



# Pandenomics 2.0

How countries faced  
the second wave of pandemic  
and the second dip of the recession

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# Key findings

The COVID-19 pandemic is an asymmetrical shock. The scale of the health crisis, restrictions and economic impact on national economies vary between European countries. In this paper, we aim to summarise the situation during the first and second wave of the pandemic in the EU and propose a new **Economic Forecasts Index** that encapsulates these differences.

We first analysed clusters of EU member states according to the severity of the pandemic and the severity of the restrictions during the spring and autumn of 2020 and identified four groups:

- **Hard-hit, hard-locked: Belgium, France, Ireland, Italy, Portugal, Spain and the United Kingdom.** In this group, both the number of cases and deaths, as well as the severity of restrictions were among the highest in Europe in the first half of 2020. During the second wave, the number of cases and deaths within this category was moderate, but the restrictions remained relatively strict compared to other European countries.
- **From bad to worse: Austria, Bulgaria, Croatia, Cyprus, the Czech Republic, Germany, Greece, Hungary, Lithuania, Malta, the Netherlands, Poland, Romania, Slovakia and Slovenia.** In these countries, the first wave of the pandemic led to the lowest number of cases and deaths, but the second wave was much more severe. The restrictions were moderate during both waves.
- **Lucky losers: Denmark, Estonia, Finland and Latvia.** Both the severity of the pandemic and the restrictions were relatively mild during both waves of the pandemic.
- **Outliers:** Sweden and Luxembourg.

Secondly, we aimed to demonstrate both the scale of the health crisis and its economic implications. By combining data on COVID mortality with European Commission economic forecasts, we created an Economic Forecasts Index (EFI). **Lithuania, Luxembourg and the Netherlands occupy the top three positions**, which means that their economic outlook is the best, while **Greece, Croatia and Spain close the ranking**. The index includes the forecasts for GDP growth, unemployment rate, government deficit and gross public debt.

- Combining clusters and positions in the EFI, we map the relative situation in all the EU countries in terms of the pandemic effect and economic perspectives. The first group consists of countries with a high EFI and a higher-than-average mortality: Belgium, the Czech Republic, Hungary, Luxembourg, the Netherlands, Poland, Romania, Slovenia, Sweden and UK.
- The second group comprises countries with relatively positive forecasts and mortality below the EU average: Austria, Denmark, Ireland, Malta, Germany, Finland, Latvia, Lithuania, Slovakia and Estonia.
- The third group, with less favourable forecasts and low mortality, consists of Greece, Cyprus and Portugal.
- The fourth, hard-hit group, with both high mortality and negative forecasts, comprises Bulgaria, Croatia, France, Italy and Spain.

In addition to the quantitative analysis, we show the scale of fiscal and monetary policies implemented so far. **The fiscal instruments designed to mitigate the crisis amounted to \$11.7 trillion in discretionary fiscal support, the equivalent of nearly 12% of global GDP,**

**significantly higher than the amount approved in response to the 2008-2009 global financial crisis.** As a result, the International Monetary Fund projects that the global level of public debt will reach 98.7% in 2020, up from 83% in 2019. The monetary policies go hand in hand with fiscal ones. **The assumed scale of corporate bond purchases varies greatly, from 0.2% of GDP in Sweden to nearly 2% of GDP in the United States.** Countries with more developed financial markets and longer QE institutional experience use this instrument more broadly and frequently.

We conclude with three pandemic scenarios for 2021, each with a set of economic challenges and possible policy responses. In the **optimistic scenario**, vaccines are rolled

out smoothly and the pandemic is under control before the summer of 2021. In the **realistic scenario**, vaccination takes several months and there is a third wave of the pandemic in the spring of 2021, but the situation is under control during the autumn. In the **pessimistic scenario**, there are significant problems with vaccination, which results not only in a serious third wave during the spring, but also a fourth wave, which has a major impact on the economy in late 2021. No matter which scenario materialises, it is clear that the policy responses are worlds apart from the reactions during the global financial crisis and that measures considered radical in recent decades, such as increased capital taxation or a universal basic income, are now entering the mainstream discussion.



## Key numbers

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4

Poland's place in the Economic Forecast Index ranking during the COVID-19 crisis

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11

number of EU-28 countries with good economic forecasts before and during the COVID-19 economic crisis, according to Economic Forecast Index

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11.5%

average budget deficit in OECD countries this year

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50 million

number of jobs supported by job retention schemes during the peak of the first wave (April-May 2020) in OECD countries

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20.2 pp

increase in gross debt in advanced economies

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19.9% of GDP

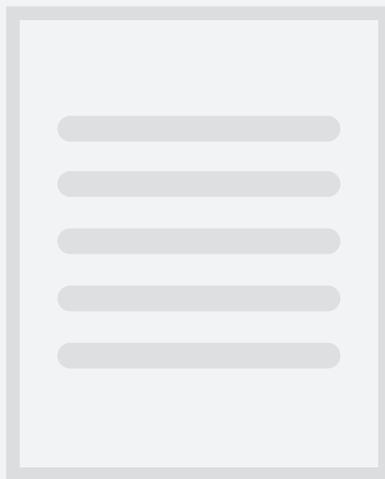
government deficit in Canada, the largest projected deficit in any country, according to IMF economic forecasts

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# 1. Introduction

**W**e are now eight months into **'pandenomics'**, a distinct state of the economy full of uncertainty, a looming recession and selective lockdowns. After the first wave in the spring, when decisions had to be made rapidly, without prior research, the reaction to the second wave in the autumn could have been more evidence-based. In this report, we look at the first results in terms of government deficits and debt, as well as monetary policy. We also dig deeper to present selected best practices from around the world. One of the most striking aspects of the current crisis is the unequal way in which it affect various countries, economic sectors and social groups. The impact on countries can be seen in the changing economic forecasts. Some countries that were in a relatively good situation before the crisis were hard-hit during the spring and will suffer well into 2021. Others

survived in relatively good condition and may be the first to return to their pre-crisis growth path. We synthesise these insights in a single index, the Economic Forecast Index. Yet no matter how positive or negative the current forecasts, the level of uncertainty is still extremely high. The economy and people's lives are dependent on medical developments at an unprecedented rate – the vaccine – and the efficiency of public health systems. Taking this into account, we present three possible scenarios for the near future and economic policy recommendations. From earmarking funds for continued fiscal stimulus to the reform of tax systems and a universal basic income, we match policy tools to possible outcomes in terms of vaccinations and the economic situation. The pandemic might not be over soon, but we should increase our resilience to tackle what the current uncertainty will bring in 2021.



## 2. Pandemic dynamics between spring and autumn 2020 in the EU and UK

### 2.1. The severity of the health crisis and government restrictions

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When we compare the situation in countries during the first and second wave of the COVID-19 pandemic, we see a certain trend.

**The first wave, in spring 2020, led to fewer infections, but prompted many governments to apply more severe economic restrictions than during the second wave, when many more people were infected.**

However, comparing the pandemic situation in different countries is difficult. Firstly, the epidemiological situation is very dynamic. Secondly, countries' legal systems have their own specificity. In addition, there are cultural contexts, different behaviour and customs. In countries where GDP is highly dependent on tourism, regulations such as flight cancellations, hotel closures and restrictions on the number of people in various places have had serious economic effects. The poorly predictable dynamics of the pandemic's spread and the specificity of individual countries make it difficult to clearly diagnose that a lockdown leads to more social and economic losses in one country, but less in another country. We therefore need to be very careful when drawing conclusions and formulating hypotheses.

Nevertheless, we attempted to answer the following question: were countries similarly

hit during the first and second wave of the pandemic? To answer this question, we conducted hierarchical cluster analysis, in which we used the following variables:

#### The scale of the health crisis:

- COVID-19 cases per 100,000 people – separately for the first and second wave (source: European Centre for Disease Prevention and Control (ECDC) – [www1](#)),
- COVID-19 deaths per 100,000 people – separately for the first and second wave (source: European Centre for Disease Prevention and Control (ECDC)).

#### The scale of the restrictions:

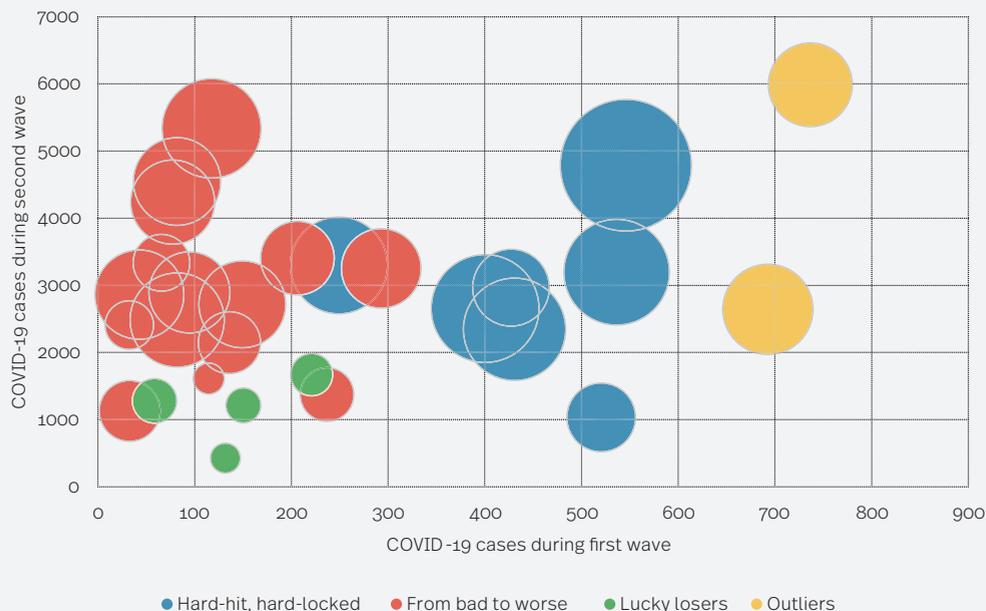
- Mean of the Government Response Stringency Index – separately for the first and second wave ([www2](#)),
- The number of days (sum) in which the Government Response Stringency Index (max value 100) was higher than 75 – separately for the first and second wave.

We applied a simple rule of thumb and split the data into time series corresponding to the first and second half of the year. The data concerning the first wave covers all the weeks up to the beginning of July (05.07.2020), while the data on the second wave covers the period from 06.07.2020 to 13.12.2020.

Taking into account all these variables at the same time, the EU-28 countries<sup>1</sup> were divided into four groups made up of countries with

a similar situation when it comes to morbidity, mortality and restrictions.

▼ **Chart 1.** COVID-19 cases in the EU and UK during the first and second wave of the pandemic (per 100,000 people)



Note: The size of the bubble represents the number of COVID-19 related deaths (per 100,000 people, up until 13.12.2020). Source: prepared by PEI based on ECDC weekly data.

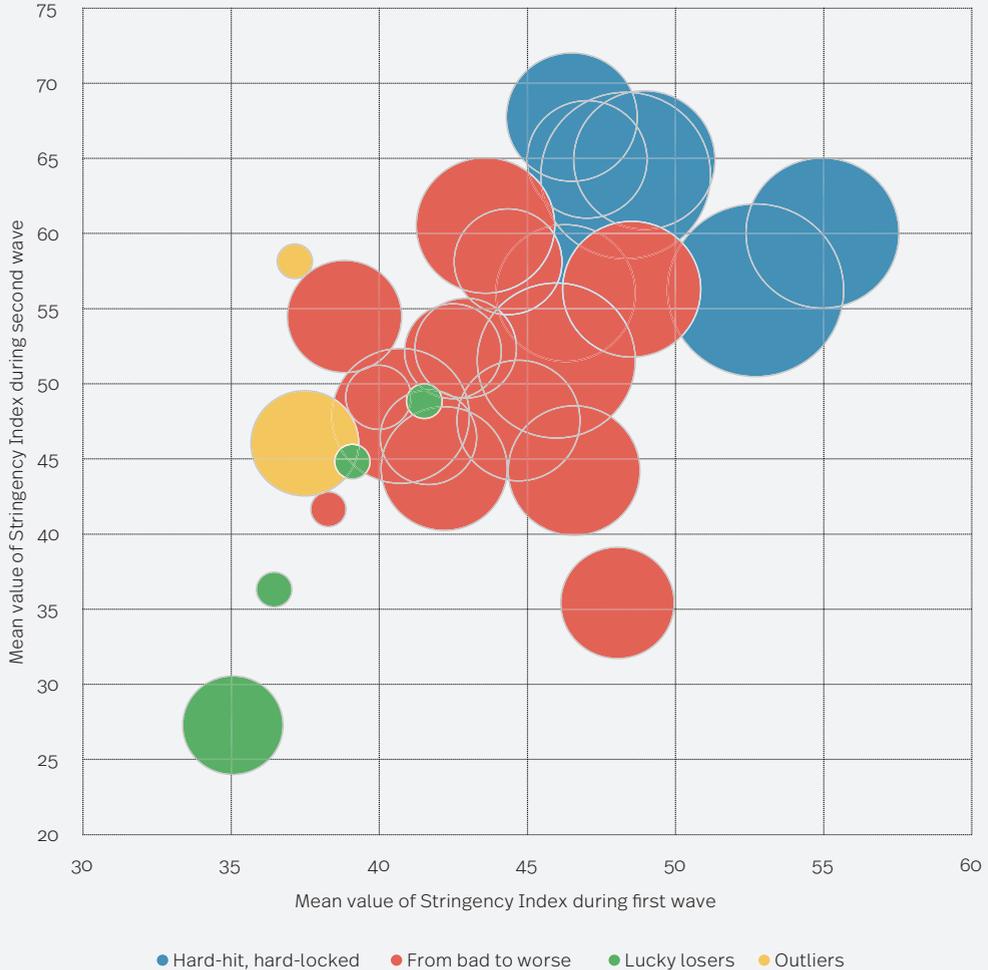
**Group 1 – ‘hard-hit, hard-locked’ is made up of 7 countries: Belgium, France, Ireland, Italy, Portugal, Spain and the UK**, where there were the most cases of morbidity and mortality during the first wave of the pandemic. During the second wave, morbidity and mortality was average compared to the other groups of countries.<sup>2</sup> In terms of restrictions, these are the countries

with the most stringent restrictions during both waves of the pandemic. It can therefore be said that these countries were the most affected by the first wave and approached the second wave with great caution, introducing strong restrictions, which meant that the morbidity and mortality rate during the second wave was no longer the highest in the three groups of countries.

<sup>1</sup> The 28 countries are the EU member states and the UK. The latter was included because it was a member of the EU in autumn 2019, when the economic forecasts from before the pandemic used in this study were formulated.

<sup>2</sup> Belgium and Ireland are outliers in this regard (Belgium with high morbidity, Ireland on the opposite side of the scale).

▼ **Chart 2.** Mean values of Stringency Index in European countries during the first and second wave of the pandemic (index value between 0 and 100)



Note: The size of the bubble represents the number of days in 2020 in which the Stringency Index in a given country was higher than 75, up until 13.12.2020).

Source: prepared by PEI based on ECDC weekly data.

**Group 2 – ‘from bad to worse’ is made up of 15 countries: Austria, Bulgaria, Croatia, Cyprus, the Czech Republic, Germany, Greece, Hungary, Lithuania, Malta, the Netherlands, Poland, Romania, Slovakia and Slovenia,** which had the lowest morbidity and mortality

during the first wave, with average restrictions compared to other groups of countries. However, these countries suffered much more during the second wave of the pandemic, with the highest levels of morbidity and mortality, yet relatively moderate government restrictions. It

can therefore be said that these countries were mildly affected by the first wave but hit hard by the second. At the same time, the restrictions introduced were not very severe, which allowed the economy to function fairly effectively.

**Group 3 – ‘Lucky losers’ is made up of 4 countries: Denmark, Estonia, Finland and Latvia.** Interestingly, these are all Baltic States. They had the fewest registered cases and relatively low mortality during both the first and second wave of the pandemic. They took different approaches to restrictions, as measured by the Oxford Stringency Index. Estonia is the member state with the lowest mean of Index during both waves, but a relatively high number of days with high restrictions (index over 75). Finland, Latvia

and Denmark had higher mean values, but fewer days with the highest level of restrictions.

**Group 4 - Outstanding duo – Sweden and Luxembourg.** These countries share two traits: they had the highest number of cases during the first wave and were among the member states with the lowest mean Oxford Stringency Index. Their situation diverged somewhat during the second wave: Sweden managed to reduce the number of cases, while Luxembourg remained the state with the highest number of registered infections (while keeping deaths per 100,000 people slightly above the EU average). In addition, the mean Stringency Index during second wave increased significantly more in Sweden.

## 2.2. The pandemic’s impact on economic forecasts

The analysis was conducted based on European Commission forecasts for 2020 concerning the economic situation in 28 European countries published in autumn 2019 (before the pandemic) and autumn 2020 (during the second wave of the pandemic). The forecasts were used to create an **Economic Forecast Index (EFI)**.<sup>3</sup>

When creating the EFI, GDP forecasts, the unemployment rate, the deficit and public debt, along with imports and exports, were taken into account. The analysis deliberately did not consider forecast inflation, a variable that could have interfered with EFI levels. For many countries, deflation – which is not a positive phenomenon – is currently being forecast.

Therefore, if we included inflation in the set of variables and made it a destimulant, the country with the highest deflation would receive the highest score for this variable.

The six variables identified above were used to create rankings of European countries

based on: economic development forecasts for 2020 issued before the pandemic and during the pandemic, in autumn 2020 (Table 1).

**The ranking shows us the group of countries that we can characterise based on the forecast economic situation before and during the pandemic:**

- A. Good forecast before and during the pandemic – Lithuania, Poland, Ireland, Hungary, Romania, Malta, Czech Republic, Estonia, Slovakia, the UK, Slovenia.
- B. Good forecast before the pandemic and bad during the pandemic – Bulgaria, Croatia.
- C. Bad forecast before the pandemic and good during the pandemic – the Netherlands, Luxembourg, Germany, Latvia, Denmark, Finland, Austria, Belgium.
- D. Bad forecast before and during the pandemic – France, Cyprus, Italy, Portugal, Spain, Greece.

<sup>3</sup> For a detailed description of how the EFI was calculated, see the Methodology appendix.

▼ **Table 1.** Ranking of countries according to economic forecasts for 2020 issued before (autumn 2019) and during the pandemic (autumn 2020)

Country	Before the pandemic		During the pandemic	
	Economic Forecast Index	Ranking Economic Forecasts	Economic Forecast Index	Ranking Economic Forecast
Lithuania	66.40	8	76.69	1
Luxembourg	52.14	15	75.76	2
The Netherlands	50.32	19	73.72	3
Poland	78.44	2	73.65	4
Ireland	70.11	4	72.93	5
Hungary	69.91	5	71.40	6
Romania	87.98	1	70.16	7
Malta	61.70	10	68.90	8
Germany	48.53	21	67.87	9
Czech Republic	56.89	12	67.23	10
Latvia	55.76	14	67.08	11
Sweden	42.82	24	65.61	12
Estonia	56.59	13	65.60	13
Denmark	51.94	16	65.60	14
Finland	50.52	17	65.39	15
Austria	49.22	20	65.05	16
Belgium	43.81	23	64.62	17
Slovakia	67.42	6	64.02	18
United Kingdom	56.97	11	61.43	19
Slovenia	73.56	3	60.71	20
Bulgaria	67.42	7	59.55	21
France	46.72	22	51.26	22
Cyprus	35.46	28	50.14	23
Italy	35.62	26	43.84	24
Portugal	50.50	18	39.69	25
Croatia	64.27	9	31.98	26
Spain	40.36	25	30.68	27
Greece	35.56	27	27.28	28

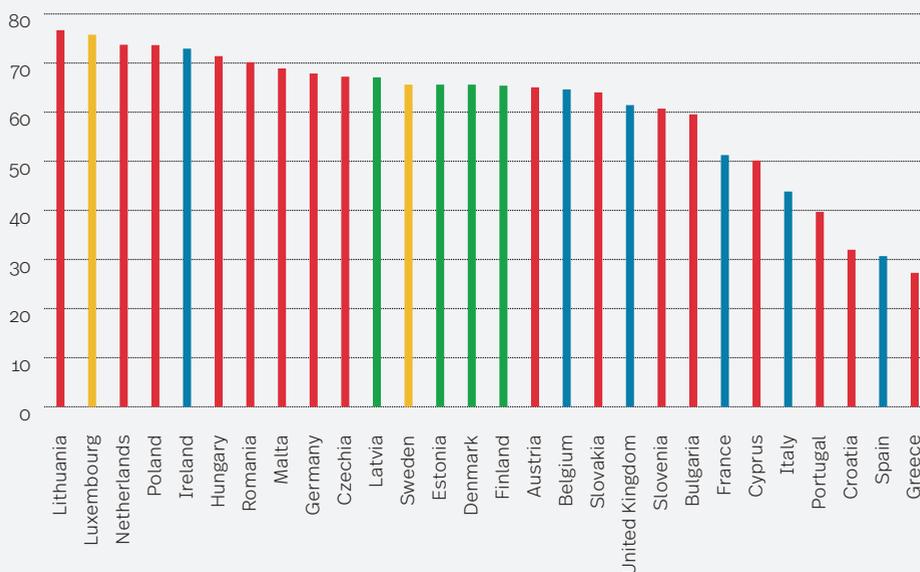
Note: Green – very good forecast; Light green – good forecast; Pink – bad forecast; Red – very bad forecast.

Source: prepared by PEI based on European Commission forecasts.

Chart 3 shows European countries ranked according to the index of economic forecasts for 2020 published during the pandemic. In

addition, the countries were colour-coded to reflect the group that they were included in during cluster analysis.

↘ **Chart 3. Countries based on macroeconomic forecasts for 2020 (colour-coded to show countries with a similar pandemic situation)**



Note: Group 1 **Hard-hit, hard-locked**; Group 2 **From bad to worse**; Group 3 **Lucky losers**; **Outliers**.

Source: prepared by PEI.

The top four countries in the ranking of economic forecasts were three countries from Group 2 and one from Group 3. These are therefore countries with low morbidity and mortality during the first wave of the pandemic. During the second wave, morbidity and mortality in these countries was high. In these countries, both during the first and second wave, the restrictions were fairly moderate, which may have translated into the freer functioning of the economy, and better economic results and forecasts there.

Countries from Group 1 – those hit the hardest during the first wave of the pandemic

– dominate the bottom of the ranking. During the second wave, these starts had the strictest restrictions, which lowered their position in the ranking of economic forecasts.

In addition, the economic forecast index was compared with the level of mortality – the total number of deaths per million inhabitants (Chart 4). These allows us to identify groups of countries that:

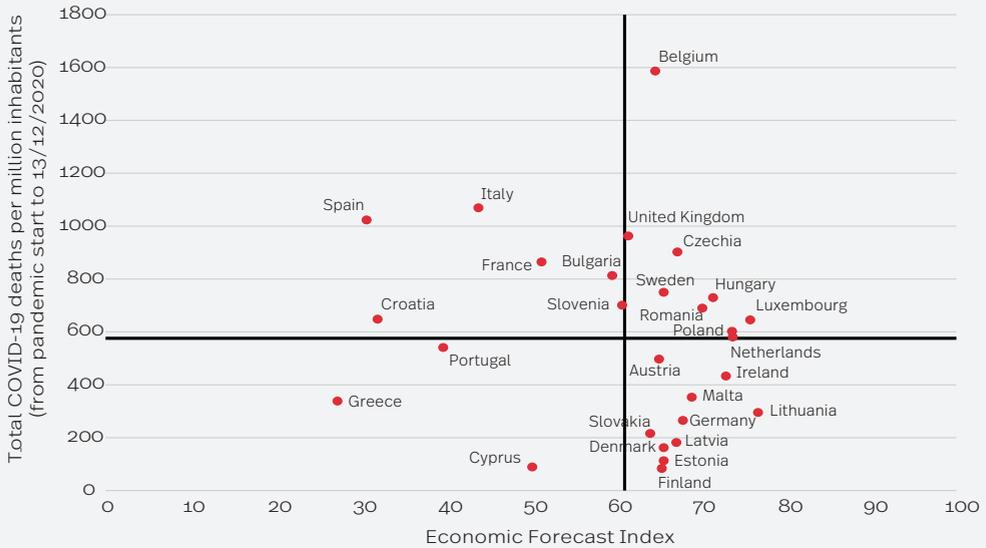
- A. Have high economic forecasts index and a higher than average mortality: Belgium, the Czech Republic, Hungary, Luxembourg, the Netherlands, Poland, Romania, Slovenia, Sweden and United Kingdom.

- B. Have high economic forecasts index and mortality lower than average in the EU: Austria, Denmark, Ireland, Malta, Germany, Finland, Latvia, Lithuania, Slovakia, Estonia.
- C. Have low economic forecasts and low mortality: Greece, Cyprus and Portugal.
- D. Have low economic forecasts and high mortality: Bulgaria, Croatia, France, Italy and Spain.

The analysis shows that the pandemic and the restrictions will probably have major but varied economic consequences in individual countries, which is resembled in forecasts changes. The pandemic's negative impact could be especially visible in the case of Slovenia and Croatia (a drop of 17 places in the ranking of forecasts from autumn 2020, compared to the ranking of forecasts from before the pandemic), as well as

Bulgaria and Slovakia (a drop of 14 and 12 places respectively). The first three countries are in Group 2, so they were severely affected by the second wave of the pandemic. In contrast, the large drop (from 6th to 18th place) of Slovakia (Group 3), which has been mildly affected by the pandemic, might seem surprising. Meanwhile, a series of countries advanced in the ranking. The Netherlands and Luxembourg advanced the most (16 places), followed by Germany and Sweden (12 places). Luxembourg aside, these countries are in Group 3, so their relatively mild experience of the pandemic may explain their improved position in the ranking. However, Luxembourg (Group 2) also advanced clearly, even though it was strongly affected by the second wave. Poland is among the countries that largely maintained their economic position.

Chart 4. Countries according to the Economic Forecast Index and the level of mortality



Source: prepared by PEI.

## 3. Government responses

### 3.1. Fiscal policy

The negative consequences of COVID-19 are unprecedented and the cost of tackling them is enormous: this year's average budget deficit in OECD countries will reach 11.5% of nominal GDP and only decrease to 8.4% in 2021. With little further scope to cut interest rates, states have mainly relied on fiscal levers to mitigate the crisis. The IMF estimates (www3) that countries announced USD 11.7 trillion in discretionary fiscal support, nearly 12% of global GDP and much more than the amount

approved in response to the 2008-2009 global financial crisis.

#### a) *First wave of the pandemic (March – June 2020)*

After the global outbreak of the pandemic, most states decided to resort to automatic stabilisers and new fiscal impulses. Their purpose was to provide citizens with adequate financial means and companies with essential liquidity.

↘ **Table 2.** Fiscal support implemented during the first wave of the pandemic

Country	COVID-19 fiscal packages: spending + lost revenue (% of 2019 GDP)
Czech Republic	4.9%
France	6%
Germany	8.9% + additional help from Länder (4.3%)
Italy	6.7%
Japan	11.3%
Poland	5.2% + financial liquidity programme (4.5%)
United Kingdom	9%
United States	11.8%

Source: prepared by the PEI, based on IMF data.

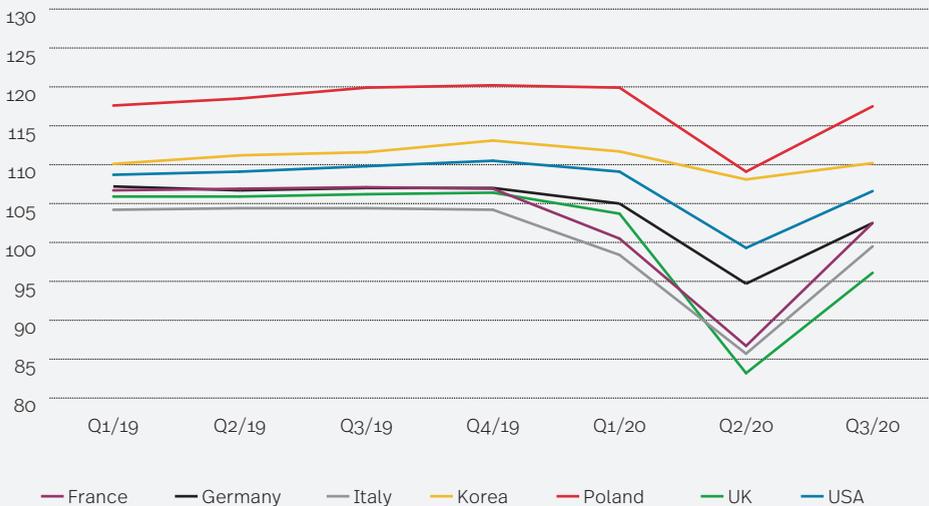
▾ **Box 1. Pandemics fiscal toolkit (instruments commonly used during the first wave of the pandemic):**

- access to a short-term work (“Kurzarbeit”) subsidy to preserve jobs and workers’ incomes;
- expanded income support for families, childcare benefits for low-income parents and easier access to basic income support for the self-employed;
- expanded unemployment benefits and duration of unemployment insurance;
- grants to small business owners and the self-employed;
- liquidity support through the postponement of social security and tax payments for companies and accelerated refund of tax credits;
- a temporary VAT reduction, particularly for the most-hit sectors;
- expanded credit guarantees for exporters and export-financing banks.

After the initial period of widespread lockdowns in the second quarter of 2020, which led to a drop in economic activity and a quarterly downward spike in GDP, the positive results of these interventions could be observed. Data from the third quarter of 2020 shows a strong rebound in economic activity

and rapid GDP growth. If this pace of recovery is maintained, most countries could return to their pre-pandemic GDP volumes as early as 2021. However, in the autumn, many states were confronted with the second wave of COVID-19, which could significantly affect their economies.

▾ **Chart 5. Quarterly GDP of selected countries (Volume Index, 100 = 2015)**



Source: prepared by PEI, based on IMF data.

### b) *Second wave of the pandemic (October 2020 – ?)*

Many countries reimposed lockdowns in October 2020. However, having learnt lessons from the spring, they have managed to protect most economic activity. According to EU consumer and business confidence indicators (ESI), sentiment deteriorated significantly in October

and November (www4). Nevertheless, economic activity generally remained higher than in the second quarter of 2020 (www5), which indicates that value chains and manufacturing sectors were not as affected by the lockdowns. Companies and factories managed to introduce strict sanitary rules, which enabled them to continue production.

#### ▸ Box 2. Companies' liquidity

To improve corporate sector liquidity, policy responses were implemented through the fiscal instruments mentioned in Box 1. Monetary policy measures were introduced, too: easing financial conditions and facilitating access to credit, prudential measures that enhance banks' lending capacity, corporate lending programmes, and bank and market funding facilities. Firms have also been able to address liquidity concerns by tapping bank credit and issuing corporate bonds.

According to IMF estimates, these instruments – if implemented as designed – could lower liquidity risks by the end of 2020. They could help reduce the pandemic-induced liquidity gap by four-fifths. They could also help save jobs (around 15% of employment in Europe) and avoid output destruction (almost a quarter of value added). As indicated by the Fund, guaranteed loans, job-retention programmes and debt moratoria are policy instruments that mostly help lower the liquidity gap, which reflects their size and broad coverage (www6).

These estimates must be supplemented by two remarks. Firstly, companies' results, liquidity and solvency vary considerably. As often mentioned, COVID-19 could lead to the creation of K-shaped economy, with the rapid development of frontier and laggard companies. Furthermore, the biggest losses could be concentrated among SMEs, which often have limited access to support, but operate in sectors most hit by the crisis.

Governments have reintroduced a number of support instruments used during the first wave of the pandemic. After the first spring wave of broad, widespread and almost unlimited support, the aid has been more targeted this time and limited to the sectors most hit by the lockdowns: tourism, leisure, gastronomy and entertainment. Policies such as revenue

compensation (Germany) or the extension and scaling-up of previously-used instruments (France, the UK, Poland) were introduced, but their size has so far not exceeded 1% of GDP (www7). Furthermore, monetary instruments that started being operational at the beginning of pandemic are still in use.

## 3.2. Monetary policy

In response to the global financial crisis, states used non-standard monetary tools (such

as quantitative easing, QE) to stabilise their economic situation. The COVID-19 pandemic has

prompted another crisis and advanced economies entered it with historically low interest rates, limiting the expansionary impact of monetary policy. Nonetheless, central banks have supported fiscal spending with even further balance sheet increases and liquidity measures. They have not only extended their QE programmes, including buying corporate bonds; they have also introduced fairly new mechanisms, usually to support struggling companies. Overall, they managed to reduce the uncertainty of financial markets early in the crisis and maintain accommodative financing conditions.

The monetary policy instruments most frequently used during the pandemic can be divided into three groups:

**1) Quantitative Easing (QE), including buying corporate bonds** – in the classic version of QE, central banks buy government bonds on the secondary market to increase monetary supply, lower long-term interest rates and expand economic activity. In recent years, it has been extended with the purchase of corporate bonds for companies to avoid liquidity problems and help them survive economic downturns. This instrument is primarily addressed to the largest companies that operate in the country where bonds are bought. In most cases, bonds with investment ratings are being purchased (although in both the US and the Eurozone, so-called fallen angels – the bonds of companies that lost their investment rating as a result of the pandemic – were also allowed to be traded), with various maturities.

The scale of corporate bonds purchases varies greatly, from 0.2% of GDP in Sweden to nearly 2% of GDP in the US. Countries with more developed financial markets and longer QE institutional experience use this instrument more broadly and frequently. In larger countries in

particular, declarations along the lines of “whatever it takes” to support companies resulted in readiness for buyouts on an almost unlimited scale. However, the demand for this instrument is still moderate, significantly lower than for government bonds; after elevated demand in the second quarter, it has decreased in recent months. However, this trend may be reversed by a possible economic collapse caused by the size of the second wave of the pandemic, which could last longer than the first.

**2) Providing commercial banks with low-interest** (usually at the deposit rate level) capital to finance SMEs. This solution has been implemented by Australia, Japan, the US, the Eurozone and Hungary, among others. This capital is to be used to maintain banks’ financial liquidity and stimulate lending to SMEs. Due to the instruments’ repayable nature, its scale can be almost unlimited and continuously adjusted to companies’ needs.

**3) Alternative solutions:** Japan, which has been carrying out an extremely expansive monetary policy for years, is the leader here. The instruments used by the Bank of Japan include controlling the yield curve; that is, purchasing enough bonds to achieve the assumed level of profitability (a similar solution was recently implemented by Australia), purchasing ETF and REIT-type investment funds (with a total value of 2.2% of GDP) and negative interest rates (also in use in the Eurozone and Switzerland).

The application and impact of the new monetary instruments calibrated during the pandemic will extend far beyond 2020. Low or even negative interest rates, QE programmes and cheap access to credit will be broadly used during the post-COVID recovery period, too, contributing to the creation of an investment-friendly environment.

▼ **Table 3. Monetary tools used during the COVID-19 crisis**

State/ Instrument	QE (including buying corporate bonds) in 2020	Providing banks with low-interest capital (for loans)	Currency interventions	Other
Australia (Reserve Bank of Australia)		1.4% of GDP, interest rate: at the discount rate level (0.1%)		controlling yield curve
Czech Republic (CNB)			interventions against currency appreciation	
Euro area (ECB)	PEPP: 15.4% of 2019 GDP, inc. 1.2% for corporate bonds	Size adjusted to economic needs, interest rate: 0.5pp below the discount rate level		negative interest rates
Great Britain (Bank of England)	40.3% of GDP, inc. 0.9% for corporate bonds	Size adjusted to economic needs, interest rate: at the discount rate level (0.1%)		
Hungary (MNB)	1% of GDP for corporate bonds	2.2% of GDP, interest rate: 0%		
Japan (Bank of Japan)	3% of GDP	1.35% of GDP, interest rate: 0%		controlling yield curve, negative interest rates, ETF and REIT purchases
Sweden (Riksbank)	4% of GDP, inc. 0.2% for corporate bonds			
Switzerland (SNB)		Size adjusted to economic needs, interest rate: at the discount rate level (-0.75%)	interventions against currency appreciation	negative interest rates
United States (Fed)	13.3% of GDP, inc. 1.9% for corporate bonds (limit of 30% for fallen angels)	PPPLF: 0.5% of GDP, interest rate: 0.35%		new forward guidance: <i>aiming to achieve inflation moderately above 2% for some time</i>

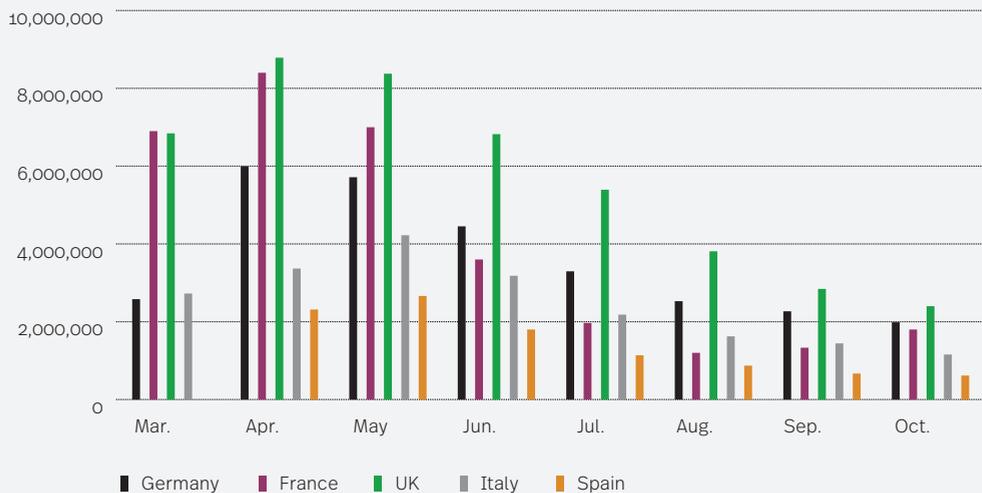
Source: prepared by PEI, based on IMF, OECD and the above-mentioned central banks' data.

### 3.3. Job protection schemes

Previous economic crises (2008-2009 and the subsequent downturn) affected the labour markets of some member states profoundly and persistently. Lessons from the past were used during the COVID-19 crisis, when most governments decided to protect jobs in a more consistent way. Indeed, the scale of state intervention in the labour market and work arrangements was unprecedented, not only in the EU, but also in other OECD countries. First of all, several countries introduced or significantly expanded work- or wage-protection schemes.

Eligible employers received subsidies to subsidise part of employees' salaries and associated healthcare, social and pension contributions. At the peak of the first wave (April-May 2020), job-retention schemes supported around 50 million jobs across the OECD, ten times as many as during the global financial crisis (OECD 2020). The scale of the response varied, but the peak occurred in April, when more than 8 million employments were supported by the French (*Activité partielle*) and British (*Coronavirus Job Retention Scheme*) programmes.

↘ **Chart 6. Number of employments supported by government job-retention schemes in the five largest European economies**



Source: prepared by PEI based on [www8](#), [www9](#), [www10](#), [www11](#), [www12](#).

As a result, the European labour market has been cushioned from a stronger shock. During the first wave of the pandemic, employment declined in a more moderate way compared to the output loss ([www13](#)), while

the quarterly GDP losses in several countries, such as Spain, Italy and France peaked at historical levels, employment losses were smaller than during the financial crisis of 2008-09. Although the initial response in Europe was more

effective than that in the US (allowing firms to lay off employees and support unemployed people with benefits), the medium- and

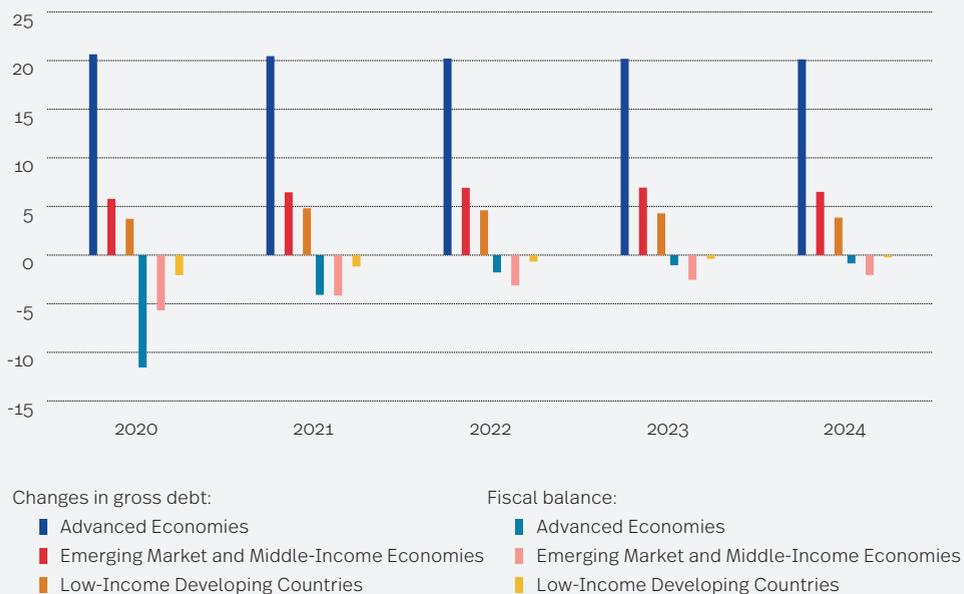
long-term consequences remain uncertain and dependent on how the pandemic develops in the future (www14).

### 3.4. Impact on public debt and the evolution of fiscal policy

The effects of policy actions by the fiscal authorities are best illustrated by soaring public debt and fiscal positions in 2020 and 2021. According to IMF projections (IMF, 2020), global public debt will reach 98.7% in 2020, up from 83% in 2019. This overall value, the highest ever recorded, masks a differentiated situation in particular countries and groups of states. Gross debt increased by 20.2 percentage points

(to 125.5% of GDP) in advanced economies, by 10 pp (to 62.2% GDP) in emerging markets and middle-income economies, and by 5.5 pp (to 48.8%) in low-income developing countries. On the one hand, these results are the effect of the new fiscal measures (with the biggest impact in the first of these country groups). On the other hand, they were caused by the fall in GDP (IMF, 2020).

↘ **Chart 7.** Changes in the level gross debt and overall fiscal balance in relation to GDP in country groupings for 2020-2024 (autumn 2020 forecast - autumn 2019 forecast, in pp)



Source: prepared by PEI based on IMF (2019) and IMF (2020).

In previous chapters of this report, we presented the values of the fiscal measures announced during the early stage of the pandemic and the lockdowns. We can now assess these efforts more precisely, looking at forecasts of government gross debt levels and the fiscal balance. The largest deficits for 2020 are currently projected for Canada (19.9% of GDP), the US (18.7%) and Brazil (16.8%) (IMF 2020). In the Eurozone, the leaders are Spain (12.2%), Belgium (11.2%) and Italy (10.8%). On the other side of the spectrum, Bulgaria, Denmark and Sweden will end 2020 with deficits below 5% of GDP (European Commission, 2020).

The spring fiscal packages were unprecedented in scale and reflected the “whatever it takes” approach of decision makers, who implemented support packages very broadly. Subsequent actions have been more tailored and targeted specific sectors. Some countries are already focusing their fiscal impulses on the recovery phase and aiming to stimulate post-pandemic economic growth. In France, the fiscal package

announced in September ([www1](http://www1)) is to a large extent focused on digital and green investments, which are expected to stimulate both the recovery and accelerate economic growth in the longer run. Similarly, the fiscal package announced in July in Germany included a major component of measures facilitating the recovery, which were not present in the spring packages.

The change in the approach to fiscal support can be attributed to several factors:

- Limited fiscal space in some countries and increased risk of dependence on favourable conditions on financial markets;
- More data on the state of the economy and the sectoral impact of the crisis;
- Economic evidence of the higher effectiveness of targeted support relative to broad support (for social security measures) (IMF, 2020);
- Banking on a positive scenario for the development of the pandemic, which justifies moving forward with public investment and the economic transformation.

## 4. Non-economic policy tools used during the pandemic

### 4.1. Mass-testing in Slovakia

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Slovakia is the first European country where the government decided to implement mass testing for the whole population. Other countries, e.g. Austria, announced similar plans (www15). Everyone between the age of 10 and 65 was eligible; those who refused to get tested were supposed to quarantine for ten days. Around 1% of people tested positive during the first phase (3.6 million tests, 95% of the target group during the weekend 31.10 – 01.11) and 0.66% during the second (2 million tests during the weekend 6.11 – 7.11). Those who tested positive

quarantined afterwards. Around 57,500 new COVID-19 cases were identified, but the testing is continued periodically in the most-affected regions (the third round was scheduled for 21.11 – 22.11) (Dębiec 2020). The whole process led to a decrease in the daily number of new cases (although this may partly be due to the restrictions introduced earlier) and to the faster, but gradual, opening of selected branches of the economy (theatres, cinemas, churches) (www16). Austria has already announced that it intends to introduce mass testing by the end of November

### 4.2. Challenges for developing countries

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In many developing countries, governments have relied on mobile banking solutions as an efficient way to disburse funds to those most hit by the pandemic and the restrictions. These kinds of measures are especially important in these countries, where the informal sector of the economy is larger or institutional safety nets are less developed. Mobile money is especially popular in African countries, but it also used in other regions where the penetration of traditional banking is low. Bazarbash, Moeller

et al. (2020) document 12 examples of cuts in transaction fees, 11 of increased transfer limits and one of easing the identification requirements for new customers. There are also examples from countries such as Togo, where, in ten days, the government managed to set up a new nation-wide mobile transfer system aimed at reaching to most vulnerable groups (such as informal workers). The growing popularity of mobile payments may become a lasting feature of many economies (“The Economist”, 2020).

### 4.3. Official statistics and the use of data during the COVID-19 pandemic

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The COVID-19 pandemic had a large impact on official statistics. The traditional work of national statistical offices based on survey and personal data, with relatively long delivery times, was unfit for the new situation. To have an up-to-date picture of the economy, policymakers had to rely on near real-time data and statistical offices had to shift from personal interviews or gathering data on prices to CATI or CAWI types of interviews (Tall, 2020), and the results were further complicated by lower response rates. To overcome these challenges, governments had to rely more on sources as such as real-time data on electrical energy consumption (a proxy for changes in economic activity), data on mobility (a proxy for reduced consumer demand; provided by Google, for example), electronic payment platforms, frequent online

surveys (PEI and PFR in Poland (www17), ONS in the UK (McLaren, 2020)) or data on job postings (Chen, 2020). Some of the data was had already been used before the pandemic (Biancotti et al., 2020), but its use has become more widespread and, often, more refined, as in the case of German daily truck index, which was used as a daily indicator of economic activity (www18). Much of the data used in these efforts were sourced from private companies (Google data on mobility is a prime example). As some scientists suggest, there are “information gaps”, rather than “data gaps”, and the challenge for official statistics is to develop appropriate legal and technical tools to tap into the data held by private companies and individual users, rather than expanding traditional statistical data gathering methods (Biancotti et al., 2020).

### 4.4. The institutional response

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The COVID-19 pandemic is a catalyst for new ways of thinking about social, economic and environmental vulnerabilities and strategies adopted by governments and organisations. (www19; www20). The response to the pandemic was based not only on short-term reactions, but also on the creation and evolution of institutions. We present a few examples of institutional changes related, directly or indirectly, to the pandemic.

#### *The European Health Union*

One of these is the European Health Union mentioned by Ursula von der Leyen in her 2020 State of the Union address. The proposals in the communiqué published by the European Commission (www21) are mainly related to the strengthening of European Centre for Disease

Prevention and Control (ECDC) and the European Medicines Agency (EMA) but also to the creation of EU Health Emergency Preparedness and Response Authority (HERA). The concrete solutions include the development of a binding EU health crisis/pandemic preparedness and response plan, strengthen the ECDC’s access to health data for research and epidemiological elements, and a new, high-performing epidemiological surveillance system at the EU level.

#### *The High Commissioner for Planning in France*

In France, in reference to the tradition of planification that triumphed after World War II during de Gaulle era, at the beginning of September 2020 François Bayrou was appointed high commissioner for planning (www22). This

might be seen as a coincidence, rather than as a direct consequence of the pandemic. However, if we look at the whole discussion about COVID-19, where the pandemic was a catalyst of the supply chain crisis, with the importance of industry for the economy and the new social, economic and environmental challenges, this institution is not just a symbolic change – it is also a change in thinking about the economy and the state. When talking about the General Planning Commission, French Prime Minister Jean Castex said that the state has lost its capacity for long-term projection (www23) and that the Commission’s goal will be “to plan an economic policy, to identify future sources of growth, to define a perspective, to set a course”. Le Plan was, during its golden age, a synonym of the developmental state approach to the economy. Such a shift may suggest that the era of the night-watchman, state which dominated in the recent decades and advocated for the opposite approach – is probably over.

### *Digital institutions*

The most visible institutional changes – not in the sense of a new administrative organisation, but in terms of new ways of functioning – were digital. Medical consultations by phone or video call, remote work or digital

epidemiological surveillance became crucial during the pandemic and will be the new normal, at least to some extent. These changes will have a huge impact on society and the economy. Telemedicine allows patients who live far from medical care points to be reached faster (www24). Remote work can affect not only how people work (and, for instance, increase the precarity of work), but also the real estate market (www25). Digital epidemiological surveillance, with new institutions like the European Health Union, can be part of an early warning system that will be used more often and more effectively than before the pandemic.

### *The systemic approach as the main result*

The European Health Union, the High Commissioner for Planning and digital micro-institutions mentioned above are just examples of the institutional response to COVID-19. However, the most important change prompted by the pandemic were not concrete measures adopted to fight with virus and its effects, but a change in thinking about risks and how to mitigate them. Building more responsive and solid institutions based on systemic concerns that will respond to complex problems – this is the new normal.

## 4.5. Sweden – an alternative model

The Swedish model for managing the COVID-19 pandemic, which was distinct from other countries’ approach, was based on public health agency experts’ decisions and individual responsibility. In March 2020, when many countries had introduced lockdowns, schools in Sweden were still open and gatherings of up to 49 people were allowed (www26). This does not mean that there were no restrictions. Visiting care homes for the elderly was banned,

there were limits for dispensing medications, and ones concerning restaurants, bars and other table service points. However, the main advice was clear and general: take personal responsibility (www27). Anders Tegnell, chief epidemiologist of Sweden, explained: “We are not just working with communicable diseases, we are working with public health as a whole” (www28). Sweden started to change its strategy during the second wave of the pandemic,

which hit the country more than in the spring. In November 2020, the government limited public gatherings to up to 8 people (www29). The other measure introduced is a nationwide ban on alcohol after 10 p.m. at bars and restaurants

(www30). Nevertheless, there was no national lockdown in Sweden and there is still no obligation to wear a face mask. However masks are recommended in public transport during rush hours.

## 4.6. The Asian Tigers' success stories

Some Asian countries, commonly referred as the "Asian Tigers", dealt with the COVID-19 pandemic more successfully than their European and American counterparts. In particular, Taiwan and South Korea are seen as COVID-19 champions. Despite their high population density and the first COVID-19 cases in early 2020, the number of new infections in both of them has been particularly low since April. As a result, the economic contraction in this part of the world will be significantly lower than anywhere else. Several factors enabled them to fight the COVID-19 pandemic successfully:

### **Institutional factors:**

- Cooperative strategy: Asian states are trying to tackle the COVID-19 pandemic through tight cooperation with private enterprises and non-governmental organisations (NGOs), which have complementary resources and expertise.
- Taiwan activated a special-purpose institution, the Central Epidemic Command Centre (CECC), to coordinate cooperation across different government ministries, agencies and NGOs. It is responsible for the coordination of big data analytics, testing, quarantine and contact tracing.

### ▶ **Box 3. Taiwan's exemplary contact tracing**

Passengers of the Diamond Princess cruise liner, many of them already unknowingly infected with the virus, left the deck for one day to explore northern Taiwan. Using big data and cell phone login monitoring, CECC identified more than 600,000 people who may have had contact with infected passengers from the cruiser. All these people received text messages with telling them to monitor their health and avoid going outside. People with symptoms were immediately tested.

- Contact tracing in South Korea: it expanded its usual Epidemic Intelligence Service (EIS) workforce by quickly training staff at around 250 local public health centres, hiring 300 private epidemiologists and leveraging staff at 11 NGOs that train and support IES officers. This multilevel approach led to earlier case

detection and efficient contact tracing and prevented infections among high-risk populations.

- Digital healthcare system (Taiwan and Korea): every citizen has a healthcare record linked to their name, allowing medical personnel to access online medical information (from both the e-dossier and data

sent by citizens). It provides health officials with almost real-time data on hospital visits and citizens' health. This enables health officials to send alerts to doctors about higher-risk patients based on their travel history. Physicians are alerted about possible cases and aware of the risk related to community transmission. Furthermore, patient trajectories were made public in Korea to enable citizens to track their own movements against those of suspected cases.

- Public space: there is an obligation in Taiwan and Korea to fill out a questionnaire and provide personal data to enter a public place (gym, restaurant, etc.). This information, as well as data from mobile logins and credit card transactions, is used by all the "Asian Tigers" for targeted testing and contact tracing.
- Quarantine hotels and a home-quarantine system in Taiwan using geofencing technology based on data collected from mobile operators. If a citizen leaves the "electronic fence" of his home or hotel, the alarm goes off. Furthermore, if he switches off his mobile phone or the battery dies, a police patrol is being sent.
- The number of hospital beds in South Korea and Japan: their health systems are centred on hospital-based care.

Compared to other high-income countries, the number of hospital beds per capita is much higher, at 13.2 beds in Japan and 11.5 in South Korea per 1,000 citizens (compared to 2.6 in the UK and 6.1 in France) (www33).

#### **Cultural factors:**

- People in east Asian countries are more tolerant when it comes to data-sharing, and less sensitive about privacy issues and individual freedoms. At the same time, they are more familiar with technology, which means that the application and scaling up of technological solutions has been more successful.
- East Asian countries have had more experience with other infectious diseases (SARS or swine flu), which leads to greater social discipline and different attitude to the pandemic reality. As a result, masks are commonly worn during the winter flu season, as well as in any other situation when a person feels unwell.
- Everyday habits and customs: bowing is in many cases more common than shaking hands or hugging. The region is also well-known for its high standards of personal hygiene. The removal of shoes when entering someone's home could be another possible explanation for the low infection rate in the above-mentioned countries.

## 5. Pandemic scenarios for 2021 and possible government responses

In this chapter, we propose three possible scenarios for 2021, based on the findings from previous sections. Health, societal and economic processes will be significantly shaped by the roll-out of the vaccine. As of mid-December 2020, vaccination had already started in UK and US, with European countries planning to start soon after Christmas. Even though mass vaccination, which could be characterised as a “staggeringly complex chain of events” of an unprecedented scale and magnitude (www34), is still ahead and there are some uncertainties regarding its implementation, the vaccine could have an impact on the economy before it is even delivered.

First of all, the start of vaccination boosts business confidence and hopes for the end of the pandemic and the approaching recovery. The initial wave of optimism was particularly visible on financial markets (the Dow Jones surged past 30,000). But it could also spread to other economic actors. Firstly, governments may decide to extend protection and support schemes rather than seek alternatives built on

the assumption that the timespan is too large and that support should be redesigned to help entities find a new place on the market, rather than maintain the status quo. Employers could decide to keep their furloughed staff for longer, rather than terminate contracts. Moreover, if the vaccines prove to be effective, they could be used as a tool to support the faster recovery of some sectors, such as aviation, tourism and HORECA, even before the threshold of herd immunity is reached.

However, the economy cannot simply return to the pre-COVID era. Some sectors were hit hard enough for structural damage to emerge. We have already observed that the employment rebound could be slow and lag behind the lifting of restrictions; that is, some workers are unable to return to their previous employers. In addition, some household and consumer behaviour (spending vs. saving, buying choices concerning channels and categories) could outlast the pandemic. People might become more fearful and unwilling to spend at pre-crisis levels. Some business models could become obsolete.

### Scenario 1: Optimistic (pandemic under control in the first half of 2021)

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**Pandemic dynamics:** Initial positive data on vaccines’ safety and effectiveness is validated and all the potential vaccines are authorised by the EMA, FDA and other responsible agencies in late 2020 or early 2021. The roll-out

phase is prepared and implemented without significant disruptions and most people around the world are willing to be vaccinated. As a result, swift vaccination starts in early 2021 and, by mid-2021, most of the vulnerable groups

are vaccinated. Subsequently, the number of COVID-19 cases that require intensive care drops significantly and non-pharmaceutical interventions (lockdowns) are no longer needed after summer 2021.

**Key economic challenges in this scenario:** The transition to the “new normal” is likely to begin in the first half of 2021. Most businesses will be able to resume their standard activities relatively soon. As a result, the key challenge for economic policy is to help businesses and employees survive in the short

term (up to 6 months) and boost consumer confidence so that the economy can reopen smoothly. At the same time, this policy must be carefully calibrated so that the fiscal stimulus that sustained economies in 2020 is not withdrawn, but, instead, smoothly redirected to boost private and public investment. In this scenario, states will have to carefully monitor companies’ liquidity and solvency – support programs will be rolled out gradually, which could lead to a new wave of bankruptcies and higher unemployment.

#### Policy options:

Challenge/Risks	Policy options
Numerous bankruptcies in the most-hit sectors	<ul style="list-style-type: none"> <li>• indirect support (facilitating access to credit, debt restructuring, accelerated depreciation or loss-carry backward)</li> <li>• direct support: grants for companies, paying firms for lost revenues</li> </ul>
Low confidence and consumer spending	<ul style="list-style-type: none"> <li>• allowing existing consumption loan borrowers to defer their principal and interest payments</li> <li>• extension/increase in the unemployment benefit (for a limited period of time)</li> <li>• targeted temporary VAT tax reduction</li> <li>• basic income provision (for 2021)</li> </ul>
Uncertainty and low investment	<ul style="list-style-type: none"> <li>• extending cheap credit programmes for companies</li> <li>• implementing tax schemes promoting private investment</li> <li>• carrying out large scale high-quality public infrastructure (physical and digital) investment projects with the highest value added and possible spillover effects</li> </ul>
Corporate insolvencies and workers’ inadequate skills	<ul style="list-style-type: none"> <li>• introducing grants and tax abolitions for companies willing to restructure</li> <li>• simplifying insolvency regimes</li> <li>• increasing funding for active labour market policies/ introducing educational vouchers (in order to facilitate restructuring).</li> </ul>

## Scenario 2: Realistic (pandemic under control in the second half of 2021)

The first vaccines are approved at the beginning of 2021. In some cases, regulatory procedures are prolonged, which means that not all producers are able to deliver as many doses as expected in late 2020. In addition, the roll-out phase is slowed down by logistical and

organisational obstacles. A significant group of people is unwilling to be vaccinated, which needs to be addressed by governments. As a result, non-pharmaceutical interventions are still needed in some countries – not only during winter/spring 2021, but also during autumn 2021.

Challenge/Risks	Policy options
The risk of spikes in the number of infections could lead to repeated short-term, local or sectoral lockdowns	<ul style="list-style-type: none"> <li>• tailor-made, sectoral support schemes to cushion economic sectors obliged to operate below their normal capacity or with the highest risk of being shut down due to repeated restrictions</li> <li>• job-retention schemes gradually transforming into re-skilling or up-skilling schemes to allow employees to leave the most-affected sectors</li> <li>• detailed monitoring of real-time data on economic activity to enable swift and targeted policy responses</li> </ul>
The “80% economy” could be a defining feature of 2021 – sluggish economic activity	<ul style="list-style-type: none"> <li>• fiscal stimulus to boost investment</li> </ul>
Second year of lower tax revenue, which will put additional strain on drained government budgets	<ul style="list-style-type: none"> <li>• higher borrowing</li> <li>• tax reforms to support drained government budgets, finding new resources (wealth tax, digital tax) rather than traditional fiscal consolidation, which could additionally hinder growth</li> </ul>
<p>The risk of the asynchronous lifting or re-introduction of restrictions</p> <p>Additional problems for internationally-oriented sectors/ companies, which could face disruption related to travel restrictions or supply shortages caused by local lockdowns.</p>	<ul style="list-style-type: none"> <li>• international-coordination efforts to safeguard global trade, tourism and other interconnected sectors, which could be affected by differences in the severity of local restrictions (due to diverging vaccination capacities).</li> </ul>

## Scenario 3: Pessimistic (pandemic under control not earlier than 2022)

Approval and/or roll-out of the vaccine is delayed (e.g. regulatory authorities find flaws in research data collected during the third stage of clinical trials or safety concerns are raised when more evidence is gathered). As a result,

seasonal peaks in infections (new waves) are observed in several countries, not only during spring and fall/winter 2021, but also in 2022. Periods of repeated lockdown will be needed not only in 2021, but perhaps even in 2022.

Challenge/Risks	Policy options
Consecutive lockdowns in 2021 and early 2022	<ul style="list-style-type: none"> <li>prolonged government support in the form of <i>Kurzarbeit</i> or similar programmes</li> <li>extension of the use of real-time data from both public and private sources to better target lockdown measures and financial support (see Chapter 3.3)</li> </ul>
Large fiscal deficits in 2021 and growing public debt	<ul style="list-style-type: none"> <li>flexible debt management, including an innovative approach to debt restructuring (<a href="http://www18">www18</a>)</li> <li>reform of tax systems with more progressive taxation, international actions (conclude the negotiations on international taxation reform, including the so-called digital tax) and capital taxation (taking into account differences in the economic impact of the recession on different companies/sectors)</li> </ul>
Uncertainty and lack of private investment	<ul style="list-style-type: none"> <li>a larger role for public investment, which can focus on maintenance as well as lay the foundations for the delayed economic upturn. Public investments can also “crowd in” private investments if uncertainty is reduced</li> <li>the delay leaves some space for detailed planning and preparation, including for creating capacity to administer and efficiently spend the additional funds from Next Generation EU Fund</li> <li>investing in public health facilities is also a natural target in this scenario, as the system may still be under pressure in 2021 and even 2022</li> </ul>
Deteriorating social conditions (unemployment, inequality, growth of the informal economy)	<ul style="list-style-type: none"> <li>reform of social security systems including universal basic income, for instance.</li> <li>introduction of active labour market policies to reskill workers and restructure certain sectors of the economy</li> </ul>
Strained public services (health, education)	<ul style="list-style-type: none"> <li>reform of education systems (teacher’s role, types of exams) towards hybrid models to reduce the educational loss due to the pandemic</li> <li>increased investments in public health facilities.</li> </ul>

**Key economic challenges in this scenario:**

The protracted pandemic will be a major challenge for all economic actors. Many sectors will need to be supported for a longer period and policy measures such as *Kurzarbeit* will need to be prolonged. On the one hand, this will put more strain on public finances; on the other hand, it will expose governments to the changing attitudes of financial markets. While the current economic environment is supportive of more government borrowing, the risk of a change in market sentiment may increase. A longer period of uncertainty delays investments and an uneven impact on countries and firms within countries can dramatically increase

various forms of inequality. As restructuring is delayed, there may be an increase in the number of bankruptcies and unemployment, which leads to more poverty, inequality and more difficult social conditions. Finally, continued strain on the public health system could lead to an increase in the number of deaths from non-COVID diseases, and countries where the education system is unprepared for remote and blended learning will suffer from the long-term consequences of educational loss. These effects will affect the global economy and reverse the long-time trend of falling inequality but could also alter the prospects for the most vulnerable emerging and advanced economies.

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# Appendix 1. Methodology

## Economic Forecast Index (EFI)

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Diagnostic variables:

- X1 – GDP (percentage change) – stimulant
- X2 – Unemployment rate – destimulant
- X3 – Public deficit (% of GDP) – destimulant
- X4 – Public debt (% of GDP) – destimulant
- X5 – Imports (percentage change) – stimulant
- X6 – Exports (percentage change) – stimulant

Step 1. Diagnostic variables for the Index were normalised using the following formulas:

a. for variables that are stimulants of economic growth:

$$x_j^S = \frac{x_{ji} - x_{jmin}}{x_{jmax} - x_{jmin}} \cdot 100$$

b. for variables that are destimulants of economic growth:

$$x_j^D = \frac{x_{jmax} - x_{ji}}{x_{jmax} - x_{jmin}} \cdot 100$$

where:

- $x_{ij}$  – the  $i$ -th value of the  $j$ -th diagnostic variable ( $i=1,2,\dots,28$ ;  $j=1,2,\dots,6$ )
- $x_{jmin}$  – the minimum value of the  $j$ -th diagnostic variable
- $x_{jmax}$  – the maximum value of the  $j$ -th diagnostic variable

Step 2. For normalised diagnostic variables, the synthetic variable was determined as the mean value of the normalized six diagnostic values.

$$EFI = \frac{\sum_{j=1}^6 x_j^{S,D}}{6}$$

Step 3. The numerical levels of the synthetic variable, put in non-ascending order, were used to create the ranking of 28 countries in terms of their economic forecasts for 2020.

Step 4. For the synthetic variable, the mean value ( $\overline{EFI}$ ), standard deviation ( $S_{EFI}$ ), minimum ( $EFI_{min}$ ) and maximum value ( $EFI_{max}$ ) were determined. On the basis of these statistics, numerical ranges of the forecast economic situation were created according to the formulas:

- $< EFI_{min}; \overline{EFI} - S_{EFI}$  – very bad forecast economic situation
- $< \overline{EFI} - S_{EFI}; \overline{EFI}$  – bad economic situation
- $< \overline{EFI}; \overline{EFI} + S_{EFI}$  – good economic situation
- $< \overline{EFI} + S_{EFI}; EFI_{max} >$  – very good economic situation

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The Polish Economic Institute is a public economic think-tank dating back to 1928. Its research spans trade, macroeconomics, energy and the digital economy, with strategic analysis on key areas of social and public life in Poland. The Institute provides analysis and expertise for the implementation of the Strategy for Responsible Development and helps popularise Polish economic and social research in the country and abroad.

