

Comparative Analysis of Unemployment Rates in The United States and China During COVID-19*

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* Presented at the 37th IBIMA International Conference, 30-31 May 2021, Cordoba, Spain

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Abstract

The paper utilizes the comparative analysis of unemployment rates in the United States and China. The obtained primary data on unemployment rates in various time intervals were compiled on categorized line charts by assigning / subordinating to the considered time series separate scales on additional X and Y axes - in order to detect the regularities governing the given phenomena. Due to the largest increase in the unemployment rate in the history of the United States during the COVID-19 pandemic, 51 states were subject to the study. The analyzes used constant-base dynamics indicators. The study ends with a summary and conclusions.

Keywords: *unemployment, unemployment rates in the USA, multivariate analyzes, economic security.*

Introduction

The rationale for undertaking the research was the observation of large increases in unemployment rates caused by the COVID-19 pandemic in the leaders of world economies, which are the United States and China. In addition, a critical analysis of the literature revealed the lack of multivariate comparative analyzes of unemployment rates in the United States and China during the world's progressive COVID-19 infectious disease.

The aim of the study is to conduct a comparative analysis of unemployment rates in the United States and China. The subject of research are the United States and China, and the object of research are the unemployment rates.

The research methods were applied, which included the analysis of the literature on the issues related to the unemployment rates in the United States and China, multivariate analyzes and economic security. The research used research tools in the form of categorized line charts.

The study consists of an introduction, three content-related sections, a summary and conclusions.

Analysis of the literature on the subject of the research

The analysis of literature and own experience show that the strongest economies in the world in terms of economy are China and the United States. It should be emphasized that there are about 1.4 billion people in China [17], and in the United States, 332 million people [17]. The observations clearly show that China has a much greater potential of the labor force than the United States, and the number of unemployed should be similarly higher here. The study attempts to perform a comparative analysis of the unemployment rates in China and the United States before and during the COVID-19 pandemic. The analysis

of the literature on the subject of the research began with explaining the term unemployed. According to the researchers, these are people who are not employed who are looking for a job, including accepting the current salary [1].

In December 2019, the first cases of the infectious disease COVID-19 appeared in Wuhan, China [8,3]. Due to the rapid spread and increasing human mortality, the disease was declared a global pandemic on March 11, 2020 [7]. Individual countries have introduced their own regulations and tightening measures to counter the pandemic. There is anxiety among the people and there is a lack of preparation for the situation in many countries [4]. The first decisions of individual countries were to close borders and limit passenger transport. This in turn translates into lower demand for crude oil and leads to global drops in its prices [2], even to the level of USD 9 per barrel. A further effect of the prevailing pandemic is the rise in unemployment in such economic powers as China and the United States.

The pandemic in China, the world's second largest economy, was the first country to wreak havoc and forced millions of people to look for work. The analysis of secondary data shows that it is difficult to capture the full phenomenon of unemployment in this country, as the official unemployment rate takes into account only the number of unemployed in urban areas, which has not exceeded 4% for years. In February 2020, the unemployment rate reached 6.2%, and in the following month it fell to 5.9%. China's government figures show that over 27 million people have remained unemployed. These official figures do not include large sections of the rural community in statistics, nor the enormous 290 million migrant workers who belong to the typical working class. Unofficial information indicates that around 80 million people in China may have lost their jobs from January to February [9].

On the other hand, the highest level of unemployment during the pandemic in the largest economy in the world, the United States, was recorded in April 2020 at the level of 14.7%. It should be emphasized that from February to March 2020 the unemployment rate increased by 11.2 percentage points. About 20.5 million people lost jobs in the United States during this time [10].

The analysis of the literature shows that the highest unemployment in the United States was recorded during the Great Depression of 1929-1933. The maximum recorded unemployment rate was 25.59%. The immediate cause of the Great Depression was the stock market crash caused by easy access to loans and overproduction. The crisis has spread to all economies in the world. This in turn has led to enormous unemployment [12].

When analyzing the world's financial crises, never in history has there been such a rapid increase in unemployment in the United States as it did during the COVID-19 pandemic. Increases in unemployment are observed in every country during this period, including the first stage of the COVID-19 emergence in China. This became the basis for a comparative analysis of unemployment rates in the United States and China. The research was conducted in the aspect of economic security.

The analysis of the literature shows that economic security is the certainty of the survival and development of the state's economic system and the maintenance of its international position [6].

A multivariate comparative analysis was used to conduct the research. It consists in ordering a relatively homogeneous set of objects in order to make decisions [4]. The grouping method was used in the research. The research began with a analysis of the unemployment rates in the United States and China.

A comparative analysis of unemployment rates in the United States and China

The research began by presentation (Fig. 1) of data on unemployment rates in the United States and China: January 2018 to October 2020, and in the United States from April 1, 1929 to June 1, 1942.

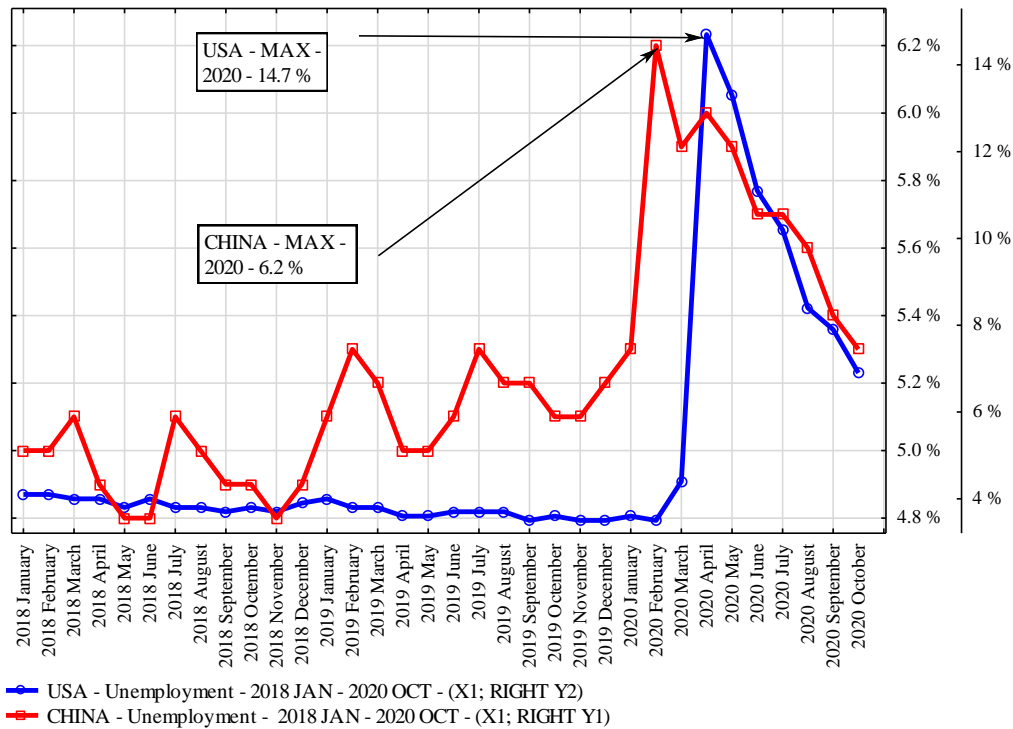


Fig. 1: Presentation of unemployment rates in the United States and China from January 2018 to October 2020 (Left Y1 axis and X1 axis - unemployment rates in China from January 2018 to October 2020; left axis Y2 and X1 axis - unemployment rates in the United States from January 2018 to October 2020) [15; 13]

For illustrative purposes, in order to emphasize the trends in the three functions considered in Figure 1, different scales of the X and Y axes were assigned to them. The scale was assigned in the form of the right 2nd Y axis and the 1st X axis to the first time series of unemployment rates from January 2018 to October 2020 in the United States. On the other hand, a scale was assigned in the form of the right 1st Y axis and the 1st X axis to the second time series of unemployment rates in China from January 2018 to October 2020.

It should be emphasized that the rise to such a high level of the unemployment rate took place over a long period of time spanning several years. In contrast, in 2020, during the COVID-19 pandemic, a large increase in the unemployment rate was observed over a short period of time. In the United States, from February to April 2020, the unemployment rate increased by 11.2 percentage points, to 14.7%. Such a strong increase in the unemployment rate in such a short time has not been recorded in the entire history of the United States. About 20.5 million people lost their jobs during this time [<https://businessinsider.com.pl/twoje-pieniadze/praca/bezrobocie-w-kwietniu-2020-r-w-usa-spowodowane-koronawirusem/gk157xg>; as of November 25, 2020]. Similar to the United States, increases in unemployment rates triggered by the COVID-19 pandemic were recorded in China. From January to February 2020, the unemployment rate increased by 0.9 percentage points to the level of 6.2%. From the data presented on the websites [<https://biznes.wprost.pl/gospodarka/10324220/do-80-mln-dojdzie-kolejnych-9-mln-bezrobotnych.html>; as of November 25, 2020] about 80 million people may have lost work in China by the end of March.

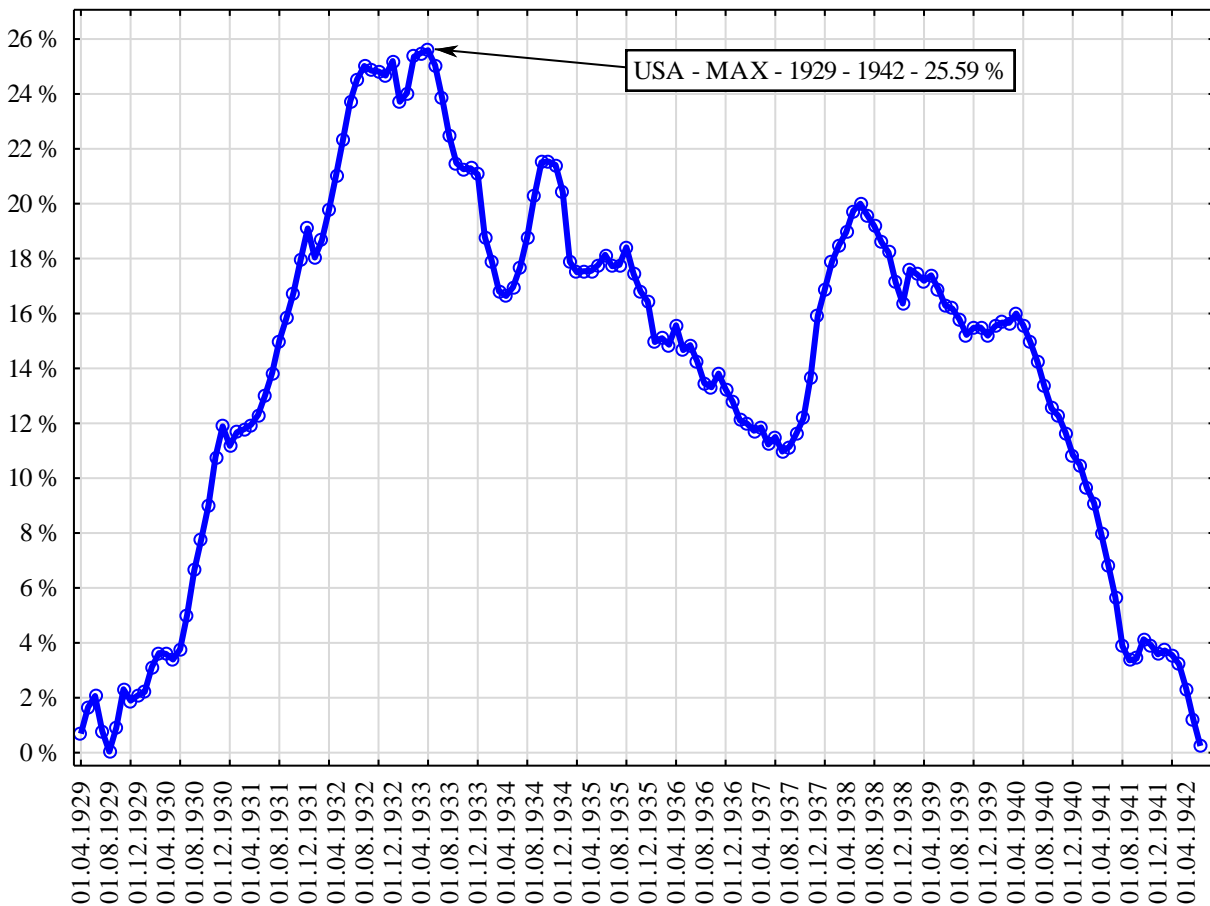


Fig. 2. Presentation of unemployment rates in the United States from April 1929 to June 1942 [11]

The Figure 2 presents unemployment rates in the United States from April 1929 to June 1942. The observation of the data presented in Figure 2 allows for the conclusion that the highest unemployment rate in the United States was recorded during the Great Depression (1929-1933) on May 1, 1933 and amounted to 25.59%.

The highest growth rate of unemployment rates was visible in the United States from April 1, 1929 to May 1, 1933. The growth of constant-base dynamics indicators (constant as of April 1, 1929) was 3608.7%. It should be emphasized that the growth continued for four years. In the 21st century, however, with the emergence of the infectious disease COVID-19, further large jumps in unemployment rates were recorded. When considering the leaders of world economies such as the United States and China, it was observed that in the short term in the United States from February to April 2020, unemployment rates increased by 273.17 percentage points. In China, on the other hand, from January to February 2020, an increase of 18 percentage points was observed.

Due to the higher dynamics of unemployment rates in the United States than in China, the United States was subjected to further research during the COVID-19 pandemic.

A comparative analysis of unemployment rates in the 51 states of the United States

In the United States, an attempt was made to analyze the changes in unemployment rates in 51 US states as the infectious disease COVID-19 spreads. To conduct the research, the absolute changes of unemployment rates (constant as of January 2020), in 51 states of the United States, were calculated. The results are outlined in Figure 3.

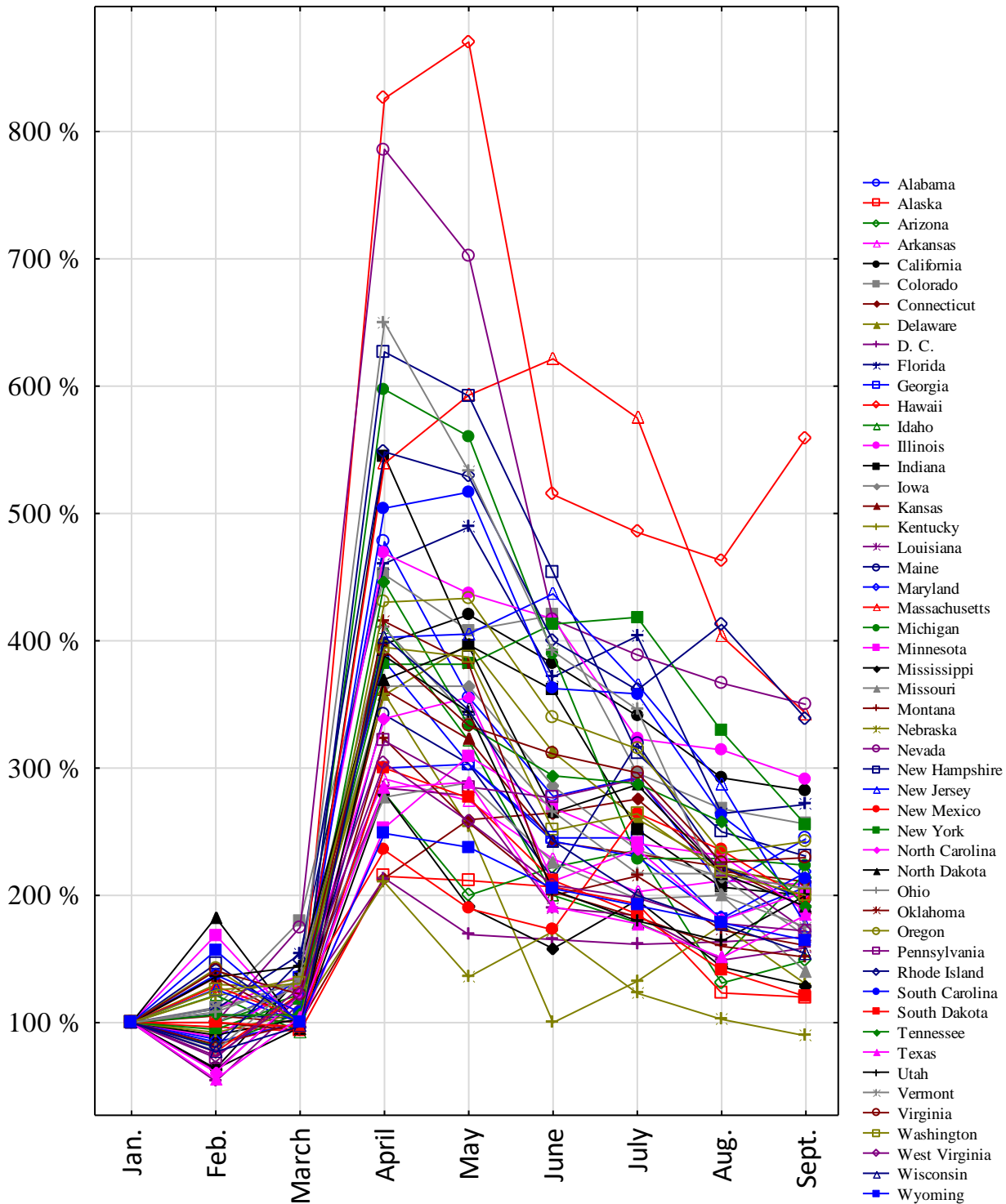


Fig. 3. Presentation of data on absolute changes of unemployment rates for 51 states of the United States from January to September 2020 [16]

The data in Figure 3 shows that from March to April 2020, a strong upward trend in unemployment rates was visible in 51 states of the United States. On the other hand, from April to September 2020, a downward trend was observed. The highest median of the constant-base dynamics indicators of unemployment rates in the month group in 51 analyzed states of the United States in 2020 (from January to August; January 2020 constant) was in April and amounted to 381.58%. The second place in the ranking in terms of the value of the median of the constant-base dynamics indicators was taken by May with the result of 339.02%. However, the third place in the ranking was taken by June with the median of 264.86%. Figure 1 shows

that the largest standard deviation from the arithmetic average of unemployment rates was in May 2020 and amounted to 138.15\$. April was second with a median of 136.05%. June came third, with the median amounting to 104.49%.

The highest growth of the constant-base dynamics indicators in 51 analyzed states of the United States was recorded in Hawaii with the result of 870.37% in May and 825.93% in April. The second state of the USA with the highest increases in the constant-base dynamics indicators was Nevada, where from January to April 2020 an increase of 668.11 percentage points was recorded.

The next stage of the research is to analyze and rank the increases and decreases in the US unemployment rates (raw data) in 51 states during the spread of the COVID-19 infectious disease. To this end, Figure 4 plots a categorized line chart of unemployment data in 51 states of the United States for the following months of 2020: March, April and September.

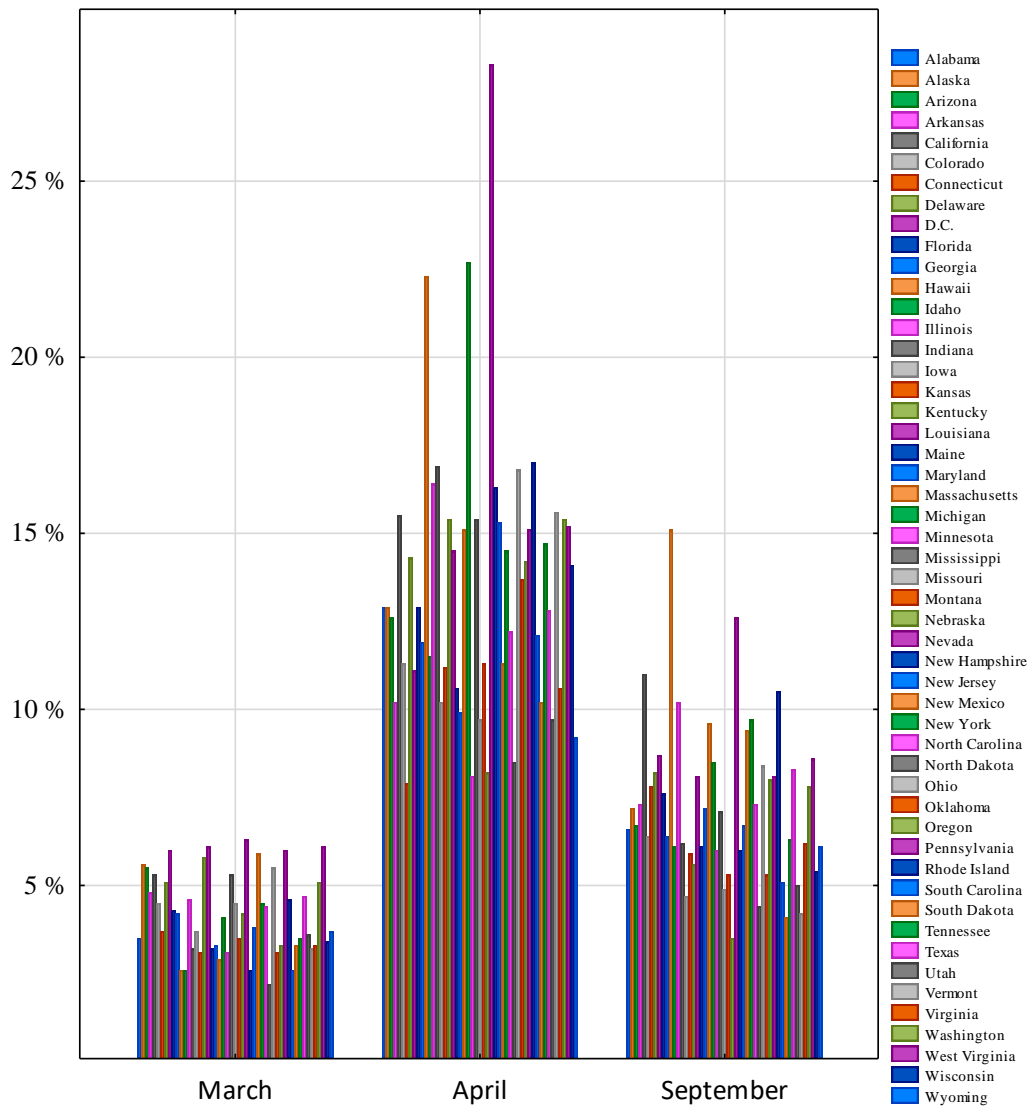


Fig. 4 Presentation of data on unemployment rates in 51 states of the United States for the following months of 2020: March, April, and September [16]

In the three functions outlined in Figure 4, representing the unemployment rates in 51 states of the United States, it was observed that the highest results were recorded in April. The median of the analyzed data in April was 12.90%. September was second with a median of 7.4%, while March was third with 4.18%. When analyzing the data on the unemployment rates in the USA in 51 states in April 2020, it was observed that the leading positions in the ranking in terms of the highest level of unemployment rate were taken by the following states: Nevada - 28.3%; Michigan - 22.7% and Hawaii 22.3%. The remaining 48 states of the United States hovered around the level of 12.76% of the unemployment rate in April 2020. The lowest unemployment rate in April 2020 was recorded in Connecticut - 8.1%.

This was followed by an examination of the biggest increases in unemployment rates in 51 states of the United States in the period from March to April 2020. The ranking (from the highest to the lowest values) shows that the top three positions are taken by the following states: Nevada: 22 percentage points, Hawaii: 19.7 percentage points, Michigan: 18.6 percentage points. The remaining 48 states oscillated around the arithmetic average of unemployment rates at 8.59%.

When looking at declines in US unemployment rates in 51 states between April and September 2020, the following states are in the top of the ranking: Nevada - 15.1%; Michigan – 14%; Vermont - 10.8%; Indiana - 10.5%; Hawaii - 9.8% and New Hampshire - 9.8%. The remaining 45 states oscillate in terms of a decline in unemployment rates in the months from April to September 2020 at the median level of 5.4%.

Summary and conclusions

The conducted research shows that the highest unemployment rate in the history of the United States was recorded during the Great Depression (1929-1933) on May 1, 1933 - at the level of 25.59%. It grew to such a high level for several years. During the COVID-19 pandemic in the United States from February to April 2020, the unemployment rate increased by 11.2 percentage points to 14.7%. It should be emphasized that such a large increase in the unemployment rate in such a short time has not been recorded in the entire history of the United States. About 20.5 million people lost their jobs during this time [<https://businessinsider.com.pl/twoje-pieniadze/praca/bezrobocie-w-kwietniu-2020-r-w-usa-spowodowane-koronawirusem/gk157xg>; as of November 25, 2020].

In China, from January to February 2020, the unemployment rate increased by 0.9 percentage points to 6.2%. According to data presented on the website [<https://biznes.wprost.pl/gospodarka/10324220/do-80-mln-dojdzie-kolejnych-9-mln-bezrobotnych.html>; as of November 25, 2020], around 80 million people could have lost their jobs in China by the end of March.

The highest growth dynamics of unemployment rates was observed in the United States from April 1, 1929 to May 1, 1933. The growth of constant-base dynamics indicators (constant as of April 1, 1929) over a period of about 4 years was 3608.70 percentage points. In the 21st century, during the COVID-19 pandemic in the United States from February to April 2020, unemployment rates rose by 273.17 percentage points. China, on the other hand, saw an increase of 18 percentage points between January and February 2020.

Such a rapid, dynamic rise in unemployment rates in the United States has been a premise for further research in this area. According to the research carried out, from March to April 2020, there was a strong upward trend in unemployment rates in 51 US states (Figure 3). On the other hand, from April to September 2020, a downward trend was observed. The highest median of dynamics indicators based on a constant unemployment rate in the month group in 51 analyzed US states in 2020 (from January to August; constant January 2020) was recorded in April and amounted to 381.58%. The second place in the ranking in terms of the value of the median of the constant-base dynamics indicators was taken by May with the result of 339.02%. However, the third place in the ranking was taken by June with the median of 264.86%. Figure 3 shows that the largest standard deviation from the arithmetic mean of unemployment rates was in May 2020 and amounted to 138.15%. April was second with a median of 136.05%. June came third, with the median amounting to 104.49%.

The highest growth of the constant-base dynamics indicators in 51 analyzed states of the United States was recorded in Hawaii with the result of 870.37% in May and 825.93 percentage in April. The second state of the USA with the highest increases in the constant-base dynamics indicators was Nevada, where from January to April 2020 an increase of 668.11 percentage points was recorded.

The highest unemployment rates in 51 analyzed states of the United States were recorded in April (Fig. 4). The median of the analyzed data in April was 12.90%. Another month in the ranking with the highest dynamics was September with the median at 7.4%. March came third in the ranking with a median of 4.18%. In April, the highest unemployment rates in 51 analyzed US states were observed in: Nevada - 28.3%; Michigan - 22.7% and in Hawaii 22.3%. In the remaining 48 states in April 2020, the median of unemployment rates hovered around 12.76%. The lowest value of the unemployment rate in April 2020 was recorded in Connecticut with a result of 8.1%.

The strongest increases in unemployment rates in 51 states of the United States were recorded in the time period from March to April 2020 (Fig. 4). When assessing the ranking, it was observed that the top three positions are taken by the following states: Nevada: 22%, Hawaii: 19.7%, Michigan: 18.6%. The remaining 48 states oscillated around the arithmetic average of unemployment rates at 8.59%. The lowest in the ranking in terms of the smallest increases was Nebraska with a result of 4 percentage.

The research carried out on declines in unemployment rates in the United States in 51 states of the United States in the period from April to September 2020, it was observed that the following states are in the lead in the ranking: Nevada 15.1 percentage points; Michigan 14 percentage points; Vermont 10.8 percentage points; Indiana 10.5 percentage points; Hawaii 9.8 percentage points and New Hampshire 9.8 percentage points. The remaining 45 states oscillate in terms of a decline in unemployment rates in the months from April to September 2020 at the median level of 5.4%.

The observation of the crisis caused by the COVID-19 infectious disease allows us to conclude that even the strongest economies in the world, such as the United States and China, are feeling its effects and must implement measures to return to the pre-pandemic state. The goal of governments is to mobilize forces and resources, sign and implement coordinated agreements that will allow organizations, enterprises and citizens to survive in such difficult times, and at the same time lead to a new gradual economic growth. Clearly, overcoming the COVID-19 pandemic requires the development and global access to a cure for COVID-19. This, in turn, will be a signal for a gradual start-up of all sectors of the economy.

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