

# Global Economic Outlook

— July 2020



# Foreword

Dear Readers,

We have entered the second half of the year, which, despite having an attractive number in the form of two twenties, is unfortunately dominated by the 19 associated with COVID. The global spread of the coronavirus is unprecedented, as is the response to it, involving a mix of measures taken by governments, central banks and macroprudential authorities.

The uncertainty associated with the impacts of the fight against the coronavirus pandemic has had a significant bearing not only on the behaviour of economic agents, but also on the key data used to prepare forecasts and forward-looking policies. As a result, it is much more difficult for central bankers and others to predict future economic developments, because the inputs for our decision-making – despite their usual high quality – are currently subject to a substantial degree of risk and uncertainty.

This situation naturally confirms that monetary policy is not on autopilot and that interest rate decisions are not made by the model. The latter is an important, but not the only, piece in the information jigsaw. Developments in other countries are crucial for the open and export-oriented Czech economy. Global Economic Outlook, an established publication issued by the CNB's Monetary Department, is therefore an invaluable source of information and analyses on major world economies.

The analytical part of this issue features a topic from the financial stability area. This is despite the fact that the current crisis, unlike the 2008 global financial crisis, is not due to unfettered mortgage lending around the world. Economic theory and the experience of macroprudential authorities have undoubtedly made great progress since the previous crisis. However, in contrast to monetary policy, which is clearly countercyclical, it remains unclear whether macroprudential policy reacts to the business and financial cycle or rather to the structural characteristics of individual countries. But this is only logical. Modern macroprudential policy is in fact entering its very first recessionary phase of the financial cycle, so some aspects of financial stability are being fine-tuned “on the fly”. This makes it even more important to study international practice and to carefully explain everything we do in this area.

I hope you find this July issue interesting.

Tomáš Nidetzký, CNB Deputy Governor



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## Cut-off date for data

17 July 2020

## CF survey date

13 July 2020

## GEO publication date

24 July 2020

## Notes to charts

ECB, Fed, BoE and BoJ: midpoint of the range of forecasts.

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

Leading indicators are taken from Bloomberg and Refinitiv Datastream.

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

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## I. Introduction

**COVID-19: daily increases in new cases worldwide hit record highs!** The summer “breath of fresh air” without face masks in many countries may have seemed to indicate that the COVID-19 pandemic was receding, but unfortunately it is not. Daily increases in new cases are hitting a record high of 240,000, about a third of them in the USA. Financial markets, though, are relatively calm, maybe due to optimism about the progress made by Moderna and AstraZeneca in finding a vaccine. US–China relations deteriorated further. According to President Trump, the USA is to end Hong Kong’s special status in response to Beijing’s previous actions in this territory. Tensions also flared in Asia over a war of words about China’s disputed claims on commodity resources (mainly oil and natural gas) in the South China Sea. The central theme for EU countries this month is the key summit at which Member States’ leaders will discuss and vote on the EU budget for

### July GDP growth and inflation outlooks for monitored countries, in %

GDP	EA	DE	US	UK	JP	CN	RU
2020	-8.1 ↘	-6.3 ↘	-5.3 ↘	-9.2 ↘	-5.1 ↘	1.7 ↘	-5.2 ↘
2021	5.9 ↘	5.0 ↘	4.0 ↘	5.9 ↘	2.5 ↘	7.9 ↘	3.3 ↘
Inflation	EA	DE	US	UK	JP	CN	RU
2020	0.4 ↗	0.6 ↗	0.8 ↗	0.8 ↘	-0.2 ↗	2.7 ↘	4.0 ↘
2021	1.0 ↗	1.5 ↗	1.7 ↘	1.3 ↗	0.1 ↗	1.9 ↗	3.8 ↘

Source: Consensus Forecasts (CF)

Note.: The arrows indicate the direction of revisions compared with the last GEO.

2021–2027 and the proposed EUR 750 billion Recovery Fund. Tough talks are expected on the form and distribution of the assistance (how much will be distributed through direct grants and how much in loans). There are disputes between smaller, richer and thriftier states (such as Sweden and the Netherlands) and the southern countries. Rather surprisingly, Germany is siding with the less austere states. As regards the ECB’s monetary policy stance, the bank communicated through President Christine Lagarde

that it intends to use the full planned amount of the PEPP (EUR 1.35 trillion). It also emphasised that it will not let the capital key for purchases of EMU member states’ bonds to impair the efficiency of monetary policy.

**The July GDP growth outlooks for 2020** mostly brought a revision towards smaller-than-expected falls in performance in the countries we monitor (except the UK and Russia), while lower growth is uniformly expected for 2021. China is expected to be one of the few countries to survive the corona crisis with positive GDP growth, a view supported by its unexpectedly good results for 2020 Q2. **Consumer inflation outlooks** were broadly unchanged from June. Despite massive monetary and fiscal policy easing, most economies will not reach the 2% inflation “ideal” next year. The dollar will weaken against the euro, the yen and the renminbi at the one-year horizon, while being broadly flat against sterling and firming slightly against the rouble. The CF outlook for the Brent crude oil price at the one-year horizon is higher than in June, at USD 47.6/bbl (highest estimate USD 67/bbl, lowest estimate USD 33.4/bbl). The outlook for market rates is very slightly falling for the 3M USD LIBOR, while the outlook for 3M EURIBOR rates remains negative over the entire outlook horizon, as has been the case for several years now.

**The chart in the current issue** shows current developments on energy markets in Europe, where the price of emission allowances has been surging lately. This has been reflected in growth in electricity prices. The price of emission allowances exceeded EUR 30 per tonne of CO<sub>2</sub> in July. The rising price will have a negative effect on production, where growing costs are reducing global competitiveness, especially in heavy industry. On the other hand, production could shift faster to emission-free sources and carmakers could also invest in electromobility.

**The current issue also contains an analysis:** [Mortgage loan regulation instruments around the world](#). The article presents the key principles and motives of macroprudential policy for maintaining financial stability, focusing on mortgage loan regulation. The article presents the dichotomy of opinion on setting instruments such as LTV and DSTI caps to mitigate the risks caused by excessively fast growth in house prices, and also academic evidence on the impact of these instruments on the real economy.

### Euro price of emission allowances per tonne of CO<sub>2</sub>



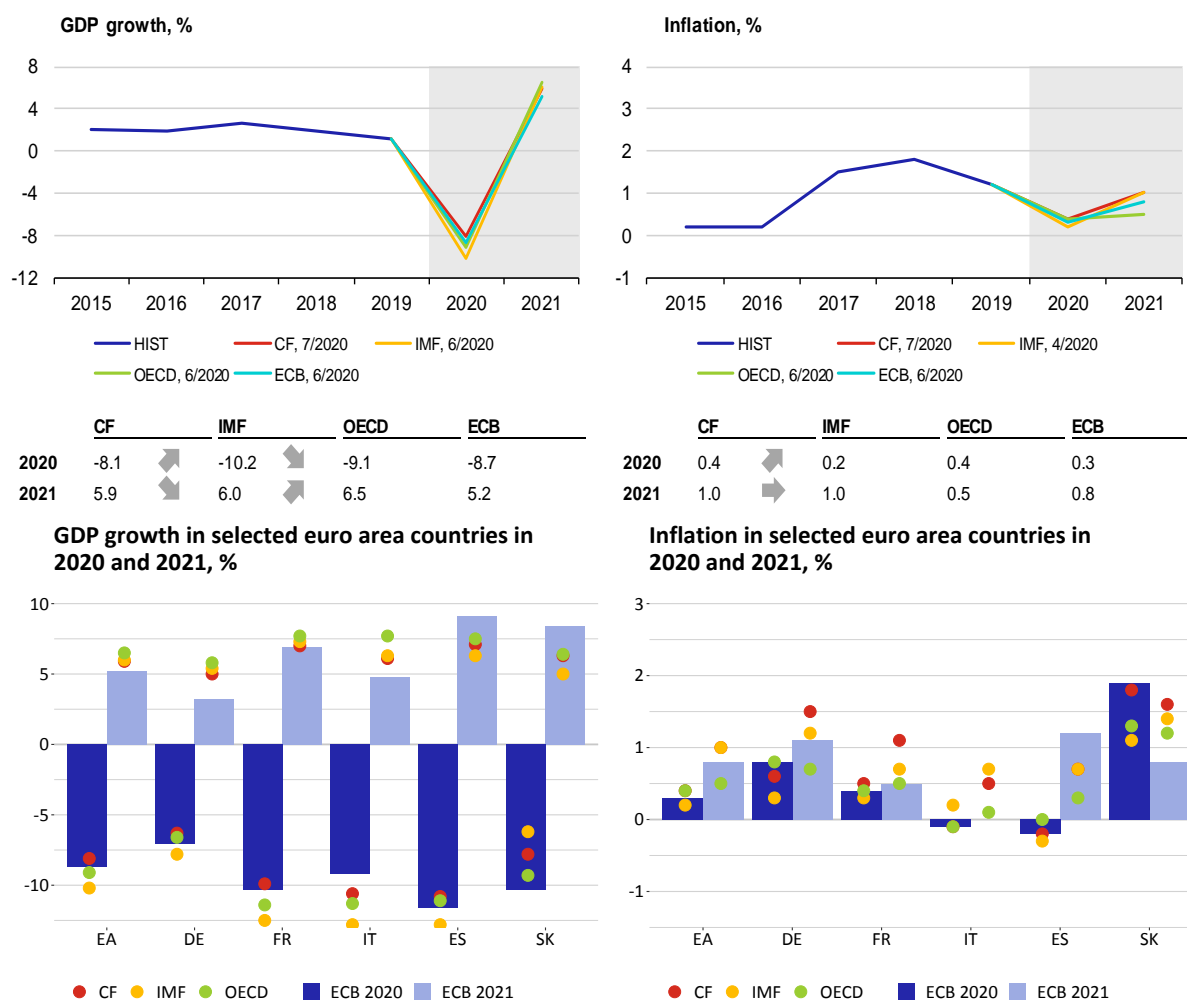
Source: Bloomberg

Note: The price of contracts maturing in December 2020.

## II.1 Euro area

**Government restrictions introduced in connection with the COVID-19 pandemic were lifted gradually in euro area countries up to the end of June, and euro area industry is slowly recovering from the shutdowns.** The Italian and Spanish economies were hardest hit by the measures, but losses were also sustained by economies with very close trade links with the EU, such as Slovakia. The industrial production figures for April and May indicate that industrial firms in Slovakia were slow in getting going again, while those in Italy and France were back up and running relatively quickly. According to the PMI leading indicators, euro area manufacturing stabilised in June. In France, the indicator even exceeded 50 points, the first improvement in the business climate since January 2020. Particularly surprising was a sizeable increase in orders. By contrast, the situation in Germany is improving only gradually and industrial activity remains in the contraction band. Overall, euro area industrial production was 20% lower in May compared with January.

**By contrast, consumer demand recovered more quickly after the crisis, aided by fiscal support measures.** Retail sales rose by a record 18% month on month in May, but remain 5% lower than in the same period of last year. The impact of the pandemic on sales was relatively limited in Germany, where retail sales even increased year on year in May. This was due mainly to strong demand for on-line shopping, which outweighed the effect of closures of brick-and-mortar shops. The fall in domestic demand was dampened to a large extent by crisis fiscal measures aimed at boosting consumption and employment. Moreover, numerous countries further expanded their packages. The announced German fiscal package is the largest, at EUR 130 billion. In addition to a VAT rate cut, it contains higher spending on the German health care system, support for families and SMEs, and greater investment in green energy, including direct support for electric car purchases. The massive fiscal stimuli are also supporting the euro area labour market. The unemployment rate rose by only 0.3 pp in May compared with March.

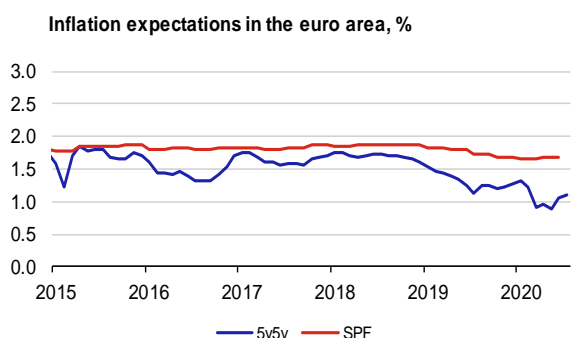
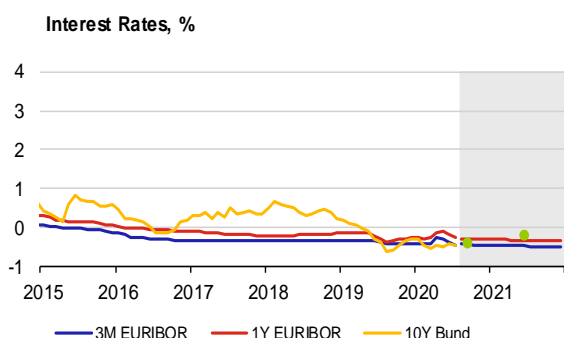
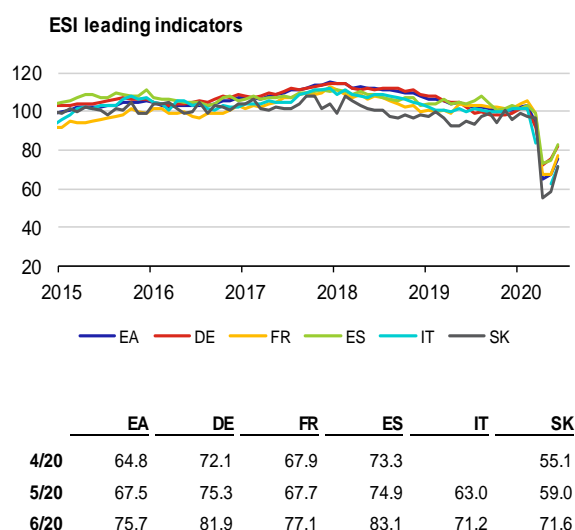
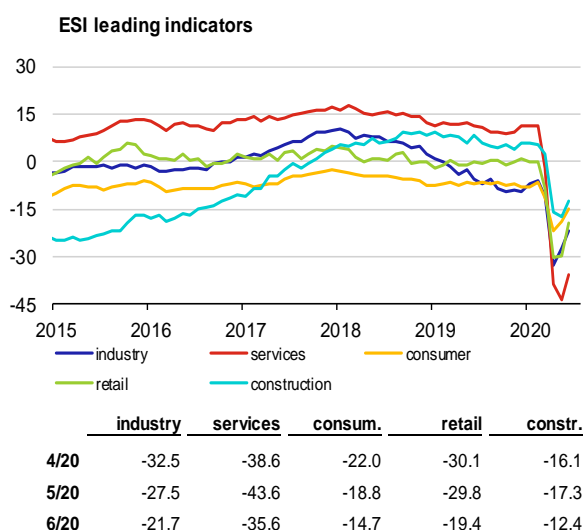


Note: Charts show institutions' latest available outlooks of for the given economy.

**According to the July CF, GDP will fall by more than 8% this year and the euro area economy will grow by almost 6% next year.** The new outlook is slightly more optimistic than the IMF forecast, which expects a deeper fall this year and a comparable recovery next year. Of the five largest countries, CF expects the sharpest drops this year to be recorded in Spain (10.8%), and Italy (10.6%), followed by France (9.9%). By contrast, the decrease in Germany will be just 6.3%. As regards the components of GDP, the decline in the euro area this year will be due mainly to household consumption and gross fixed capital formation. However, government debt and unemployment will rise significantly. According to the analysts, gross government debt in the euro area will exceed 100% this year, while in Italy it will rise to a record-high 166% of GDP.

**The expected economic downturn is reflected in a lower consumer inflation outlook.** According to the July CF, inflation will be just above zero this year and accelerate to 1% next year. The highest price growth will be recorded by Slovakia, while consumer prices in Spain and Italy will decline. Core inflation in the euro area will stay below 1%. However, inflation expectations have remained stable for several months now.

**At its meeting in July, the ECB left its monetary policy stance unchanged.** The ECB will continue to purchase assets under the PEPP with a total envelope of EUR 1,350 billion, which President Lagarde says will be used in full. Net purchases under the older APP will continue at a monthly pace of EUR 20 billion, together with the purchases under the additional EUR 120 billion temporary envelope until the end of the year. Monetary conditions in the euro area are thus very accommodative, as confirmed by the results of the ECB’s survey of banks. Loans to corporations recorded a record high in Q2 as the pandemic triggered a major increase in liquidity and working capital funding requirements. Banks expect a downturn to come in the second half of the year after government guarantee frameworks are exhausted.



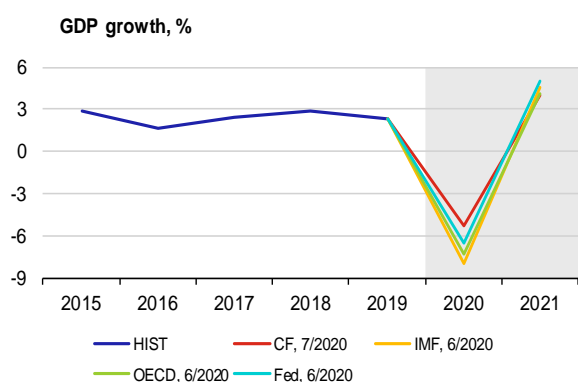
Note: Inflation expectations based on 5year inflation swap and SPF

## II.2 United States

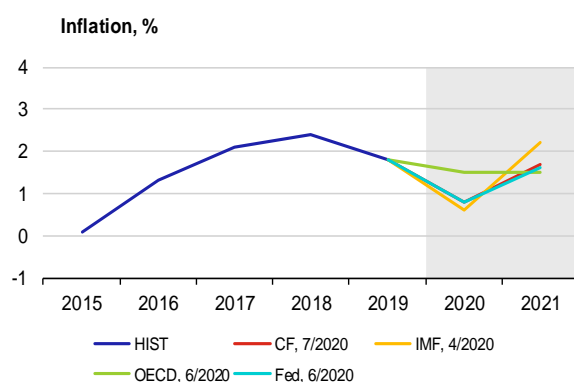
**The US economy is slowly recovering after the easing of restrictions, but the virus is not yet under control.** The latest data from the US economy are positive and the GDP outlooks are heading upwards. According to CF, GDP will fall by 5.3% this year, but the IMF outlook published at the end of June estimates the decline at as much as 8%. The recovery is clear from the retail sales figures, which rose by 1.1% year on year in May, and from growth in new orders. Growth in sales was also fostered by a declining saving rate, which dropped by almost 10 pp to 23.2% in May. Leading indicators remain in the contraction band but are close to the magic threshold, while the non-manufacturing PMI surged to 57.1. The labour market is slowly creating jobs, with 4.8 million added in June. Unemployment declined to 11.1% in June, while wages went down by 5.7%. Should the current trend continue, unemployment will soon fall below 10% and wages will start rising again. Inflation reached 0.7% in June, driven by food prices, which rose by 4.5%, and prices of services, which grew by 1.9%.

**The government is discussing further support measures; analysts believe the fiscal stimulus should be bigger.** According to the outlooks, the economic downturn and support packages will cause a government deficit of 17% of GDP, but many analysts believe that the support should be higher. The Fed continues to boost the economy with expansionary policy and unconventional instruments. Its balance sheet is thus continuing to grow strongly and could amount to 50% of GDP at the year-end according to outlooks.

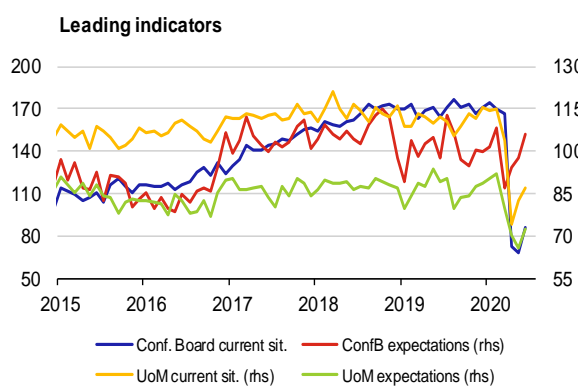
**The future course of the US economy depends strongly on the further spread of the coronavirus.** The number of new cases has not peaked yet, and states such as California, Texas, Arizona and Florida have had to re-introduce restrictions. Globally, the USA now accounts for one-third of the number of new cases, while the percentage of positive tests is also increasing. The total number of victims has exceeded 130,000. Aside from the coronavirus, the USA is starting to prepare for the presidential election, which will be held at the end of the year. Polls suggest that current president Donald Trump is falling behind his rival Joe Biden.



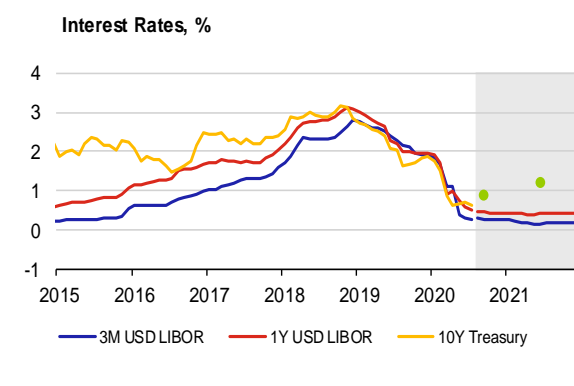
	CF	IMF	OECD	Fed
2020	-5.3	-8.0	-7.3	-6.5
2021	4.0	4.5	4.1	5.0



	CF	IMF	OECD	Fed
2020	0.8	0.6	1.5	0.8
2021	1.7	2.2	1.5	1.6



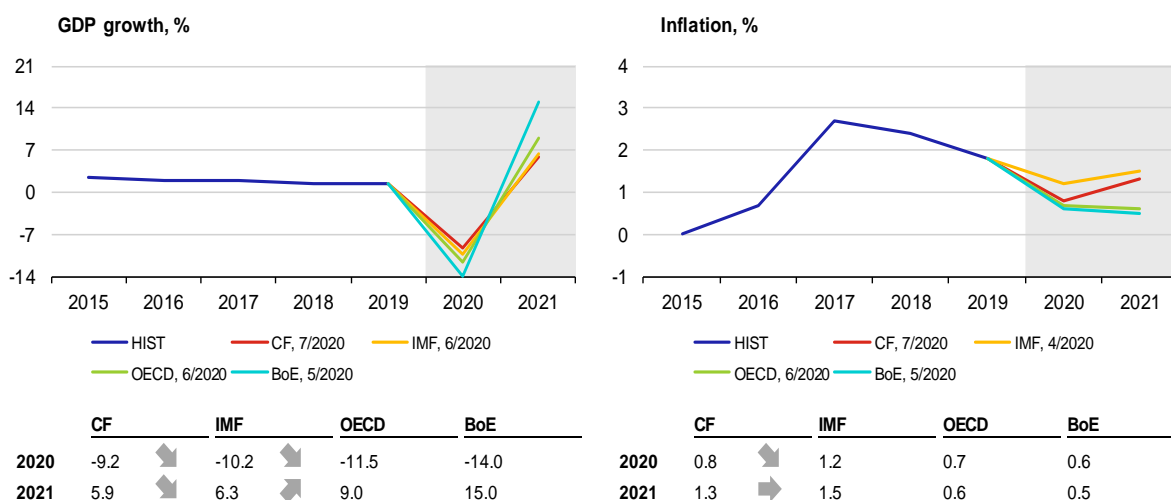
	ConfB curr.	ConfB exp.	UoM curr.	UoM exp.
4/20	73.0	94.3	74.3	70.1
5/20	68.4	97.6	82.3	65.9
6/20	86.2	106.0	87.1	72.3



	6/20	7/20	10/20	7/21
USD LIBOR 3M	0.31	0.28	0.28	0.18
USD LIBOR 1R	0.60	0.60	0.46	0.42
Treasury 10R	0.72	0.65	0.00	0.00

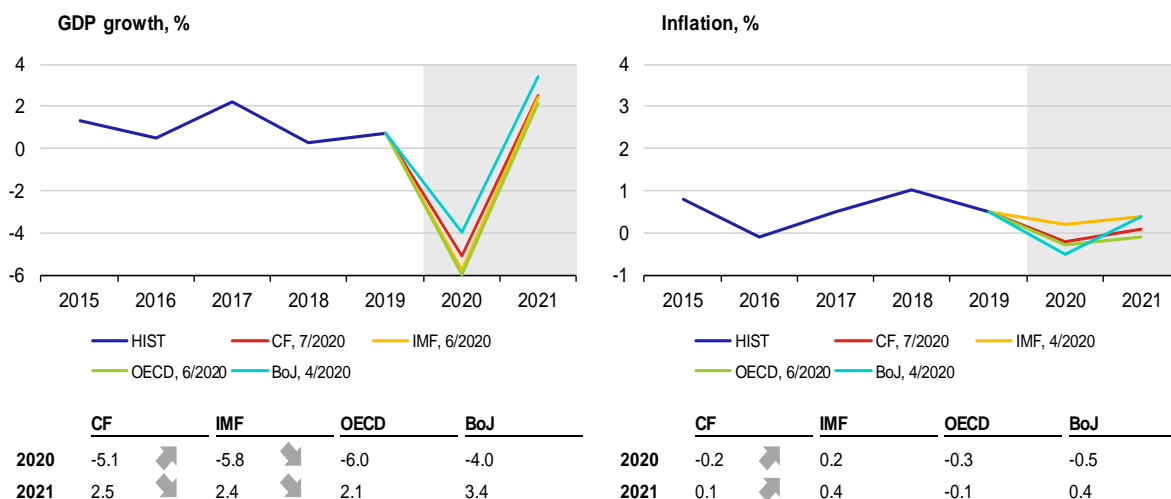
### II.3 United Kingdom

The BoE left its key interest rate at a historical low of 0.1% and expanded its bond purchase programme by a further GBP 100 billion. Quantitative easing will thus total GBP 745 billion. Finance Minister Rishi Sunak also introduced new measures amounting to GBP 30 billion to support the pandemic-hit UK economy and labour market. These include contributions for the return of furloughed employees, a temporary VAT rate cut in the tourism sector and a kickstart jobs scheme for young people. However, the consequence of the measures introduced is a record-high national debt, which will probably rise by GBP 350 billion this year. Progress with Brexit revolves around intensive negotiations in July between the UK and the EU. Neither party has given up hope on achieving real progress in key areas, even though the transition period ends at the end of 2020. The UK is insisting that a free trade agreement should be reached by the end of July, despite the EU's scepticism regarding this schedule. The forward-looking composite indicator PMI rose to just below 48 in June. The CF slightly lowered its forecast for economic growth both this year and the next. The new June IMF outlook expects the economy to contract by 10.2% this year and grow by 6.3% in 2021.



### II.4 Japan

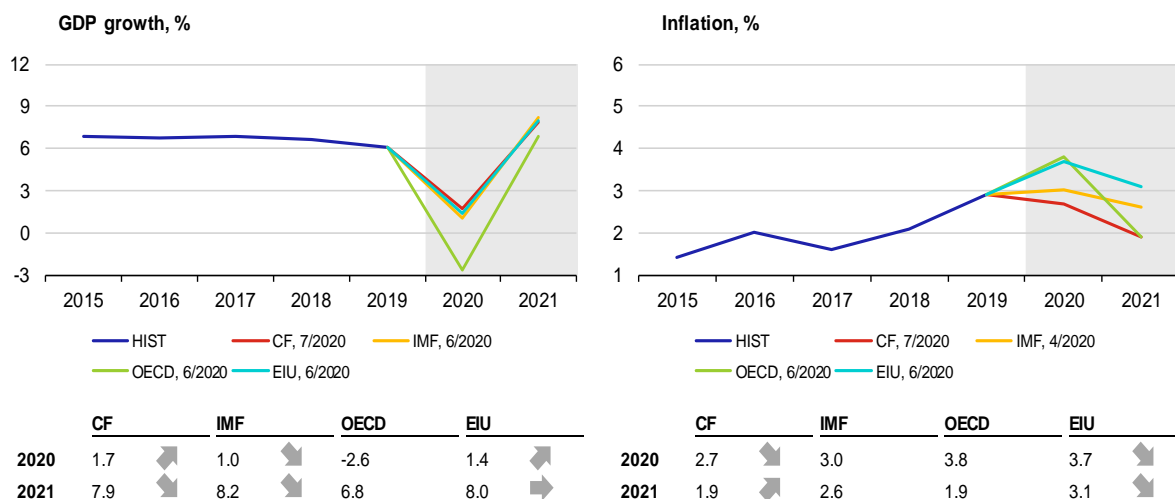
The Japanese economy remains strongly affected by the coronavirus epidemic. May was the worst month for manufacturing in terms of leading indicators. Although growth has been observed since then, the PMI in this sector (40.1) was well far from the threshold between recession and expansion in June. The year-on-year fall in industrial production accelerated to 26.3% in May, the worst result in 11 years. Industrial production decreased by almost 9% month on month, mostly due to a decline in the category of motor vehicles (24.3%), which, however, moderated compared with May (36.6). The PMI in services recorded its largest fall in April (21.5) and rebounded to 45.0 in June. Retail sales are indicating a slight recovery in this segment after two months. The new outlooks expect GDP to decline by 5%–6% in 2020. The economy will see renewed growth of around 2.5% next year. Inflation will try to get out of the deflation band and enter a positive territory.





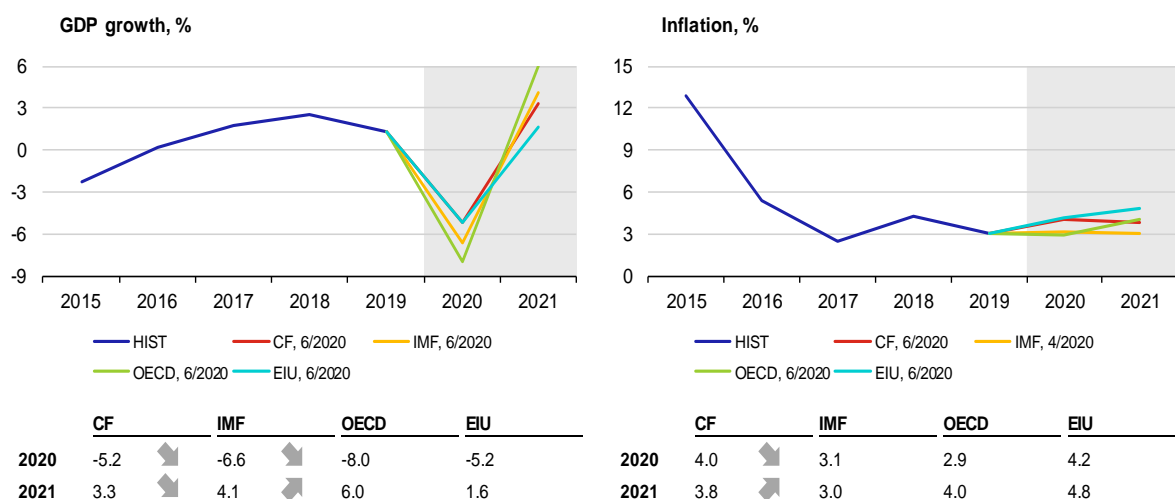
## II.5 China

**The Chinese economy surpassed expectations in 2020 Q2, growing by 3.2% year on year and rebounding from a record contraction of 6.8% the previous quarter.** China thus became the first large economy to show growth since the outbreak of the pandemic. This to some extent reflects an easing of the extensive quarantine measures already at the start of Q2 (unlike in the rest of the world), which was accompanied by massive support measures from the Chinese government and central bank. On the other hand, the strong recovery of the Chinese economy in Q2 is not spread evenly across the economy. Solid growth in industry fostered by government fiscal stimuli contrasts with a continued decline in retail sales reflecting weak domestic consumer demand. The CF analysts expect the Chinese economy to grow by 1.7% this year and 7.9% next year. According to the July CF outlook, consumer prices in China will grow at a pace of 2.7% this year, slowing to 1.9% in 2021.



## II.6 Russia

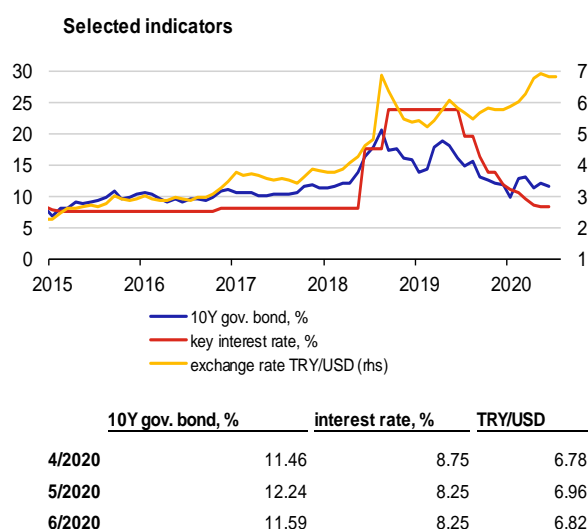
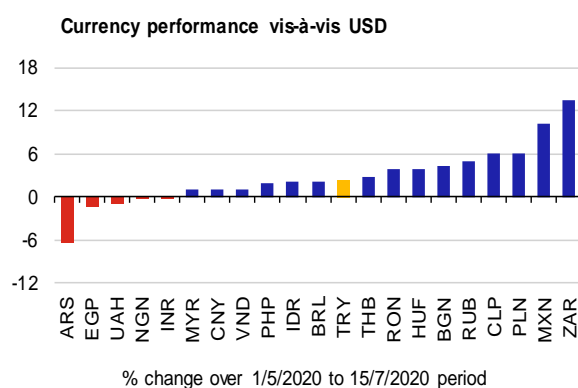
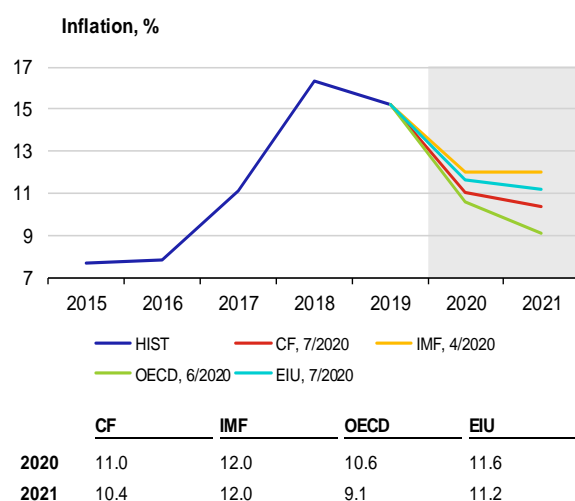
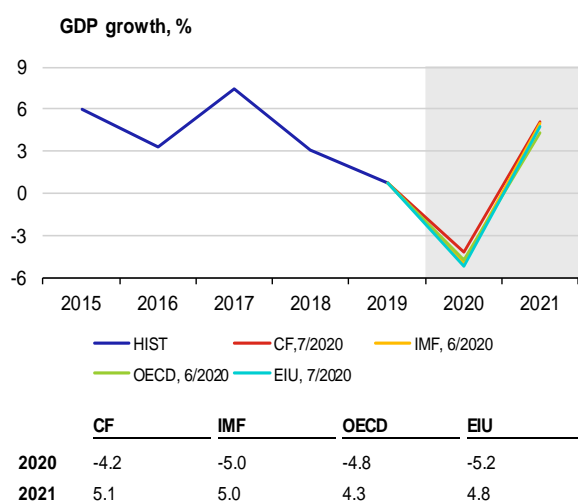
**The leading indicator in industry expresses optimism, which is not yet reflected in short-term indicators.** The PMI in manufacturing rose from 36.2 to 49.4 in June. The respondents point to renewed activity and a return to growth in new orders. Nevertheless, the June figures for industry indicate a year-on-year decline of roughly the same size as a month earlier: 9.4%, versus 9.6% in May. Exports of goods declined by one-third year on year in Q2, while imports fell by 14%. Also according to the balance of payments statistics, turnovers in services decreased by a half or more. Exports of oil and oil products fell by one-half due to a 57% drop in the Urals oil price and a 10% reduction in oil output by agreement with OPEC+. The key rate was lowered to 4.5% on June 22. The Russian central bank left its forecast unchanged but admitted that Q2 may be worse than originally expected.



## II.7 Developing countries in the spotlight – Turkey

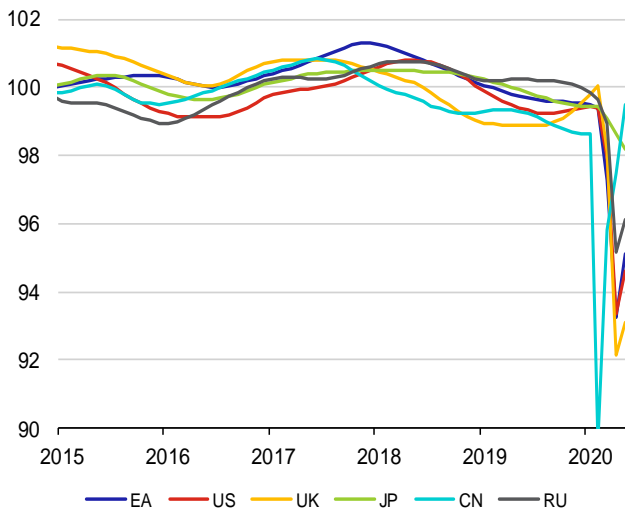
**The Turkish economy has barely recovered from the 2018 recession and now faces another large contraction caused by the unexpected global pandemic.** The economy was expected to grow by around 3% this year, but instead will contract by roughly 5% owing to the COVID-19 pandemic. The CF analysts are the most optimistic in this regard, predicting a downturn of 4.2% this year. The coronavirus not only shut down the Turkish economy, but also exposed it to the risk of an outflow of foreign capital, as the Turkish lira has weakened by 16% since the start of the year, which will adversely affect debt financing (about half of government debt is denominated in foreign currency). Paradoxically, however, a record amount of foreign capital (almost USD 10 trillion overall) entered Turkey in March and April. As in other countries, the economy is recovering after the easing of restrictive measures, but this is going hand-in-hand with a renewed rise in the number of new cases and there is a risk of the pandemic resurging. The current situation has affected the labour market above all in terms of employment, which fell by 4.2 pp to 41.1% compared with January. At 12.8% in April, however, unemployment was lower than at the start of the year. The forward-looking PMI in manufacturing switched into the expansion band in June, reaching 53.9, but exports are recovering only very slowly. At the same time, Turkey has always benefited strongly from summer tourism, but this season will see a sharp decrease due to travel restrictions.

**Turkey is still struggling with high inflation, which reached 12.6% in June.** As part of its support measures, the central bank cut the repo rate, which is now at 8.25%, more than 4 pp below inflation. Real interest rates are thus more negative than in the euro area. In most countries, higher inflation is expected owing to expansionary fiscal policies. However, the Turkish central bank expects anti-inflationary pressures, caused by a lower oil price and weaker domestic demand, and predicts inflation of 7.4% at the end of this year. Retail sales dropped by 16.7% year on year in May, and household debt rose by 6% in June compared with May. The stock market has already returned to its pre-crisis levels.

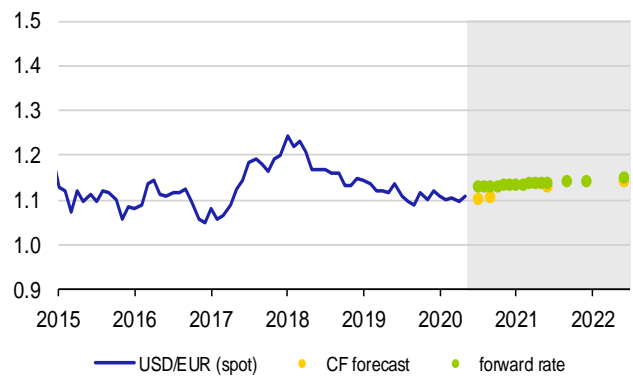


### III. Leading indicators and outlook of exchange rates

OECD Composite Leading Indicator

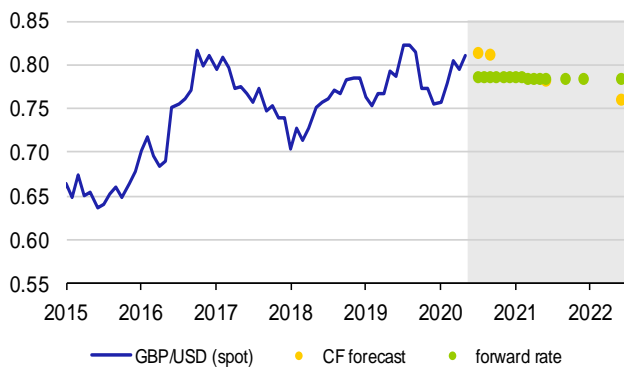


The US dollar (USD/EUR)



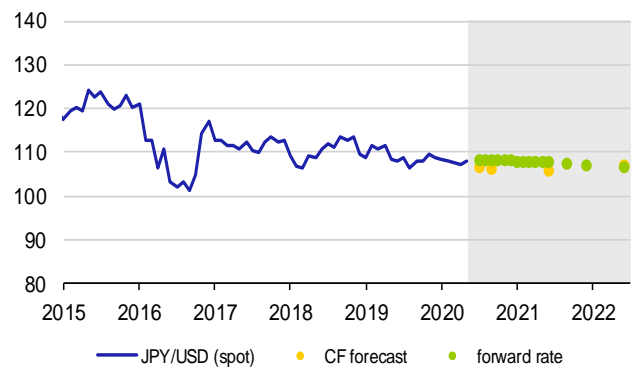
	8/6/20	7/20	9/20	6/21	6/22
spot rate	1.130				
CF forecast		1.105	1.106	1.129	1.144
forward rate		1.130	1.132	1.139	1.150

The British pound (GBP/USD)



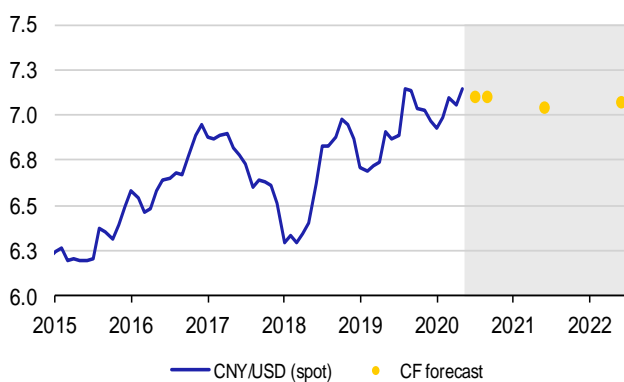
	8/6/20	7/20	9/20	6/21	6/22
spot rate	0.787				
CF forecast		0.814	0.811	0.782	0.760
forward rate		0.786	0.786	0.785	0.783

The Japanese yen (JPY/USD)



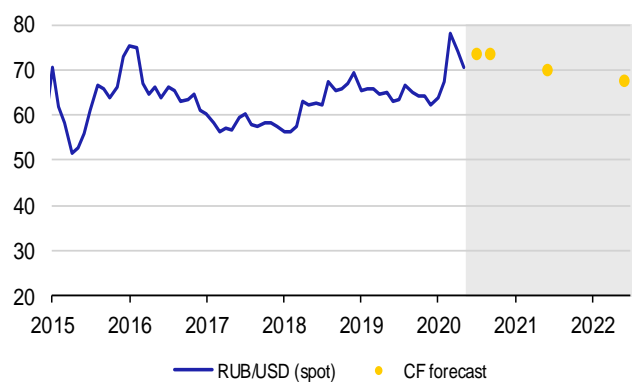
	8/6/20	7/20	9/20	6/21	6/22
spot rate	108.6				
CF forecast		106.8	106.1	106.0	107.2
forward rate		108.4	108.3	107.6	106.7

The Chinese renminbi (CNY/USD)



	8/6/20	7/20	9/20	6/21	6/22
spot rate	7.075				
CF forecast		7.097	7.099	7.038	7.068

The Russian rouble (RUB/USD)



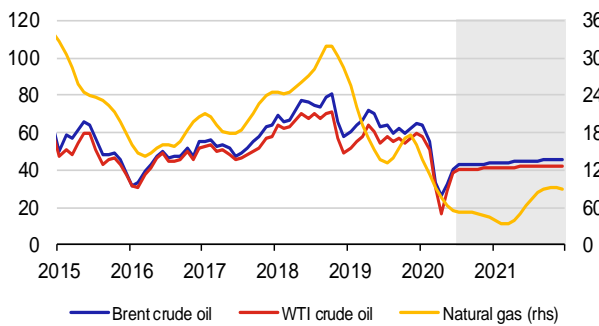
	8/6/20	7/20	9/20	6/21	6/22
spot rate	68.50				
CF forecast		73.51	73.30	69.93	67.56

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

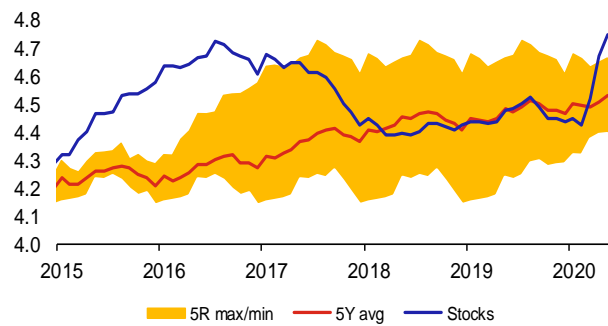
**The Brent crude oil price more than doubled compared with late April. However, the strong growth slowed in June after the price approached USD 40/bbl.** The rise in oil prices was driven by an unprecedented production cut by OPEC+ and by a decline in output in other countries due to low oil prices and limited storage capacity. Of course, rapidly recovering demand from China and other countries, which started to relax their anti-COVID-19 measures, also played a role. However, renewed growth in new cases of the disease around the world is causing concerns of a slowdown in growth in physical demand. Financial investors also remain cautious, and growth in their net long positions has eased. OPEC+ intends to gradually increase its oil production starting in August. Output will also probably start to rise moderately in the USA, where shale oil producers are reopening closed wells and bringing previously drilled but uncompleted wells into service. However, drilling activity is virtually at a standstill for now. Given the rapid natural decline in yields of shale wells, a further slight decrease in US production is therefore expected over the medium term. According to the EIA, global oil inventories will fall by 3.3 million barrels per day on average in the second half of this year and 1.1 million barrels per day next year. However, the EIA expects the Brent crude oil price to average just USD 41/bbl during the second half of 2020, as its growth will initially be dampened by high inventory levels and surplus production capacity. Next year, the oil price is expected to rise to USD 50/bbl on average (and USD 53/bbl by the year-end). The market situation will remain fragile until the COVID-19 pandemic is brought under control. Demand for aircraft fuel will remain muted for some time, growth in demand for petrol will be dampened by rising unemployment, and diesel consumption will depend on the course of the economic cycle.

**Outlook for prices of oil (USD/barrel) and natural gas (USD / 1000 m<sup>3</sup>)**

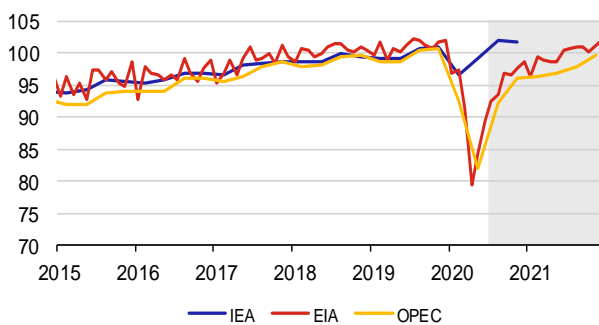


	Brent	WTI	Natural gas
2020	42.62 ↗	38.79 ↗	69.86 ↗
2021	44.80 ↗	41.88 ↗	64.77 ↗

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

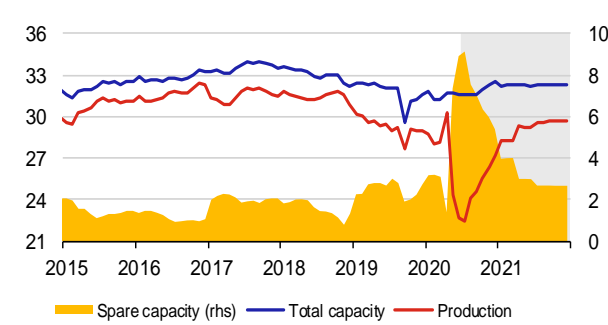


**Global consumption of oil and oil products (mil. barrel / day)**



	IEA	EIA	OPEC
2020	99.89 ↗	92.90 ↗	90.70 ↗
2021		99.88 ↗	97.70 ★

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



	Production	Total capacity	Spare capacity
2020	26.03 ↗	31.73 ↗	5.71 ↗
2021	29.19 ↗	32.27 ↗	3.08 ↘

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

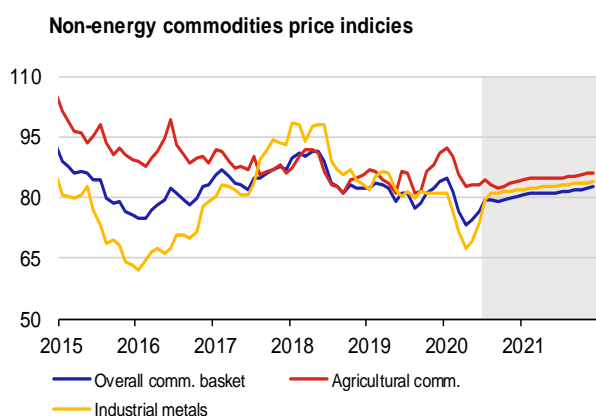
Note: Oil price at ICE, average gas price in Europe – World Bank data, smoothed by the HP filter. Future oil prices (grey area) are derived from futures and future gas prices are derived from oil prices using model. Total oil stocks (commercial and strategic) in OECD countries – IEA estimate. Production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

### IV.2 Other commodities

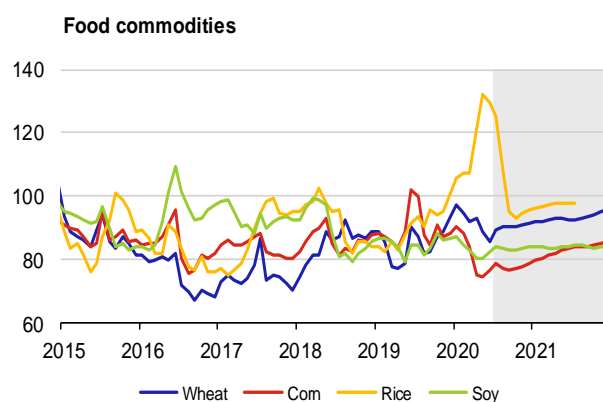
**Prices on commodity markets started returning to growth in May. The average price of natural gas in Europe edged up in June following six consecutive declines.** This was due to slower imports of LNG, which was no longer competitive in Europe at the prevailing prices. However, above-average gas inventories will prevent stronger price growth in the coming months. Coal prices also increased, first at the start and then at the end of June. However, growth in output in China and an expected decrease in imports to China in the second half of this year should prevent further growth in coal prices.

**The aggregate non-energy commodity price index rose in June and the first half of July, driven mainly by the industrial metals sub-index.** The latter was supported by the recovery of Chinese industry and improved financial market sentiment. Growth in copper, nickel and zinc prices, which had begun in late March, gathered pace in July. The copper price continued to be supported by falling stocks on the LME. A rising trend was also seen for aluminium, lead and tin prices from mid-May. Iron ore prices surged in May and early June and accelerated again in early July owing to rising steel production in China and a risk of restricted supply of Brazilian ore due to the spread of COVID-19 in Brazil's mines.

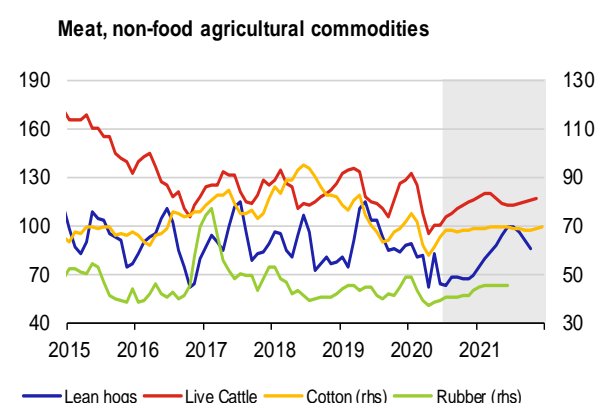
**The movements in the food commodity price sub-index were more mixed.** The decrease in wheat prices, which had started in early March, halted at the end of June and the wheat price rose sharply in early July. By contrast, corn and soy prices have been rising modestly since May. The rice price surged in late May and early June but then fell even more sharply. It then returned roughly to its May level in early July. Prices of sugar and coffee were broadly stable in June and the first half of July. Cocoa prices declined in late June and early July. Pork prices have been falling only slightly since mid-June, and the price of beef has also been relatively stable since June.



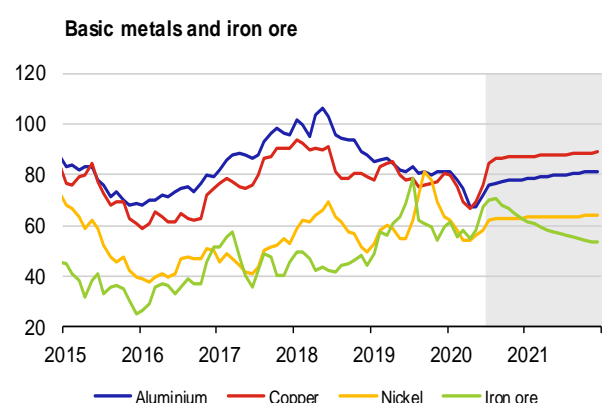
	Overall	Agricultural	Industrial
2020	78.7 ↕	84.8 ↘	77.1 ↗
2021	81.5 ↗	85.1 ↘	83.0 ↗



	Wheat	Corn	Rice	Soy
2020	91.3 ↘	79.7 ↘	109.7 ↗	83.3 ↗
2021	93.3 ↘	83.2 ↘	97.3 ↘	84.1 ↘



	Lean hogs	Live Cattle	Cotton	Rubber
2020	71.6 ↘	110.5 ↗	66.5 ↗	40.9 ↘
2021	88.9 ↘	115.7 ↗	68.8 ↗	45.2 ↘



	Aluminium	Copper	Nickel	Iron ore
2020	75.3 ↗	79.6 ↗	59.9 ↗	63.1 ↗
2021	80.0 ↗	88.0 ↗	63.5 ↗	56.8 ↗

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.

## Mortgage loan regulation instruments around the world<sup>1</sup>

The property market has been experiencing a long-running and seemingly endless boom. Until an unexpectedly strong adverse shock occurred in the form of the coronavirus pandemic, the situation in many countries had been assessed as a clear market overheating with overvalued property prices. Property prices are closely followed by households, the real estate sector and commercial banks as well as by supervisory and prudential authorities. The latter use the tools available to them to try to take the action necessary to ensure the stability of the financial system. Calm and sustainable property prices are crucial for such stability. This article provides a brief overview of the possible ways of regulating mortgage loans together with the arguments available in the – mostly still only emerging – academic literature.

### An introduction to macroprudential policy and an overview of its measures

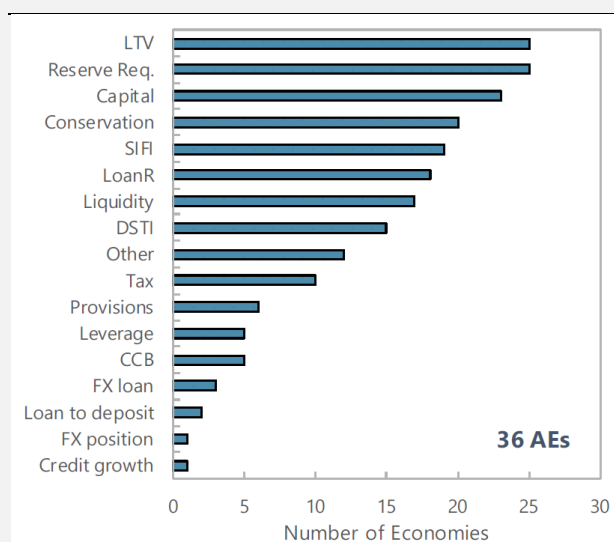
**Risks associated with credit growth and overvalued property prices may increase in times of sustained economic growth. Supervisory authorities can use macroprudential instruments to mitigate such risks.** The aim of such measures is to reduce risks to financial stability in a timely manner. According to the financial stability paradox, risks to financial stability arise mainly in periods of strong economic growth, when market participants tend to underestimate the risks they undertake. In such situations, asset prices often record excessive growth and become highly misaligned, and bubbles may even emerge. If assets are bought mostly on debt, the availability of which also rises, such bubbles may inflate quickly. Residential property is generally considered the most important asset in terms of its impacts on society and the public, financial institutions and financial market regulators. The 2008–2009 financial crisis caused a big drop in property prices in many countries, jeopardising the stability of financial institutions, which had large shares of loans secured by property on their balance sheets.<sup>2</sup> This recent experience supports general caution regarding the expected negative effects of the current pandemic, which could again be significant.

**Macroprudential policy works to ensure that financial institutions are sufficiently solvent and liquid even during crises. To this end, it applies measures to both financial institutions and borrowers.** Loan collateral measures come under solvency risk. They aim to ensure that there are sufficient resources to cover credit losses. Supervisory authorities thus endeavour to safeguard financial stability by mitigating the risks and making sure they are sufficiently covered.

The main macroprudential tools for mitigating risks in the banking sector, which provides the bulk of loans in the European economy, are capital requirements. They are set out in the Basel I–IV regulations, which are implemented in Europe via CRR/CDR IV.<sup>3</sup> In simplified terms, every reduction or elimination of risk costs a financial institution some of its own funds. Other instruments increasingly used by macroprudential policy are applied at the borrower level. These instruments, aimed at reducing borrower bankruptcy risk, do not have a unified legislative framework at the international level, but individual countries are gradually implementing them in their legal systems. This is also true of probably the most closely watched segment, namely loans secured by residential property, which are regulated in many countries around the world using limits on collateral value and borrowers' income.

**The range of macroprudential policy options is wide, with regulators most often using loan-to-value limits for loans secured by residential property.** A centralised overview of macroprudential measures can be found in the IMF's Macroprudential Policy Survey.<sup>4</sup> A complete and up-to-date overview for Europe can be found in the ESRB's Overview of

**Chart 1 – Use of macroprudential instruments in advanced economies**



Source: Alam et al. (2019), IMF Macroprudential Policy Survey  
Note: For 36 advanced countries as of December 2016.

<sup>1</sup> Authors: Petr Polák 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. We would like to thank, in particular, Jan Brůha, Dana Hájková, Zlataše Komárková, Petr Král and Jan Frait for discussions, suggestions and comments.

<sup>2</sup> The main problems were an inability and unwillingness to repay and simultaneously an inability to sell pledged properties in large numbers on the real estate market.

<sup>3</sup> The CRD IV directive and CRR II regulation will take effect in 2021.

<sup>4</sup> <https://www.elibrary-areaer.imf.org/Macroprudential/Pages/Home.aspx>; data available only until 2017. The IMF created the integrated Macroprudential Policy (iMaPP) database in 2019.

national macroprudential measures.<sup>5</sup> Chart 1 illustrates the use of macroprudential instruments in advanced economies. It is based on Alam et al. (2019), which also analyses the use of instruments in emerging market economies and, like Cerutti et al. (2017), stresses that advanced economies are most concerned about property market vulnerabilities, whereas emerging market economies are more worried about external shocks. External shocks include capital flow volatility and sharp exchange rate swings.

**In Europe, macroprudential instruments regulating mortgage loans are focused mainly on the property market.**

Hejlová et al. (2018) present an overview of risks and instruments intended primarily to mitigate the above risks, based on ESRB (2016). LTV is used for the risk associated with collateral value (property prices), LTI/DTI and LSTI/DSTI for the risk associated with income and consumers' ability to repay, and capital buffers and risk weight limits for the risk associated with institutions' credit portfolios and capitalisation. The first two risks must be covered with capital, and the third arises if there is a lack of capital. It might seem sufficient merely to cover the risk associated with the resilience of mortgage lenders, but that is not the case. A build-up of risks increases systemic risk, which might jeopardise the functioning of the entire financial system even if, at first glance, banks are sound (in terms of capital adequacy). Restrictions applied to loan applicants thus also aim to limit asset market misalignment and the emergence of property price bubbles.

**Measures focused on borrowers are set using LTV, LTI/DTI, LSTI/DSTI and loan maturity limits.** LTV (loan-to-value) implies that borrowers must use their own assets to make a down payment. This limits the incentive to default and therefore reduces the probability of default (PD), and also lowers the loss given default (LGD) that the bank may suffer in the event of a drop in property prices. This parameter is therefore very important from the lender's perspective, as it directly affects, among other things, the amount of capital the bank must hold to secure the loan. LTI (loan-to-income), or sometimes DTI (debt-to-income), monitors the ratio of total debt to income. Income directly determines how much the applicant may borrow and still be able to repay. It thus affects PD. LSTI (loan-service-to-income), or also DSTI (debt-service-to-income), focuses on the applicant's cash flow, i.e. the ability to repay regularly. The applicant has other expenditures in addition to debt obligations and must therefore have a financial buffer. This parameter also affects PD. Banks should ideally focus on the applicant's total debt, not only on the loan provided. DTI and DSTI caps are therefore crucial to risk management. Maximum loan maturity is also a commonly used instrument. The regular instalment amount decreases with increasing maturity, making it possible to circumvent the DSTI and LSTI limits. A maturity cap also forces the lender to take into account the expected future duration of the borrower's economic activity, which is a desirable factor.

**Caps on total debt prevent circumvention of the limits, but banks have to share information in order to introduce them.** Mortgages are usually regulated using LTV and DSTI, but some countries (Denmark, Ireland and the UK) use LTI. The "L" ratios pertain to the given loan only. It therefore makes sense to speak of LTV, as a mortgage loan is secured by the specific property relating to the loan. However, the borrower may have other loans and may borrow again to make the down payment. The "D" ratios focus on applicants' total debt and therefore take all their loans into account. DSTI is therefore the second most frequently used indicator. A functioning credit register where banks and non-bank lenders can enter and share the relevant data is very important for determining the applicant's total debt and instalments.

**What do academics say about the effectiveness of macroprudential measures?**

Macroprudential measures started to be used in the early 1990s (Alam et al., 2019), i.e. they were in use before the institutional macroprudential policy framework was established. Since then, the number of countries introducing such measures has been rising gradually. The number of studies examining the effect of these measures, especially on the property market, has been rising in parallel. Like Galán and Lamas (2019), we can classify them according to their nature roughly as follows: (i) those that focus on the effectiveness of the measures, (ii) those that focus on the probability of default and its determinants, and (iii) those that focus on the implementation of the measures. Those that focus on effectiveness mostly study countercyclicality (the effect on growth in loans or property prices over the cycle), household indebtedness and the default rate (i.e. the financial stability area). Studies in second category examine what properties of a loan or household behaviour lead to default. These include indicators targeted by macroprudential policy. The third group comprises studies examining what affects the introduction of such measures, when and with what settings they are effective, or what their side-effects are.

**Introducing and tightening caps reduces demand for loans and property.** BIS (2012) states that a tightening causes lending to fall and saving to rise. However, it is unclear whether the fall in lending is temporary, with applicants postponing the property purchase until they have sufficient savings, or permanent. However, other studies find more permanent impacts. Using a panel of 49 countries over a period of ten years, Lim et al. (2011) found that LTV and DTI caps effectively restrict the cyclicality of lending. Other studies, such as Igan and Kang (2011) analysing the situation in Korea, conclude that LTV and DTI caps have a restrictive effect on property price growth and the number of property market transactions. They also curb expectations and speculative incentives. Wong et al. (2011) state that LTV limits reduce the default rate. Kuttner and Sim (2016) estimate the effects of DSTI and LTV tightening on a panel of 57 countries. A tightening of a limit (regardless of its level) lowers the real credit growth rate by 4–6 pp on average over four quarters, but only for DSTI,

<sup>5</sup> [https://www.esrb.europa.eu/national\\_policy/html/index.en.html](https://www.esrb.europa.eu/national_policy/html/index.en.html)

whereas LTV has no effect on credit growth. According to this study, housing-related taxes slow housing credit and price growth. Carreras et al. (2018) confirm the restrictive effect of LTV and DTI caps on growth in credit and property prices using a sample of 19 OECD countries. Richter et al. (2019) use a panel of 53 countries to demonstrate the effects on GDP, credit and property prices. A 10 pp LTV tightening led to a decrease in real GDP of 0.5% after two years and 1.1% after four years, a reduction in loans to households for house purchase of more than 5% after two years, and a decline in property prices. The authors therefore compare an LTV tightening of this magnitude to an interest rate increase of roughly 0.25 pp. Using a sample of 46 countries, Morgan et al. (2019) find a reduction in credit growth after the introduction of LTV caps.

**The effect of tightening LTV and DTI limits on client interest rates is regarded as secondary and has hardly been discussed in the literature so far, as caps are assumed to have no direct effect on the cost of funds (BIS, 2012).** In principle, introducing caps could cause rates to go down, as they affect the riskiest clients, to whom banks assign a higher risk premium. At the same time, restricting demand fosters stronger competition among lenders.

### Introduction of measures around the world

**Hong Kong was one of the first countries to use an LTV limit as a macroprudential instrument.** Wong et al. (2011) describe the LTV experience in Hong Kong. LTV was capped 70% in 1995. However, this level had been applied voluntarily by banks since 1991. Before that, the maximum LTV had been 90%. The cap was effective in limiting the decline in property prices that started in autumn 1997 due to the Asian financial crisis and ended in 2003 (see Chart 2). Since then, Hong Kong has both tightened and relaxed this regulation. Currently, the limits depend on the price of the property – those for more expensive properties are stricter. The latest tightening took place in spring 2017. The “softest” LTV value, applied to first mortgages for personal use with a maximum loan amount of HK\$5 million, is 60%. The strictest limit, applied to certain types of commercial projects, is 20%.

**The 2008 financial crisis, which was closely linked with house purchase loans, prompted calls for broader use of macroprudential instruments, especially collateral limits.**

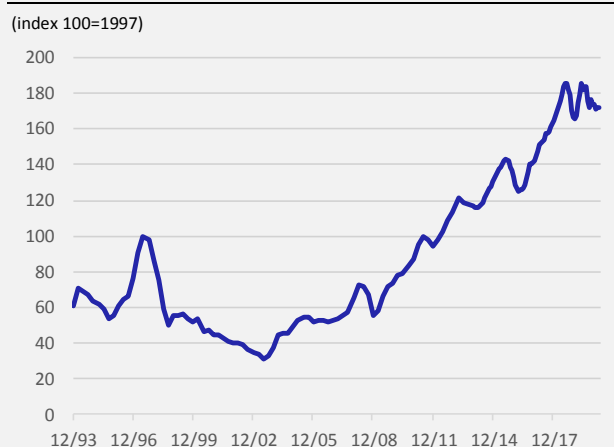
Before the financial crisis, very few countries had implemented such measures – only Hong Kong, South Korea, Malaysia and Singapore. According to the IMF’s Macroprudential Policy Survey, a total of 55 countries had introduced LTV caps by 2018. The lessons learned from the financial crisis were also visible on the US property market, where mortgage LTV caps are now in place just like in other countries. Loans with an LTV of more than 80% usually require insurance.

**Insurance of loans exceeding certain LTV levels is also common in other countries.** Among large advanced economies besides the USA, examples include Canada and Australia. These two countries require insurance of loans with an LTV of more than 80%. The use of mortgage insurance also eliminates systemic risk, as the potential losses are shared between the banking sector and the insurance sector. Wong et al. (2011), analysing the situation in Asia, emphasise that loan insurance programs suitably complement collateral limits.

**The first country to introduce caps in Europe was Latvia in 2007, followed by Norway and Sweden three years later.** Latvia capped the LTV on new loans at 90% and has applied this ratio ever since. Norway also started at 90% but subsequently lowered the level. Sweden introduced an LTV limit of 85%, which still applies. In 2011, Romania and Lithuania became the first European countries to introduce caps on instalments relative to income. The Lithuanian measure stipulates a maximum DSTI of 40% of net income and is still in place. Ireland, which recorded a slump in property prices during the financial crisis and a subsequent rise in the default rate, introduced LTV and LTI caps with effect from 2015. Since then it has fine-tuned the measure, but the key LTV and LTI caps are unchanged. Cyprus, Austria and Slovenia are the strictest countries in Europe, each with an LTV cap of 80%. Not all countries apply caps to borrowers. Interestingly, none of the large European countries (Germany, Spain, Italy, France and the UK) uses an LTV cap, and only the UK limits LTI, though it does so in the form of a permitted amount in excess of a certain level rather than a cap.

**The gradual introduction of regulatory measures around the world enables countries to learn from each other’s experience.** The assessment of the measures introduced and above all of their calibration depends on the quality and availability of information. A great deal of information on loan riskiness can be drawn from Ireland’s experience, as it has very detailed data on loans provided and their history. Hallissey et al. (2014) find that the probability of default is affected by LTI at the time of loan origination and the loss given default depends on LTV at origination. These empirical data confirm the expected and targeted links in lending.

Chart 2 – Property prices in Hong Kong



Source: HKMA, Wong (2011), Tradingeconomics, Centaline Property Agency Ltd., Hong Kong



The form of implementation of the rules is also important, as they are not enforceable by law in every country. In most European countries that use some form of regulation, the rules are incorporated into national law (see Table 1). The largest number of countries limit LTV, followed by DSTI and maturity. A minimal number of countries limit LTI.

**Tabulka 1 – Overview of measures incorporated into national law in European countries**

Country	AT	CY	CZ	DK	EE	FI	HU	IS	IE	LT	LI	LT	MT	NL	NO	PL	PT	RO	SK	SL	SE	UK
<b>LTV</b>		x		x	x	x	x	x	x	x	x			x	x	x	x	x	x			x
<b>LTI</b>									x						x							
<b>DSTI</b>		x			x		x					x				x	x	x	x	x		x
<b>Maturity</b>					x							x				x	x	x	x	x		x

Source: ESRB

### Ways of setting caps – structurally or cyclically?

**The cyclical approach to setting caps means that the regulations adapt to the cycle and try to lean against it and thereby smooth it.** So, the caps are tightened in periods of excessive risk-taking, and macroprudential policy may conversely be eased in periods when banks are adequately managing the risks. In addition, property prices are cyclical, which is an argument for setting the LTV limit in a cyclical manner. At the same time, academic studies using DSGE models show that if LTV is adapted in response to the business or financial cycle, it helps stabilise not only financial, but also real variables (see, for example, Christensen and Meh, 2011; Rubio and Carrasco-Gallego, 2014; Tobias and Luisa, 2019).

**The structural approach assumes it is unnecessary to set caps cyclically, as the instrument should work constantly.** According to this view, stable rules have a positive effect on the expectations of all market participants and set clear lines in the sand that should never be crossed regardless of the current situation. This involves general, transparent, constant and comprehensible rules for the “playing field” and a stronger assumption that frequent and inaccurate interventions are more likely to destabilise the economy than stabilise it. To use mathematical terminology, the LTV ratio should be a necessary but not sufficient condition for being granted a mortgage loan. For lenders, predictable caps facilitate risk control. Fixed caps send out a clear signal about what income situation and own funds applicants should have before being granted a loan. For example, de Araujo et al. (2019) show that the introduction of a limit fostered less risky behaviour by loan applicants.

**The question is whether rules should be set on the basis of a model or group of models, or by expert judgement.** A model-based or technical approach may not capture everything and can only be calibrated using the available data, i.e. based on the past. If a systemic change is under way, the model may not take it into account, and as macroprudential policy should mainly be forward-looking, expert judgement should also be used. A mechanistic, model-based LTV limit based on property price misalignment (overvaluation/undervaluation) sounds logical, but the key problem is the ability to capture the true overvaluation, as market participants trade at prices they voluntarily accept. Since prices are set by the market and depend on both demand and supply, overvaluation is very difficult to quantify and a decent estimate is the best that can be achieved (see, for example, Anderle and Plašil, 2019). We should also mention that property price data are reported with a visible lag, at insufficient frequency (often quarterly) and with a lack of detail. In reality, the decision-making – regardless of its degree of transparency – is not black-and-white; it very likely involves a mix of model-based and expert approaches, like, for example when setting monetary policy.

**Prudential authorities usually are not fully transparent in setting and calibrating their macroprudential measures concerning borrower limits, so it is unclear which approach (cyclical or structural, model-based or expert judgement) they prefer.** It is in fact impossible to find individual institutions’ methodologies for setting LTV, LTI, DTI, DSTI or LSTI caps, as the large majority of regulators do not disclose them. However, there are a few exceptions, including Ireland, Romania and the Czech Republic. Ireland’s approach to setting LTV and LTI limits is described in Cassidy and Hallissey (2016), Romania’s approach to setting DSTI limits is set out in IMF (2018) and the Czech Republic’s approach to LTV is outlined by Hejlová et al. (2018). We should add that these documents do not give the exact wording or definition of the rules, but only partly reveal the methods used by the institutions concerned. Unfortunately, institutions’ preferred approaches are not fully clear from their communications either, as regulators’ official statements and documents often use formulations like “analyses using microdata were performed to determine the safe thresholds”. For example, Poland’s description of the introduction of an LTV ratio states that the choice of the 80% limit was discretionary and not based on a specific methodology, although this threshold is commonly used for the property market (see Bierut et al., 2015).

**The current crisis may partly reveal which approaches individual countries *de facto* prefer.** The non-public nature of the calibrations means that the approach can only be deduced from the history of changes made to the limits. So far, that history shows that only some countries change their caps regularly, doing so more frequently upon their introduction, when they need to reach a target position and prefer to do so gradually rather than in a single jump. However, we need more time to make a better assessment, as many countries have yet to experience a significant economic contraction. Most countries

have still to go through an entire cycle with macroprudential instruments and learn how to use them appropriately. The reaction of monetary policy to changes in inflation is symmetrical, but so far we do not know the nature of the response in the case of macroprudential policy and the financial cycle.

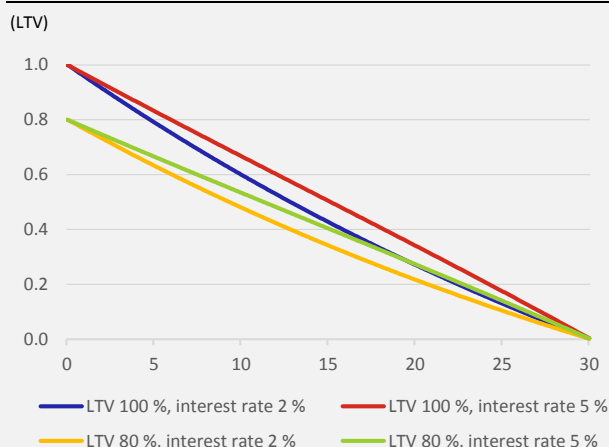
### Box 1 – Mortgage loan risk from the LTV perspective

**Macroprudential policy should aim to limit risk to a “sound” level, not to eliminate it entirely.** The principle for setting LTV, DSTI and DTI caps is to limit highly risky loans, i.e. loans that lead to losses significantly exceeding the capital allocated. The LTV ratio is therefore crucial from the perspective of the resulting loss, as a high LTV (a small down payment) means a higher loss given default. The size of the loss depends logically on the current level of property prices. Assuming that the value of a property is given by its market price, the value of 1-LTV indicates how large a decrease in price can take place without a credit loss occurring in the event of default. If the property market is overheating and excessive price growth is generating property price overvaluation, a larger price decrease and, in turn, larger losses may occur in the event of an economic downturn. Theoretically, then, the LTV value could be derived from property price overvaluation.

**Secured loans are riskiest at origination and the risk of loss falls over time.** Chart 3 illustrates a simulation in which we assume a maturity of 30 years and annual property price growth of 2%, i.e. the inflation rate.

In addition, we assume two initial LTV levels – 100% and 80%. For each level of collateral, we assume two interest rates – 2% and 5%. For simplicity, we consider the loan to be “safe” at the moment its LTV reaches 60%. At that moment, property prices can fall by more than one-third and the collateral will still be sufficient to cover the outstanding amount of the loan. The simulation indicates that if the initial LTV is 80% and the interest rate 2%, this situation will occur in six years. With a higher interest rate of 5%, it will arise in just under eight years. However, if the initial LTV is 100%, it takes the loan ten years to reach an LTV of 60% at a 2% rate and as long as twelve years at a 5% rate. If property prices increase faster, for example by 5% a year, the loan will move from an initial LTV of 80% to 60% in about four years.

Chart 3 – Model-based evolution of LTV over time



Note: This example assumes a maturity of 30 years and annual property price growth of 2%.

### Conclusion

**Detailed, high-quality data on households are necessary to set loan ratios using quantitative analysis.** The literature uses aggregated data or detailed data on loans provided to demonstrate the effects. Detailed data on new loans are very useful in quantifying the risk entering banks' balance sheets. However, if macroprudential measures are already in place, these data can be used to only a limited extent to estimate the effects. As the experience of several countries shows, market participants adapt to the conditions. So, if LTV caps are tightened, for example, new loans do not necessarily decrease sharply.

**Most European countries have already introduced certain limiting rules for the provision of loans secured by residential property.** Interestingly, however, none of the large countries (Germany, France, Italy, Spain and the UK) has an LTV limit.

**The limits can be set in various ways depending on their perceived nature – cyclical or structural.** In some countries, different limits are applied to different parts of the country, usually the capital or large cities versus the rest of the country.

**Unfortunately, the public debate about the approach to setting regulatory limits and their nature is still in its early days.** Institutions calibrate and set the limits mainly internally, and we have not found a broader debate in the academic community either. There are substantive arguments on both sides, and the approach one supports is a matter of opinion. At the same time, most countries are still going through their first cycle of using macroprudential instruments and learning how to apply them.

**Macroprudential measures are aimed at reducing, not completely erasing risks in the financial sector, but they also affect the real sector.** The academic studies we found monitor the impacts of measures mainly on the financial sector and devote very limited space to the impacts on the real sector. Studies that discuss the impacts on the real sector primarily use model-based approaches to setting caps and determining the transmission of their effects. Further research in this direction is highly desirable, because in the Czech Republic, for example, the limits are set by the institution simultaneously responsible for monetary policy.

## References

- Alam, Z., Alter, A., Eiseman, J., Gelos, G., Kang, H., Narita, M., Nier, E., & Wang, N. (2019). Digging deeper – Evidence on the effects of macroprudential policies from a new database. International Monetary Fund.
- Andrle, M., & Plašil, M. (2019). Assessing house prices with prudential and valuation measures (No. 19/59). International Monetary Fund.
- Bierut, B. K., Chmielewski, T., Glogowski, A., Stopczyński, A., & Zajączkowski, S. (2015). Implementing loan-to-value and debt-to-income ratios: Learning from country experiences. The case of Poland. National Bank of Poland Working Paper 212.
- BIS (2012). Operationalising the selection and application of macroprudential instruments. CGFS Papers, No. 48.
- Carreras, O., Davis, E. P., & Piggott, R. (2018). Assessing macroprudential tools in OECD countries within a cointegration framework. *Journal of Financial Stability*, 37, 112–130.
- Cassidy, M., & Hallissey, N. (2016). The introduction of macroprudential measures for the Irish mortgage market. *Economic and Social Review*, 47(2, Summer), 271–297.
- Cerutti, E., Correa, R., Fiorentino, E., & Segallad, E. (2017). Changes in prudential policy instruments – A new cross-country database. *International Journal of Central Banking*, 13(2), 477–503.
- Claessens, S. (2015). An overview of macroprudential policy tools. *Annual Review of Financial Economics*, 7, 397–422.
- de Araujo, D. K. G., Barroso, J. B. R. B., & Gonzalez, R. B. (2019). Loan-to-value policy and housing finance: Effects on constrained borrowers. *Journal of Financial Intermediation*, 42, 100830.
- ESRB (2013). Recommendation of the ESRB on intermediate objectives and instruments of macro-prudential policy. ESRB/2013/1.
- ESRB (2016). Vulnerabilities in the EU Residential Real Estate Sector, November 2016.
- Galán J. E., & Lamas, M. (2019). Beyond the LTV ratio: New macroprudential lessons from Spain. Documentos de trabajo/Banco de España, 1931.
- Hallissey, N., Kelly, R., & O'Malley, T. (2014). Macro-prudential tools and credit risk of property lending at Irish banks. *Economic Letters* 10/EL/14, Central Bank of Ireland.
- Hejlová, H., Holub, L., & Plašil, M. (2018). The introduction and calibration of macroprudential tools targeted at residential real estate exposures in the Czech Republic. *Financial Stability Report 2017/2018*, 126–135.
- Igan, D., & Kang, H. (2011). Do loan-to-value and debt-to-income limits work? Evidence from Korea. IMF Working Papers, WP/11/297.
- IMF (2018). Technical note – Calibration of a debt service-to-income limit in Romania – Evidence from microdata. IMF Country Report No. 18/161.
- Kuttner, K. N., & Shim, I. (2016). Can non-interest rate policies stabilize housing markets? Evidence from a panel of 57 economies. *Journal of Financial Stability*, 26, 31–44.
- Lim, C., Columba, F., Costa, A., Kongsamut, P., Otani, A., Saiyid, M., Wezel, T., & Wu, X. (2011). Macroprudential policy: What instruments and how to use them? Lessons from country experiences. IMF Working Papers, WP/11/238.
- Morgan, P. J., Regis, P. J., & Salike, N. (2019). LTV policy as a macroprudential tool and its effects on residential mortgage loans. *Journal of Financial Intermediation*, 37, 89–103.
- Richter, B., Schularick, M., & Shim, I. (2019). The costs of macroprudential policy. *Journal of International Economics*, 118, 263–282.
- Rubio, M., & Carrasco-Gallego, J. A. (2014). Macroprudential and monetary policies: Implications for financial stability and welfare. *Journal of Banking & Finance*, 49(C), 326–336.
- Schuler, T., & Corrado, L. (2019). Financial cycles, credit bubbles and stabilization policies. Working Paper Series 2336, European Central Bank.
- Tzur-Ilan, N. (2018). LTV limits and borrower risk. Bank of Israel Working Papers 2018.12, Bank of Israel.
- Wong, E. & Fong, T. & Li, K. & Choi, H. (2011). Loan-to-value ratio as a macro-prudential tool – Hong Kong's experience and cross-country evidence. Working Papers 1101, Hong Kong Monetary Authority.

**Keywords**

Property market, regulation, financial crisis

**JEL classification**

G01, G28, R30

## A1. Change in predictions for 2020

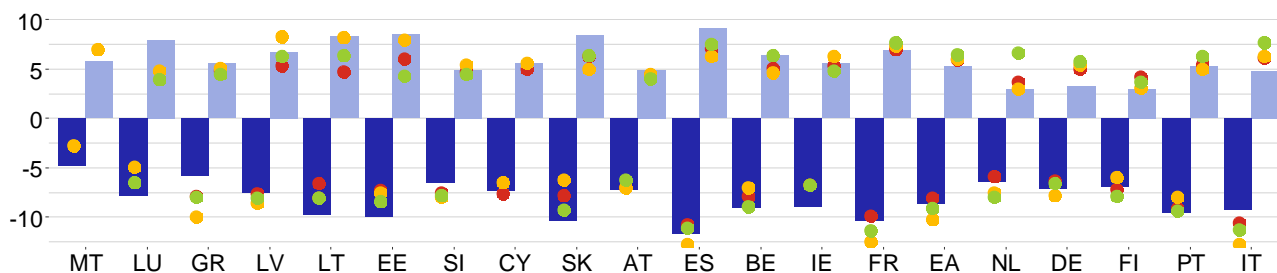
	GDP growth, %				Inflation, %			
	CF	IMF	OECD	CB / EIU	CF	IMF	OECD	CB / EIU
EA	+0.3 2020/7 2020/6	-2.7 2020/6 2020/4	-9.9 2020/6 2020/3	-9.5 2020/6 2020/3	+0.1 2020/7 2020/6	-1.2 2020/4 2019/10	-0.7 2020/6 2019/11	-0.8 2020/6 2020/3
US	+0.3 2020/7 2020/6	-2.1 2020/6 2020/4	-9.2 2020/6 2020/3	-8.5 2020/6 2019/12	0 2020/7 2020/6	-1.7 2020/4 2019/10	-0.6 2020/6 2019/11	-1.1 2020/6 2019/12
UK	-0.2 2020/7 2020/6	-3.7 2020/6 2020/4	-12.3 2020/6 2020/3	-14.8 2020/5 2020/1	-0.1 2020/7 2020/6	-0.7 2020/4 2019/10	-1.5 2020/6 2019/11	-0.9 2020/5 2020/1
JP	+0.2 2020/7 2020/6	-0.6 2020/6 2020/4	-6.2 2020/6 2020/3	-4.9 2020/4 2020/1	+0.1 2020/7 2020/6	-1.1 2020/4 2019/10	-1.4 2020/6 2019/11	-1.5 2020/4 2020/1
CN	+0.3 2020/7 2020/6	-0.2 2020/6 2020/4	-7.5 2020/6 2020/3	+0.4 2020/6 2020/6	-0.2 2020/7 2020/6	+0.6 2020/4 2019/10	+1.6 2020/6 2019/11	-0.3 2020/6 2020/6
RU	-0.2 2020/6 2020/5	-1.1 2020/6 2020/4	-9.2 2020/6 2020/3	0 2020/6 2020/4	-0.2 2020/6 2020/5	-0.4 2020/4 2019/10	-1.1 2020/6 2019/11	0 2020/6 2020/4

## A2. Change in predictions for 2021

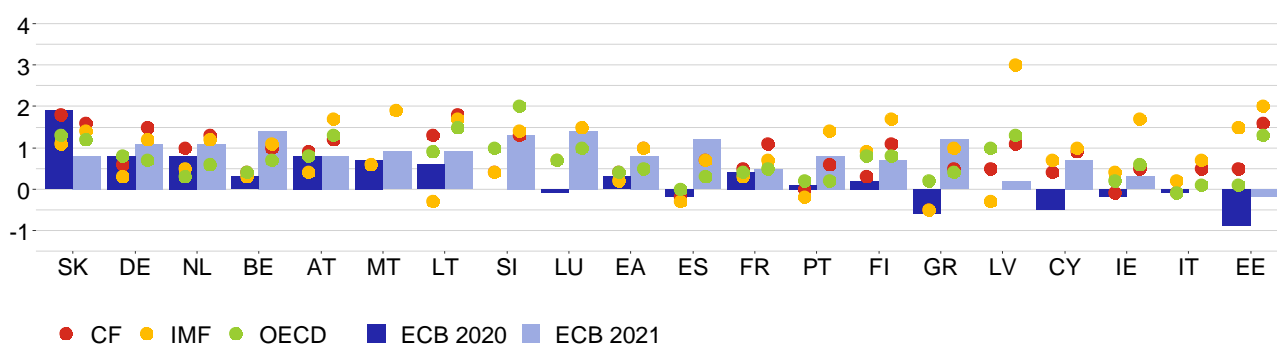
	GDP growth, %				Inflation, %			
	CF	IMF	OECD	CB / EIU	CF	IMF	OECD	CB / EIU
EA	+0.3 2020/7 2020/6	-2.7 2020/6 2020/4	-9.9 2020/6 2020/3	-9.5 2020/6 2020/3	+0.1 2020/7 2020/6	-1.2 2020/4 2019/10	-0.7 2020/6 2019/11	-0.8 2020/6 2020/3
US	+0.3 2020/7 2020/6	-2.1 2020/6 2020/4	-9.2 2020/6 2020/3	-8.5 2020/6 2019/12	0 2020/7 2020/6	-1.7 2020/4 2019/10	-0.6 2020/6 2019/11	-1.1 2020/6 2019/12
UK	-0.2 2020/7 2020/6	-3.7 2020/6 2020/4	-12.3 2020/6 2020/3	-14.8 2020/5 2020/1	-0.1 2020/7 2020/6	-0.7 2020/4 2019/10	-1.5 2020/6 2019/11	-0.9 2020/5 2020/1
JP	+0.2 2020/7 2020/6	-0.6 2020/6 2020/4	-6.2 2020/6 2020/3	-4.9 2020/4 2020/1	+0.1 2020/7 2020/6	-1.1 2020/4 2019/10	-1.4 2020/6 2019/11	-1.5 2020/4 2020/1
CN	+0.3 2020/7 2020/6	-0.2 2020/6 2020/4	-7.5 2020/6 2020/3	+0.4 2020/6 2020/6	-0.2 2020/7 2020/6	+0.6 2020/4 2019/10	+1.6 2020/6 2019/11	-0.3 2020/6 2020/6
RU	-0.2 2020/6 2020/5	-1.1 2020/6 2020/4	-9.2 2020/6 2020/3	0 2020/6 2020/4	-0.2 2020/6 2020/5	-0.4 2020/4 2019/10	-1.1 2020/6 2019/11	0 2020/6 2020/4

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

GDP growth in the euro area countries in 2020 and 2021, %



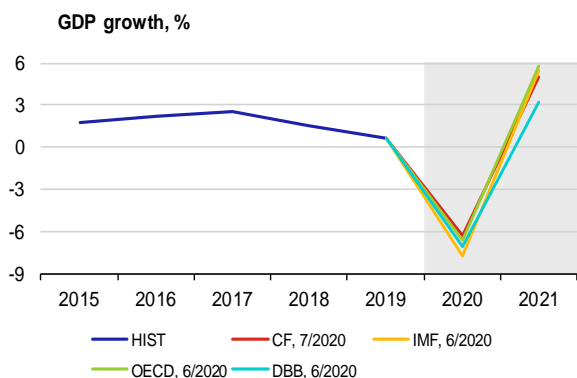
Inflation in the euro area countries in 2020 and 2021, %



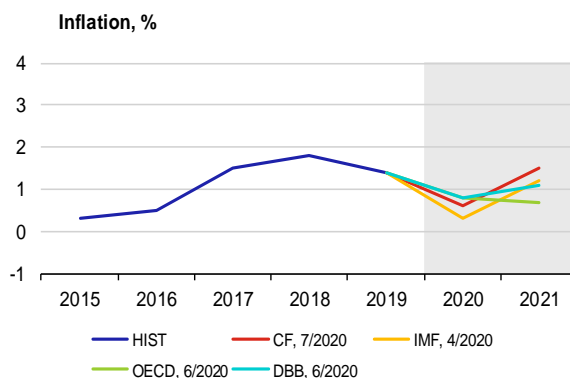
Note: Charts show institutions' latest available outlooks of for the given country.

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

#### Germany

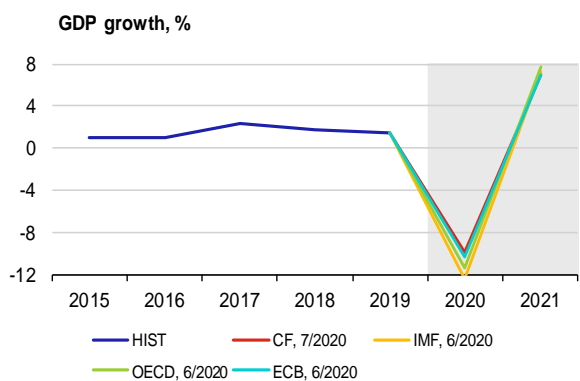


	CF	IMF	OECD	DBB
2020	-6.3	-7.8	-6.6	-7.1
2021	5.0	5.4	5.8	3.2

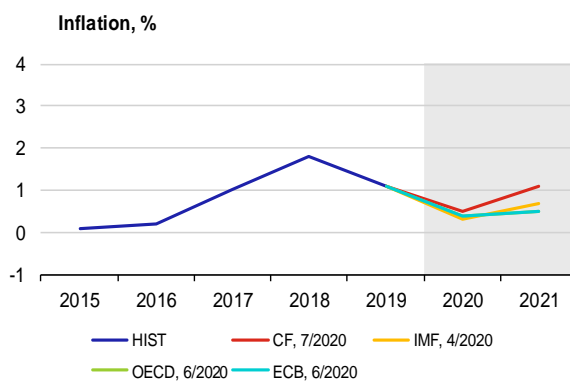


	CF	IMF	OECD	DBB
2020	0.6	0.3	0.8	0.8
2021	1.5	1.2	0.7	1.1

## France

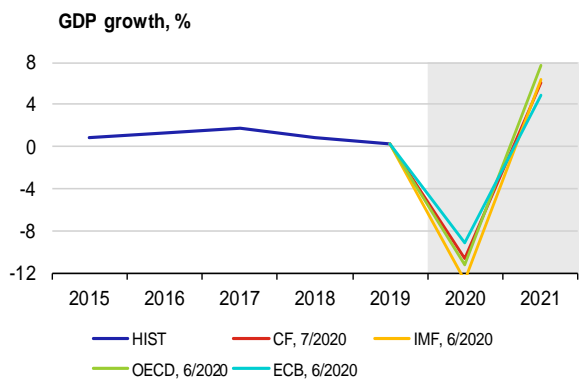


	CF	IMF	OECD	ECB
2020	-9.9	-12.5	-11.4	-10.3
2021	7.0	7.3	7.7	6.9

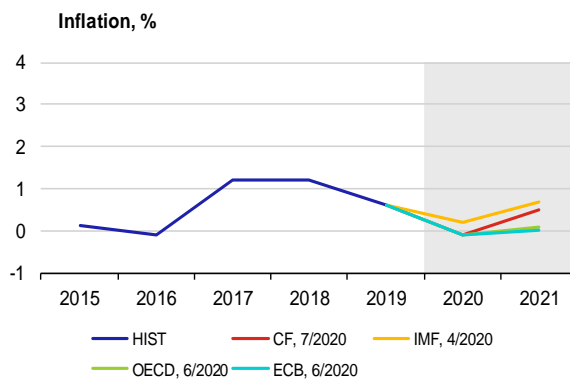


	CF	IMF	OECD	ECB
2020	0.5	0.3	0.4	0.4
2021	1.1	0.7	0.5	0.5

## Italy

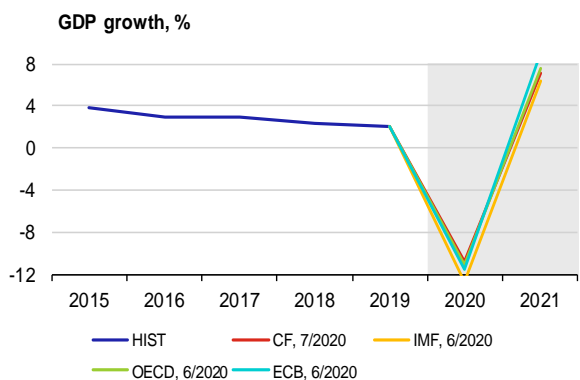


	CF	IMF	OECD	ECB
2020	-10.6	-12.8	-11.3	-9.2
2021	6.1	6.3	7.7	4.8

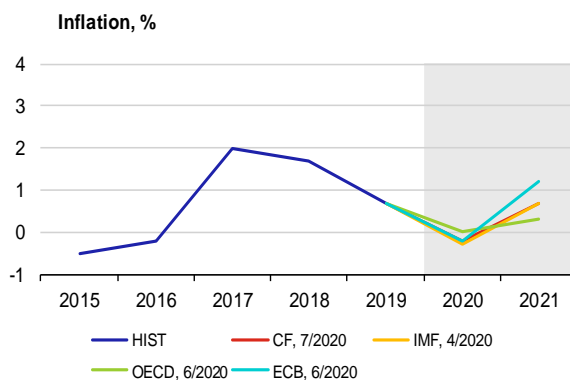


	CF	IMF	OECD	ECB
2020	-0.1	0.2	-0.1	-0.1
2021	0.5	0.7	0.1	0.0

## Spain

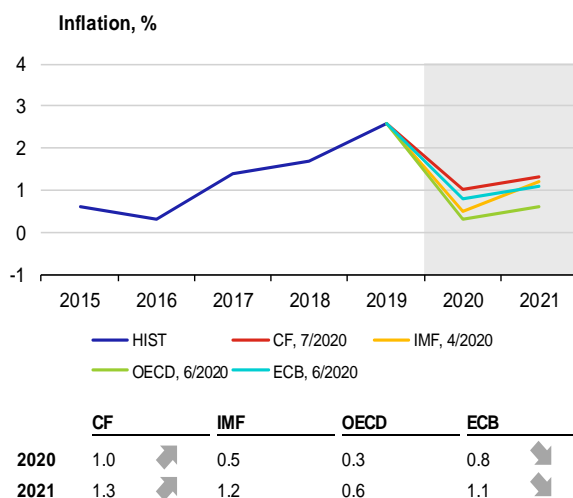
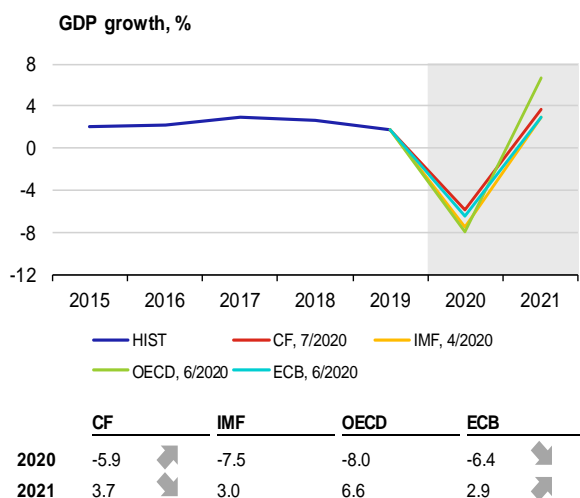


	CF	IMF	OECD	ECB
2020	-10.8	-12.8	-11.1	-11.6
2021	7.1	6.3	7.5	9.1

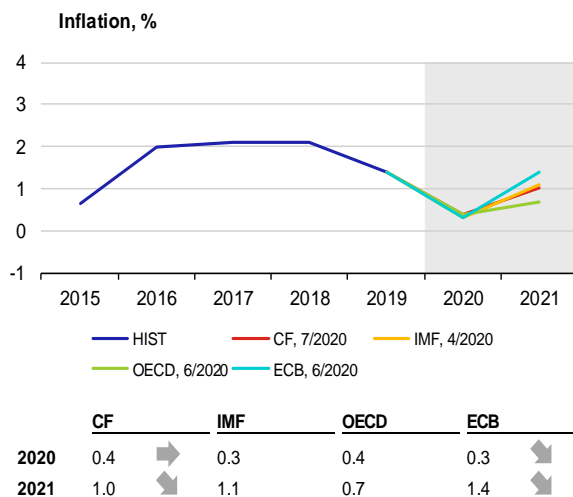
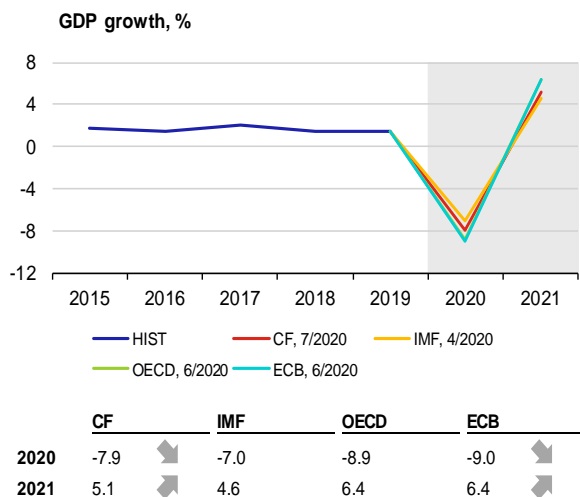


	CF	IMF	OECD	ECB
2020	-0.2	-0.3	0.0	-0.2
2021	0.7	0.7	0.3	1.2

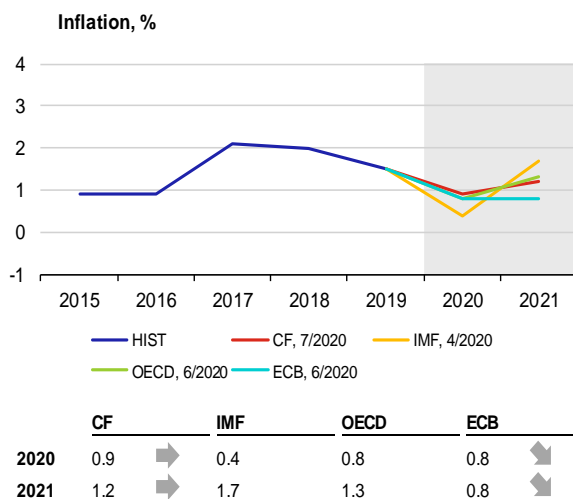
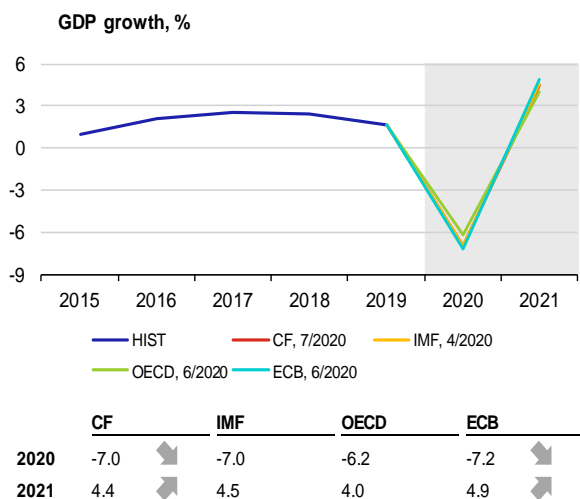
## Netherlands



## Belgium

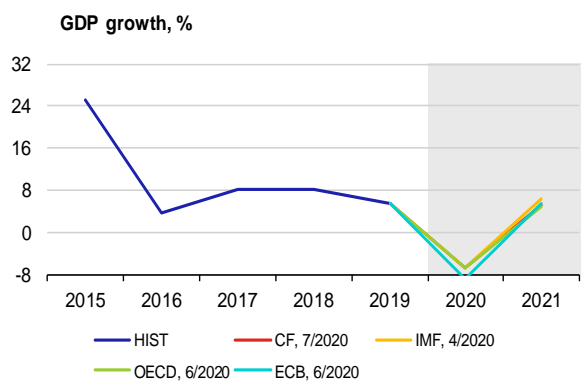


## Austria

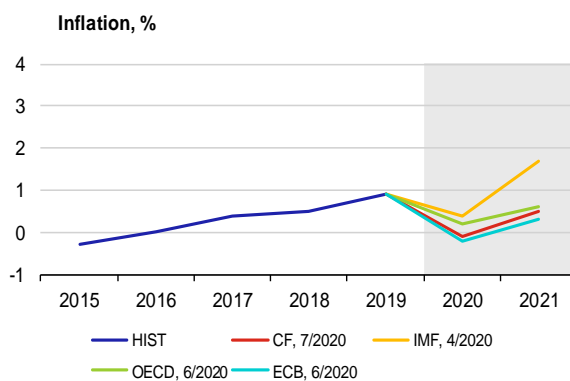




## Ireland

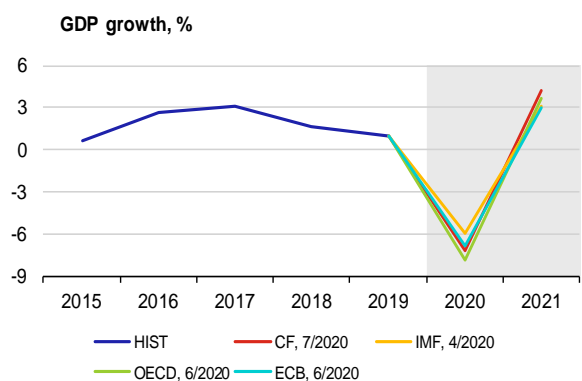


	CF	IMF	OECD	ECB
2020	-6.8	-6.8	-6.8	-8.9
2021	5.3	6.3	4.8	5.6

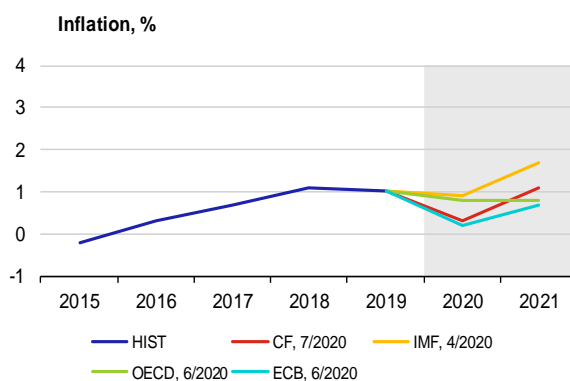


	CF	IMF	OECD	ECB
2020	-0.1	0.4	0.2	-0.2
2021	0.5	1.7	0.6	0.3

## Finland

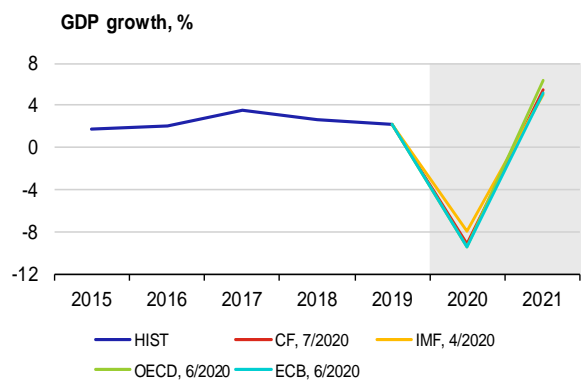


	CF	IMF	OECD	ECB
2020	-7.2	-6.0	-7.9	-6.9
2021	4.2	3.1	3.7	3.0

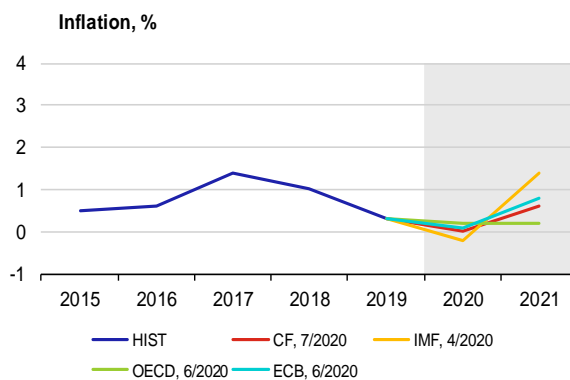


	CF	IMF	OECD	ECB
2020	0.3	0.9	0.8	0.2
2021	1.1	1.7	0.8	0.7

## Portugal

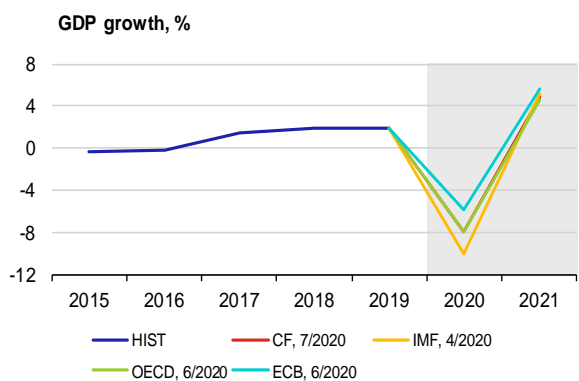


	CF	IMF	OECD	ECB
2020	-9.1	-8.0	-9.4	-9.5
2021	5.4	5.0	6.3	5.2

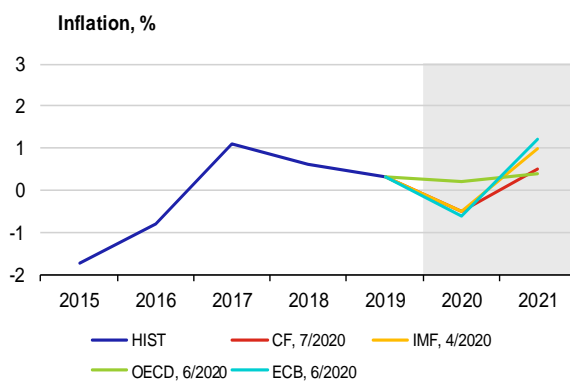


	CF	IMF	OECD	ECB
2020	0.0	-0.2	0.2	0.1
2021	0.6	1.4	0.2	0.8

### Greece

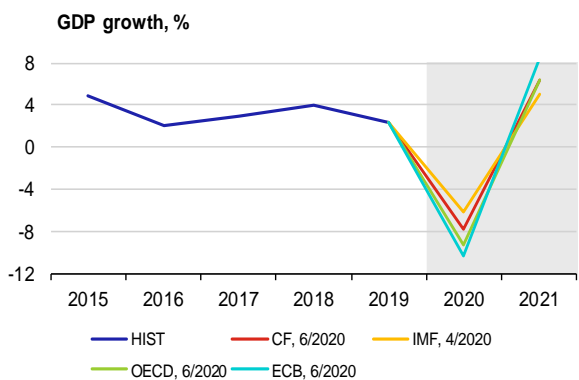


	CF	IMF	OECD	ECB
2020	-7.9	-10.0	-8.0	-5.8
2021	4.8	5.1	4.5	5.6

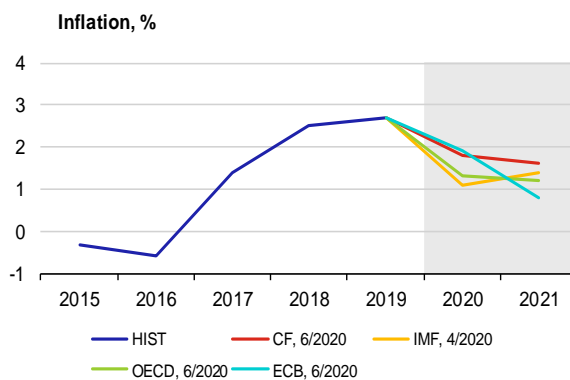


	CF	IMF	OECD	ECB
2020	-0.5	-0.5	0.2	-0.6
2021	0.5	1.0	0.4	1.2

### Slovakia

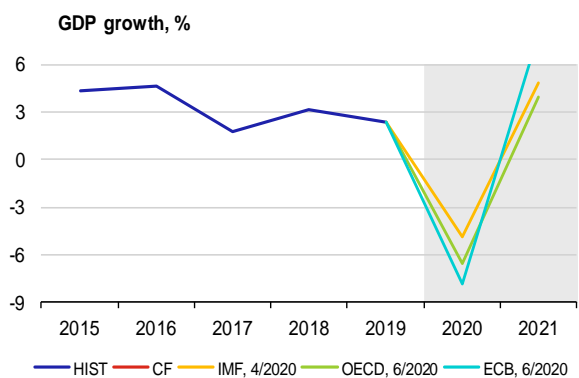


	CF	IMF	OECD	ECB
2020	-7.8	-6.2	-9.3	-10.3
2021	6.3	5.0	6.4	8.4

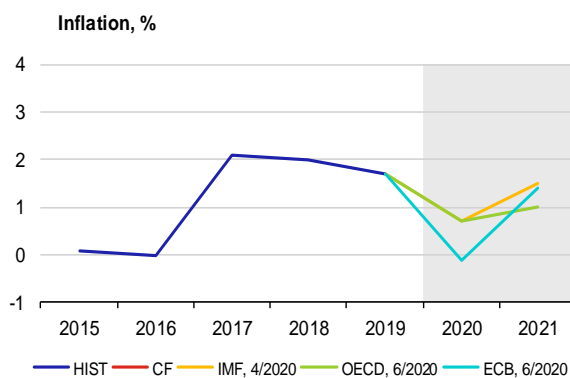


	CF	IMF	OECD	ECB
2020	1.8	1.1	1.3	1.9
2021	1.6	1.4	1.2	0.8

### Luxembourg

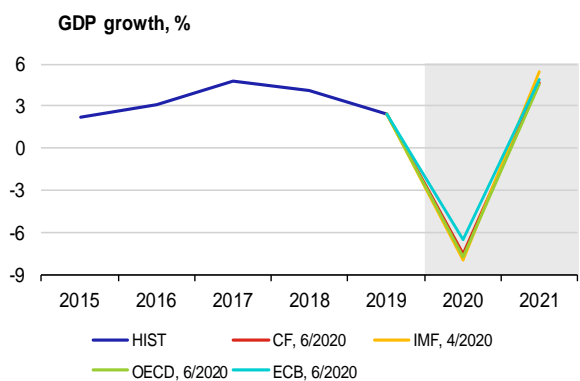


	CF	IMF	OECD	ECB
2020	n. a.	-4.9	-6.5	-7.8
2021	n. a.	4.8	3.9	7.9

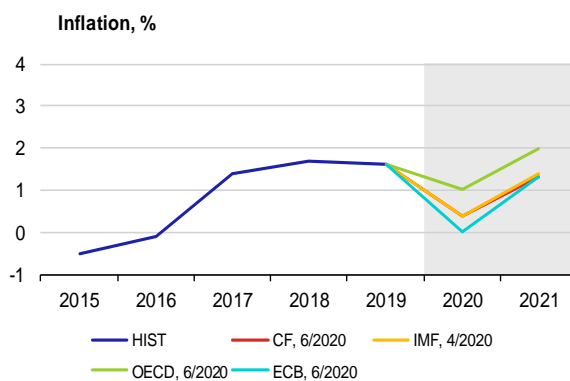


	CF	IMF	OECD	ECB
2020	n. a.	0.7	0.7	-0.1
2021	n. a.	1.5	1.0	1.4

### Slovenia

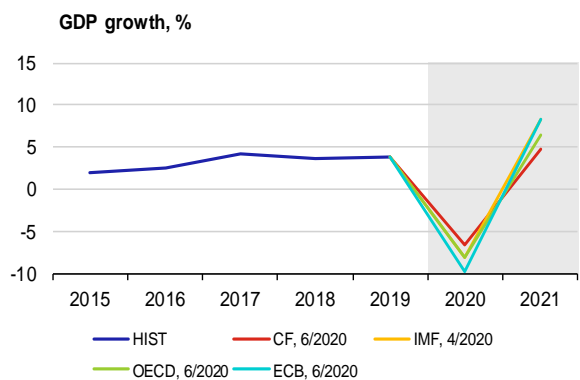


	CF	IMF	OECD	ECB
2020	-7.5	-8.0	-7.8	-6.5
2021	4.7	5.4	4.5	4.9

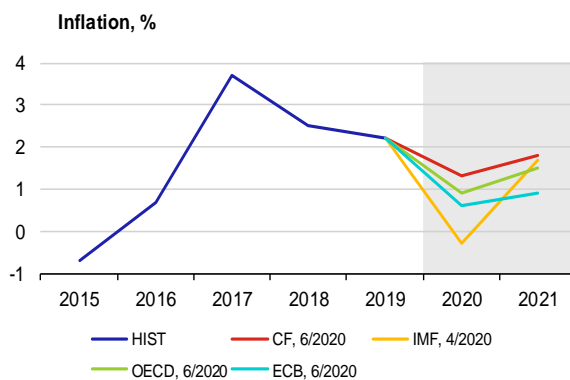


	CF	IMF	OECD	ECB
2020	0.4	0.4	1.0	0.0
2021	1.3	1.4	2.0	1.3

### Lithuania

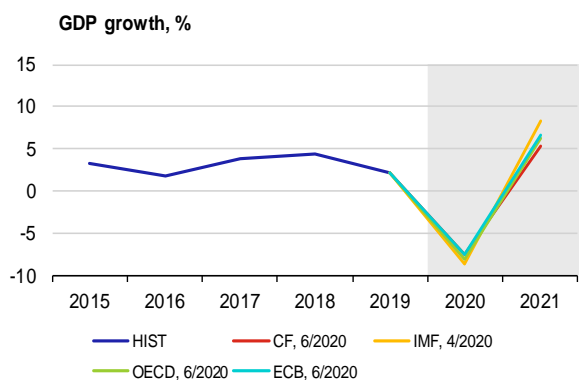


	CF	IMF	OECD	ECB
2020	-6.6	-8.1	-8.1	-9.7
2021	4.7	8.2	6.4	8.3

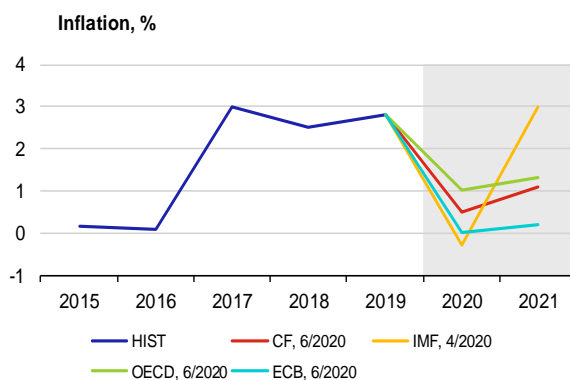


	CF	IMF	OECD	ECB
2020	1.3	-0.3	0.9	0.6
2021	1.8	1.7	1.5	0.9

### Latvia

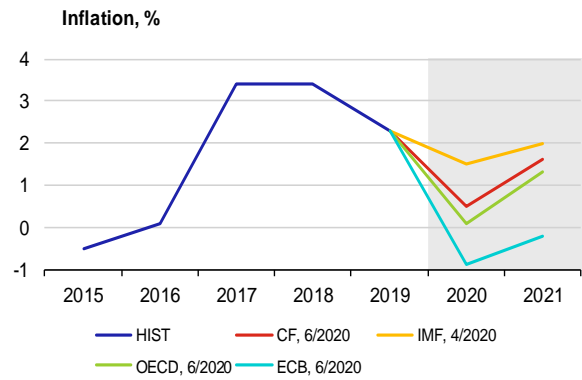
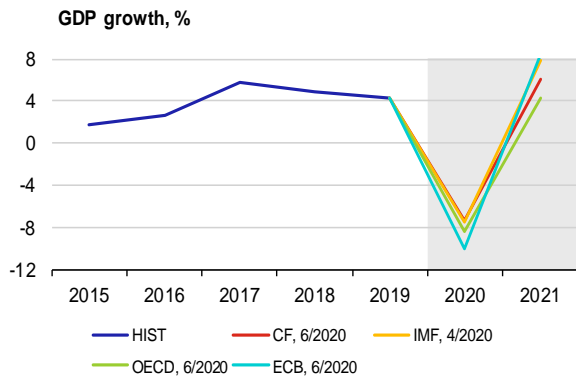


	CF	IMF	OECD	ECB
2020	-7.6	-8.6	-8.1	-7.5
2021	5.3	8.3	6.3	6.7



	CF	IMF	OECD	ECB
2020	0.5	-0.3	1.0	0.0
2021	1.1	3.0	1.3	0.2

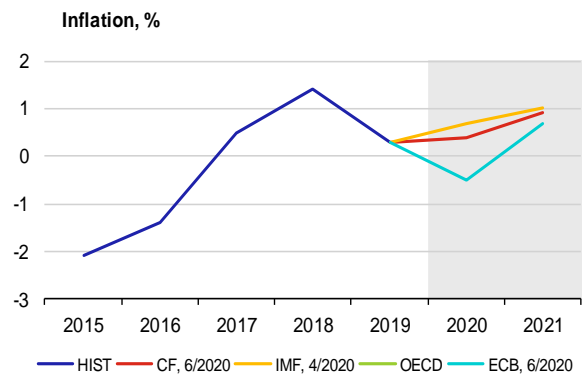
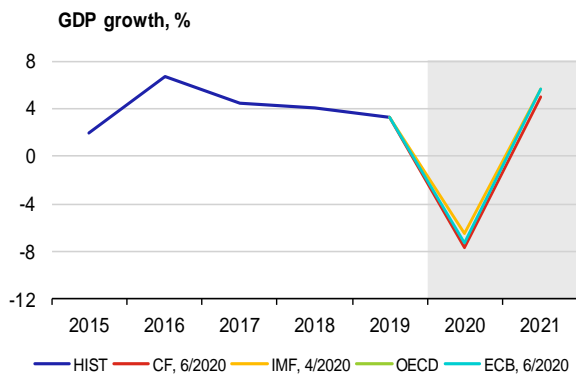
## Estonia



	CF	IMF	OECD	ECB
2020	-7.3	-7.5	-8.4	-10.0
2021	6.0	7.9	4.3	8.5

	CF	IMF	OECD	ECB
2020	0.5	1.5	0.1	-0.9
2021	1.6	2.0	1.3	-0.2

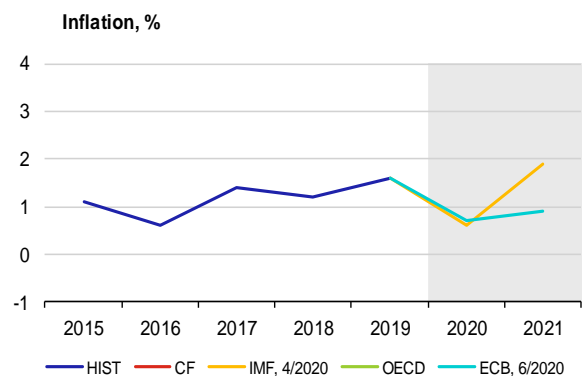
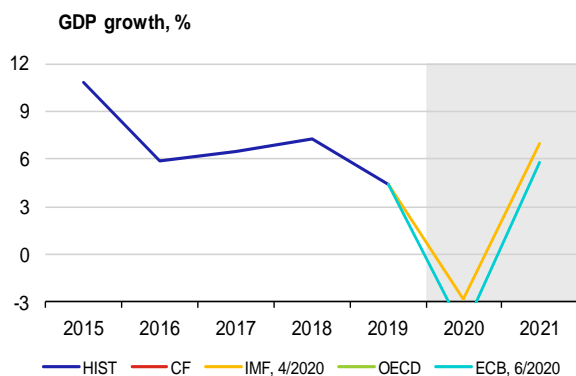
## Cyprus



	CF	IMF	OECD	ECB
2020	-7.6	-6.5	n. a.	-7.3
2021	5.0	5.6	n. a.	5.6

	CF	IMF	OECD	ECB
2020	0.4	0.7	n. a.	-0.5
2021	0.9	1.0	n. a.	0.7

## Malta



	CF	IMF	OECD	ECB
2020	n. a.	-2.8	n. a.	-4.8
2021	n. a.	7.0	n. a.	5.8

	CF	IMF	OECD	ECB
2020	n. a.	0.6	n. a.	0.7
2021	n. a.	1.9	n. a.	0.9

## A5. List of abbreviations

<b>AT</b>	Austria	<b>IFO</b>	Leibniz Institute for Economic Research at the University of Munich
<b>bbl</b>	barrel	<b>IMF</b>	International Monetary Fund
<b>BE</b>	Belgium	<b>IRS</b>	Interest Rate swap
<b>BoE</b>	Bank of England (the UK central bank)	<b>ISM</b>	Institute for Supply Management
<b>BoJ</b>	Bank of Japan (the central bank of Japan)	<b>IT</b>	Italy
<b>bp</b>	basis point (one hundredth of a percentage point)	<b>JP</b>	Japan
<b>CB</b>	central bank	<b>JPY</b>	Japanese yen
<b>CBR</b>	Central Bank of Russia	<b>LIBOR</b>	London Interbank Offered Rate
<b>CF</b>	Consensus Forecasts	<b>LME</b>	London Metal Exchange
<b>CN</b>	China	<b>LT</b>	Lithuania
<b>CNB</b>	Czech National Bank	<b>LU</b>	Luxembourg
<b>CNY</b>	Chinese renminbi	<b>LV</b>	Latvia
<b>ConfB</b>	Conference Board Consumer Confidence Index	<b>MKT</b>	Markit
<b>CXN</b>	Caixin	<b>MT</b>	Malta
<b>CY</b>	Cyprus	<b>NIESR</b>	National Institute of Economic and Social Research (UK)
<b>DBB</b>	Deutsche Bundesbank (the central bank of Germany)	<b>NKI</b>	Nikkei
<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>EE</b>	Estonia	<b>OPEC+</b>	member countries of OPEC oil cartel and 10 other oil-exporting countries (the most important of which are Russia, Mexico and Kazakhstan)
<b>EIA</b>	Energy Information Administration	<b>PMI</b>	Purchasing Managers' Index
<b>EIU</b>	Economist Intelligence Unit	<b>pp</b>	percentage point
<b>ES</b>	Spain	<b>PT</b>	Portugal
<b>ESI</b>	Economic Sentiment Indicator of the European Commission	<b>QE</b>	quantitative easing
<b>EU</b>	European Union	<b>RU</b>	Russia
<b>EUR</b>	euro	<b>RUB</b>	Russian rouble
<b>EURIBOR</b>	Euro Interbank Offered Rate	<b>SI</b>	Slovenia
<b>Fed</b>	Federal Reserve System (the US central bank)	<b>SK</b>	Slovakia
<b>FI</b>	Finland	<b>UK</b>	United Kingdom
<b>FOMC</b>	Federal Open Market Committee	<b>UoM</b>	University of Michigan Consumer Sentiment Index - present situation
<b>FR</b>	France	<b>US</b>	United States
<b>FRA</b>	forward rate agreement	<b>USD</b>	US dollar
<b>FY</b>	fiscal year	<b>USDA</b>	United States Department of Agriculture
<b>GBP</b>	pound sterling	<b>WEO</b>	World Economic Outlook
<b>GDP</b>	gross domestic product	<b>WTI</b>	West Texas Intermediate (crude oil used as a benchmark in oil pricing)
<b>GR</b>	Greece	<b>ZEW</b>	Centre for European Economic Research
<b>ICE</b>	Intercontinental Exchange		
<b>IE</b>	Ireland		
<b>IEA</b>	International Energy Agency		

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