

# HIGHLIGHTS

## Highlight 1. The impact of economic characteristics and government policy on GDP trends in 2020<sup>1</sup>

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### Introduction

The economic crisis initiated by the COVID-19 pandemic in 2020 caused the biggest drop in world GDP since the World War II. In 2020, GDP fell in all parts of the world, unlike the great economic crisis in 2009, during which GDP fell in the countries of Europe and North and South America, while in other parts of the world there was only a slowdown in economic growth. While GDP fell in approximately half of the world's countries in 2009, in 2020 it fell in 85% of countries.

Although the crisis has hit all countries, GDP rates in 2020 ranged widely from falling by -15.2% to growing by + 6%<sup>2</sup>. In this paper, we investigate the extent to which differences in GDP trends by country can be explained by differences in the characteristics of their economies, and to what extent by differences in government policies, such as the intensity of epidemiological measures and the size of fiscal and monetary stimuli. We analyzed how much the decline in GDP depends on the following characteristics of the economy: the structure by activities, the level of development of countries and the growth rate in the pre-crisis 2019. Large differences in the decline in economic activity by industry imply that differences in the structure of the economy are one of the key determinants of differences between countries in the depth of GDP decline during 2020. Differences in the level of development of countries are related to differences in the characteristics of their economies (structure, technological development, openness, etc.), possibilities for fiscal and monetary incentives, quality of institutions, average education, health system development, etc. Therefore, we examine whether and to what extent differences in the level of development influenced the decline in GDP during the crisis. Finally, we investigated whether the decline in GDP by country, in the crisis year 2020, depended on the growth rate in the previous year.

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<sup>2</sup> Countries with less than 0.5 million inhabitants are excluded from the sample

The key government policies that have influenced GDP trends in 2020 are epidemiological measures on the one hand and fiscal and monetary stimuli on the other. The specificity of the current economic crisis in relation to other economic crises is that it is directly caused by epidemiological measures<sup>3</sup> that restrict the movement of people, but also the performance of some economic activities, and not the internal structural weaknesses of the economy. Governments around the world have implemented various epidemiological measures, so we are investigating whether and to what extent stricter epidemiological measures have led to a larger decline in GDP.

Expansive fiscal and monetary policies have improved the liquidity of the economy and citizens, prevented mass bankruptcies of companies and layoffs, and mitigated the decline in aggregate demand in 2020. In this paper, we investigate whether and to what extent stronger fiscal and monetary stimuli contributed to a smaller decline in GDP in 2020.

The first chapter analyzes the movement of GDP at the global level, by regions, countries and economic activities in 2020. The second chapter analyzes, using graphical and correlation analysis, the interdependence of GDP decline by country and the characteristics of countries and state policies. The third chapter presents the results of a preliminary econometric analysis of the impact of country characteristics and state policies on GDP trends in 2020.

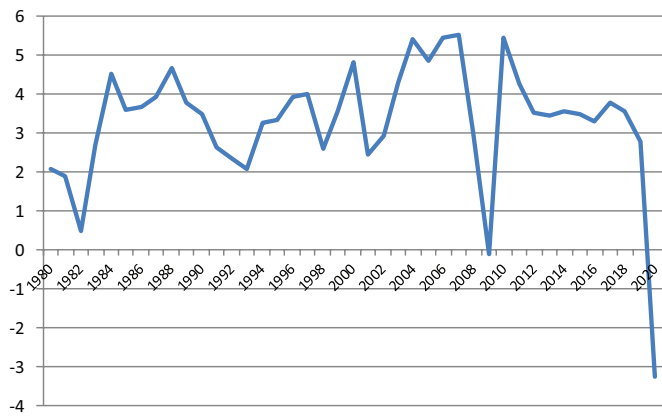
### 1. GDP trends in 2020

The decline in world GDP in 2020 was 3.2%, which is the largest annual decline since World War II. The depth of the fall in GDP last year was significantly greater than in previous major world economic crises, such as: the great financial crisis of 2009, the crisis of 1982 or the oil crisis of 1973-1974. According to the depth of the fall in GDP in one year, this crisis can be compared to the great world crisis during the 1930s. However, unlike the great world economic crisis of the 1930s, during which GDP fell for several years, in the current crisis the decline in GDP was short-lived, so in 2021 the world economy is expected to grow by about 6%. The short-term decline in GDP is a consequence of the fact that it was caused by non-economic factors (epidemiological measures), so the economic recovery

<sup>3</sup> Of course, the epidemiological measures were justified from the point of view of reducing the morbidity and mortality of the inhabitants, but their effect is beyond the scope of this paper.

began immediately after the epidemiological measures were mitigated. Another key reason for the short-lived decline in GDP is the application of strong fiscal and monetary stimuli around the world, which prevented mass bankruptcies of companies, large layoffs and mitigated the decline in aggregate demand.<sup>4</sup>

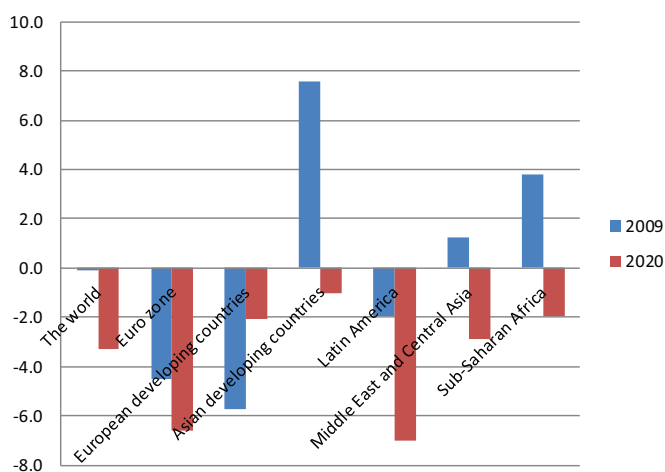
**Graph 1. World GDP growth rates, in %**



Source: IMF, World Economic Outlook Database, April 2021

Unlike the crisis of 2009, which covered mainly European countries and North and South America, the crisis caused by the COVID-19 pandemic covered all regions of the world. While in 2009 Asian and African countries achieved high growth rates, in 2020 these countries achieved a decline in GDP. Although the decline in the eurozone countries was high in 2009, it was even higher in 2020. European developing countries are the only macro-region in the world that achieved a smaller decline in GDP in 2020 than in 2009, and the reason for that is the extremely deep decline in GDP in the Baltic countries in 2009.

**Graph 2. GDP trends by regions of the world, in %**

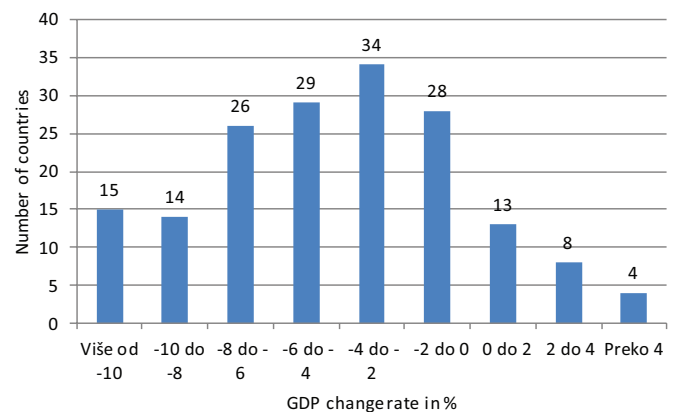


Source: IMF, World Economic Outlook Database, April 2021

<sup>4</sup> Fiscal stimulus, in addition to positive ones, has negative consequences, such as an increase in government debt that can lead to debt crises in some countries, while monetary stimulus results in an increase in private debt, rising inflation, and possibly worsening debt quality.

The widespread impact of the crisis caused by the COVID 19 pandemic is illustrated by the fact that 85% of the world's countries in 2020 achieved a decline in GDP compared to the previous year. The largest number of countries (53%) had a decline in GDP up to -6%, while as many as 32% of countries had a larger decline than -6%. Among the countries that had GDP growth are mostly underdeveloped countries from Africa and Asia, several middle-developed countries (China, Turkey and Iran), while Ireland is the only developed country that achieved GDP growth last year.

**Graph 3. Distribution of countries according to the rate of change of GDP in 2020**



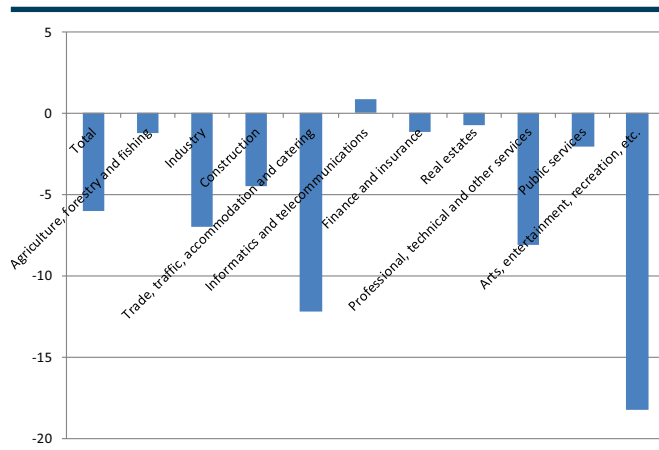
Calculated based on IMF, World Economic Outlook Database, April 2021

An important feature of the economic crisis caused by the pandemic is the large differences in GDP trends during 2020 by industry. These differences are primarily a result of the fact that epidemiological constraints have had a different impact on different activities - while epidemiological constraints have drastically affected some activities such as accommodation services, catering, entertainment, culture, etc., they had almost no impact on work in agriculture, utility companies, electricity production, information technology sector, telecommunications, etc. Another factor that influenced the differences in the decline in GDP by industry is the large differences in demand for different products. Due to the uncertainty regarding the movement of employment and future income during 2020, the demand for non-existent products, such as durable consumer goods (cars, furniture, white goods), fell sharply, while in the economy the demand for investment products fell. Demand for existential products (food, utilities, electricity) remained similar to previous years, while demand for some products increased (medicines, hygiene, IT, telecommunications).

## Highlight 1. The Impact of Economic Characteristics and Government Policy on GDP Trends in 2020

The movement of gross value added by activities in the 27 EU countries<sup>5</sup> in 2020, shown in Graph 4, confirms the assumption that activity decreased more in sectors that were hit harder by epidemiological constraints, as well as in sectors for whose products demand fell more. Although the sectors in Graph 4 show large differences in terms of GVA trends in 2020, the differences in the depth of decline at the level of product groups or individual products are even greater. Thus, for example, the industry contains sectors that had a deep decline (automotive industry), but also sectors that have achieved growth (pharmaceutical industry). Similarly, within the trade, transport, accommodation and catering sector, there are activities that achieved a dramatic decline (air transport, hotels, catering), but also activities that did not have a large decline (trade in existential products).

**Graph 4. Rate of change of GDP in the EU in 2020 by activities**



Source: Eurostat

## 2. Factors that influenced the depth of GDP decline in 2020 - descriptive analysis

The descriptive analysis of the impact of various factors on the fall in GDP in 2020 is based on data for 171 countries, excluding micro states from the sample, i.e. countries with less than 0.5 million inhabitants. Also, data are missing for some countries, so graphs are shown based on the available amount of data.

### 2.1. The impact of the characteristics of the economy on the fall in GDP in 2020

One of the important characteristics of the economy that influenced the depth of the decline in GDP of individual countries in 2020 is the structure of their economies by economic activities. The impact of the

structure of the economy on the depth of the fall in GDP is a consequence of the fact that epidemiological measures have acted differently on performance of different economic activities. Epidemiological measures, such as restricting the movement of people between or within countries, have drastically affected international tourism and international passenger traffic. Similarly, the ban on the provision of certain services such as catering, entertainment, cultural services, sports events or restricting the performance of other activities such as cosmetics salons, hairdressing services, etc. has led to a large decline in performance in these activities.

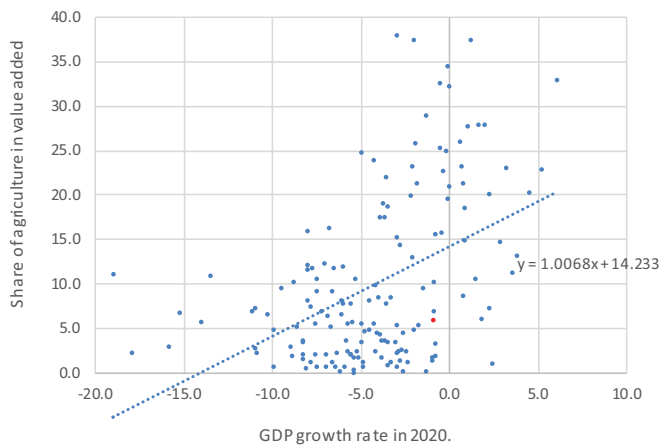
On the other hand, the impact of epidemiological restrictions on activities such as agriculture, construction, food industry, electricity production, utility companies, various government services, etc. was minimal. In addition to the ban on performing and restricting the performance of some activities, the decline in demand for products of various sectors was different. The growth of risks related to the future incomes of citizens has affected the decline in demand for durable consumer goods, such as cars, furniture, consumer electronics, etc. Similarly, the uncertainty regarding the duration of the crisis and economic recovery that existed during 2020 affected reduction in the demand for equipment.

Although the pandemic negatively affected the economy as a whole, some activities achieved high growth during the pandemic. These are primarily activities that are not significantly affected by epidemiological constraints, and whose services have increased in demand during the pandemic, such as telecommunications, IT and financial services. Also, within the industry, the demand for pharmaceutical products, hygiene products, household chemicals, etc., has increased.

The impact of the structure of the economy on GDP trends in 2020 was analyzed on the basis of highly aggregated data according to which the economy is divided into three basic sectors: a) agriculture, forestry and fisheries b) industry and construction and c) services. Sectors defined in this way contain activities that have been affected by the pandemic in different ways, so the overall effect at the sector level is averaged. Thus, for example, the industry contains activities that are strongly negatively affected by the pandemic, such as car production, equipment production, oil refining, but also activities such as the pharmaceutical industry, food industry, etc. on which the pandemic did not have a negative impact. Similarly, in the services sector some services had a deep decline (tourism, catering, entertainment, recreation, personal services) while others recorded growth (telecommunications, IT and others).

<sup>5</sup> At the global level, there are currently data on gross value added at the level of three sectors: a) agriculture, forestry and fisheries, b) industry and construction, and c) services.

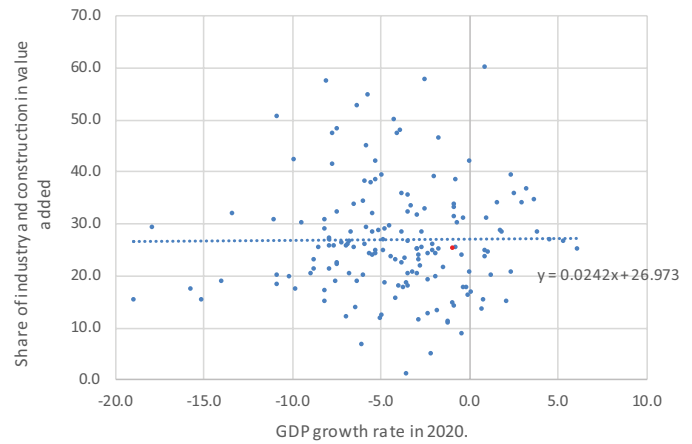
**Graph 5a. Share of agriculture in GVA and GDP trends in 2020**



In Graph 5a. there is a strong positive link between the share of agriculture, fisheries and forestry in GDP and the rate of change of GDP by country, which means - a higher share of agriculture in the GDP of a country implies a smaller decline in GDP in 2020. This result is expected considering that agricultural production is carried out in such a way that it was not significantly affected by epidemiological measures.

In Graph 5b. there is no connection between the share of industry and construction in GDP and the decline in GDP by country in 2020. This result is a consequence of the fact that the industry contains heterogeneous activities, some of which were negatively affected by the pandemic, while others were positively affected by the pandemic. The impact of industry share on GDP decline in 2020 in individual countries depends on whether pandemic-affected activities, such as the automotive industry and the production of capital equipment, or pandemic-resistant activities such as food production,

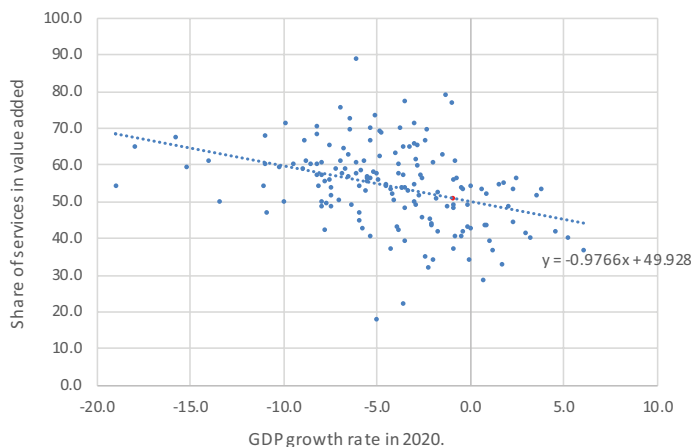
**Graph 5b. Share of agriculture in GVA and GDP trends in 2020**



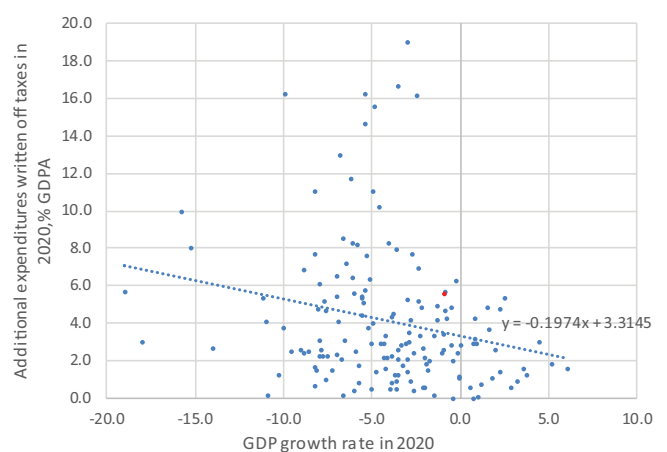
pharmaceutical industry, electric power production, etc., are more significant in a particular country. In the aggregate classification of activities published for all countries of the world, activity in industry is presented together with construction. Construction, as an activity that is largely performed outdoors, is not significantly affected by epidemiological measures, and therefore the decline in GDP was smaller in countries where this activity has a larger share in GDP.

The service sector, like the industry, is very heterogeneous and includes various services such as: accommodation, catering, culture, entertainment, sports, personal services (cosmetics, lawyers, etc.), banking and finance, telecommunications, IT, health, education etc. Epidemiological measures have dramatically affected some types of services (accommodation, catering, entertainment, etc.), others in the conditions of the pandemic achieved an increase in activity (telecommunications, IT, health services), while on

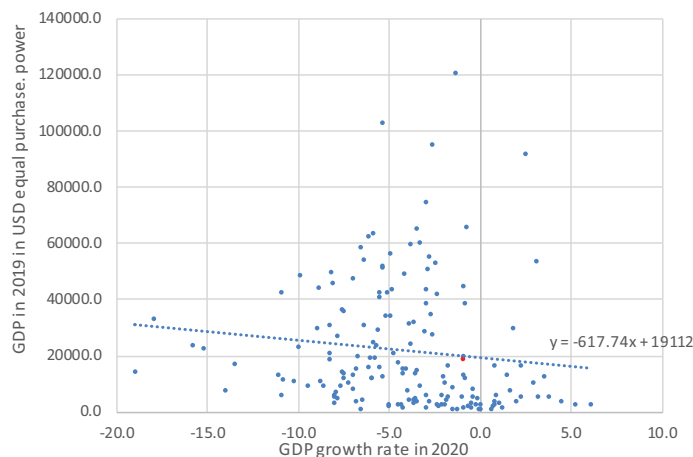
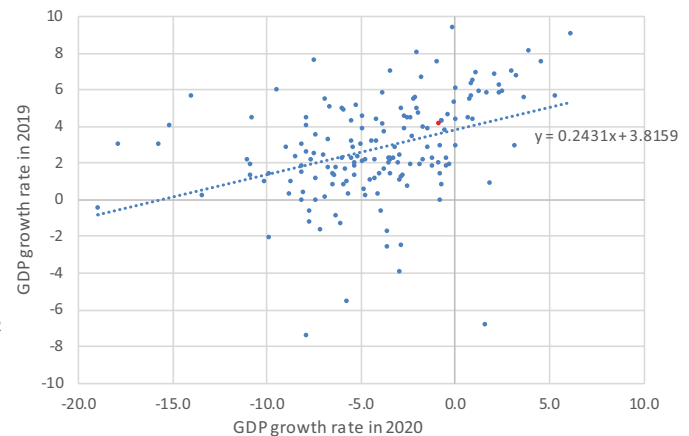
**Graph 6a. Share of services in GVA and GDP trends in 2020**



**Graph 6b. Tourism share in GVA and GDP trends in 2020**





**Graph 7a. Country development and GDP trends in 2020****Graph 7b. Relationship between GDP growth in 2020 and 2019**

some pandemic had no significant impact (utilities, banking, financial services, etc.). Due to the different impact of pandemic on different types of services, the impact of the share of services on the GDP decline in individual countries depends on which types of services are dominant in them. If the services affected by the pandemic (tourism) are dominant, then the impact is negative, while in the case where dominant services are not affected by the pandemic, or the pandemic has even stimulated an increase in the volume of activities in them, then the impact can be positive (IT sector in Ireland). On the worldwide level, the higher share of services in GDP in a country, on average, contributed to a larger decline in GDP in that country (Graph 4a.), which indicates that the services sector, on average, is dominated by services negatively affected by the pandemic. Tourism is one of the activities within the services sector that has been particularly hard hit by the pandemic. In line with expectations, countries with a higher share of tourism in GDP had a larger decline in GDP in 2020 (Graph 6b).

An important question for researchers, but also for economic policy makers, is whether the decline in GDP during 2020 depended on the level of development of countries<sup>6</sup>. The link between development levels and GDP decline during a pandemic is relatively complex. Some characteristics of developed countries affect a smaller decline in their GDP, while others affect a deeper decline. Developed countries borrow at lower interest rates, which allows them to apply strong fiscal stimulus to mitigate the fall in GDP. Also, investor confidence in the monetary policy of developed countries is relatively high, which enables the application of strong monetary stimulus, and this results in a modest acceleration of

inflation. In addition, developed countries have a more efficient state administration and a more developed health care system, which could also lead to a smaller decline in GDP during a pandemic. On the other hand, the structure of the economy of developed countries is characterized by a high share of services and a low share of agriculture and construction, which affects the deeper decline of their GDP. In addition, in the industrial sector in developed countries, there is a greater share of the automotive industry, equipment production and other activities that are strongly affected by the pandemic. In contrast, less developed countries have fewer opportunities to apply fiscal and monetary stimulus, but have an economic structure that is more resilient to the application of epidemiological measures (higher share of agriculture and construction, lower share of services). The exceptions are developing countries that are significantly dependent on tourism.

In Graph 7a. there is a slight negative link between the level of development and the decline in GDP in 2020, which means that more developed countries had a slightly larger decline in GDP than less developed countries. This result could be interpreted in such a way that the impact of the structure of the economy on the fall in GDP in 2020 was somewhat stronger than the impact of fiscal and monetary stimulus.

The speed of economic growth in the pre-crisis 2019 could have affected the depth of the decline in the following pandemic year. If it is assumed that, under other similar conditions (similar economic structure, similar epidemiological measures, similar monetary and fiscal stimuli, etc.), the crisis has equally affected the decline in GDP of all countries, then a smaller decline in 2020 will be recorded in countries that in 2019 had a higher growth rate. If we assume that the crisis has

<sup>6</sup> The research observes the level of development of countries in the pre-crisis year 2019, measured by GDP per capita in dollars of equal purchasing power.

brought down the GDP growth rate by 6 percentage points<sup>7</sup>, then a country that had a growth rate of 5% in 2019 will have a decline of -1% in 2020, while a country that in 2019 had a growth rate of 1% in 2020 have a decline of -5%. Graph 7b. is in line with the hypothesis that the decline in GDP in 2020 was somewhat smaller in countries that had a high growth rate in 2019.

## 2.2. The impact of epidemiological measures on GDP decline

The current pandemic is characterized by the application of strong epidemiological restrictions in almost all countries of the world. Due to the lack of effective drugs and vaccines against COVID-19 during 2020, the application of non-pharmacological measures was a way to slow the spread of the disease and reduce mortality. The application of strict epidemiological measures reflects the progress of civilization which is manifested in a greater appreciation of human lives than has been the case in the past. Civilizational progress can be seen by comparing the epidemiological constraints introduced during the COVID-19 pandemic with those introduced during the Spanish flu. The current epidemiological restrictions are much more rigorous and are applied almost all over the world, while at that time they were milder and were applied mostly locally. The application of strong epidemiological restrictions during the pandemic was largely made possible thanks to the higher level of human development, which as a result was able to more easily endure casualties in the form of falling GDP and declining income. Finally, the negative effects of epidemiological restrictions have been significantly mitigated by the application of fiscal

and monetary stimuli, which was not the case in similar situations in the past.

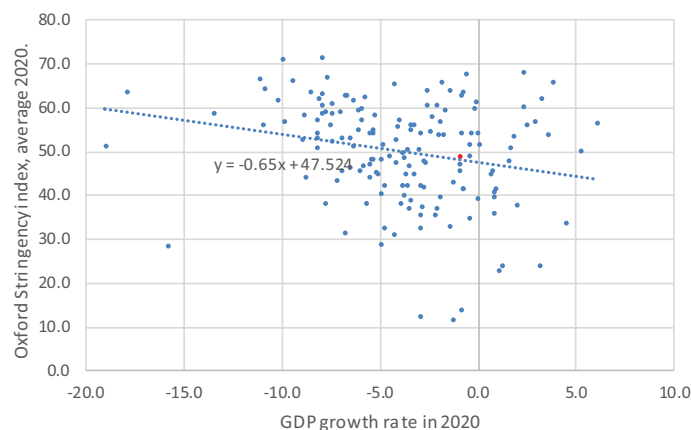
Although almost all countries in the world introduced epidemiological restrictions during the COVID-19 pandemic, measuring the intensity of these restrictions in individual countries is a major challenge. An additional problem is the existence of a difference between legal restrictions and their application. In order to measure the strictness of epidemiological measures, the University of Oxford has developed a synthetic (composite) index (OSI) that is calculated for all countries of the world, for each day, since the beginning of the COVID-19 pandemic. The severity index of measures represents the unweighted average of a number of indicators such as: school closures, bans on certain activities, bans on public gatherings, bans on leaving the apartment / house, closures of public transport, restrictions on domestic travel and restrictions on interstate travel. The value of the index is in the range from 0 to 100, where the value of 0 corresponds to the absence of any epidemiological measures, and the value of 100 to the maximum application of all the mentioned epidemiological measures<sup>8</sup>.

Based on data for all countries of the world in Graph 8a. there is a negative relationship between the Index of strictness of epidemiological measures in 2020 and the fall in GDP in that year, which means that countries that applied stricter epidemiological measures had a larger fall in GDP. In addition to the average level of strictness of epidemiological measures, the movement of GDP was influenced by the frequency and degree of variation of measures. Countries that changed the strictness of measures more often and significantly, had

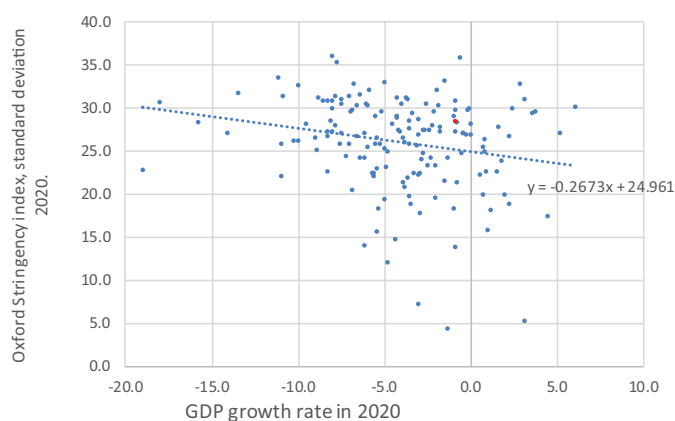
7 The growth rate of world GDP in 2020 is 6 percentage points lower than in 2019

8 During April 2020, during the state of emergency, the value of the index of severity of epidemiological measures for Serbia was 98.5, and in the period June 2020 - April 2021, the value of the index averaged 53.4

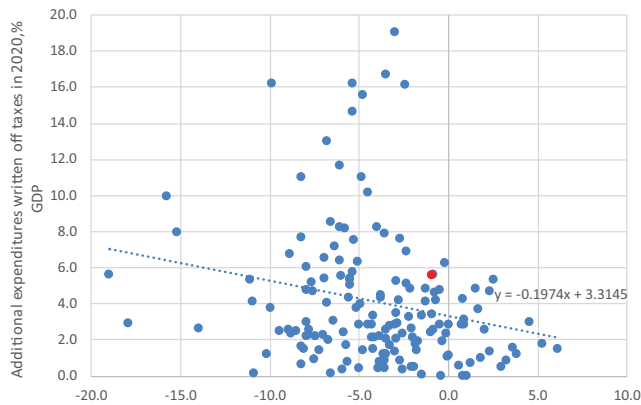
**Graph 8a. GDP trends and severity of epidemiological measures**



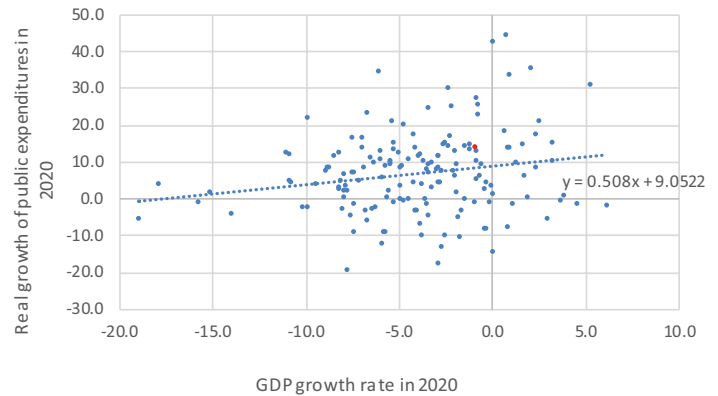
**Graph 8b. GDP trends and variability of epidemiological measures**



Graph 9a. Fiscal stimuli and GDP trends in 2020



Graph 9b. Real growth of public expenditures and GDP trends in 2020



a larger decline in GDP than countries that changed the strictness of measures less frequently and less often (Graph 8b).

### 2.3. The impact of fiscal and monetary policy on GDP trends in 2020

The application of strong epidemiological measures, without an appropriate reaction of fiscal and monetary policy, would result in a deep fall in GDP in 2020, which according to the IMF would amount to about 10%, which means that it would be about 3 times higher than the one achieved. Such a fall in GDP would trigger a negative spiral of economic events, such as mass layoffs, mass corporate bankruptcies, the banking crisis, etc. that would have the effect of prolonging the crisis for the next few years. Another major economic crisis in a relatively short period of time would provide a fertile ground for the strengthening of various populist and extremist groups, as was the case during and after the World War I.

A large deterioration in the state of the economy and the standards of citizens would probably not be socially and economically acceptable, so it can be estimated that without fiscal and monetary stimuli that mitigated the fall in GDP, strict epidemiological measures that significantly reduced morbidity and mortality would not be implemented. Without fiscal and monetary stimuli epidemiological responses would likely be similar to those of the Spanish flu pandemic, meaning morbidity and mortality would be many times higher than in 2020.

Fiscal stimulus significantly mitigated the decline in citizens' incomes during the pandemic, thus preventing a large drop in demand, which, if it happened, would further bring down GDP and employment. In addition, fiscal stimulus, together with monetary stimulus, has significantly reduced corporate bankruptcies and job

losses. However, the price of fiscal stimulus is a large increase in public debt, while monetary stimulus has affected the growth of corporate and citizen indebtedness, and is likely to affect the growth of global inflation.

The total volume of fiscal stimulus by country has been estimated by the IMF<sup>9</sup>. According to IMF estimates, total fiscal stimulus in 2020, which includes additional government spending and tax write-offs, was 7.4% of world GDP. Of this amount, about 1% of GDP relates to increased health expenditures, while the remaining 6.4% of GDP relates to state aid to enterprises and citizens. In addition to realized expenditures and tax write-offs, the state approved guarantees for loans to companies and citizens (the value of guarantees is about 4% of world GDP) which will, to a greater or lesser extent, be converted into government expenditures in the future, while some companies have been recapitalized to prevented their bankruptcy.

The level of fiscal stimulus applied during 2020 is strongly related to the level of development of countries. Fiscal stimulus seen as a percentage of GDP was approximately twice as high in developed countries than in developing countries, while it was even lower in underdeveloped countries<sup>10</sup>.

The relationship between total fiscal stimulus, estimated by the IMF, and GDP decline by country is shown in Graph 9a, and it is slightly negative, meaning that countries that had higher fiscal stimulus had greater GDP decline! It is possible that this link maintains a false causality between fiscal stimulus and GDP developments in 2020 for several reasons. First, the

9 The impact of fiscal stimuli on GDP trends depends not only on their size but also on their structure, timeliness of implementation and efficiency of the state in the implementation of stimuli. However, for now, only data on the total amount of stimuli are available for larger sets of countries, but not data on their structure, dynamics during 2020, year and efficiency in implementation.  
10 IMF 2021 „Fiscal monitor“.

fiscal stimulus in 2020 is compared to GDP in 2020, which means that the fiscal stimulus, as a percentage of GDP, is higher the larger the decline in GDP. At the same time, the larger decline in GDP is a consequence of the structure of the economy, stricter epidemiological measures, etc., and not fiscal stimulus. Another problem with this measure is that it contains tax write-offs, and the tax write-off is a consequence of the fall in GDP, and not the cause of its fall.

Therefore, as an alternative measure of fiscal stimulus, we used the growth rate of real expenditures in 2020 compared to 2019. The advantage of this measure is that it does not depend on the fall in GDP in 2020, as well as that it does not include tax write-offs, which is mainly a consequence of the fall in GDP. In contrast to overall fiscal stimulus, real public expenditure growth is positively related to GDP trends in 2020 (Graph 9b), which means that higher real public expenditure growth is associated with a smaller decline in GDP.

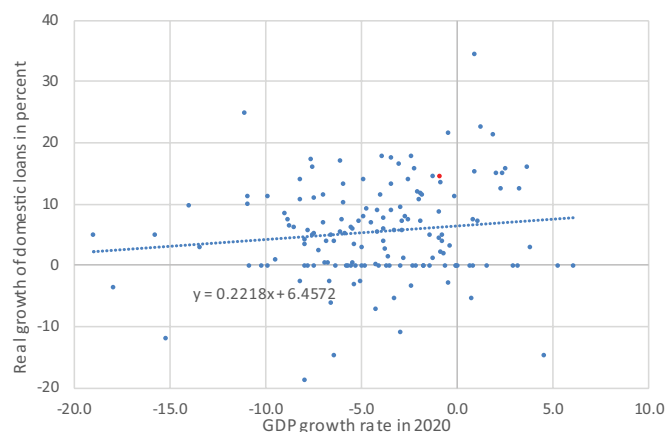
Along with fiscal expansion, strong monetary stimulus has been applied in most countries. The main goal of the monetary stimulus was to reflect the liquidity of the economy during the crisis, despite the fact that a large number of companies reduced the volume of business, while some temporarily stopped working. Monetary expansion, together with fiscal, has prevented mass bankruptcies of companies, but its consequence is the growth of indebtedness of companies and citizens, which can jeopardize their solvency after the crisis.

The range of monetary stimulus applied by central banks was relatively generous. Central banks reduced key interest rates, introduced additional liquidity by buying government and corporate securities on the secondary market, introduced the possibility of delaying loan repayments by businesses and citizens, eased prudential norms, etc. The expansion of banks' lending activity during the crisis was stimulated by fiscal policy measures, such as providing government guarantees for bank loans granted to small and medium-sized enterprises.

Data on real growth of domestic loans<sup>11</sup> by countries during 2020 were used as a synthetic indicator of monetary expansion. Based on Graph 10, it can be seen that during 2020 there was a slight positive relationship between the growth rate of real value of domestic loans and the GDP growth rate, i.e. that countries that achieved higher credit growth had a slightly smaller decline in GDP.

<sup>11</sup> Other potential indicators of monetary expansion in 2020, such as the real growth of the broadly defined money supply, are still not available for a large number of countries. In addition, money supply data are not available for individual member states of monetary unions (such as the Eurozone).

**Graph 10. Monetary expansion and GDP trends during 2020**



Napome

### 3. Econometric analysis of the impact of economic characteristics and government policies on GDP changes in 2020

Previous graphical representations and simple regressions give an indication of the existence of the influence of some characteristics of the economy and government policies on GDP trends during 2020 by country. However, these indications may be wrong. The existence of a link between some characteristic of the economy or state policy and changes in GDP in 2020 may be due to the influence of one or more other variables that affect the characteristics of countries and their policies, but also changes in GDP. Thus, for example, the negative relationship between the level of development of countries and the movement of GDP in 2020 may be a consequence of differences in the structure of the economy, and not the negative impact of the level of development on the movement of GDP in 2020. On the contrary, the absence of a significant impact of fiscal and monetary policy measures on GDP trends in 2020 may be due to the fact that the strongest incentives were applied by developed countries, which also applied stricter epidemiological measures, and which have economic structure severely affected by epidemiological measures.

A more reliable assessment of the impact of the characteristics of the economy and state policies on the movement of GDP by country in 2020 is possible on the basis of econometric models. In the process of assessing the impact of some characteristic of the economy or government policy on GDP trends, other relevant variables are included in the model. For example, when examining the impact of fiscal stimulus on GDP trends, other variables are included in the model, such



**Table 1. Econometric assessment of the impact of country characteristics and state policies on GDP changes in 2020 at the global level**

| Dependent: GDP rate of change 2020                    | Rating             | Statistical significance |
|---|--------------------|--------------------------|
| Variable  | (average interval) |                          |
| GDP per capita 2019 (dollars, equal purchasing power) | 0.820              | YES/NO                   |
| Growth of real public expenditures 2020               | 0.089              | YES                      |
| Fiscal stimulus (% of GDP)                            | -0.135             | YES                      |
| Real growth of domestic loans 2020                    | 0.033              | NO                       |
| Severity of measures (OSI average)                    | -0.020             | NO                       |
| Severity of measures (OSI std. dev.)                  | -0.079             | YES/NO                   |
| Agriculture, fisheries and forestry services          | 0.196              | YES                      |
| Services  | -0.126             | YES                      |
| Tourism   | -0.596             | YES/NO                   |
| Adjusted R <sup>2</sup> (average)                     | 0.272              |                          |
| Number of countries (N)                               | 110 - 147          |                          |

as differences between countries in the structure of the economy, differences in the severity of epidemiological measures, differences in the expansion of monetary policy, etc.

The impact of the characteristics of the economy and state policy on the movement of GDP in 2020 was assessed first for all countries in the world<sup>12</sup> for which data exist, and then for the countries of Europe and Central Asia. The evaluation results are preliminary and may be corrected once additional data become available.

Based on the econometric model, it is estimated that the following factors had a negative and statistically significant impact on GDP trends: stricter epidemiological measures and a higher share of total and especially tourist services in GDP. Stricter epidemiological measures by 10 percentage points,

<sup>12</sup> As with descriptive analysis, in the case of econometric analysis, countries with less than 0.5 million inhabitants are excluded. Depending on the available data, the sample at the global level includes between 111 and 147 countries.

according to OSI, other things being equal, led to a larger decline in GDP by 0.2 percentage points. A higher share of services in GDP by 10 percentage points on average led to a larger decline in GDP by 1.3 percentage points, other things being equal. The strongest impact on the decline in GDP had the high share of tourism services - a higher share of tourism services in GDP by 10 percentage points affected the decline in the GDP rate by 6 percentage points. Frequent variation of epidemiological constraints had a negative impact on GDP trends, but this impact is statistically significant in some equations, while not in others. Fiscal stimulus and a higher share of agriculture in GDP had a positive and statistically significant impact on GDP trends in 2020. A higher real growth rate of public expenditures by 10 percentage points resulted in a smaller decline or higher GDP growth by 0.9 percentage points, on average. The higher share of agriculture, forestry and fisheries in GDP by 10 percentage points led to a smaller decline or higher GDP growth by 2 percentage points. The level of

**Table 2. Econometric assessment of the impact of country characteristics and government policies on GDP changes in 2020**

| Dependent: GDP rate of change 2020                    | Rating             | Statistical significance |
|---|--------------------|--------------------------|
| Variable  | (average interval) |                          |
| GDP per capita 2019 (dollars, equal purchasing power) | 1.605              | YES                      |
| Growth of real public expenditures 2020               | -0.011             | NO                       |
| Fiscal stimulus (% of GDP)                            | -0.269             | YES/NO                   |
| Real growth of domestic loans 2020                    | -0.020             | NO                       |
| Severity of measures (OSI average)                    | -0.160             | YES                      |
| Severity of measures (OSI std. dev.)                  | -0.267             | YES                      |
| Agriculture, fisheries and forestry services          | 0.286              | YES                      |
| Services  | -0.184             | YES                      |
| Tourism   | -0.228             | YES                      |
| Adjusted R <sup>2</sup> (average)                     | 0.493              | YES                      |
| Number of countries (N)                               | 40-43              |                          |

development of countries, measured by GDP per capita (in dollars of equal purchasing power), had a positive impact on GDP, but its impact is unstable – in some equations it is statistically significant, and in others it is not. The unstable impact of the level of development on the GDP growth rate is probably a consequence of the correlation of this variable with other variables in the model, such as the structure of the economy, the severity of epidemiological measures and the intensity of growth of government spending. The higher growth rate of the real level of domestic loans also had a positive effect on GDP, but this effect was not statistically significant.

The impact of the characteristics of the economy and politics of countries on the GDP growth rate in 2020 was assessed especially for European countries and Central Asian countries that were members of the Soviet Union during the 20th century. This sample of countries is much smaller, but the countries in it are more homogeneous, while the data are more reliable on average than for all countries in the world. In the sample of European and Central Asian countries, the level of development and share of agriculture in GDP has a positive impact on GDP, while stricter and more variable epidemiological measures, higher share of services in GDP, and especially higher share of tourist services, have a negative impact on GDP. No statistically significant impact of fiscal and monetary policy on GDP trends during 2020 was found in this sample. Estimates of parameters that show how much the characteristics of the economy or government policy have influenced the GDP growth rate in this group of countries are in a relatively narrow interval.

In this sample, the greatest impact on mitigating the fall in GDP or its growth had the large share of agriculture in GDP – a higher share of agriculture by 10 percentage points resulted in a smaller fall in GDP by 2.9 percentage points. On the other hand, a higher share of services in GDP by 10 percentage points reduced the GDP growth rate by 1.8 percentage points. Increasing the rigor of epidemiological measures by 10 percentage points lowered the GDP growth rate by 1.6 percentage points, while increasing the variability of epidemiological measures by 10 percentage points lowered the GDP growth rate by as much as 2.7 percentage points. In this group of countries, it has been shown that the country's development has a positive and statistically significant impact on GDP trends in the years of crisis.

## Conclusion

The economic crisis triggered by the COVID-19 pandemic resulted in a 3.2% drop in world GDP in 2020, the largest decline since World War II. Observed

by countries, GDP changes range from a decline of -15.2% in Montenegro to a growth of 6% in Ethiopia. Based on descriptive statistical analysis and preliminary econometric estimates, GDP trends in 2020 depended crucially on the structure of the economy and the severity of epidemiological measures, and there is some evidence that stronger fiscal stimulus and higher levels of development positively affected GDP trends.

The higher share of agriculture in GDP and the lower share of services, especially tourism, led to a smaller decline in GDP. On the contrary, stricter epidemiological measures and more frequent changes in the degree of severity of epidemiological measures had a negative impact on GDP trends. When it comes to fiscal stimulus, there is evidence that higher growth in the real value of public spending has had a positive effect on GDP trends.

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