Global Energy Crisis: Inflation and Recession

Hualing Xu

College of Science, Xi'an Jiaotong Liverpool University, Suzhou, China

hualing.xu20@student.xjtlu.edu.cn

Abstract. With the deepening process of world economic integration and financial globalization, the fluctuation of international crude oil prices will have a substantial impact on the world economy and financial market. This paper will study the relationship between the energy and the financial crises. The price of crude oil has a relatively significant impact on the market, especially during the outbreak of the COVID-19 pandemic and after this year's conflict between Russia and Ukraine. Taking crude oil as an example (the most basic energy), analyze the impact of the price of crude oil on the three financial markets of the United States, the United Kingdom and China through three transmission chains, namely the Producer Price Index, energy sub-item in Consumer Price Index and the Inflation Rate. The empirical research results show that the financial and the energy crises are inseparable. The energy crisis triggered the financial crisis, and the financial crisis buried the root of the energy crisis. By applying the sustainable development theory and implementing the corresponding new financial crisis countermeasures and energy policies, countries can effectively mitigate and prevent the crisis.

Keywords: Crude oil; energy crisis; US; UK; China.

1. Introduction

Since 2019, two major events have had a relatively large impact on global energy. The global epidemic of COVID-19 has become one of the agendas of the world in recent years, and has had a significant effect on financial markets [1]. The uncertainty and risk perception caused by the epidemic led to the global energy supply chain shortage. At the same time, it also caused a series of problems, such as the inability of factories in some regions to be put into operation, the lack of global capacity, and the decline of transportation capacity, which ultimately led to fluctuations in the financial market and commodity prices. As Russia is an essential participant in the global energy market, a conflict between Russia and Ukraine that began in the first half of this year also impacted the global supply chain of vital energy. In short, due to the decrease in energy supply and the rise in prices (see Figure 1), the global energy crisis has a particular impact on the financial market.

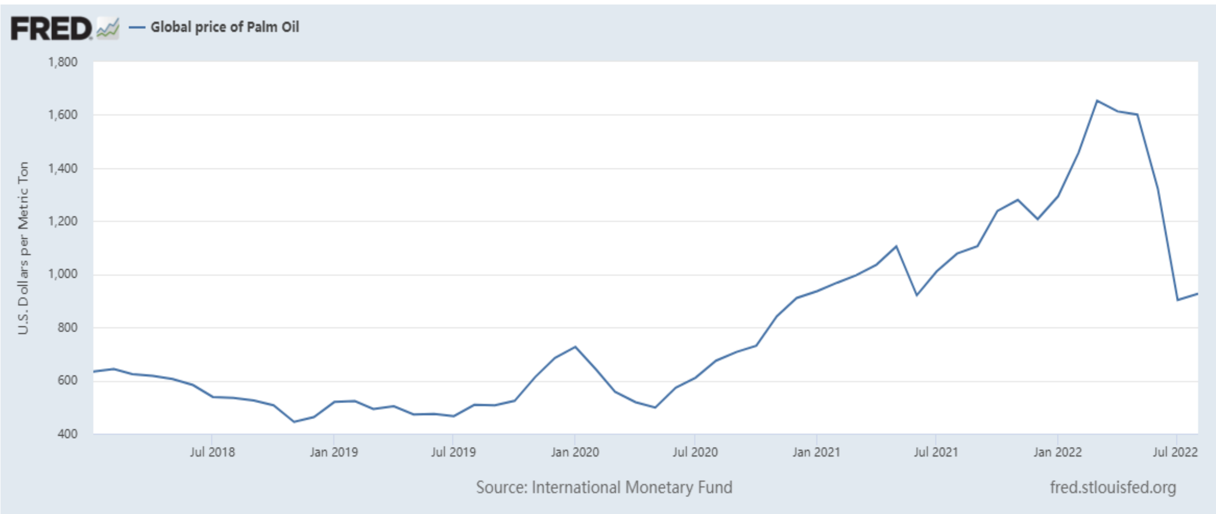

Fig. 1 Global price of palm oil [2]

Since this year, inflation in European and American countries has been inseparable from the dependence on traditional energy. As the largest trading commodity in the world, the crude oil futures market has shown an obvious financial attribute. Because of the relevance of crude oil in the macro-economy, crude oil plays an important role in determining macroeconomic indicators. Almost all economic activities seem to be directly or indirectly related to oil. Its use is so massive that in addition to the manufacturing sector directly using it, even the service sector cannot do without it by driving factories for various purposes. Therefore, we choose crude oil as the representative of energy to study the relationship between energy and the financial economy [3]. This paper will make the analysis of three groups of indexes, exploring the impact of the price of crude oil on the three financial markets. They are, respectively, the United States, the United Kingdom and China.

2. U.S.: Energy Shocks Amid Rapid Inflation

Since the 21st century, the price of crude oil has fluctuated violently. It is typically to select and study the impact of oil prices on the US market in the five years from 2018 to 2022. Firstly, from the oil price shown in Figure 2, the overall trend of this chart is upward. During 2019, there has been approximately flat growth, and in 2022, there is a steep growth. Next, it is necessary to focus on these two-time nodes. COVID-19 in 2019 directly impacted the profitability of the energy sector and financial sectors' profitability. The impact of the epidemic on social production and life, from industrial production to consumer goods expenditure, has led to a decline in oil demand. At the same time, the outbreak of a price war among significant oil countries directly hit the international oil price, which is shown in the Figure 2 and Figure 3, influencing both the PPI and CPI of the US market negatively.

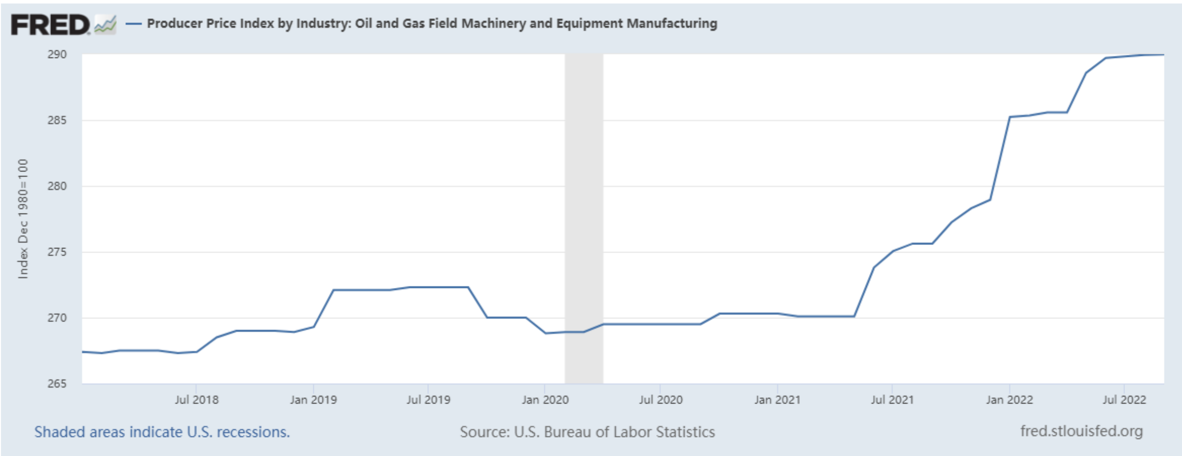

Fig. 2 PPI by industry: oil and gas field machinery and equipment manufacturing [2]

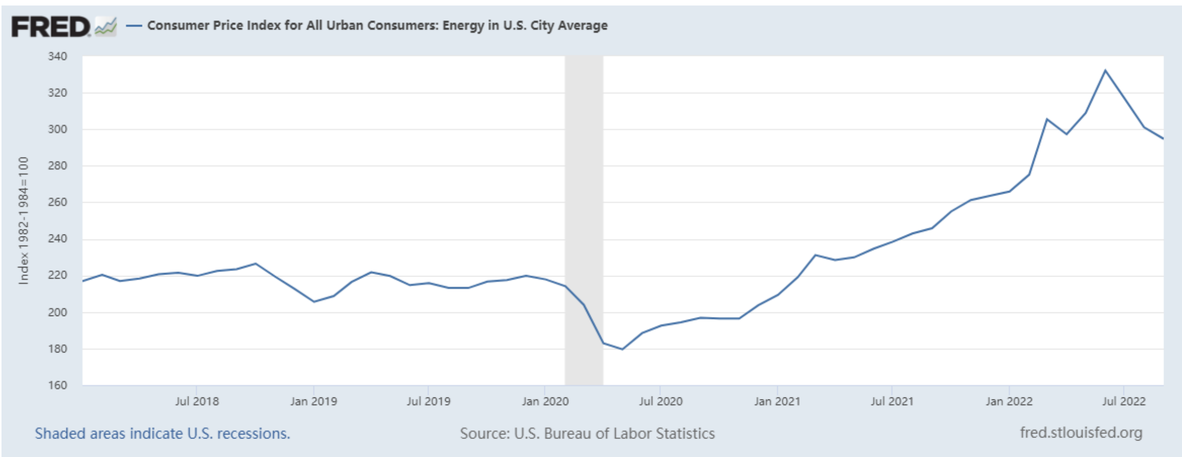

Fig. 3 CPI for all urban consumers: energy in U.S. city average [2]

Furthermore, the second time node where significant changes have taken place is also needed to be analyzed. In combination with Figure 1, due to the escalation of the conflict between Russia and Ukraine, the oil price has continued to rise after February 2022, underwent severe fluctuations in March and April, and showed a steady downward trend from June. The reduction of the Russian oil supply undoubtedly impacts the market, and it is reasonable for the spread of panic to stimulate the uncontrolled rise of oil prices. However, in the later stage, as almost all countries announced the release of oil reserves to deal with the energy gap, market sentiment gradually stabilized, and oil prices retreated. Corresponding to the figure of PPI and CPI, there was a sharp increase in both indexes in February. The PPI was flat after June, while the CPI started to decrease after June, which shows that the implementation of the US sanctions against Russia has made its domestic enterprises gradually adjust production and reduce output in the face of the trend of declining market demand. However, for the US, the energy sanctions against Russia generally have little impact on itself.

The inflation rate can help us more intuitively infer the impact of the energy crisis on the financial market. In Figure 4, global factors were important reasons for inflation during the epidemic. At the beginning of the epidemic, most economic activities stagnated, household consumption decreased, and commodity prices plummeted, leading to a sharp decline in inflation. In the later period of the epidemic, with the increase of global trade and bulk commodity demand, international economic activities gradually recovered. At the same time, the supply chain recovery slowed down due to the strong demand growth in the United States and a series of supply shocks, which significantly increased inflation. While during the Russian-Ukrainian conflict, because Russia is not the main trading partner of the United States and itself has very rich mineral resources and low demand for energy imports, the change in oil prices will not bring too much risk to the American financial market. In other words, the direct impact of the U.S. sanctions on Russian energy imports and exports on U.S. economic activities is moderate. The short-term rise in the prices of bulk commodities such as crude oil may have a more significant impact on domestic enterprises, but it will not bring difficulties to the supply of most items. However, according to Figure 4, the United States is still in an inflationary environment during this period, so the rise in crude oil prices has also brought considerable upward pressure on American inflation. This is because the increase in oil and gas prices will inevitably result in spillover effects. The rise in transport costs is likely to be passed on to ordinary American consumers. This forced the Federal Reserve to tighten monetary policy significantly [4].

Fig. 4 U.S. Inflation rate [5]

3. UK: Soaring Inflation Rates

Technological progress in developed countries may have succeeded in minimizing the role of oil as an energy input and promoting other energy sources, especially renewable energy. However, developed countries are still highly industrialized, which may make them unable to veto the importance of using oil in large quantities [6]. Therefore, the market reaction of developed countries to oil prices will be different from that of developing countries. However, it is not represented to study the changes in the United States market alone, so it is necessary to review the changes in the British market to oil prices.

Since the epidemic spread, the British economy has suffered an unprecedented impact. To start with Figure 5, Britain's PPI index has been changing erratically. In contrast, in the first three months of 2020, the PPI index of the UK market declined seriously to a new low, indicating that the direct impact of the COVID-19 pandemic on output was severe. A report by the Organization for Economic Cooperation and Development (OECD) also said that the UK economy might be the most seriously affected country by the COVID-19 crisis among all developed countries [7]. The change in Britain's PPI index seems to have nothing to do with the price of crude oil, the PPI index repeatedly fluctuates within the range. Still, according to a report by the Civil Society Research Institute, the UK relies too much on the service industry at the expense of manufacturing, resulting in no stable trend of the PPI index [8]. In particular, during the epidemic period, the production output of the service industry and its related industries declined significantly, leading to the British economy’s failure to recover quickly. From Figure 5, there is a sudden increase in 2022, the situation of Britain and the United States is entirely different, and their dependence on foreign energy is relatively high. The rise in energy prices has led to higher emission costs for enterprises, leading to the UK PPI index rising during this period. With the existence of the market stability reserve mechanism, Britain's PPI index gradually retreated.

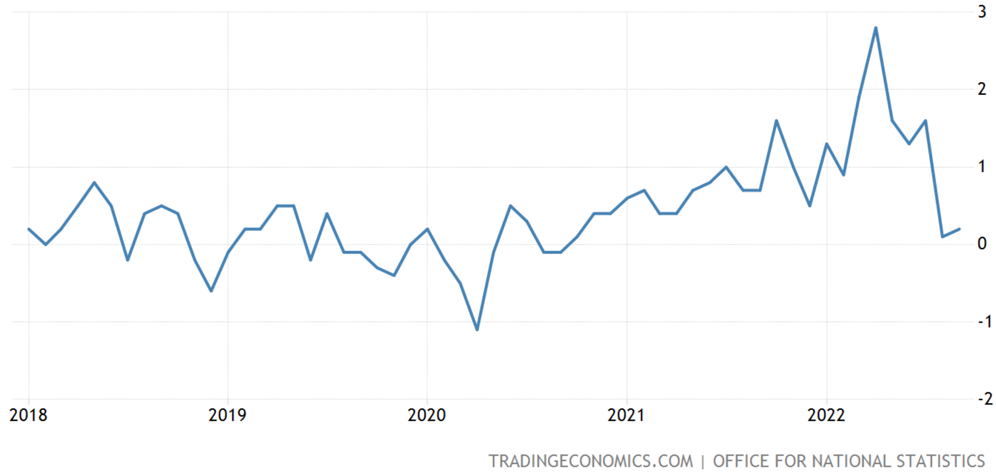

Fig. 5 PPI in the UK [5]

Moreover, it is natural to focus on the CPI index in the UK market. As mentioned above, the UK economy depends on the service industry, so the crude oil price has little impact on the UK CPI index during the epidemic. However, the life of British people has changed a lot due to the conflict between Russia and Ukraine, which is reflected in a sharp increase in the CPI index in 2022 (see Figure 6). The rise of crude oil prices caused panic buying, which increased the oil price. In other words, the increase in oil prices caused by the Russian-Ukrainian conflict has brought a vicious circle to the financial market in Britain.

After observing the two indexes, the inflation rate in Britain should be analyzed (see Figure 7). The inflation rate before 2022 has nothing to do with the change in crude oil prices, but is more related to the UK's "Brexit". Therefore, we focus on analyzing the impact of crude oil prices on the UK's inflation rate during the Russian-Ukrainian conflict. From the economy perspective, the conflict between Russia and Ukraine has aggravated the tense situation of energy supply and demand in Britain. Crude oil is necessary for industry and the primary fuel for Britain's final energy consumption. The rise of crude oil leads to higher prices of oil and industrial raw materials, which leads to inflation. From the perspective of potential impact, crude oil prices fluctuation directly affects a series of industries using crude oil as raw material.

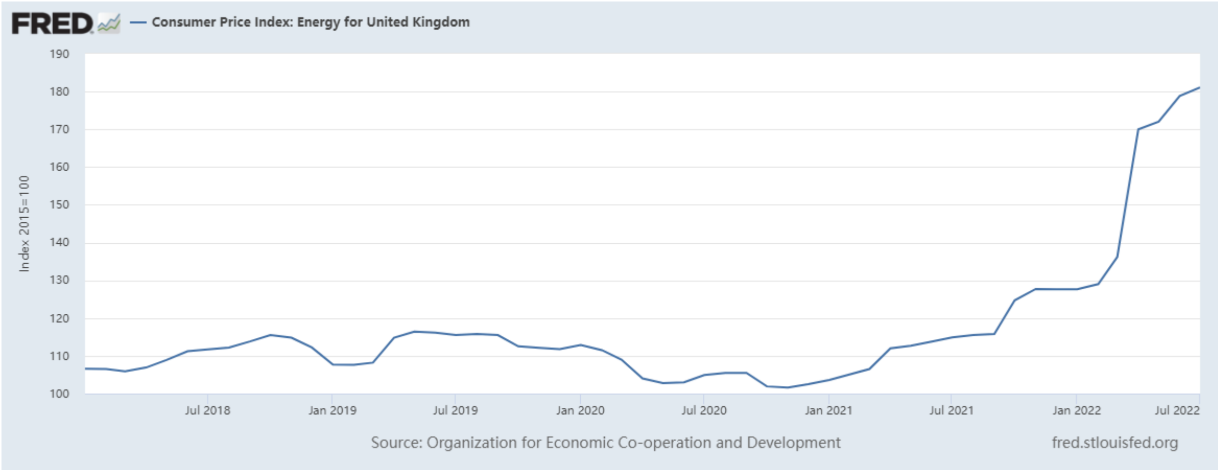

Fig. 6 CPI: energy for United Kingdom [2]

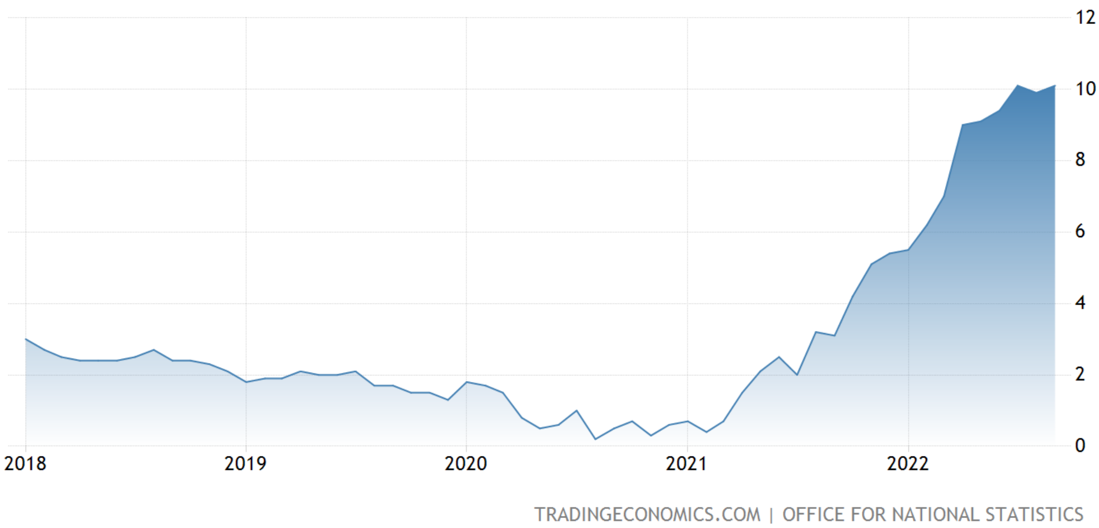

Fig. 7 Inflation rate in the UK [5]

4. China: Monetary Policy Easing

China is the largest net oil importer and the second largest oil consumer globally, so oil prices play a vital role in the Chinese market [9]. There is no doubt that China is the developing country most worthy of research and analysis on this topic. After studying the impact of crude oil prices on foreign financial markets, we will focus on the Chinese market. As mentioned above, it is still the first to analyze the effect during the epidemic.

From the perspective of PPI, the year-on-year change of PPI in 2019 showed a trend of high before and low after, as Figure 8 shown. The emergence of the epidemic further strengthened this trend. It can be seen from the figure that the first quarter was greatly affected. In combination with Figure 1, the low demand for oil during the epidemic period makes it unlikely that the international oil price will rise significantly. As an oil-importing country, China will help stabilize the production costs of domestic enterprises and restrain the year-on-year increase of PPI from the cost side. In general, the transmission of international oil and other commodity price declines to China will lead to the deterioration of industrial product prices. The higher PPI base in the same period of 2019 determines that PPI still has downward pressure in the short term, which also explains that the low point of PPI year-on-year change occurred in the second quarter.

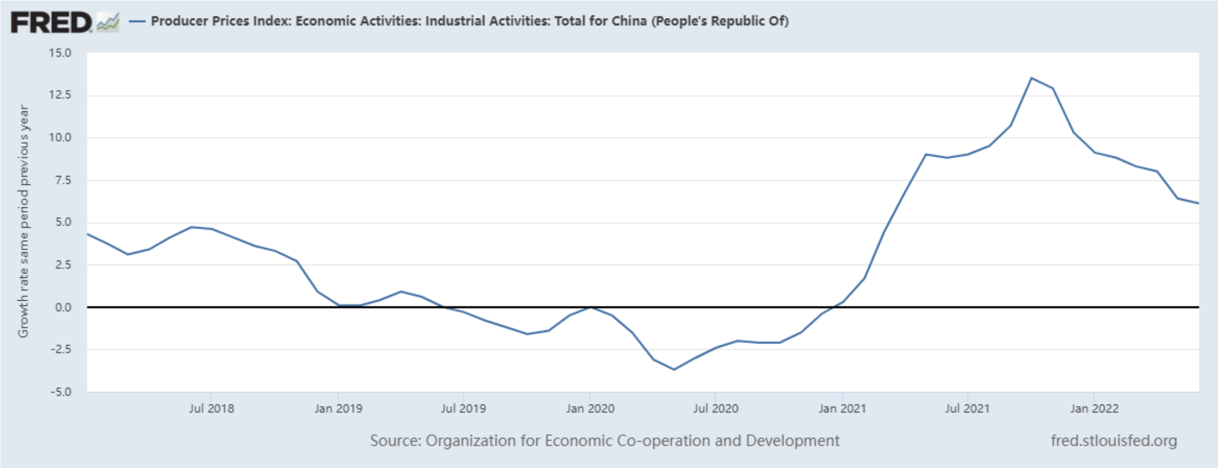

Fig. 8 PPI: economic activities: industrial activities: total for China [2]

Then from the perspective of CPI, the year-on-year change of CPI in 2019 shows a trend of low in the first place and high in the second. In 2019 shows a trend of quiet in the first place and high in the second. This change is mainly due to the impact of the epidemic on supply and demand. For example, the supply side was blocked, and the demand side residents stocked up goods for a short time in response to the epidemic, resulting in a mismatch between supply and demand, which led to a year-on-year decline in CPI changes. In terms of the follow-up situation, although the current epidemic prevention and control is showing a positive trend, the pent-up consumption in the early period after the end of the epidemic will be partially released, especially the retaliatory rebound will also increase the demand for non-necessities, which will play a supporting role in CPI, leading to an increase in the year-on-year CPI. While the straight decline of CPI in 2021 may be due to the spread of the COVID-19 epidemic abroad, which has affected global economic growth and caused high domestic inflation pressure. In addition, the sharp adjustment of energy prices has also led to a sharp fall in CPI.

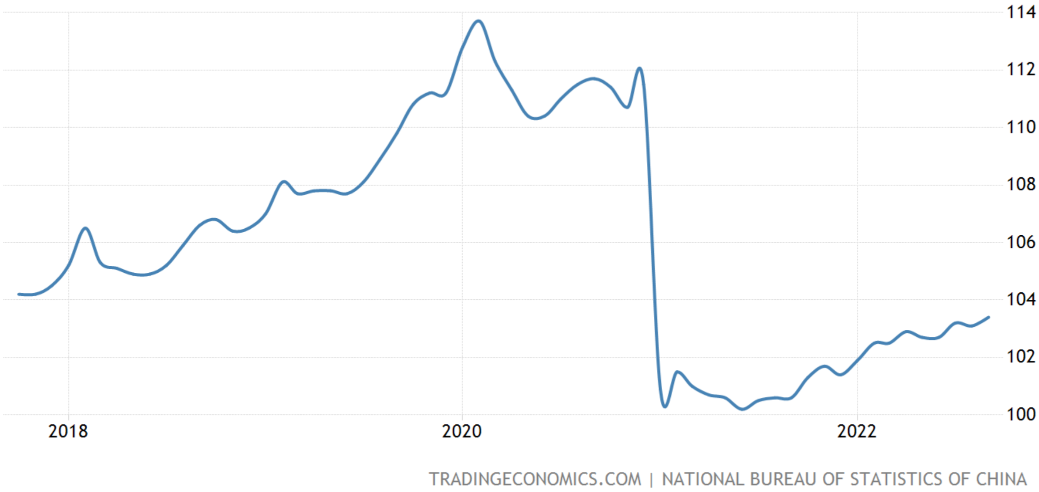

Fig. 9 CPI in China [5]

In addition, the inflation rate in China should also be discussed (see Figure 10). The outbreak of the epidemic at the end of 2019 triggered a super loose monetary and fiscal policy, and the inflation rate rose unexpectedly. Since the change in the epidemic situation, the shrinking demand has led to the decline of commodity prices. In short, the imbalance between supply and demand has caused inflation. Other psychological factors, expectations and speculation in the international financial market have all affected the inflation rate. Based on the above analysis, it is found that China's price level was well controlled during the Russian-Ukrainian conflict. However, in the global inflationary environment, the pressure of international imported inflation cannot be ignored, especially the inflation in the United States and Europe, as well as the rise of related commodity prices. Due to geopolitical reasons, the pressure of imported inflation is relatively high shortly [10].

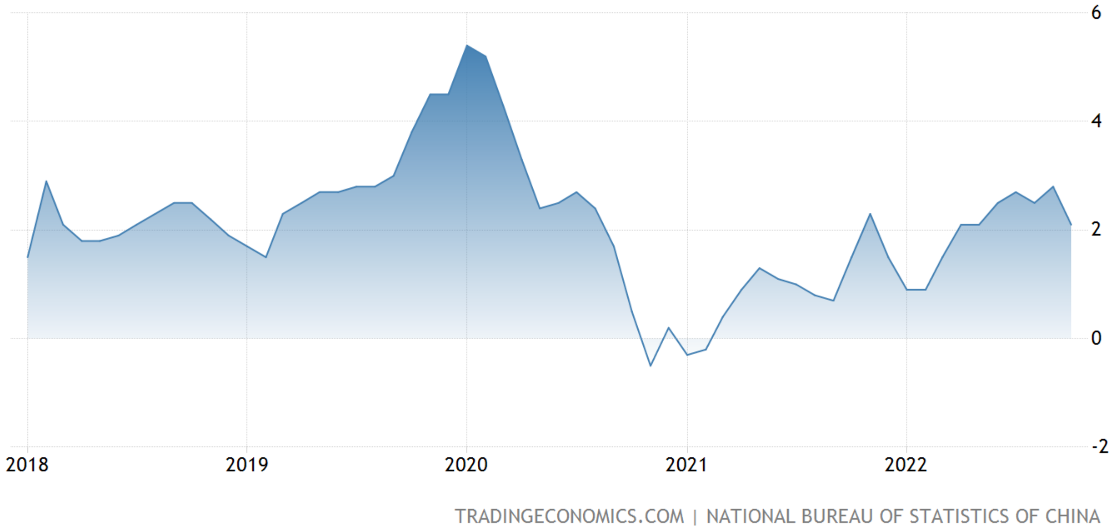

Fig. 10 Inflation rate in China [5]

5. Conclusion

As the most important industrial raw material, crude oil can not only reflect the total demand but also restrain the effective demand by pushing up the cost. It has a good indication for the economic cycle. As the most critical energy and industrial raw material, crude oil can reflect the total demand of the global economy. At the same time, the increase in crude oil price can reflect the rising pressure of total cost and expense. The cost and price increases caused by the sharp rise in oil prices will restrain effective demand and push the tightening of monetary policy. Therefore, the increase of crude oil often represents the expansion of overall order. At the end of the rising cycle, when the oil price starts to stagnate or even turn around, it usually means the contraction of overall market and the opening of the downward economic cycle.

To sum up, in 2020, when the epidemic began to spread around the world, financial markets were filled with worries about the liquidity crisis. The price of crude oil fell sharply all the way. After that, the Federal Reserve adopted a more generous policy than expected. At the same time, the US Treasury also significantly expanded its fiscal expenditure, which eventually led to a sharp rise in the price of crude oil and other commodities and triggered high inflation. Under normal circumstances, the cost of crude oil and some bulk things is expected to fall back this year as the Federal Reserve starts the interest rate-raising cycle. However, in February, there was the Black Swan incident, a sudden conflict between Russia and Ukraine, and global tensions again led to crude oil prices' rise. Crude oils as a major commodity in the international market, and crude oil has a noticeable impact on the financial market. As a result, the rise of crude oil triggers further inflation, which is not a good thing for the global economy.

References

[1] Adekoya, O.B., Oliyide, J.A., Oduyemi, G.O., "How COVID-19 upturns the hedging potentials of gold against oil and stock markets risks: nonlinear evidences through threshold regression and markov-regime switching models." 2021, Resour. Pol. 70.

[2] Federal Reserve Economic Data. https://fred.stlouisfed.org/. Last accessed 2022/11/5.

[3] Salisu, A.A., Isah, K.O., Oyewole, O.J. and Akanni, L.O., "Modelling oil price-inflflation nexus: the role of asymmetries", 2017, Energy, Vol. 125, pp. 97-106.

[4] Megan Leonhardt, “Russia Ukraine conflict will further aggravate US inflation”, 2022-03-02, https://www.fortunechina.com. Last accessed 2022/11/5.

[5] Trading Economics. https://tradingecnomics.com. Last accessed 2022/11/5.

[6] Zhang, D., Ji, Q., “Energy finance: frontiers and future development”, 2109, Energy Econ. 83, 290–292.

[7] Phillip I. UK economy likely to suffer worst Covid-19 damage, says OECD. Last accessed 2022/11/5.

[8] John M. The road to recovery: reviving manufacturing after coronavirus. Last accessed 2022/11/5.

[9] Xiao, J., Zhou, M., Wen, F. and Wen, F., “Asymmetric impacts of oil price uncertainty on Chinese stock returns under different market conditions: evidence from oil volatility index”, 2018, Energy Economics, Vol. 74, pp. 777-786.

[10] Hongru. Wang, “The conflict between Russia and Ukraine broke out, and the potential international inflation pressure remained high. What is the prospect of inflation in China?”, 2022-04-15, www.ceweekly.cn. Last accessed 2022/11/5.