Macrothink Institute™

International Journal of Accounting and Financial Reporting
ISSN 2162-3082
2022, Vol. 12, No. 3

# Research on the Impact of Economic Policy Uncertainty on Commodity Prices

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Received: July 1, 2022 Accepted: August 20, 2022 Published: September 17, 2022

doi: 10.5296/ijafr.v12i3.20277 URL: https://doi.org/10.5296/ijafr.v12i3.20277

**Abstract**

Global economic environment has an important impact on commodity prices. Economic policy uncertainty is an important indicator of global economic environment and an important factor affecting commodity prices. Through empirical research on the impact of global economic policy uncertainty index on global commodity composite index, it is found that Economic policy uncertainty on global commodities comprehensive index, the index of the commodities except gold (energy), fuel prices, oil prices index, the index of fossil fuel, food and beverage prices index, the food price index, industrial base of raw materials prices, agricultural prices index, the index of base metal prices, in addition to the gold metal price index, agriculture as the foundation of raw material The effect of material price index was significant, but not on beverage price index, metal price index, precious metal price index, fertilizer price index, natural gas price index and coal price index. The results show that the increase of economic policy uncertainty will lead to the decline of commodity price index. Therefore, the establishment and implementation of economic policies should consider its influence on the economic base -- commodities, which will have certain reference value for our economic reform.

**Keywords:** economic uncertainty, bulk commodity, index

Bulk commodities are homogeneous, tradable and widely used as basic industrial raw materials. They are the lifeblood of the national economy and affect every aspect of people's lives. Commodities are mainly divided into four categories: energy commodities, agricultural and sideline products, basic raw materials and precious metals. In addition to supply and demand factors, commodity prices are mainly affected by the global economic environment.

Economic policy uncertainty is one of the important indicators to measure the global economic environment, in the context of the current trade war, the United States and China often adjust the import and export policy, especially the United States since 2018, the part China export enterprise and improve the tariff rates of commodities, limit the major suppliers

to provide high-tech products to China science and technology enterprises, withdrew from the major international organizations, All reflect the high uncertainty of economic policy. Such economic policy of high uncertainty also reflects the problem that the current global economic environment, the power of international trade rules between ignoring the outbreak of the global economy, the new champions league against all reflected the current economy faces serious challenges, therefore, the uncertainty of economic environment first performance in the various countries' economic policy changes frequently, This will have an important impact on the commodity sector, which matters to the national economy and people's livelihood.

## 1. Research Summary

Economic policy uncertainty not only affects the global macro economy, but also has a significant impact on the macroprudential assessment system, bringing uncertainty to the import economy of countries. Economic policy uncertainty will affect the price of oil, economic policy uncertainty will increase the return of oil investment (at a specific time), increase the volatility of the stock market, increase the stock market risk. Economic policy uncertainty will also guide the real estate market and housing prices. At the micro level, the increase of economic policy uncertainty will lead to the increase of trade tax rate and the intensification of trade protectionism, which will affect the entry of export enterprises into new markets, increase the export cost of enterprises, and slow the response of enterprises to tariffs (for example, the United States increases exports to non-MFN countries by 6.5%). Economic policy uncertainty also affects a company's ownership structure. With the increase of economic policy uncertainty, the company will reduce the financial leverage ratio and adjust the financing structure by using credit products, thus restraining the investment of the enterprise, affecting the change of the senior management of the enterprise and increasing the risk taking of the enterprise. Economic policy uncertainty can also affect families, businesses, policy makers and decision on financial intermediary, and negative affect bank credit product quantity, economic policy uncertainty can increase the risk of bank credit, and reduce the number of loans, reduce enterprise credit scale, reduce the total financial assets, inhibition of enterprise technology innovation, reduce the number of trade and consumer income, It affects foreign investment, affects information asymmetry in the stock market, increases bid-ask spread, reduces the reaction degree of stock price to expected earnings, and affects information disclosure of enterprise management. The higher the uncertainty of economic policy, the lower the company's fixed asset investment, the lower the leverage ratio, the higher the cash holding level, the more serious the agency problem. The regions with a low degree of marketization are more sensitive than the mature marketization regions. The impact of economic policy uncertainty on state-owned enterprises and non-state-owned enterprises is obviously different. Economic policy uncertainty is directly proportional to the leverage ratio of state-owned enterprises, and inversely proportional to the leverage ratio of non-state-owned enterprises. In addition, increased economic policy uncertainty will lead to higher unemployment and affect people's living standards.

The economic policy uncertainty index can reflect the frequency of changes in economic policies of major economies in the world and is the most intuitive indicator to measure the

policy risks faced by investors and enterprises. The most commonly used Economic Policy Uncertainty Index (EPU) is compiled by Scott R. Aker, Nicholas Bloom and Steven J. Davis of Stanford University and the University of Chicago. Huang et al. compiled China's economic policy uncertainty index based on China's unofficial newspapers and magazines. The construction of economic policy uncertainty index is mainly based on the number and frequency of keywords in news and newspaper media, and the keywords involved are as follows: uncertain, uncertainty, unstable, stand, unpredictable, volatility, reform, economic, economy, Financial, finance, politics, Congress, DEFI-CIT, Federal Reserve, legislation, Law, regulation, regulatory, White House, Fiscal, Budget, spending, Policy, tax, Taxation), the interest rate (what), war (war), the house of representatives (house of representatives), government, government, Authority, Senate, Chairman/President, Prime minister, etc.

Before 2017, the Global Economic Policy Uncertainty Index (GEPUI) and the global 18 commodity price indexes basically kept changing in the same direction. However, with the inauguration of former US President Trump, the global economic policy uncertainty index began to fluctuate with the commodity price index in a large range, and reached the historical maximum in May 2020. At this time, the outbreak of COVID-19 in the United States and the gradual start of the presidential election campaign in the United States, coupled with the intensification of trade frictions with China, Vietnam, Europe, Russia and other countries, trade protectionism intensified, making the global economic uncertainty significantly increased, reaching a historic high. Looking at the trend of the global economic policy uncertainty index before 2017, there were four major surges: the first was the Asian financial crisis in 1997, which made the Asian economy in the stage of increasing risk, which was also reflected in the obvious rise of the global economic policy uncertainty index; The second was the Iraq War in 2003, which immersed the Middle East in gunfire, which also brought uncertainties to the global economy. Meanwhile, according to the change of GEPUI index, the uncertainty index of global economic policies also increased significantly at this time. The third is the 2008 financial crisis, which is a global financial crisis, directly leading to the bankruptcy of a number of large enterprises such as Lehman Brothers, and dealt a heavy blow to the global economy. The change of GEPUI also clearly reflects the uncertainty faced by the global economy at this time. Before and after the fourth time for the 2013, with the eighteenth National Congress of the Communist Party of China held victory, the 12th at a meeting of the National People's Congress elected a new session of national leaders, opened up a new situation in our country, at the same time, countries around the world to our country economic, political and into a new stage of the reaction is not the same, and also experienced in Chinese stock market crash, As a result, the global economic uncertainty increased. GEPUI experienced frequent fluctuations at this stage, which also reflected the uncertainty of global economic policies.

In terms of the commodity price index, the global commodity price showed an upward trend before the 2008 financial crisis, especially the natural gas price index (NGPI), which showed a rapid increase at the end of 2005. Because of this, the long-term contract signed by China and the North West Shelf Company of Australia was broken by the Australian side. To 2008 years before the financial crisis, the natural gas price index peaked, oil prices index (COPI),

fuel (energy) price index (FEI) at the upper end of history and international crude oil prices have also reached historical peak, especially by American WTI crude futures prices in July 3, 2008 to $145.29 a barrel, It is the highest price ever recorded. Since natural gas and oil have similar functions, and the price of natural gas is closely linked to the price of oil, the natural gas price index also reached a record high during the same period. It is worth noting that the precious metal Price Index (PMPI) has been at a low level. Although there were brief rises before the financial crisis in 2008 and in the bull market in 2013, the rise was smaller than that of other commodity indexes and there has been no drastic fluctuation, which also reflects the risk-hedging properties of precious metals such as gold.

## 2. Empirical Research

### *2.1 Sources of Data*

The empirical research data of this paper adopts the global economic policy uncertainty index and global commodity price index data from 1997 to 2020. Among them, the global economic uncertainty index is calculated using the adjusted GDP data (GEPU_ppp). The relevant Data of commodity price index are from IMF External Data, and the Data frequency is the monthly Data from January 1997 to September 2020 (285 months in total). Table 2 shows the descriptive statistics of Global Economic Policy Uncertainty Index (GEPUI) and 18 commodity price indices. As can be seen from Table 2, the maximum value of global economic Policy Uncertainty Index (GEPUI) is 423.9683, which is the largest among all indexes. In terms of the commodity price index, the maximum value of the fertilizer price index reached 332.0745, the highest value of all the commodity price index, and the minimum value of the precious metal price index was 22.5419, the lowest value of all the price index. In terms of mean value, the average value of natural gas price index is the largest, and the average value of precious metal price index is the smallest, which are 143.6568 and 72.8907 respectively. In terms of risks, the standard deviation of the global economic policy Uncertainty index is the largest, reaching 65.5637. Among commodities, the standard deviation of the fuel (energy) price index is the largest, at 64.9410, and the standard deviation of the agricultural product price index is the smallest, at 21.6838. Through the above data analysis shows that due to the effect of the global financial crisis, fertilizer prices, fertilizer price index in August 2008 peak of 332.0745, precious metals prices remained low, wherein the minimum and mean values There are at the lowest level in the commodity price index, fuel price index fluctuation (energy) is the largest, It highlights the high volatility of its price, especially before the financial crisis on July 3, 2008, when the international oil price reached a record high (WTI crude oil futures price of $145.29 / barrel, spot price of $145.31 / barrel). On April 20, 2020, the U.S. WTI crude oil futures contract (contract 1) fell to -37.63 USD/BBL, and the spot price fell to -36.98 USD/BBL, which fully illustrates the highly volatile nature of energy prices. On the contrary, agricultural prices have been stable in terms of volatility, being the least volatile of all commodity price indices, reflecting the stability of world food supply and the absence of drastic price fluctuations.

### *2.2 Empirical Research Result*

In this paper, empirical studies using formula (1) in the multivariate linear regression model,

according to the empirical research on the related theory, the regression analysis of time series data shall be checked before, if there are unit root in time series data, show that non-stationary data rendering, the difference should be made for the original data or take logarithm processing, such as to ensure the validity of the results of the study.

### 2.2.1 Unit Root Test

Unit root test refers to the test conducted to verify the existence of unit root in time series data. If unit root exists in time series, the series is non-stationary, and spurious regression phenomenon may occur when used for regression. If there is a unit root in the time series, we can eliminate the unit root according to difference or logarithmic operation, so that the non-stationary time series will become stationary time series, so as to ensure the stationarity of the data used for regression analysis. Table 3 shows the results of the unit root test of the global economic policy uncertainty index GEPUI and the global commodity price index.

The unit root test in this paper adopts the commonly used ADF test. Specifically, we use the Dichey-Fuller test method, and the relevant results are shown in Table 3. As can be seen from Table 3, GEPUI data of global economic policy uncertainty index has stationarity. The T value of unit root test of original data of GEPUI is -4.746 and P value is 0.0006, falling into the rejection domain and rejecting the null hypothesis, indicating that the original data of GEPUI of global economic policy uncertainty index does not have unit root and has stationarity. The first difference t value is -20.717, P value is 0, which is better than the original data stationarity. The corresponding seasonal difference data t value is -6.988, P value is 0, which is better than the original data stationarity, but it cannot reach the level of stationarity of the first difference data.

In terms of the commodity index, the original data of each commodity price index did not have stationarity, and passed the unit root test after the first difference, showing stationarity. Among them, the unit root test t value of ACPI original data was -0.922, and the P value was 0.9537. The t-value of unit root test of first-order difference data was -9.911, and the P-value was 0. The t value of unit root test of seasonal difference data is -2.522, and the P value is 0.3171, which means that the original ACPI data has unit root and is non-stationary data. The first-order difference stationary data series of ACPI and ACPI seasonal difference data are non-stationary. Similarly, Table 9.3 shows that the T-value of unit root test of ACIEG original data of commodity index is -0.904, and the P-value is 0.9557; The t-value of unit root test for first-order difference data is -9.898, and the P-value is 0. The t-value of unit root test for seasonal difference data is -2.532, and the P-value is 0.3121. That is, the original ACIEG data has unit root, while the first-order difference data does not, which is a stationary data series, and the ACIEG seasonal difference data is non-stationary.

### 2.2.2 Regression Analysis

After the difference, the data are stable and can be used for regression analysis to test the relationship between global economic policy uncertainty and commodity price indices. Formula (1) was used for regression analysis here, the dependent variable was the first-order difference ($\Delta yi$) of each commodity price index, the independent variable was the global

economic policy uncertainty index ($\Delta xi$), and the control variable was the seasonal difference ($\Delta syi$) of each commodity price index. The data were monthly data from January 1998 to September 2020 (a total of 273 months).

Similarly, the impact of global economic policy uncertainty index GEPUI on various commodity price indices can be shown in the table, Its index of commodities other than gold ACIEG, fossil fuel index NFPI, food and beverage price index FBPI, food price index FPI, industrial basic raw material price index IIPI, agricultural commodity price index API, agricultural basic raw material price index ARMI, basic metal price index BMPI, metal price index other than gold AMIEG, fuel (energy) price index FEI and oil price index COPI have significant negative effects. It has no significant effect on beverage price index BPI, metal price index AMI, precious metal price index PMPI, fertilizer price index FI, natural gas price index NGPI and coal price index CLPI, and the seasonal characteristics of each commodity price index are obvious.

In addition, the global economic policy uncertainty index GEPUI has the most significant impact on the oil price index COPI. The estimated value of the corresponding coefficient A1 is -0.0999, and the corresponding T value and P value are -4.12 and 0, respectively, which is the most significant impact of GEPUI on all commodity price indexes. In general, the global economic policy uncertainty index GE-PUI has a significant impact on global commodity indexes. Table 5 summarizes the impact results of GEPUI on various commodity indexes. It can be seen from the table that, The global economic policy uncertainty index GEPUI has a significant impact on ACPI, ACIEG, FEI and COPI at 1% significance level, and has a significant impact on NFPI, FBPI, FPI, IIPI, API, BMPI and AMIEG at 5% significance level. It has a significant effect on ARMI at 10% level of significance, but has no significant effect on BPI, AMI, PMPI, FI, NGPI and CLPI.

## 3. Conclusions and Suggestions

### *3.1 Conclusions*

Economic policy uncertainty is an important index to measure the macroeconomic environment, and the economic policy uncertainty index has an important effect on bulk commodities. Based on the research of global economic policy uncertainty index GEPUI and global commodity index, this paper finds that global economic policy uncertainty increases, Will result in a composite index of global commodity prices ACPI, commodities other than gold ACIEG, Non-fossil fuel Price Index NFPI, Food and Beverage Price Index FBPI, Food price Index FPI, Industrial Basic raw material Price Index IIPI, Agricultural commodity price Index API, agricultural basic raw material price index ARMI, Basic metal price Index BMPI, Metal Price Index Other than Gold AMIEG, Fuel (energy Price index FEI and oil price index COPI fell. The results of this paper prove the relationship between economic policy uncertainty and commodity prices. The increase of economic policy uncertainty indicates that the increase of economic environment instability and policy change factors will have an impact on commodity trading volume, thus leading to the decline of commodity prices. Therefore, the formulation and implementation of economic policies should consider its impact on economic basis -- commodity prices. We should adjust economic policies on the

premise of keeping economic foundation stable and commodity prices do not fluctuate greatly, which has some reference value for our economic reform.

*3.2 Suggestions*

Policies: Energy policies should be timely, and the foundation of industry and agriculture should be stable. According to this article research results, the uncertainty of economic policies for energy, the fossil fuel, food and beverage, industrial and agricultural raw materials, agricultural products and food industries have a significant impact, energy is usually involved in international trade, price changes in order to adapt to the international market, our country related policy in the field of energy and non-fossil fuels should be timely; Industrial and agricultural basic raw materials and agricultural products are the foundation of our country's economy. The relevant policies should maintain stability in order to stabilize the price and protect development. Investment: carefully choose the investment industry, appropriate use of financial tools. For oil, natural gas and other commodities with financial attributes, investors can be properly used to market for financial derivatives for hedging, related products to hedge the international market price fluctuations brings the risk of price fluctuation and small agricultural products and food and beverage industries, its liquidity is poorer, less related financial derivative products, investors should not be excessive.

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