Proceedings of the 2nd International Conference on Business and Policy Studies
DOI: 10.54254/2754-1169/15/20230916

Impact of COVID-19 on Inflation Measurement

Chuyu Deng[1,a,*]

[1]Barnard College, New York NY 10027, USA
a. cd3216@barnard.edu
**corresponding author*

Abstract: The COVID-19 pandemic influences people's everyday living as well as the functioning of the society in many aspects including healthcare, government policies and so on. The effects that act on economics and finance are nonnegligible. There are changes in people's investment expectations and strategies when taking the current inflation situation into consideration. Moreover, citizens of the United States change their consumption preferences correspondingly, which can have a considerable effect on the United States economy. In this paper, the author will examine how the COVID-19 pandemic effects these aspects in the United States using inflation situation as a parameter and indicator. The author will largely focus on the historical data of GDP deflator, inflation rate, and CPI. The first two indexes are significant and common indicators when reviewing inflation situations, while the third index reveals inflation situation as well as changes of people's consumption habits. Based on the historical data, the author will then estimate the future trend of inflation situations, and finally provide some suggestions based on the analysis of the historical data.

Keywords: inflation, GDP Deflator, inflation rate, CPI

1. Introduction

Inflation situation is undoubtedly an obvious and instantaneous parameter of an economy. Before the Dissolution of the Soviet Union, one remarkable historical fact was the depreciation of the Ruble, foreshadowing the breakdown of the Soviet Union economy. Although this circumstance is notably extreme, the inflation situation is surely a significant indicator when people examine the behavior of an economy. The inflation situation in the United States strikes the world in 2022. The year-by-year growth rate of CPI has been exceeding 8% since March. To remit the inflation situation in the United States, the Fed Reserve announced to increase the interest rate by 75bp again in September, which is the third consecutive time announcing this amount during this year and sets up a record for the past forty years. The American stock market fluctuates sharply along with the Fed's announcement, with NASDAQ index drops by 1.79% and S&P 500 index drops by 1.71%. Inflation situation is always a key factor when people consider about Macroeconomics as well as Finance. When the inflation rate is negative, the unemployment rate goes low, resulting a depression, or even worse, financial crisis. However, when the inflation rate is extremely high as it is today in the United States, there are also several severe problems which can be detrimental to the nation's economical and financial well-being. For example, in the United States, high inflation "Can Cause Painful Recessions". The Fed Reserve tried to lower inflation by increasing interest rates, which "in turn, caused unemployment to soar, and to stay high for longer than would likely have been the case that the Fed not allowed inflation

DOI: 10.54254/2754-1169/15/20230916

to spiral so high" [1]. The current inflation circumstance in the United States not only affects the future status of the United States economically but also is likely to affect the economy of the world as a whole, since the United States is the world's largest economy. Consequently, an analysis of the inflation situation of the present-day United States is essential when reviewing the world's economy contemporarily as well as predicting the world's future economic well-being.

This article will examine three primary indexes considering inflation situation: GDP deflator, inflation rate, and CPI. The first index, GDP deflator, is an abbreviation of the US gross domestic product price index, which "measures changes in the prices of goods and services produced" [2]. The second index, inflation situation, is the percentage measurement of inflation that "is a general increase in the prices of goods and services in an economy" [3]. The United States government measures this general price of goods and services by CPI, an abbreviation of the Consumer Price Index, another commonly used index while people examine inflation. In a typical Macroeconomics theory, Consumer Price Index is "a measure of the average change over time in the prices paid by urban consumers for a market basket of consumer goods and services" [4]. This article will focus on analyzing why and how these three indexes fluctuated in the past one year.

2. GDP Deflator

The first index that the author chooses to observe and analyze is the GDP deflator. GDP, also known as "Gross Domestic Product", "represents the total money value of all fine goods and services produced" (https://www.worldometers.info/gdp/what-is-gdp/). When looking at the present level of an economy people generally first focus on the GDP status. The behaviors and fluctuations of GDP represent clearly how an economy is functioning. GDP deflator is one measurement of inflation situation. The precise of definition of GDP deflator is that it "measures the changes in prices for all goods and services produced in an economy" [5]. The formula of calculation of GDP deflator is "(Nominal GDP/Real GDP) * 100", where Nominal GDP implies the face value of GDP in an economy whereas Real GDP takes inflation into account. Consequently, by looking at the data of GDP deflator, one can gain a first-sight broad overview of the inflation situation of a particular economy as a whole.

During the past six months, the value of GDP deflator in the Unites States increases drastically. The current GDP deflator value is 126.31 as shown on Trading Economics website, which means that the Nominal GDP is about 25% higher than the Real GDP [6]. Considering the definition of GDP deflator, this number clearly shows that there is more money in the market than the value of the real economy, showing the severeness of level of inflation in the present day Unites States. One direct consequence of this situation is that the value of money depreciates in the United States society, therefore increasing people's everyday consumption on necessary products such as food and energy. However, their salaries may not increase at the same speed of current inflation. Consequently, their real purchasing power decreases, and the gap between the rich and the poor intensifies. In an extreme circumstance of this situation, with the decrease of real purchasing power of a majority group of people, there will eventually be economic crisis as it was in the 1929 Unites States, which people characterize it as the Great Depression. Figure 1 shows the past historical data of the GDP deflator in the Unites States from pre-pandemic period until present.

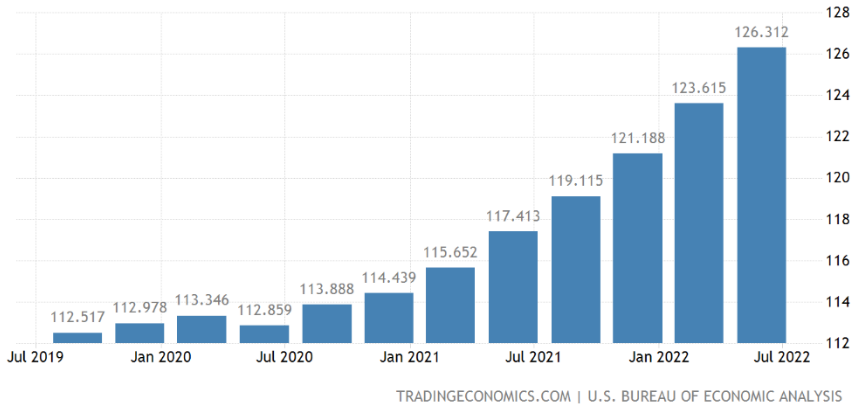


Figure 1: GDP deflator historical data [7].

As Figure 1 shown, it is obvious that the price level in the United States increases drastically after the beginning of the pandemic. From 07/2019 to 07/2022, the value of GDP deflator increases by 12%. The highest increase by quarter happened in the second quarter of this year with a value of increment of 2.697, which is unsurprising giving the fact that the inflation situation in the United States strikes the world. Although the value of nominal GDP of the United States is increasing, showing a seemingly positive sign of the economy status of the country. However, when considering carefully about the dramatic increase of the GDP deflator, the United States economy is not as flourish as what the data of nominal GDP indicates because of the inflation. Consequently, this paper will look closer at the inflation situation in the United States by examining the general situation of the United States interest rate as well as its impacts.

3. Inflation Rate

The inflation rate of the United States Economy boosts evidently. Starting from September in the year 2021 where the year-by-year inflation rate was already 5.4%, the United States has been going through a highly expanding inflation situation. The value of the interest rate increases continually to March in 2022, went down for a little amount and reached a peak value of 9.1% in June of the year 2022. In July and August, the value of inflation rate decreases slightly, and up till now the inflation rate is 8.3% (see Fig. 2).

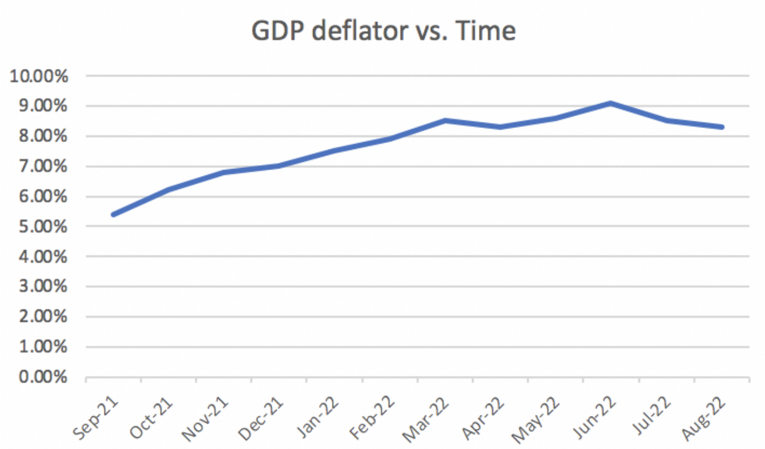


Figure 2: GDP deflator data for the past year.
(Photo credit: Original)

DOI: 10.54254/2754-1169/15/20230916

The main reason why the inflation rate in the United States goes high, in the author's opinion, is the COVID-19 pandemic, or more specifically, the policies that the Unites States government implemented in response of the pandemic. In 2020, to stimulate the lagged economic situation under the pandemic situation, the Trump government announced to grant a $3 trillion coronavirus-induced emergency stimulus package. Later, in 2021, the Biden government also announced to grant a $1.9 trillion stimulus package. Consequently, the Fed generated nearly a total of $5 trillion simply by printing dollars. With this great amount of dollars entering the market along with little production process, the price level of price and levels undoubtedly goes high. Moreover, although the primitive purpose of granting stimulus package of the Fed is to stimulate real economy, in reality, a large amount of these "printed" money flows to financial system, for example, the stock market. Figure 3 demonstrates the variation of NASDAQ index. In the year 2020 and 2021, a huge amount of money flows into the United States stock market. Consequently, with the quantity of money increasing much faster than that of real economy, the inflation rate in the United States proliferates.

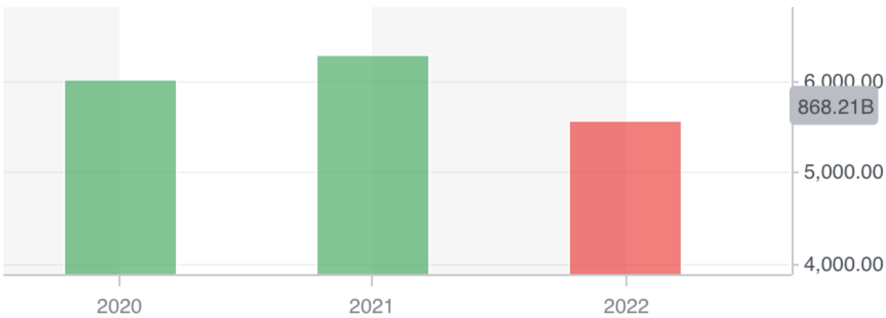


Figure 3: NASDAQ data for past three years [8].

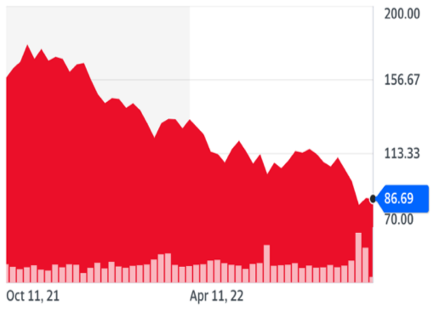
As Figure 3 shown, the stock market in the United States fluctuated drastically along with the unstable inflation situation. Comparing the NASDAQ index between period 09/2020 to 09/2021 with period 09/2021 to 09/2022, the average daily return in the first period is 0.0014, whereas the average daily return in the second period is -0.011. The volatility of daily return in 2022 is also much more drastic. The standard deviation of the daily return in 2022 is 0.0184, almost twice the value of standard deviation of the daily return in 2021, which is 0.0117. Consequently, the value as well as stability of stock market and the high-speed growth of inflation situation is negatively correlated. One notable correlation of the United States stock market and inflation situation stands on the causal effect of the Fed Reserve's increment of interest rate. The market expectations on interest rate inevitably imposes a nonnegligible effect on the stock market. Every time the Fed announced to increment the interest rate, the value of the United Stock market shrinks (see Fig. 4).

DOI: 10.54254/2754-1169/15/20230916

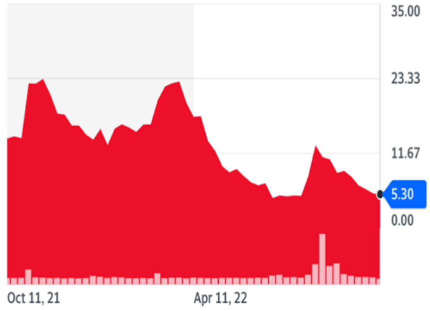
Figure 4: NASDAQ between 09/21/2022 to 09/26/2022 [8].

One possible explanation, in the author's opinion, lies in the fact that people intend to avoid risks. When there are not definite and direct benefits of an asset, people tend to avoid it, even in ways considered as an undersell. The Fed's decision to increase the interest rate for a comparably huge amount for several consecutive times shows its determination to reduce the amount of money circulated in the United States market. Consequently, under the high inflation rate situation, where money is becoming less valuable than before, people will possibly intend to quit the stock market which is considerably volatile as "stocks tend to be more volatile when inflation is elevated" [9]. When the high inflation rate is becoming a feature of the United States economy recently, it is unsurprising that the stock market fluctuates violently. The prices of different kinds of stocks also fluctuates specifically under such a high inflation rate. In the author's observation, although the values of the stock market decrease as a whole, there are still differences between various kinds of stocks. The stocks with a comparably steady price that fluctuate less violently are those of big and well-developed companies that are mostly related to real economy, for example, Nike INC, Bed Bath & Beyond INC, and so on. A characterization of these stocks is value stocks with "strong current cash flows" [9]. Compared to the fluctuation of NASDAQ index during the last six months (see Fig. 5(d)), these two stocks, Nike INC and Bed Bath & Beyond INC (see Fig. 5(a) and Fig. 5(b)) are comparably stable. The stocks whose values decrease the most and show greater sensitivity to the high inflation rate are the stocks of some comparably new-developed companies which have a tendency not to be profitable. A typical company that represents these kinds of companies is Tesla. As demonstrated from the graph, Tesla shows a higher volatility with regards to the current inflation situation as well as a larger decrease in values (see Fig. 5(c)). This observation also corresponds with the claim that "inflation hurts stocks overall because consumer spending drops" with the difference that "value stocks may do well" whereas growth stocks "tend to be shunned by investors" [9]. Consequently, the increment of interest rate negatively affects the stock market as a whole with different kinds of stocks undergoing different conditions. Given the above data and the analysis, the author further concludes that under the situation in which a high interest rate is affecting the whole society, people tend to invest carefully, thoughtfully and conservatively to avoid their possession from diminishing as likely as possible.

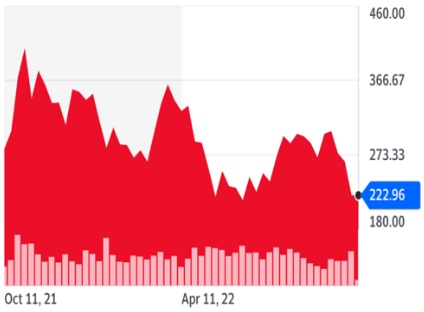
DOI: 10.54254/2754-1169/15/20230916



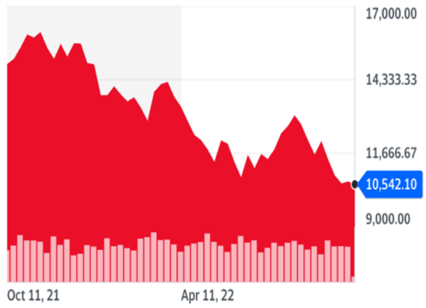
(a) Nike, Inc.



(b) Bed Bath & Beyond Inc.



(c) Tesla, Inc.



(d) NASDAQ index

Figure 5: Stock price for the past two years [8].

4. CPI

After analyzing the inflation rate status in the current United States as well as the effects of it, it is significant to look closer at the source of computation of the inflation rate, CPI, to better understand the contemporary economic status in the United States.

CPI is an abbreviation of “Consumer Price Index”. It “is a measure of the average change over time in prices paid by urban consumers for a market basket of consumer goods and services” [4]. In other words, it measures how a typical consumer in the United States distributes his spending on consumption. The three major parts of CPI are food, energy, and all items less food and energy. The first two parts solely measure the basic daily necessities of people’s everyday life, whereas the third part includes several adjustable aspects such as service, transportation, shelter and so on. The largest year-by-year increase among these three parts is the increment of energy with an amount of 23.8% year-by-year increase, which is not surprising given the increase of oil price in the world as a whole [10]. Though the 2022 Russian invasion of Ukraine also plays a exacerbation rule, the fact that pandemic largely affected the exploitation of crude oil as well as the current inflation status are able to affect the worldly oil price to a certain extent, as Moran mentions in “From zero to 100: Crude Oil Price Changes in 2020-2022” that “the risk that consumption levels may slump due to slower economic growth caused by COVID-19 restrictions in China and the threat of tighter U.S. monetary policy to curb inflation, has led to a sharp increase in volatility” [11]. Moreover, when considering about the oil price, the situation two years ago that the COVID-19 pandemic lagged the oil mining process therefore decreasing the supply of crude oil also plays an important role on the increase of oil price. The fact that electricity consumption rises due to the coming of summer and usage of air conditioners also accounts for the increase of energy consumption, but the effects are trivial considering the increase of electricity consumption equals to 15.8%, which is less than the overall increase of energy consumption.

Though the drastic increment of oil price undoubtedly matters significantly as a contribution to the high inflation rate, it is not the only reasons leading to such a severe inflation situation in the United States. The year-to-year food CPI increases by 8.3% in August, which is also a huge amount as comparing to the historical data. This data eloquently demonstrates the raise of price level in the United States society as a typical consumer usually regards food as his basic daily needs. In the author's opinion, this kind of consumptions that are least adjustable to consumers depicts how an economy functions clearly. On the contrast, the CPI of all items least food and energy, which in the author's opinion can be seen as adjustable consumptions, grows less than the two other types of commodities. Under a condition in which the year-by-year increase of CPI reaches the number of 8.3%, with an increase of food consumption that equals to 8.3% and energy consumption that equals to 23.8%, the increase of all other items is notably less, which equals to 6.3%. This reveals that people in the United States are saving money on adjustable consumptions such as services and rent. The data shows that the life quality of the people in the United States is less satisfactory than what it was before as well as a tendency for saving under such a high inflation rate, which can be detrimental to industries such as airlines and travelling.

The specific data of the Unites States CPI not only represents that the society is undergoing a situation with high inflation rate but also demonstrates how the inflation rate affects the changes of consumption habit of a typical American, therefore depicting his/her life to a certain degree. Looking specifically into these data provide people with an overview of the United States society in a more micro way under a macroeconomics domain.

5. Discussion

In September, the Fed Reserves announced to increase the Fed rate by 75 bp, showing its ambition to lower the inflation rate in the United States. The values of the stock market as a whole diminished correspondingly, which represents the public's expectation that the high inflation situation will still prevail in the short future. Based on the above analysis, the author predicts that the stock market will fluctuate violently in the future. The overall value of the stock market will also go down continually with some stocks performing better than others. Moreover, the proportion of spending on food and energy will be larger in a typical United State citizen's consumption. The inclination to saving rather than spending will be a trend in the short future as people have a tendency to avoid risks, which has a negative effect on the growth of real economy of the Unites States.

The United States economy is undoubtedly experiencing a harsh time and people are trying their best to protect their properties. As the author analyzed before, people in the Unites States have a tendency to saving compared with before. However, with the inflation rate going high continuously, money is gradually losing its values and depreciating. Consequently, in the author's opinion, keeping all the money in hand is not a wise move. The investment in items that have real values, for example, real estates of big cities may be smart as the rental price in New York City has been increasing for one year. As for the investment in the stock market, people should avoid investing particularly in one industry given the drastic fluctuation of the stock prices to disperse risk and invest mostly in the value stocks as analyzed in the above passage. Moreover, depositing money in reliable banks with a long history is also a good idea.

6. Conclusion

When analyzing the overall behavior of an economy, inflation situation is always one of the most important indicators, as it not only reveals the current status of an economy, but also provides valuable insights about the future trends. In this paper, the author analyzes the inflation situation in the United States by three indexes: GDP deflator, inflation rate as well as CPI to gain both general and micro insights of the inflation situation. The analysis of the similarities and differences of these three indexes gives a comprehensive representation of the current circumstances of the United States economy. The inflation situation is severe in the current United States economy, affecting both the whole market as well as people's everyday life. The stock market fluctuates violently in accordance with people's expectations about the future trends of inflation situations change, especially after the Fed Reserve's decision to increase the Fed's rate. Although some stocks perform better than others, the general performances of the United States stocks are much worse than what it was before. In the macroeconomics aspect, people's spending proportion on daily needs increases visibly. The inflation rate of the United States economy will not shrink to a normal level as what it was during the pre-pandemic period in the foreseeable future. To avoid sharp depreciation of properties in such an environment, the author suggests some ideas on investing under such a high inflation rate based on the analysis, such as investing on real economy.

References

[1] 10 Common Effects Inflation, https://www.investopedia.com/articles/insights/122016/9-common-effects-inflation.asp, last accessed 2022/10/5.
[2] Trading Economics GDP deflator, https://tradingeconomics.com/united-states/gdp-deflator, last accessed 2022/10/2.
[3] Inflation, https://en.wikipedia.org/wiki/Inflation, last accessed 2022/10/5.
[4] BLS CPI, https://www.bls.gov/cpi/, last accessed 2022/10/5.
[5] GDP Deflator, https://www.investopedia.com/terms/g/gdppricedeflator.asp, last accessed 2022/10/10.
[6] Trading Economics GDP Deflator, https://tradingeconomics.com/united-states/gdp-deflator, last accessed 2022/10/5.
[7] Trading Economics GDP Deflator, https://tradingeconomics.com/united-states/gdp-deflator, last accessed 2022/10/10.
[8] Yahoo Finance, https://finance.yahoo.com, last accessed 2022/10/10.
[9] Inflation's Impact on Stock Returns, https://www.investopedia.com/articles/investing/052913/inflations-impact-stock-returns.asp, last accessed 2022/10/5.
[10] BLS CPI News, https://www.bls.gov/news.release/cpi.t01.htm, last accessed 2022/10/10.
[11] Nicole M. Moran, Chanel F.O'Neill, Laurent Samuel.: From zero to 100: Crude Oil Price Change in 2020-2022. In: Cornerstone Research. The National Law Review, Volume XII, No.283, (2022).