Research on the International Relevance of China's Economic Policy Uncertainty

LÜ Rongxia [a]; ZHOU Xiaojing[b], *

[a] PhD Student, Central University of Finance and Economics, China.
[b] Professor, Beijing University of Civil Engineering and Architecture, China.
*Corresponding author.

Abstract

Currently facing a complex international environment, the world faces instability and uncertainty, and the world 's economic growth momentum is inadequate. Facing environmental instability in various aspects, in order to promote sustainable economic development, governments of various countries are also implementing policies. There is a large uncertainty. Based on the economic policy uncertainty index, this article deeply studies the correlation between the uncertainty of China's economic policies and the uncertainty of economic policies of the world's important economies, and draws the following conclusions: In terms of correlation, when major historical events occur, the economic policy uncertainty index of each country has increased significantly. Secondly, in terms of targeted correlation, the economic policy uncertainty of each country is not completely independent and will be affected by other countries. Among them, the United States and China have the highest autonomy index and have the greatest impact on other countries. France and Germany have less influence on other countries and are more affected by other countries.

Key words: Epu index; Total correlation; Directional correlation

INTRODUCTION

The report of the Nineteenth People's Congress of China stated: "World multipolarization, economic globalization, social informatization, and cultural diversification have developed in depth, the global governance system and the international order have accelerated, and the interconnectedness and interdependence of countries have deepened The international power comparison is more balanced, and the trend of peaceful development is irreversible. At the same time, the world faces instability and uncertainty, and the world 's economic growth momentum is insufficient ". It can be seen from the report that uncertainty is a common problem the world is facing. One of the problems: At the new normal stage of economic development, a series of reforms and adjustments are needed to achieve a smooth transition of the economy to alleviate the downward pressure on the economy, so the government is bound to launch various policy adjustment measures to escort economic development. Looking at the overall status of economic policy implementation in recent years, compared with previous years, the frequency of policy release has increased significantly. While the policy has continued to exert good regulatory effectiveness, the uncertainty of the policy has gradually become the focus of everyone's attention. Plays an important role in the allocation, but China's economic development has always been inseparable from the national macro Control, the adjustment of economic structure and the development of macroeconomics have been affected by government policies. A continuous and stable policy is conducive to all economic actors to better adapt to policy regulations in order to better achieve the initial goals of policy formulation. Frequent policy changes or adjustments can easily trigger speculative behavior by economic actors.

The problem of high uncertainty in economic policy is not unique to China, and the reason for the high degree of uncertainty in China's economic policy is not just the result of internal economic operations. First of all, facing the increasingly complex and arduous world economic and political issues. The uncertainty of internal economic policies in various countries will also fluctuate greatly,

and the uncertainty of global economic policies is not static. Second, the uncertainty of economic policies within each economy is not only affected by the internal operation of the economy It will also be affected by the surrounding countries and the international situation. As the process of globalization continues to accelerate, the interaction between major economies is deepening. With the continuous extension and development of international trade and international cooperation, the economy Development and policy-making are increasingly affected by neighboring countries. After analyzing various quantitative indicators of economic policy uncertainty, this article selects the epu of major economies formulated by scholars at the University of Chicago and Stanford . The index is used as a quantitative indicator for the research in this article. For the research on the correlation between the Chinese epu index and the epu index of other countries. There are 14 countries in the world that have more international exchanges with China and have important influence on the global economy as research objects: including the United States, Britain, Switzerland, Russia, South Korea, Japan, Italy, Hong Kong, China, Sweden, Germany, Ireland, France, Australia, Brazil, and other countries. The above 14 countries include not only Asian countries such as Japan, South Korea, and Russia that are adjacent to China, but also Brazil, Italy, Australia, and other countries that play an important role in international trade. Capitalist countries such as the United States, the United Kingdom, and France that have important economic impacts. In-depth study of the correlation between the uncertainty of China's economic policies and the uncertainty of other countries' economic policies, for a better grasp of the global economic operating situation. The economic environment and a deeper understanding of China's policy direction are of great guiding significance. This research has a very important reality for promoting the sustained, rapid, and healthy development of the Chinese economy, avoiding various policy risks, and safeguarding the development of the national economy, the people's livelihood and the real economy significance.

1. LITERATURE REVIEW

The current research on the uncertainty of China's economic policy mainly focuses on the impact of policy uncertainty on various industries and the relationship between policy uncertainty and the development of other market economies. There is less correlation between national uncertainties. First, in the study of the correlation between economic policy uncertainty and macro-microeconomics, Julio & Yook (2012) used countries with fixed-term tenure as leaders as a sample. Select the target and comprehensively consider the changes in government investment behavior of different countries during the election period, and find that the total investment expenditure of enterprises is significantly reduced by 4.8% in the election year compared with ordinary years (Julio

& Yook, 2012). In addition to the impact on corporate investment, Pastor & Veronesi (2012) The study found that in years with high uncertainty in economic policies, financial risks increased significantly, which led to a reduction in both investment in production and technology (Pastor & Veronesi, 2012). Bhattacharya et al (2017) also found through empirical analysis of multinational panel data that the uncertainty of economic policies significantly hindered the pace of innovation of enterprises, which led to insufficient innovation momentum in the entire country, especially in key innovation industries with high R & D intensity (Bhattacharya, et al, 2017). The effect is more obvious. Ion et al (2016) proposed that the timing, direction, and content of economic policy adjustments will affect the decision-making behavior of various aspects of economic entities, and the increase in policy uncertainty will significantly increase the uncertainty of corporate future profit (Ion, Kang, & Park, 2016). Zhang Qianxiao and Feng Lei (2018) Through empirical analysis, it is found that the rise of the EPU index has threatened the capital chain of enterprises, and credit risk from banks has led to insufficient financial strength to support existing innovation activities, especially private enterprises that are more constrained by capital (Zhang & Feng, 2018).

The second is the research on the correlation between the uncertainty of China's economic policy and the uncertainty of other economies. Wang Zhengxin (2019), using the DCC-GARCH model, analyzes the uncertainty of China's economic policy with the United States, Japan and the United Kingdom (Wang & Yao, 2019). Dynamic spillover effects, found that the correlation with this country is different, in which the correlation with the economic policy uncertainty of the United States is greater than that with Japan and the United Kingdom. Xiao Xiaoyong (2019) is based on the economic policy uncertainty index of each country, Drawing on the correlation measurement framework proposed by Diebold and Yilmaz, the study found that country-specific differences exist in the pairwise orientation of economic policy uncertainty (Xiao, Huang, & Tian, 2019). Geographical and political factors are factors that need to be focused on. At the same time, when major international events occur, The correlation between uncertainties in economic policies has been significantly strengthened.

2. ECONOMIC POLICY UNCERTAINTY INDEX

2.1 Quantitative Indicators of Economic Policy Uncertainty

In the research process of policy uncertainty and its main impacts, scholars measuring the variable of "policy uncertainty" have measured it from the following three angles. The first is the policy of leadership change. Measurement of uncertainty. In capitalist countries such as the United States, the leadership turnover caused by each election is a good measure of policy uncertainty, because not only the fierce election process itself represents the

replacement and retention of leaders in power, personnel There is a lot of uncertainty in going to stay. And the new leader is likely to have different policy preferences and value orientations than the previous leader. Based on the new political background, the uncertainty of the election and the result itself represents a great degree. Policy uncertainty. Hong & Kostovetsky (2012) proposed that leaders of different parties have very different policies. The existence of such differences often becomes a powerful magic weapon for defeating rival parties and becoming "victors" (Hong & Kostovetsky, 2010). In the case of greater dissatisfaction, the existence of such a difference will inevitably lead to policy uncertainty. In the study of China's policy uncertainty measurement, changes in local officials similar to the Western election system mainly come from term systems and remote locations. Communication system.

The second is to measure policy uncertainty based on major events. Because the occurrence of major events and their impacts are highly unpredictable, and often after major events, it is bound to cause turbulence and policy emergency responses, so use The occurrence of major events as a measure of policy uncertainty also has some reasonableness. Kim & Kung (2014) researched the impact of policy uncertainty on corporate investment. If it was affected by asset replacement capabilities, he used the Gulf War and "9.11" incident, which is a destructive asset, as a measure of policy uncertainty (Kim & Kung, 2016). The dangers of the Gulf War and the "9.11" incident and a series of emerging policy responses will not be repeated here, but it is sufficient to see that the occurrence of major events will indeed lead to policy uncertainty.

The third is Baker et al (2016) from Stanford University and the University of Chicago creatively proposed the Economic Policy Uncertainty Index (EPU Index) to measure the uncertainty of the economic policies of the world's major economies (Baker, Bloom, & Davis, 2016) .Baker and other scholars define economic policy uncertainty as the economic risks caused by the uncertainty of the government's future policies. Their research team has constructed the economic uncertainty index of multiple large economies, including the United States, Europe, Japan, Russia, China and other economies.

This article chooses the third type in the research process, that is, the epu index as a substitute indicator of economic policy uncertainty, because the epu index uses information and data in newspapers to determine economic policy uncertainty, which is a method of measuring economic variables. Innovation and development, through a new perspective, the reasonable processing and integration of information in news media publications, the flexible use of advanced information technology analysis methods, and the conversion of information into data that can be quantified and used for empirical research, is highly scientific And advanced. Moreover, the continuity and quantification have superiority that the first two indicators cannot match.

2.2 Descriptive statistics of the epu index of major economies

Under the basic premise of adhering to international trade and opening to the outside world, the promotion of various economic policies is the fundamental driving force for the sustainable development of the country's economy and the rapid progress of science and technology to achieve more long-term development. The promulgation of economic policies itself is to increase social welfare and solve the development process In order to achieve the various economic development goals set by the country, the various economic problems in the new normal state are reduced, but in the process of economic development, due to the effects of various external and local factors, The principles and specific measures of various economic policies to solve economic problems must be changed accordingly. There is not a single causal relationship between changes in economic policies and changes in the external situation and abnormalities in internal operations. For example, when the external environment suddenly emerges Changes or internal operational imbalances lead to changes in economic policies. This is a common transmission mechanism. At the same time, the state or government as the formulator of economic policies, changes in the adjustment goals set by them will also bring changes in economic policies.

Table 1
Descriptive statistics of EPU indices for major economies

	N	MIN	MAX	MEAN	STD	VAR	Skewnes	Kurtosis
CHINAscmp	291	9.07	935.31	153.80	139.90	19570.74	2.46	7.22
US	291	44.78	284.14	115.48	45.78	2095.66	1.16	1.32
England	255	24	558	120.01	68.87	4743.40	2.27	9.80
Swedish	291	53.73	156.73	94.01	19.07	363.77	0.28	-0.14
Russia	291	12.40	421.65	129.04	81.69	6672.49	0.97	0.59
Korean	291	22.43	391.80	116	61.79	3817.73	1.42	3.25
Japan	291	48.57	237.05	107.68	35.47	1257.83	1.35	2.15
Ireland	291	19.99	282.13	107.54	56.94	3241.66	0.59	-0.29
CNHK	252	23	425	126	72.64	5276.39	1.37	2.33
Greece	255	29	344	120	58.82	3460.01	1.18	128
Germany	291	28.43	454.01	125.26	61.82	3821.31	1.52	3.77
Italy	267	32	244	109	38.55	1485.75	0.77	0.57
France	291	11.29	574.63	154.83	101.29	10259.74	1.01	1.00
Brazil	291	12.69	676.96	133.82	90.74	8233.38	2.12	6.73
Australia	255	26	337	99.45	57.57	3314.65	1.52	2.54
CHINAml	291	10.10	438.20	111.52	75.06	5633.92	1.62	2.99

Data source: http: //www.policyuncertainty.com/index.html

Table 1 is the basic indicators of the EPU index of 15 economies, including key indicators such as maximum, minimum, standard deviation, mean, kurtosis, and skewness. The time range of the data is from January 1995 to March 2019. Among them, the United Kingdom, Greece, Hong Kong, China and other regions, due to special reasons, the data start time is later than January 1995, but the overall data volume is not much different. Among them, it is important to note that the economic development policy of the index for China is uncertain. There are two kinds of indexes, the first one is the EPU index developed by Beker and others based on Hong Kong's largest Chinese newspaper, South China Morning Post (SCMP), and the second one is based on scholars such as Steven J. Davis and the Guangming Daily. The EPU index developed by the two Mainland newspapers, People's Daily. In order to verify the robustness of the research conclusions, this article uses two types of Chinese EPU indexes in the empirical analysis. In order to facilitate comparison and differentiation in the study, based on the "South China Morning Post" The abbreviation of "Chinascmp" is based on the "Guangming Daily" and "People's Daily" the abbreviation of the Chinaml index, and this type of abbreviation that needs to be explained here is only applicable to the internal research of this article and is not representative. It can be seen from the table that there is a large gap in key indicators between various economies, but there are some similarities, such as a huge gap between the maximum and minimum values, and each group of data has a large skewness And kurtosis, that is, with peaks and tails, and non-normality. Below we use economic aggregates and special relations with China as indicators to select several special economies and show the basic characteristics by drawing.
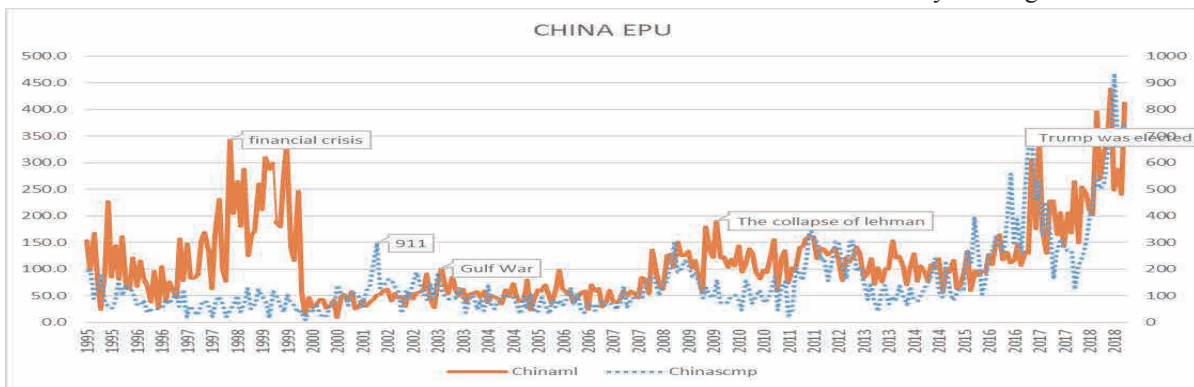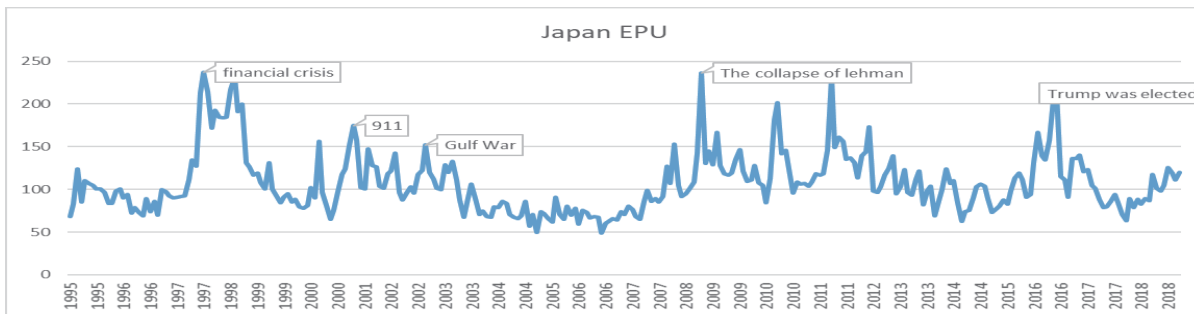

Figure 1
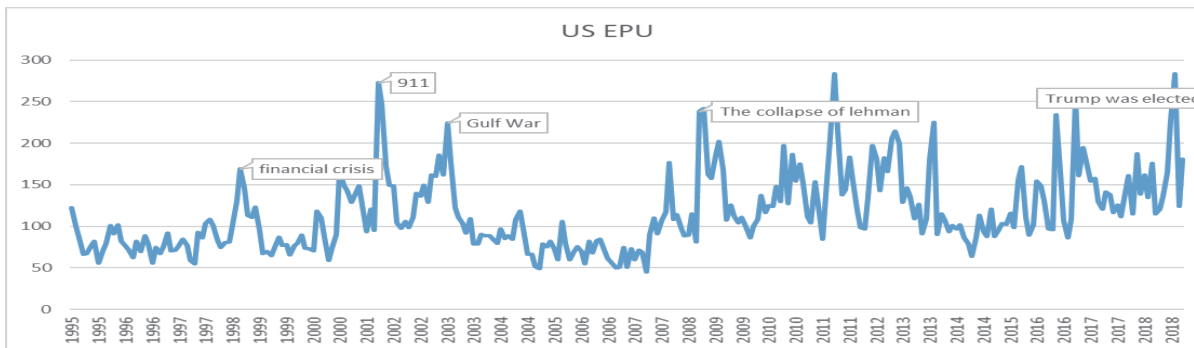**China EPU index**

Figure 2
Japan EPU index

Figure 3
US EPU index

From figure 1-3, it can be seen that the uncertainty of China, Japan, and the United States has been in a non-stationary state with different amplitudes, but at the time of the global event, the epu index of each country reached a high level over the same period. When the global financial crisis of 1992, the events of September 11, 2001, the Second Gulf War in 2001, Lehman Brothers in 2008, and Trump's election as the U.S. President in 2016, these are important global events that occur globally, The epu index of each country has risen significantly, which shows that there is a certain correlation between the major economies, and the following will study the specific correlation index between countries in detail.

3. EMPIRICAL ANALYSIS

3.1 Model Introduction

This article will establish a vector autoregressive model, and use the method of variance decomposition to study the directional and total correlation between the epu indices of various economies.

Compared with the garch model, the main feature of the var model is the application of multivariate time series data to the idea of autoregression. In the var model, all explanatory variables are the lag values of each variable. Incorporate into the equations of other variables to reflect the inherent statistical correlation of the variables. In the directional analysis, the epu index between the two countries is taken as an example to first establish an autoregressive model for the two variables, in the form

$$y_t = f(y_{t-1}, y_{t-2} \ldots \quad y_{t-p}) \tag{1}$$

$$z_t = f(z_{t-1}, z_{t-2} \ldots \quad z_{t-p}) \tag{2}$$

Equations (1) and (2) reflect the relationship between a single variable and its own lag term. The mutual relationship between two variables can be captured by establishing simultaneous equations in the form:

$$y_t = b_{10} - b_{12}z_t + \gamma_{11}y_{t-1} + \gamma_{12}z_{t-1} + \varepsilon_{yt} \tag{3}$$

$$z_t = b_{20} - b_{21}y_t + \gamma_{21}y_{t-1} + \gamma_{22}z_{t-1} + \varepsilon_{zt} \tag{4}$$

Among them, suppose: ① y_t with z_t All are stationary time series data; ② ε_{yt} with ε_{zt} Is the white noise interference term, and the standard deviations are σ_y with σ_z; ③ $\{\sigma_y\}$ with $\{\sigma_z\}$ Is an irrelevant white noise interference term. Due to the volatility of the epu index between countries, this paper has performed logarithmic processing on the data during the research process. y_t

Correct z_t Has a simultaneous effect, and z_t Correct y_t There is also a contemporaneous effect, so it is not an inductive equation, and the equation can be transformed into a more practical way through the application of a matrix:

$$\begin{bmatrix} 1 & b_{12} \\ b_{21} & 1 \end{bmatrix} \begin{bmatrix} y_t \\ z_t \end{bmatrix} = \begin{bmatrix} b_{10} \\ b_{20} \end{bmatrix} + \begin{bmatrix} \gamma_{11} & \gamma_{12} \\ \gamma_{21} & \gamma_{22} \end{bmatrix} \begin{bmatrix} y_{t-1} \\ z_{t-1} \end{bmatrix} + \begin{bmatrix} \varepsilon_{yt} \\ \varepsilon_{zt} \end{bmatrix} \tag{5}$$

or,

$$Bx_t = \Gamma_0 + \Gamma_1 x_{t-1} + \varepsilon_t \tag{6}$$

among them,

$$B = \begin{bmatrix} 1 & b_{12} \\ b_{21} & 1 \end{bmatrix}, x_t = \begin{bmatrix} y_t \\ z_t \end{bmatrix}, \Gamma_0 = \begin{bmatrix} b_{10} \\ b_{20} \end{bmatrix}, \Gamma_1 = \begin{bmatrix} \gamma_{11} & \gamma_{12} \\ \gamma_{21} & \gamma_{22} \end{bmatrix}, \varepsilon_t = \begin{bmatrix} \varepsilon_{yt} \\ \varepsilon_{zt} \end{bmatrix}$$

(7)

use B^{-1} Multiply left by the equation to get the standard form of vector autoregressive var

$$x_t = A_0 + A_1 x_{t-1} + e_t \tag{8}$$

among them,

$$A_0 = B^{-1}\Gamma_0, A_1 = B^{-1}\Gamma_1, e_t = B^{-1}\varepsilon_t \tag{9}$$

For the convenience of marking we will a_{10} defined as A_0 Element i, a_{ij} For matrix A_1 Element in row i and column j, e_{ij} For vector e_t Element i can be represented by the following formula through the above notation:

$$y_t = a_{10} + a_{11}y_{t-1} + a_{12}z_{t-1} + e_{1t} \tag{10}$$

$$z_t = a_{20} + a_{21}y_{t-1} + a_{22}z_{t-1} + e_{2t} \tag{11}$$

Need to pay attention to the error term here e_{1t} versus e_{2t} Yes y_t versus z_t Two shocks in the sequence ε_{yt} versus ε_{zt} Synthetic because $e_t = B^{-1}\varepsilon_t$, e_{1t} versus e_{2t} It can be written as:

$$e_{1t} = (\varepsilon_{yt} - b_{12}\varepsilon_{zt})/(1 - b_{12}b_{21}) \tag{12}$$

$$e_{2t} = (\varepsilon_{zt} - b_{21}\varepsilon_{yt})/(1 - b_{12}b_{21}) \tag{13}$$

because ε_{yt} versus ε_{zt} Obey the white noise process,

so e_{1t} versus e_{2t} The mean is 0, the variance is constant and independent and uncorrelated.

e_{1t} The variance is:

$$Ee_{1t}^2 = E[(\varepsilon_{yt} - b_{12}\varepsilon_{zt})/(1 - b_{12}b_{21})]^2 = (\sigma_y^2 + b_{12}^2\sigma_z^2)/(1 - b_{12}b_{21})^2$$

(14)

because e_{1t} The variance is independent in time, so e_{1t}

versus e_{1t-i} The autocovariance of is:

$$Ee_{1t}e_{1t-i} = E[(\varepsilon_{yt} - b_{12}\varepsilon_{zt})(\varepsilon_{yt-i} - b_{12}\varepsilon_{zt-i})]/(1 - b_{12}b_{21})^2 = 0 \quad \text{当} i \neq 0$$

(15)

4.2 Empirical results

The correlation between the economic policy uncertainty index of each country is solved by the variance decomposition between the two indicators. The specific empirical results are shown in the following table:

Table 2
Directional correlation and overall correlation between countries' EPU indices

	China	US	England	Swedish	Russia	Korean	Japan	Ireland	HK	Greece	Germany News Index	Italy News Index	France News Index	Brazil	Australia	Influenced by other countries
Chinascmp	84.4	0.8	2.5	6.2	1	0.1	1.1	0.3	0.1	0.4	0.1	0.4	0.1	0.4	1.9	15.4
US	19.6	64.4	2.6	2.6	1.3	0.2	1.5	0.4	1.1	1.3	0.6	0.9	0	1.1	2.3	35.5
England	20.6	8.9	58	5	0.6	0.4	2	1.3	0.5	0.2	0	0.2	0.3	0.2	1.6	41.8
Swedish	6.2	14.3	5.5	65.5	2	0	0	2.1	0.2	1.2	0	1.2	1.3	0.2	0.1	34.3
Russia	8.8	0.7	3	11.6	67.7	0.3	1.2	2	1.3	0	0.5	1.3	1.2	0.1	0.3	32.3
Korean	23.3	18.3	5.5	1.5	0.5	44.2	0.2	0.6	0.6	1	0	2.3	0.1	0.9	1	55.8
Japan	7.6	17.8	8.9	5.9	3.3	2.3	52.3	0.6	0.2	0.4	0	0.1	0.1	0.2	0.4	47.8
Ireland	5.7	6.4	15.9	2.3	1.5	0.8	0.2	55.6	1.1	0.3	0	0.5	6.8	1.4	1.2	44.1
HK	8.3	5.1	2.4	9.2	3.1	5.4	0.5	0.8	57.5	0.2	0.9	1.9	2.5	1.6	0.5	42.4
Greece	3.8	8.1	5.7	4.8	1	4.1	0.2	1.1	0.3	65.6	0.1	2.9	1.5	0.3	0.3	34.2
Germany	20.3	18.2	12.7	10.2	0.9	1.3	1.4	0.9	0.6	1.5	29.7	0.7	0.5	0.2	0.8	70.2
Italy	3.9	17.5	1.8	2.4	0.5	0.5	2.9	0.6	0.1	2.1	0.9	60.8	0.4	2.8	2.8	39.2
France_	17	13.2	9.9	8	6.4	4.1	0.2	2.1	2.6	0.7	2	3.7	29.2	0.5	0.3	70.7
Brazil	10.6	1.3	5.5	6	2.9	6.3	0.7	0.5	2.4	4.5	0.3	1.3	1.1	50.4	6.3	49.7
Australia	5.2	26.8	13	4.6	0.6	1.6	10.2	1.2	0.7	1.7	0.4	2.1	0.5	2	29.4	70.6
Impact on other countries	160.9	157.4	94.9	80.3	25.6	27.4	22.3	14.5	11.8	15.5	5.8	19.5	16.4	11.9	19.8	45.6
Net overflow	-145.5	-121.9	-53.1	-46.0	6.7	28.4	25.5	29.6	30.6	18.7	28.4	50.7	22.8	58.8	29.9	

Through Table 2, we draw three important conclusions. The first is that the economic policy uncertainty index of each country is not completely independent, and is more or less affected by the epu index of other countries. China's independent decision share The highest was 84.4%, followed by Sweden and the United States. France's economic policy uncertainty index had the lowest autonomy at 29.2%. Second was Australia and Brazil. The second conclusion was the impact of China and the United States on the epu index of other countries The largest are 160 and 157, respectively, Hong Kong and Germany have the least impact on other countries' epu indices, 11 and 5. The epu indices of France and Germany are most affected by other countries, 70.7 and 70.2, and China and Russia are affected by other countries. The least impact is 15.4 and 32.3. The third conclusion is that China's epu index has a greater impact on the epu index of the United Kingdom, South Korea, and Germany, which are 20.6, 23.3, and 20.3. The Chinese economic policy uncertainty index is affected by the United Kingdom, Sweden and Australia has the largest impact with 2.5, 6.2 and 1.9 respectively.

CONCLUSION

This article selects the epu index published on the website of economic policy uncertainty as a quantitative indicator of economic policy uncertainty in various countries. Compared with other indicators, this indicator has strong continuity and comparability. From 1995 to 2019, When analyzing the monthly epu index, it was found that the epu index of each country has varying degrees of volatility and non-normal distribution, and all have certain national characteristics. However, in the years when major historical events occurred, the epu index was obvious. Rising trend. Through the variance decomposition in the var model, when analyzing the directional and total correlations of the epu index in different countries, it was found that the economic policy uncertainty index in each region was more or less affected by other regions. Targeted at China Compared with other countries, its epu index is relatively autonomous and less affected by other regions, but it is not completely independent.

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