About The Unemployment Economic Welfare Strategy Based On The Economic Crisis Under The Pandemic

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Abstract. With the development of the world economy, people's quality of life has improved. The economic welfare of various countries is also constantly improving. Economic welfare can not only help unemployed residents to alleviate their living difficulties and solve the basic survival problems of residents, but also help enterprises in difficulty to relieve the economic pressure. For countries under the pandemic, economic growth is slow or even negative. Many countries have severe inflation. Higher inflation leads workers to demand higher wages, and producers can only make profits by laying off workers or raising prices. This leads to the increase of many residents without living pressure, the number of poverty and unemployment greatly increased. It is economic welfare that can alleviate such problems, as will be mentioned in this article if economic welfare policies are implemented more rationally. We will start by analyzing the changes in economic growth and unemployment rates in different countries under the pandemic. There will also be a focus on economic welfare practices in relation to countries with different economic growth rates and their unemployment rates

Key word: GDP, unemployment, economic welfare, inflation.

1. Introduction

With the development of the pandemic, the global economy is facing difficulties. The change in social activity has impacted some trade industries more than others, mainly entertainment industries such as tourism and catering. For example, the entertainment industry such as catering and tourism industry. Economic activity around the world is sluggish as residents cut back on travel and travel to crowded places, and as some countries cut back on air travel. Since producers cannot make a profit, they can only cover their costs by raising prices and reducing production or laying off workers and wages. This has led to higher cost-driven inflation, followed by slower growth or even recession. For example, China implemented strict lockdown management during the pandemic, which severely hit most industries and disrupted many industrial and capital chains. As a developing country, China's GDP growth has fallen into a serious state of almost stagnation. The Chinese government implemented policies to improve economic welfare, which played an important role. In the face of declining industries, the government will give some subsidies to these industries, which can reduce the production cost of some enterprises. At the same time, due to the reduction of jobs due to the epidemic, many people are laid off by companies and lose their jobs. They cannot find new jobs in a short period of time. The government will implement unemployment benefits or increase social security for these people. For the higher inflation, the nominal wage is smaller than the inflation rate, which leads to the great living pressure of the people, and leads to the frictional unemployment of the people who want to change jobs. The government will give preferential policies to various industries or reduce income tax to alleviate national unemployment.

For the implementation of economic welfare under the pandemic, it is necessary to study the relationship between unemployment, inflation and economic growth. In this paper, linear regression will be used to find the relationship between the three, so that different levels of economic welfare policies can be implemented according to the impact of different GDP and inflation rates on unemployment. For some countries with unemployment rates in GDP and inflation, the government may have to increase economic welfare. This article will analyze the economic welfare policies for unemployment in countries with different degrees of economic impact under the pandemic.

2. Related Work

This part is designed to review the past studies which demonstrate the relationship among unemployment; inflation, economic growth (GDP growth).

Stephen [1] investigates the impact of unemployment on economic growth for a case of Nigeria for the period from 1980 – 2008. He used Cobb – Douglas production function to develop his model and estimates his results by using simple OLS method. He has found the unemployment changes significantly and inversely to the economic growth in Nigeria.The studies made by Schreiber and Wolters (2007) and Franz (2005) [2] for a

case of Germany to sense whether there prevails long run trade off between inflation and unemployment or there exists positive relationship between them. Both studies concluded that there exist an inverse relation between inflation and unemployment in the long run in case of Germany.Silvapulle et al (2004) [3] used the other way of examining the relationship between unemployment and economic growth. They explored the impact of cyclical output on cyclical unemployment for a case of U.S. by applying dynamic model for post – war period dataset. They found two conclusions from their study; the first conclusion made by them was that the positive impact of cyclical output on unemployment differs from the negative impact of cyclical output on unemployment in the short run, the second conclusion made by them was that their dataset support this their proposition that the negative impact of cyclical output on cyclical unemployment is more significant than that of the positive impact of cyclical output on cyclical unemployment. Cashell (2004) [4] conducted a paper and examined the connection between unemployment and inflation. The data was collected from 1997 to 2001. He found that the sensitivity of inflation to changes in the unemployment was very low. The author concluded that existing calculation of natural rate suggested that unemployment rates below 5% will increase the inflation rate in the end. Messkoub (2008) [5] analyzed data from 1980-2003 using descriptive analysis method and demonstrated that even though economic growth in MENA countries was stable they attained moderate increase in lowering unemployment. Phillips (1958) [6] used dataset from 1861 to 1957 for the U.K. in order to test the relationship between wage inflation and unemployment and concluded that there exists an inverse relationship between these two variables.

These past studies have shown that both GDP growth and inflation are negatively correlated with unemployment. In this paper, we will use multiple regression to explore the relationship between the three and explore whether GDP growth and inflation are negatively correlated with unemployment.

3. Analysis Date

We collected the real GDP values of 14 countries, including China and the United States, from 2018 to 2022, and found that almost all countries had slow or negative economic growth under the pandemic. In order to analyze the impact of this economic situation on unemployment, we selected the unemployment rate, inflation and GDP growth data of the United States from 1995 to 2020 as the research object for analysis.

3.1. Date

Figure 1. Real GDP Index for Different Countries

Country	*Real GDP %*	2018	2019	2020	2021	2022
China		**6.8**	**6**	**2.2**	**8.1**	**4.4**
United state		**2.9**	**2.3**	**-3.4**	**5.7**	**3.7**
Russia		**2.8**	**2.2**	**-2.7**	**4.7**	**-8.5**
Japan		**0.6**	**-0.2**	**-4.5**	**1.6**	**2.4**
United kingdom		**1.7**	**1.7**	**-9.3**	**7.4**	**3.7**
Australia		**2.8**	**2**	**-2.2**	**4.7**	**4.2**
South Korea		**2.9**	**2.2**	**-0.9**	**4**	**2.5**
France		**1.8**	**1.8**	**-8**	**7**	**2.9**
India		**6.5**	**3.7**	**-6.6**	**8.7**	**8.2**
Kazakhstan		**4.1**	**4.5**	**-2.6**	**4**	**2.3**
South Africa		**1.5**	**0.1**	**-6.4**	**4.7**	**1.9**
Iran		**-2.3**	**-1.3**	**1.8**	**4**	**3**
Philippines		**6.3**	**6.1**	**-9.6**	**5.6**	**6.5**
Thailand		**4.2**	**2.2**	**-6.2**	**1.6**	**3.3**

From Figure 1, it can be observed that after the outbreak of the pandemic, the GDP of each country declined. As a developing country, China's real GDP will be as low as 2.2% in 2020 and 4.4% in 2022. The real GDP of the UK, as a developed country, was as low as -9.3% at the beginning of the outbreak in 2020. In the United States, real GDP fell to minus 3.4 percent in 2020. From these figures, we can see that the economic development of countries has been hit by the pandemic. In this paper, we will select the relationship between real GDP inflation and low unemployment rate in the United States from 1995 to 2020 to analyze the different unemployment rates caused by different GDP, so as to analyze or predict the intensity of national unemployment economic welfare policies.

Figure 2. US unemployment rate, GDP and inflation

YEAR	UNEMPLOYMENT RATE (DECEMBER)	ANNUAL GDP GROWTH	INFLATION (DECEMBER, YOY)	YEAR	UNEMPLOYMENT RATE (DECEMBER)	ANNUAL GDP GROWTH	INFLATION (DECEMBER, YOY)
1995	5.6%	2.7%	2.5%	2009	9.9%	-2.6%	2.7%
1996	5.4%	3.8%	3.3%				
1997	4.7%	4.4%	1.7%	2010	9.3%	2.7%	1.5%
1998	4.4%	4.5%	1.6%	2011	8.5%	1.5%	3.0%
1999	4.0%	4.8%	2.7%				
2000	3.9%	4.1%	3.4%	2012	7.9%	2.3%	1.7%
2001	5.7%	1.0%	1.6%	2013	6.7%	1.8%	1.5%
2002	6.0%	1.7%	2.4%				
2003	5.7%	2.8%	1.9%	2014	5.6%	2.3%	0.8%
2004	5.4%	3.9%	3.3%	2015	5.0%	2.7%	0.7%
2005	4.9%	3.5%	3.4%	2016	4.7%	1.7%	2.1%
				2017	4.1%	2.3%	2.1%
2006	4.4%	2.8%	2.5%	2018	3.9%	2.9%	1.9%
2007	5.0%	2.0%	4.1%	2019	3.6%	2.3%	2.3%
2008	7.3%	0.1%	0.1%	2020	6.7%	-3.4%	1.4%

Source: The balance money

Figure 2 shows the data of unemployment, inflation and GDP growth in the United States from 1995 to 2020. It can be seen from the table that the GDP growth in 2009 was -2.6%, while the unemployment rate was 9.9%. In 2014, GDP growth was 2.3%, while the unemployment rate was 5.6%. Thus, it can be speculated that unemployment rate and GDP growth may be negatively correlated

3.2. Description of variables

Unemployment

Unemployment is defined as a situation where someone of working age is not able to get a job but would like to be in full-time employment. Unemployment is taken as dependent variable in this study.

Economic growth

Economic growth can be defined as the increase or improvement in the inflation-adjusted market value of the goods and services produced by an economy over a certain period of time. Statisticians conventionally measure such growth as the percent rate of increase in the real gross domestic product, or GDP growth (annual %). It is taken one of the explanatory variable in this study.

Inflation

Inflation is the percentage change in the value of the Wholesale Price Index (WPI) on a year-on year basis. It effectively measures the change in the prices of a basket of goods and services in a year.When inflation is high it increases the prices of goods and services that lead to fall in aggregate demand as well as a fall in demand for labor and therefore low unemployment . Inflation is taken one of the explanatory variable in this study.

4. Methodology for unemployment rate, inflation and real GDP in the US

4.1. multiple regression

When observing random variable in experiments, they are often related to one or more variables. Regression analysis is a statistical tool designed to deal with these situation.

Where Y is an observed score on the dependent variable, a is the intercept, b is the slope, X is the observed score on the independent variable.

We can extend this to any number of independent variables:

$$Y = a + b_1 X_1 + b_2 X_2 + \ldots + b_k X_k$$

Finding the values of b (the slopes) is tricky for k>2 independent variables, and you really need matrix algebra to see the computations. It's simpler for k=2 , which we will discuss here.

For two variable case:

$$b_1 = \frac{(\sum x_2^2)(\sum x_1 y) - (\sum x_1 x_2)(\sum x_2 y)}{(\sum x_1^2)(\sum x_2^2) - (\sum x_1 x_2)^2}$$

and

$$b_2 = \frac{(\sum x_1^2)(\sum x_2 y) - (\sum x_1 x_2)(\sum x_1 y)}{(\sum x_1^2)(\sum x_2^2) - (\sum x_1 x_2)^2}$$

The equation for a with two independent variable is

$$a = \overline{Y} - b_1 \overline{X}_1 - b_2 \overline{X}_2$$

Therefore, the Y is the unemployment rate , X_1 shows GDP growth and X_2 is inflation.

We can use these to solve analysis date

$$\sum x_1 y = \sum X_1 Y - \frac{(\sum X_1)(\sum Y)}{N}$$
$$\sum x_2 y = \sum X_2 Y - \frac{(\sum X_2)(\sum Y)}{N}$$
$$\sum x_1 x_2 = \sum X_1 X_2 - \frac{(\sum X_1)(\sum X_2)}{N}$$

4.2. The Results and Analysis

Y	X_1	X_2	$(X_1)^2$	$(X_2)^2$	X_1Y	X_2Y
5.6	2.7	**2.5**	**7.29**	**6.25**	**15.12**	**14**
5.4	3.8	**3.3**	**14.44**	**10.89**	**20.52**	**17.82**
4.7	4.4	**2.7**	**19.36**	**7.29**	**20.68**	**12.69**
4.4	4.5	**1.6**	**20.25**	**2.56**	**19.8**	**7.04**
4.0	4.8	**2.7**	**23.04**	**7.29**	**19.2**	**10.8**
3.9	4.1	**3.4**	**16.81**	**11.56**	**15.99**	**13.26**
5.7	1.0	**1.6**	**1**	**2.56**	**5.7**	**9.12**
6.0	1.7	**2.4**	**2.89**	**5.76**	**10.2**	**14.4**
5.7	2.8	**1.9**	**7.84**	**3.61**	**15.96**	**10.83**
5.4	3.9	**3.3**	**15.21**	**10.89**	**21.06**	**17.82**
4.9	3.5	**3.4**	**12.25**	**11.56**	**17.15**	**16.66**
4.4	2.8	**2.5**	**7.84**	**6.25**	**12.32**	**11**
5.0	2.0	**4.1**	**4**	**16.81**	**10**	**20.5**
7.3	0.1	**0.1**	**0.01**	**0.01**	**0.73**	**0.73**
9.9	-2.6	**2.7**	**6.76**	**7.29**	**-25.74**	**26.73**
9.3	2.7	**1.5**	**7.29**	**2.25**	**25.11**	**13.95**
8.5	1.5	**3.0**	**2.25**	**9**	**12.75**	**25.5**
7.9	2.3	**1.7**	**5.29**	**2.89**	**18.17**	**13.43**
6.7	1.8	**1.5**	**3.24**	**2.25**	**12.06**	**10.05**
5.6	2.3	**0.8**	**5.29**	**0.64**	**12.88**	**4.48**

So: b_1=-0.70182 b_2=-0.19397 a=8.22597 . And we can get:

$\hat{y}$ = -0.70182X1 - 0.19397X2 + 8.22597

Which shows: $unemployment\ rate\hat{}$=8.22597-0.70182GDP growth-0.19397inflation

The results show the relationship between unemployment, GDP growth and inflation, based on data from 1995 to 2020 in the United States. The results are not representative of all countries because of other factors. But it can be reflected in some countries in the general relationship between the three. In addition, for some countries, the method of multiple regression may have large errors and low accuracy due to large data fluctuations.

5. Conclusion And Recommendations

5.1. recommendation

According to the study results, inflation and GDP growth are negatively correlated with unemployment. The relationship between inflation and unemployment is not statistically significant, and fiscal and monetary policy makers need to pay attention to the level of inflation that affects unemployment. Since GDP growth has a relatively significant inverse relationship with unemployment, the government can use economic welfare to alleviate unemployment in the short term under the epidemic situation. When GDP growth is slow or negative, it can increase economic subsidies to the unemployed and producers. For example, we should increase welfare policies for

declining industries, increase investment in education and training, and reduce income tax for elderly workers. When GDP growth is relatively large, social welfare for unemployment can be reduced, which can relieve the economic pressure of the government and reduce the budget deficit.

The government can adjust policies flexibly and allocate resources reasonably. When GDP growth is taken as the main variable, relevant policies aimed at reducing unemployment and increasing GDP growth can be considered for economic welfare, so as to maximize benefits.

5.2. Conclusion

This paper studies the impact of inflation and economic growth on the unemployment rate. From the results, we can see that the impact of inflation on the unemployment rate is relatively weak, while the impact of GDP growth on the unemployment rate is relatively large, but both of them are inversely proportional to the unemployment rate. This paper studies the influence of inflation and economic growth on the unemployment rate, so as to discuss the strength of economic welfare policy for unemployment. As can be seen from the results, the effect of inflation on the unemployment rate is relatively weak, but the negative association confirms the Phillips curve in the United States. However, GDP growth has a relatively large impact on the unemployment rate, but both of them are negatively correlated with unemployment. In addition to the variables studied in this paper, there are many other variables that affect unemployment such as population growth, war and so on. In this paper, the United States is selected as the research object, and the data gap is small, so the model can be better used.

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