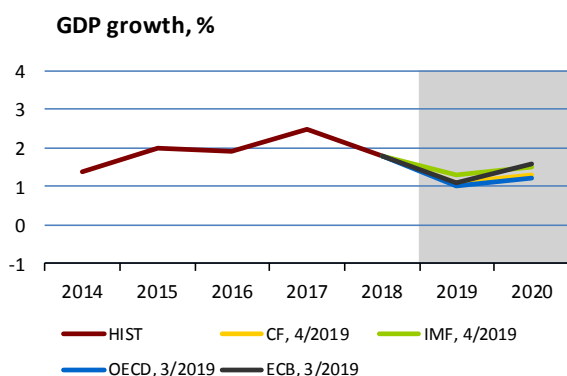**Central banks' total assets relative to GDP, %**
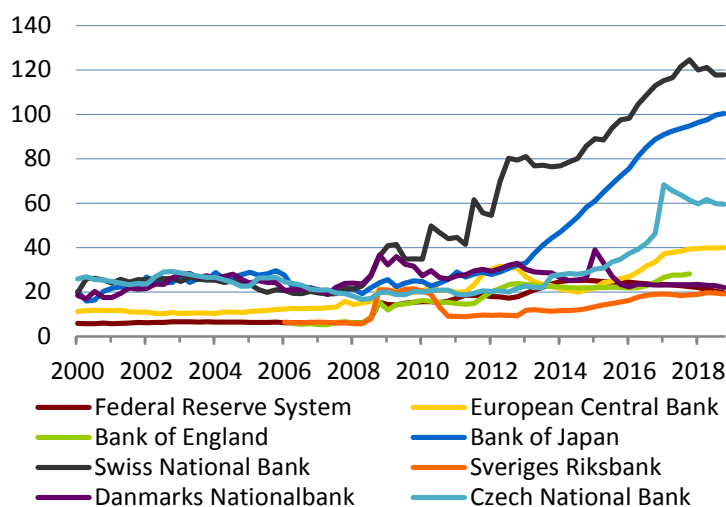
Source: Bloomberg
Note: Central bank assets and nominal GDP are denominated in the home currency.
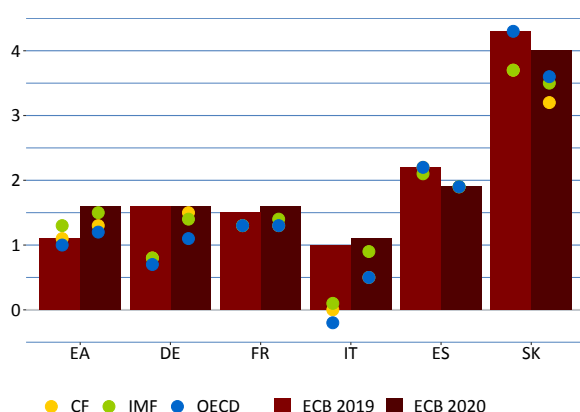
II.1 Euro area

Indicators available at the start of the year are signalling only a modest pace of economic growth in the euro area. The economic moderation since the first half of 2018 mainly reflects uncertainty regarding US trade policy and Brexit-related uncertainty, which have caused global trade to slow sharply. These factors are weighing mainly on industry in the euro area, while household consumption and services are showing positive trends. Industrial production decreased in February relative to January, falling by 0.3% year on year. A continued decline in industry is signalled by the PMI in manufacturing, which was in the contraction band for the third consecutive month in March. However, the labour market situation remains favourable. Despite the economic slowdown, year-on-year wage growth remained at 2.3% in 2018 Q4 and the unemployment rate stayed at 7.8% in February. This is reflected in household consumption, as signalled, for example, by retail sales, which recorded year-on-year growth of 2.8% in February.

Economic developments remain relatively uneven across the monitored countries. Global factors, together with car industry issues, are affecting predominantly German manufacturing, where output fell again in February. Moreover, export orders and some leading indicators are signalling a further deterioration of the situation. For example, the PMI in manufacturing hit its lowest level since July 2012 in March. On the other hand, the situation in the labour market and the services sector remains positive in Germany, although a long period of contraction in industry could spill over to the wider economy. In Italy, industrial production rose in January and February, and other indicators are also signalling an end to the recession that the Italian economy has been in since the second half of 2018. Growth in industry was also recorded in France, where economic sentiment is expected to improve as the anti-government protests gradually subside. Spain is continuing to show buoyant growth. Given its less open economy, it has been almost unaffected by the global negative factors.

Slower growth is expected this year and the next by comparison with last year. The April CF revised most of its outlooks downwards. Growth in the euro area is expected to reach 1.1% this year and rise to 1.3% next year. The new IMF outlook expects similar growth figures. Growth of just 0.8% is expected for Germany this year and CF expects stagnation in Italy (several CF panellists are even predicting a recession for Italy). By contrast, solid growth rates are expected for Spain and Slovakia.

GDP growth, %

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

Inflation, %

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

GDP growth outlooks in the euro area countries in 2019 and 2020

**Inflation outlooks in the euro area countries in 2019 and 2020**
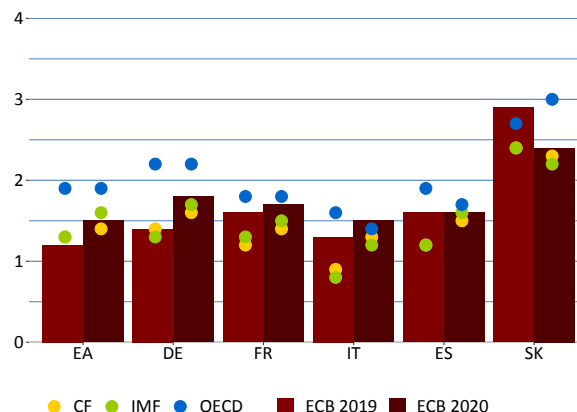
Note: Charts show institutions' latest available outlooks of for the given economy.

Inflation pressures in the euro area remain subdued. Headline HICP inflation dropped from 1.5% to 1.4% in March due to lower contributions of prices of food, goods and services. Core inflation fell by 0.2 pp to 0.8%, almost the lowest level in the last 12 months. Relatively solid wage growth, which is picking up in some countries, including Germany, has therefore yet to feed through to the core components of inflation. The monitored outlooks expect inflation to be well below the ECB's inflation target this year (CF expects it to average 1.3%). Inflation is expected to rise slightly next year. Sizeable differences are expected across countries. Among the countries under review, Slovakia is expected to record the highest inflation and Italy the lowest.

The ECB confirmed its monetary policy stance at its April meeting. Policy rates will thus remain at the current level at least until the end of 2019. At the same time, the Board of Governors reiterated its commitment to reinvest the principal payments from maturing securities for an extended period of time after the ECB raises its key interest rates. At future meetings, the governors will also consider introducing measures to mitigate the possible side-effects of negative interest rates on banks' profitability (around EUR 600 billion was deposited on the ECB's deposit facility in March). Among other things, stagnant demand for new loans by non-financial corporations, as signalled by the April bank lending survey, is complicating the return of inflation to the target. Inflation swaps also reflect the only gradual return of inflation to the target. They are trading at a price consistent with average five-year inflation of 1.34%. This is below the level at which the ECB's extended asset purchase programme (quantitative easing) was launched. The market rate outlook, which expects the 3M Euribor to be negative until the end of 2020, is also signalling a long period of accommodative monetary policy.
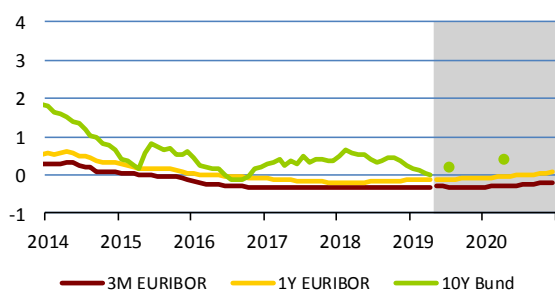
Leading indicators (ESI)
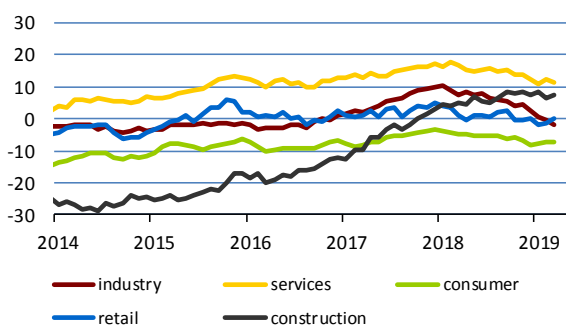
	industry	services	consum.	retail	constr.
1/19	0.6	11.0	-7.9	-2.1	8.4
2/19	-0.4	12.1	-7.4	-1.3	6.6
3/19	-1.7	11.3	-7.2	0.2	7.5

Leading indicators (ESI)
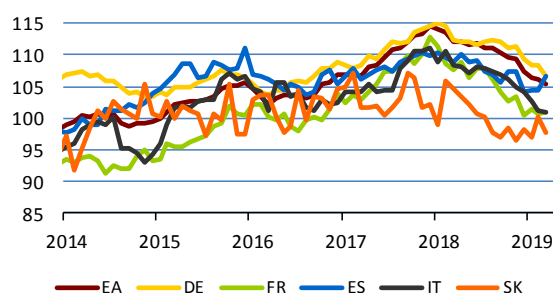
	EA	DE	FR	ES	IT	SK
1/19	106.3	108.5	101.4	104.4	102.8	97.1
2/19	106.2	108.4	100.8	104.4	101.2	100.1
3/19	105.5	106.6	101.0	106.7	101.0	97.7

Interest Rates, %

	03/19	04/19	07/19	04/20
3M EURIBOR	-0.31	-0.31	-0.31	-0.29
1Y EURIBOR	-0.11	-0.11	-0.11	-0.04
10Y Bund	0.06	0.01	0.20	0.40

The size of the Eurosystem central banks' balance sheet (assets), in EUR billions
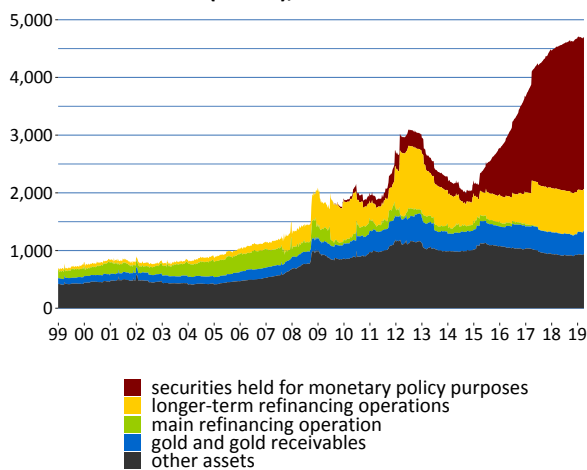
II.2 United States

**The US economy slowed more at the year-end than the second growth estimate had indicated.** According to the final estimate, GDP grew by 2.2% in 2018 Q4 and 2.9% for the year as a whole. Private consumption and government expenditure were revised down, while foreign trade saw an improvement (higher exports and lower imports). Besides domestic factors, the trade disputes between the USA and China had an effect. Despite progress in the negotiations, a deal has yet to be signed. President Trump also declared his intention to impose tariffs on imports from the EU worth USD 11 billion (aircraft, helicopters and numerous food products). According to the USA, the motive for introducing tariffs is the European subsidies provided to Airbus, which are alleged to be putting its US competitor Boeing at a disadvantage.

**Despite slightly more optimistic results in Q1, GDP growth in the USA is expected to slow to around 2% this year and the next.** According to the Atlanta Fed's current estimate, GDP will grow by as much as 2.3% in 2019 Q1. Retail sales rose by a solid 2.7% in February compared with the same period a year earlier, while the labour market situation stabilised after a fall in January. Non-farm payrolls rose by 196,000 in March and unemployment stayed at 3.8%. Following a decline in the first two months of 2019, inflation pressures re-emerged in the US economy. The headline and core inflation indicators were both close to the 2% target in March. Industrial production also increased in year-on-year terms in February (3.6%), but capacity utilisation and the situation in manufacturing were significantly worse. Car sales were also surprisingly low in 2019 Q1.

**The inflation outlooks were also revised, but stable consumer price inflation of around 2% is generally expected for 2019 and 2020.** The uncertain outlook for the US economy led the central bank to change its rate outlook to stable until the end of 2019. Financial markets do not rule out a reduction in rates at the one-year horizon.

GDP growth, %
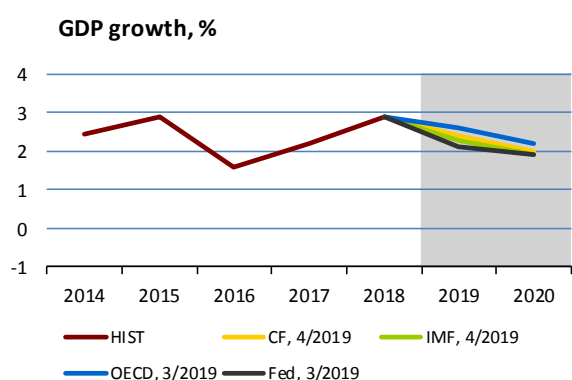
	CF	IMF	OECD	Fed
2019	2.4	2.3	2.6	2.1
2020	2.0	1.9	2.2	1.9

Inflation, %
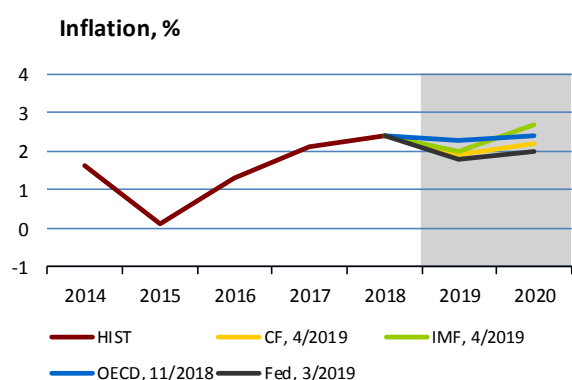
	CF	IMF	OECD	Fed
2019	1.9	2.0	2.3	1.8
2020	2.2	2.7	2.4	2.0

Leading indicators
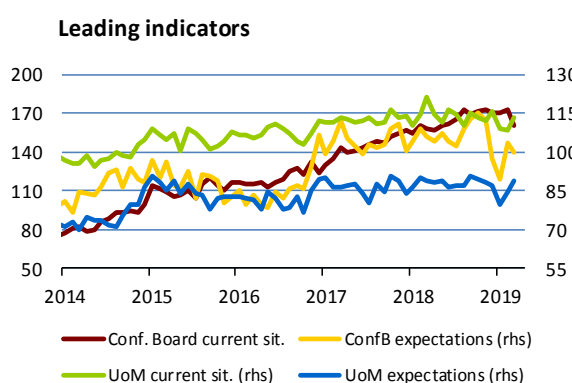
	ConfB curr.	ConfB exp.	UoM curr.	UoM exp.
1/19	170.2	89.4	108.8	79.9
2/19	172.8	103.8	108.5	84.4
3/19	160.6	99.8	113.3	88.8

Interest Rates, %
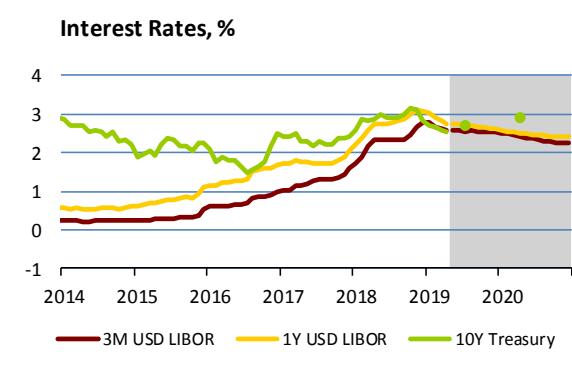
	03/19	04/19	07/19	04/20
USD LIBOR 3M	2.61	2.59	2.56	2.42
USD LIBOR 1R	2.82	2.82	2.71	2.51
Treasury 10R	2.57	2.53	2.70	2.90

II.3 United Kingdom

The UK economy is still in low gear. According to an NIESR estimate, GDP grew by 0.4% in Q1 (as against 0.2% at the end of 2018) due to better January and February figures. However, they mainly reflect a huge rise in inventories (of inputs and finished goods) created by firms faced with rising Brexit uncertainty (which has now been postponed to the end of October). Conversely, car production slumped by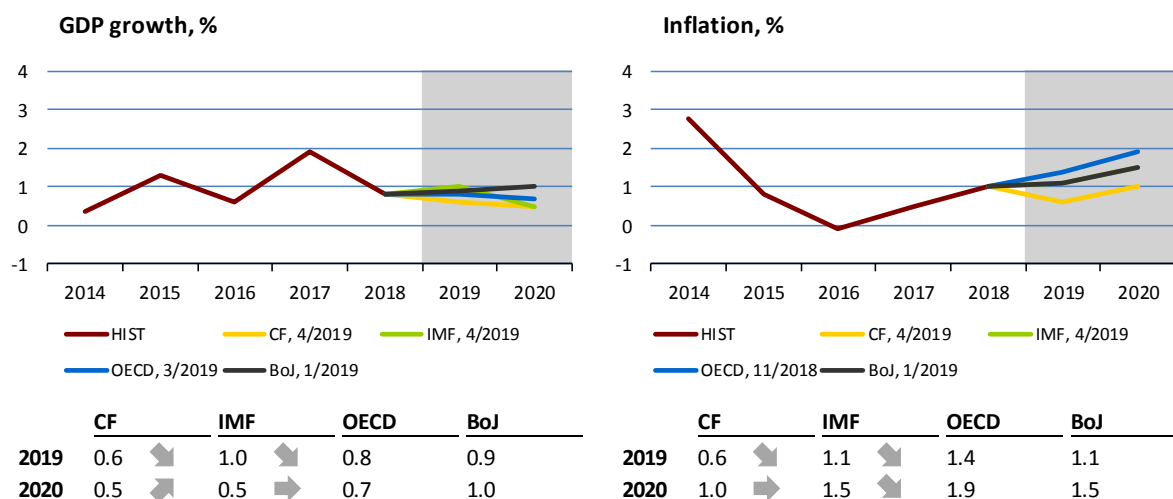 15.3% year on year in February due to lower demand from the euro area and China. The modest GDP growth is likely to continue, as the services sector can be expected to contract (a PMI of 48.9 in March). Growth is also being dampened by stagnant productivity, which has been broadly flat over the last 18 months and is up just 1.5% on 2007. Growth prospects are being boosted solely by the labour market (a drop in unemployment, growth in real wages and a rise in the minimum wage in April). The IMF and CF are thus forecasting annual GDP growth of around 1.3%, which is not at all bad compared with the outlooks for the euro area.
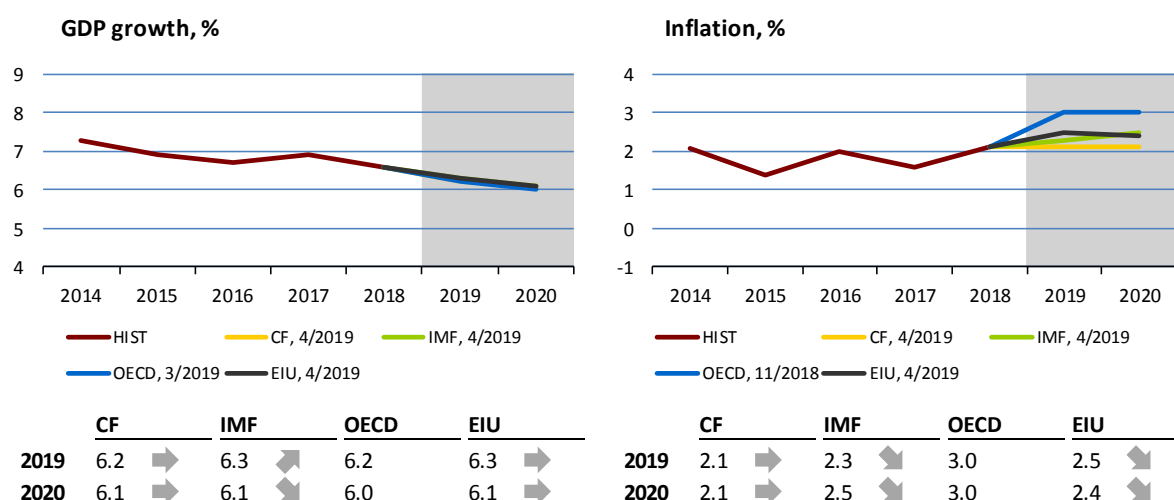
GDP growth, %

Inflation, %

	CF		IMF		OECD	BoE
2019	1.3	→	1.2	⬊	0.8	1.2
2020	1.5	→	1.4	⬊	0.9	1.5

	CF		IMF		OECD	BoE
2019	2.0	→	1.8	⬊	2.3	2.0
2020	2.1	→	2.0	→	2.1	2.1
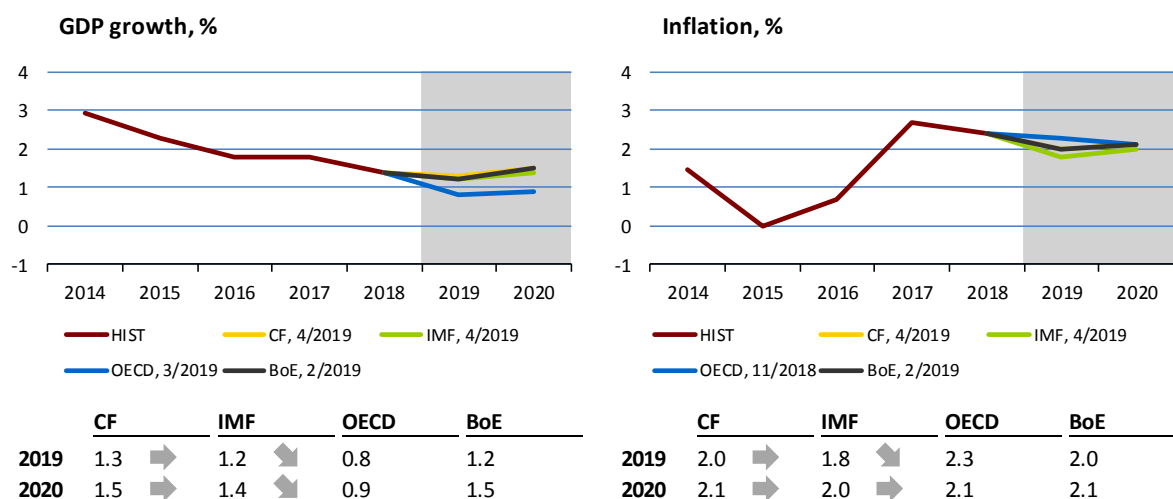
II.4 Japan

Despite an increase in the final GDP growth estimate for 2018 Q4, the country's economic situation remains fragile. The growth rate was revised upwards by 0.5 pp at the year-end (to 1.9% in quarter-on-quarter annualised terms). Industrial production and machinery orders showed positive growth in February (but declined year on year) and the leading PMI indicators and the coincidence index improved. New orders increased in month-on-month and quarter-on-quarter terms in January. On the other hand, exports and imports fell year on year in February. Japan is still exposed to the risk of an adverse impact of trade wars via its major trading partners – China and the USA. More than 40% of Japan's total exports went to those countries last year; Japan imported about a quarter of its goods from China and around 11% from the USA. According to the new CF and IMF outlooks, economic growth will remain subdued over the next two years. Both institutions also lowered their outlooks for this year.

GDP growth, %

Inflation, %

	CF		IMF		OECD	BoJ
2019	0.6	⬊	1.0	⬊	0.8	0.9
2020	0.5	⬈	0.5	→	0.7	1.0

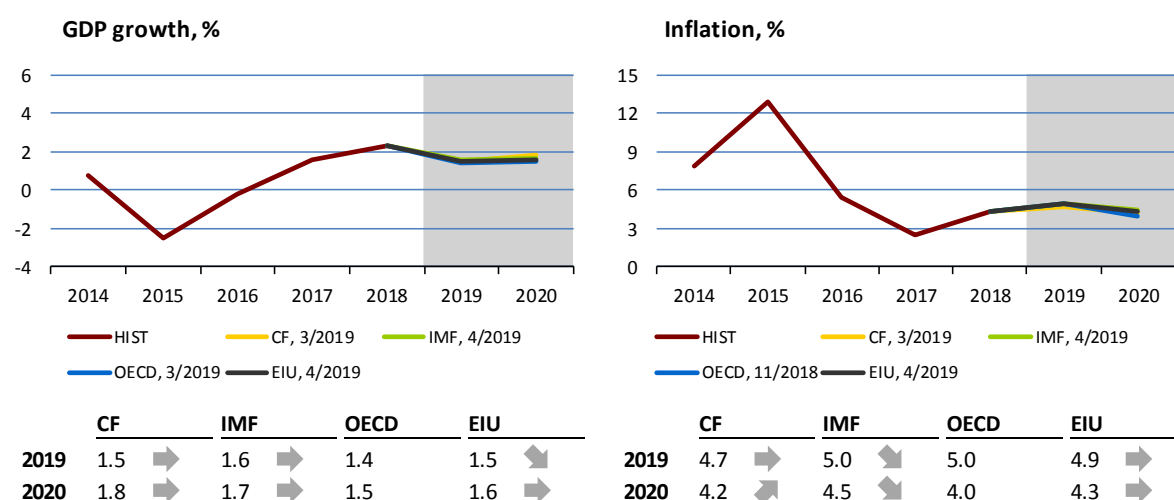|	CF		IMF		OECD	BoJ
2019	0.6	⬊	1.1	⬊	1.4	1.1
2020	1.0	→	1.5	⬊	1.9	1.5

II.5 China

A set of indicators for China confirmed that the economy does not currently face a deeper economic decline. Concerns about the condition of the Chinese economy were sparked mainly by a drop in industrial output growth to a 17-year low in 2019 Q1 (5.3%). A government business survey also indicated an adverse situation in manufacturing at the start of this year. Unemployment rose slightly as well. On the other hand, investment growth increased and retail sales also remained positive (up 8.2% year on year). The leading indicator for manufacturing (Caixin PMI) indicates that output returned to growth in March, due mainly to government incentives. Conversely, orders from abroad remain low. The new CF brought no change in outlook. The IMF even slightly raised its GDP growth outlook for this year in its new forecast. The IMF and EIU lowered their inflation outlooks for both years closer to the CF forecasts.

GDP growth, %

Inflation, %

	CF		IMF		OECD	EIU	
2019	6.2	→	6.3	↗	6.2	6.3	→
2020	6.1	→	6.1	→	6.0	6.1	→

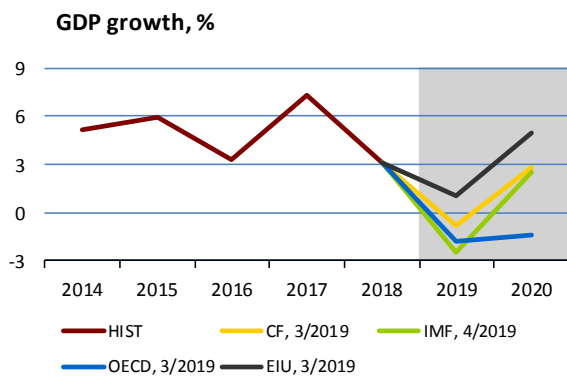|	CF		IMF		OECD	EIU	
2019	2.1	→	2.3	↘	3.0	2.5	↘
2020	2.1	→	2.5	↘	3.0	2.4	↘

II.6 Russia

Economic growth in Russia reached a six-year high at the year-end, but a slight slowdown is expected. Russia's economic performance in the first three months of last year was revised towards higher growth at the start of the month, with the revision increasing gradually in each subsequent quarter. Moreover, a further pick-up in growth is expected at the end of the year. According to the first GDP estimate, the economy grew by 2.7% year on year in Q4. This was due mainly to growth in household consumption (2.6%) and gross capital formation (3.0%). Annual growth in exports at constant prices slowed from 7.5% to 2.6% during the year. Import growth declined even more significantly: from an increase of 10% in Q1 to a fall to 0.3% at the year-end. The GDP growth estimate for the year as a whole remained at the original 2.3%. Last year thus so far seems the most successful since 2013. However, the economy is expected to cool this year and the next. The GDP outlooks in the new CF, IMF and EIU publications stand at around 1.5% this year and only slightly higher in 2020.

GDP growth, %

Inflation, %

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

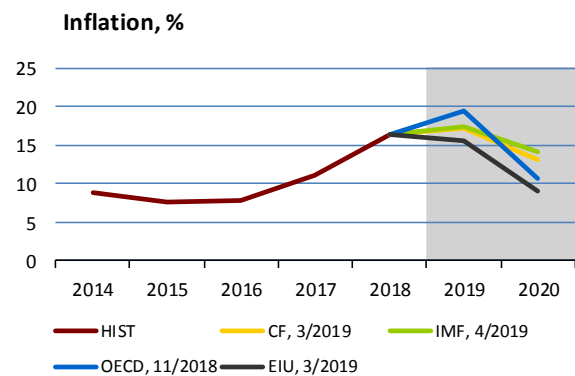|	CF		IMF		OECD	EIU	
2019	4.7	→	5.0	↘	5.0	4.9	→
2020	4.2	↗	4.5	↘	4.0	4.3	→

II.7 Developing countries in the spotlight

The Turkish economy is short of breath. Last year it experienced a dramatic currency crisis and fell into recession, recording negative quarter-on-quarter GDP growth twice in the second half of the year. GDP thus contracted by 3% year on year in 2018 Q4, dragged down primarily by falling domestic demand. The unemployment rate remains above 12% (seasonally adjusted). Consumer price inflation (19.7% in March) is far from the 5% target of the Turkish central bank (CBRT) and the key rate has climbed from 8% in May 2018 to 24% at present. The high inflation has also significantly affected real wage growth, which showed a substantial decline (of almost 12% year on year) in 2018 Q4. The nearest outlook does not offer many reasons for optimism.

The developments in Turkey since last year have rattled investors. The president's idiosyncratic views on interest rates and the role of the central bank, combined with a surprising drop in international reserves in March 2019 and generally worsening financial indicators, have significantly altered investor perceptions of Ankara. The net value of the foreign reserves has recently been fluctuating around USD 30 billion, which would not be enough for the CBRT to fend off a speculative attack on the Turkish lira. Turkey's dependence on foreign capital is an aggravating factor. Although its government debt-to-GDP ratio is relatively low, Turkey's total external debt amounted to almost USD 445 billion at the end of 2018, most of it held by banks and repayable during 2020. Servicing external liabilities has become significantly more costly due to the weak currency (the lira has lost 30% against the dollar in the past year). Should the lira weaken further, many firms might not be able to meet their obligations. This would be reflected in lower stability of the banking sector. This can already be observed in sizeable growth in the NPL ratio, which stood at 4.1% in February, up almost 1.2 pp in year-on-year terms. Another pressure on the lira last month was an increasing dollarisation trend – residents' foreign currency deposits rose by 11.8% month on month, signalling a growing lack of confidence among Turks in their own currency.
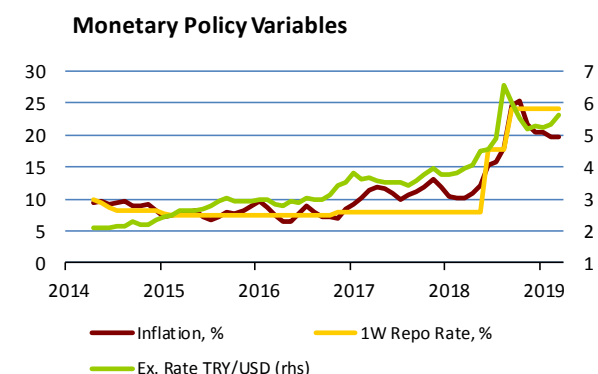
GDP growth, %

	CF	IMF	OECD	EIU
2019	-0.8	-2.5	-1.8	1.1
2020	2.8	2.5	-1.4	5.0

Inflation, %

	CF	IMF	OECD	EIU
2019	17.2	17.5	19.5	15.5
2020	13.2	14.1	10.7	9.1
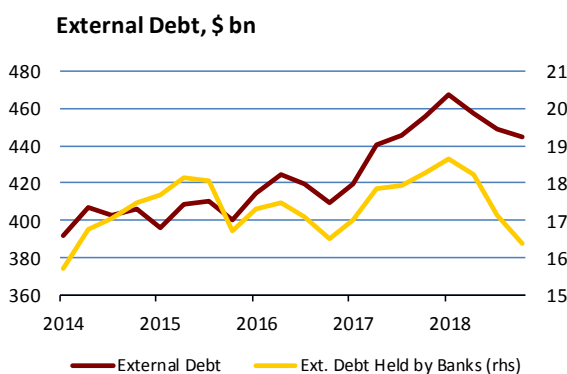
External Debt, $ bn

	External Debt	Ext. Debt Held by Banks
II/2018	457.63	182.39
III/2018	448.83	171.44
IV/2018	444.88	163.86

Monetary Policy Variables

	Inflation	1W Repo Rate	TRY/USD
1/2019	20.35	24.00	5.22
2/2019	19.67	24.00	5.32
3/2019	19.71	24.00	5.63

The coming quarters do not give many reasons to rejoice. According to the EIU, annual GDP growth will remain negative in the next two quarters and only later return to positive growth. Real wage growth will stay close to zero this year and is expected to rise slightly next year. Although there is a chance that consumer inflation will slow slightly in June due to base effects, it will remain well above 10%. The expected lower oil price might help Turkey. The Turkish lira still represents the greatest uncertainty. The CF estimates that it will gradually depreciate over the next two years, but strong short-term volatility cannot be ruled out in the current situation given the political tensions inside Turkey (the defeat of President Erdogan's party in key parts of Turkey in local elections and his subsequent reaction) and the still strained relations with the USA, which escalated last month due to Turkey's intended purchase of a Russian defence system.

In response to growing problems in the banking sector (firms' repayment problems and subsequent requests for debt restructuring), Turkey announced it would shore up state-owned banks by injecting capital. The government will issue bonds worth TRY 28 billion (USD 4.9 billion) and deposit them in state-owned banks. It also plans to use two funds managed by banks and investors to clear banks' balance sheets of toxic loans relating mainly to construction and energy sectors. However, the question is how this plan will be implemented and whether investors will be interested in it. Other promised changes focus on the fiscal area. The reforms will involve changes in pensions, more efficient tax collection and support for tourism and exports. A more detailed plan will be published in the months ahead.

Turkey is facing a big challenge – it needs to pacify the domestic public and foreign investors while carefully considering its further actions on the international stage. The Finance Minister recently tried to do just this with a positive presentation about the economic situation, but his efforts were not particularly successful. Turkey's main issue is its dependence on loans, which makes it very vulnerable to sudden outflows of capital, so it will take more than currency stabilisation efforts by the central bank and optimistic presentations and vague promises by the government to convince the markets.
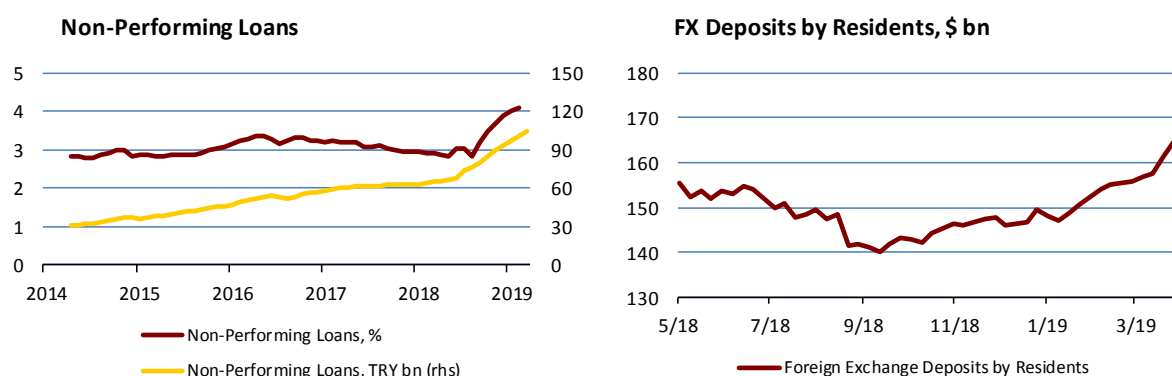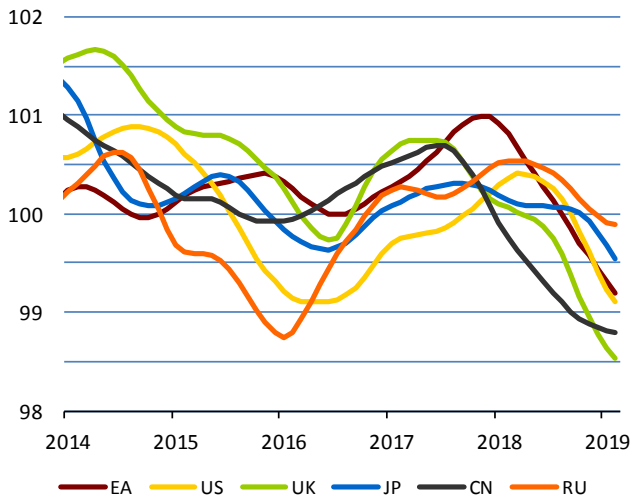
Non-Performing Loans

— Non-Performing Loans, %
— Non-Performing Loans, TRY bn (rhs)

FX Deposits by Residents, $ bn

— Foreign Exchange Deposits by Residents

	NPL in %	NPL in TRY bn		FX Deposits by Residents
1/2019	4.03	96.70	20/3/19	161.41
2/2019	4.11	100.57	27/3/19	164.82
3/2019		105.05	3/4/19	166.96

III. Leading indicators and outlook of exchange rates

OECD Composite Leading Indicator

The US dollar (USD/EUR)
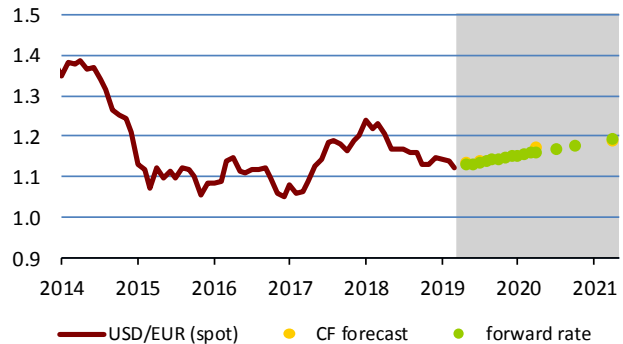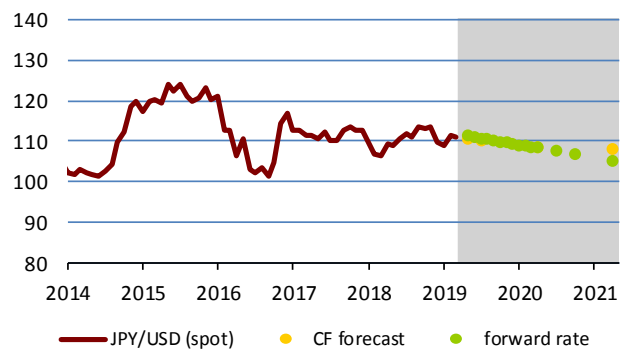

	8/4/19	05/19	07/19	04/20	04/21
spot rate	1.122				
CF forecast		1.135	1.140	1.171	1.188
forward rate		1.129	1.135	1.161	1.193

The British pound (GBP/USD)
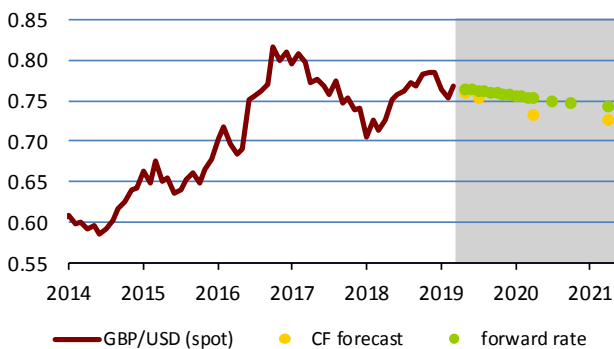
	8/4/19	05/19	07/19	04/20	04/21
spot rate	0.769				
CF forecast		0.759	0.754	0.733	0.726
forward rate		0.764	0.762	0.752	0.743

The Japanese yen (JPY/USD)

	8/4/19	05/19	07/19	04/20	04/21
spot rate	111.8				
CF forecast		110.4	110.1	108.6	108.1
forward rate		111.2	110.7	108.3	105.3

The Chinese renminbi (CNY/USD)
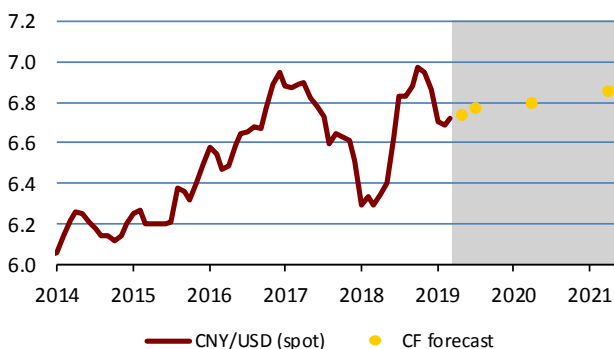
	8/4/19	05/19	07/19	04/20	04/21
spot rate	6.719				
CF forecast		6.737	6.773	6.798	6.854

The Russian rouble (RUB/USD)
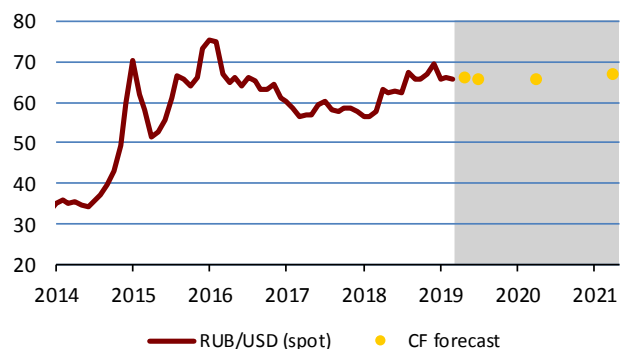
|	8/4/19	05/19	07/19	04/20	04/21
spot rate	65.28				
CF forecast		66.08	65.79	65.82	66.83

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

IV.1 Oil and natural gas

The Brent crude oil price has been fluctuating in a very narrow band around a slightly upward trend since the end of February. In early April, the price exceeded USD 70/bbl for the first time since last November. Compliance with voluntary output limits by OPEC and Russia helped improve sentiment in the oil market. The increase in oil prices was also fostered by involuntary output decreases in Iran and Venezuela due to US sanctions (and also by massive power failures in the latter country). The EIA estimates that these factors led to a fall in global oil inventories of 0.5 million barrels a day in Q1 (the first decline since the end of 2017). A slight shift towards a US-China trade agreement and an improved outlook for manufacturing in China also aided sentiment (not only on commodity markets). This reduces the risk of a sharp slowdown of the global economy and hence also demand for oil. On the other hand, the deteriorating political situation in Libya and the further escalation of tensions between the USA and Iran increased the supply-side risks. An increase in net long positions by speculative funds is also pushing up oil prices. Conversely, the dollar's modest appreciation trend and growth in production in the USA (which should intensify in the second half of the year) is counteracting stronger growth in oil prices.

The lack of oil currently perceived in the market has caused the Brent oil futures curve to switch to backwardation. The curve is signalling an average price of USD 68.0/bbl and USD 66.3/bbl for this year and the next respectively. With an expected price of USD 66/bbl at the one-year horizon, the April CF is only just below the market curve. The EIA forecast is even lower, expecting an average price of USD 65/bbl in 2019 and USD 62/bbl in 2020. Global oil inventories are expected to rise again at a pace of 0.4 million barrels a day next year, leading to a renewed decline in oil prices.

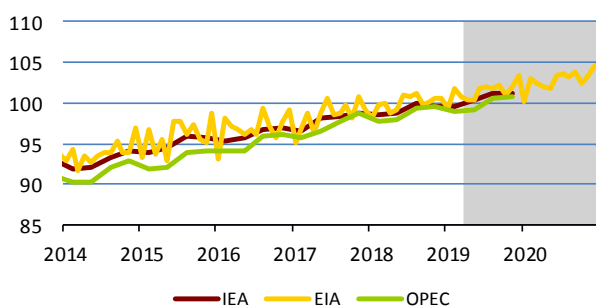### Outlook for prices of oil (USD/barrel) and natural gas (USD / 1000 m³)
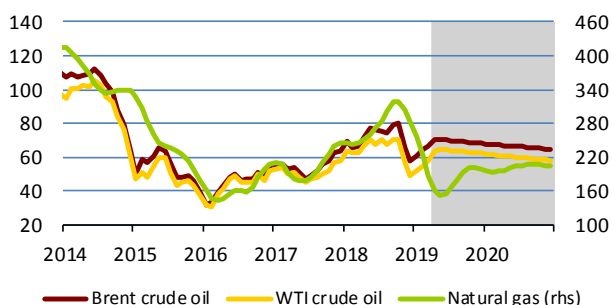
	Brent		WTI		Natural gas	
2019	68.04	↗	61.40	↗	189.49	↘
2020	66.29	↗	60.02	↗	202.02	↘

Total stocks of oil and oil products in OECD (bil. barrel)
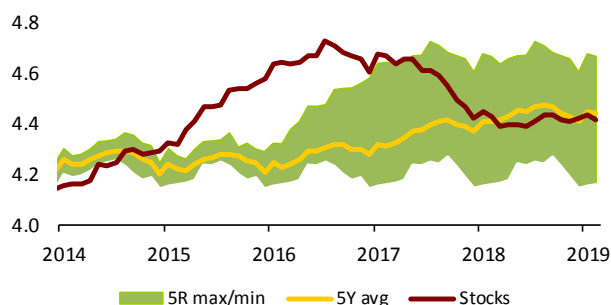
Global consumption of oil and oil products (mil. barrel / day)

	IEA		EIA		OPEC	
2019	100.59	↘	101.39	↘	99.91	↘
2020			102.83	↘		

Production, total and spare capacity in OPEC countries (mil. barrel / day)
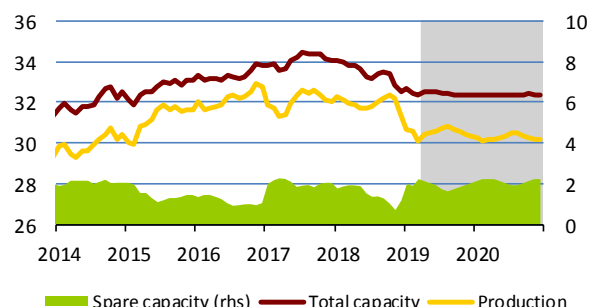
	Production		Total capacity		Spare capacity	
2019	30.53	↘	32.45	↘	1.93	↘
2020	30.27	↘	32.39	↘	2.12	↘

Source: Bloomberg, IEA, EIA, OPEC, CNB calculation
Note: Oil price at ICE, average gas price in Europe – World Bank data, smoothed by the HP filter. Future oil prices (grey area) are derived from futures and future gas prices are derived from oil prices using model. Total oil stocks (commercial and strategic) in OECD countries – IEA estimate. Production and extraction capacity of OPEC – EIA estimate.

IV.2 Other commodities

The aggregate non-energy commodity price index continues to fluctuate along a horizontal trend amid mixed developments of its components; its outlook is still slightly rising. It thus remains at reduced levels for the ninth consecutive month. It is expected to rise more visibly at the end of 2019.

The base metals price sub-index rose further in March and was broadly flat in the first half of April; its outlook is only slightly rising. Prices of copper, nickel, tin and iron ore stopped rising in mid-February and were later flat. Only the price of tin continued to rise. Base metal prices maintained elevated levels, partly due to an improved outlook for manufacturing in China. After several declines, its PMI rose thanks to a Chinese government stimulus. Nevertheless, the J.P.Morgan PMI in global manufacturing stayed at a 32-month low of 50.6 points. Its new exports component slid deeper into the contraction band, preventing metal prices from rising faster. Turning to energy commodities, coal (and gas) prices in Europe and Asia – unlike oil prices – continued to fall sharply due to warmer winter weather and robust growth in supply on overstocked markets.

By contrast, the food commodity price sub-index weakened in March (due mainly to a fall in wheat prices) and its decline later halted; however, its outlook is rising. The only food commodity prices worth mentioning are those of wheat, which recorded a partial reversal of the sharp decline seen before mid-March and whose outlook is strongly rising, and rice, which has been rising sharply since mid-February but lost a large part of its gains in the second half of March. The price of pork saw seasonal growth in March, while the price of beef was flat close to a several-year high. The price of cocoa surged in the second half of March. As for non-food commodities, the price of cotton recorded growth.
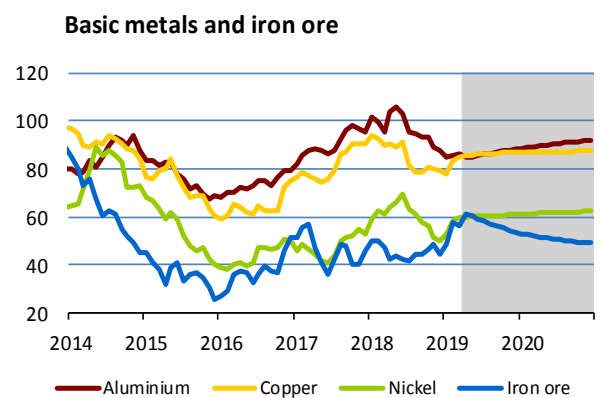
Non-energy commodities price indicies
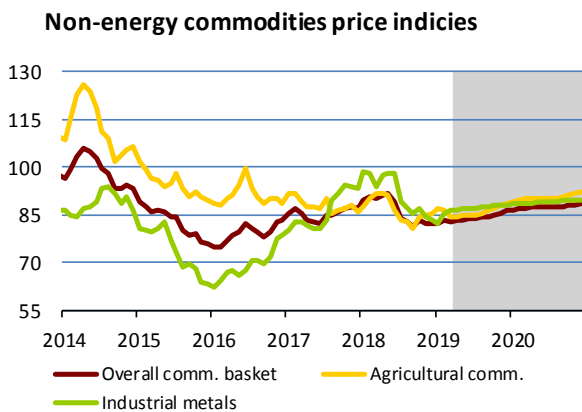
	Overall		**Agricultural**		**Industrial**	
2019	84.1	↗	86.0	↗	86.8	↗
2020	87.4	↗	90.5	↗	89.1	↗

Food commodities
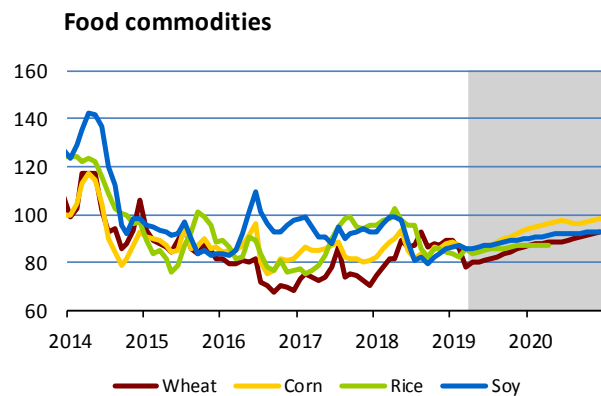
	Wheat		**Corn**		**Rice**		**Soy**	
2019	83.2	↗	88.4	↗	85.3	↘	87.6	↗
2020	89.5	↗	96.5	↗	87.2	↘	91.8	↗

Meat, non-food agricultural commodities
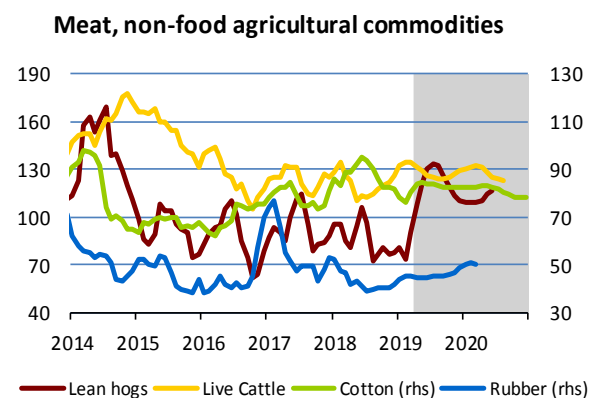
	Lean hogs		**Live Cattle**		**Cotton**		**Rubber**	
2019	111.6	↗	128.6	↗	81.9	↗	45.4	↘
2020	111.5	↗	128.2	↗	81.1	↗	50.5	↘

Basic metals and iron ore

	Aluminium		**Copper**		**Nickel**		**Iron ore**	
2019	86.4	↗	85.3	↗	59.7	↗	56.5	↗
2020	90.4	↗	87.3	↗	61.8	↗	50.8	↗

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

International reserves as a mirror of external effects and macroeconomic policies[2]

The article sets out to document the motives that have led central banks (especially inflation targeters) to accumulate international reserves over the last two decades. We start by outlining contemporary theories on the adequate level of international reserves, a topic the economic literature has been addressing since around the second half of the 1960s. We then present evidence of a sharp absolute increase in international reserves around the world and rank the central banks with the highest reserve levels. This ranking changes significantly depending on the ratio selected (reserves are most often expressed as a ratio to GDP, exports, M2 or short-term external debt). We also test the hypothesis that there is a concave relationship between the reserves-to-GDP ratio and economic development as measured by GDP per capita. The article goes on to discuss the various motives that have led to the accumulation of international reserves, most notably external effects (especially in emerging economies) and macroeconomic policies (particularly unconventional ones) in developed countries. We also pay greater attention to the current debate about the level of international reserves and the sensitivity of an economy to changes in the Federal Reserve's monetary policy. In several places in the text, we look more closely at the specific case of the Czech Republic, where unconventional monetary policy led to strong growth in international reserves.

International reserves adequacy

Since the 1960s, the theoretical literature has provided central banks with several rationales for holding adequate international reserves. To begin with, it tended to focus on the benefits, rather than the costs, of holding reserves. The potential benefits were defined on the basis of historical experience and derived from the theoretical concepts of optimal reserve holdings. Examples include Heller (1966) and Oliver (1969), who concentrated on the benefits of reserves, which accommodate fluctuations in external transactions, and compared them with the costs of holding them. According to this "buffer stock" approach, the optimal reserve level should be determined by disequilibria on the balance-of-payments accounts (current, capital and financial), the propensity to import and the opportunity cost of holding reserves. Frenkel and Jovanovic (1981) incorporated the above criteria into a theoretical approach to inventory management, which they then tailored to the case of international reserves. Under this approach, the central bank should focus on minimising the cost of holding reserves, i.e. compare the opportunity cost of holding reserves versus the cost of adjustment whenever the level of reserves reaches the minimum acceptable level. Higher levels of reserves mean a larger buffer of funds that might be used to stabilise the economy, but also higher forgone earnings.

With the collapse of the Bretton Woods system in the early 1970s, the debate on the role of international reserves changed discernibly as many developing countries were hit by sudden massive capital outflows ("sudden stop syndrome"). This gave rise to a series of studies on crisis prevention and led to a change in view as regards the motives for holding reserves. This was reflected in the theoretical literature in, among other things, the design of first-generation models explaining how overly expansive domestic policies together with fixed exchange rate regimes can lead to currency crises (Krugman, 1979). Higher reserve levels can postpone a crisis until the reserves are exhausted, the fixed exchange rate regime is abandoned and the domestic currency is sufficiently devalued. The subsequent second-generation models stressed the self-fulfilling aspect of currency crises. In this case, reserves are understood as reflecting macroeconomic fundamentals or a commitment to defend a fixed exchange rate with a fluctuation band (Obstfeld, 1996). This literature shows that the exchange rate regime should be taken into account in monetary policy-makers' ideas of the adequate level of reserves. In very simplified terms, the more fixed the exchange rate regime applied by the central bank, the higher the reserves the country should have to defend the selected exchange rate level and avoid devaluing its currency.

The 1997 Asian financial crisis revealed how excessive and poorly managed foreign borrowing coupled with very limited exchange rate flexibility and large current account deficits can destabilise both the local economy and the entire region. This did not go unaddressed in the theoretical literature. A large stream of literature appeared exploring how to identify countries' vulnerability (i.e. how countries are endangered by sudden stops of capital flows) and what measures they should adopt to minimise the present costs and the costs of any future attacks.[3] The lesson learned from the Asian crisis was clear: if a country's economic fundamentals are weak and the risk of contagion is high, the appropriate response of the central bank is to increase the international reserves and/or take steps to improve the country's liquidity position, which can be done in cooperation with international financial bodies (such as the IMF). As a result, central bankers changed their view on reserves management and started to use reserves

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[2] Authors: Soňa Benecká and Luboš Komárek. The views expressed in this article are those of the authors and do not necessarily reflect the official position of the Czech National Bank.

[3] The work of the International Monetary Fund in particular led to the first proposed indicators, such as overvaluation of the real exchange rate, the M2-to-reserves ratio, the short-term debt to reserves ratio and growth of domestic credit, which signal a potential currency crisis quite effectively.

actively as an effective instrument for mitigating and even preventing financial crises. Mendoza (2010), for example, showed that policy-makers in developing countries were more responsive in holding reserves after the Asian crisis than they were before it. The elasticity of reserves with respect to certain indicators (in particular growth in external debt and other financial liabilities) rose, indirectly confirming that the importance of reserves for preventing financial crises had increased.

Reserves accumulation became a global phenomenon at the start of the new millennium (see Chart 1). The "Great Moderation" was marked by growth in international reserves worldwide, growth far exceeding that implied by the previous preventive recommendations. New reserve accumulation theories, such as mercantilist motives, appeared in response. Dooley et al. (2004), for example, show that the accumulation of financial assets and liabilities, in particular international reserve assets and domestic currency liabilities, represents a development strategy based on channelling investment to export industries. As a result, exporting countries finance the US current account deficit and real interest rates are lower than they would otherwise probably be. In other words, supporting exports and economic growth can lead to hoarding of reserves, reflecting both mercantilist and precautionary motives. As Ghosh et al. (2012) show, the combination of the two motives has varied across countries and over time. In addition, reserve accumulation for mercantilist motives can start a "keeping up with the Joneses" effect, particularly in the case of neighbouring countries and countries ranked in the same category by investors.

The reserve accumulation trend in this period may also have been a result of efforts to escape the constraints of the well-known monetary policy "trilemma". The trilemma hypothesis states that a country cannot simultaneously have a completely fixed exchange rate, completely free capital flows and an autonomous monetary policy. According to some authors, the change in the international reserves may have relaxed this trilemma (Aizenman, 2013). Many emerging economies prefer managed exchange rate flexibility, using reserves as a buffer enabling them to retain at least some monetary policy autonomy (Aizenman et al., 2013). Inflation-targeting economies, by definition, cannot apply a fixed exchange rate. They therefore tend to use a free float or a managed float, where the central bank retains the option of intervening ad hoc in foreign exchange markets (particularly if the exchange rate is excessively volatile) and, where appropriate, pursuing unconventional monetary policy.

The latest motive for holding reserves is financial stability. Financial integration and growth in cross-border capital flows have altered the architecture of the global financial system, creating a need for more complex decision-making under the classic trilemma (and now perhaps even a quadrilemma). Sharp growth in financial flows due to sudden capital outflows and increasing deleveraging forced many countries to improve their financial stability by accumulating international reserves. According to Obstfeld et al. (2008), an important reason to hold reserves is to protect the domestic banking sector (or credit market) while limiting currency depreciation. Financial factors – such as a high degree of dollarisation (Magnusson, 2011) and banking sector financing from abroad (as in the case of Sweden, for example) – are now considered other motives for accumulating reserves.

Benecká and Komárek (2018) also document the importance of the financial stability motive. Their study shows how financial globalisation and monetary policy have changed the traditional determinants of reserve holdings. Trade openness and the M2-to-GDP ratio seem to remain the key variables with a positive link to the level of international reserves. These variables are measures of the size of the financial sector and, to some extent, also of potential capital outflows. The authors also show that the effect of financial development on reserves is negative. Economies with more advanced financial systems generally hold lower reserves. However, if the central bank's decisions start to be driven by fears of capital flight and the negative impact thereof on the financial system, the reserves can grow. At the same time, it is clear that an alternative to accumulating reserves is to make the domestic financial system more resilient to internal and external shocks.

Reserve ratios are the most suitable indicators to use for making international comparisons. This is because such ratios also take into account other important country characteristics and the motives for holding reserves described above. These indicators were previously used as measures of external vulnerability by the IMF,[4] but they can now have a signalling effect for the financial markets and others.

- **The reserves-to-GDP ratio (RE/GDP)** is the basic measure for making international comparisons of reserve holdings. It reflects the different sizes of countries in the economic sense.
- **The reserves-to-imports ratio (RE/IM)** is a useful indicator for comparing countries with limited access to international capital markets within a large group of countries. It is a traditional metric usually expressed in months of imports. It thus expresses the time in months for which a country could finance its present level of imports using its international reserves if other flows completely stopped. The threshold is usually 3 months of imports. In this sense, international reserves are used as a buffer for accommodating fluctuations on the current account. This ratio is, of course, less suitable for comparing

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[4] The IMF has extended its methodology for assessing reserve adequacy to include a complex metric (ARA) that takes into account other portfolio liabilities and exchange rate regimes. More details can be found at: https://www.imf.org/en/Publications/Policy-Papers/Issues/2016/12/31/Assessing-Reserve-Adequacy-PP4547

industrial countries with flexible exchange rates and large capital accounts. However, it is still relevant to developing countries and the data are available relatively quickly and are of good quality.

- **The reserves-to-M2 ratio (RE/M2)** shows, under the traditional approach, the potential impact of a loss of confidence in the domestic currency. This is useful if the banking sector is weak and there is a risk of capital flight (especially if a fixed exchange rate regime is applied). On the other hand, demand for money is traditionally higher and more stable in countries where there is confidence in the domestic currency. A low level of this ratio therefore does not necessarily indicate future capital flight. Moreover, this ratio ignores the possibility of residents preferring another form of flight from domestic assets. As a result, no explicit risk threshold is set for this ratio.
- **The reserves to short-term external debt ratio (RE/STD)** is the most important measure of a country's external vulnerability. It is important for countries with significant but uncertain access to international capital markets. It indicates the degree to which a country would be endangered if its external debt financing were stopped.

Contemporary international reserves trends

Significant growth in international reserve holdings, particularly in emerging economies, has been a key feature of the international monetary system in recent decades. This trend is a consequence of changes in international capital flows and policies responding to specific domestic and global events and trends, in particular the latest financial crisis in the post-Lehman period.[5] The reserves are thus increasing mainly for precautionary reasons, although we cannot rule out the other motives described above (relaxing the monetary policy trilemma and financial stability motives).

The notional winner in terms of absolute reserve size is currently China, followed by Japan and Switzerland. From one perspective, though, this can be seen as a Pyrrhic victory, as we cannot simply say that higher reserves are automatically better for a country or that they lead to a Pareto improvement. Chart 1 shows the international reserves trends in 182 countries over the past almost two decades. There are several reasons for China's dominance in nominal reserves holdings, ranging from the need to maintain only slight appreciation under its export-oriented growth model to ensuring a sufficient buffer in the event of capital outflows. The positions of Japan and Switzerland, however, are surprising. Their currencies are generally regarded as reserve currencies playing the role of global "safe havens". The current reserves levels in Switzerland and Japan reflect their central banks' unconventional monetary policies. Incidentally, the same reason lies behind the sharp rise in the CNB's international reserves, as the koruna is also a would-be regional "safe haven". However, the dollar and the monetary policy of the Federal Reserve still play the central role in the global financial system, as the US currency is the most widely accepted reserve currency worldwide.

**Chart 1 – Reserves by country 1999–2017**
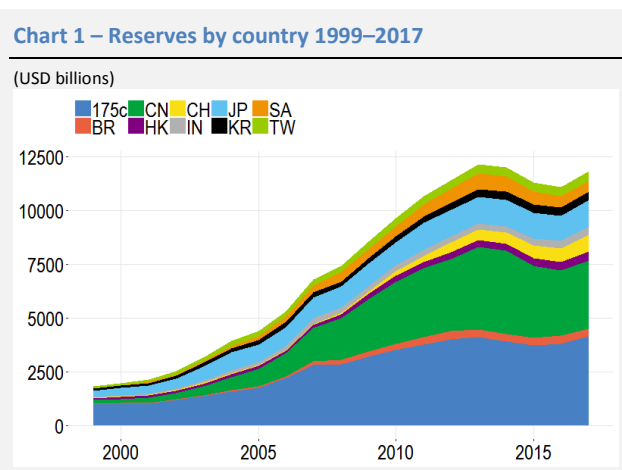
Source: EIU
Note: CN – China, CH – Switzerland, JP – Japan, SA – Saudi Arabia, BR – Brazil, HK – Hong Kong, IN – India, KR – South Korea, TW – Taiwan, 175c – Other 175 countries in total.

The largest reserve holdings in the post-crisis period are recorded by both emerging and advanced economies, so the traditional concave relationship between a country's wealth and the size of its international reserves is no longer so clear-cut. Using data for 182 countries, Chart 2 shows the distinctly concave relationship between GDP per capita and the reserves-to-GDP ratio usually recorded before the financial crisis. The hypothesis that might explain this phenomenon is that relatively poor countries, which have little involvement in the international financial system, do not need large amounts of international reserves. As a country develops and its society gets wealthier, reserves per capital grow. These countries meanwhile remain relatively vulnerable, so they need to create buffers. Very advanced and, from an investor perspective, the most credible economies (with the highest ratings) no longer concentrate on the size of their reserves. Their high credibility and macrofinancial results mean that their reserves can be distinctly smaller than those of less advanced or less indebted countries. However, the behaviour of the central banks of very advanced economies changed following the crisis. The right-hand end of the curve in Chart 3 is higher, indicating strong growth in the advanced economies' reserves. This is primarily a side-effect of unconventional monetary policies. Inflation-targeting economies (marked in green in Charts 2 and 3) are no exception, despite showing no clear trend.

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[5] We can assume from anecdotal evidence that the financial crisis led to greater emphasis being put on the liquidity function of reserves, as central banks do not hold their reserves in the form of foreign currencies, but invest them conservatively on foreign markets, often spread over multiple currencies. The reserves are invested in credible assets such as government bonds, Treasury bills and other debt securities. A smaller part is usually invested in shares, which tend to move in the opposite direction to bonds. A specific type of investment is investment in gold (Komárek and Polášková, 2018).
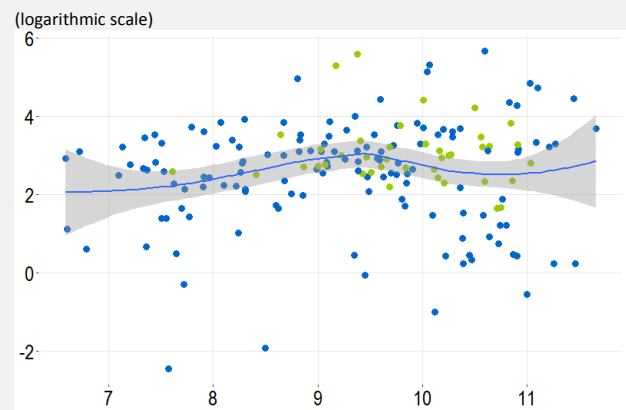
Chart 2 – Pre-crisis development and reserve levels (2005)
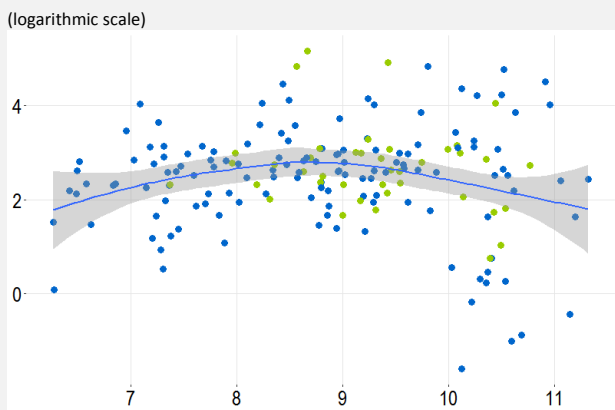
(logarithmic scale)

Source: EIU, CNB calculations
Note: GDP per capital on x-axis, reserves-to-GDP ratio on y-axis (in logarithms). 182 countries in total. Inflation-targeting economies indicated in green. Grey area denotes confidence intervals.

Chart 3 – Post-crisis development and reserve levels (2017)

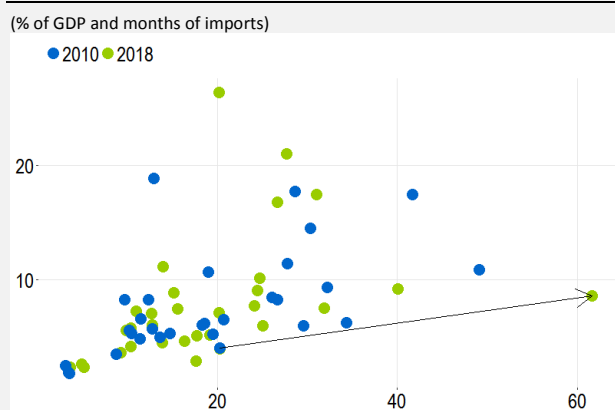(logarithmic scale)

Source: EIU, CNB calculations
Note: GDP per capital on x-axis, reserves-to-GDP ratio on y-axis (in logarithms). 182 countries in total. Inflation targeting economies indicated in green. Grey area denotes confidence intervals.

International comparison of reserve holdings from the perspective of ratios

To compare the ratios, we chose only inflation-targeting countries, which can be expected to have similar motives for holding reserves. Inflation-targeting economies usually have floating exchange rates or managed floats and their main monetary policy instruments are interest rates. Charts 4 and 5 compare the first three ratios for inflation-targeting countries in 2010 and 2018. The reserves-to-GDP ratio increased on average in this period, though differences are apparent between the ratios and between countries. For most inflation-targeting economies, the reserves-to-GDP ratio is below 40%. The reserves-to-imports ratio is higher for countries with a higher reserves-to-GDP ratio. The situation is similar for the comparison based on M2. The exception is the Czech Republic, where the reserves-to-GDP ratio rose sharply but the change in the other ratios was less dramatic. In particular, the current level of reserves expressed in months of imports seems little different from that in other inflation-targeting countries, as the Czech Republic recorded the fastest import growth (67%) of all these countries in the period under review.

The Czech Republic therefore has the highest reserves-to-GDP ratio among the inflation-targeting economies (over 60%). This can also be seen in the chart in Appendix 1. However, it drops to 13th place in terms of months of imports and fourth in terms of the reserves-to-M2 ratio.

Chart 4 – Reserves-to-GDP and reserves-to-imports ratios in inflation-targeting economies in 2010 and 2018

(% of GDP and months of imports)

● 2010 ● 2018

Source: EIU, CNB calculations

Note: Reserves-to-GDP ratio on x-axis, reserves in months of imports on y-axis. 62 countries in total. The arrow shows the change for the Czech Republic between 2010 and 2018.

Chart 5 – Reserves-to-GDP and reserves-to-M2 ratios in inflation-targeting economies in 2010 and 2018

(%)

● 2010 ● 2018
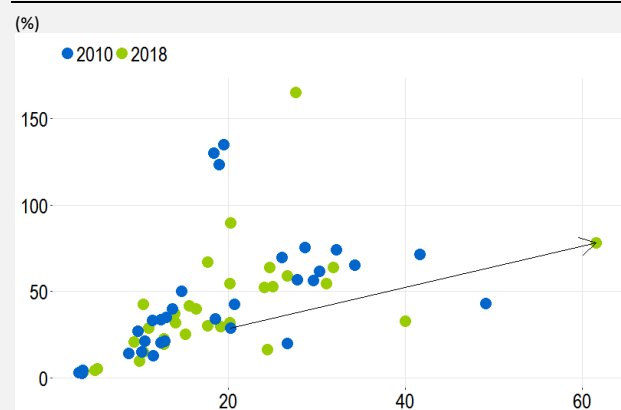
Source: EIU, CNB calculations

Note: Reserves-to-GDP ratio on x-axis, reserves-to-M2 ratio on y-axis. 62 countries in total. The arrow shows the change for the Czech Republic between 2010 and 2018.

The Czech experience shows that growth in reserves was a typical indirect consequence of autonomous monetary policy. To fulfil its mandate, the CNB used the exchange rate as an additional monetary policy instrument from November 2013 until April 2017. This was preceded by a one-year period of interest rates "parked" at technical zero, when the CNB used the soft (sometimes called Delphic) policy[6] of "forward guidance". The CNB's primary motive for pursuing this unconventional monetary policy was to achieve the statutory 2% inflation target. The unconventional policy, i.e. the CNB's commitment to maintain the exchange rate above CZK 27 to the euro, was conditional on making foreign exchange interventions. The foreign currency purchases caused the CNB's reserves to expand to EUR 75.878 billion.

The level of international reserves and sensitivity to changes in Fed monetary policy

The debate on the motives for holding reserves was enriched by last year a new hypothesis stating that higher reserve holdings may reduce an economy's sensitivity to changes in the monetary policy of the Federal Reserve. This sensitivity was first felt strongly on the financial markets of emerging economies after the "taper tantrum". In 2013, the announcement by the then Fed head Ben Bernanke that the Fed's extremely accommodative monetary policy was to end triggered large sell-offs on emerging markets. The sensitivity of emerging countries to Fed monetary policy thus moved to the forefront of interest and become the subject of many studies. According to Chen et al. (2014), US monetary policy shocks affect capital flows and asset prices in emerging economies and the effects are stronger during the unconventional monetary policy phase. Emerging economies with stronger fundamentals, such as higher real GDP growth, stronger external positions (current account balances), lower inflation and lower shares of debt held by foreign investors, are subject to smaller spillovers.

Higher international reserves often reflect emerging countries' concerns about the cost of financing their – usually dollar-denominated – external debt. The Asian crisis showed that using external debt to finance a current account imbalance can have a devastating effect on the economy. Debt-servicing costs depend not only on the local currency's exchange rate against the currency in which the debt is financed, but also on interest costs. So, if the US central bank raises the target range for its policy rates or reduces the amount of liquidity available, emerging economies can become difficult to finance. Borrowers must spend more of the local currency to finance the same debt. Such countries' central banks may therefore decide that their reserve holdings will reflect the amount of foreign-currency debt. Reserve levels also have a signalling effect. Large reserves can discourage financial market speculators from attacking emerging economies' currencies. The reserve level is thus an important

Chart 6 – CEMBI spreads for selected economies

(basis points)

Source: J.P.Morgan, Thomson Reuters
Note: AR – Argentina, ID – Indonesia, TR – Turkey. See footnote 8 for information on the CEMBI spread.
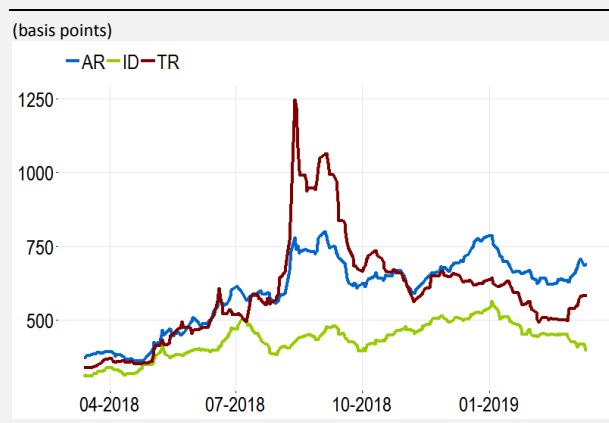
stabiliser of external imbalances, particularly with regard to the exchange rate. Besides the impacts on the exchange rate, a second channel via interest costs has also been discussed recently. Changes in US monetary policy can thus greatly worsen the situation in countries with higher external vulnerability as defined by the IMF.[7] A rate hike in the USA can trigger a real currency crisis via the interest rate channel. However, it can be shown again via the signalling channel that countries with higher reserves will be less sensitive to Fed monetary policy tightening.

The economies of Argentina and Turkey got into difficulty in 2018. Turkey's current account deficit-to-GDP ratio is currently one of the highest in the world (over 6%), while its external debt (mainly dollar-denominated) stands at 55% of GDP. The Turkish currency weakened by more than 30% in 2018 after having lost more than one-quarter of its value in 2017. High inflation led to an increase in rates and the economy fell into recession at the year-end. The situation in Argentina is quite similar.

Investors' concerns about a country's inability to repay its foreign-currency debts can be illustrated using the CEMBI[8] spread (see Chart 6). A higher CEMBI spread indicates a higher probability of default on dollar debt. Turkey's CEMBI spread exceeded 1,000 basis points in 2018. Argentina's also rose significantly, and an increase can be observed for Indonesia as well.

The CEMBI spread can also be used to test an economy's sensitivity to Fed monetary policy. Similarly to Davis et al. (2018), we tracked the relationship between CEMBI spreads in 35 selected

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[6] See Klíma and Komárek (2014).

[7] https://www.imf.org/external/np/exr/facts/vul.htm

[8] JPMorgan's Corporate Emerging Market Bond Index tracks the weighted average yield for dollar-denominated corporate bonds issued by emerging market entities. The spread is calculated against the 10-year US government bond yield.

economies and 12-month Federal Funds Futures (FFFs) using daily data in the period from March 2018 to March 2019. As Chart 7 shows, there may be an empirical relationship between changes in FFFs and CEMBI spreads, at least for some countries. We therefore tested individual countries for sensitivity of the CEMBI spread to changes in FFFs (the beta coefficient). In Chart 8, we relate this sensitivity to the reserve level. Some of the economies in Chart 8 lie well to the right, i.e. their sensitivity is high, while their reserves are relatively low. The Economist Intelligence Unit (EIU) estimates the reserves-to-GDP ratio at less than 10% in Turkey, 11% in Indonesia and 14% in Argentina in 2018.

It is therefore clear that sensitivity to Fed policy is indeed higher in countries whose reserves-to-GDP ratio is low. However, this relationship does not apply universally, i.e. the reserve level has no direct implications for sensitivity to changes in FFFs. The reserves-to-GDP ratios of most of the countries in the sample are below 40%, while their sensitivity differs greatly. In light of these facts, we looked for other factors to take into account. One possible candidate is the choice of monetary policy regime.
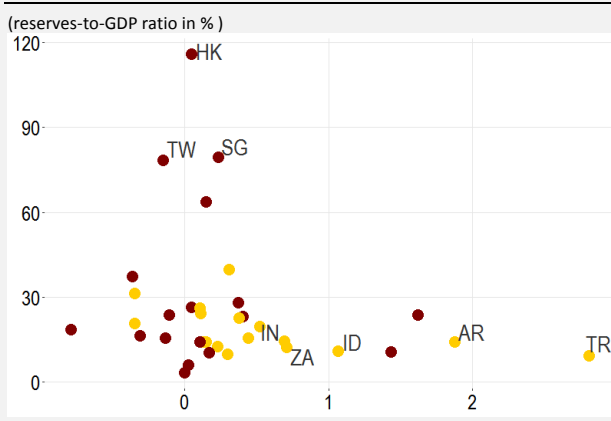

Chart 7 – Daily changes in CEMBI spreads versus FFFs
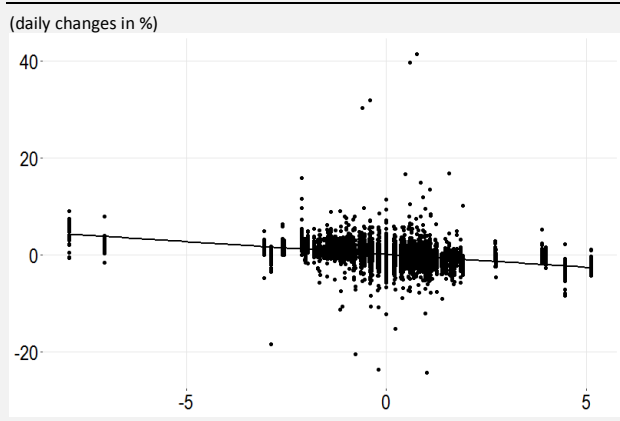
(daily changes in %)

Source: EIU, CNB calculations
Note: Daily changes in FFFs (Fed Funds Futures) on x-axis, CEMBI (Corporate Emerging Market Bond Index) on y-axis; all observations for all countries in the given period are shown.

Chart 8 – Sensitivity to changes in FFFs versus reserve level

(reserves-to-GDP ratio in %)

Source: EIU, CNB calculations
Note: Sensitivity to FFFs (Fed Funds Futures) on x-axis, reserve to-GDP ratio on y-axis. AR – Argentina, ID – Indonesia, TR – Turkey, ZA – South Africa, IN – India, HK – Hong Kong, TW – Taiwan, SG – Singapore. Inflation-targeting economies indicated in yellow.

As Chart 8 shows, inflation-targeting countries (indicated in yellow), which are considered to have low external vulnerability, tend to have lower reserves-to-GDP ratios. It seems that inflation targeting is no guarantee of macroeconomic stability. However, countries that have implemented it successfully have no need to accumulate large international reserves. By contrast, emerging economies, such as Singapore and Hong Kong, prefer to hold higher international reserves. These countries' sensitivity to changes in Fed monetary policy is also relatively low.

Conclusion

International reserves have expanded significantly since the start of the new millennium. They have either been increased intentionally for precautionary reasons (particularly in emerging economies) or have grown as a side effect of unconventional monetary policy (in some advanced countries). The growth has been reflected in economic theory, which has provided new rationales for accumulating reserves, such as partial relaxation of the monetary policy trilemma and financial stability motives. Reserve ratios are more suitable for making international comparisons than the absolute size of the reserves.

The financial crisis changed the concave relationship between a country's wealth and the size of its international reserves. This was due mainly to general growth in uncertainty and vulnerability in developing and emerging economies and, as the Czech and Swiss experience confirms, to the application of unconventional monetary policies in advanced countries.

The level of international reserves is an important stabiliser of external imbalances, particularly with regard to the exchange rate and interest rates. This is evidenced by the results of a sensitivity analysis focusing on the relationship between the reserve level and the US Fed's monetary policy, which unprecedentedly affects global monetary conditions. Our analyses confirm that a successful inflation-targeting regime substitutes for the need to accumulate large international reserves.

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Keywords

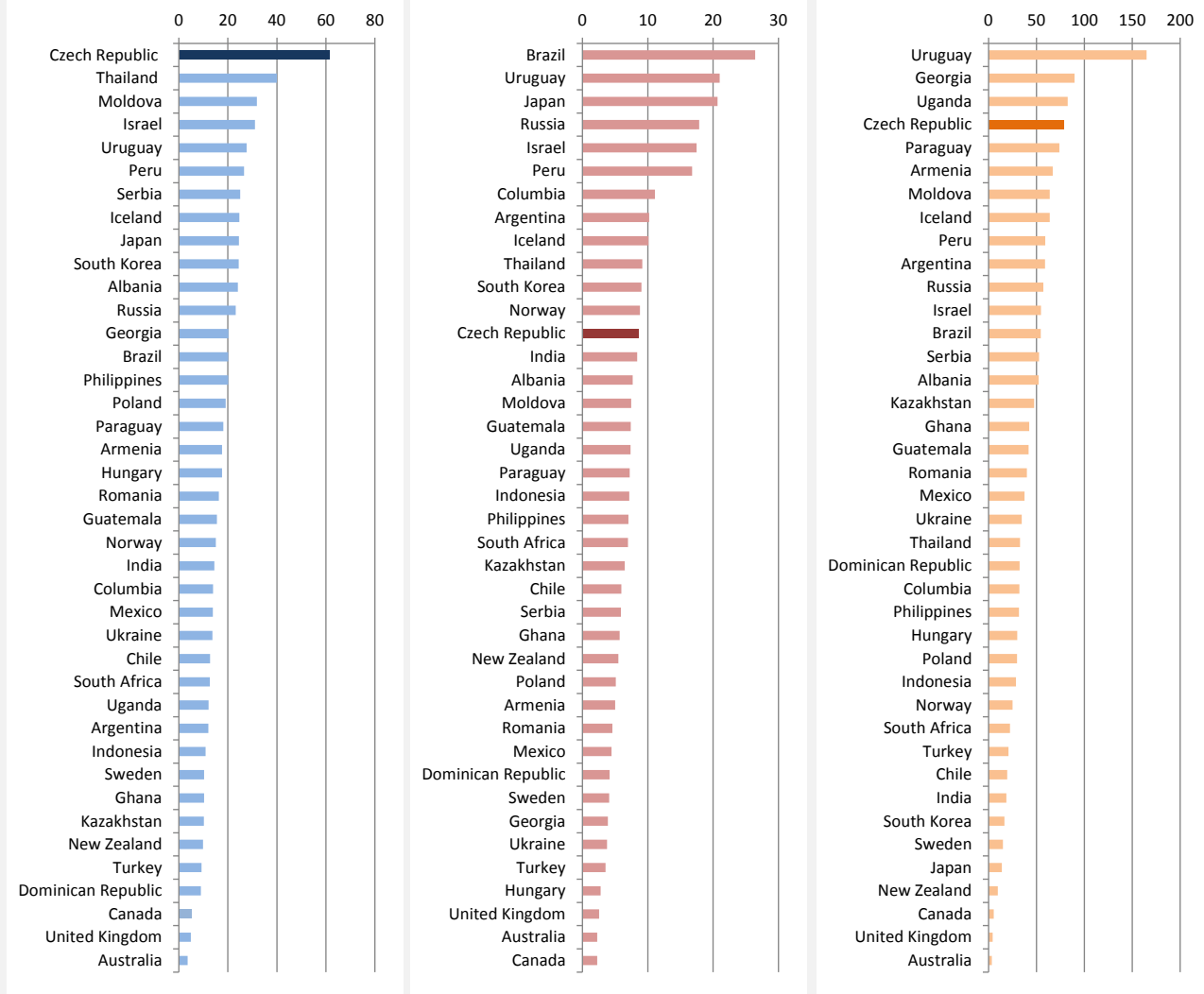foreign exchange reserves, monetary policy, inflation targeting, financial crisis

JEL Classification

E58, F31, F41

Appendix

Chart Appendix 1 – Reserves-to-GDP ratio, reserves in months of imports and reserves-to-M2 ratio in 2018

(%, months, %)

Source: EIU

A1. Change in predictions for 2019

GDP growth, %

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

Inflation, %

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

A2. Change in predictions for 2020

GDP growth, %

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

Inflation, %

	CF		IMF		OECD		CB / EIU	
EA	-0.1	2019/4 2019/3	-0.2	2019/4 2018/10	---	2018/11 ---	-0.2	2019/3 2018/12
DE	0	2019/4 2019/3	-0.4	2019/4 2018/10	---	2018/11 ---	0	2018/12 2018/6
US	0	2019/4 2019/3	+0.4	2019/4 2018/10	---	2018/11 ---	-0.1	2019/3 2018/12
UK	0	2019/4 2019/3	0	2019/4 2018/10	---	2018/11 ---	0	2019/2 2018/11
JP	0	2019/4 2019/3	-0.2	2019/4 2018/10	---	2018/11 ---	-0.5	2019/1 2018/10
CN	0	2019/4 2019/3	-0.2	2019/4 2018/10	---	2018/11 ---	-0.1	2019/4 2019/2
RU	+0.1	2019/3 2019/2	-0.3	2019/4 2018/10	---	2018/11 ---	0	2019/4 2019/1

A3. GDP growth in the euro area countries

HIST — CF — IMF — OECD — ECB
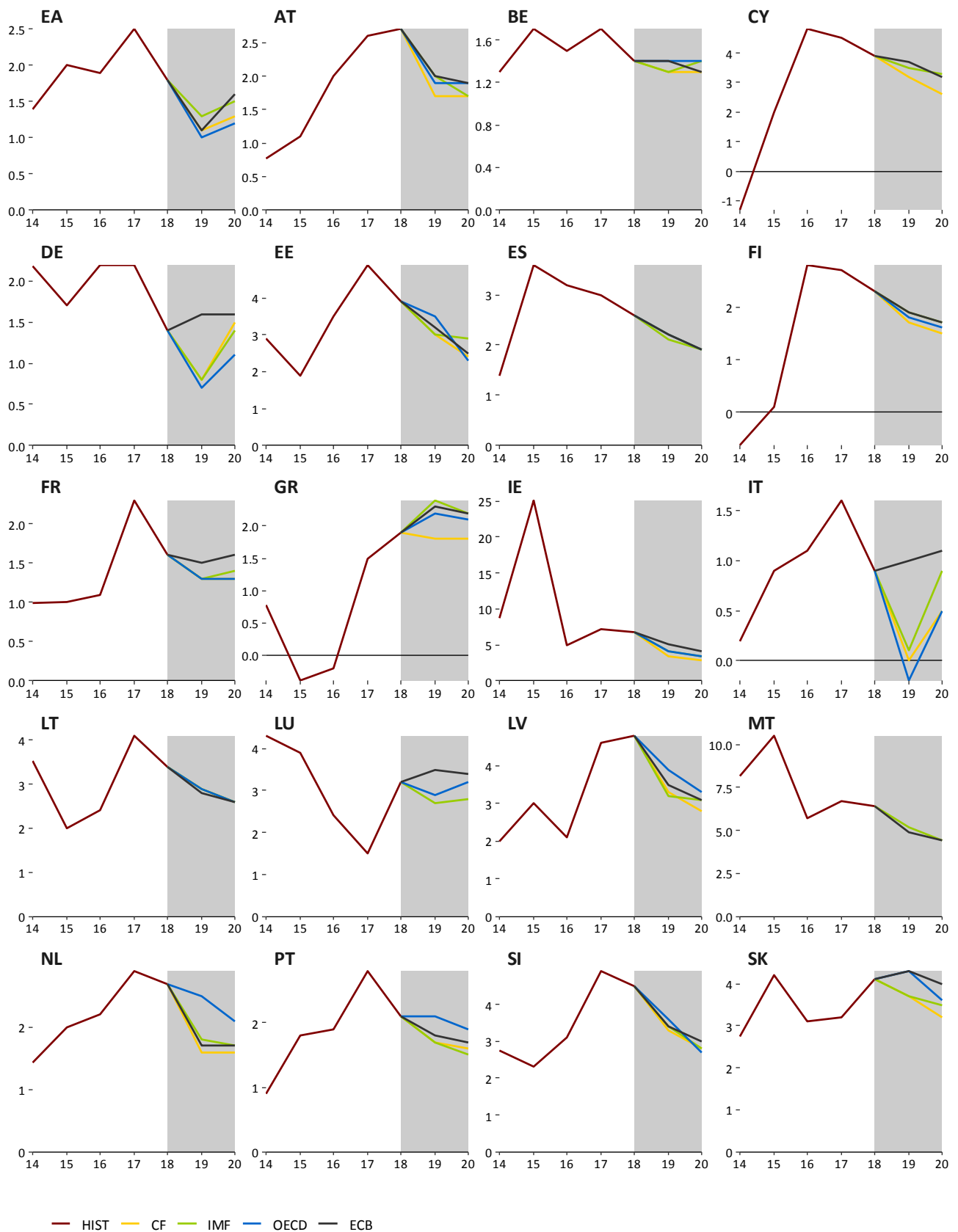
Note: The chart shows institutions' latest available outlooks of for the given country (in %).

A4. Inflation in the euro area countries

| — HIST | — CF | — IMF | — OECD | — ECB |
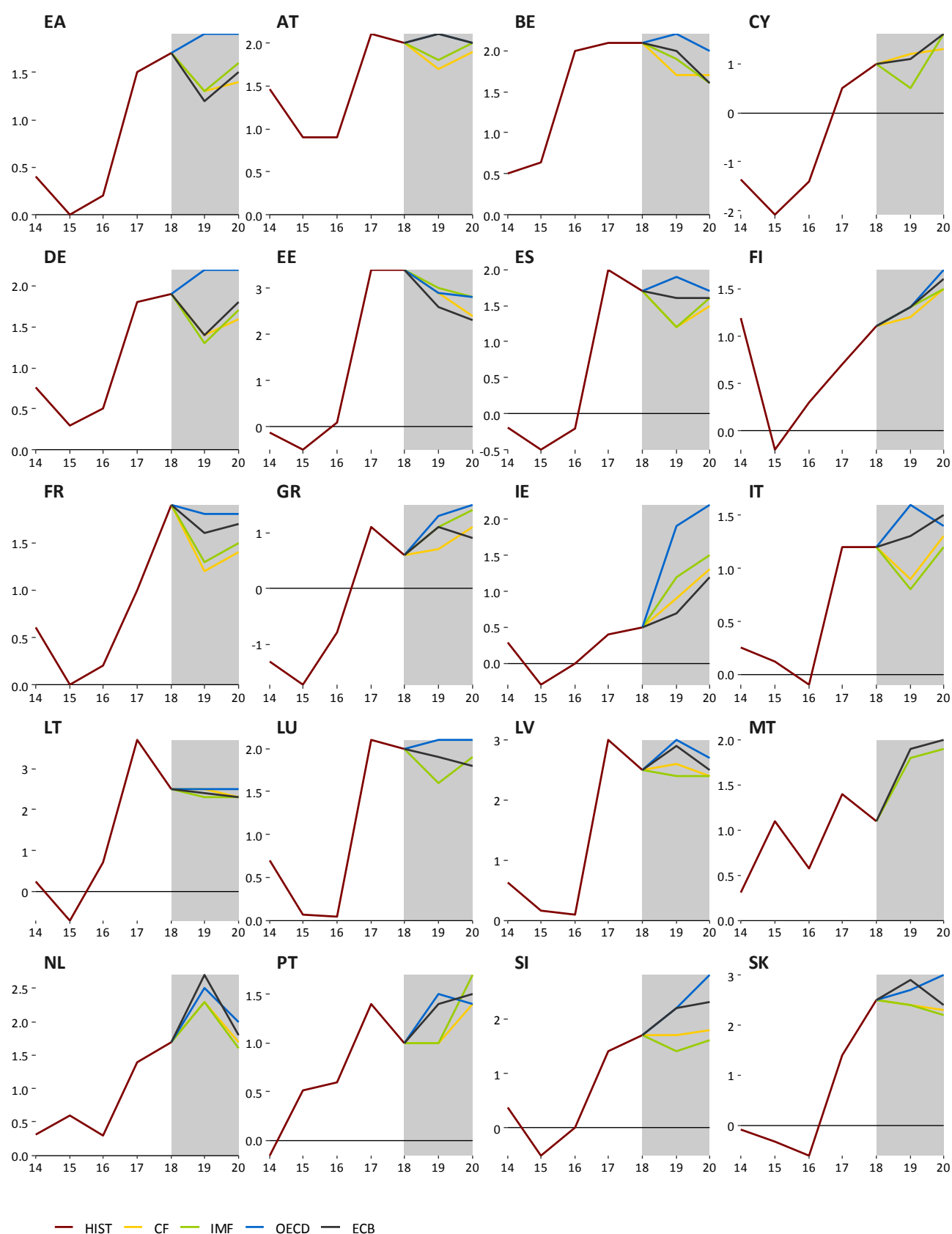
Note: The chart shows institutions' latest available outlooks of for the given country (in %).

A5. List of abbreviations

AT	Austria
bbl	barrel
BE	Belgium
BoE	Bank of England (the UK central bank)
BoJ	Bank of Japan (the central bank of Japan)
bp	basis point (one hundredth of a percentage point)
CB	central bank
CBR	Central Bank of Russia
CF	Consensus Forecasts
CN	China
CNB	Czech National Bank
CNY	Chinese renminbi
ConfB	Conference Board Consumer Confidence Index
CXN	Caixin
CY	Cyprus
DBB	Deutsche Bundesbank (the central bank of Germany)
DE	Germany
EA	euro area
ECB	European Central Bank
EE	Estonia
EIA	Energy Information Administration
EIU	Economist Intelligence Unit
ES	Spain
ESI	Economic Sentiment Indicator of the European Commission
EU	European Union
EUR	euro
EURIBOR	Euro Interbank Offered Rate
Fed	Federal Reserve System (the US central bank)
FI	Finland
FOMC	Federal Open Market Committee
FR	France
FRA	forward rate agreement
FY	fiscal year
GBP	pound sterling
GDP	gross domestic product
GR	Greece
ICE	Intercontinental Exchange
IE	Ireland
IEA	International Energy Agency

IFO	Leibniz Institute for Economic Research at the University of Munich
IMF	International Monetary Fund
IRS	Interest Rate swap
ISM	Institute for Supply Management
IT	Italy
JP	Japan
JPY	Japanese yen
LIBOR	London Interbank Offered Rate
LME	London Metal Exchange
LT	Lithuania
LU	Luxembourg
LV	Latvia
MKT	Markit
MT	Malta
NIESR	National Institute of Economic and Social Research (UK)
NKI	Nikkei
NL	Netherlands
OECD	Organisation for Economic Co-operation and Development
OECD-CLI	OECD Composite Leading Indicator
OPEC+	member countries of OPEC oil cartel and 10 other oil-exporting countries (the most important of which are Russia, Mexico and Kazakhstan)
PMI	Purchasing Managers' Index
pp	percentage point
PT	Portugal
QE	quantitative easing
RU	Russia
RUB	Russian rouble
SI	Slovenia
SK	Slovakia
UK	United Kingdom
UoM	University of Michigan Consumer Sentiment Index - present situation
US	United States
USD	US dollar
USDA	United States Department of Agriculture
WEO	World Economic Outlook
WTI	West Texas Intermediate (crude oil used as a benchmark in oil pricing)
ZEW	Centre for European Economic Research