

# Is There an Economic Recession in the United States During COVID-19 from the Perspective of Employment Factor?

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**Abstract.** In the period of 2019-2020, the economies of all countries have been affected to some extent, with higher unemployment and lower consumer inflation. This paper takes the United States as an example to analyze whether there will be an economic recession in the United States during 2019-2020 from the perspective of unemployment rate and the impact of this recession. In addition, this paper also uses the fitted matched text was also used to test the hypothesis, and it was found that the same trend did appear in the United States during Covid-19 and the recession of 2008. In addition, this paper also gives some suggestions on how to react to this trend in the United States. The study suggests that during the economic recession, the government should not only maintain good inflation rate to stimulate the economy to avoid hyperinflation, but also avoid falling into the trap of low inflation rate.

**Keywords:** Economic recession, employment factor, consumer inflation.

## 1. Introduction

In 2020, the pandemic has broken out all over the world, which is a disaster of human being. And according to Ding and Luo's study (2022), the global economy recorded negative growth during the year, nearly 3.2%. In addition, as the biggest economy, the American also have not get rid of the negative growth, which is nearly -3.5% in 2020, moreover, the unemployment is even exceed 12% in united states [1]. As mentioned above, these phenomena have been trending towards recession. Therefore, it is important for finding the cause of economic recession. In this paper, the existing phenomenon of high unemployment and economic recession in the United States as a breakthrough point, in-depth discussion of the causes of this phenomenon of recession in the United States, as well as the impact on society.

This essay will be divided into three parts. In the first part, the essay interprets the identification of recession specifically. In addition, the essay will focus the cause of recession in different period, and then, this essay will focus a specific period of covid-19 which is test whether American faces the recession by comparing the recessions which has occurred. In the last part, the essay will use the customer price index to model which use the matched fitted text to text the effect of recession in the period of covid-19. According to the final results, the 2019-2020 period in the United States does have similar characteristics to the 2008 economic crisis.

## 2. Literature Review and Analytical Framework

### 2.1. Identification of Recession

First, according to Choudhry (2012), Since the Great Depression of the 1930s, the financial crisis of 2007-08 led to the deepest recession on record (2008-09), with some impact on economic performance, Labor productivity and employment in all countries around the world furthermore, this section will focus on explaining why inflation can produce economic stagnation [2]. Furthermore, this article will illustrate the manifestations of recession in the United States in the 2008 as a supplement. This study will summarize the above reasons and whether recession existed in the United States during the pandemic.

## 2.2. Cause of Recession in Employment Factor

For the identification of inflation, Mankiw (2020) has pointed out, which means that the supply of money is greater than the actual demand for money in the course of paper money circulation [3]. In other words, this leads to greater purchasing power than output supply. In this way, currencies depreciate, which causes a period of sustained and general price increases. It is worth noting that this is a special currency devaluation. General devaluation is a reduction in the relative value of a currency among economies. However, compared with general devaluation, an inflation-induced devaluation affects the domestic value of the currency and does not affect the value of the currency in the international market. As a result, inflation is the rise in prices caused by currency depreciation, which is a persistent and universal rise in prices caused by the imbalance between money supply and demand.

In addition, as mentioned above, inflation means that the real purchasing power is greater than the real productivity, leading to rising prices. In the following article, this paper will focus on explaining the causes of inflation from the perspective of employment. How will the changes of employment factors affect the currency value and purchasing power.

## 3. Relationship Between Unemployment and Inflation

### 3.1. Unemployment

In the next part, this paper will use the causal relationship between unemployment and inflation in Frank's book (2015) to elaborate on the causes of inflation.

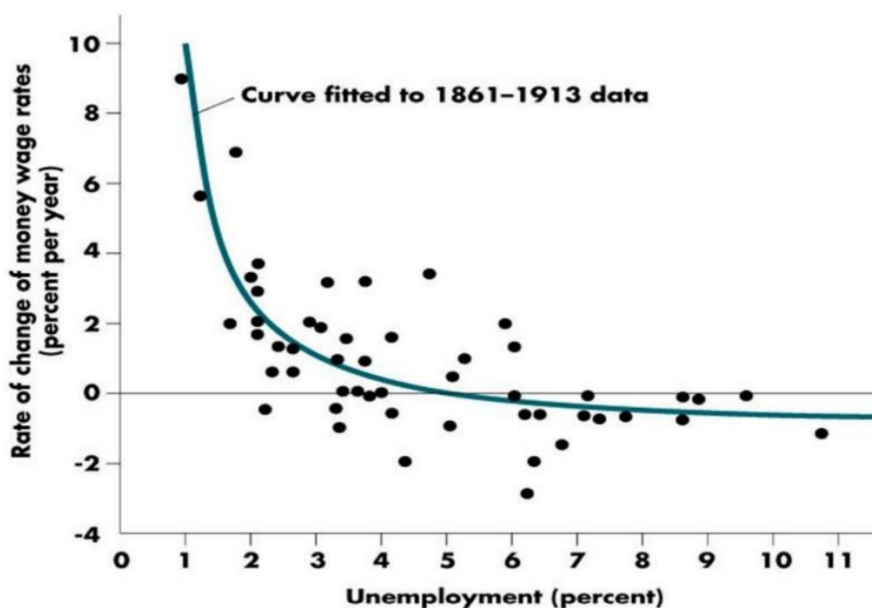
Firstly, according to Tobin (1995), full employment means that the maximum expansion of aggregate supply, that is, aggregate demand, cannot further increase employment and output. This means that demand and supply determine the number and number of people employed in the market [4]. In addition, according to Frank (2015), when economic times are good, business owners will increase their supply to meet the high market demand [5]. Under this condition, it was increased their own spending to boost output. Factories need productivity to produce, and to meet their increased output, they recruit more workers into the labor market. In this way, employment in the country will increase and unemployment will fall, which means fewer people are unemployed. This leads to an unemployed population that is a scarce resource. In order to ensure their production, the manufacturer will increase the wages of the workers, on the one hand, it can retain the workers, on the other hand, it can attract more labor force into the factory for manufacturing. This will increase their labor factor cost. When their cost rises, in order to ensure their profit, producers will raise prices to coordinate the relationship between cost and benefit. This means that an increase in aggregate demand is followed by an increase in the demand for labor by producers. Increased demand for labor contributed to the decline in labor unemployment. As a result, the unemployed are a scarce resource. In this way, producers need to hire production labor at a high price, which promotes the increase of wage ratio. In order to ensure that their marginal benefits and marginal costs are equal, producers will raise prices, which explains the above mentioned inflation theory that real purchasing power is greater than supply. This shows that rising wages promote rising prices, which reduce the purchasing power of money and thus lead to currency depreciation.

In general, when market demand increases, manufacturers may recruit more people to produce products in order to meet the demand. This will make labor a scarce resource. As a result, manufacturers will raise higher wages to attract more labor to their factories. However, with the rise of wages, in order to make up for this part of the cost, manufacturers will raise the price of goods to make up for the increase in labor cost, which will cause the real purchasing power of wages to decrease, which will lead to inflation when it exceeds a certain percentage.

### 3.2. Phillips Curve

To make it easier to understand, it can also introduce the Phillips curve to understand the relationship between unemployment and inflation. There is an example to explain it, the diagram 1

which is sourced by Phillips (1958) has shown the relationship between unemployment and the rate of change of money wage rates in the UK [6]. In Figure 1, it is clear that with the increase of unemployment rate between 0 and 6, the rate of change of money wages in the UK decreases [6]. When unemployment is 6% the rate of change in wages is even zero, which means that when unemployment is high, labor is no longer a scarce resource, and manufacturers don't have to raise wages to attract more people to produce their products. In this case, manufacturers do not have to raise commodity prices to compensate for the increased labor costs. Conversely, as unemployment falls, the rate of wage change increases. In order to protect their own interests, manufacturers will raise prices to compensate for their increased labor costs.

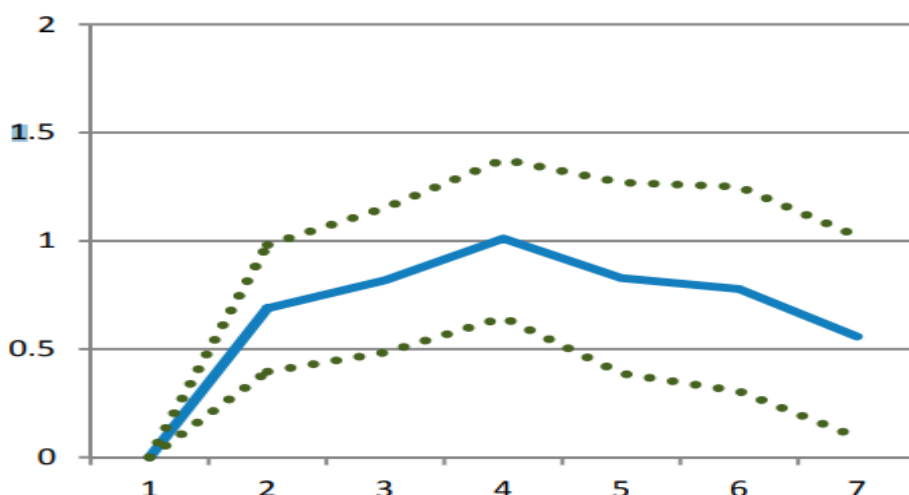


**Fig. 1** Relationship between unemployment and the rate of change of money wage rates in the UK

First of all, the second part of this paper will take the unemployment rate and inflation rate of the United States during the 2008 economic depression as an example to find out whether the unemployment rate and inflation rate in the covid-19 stage have the same trend with that time. This can be used as a basis to find out if there is recession in the United States during Covid-19.

### 3.3. Comparison of Recession in 2008

Gilchrist Schoenle and Zakrajšek's article (2017) has point out, the U.S. economy continues to languish, but in the Great Recession and its aftermath, it experienced mild deflation rather than inflation [7]. Take consumer price inflation, as measured by the core personal consumption expenditures (PCE) price index. Before the Great Depression, it averaged 2 percent between 2003 and 2007. But it only slowed to an average annual growth rate of around 1.5% over the following eight years. This means that during the Great Depression, there was not necessarily inflation, but the unemployment rate was different compared to the inflation in the United States. According to Bernal-Verdugo Furceri and Guillaume (2012), Figure 2 shows the change in the unemployment rate after the Great Depression [8]. The horizontal axis is the number of years since the Great Depression, and the vertical axis is the rate of inflation. In the three years after the crisis, unemployment increased by about 1 per cent at its peak. This means that during the Great Depression, the economic development of the United States was characterized by negative inflation and rising unemployment, and they were negatively correlated. Second, it confirms the definition of the Phillips curve. This shows that the United States in 2008 during the Great Depression in line with the Phillips curve trend.



**Fig. 2** Change in the unemployment rate after the Great Depression in 2008

Generally speaking, the overall economic situation of the United States during the Great Depression in 2008 was deflation with high unemployment rate. In the next part, this paper Fitted matched text to test whether the economic form of the United States was also deflation with high unemployment rate in 2019-2020.

#### 4. Unemployment During COVID-19

##### 4.1. Text with Matched-Pair t-test

As mentioned above, one way to test the existence of inflation in the United States is to look at the level of unemployment. In other words, if the unemployment rate is high, the inflation rate will be relatively low, which does not fit the definition of inflation in recession phenomenon. The fitted text will be Matched-Pair t-test the unemployment rate of each country during the fitted pandemic. Through the Angle of high and low unemployment rate to judge whether there is inflation.

**Table 1.** Comparison of unemployment rates among major economies

| Country     | 2019 (percentage) | 2020 (percentage) | D0     |
|-------------|-------------------|-------------------|--------|
| U.S.        | 8.34              | 14.85             | 6.511  |
| UK          | 11.09             | 13.51             | 2.417  |
| Garman      | 5.763             | 20.179            | 14.416 |
| Japan       | 3.897             | 4.641             | 0.744  |
| China       | 10.7              | 11.9              | 1.22   |
| France      | 19.51             | 20.18             | 0.667  |
| India       | 22.74             | 24.9              | 2.159  |
| Brazil      | 27.32             | 30.53             | 3.206  |
| Korea       | 10                | 10.15             | 0.296  |
| Canada      | 11.043            | 20.265            | 9.222  |
| Mean        | 13.027            | 17.113            | 4.0858 |
| variance    | 57.895            | 32.65             | 21.297 |
| sample size | 10                | 10                | 10     |

According to the world bank (2022) Table 1 shows the unemployment situation of 14 countries including developed and developing countries in 2019-2020, paired pairings and T-tests can be established to explore the impact of the pandemic on world unemployment [8]. It chose a country as a sample and selected different time periods in 2019 and 2020 to reference changes in its

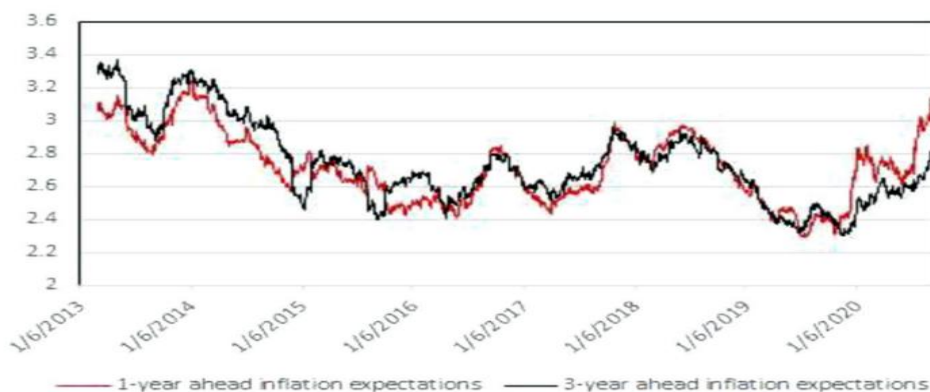
unemployment rate [9]. The reason for using the matching pairs and t test here is that it can only look at the differences between two sets of variables in the same sample. It can avoid the influence of other factors which is also known as fixed influence. In other words, if don't use this test. it may be influenced by other factors, such as laziness in labor.

$$\frac{\bar{D}_0 - \mu}{SD(X)/\sqrt{n}} \tag{1}$$

X bar means the sample mean. In other words, D0 means the average unemployment rate in the countries sampled, which is measured by unemployment all over the world 2020 min that of 2019.  $\mu$  means the test, which is what the national average unemployment rate is the essay want to test. Finally, SD refers to sample variance, which in this article means the degree of fluctuation between the sample mean and the actual mean of the sample country.

Firstly, assuming a 5% power of text. setting the null hypothesis that covid-19 has no effect on unemployment, while the alternative hypothesis is that COVID-19 influences it. So, it's expressed by a mathematical formula.  $\mu=0, N \neq 0$ . and the t value is 2.21 which is the power of text 5%, degree of freedom is 9. This means that rejecting the null hypothesis, and it also means that covid-19 has an impact on unemployment, and it also means that covid-19 will increase unemployment and it will further stimulate inflation. Now, this paper will bring the collected data into hypothesis formula to test whether there is a 95% power of text to prove whether the US unemployment rate has been affected by covid-19. As shown in Figure 3, the sample mean is 4.0858, variance is 21.297, SD is its square root, and the sample size is 10. If put these data into the formula, the solution is 2.78. It is in the rejected region because it is not between -2.262 and 2.262, which means that it is rejected the original hypothesis that COVID-19 has an impact on the unemployment rate around the world.

In addition, Detmers and Karagedikli (2022) has point out Excluding personal consumption expenditures (PCE) for food and energy, core inflation, as measured by inflation, fell to around 1 percent in April 2020 from 2.1 percent in February [10]. Figure 3 shows the rate of consumer inflation over the last 8 years. It's not hard to see that it reaches a minimum of about 2.2% in 2020 [10]. This means that consumer inflation in the US has slowed down due to the COVID-19 pandemic.



**Fig. 3** The rate of consumer inflation over the last 8 years in US

As noted above, the same factors do exist in the US in 2019-2020 as they did during the 2008 recession, so US policy on how to deal with unemployment during the recession will be important. The final part of this article will focus on explaining how the Minimum Employment Guarantee Program (PPP) is used to alleviate unemployment in the United States and the economic rationale behind it.

#### 4.2. Solution for the United States

According to Béland et al's research (2021), Table 2 shows that the protection methods of Canada and the United States during the outbreak in the new pavilion, it is clear that the United States uses the PPP employment assistance program in terms of job security [11]. On the job security front, Congress appropriated \$660 billion for a temporary emergency program known as the Wage

Protection Program (PPP), which is a loan program as long as companies spend 75 percent of the money they receive on payroll within eight weeks [11]. By June 2020, Congress amended the program, lowering the threshold to 60 percent and extending the pay period until the end of 2020. According to the calculation formula of inflation, inflation rate = quantity of money in circulation/velocity of circulation [5]. Thus, when \$660 billion of loans are made, that will increase the amount of money in circulation, that will increase the rate of inflation, and according to the Feldman curve, when the country will temporarily increase inflation to reduce unemployment. Therefore, the United States has reduced it through aggressive fiscal policy, which has led to higher inflation.

**Table 2.** Protection method of Canada and the United States

|                          | Canada  | United States   |
|--------------------------|---|---|
| Employment protection    | <ul style="list-style-type: none"> <li>• CEWS</li> <li>• Employment protection, wage subsidy</li> <li>• Temporary supports (varies at province level)</li> </ul>  | <ul style="list-style-type: none"> <li>• PPP employment protection, wage subsidy to business</li> </ul>   |
| Unemployment protection  | <ul style="list-style-type: none"> <li>• CERB unemployment benefits</li> </ul>  | <ul style="list-style-type: none"> <li>• PEUC unemployment benefit</li> <li>• PUAP unemployment</li> <li>• PUCP unemployment</li> <li>• Temporary unemployment extension from disaster relief fund</li> </ul> |
| Social assistance/family | <ul style="list-style-type: none"> <li>• CBB one-off payment</li> <li>• Goods &amp; Services tax Credit</li> <li>• One-off payment to low-income seniors</li> <li>• Assistance to individuals (varies at province level)</li> </ul> | <ul style="list-style-type: none"> <li>• SNAP food assistance</li> <li>• One-off payment per household</li> </ul>   |
| Health care              |   | <ul style="list-style-type: none"> <li>• Enhanced Medicaid match rates</li> </ul>   |
| Housing                  | <ul style="list-style-type: none"> <li>• Federal funding for mortgage pools</li> <li>• Rental assistance payments (varies at province level)</li> </ul>   | <ul style="list-style-type: none"> <li>• Temporary eviction moratoria (federal/state)</li> <li>• Rental assistance payments (varies at state level)</li> </ul>  |

## 5. Conclusion

In conclusion, this article is divided into three parts. The first part introduces the definition of recession, and in this part, it mainly explains how to produce recession, mainly from the perspective of business. In the second part, this paper mainly introduces the test methods and test results of this paper, and explains the similarity between the United States economic development in 2019-2020 and that in 2008. Finally, the article names the ways to solve the recession. However, the article is not perfect, for example, this article mainly focuses on unemployment one Angle. A multi-angle analysis of whether there is economic stagnation during covid-19 in the United States will be the future research direction.

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