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Assessment of global equity

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Abstract: In today's world, global justice has become the aspirational goal of people all over the world. With limited resources, how to achieve global equity has always been a problem. This paper mainly studies what global fairness is, and gives a definition of global fairness. Based on the recognized indicator data of cities around the world, the main factors of fairness indicators are determined by means of official data and the TOPSIS method, and a global indicator based on each indicator is established. Equity model, and on the basis of this model, summarizes the impact of some factors on global equity.

1. Introduction

Many countries in the world have signed UN agreements and pursue global equity, which has brought benefits to many countries. Therefore, global equity is indispensable in the international community. Global equity is mainly reflected in four aspects, which include many indicators, so they can clearly evaluate global equity. In today's world, global equity has been assessed and defined. Among them, the goal of the United Nations is to maintain global equity and reduce inequality. However, with people's growing desire for equity, will this kind of international commitment to equity still exist? If we consider asteroid mining, we don't know many problems, such as technical feasibility, mining cost and profit margin, whether the mined ore can be brought back to the earth and so on. However, in order to solve these problems, it is assumed that mining can be carried out in a certain period of time, can also be brought back to the earth, and has the characteristics of low cost and high return. So what impact will asteroid mining have on global equity? What are the main influencing factors? What policies can the United Nations adopt to increase global equity?

By consulting the relevant literature on the factors affecting global equity, we can understand the main impact of the four dimensions on global equity, namely, economic dimension, social dimension, resource and environment dimension. Through previous studies, we know that there are nine important indicators under the three dimensions. Through the careful analysis of the nine indicators, we establish the definition of World Equity Based on three dimensions. With the establishment of three-dimensional degree, we can consult the national data of nine indicators respectively, calculate the weight of each indicator by entropy weight method, and then analyze the national data by TOPSIS method, so as to calculate the score of each country [1].

The future of asteroid mining will be vigorously promoted in the world, and will eventually have an important impact on the global economy and become an important

resource. Each country will have different investment costs for asteroid mining. The final profit is closely related to the investment cost, and the resulting income is in a multiplier relationship with the investment cost. At the same time, the world will define the power of mining by the power of science and technology and the consumption of minerals. Many countries will invest a lot of assets in the research of science and technology. In this way, scientific and technological factors become an important power of mining and highlight the mining power of a country. The rational distribution of minerals will not have a great impact on global equity, but also conform to the basic norms of global equity. Through consulting the data, we know the main factors affecting mineral distribution, and determine the weight of each factor on mineral distribution through the coefficient of variation method, so as to distribute minerals according to the weight of different countries in each factor.

2. Establishment and solution of model

2.1. Establishment of a model for measuring global equity

Global fairness refers to the mutual cooperation between different countries in society, economy, resources, environment and technology, reducing unfair treatment and contradictions, and achieving the mutual exchange of society, the mutual cooperation of economy, the rational distribution of resources and environment, and the common use of science and technology, so as to achieve the goal of global fairness. In the case of limited resources, according to the different levels displayed by different countries, the limited resources are allocated according to the scores of different countries to achieve fairness, rather than the equal allocation of resources to determine fairness [2].

According to the close connection between global equity and social, economic, resource and environmental and technological development, as well as the desire of different countries for global equity, and based on time as an important basis, this paper constructs an indicator model for measuring global equity from four dimensions. The specific indicators are shown in the table 1.

Table 1 The specific indicators

Target	Dimension	Guidelines	Indicator layer	Indicator code
Global Equity	Economic dimension	Import level	Import of ores and metals	1
		Tax	Tax	2
		Economic rent	Mineral rent	3
	Social dimension	Educate	Years of primary education	4
		Law	Strength of legal rights index	5
		Employment	Long-term Unemployment	6
		Population	Population Density	7
	Resource	Mineral Depletion	Mineral Resource Depletion Current USD	8
		Energy	Energy use per unit of GDP	9

Due to the serious objectivity of the AHP method, this paper uses the entropy weight method to determine the weight. The formula is as follows:

$$x_{ij} = 0.998\frac{x_{ij}-min\{x_{1j},\ldots,x_{nj}\}}{max\{x_{1j},\ldots,x_{nj}\}-min\{x_{1j},\ldots,x_{nj}\}} + 0.002 \quad (1)$$

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After the data is normalized, we need to calculate the indicator weights. The formula is as follows:

$$p_{ij} = \frac{x_{ij}}{\sum_{i=1}^{n} x_{ij}} \ (j = 1,2,\ldots,m) \quad (3)$$

where p_{ij} is the proportion of the indicator value of the i-th country under the j-th indicator.

The formula for calculating the information entropy value is as follows:

$$e_j = -k\sum_{i=1}^{9} p_{ij} lnp_{ij} \quad (4)$$

$$\mathrm{k} = \frac{1}{\ln(n)} \quad (5)$$

where e_j is the information entropy value of the j-th index.

Calculating the entropy redundancy:

$$g_i = 1 - e_j \quad (6)$$

where g_i is the redundancy of the i-th index.

Calculating distance weights:

$$w_j = \frac{g_j}{\sum_{j=1}^{n} g_j} \quad (7)$$

After the data has been processed forward, the data still has its own dimension. In order to eliminate the influence of the dimension of the index data, the data should be standardized. The way to normalize the data is as follows:

$$z_{ij} = \frac{x_j}{\sqrt{\sum_{i=1}^{n} x_{ij}^2}} \quad (8)$$

The distance weight calculates the generalized distance of each index from the ideal optimal solution and the ideal worst solution, where the relative proximity calculation formula to the ideal optimal solution is as follows:

$$D_i^+ = \sqrt{\sum_{j=1}^{9}\left(z_j^+ - z_{ij}\right)^2} \quad (9)$$

The formula for calculating the relative closeness to the ideal worst solution is as follows:

$$D_i^- = \sqrt{\sum_{j=1}^{9}\left(z_j^- - z_{ij}\right)^2} \quad (10)$$

The final score is:

$$S_i = \frac{D_i^-}{D_i^+ + D_i^-} \quad (11)$$

Summary of the total scores for the different countries is shown in table 2 and Fig.1.

Table 2 Total scores

Country \ Day	2015	Rank	2016	Rank	2017	Rank	2018	Rank	2019	Rank
ZMB	0.7	2	0.8	1	0.63	2	0.55	2	0.84	1
AUS	0.82	1	0.75	2	0.81	1	0.82	1	0.68	2
RUS	0.41	5	0.5	4	0.38	5	0.35	8	0.57	3
BRA	0.42	4	0.47	5	0.38	7	0.36	5	0.47	4
ZAF	0.46	3	0.51	3	0.4	4	0.38	4	0.46	5
CAN	0.4	7	0.47	6	0.4	3	0.39	3	0.45	6
MMR	0.41	6	0.45	7	0.38	6	0.36	6	0.44	7
USA	0.4	8	0.44	8	0.37	8	0.35	7	0.43	8
CHN	0.34	10	0.38	9	0.32	9	0.32	9	0.39	9
ESP	0.34	9	0.37	11	0.31	11	0.29	11	0.36	10
GBR	0.33	11	0.38	10	0.32	10	0.3	10	0.36	11
ITA	0.31	12	0.36	12	0.3	12	0.29	12	0.35	12
JPN	0.28	13	0.33	13	0.28	13	0.27	13	0.32	13
IND	0.25	14	0.29	14	0.26	14	0.24	14	0.32	14
KOR	0.24	15	0.27	15	0.25	15	0.24	15	0.27	15

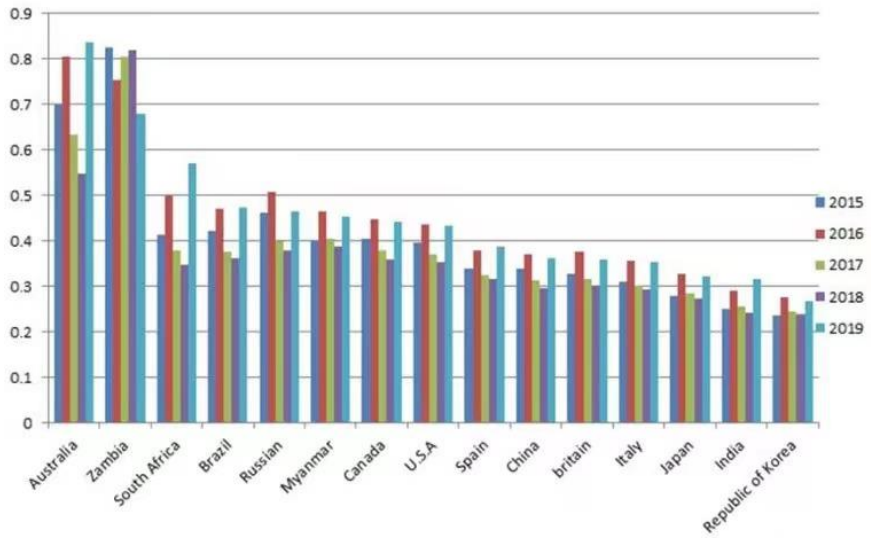


Figure 1 Histogram of total scores

As can be seen from the Fig.1, resources can be allocated according to the ranking and score in the table 2. Countries with high scores need more resources accordingly, so that more mineral resources can be obtained in the global distribution of mineral interests. Such an allocation method. It avoids the unfair results brought about by the equal distribution, so as to realize the relative fairness of resource distribution and promote global fairness.

2.2. Future of asteroid mining and Its impact on global equity

The following paper mainly studies how to rationally allocate the mineral resources mined by asteroids, so as to study the impact of mining of asteroid minerals on global equity [3]. By analyzing the relevant data of each factor and using SPSS bivariate correlation method, the correlation between each factor is determined as shown in table 3.

Table 3 Picardson coefficient

index	Ore import	Depletion of mineral resources	Energy use per unit of GDP	Science and Technology Journal Articles
Ore import	1	0.412	-0.196	0.463
Depletion of mineral resources	0.412	1	-0.301	0.445
Energy use per unit of GDP	-0.196	-0.301	1	-0.163
Science and Technology Journal Articles	0.463	0.445	-0.163	1

By collecting the data of major factors in several years, we need to assign weight to these major factors, and the specific weight algorithm is as follows. The formula for calculating the coefficient of variation of the defined index:

$$v_i = \frac{\sigma_i}{\bar{x_i}} \tag{12}$$

$$W_i = \frac{v_i}{\sum_{i=1}^{n} v_i} \tag{13}$$

The distribution formula is calculated as follows:

$$\rho = \mathrm{E} * (w_1 / w_2) \tag{14}$$

The model successfully illustrates the impact of technological factors on asteroid mining, as well as the impact on global equity. It can be seen from the calculation results of the above model that science and technology factors play a leading role, and it is proved that the main factors of asteroid mining in the future are science and technology factors [4]. Whichever country has high technology level, the country will have corresponding allocation of rich mineral resources, thus accelerating the global development and opening the market of mineral resources. Countries all over the world attach importance to the development of education, set up universities, a large number of scientific research funds are invested in the research of scientific and technological products.

To sum up, the impact of asteroid mining on global equity needs to be measured by a scheme. The formulation of a good distribution scheme can not only promote the realization of global equity, but also promote the development of the whole world. Without good distribution policies, the world will be competitive. This will have an impact on global equity, even if no country observes global equity, leading to global disaster.

3. Sector changes related to asteroid mining and its impact on global equity

When the number of these factors changes, it has an impact on asteroid mining, which in turn has an impact on our global economy because of the large market and the large amount of economic transactions. So changes in these factors are bound to have an important impact on global stock prices [5]. How and to what extent these factors affect global stocks is an important issue in this paper.

By collecting the data of the change of relevant factors in recent years, this paper analyzes the

statistical relationship between factors and stocks by regression analysis method, and the regression model is established as follows:

$$S = \theta_1 + \theta_2 X + \epsilon \tag{15}$$

where S, θ_1, θ_2, X is the value of the closing price of the stock price, the regression coefficient, year, the constant term, and is the error term which represents the variability of the data.

In the actual calculation, we analyze the collected data to estimate, and get the values of A and B, the regression equation is established as follows:

$$S' = \theta_1' + \theta_2' X \tag{16}$$

Then we use the principle of least square method to obtain the values of and by using the known data to calculate the sum of the squares of the smallest deviations between the estimated value and the observed value.

$$\mathrm{P} = \min \sum (\mathrm{S} - S')^2 \tag{17}$$

The θ_2' indicator is calculated as:

$$\theta_2' = \frac{\sum (x_i - \bar{x})(s_i - \bar{s})}{\sum (x_i - \bar{x})^2} \tag{18}$$

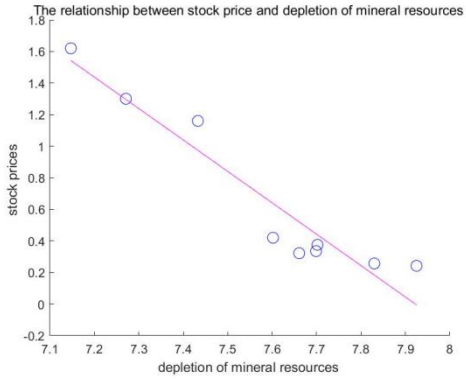
$$\theta_1' = \bar{S} - \theta_1' \bar{X} \tag{19}$$

We judge the correlation by solving the linear coefficient. If the linear coefficient is not 0, it is considered that there is a linear relationship, where positive and negative represent positive and negative correlation. In this paper, the regression analysis of the above main factors is carried out through the model, and the linear coefficient is finally obtained. At the same time, the sum of data R^2 is also obtained through linear regression, as shown in the following table 4.

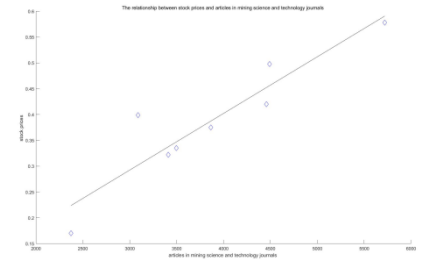
Table 4 Results of linear regression

Indicator factors	θ_1'	θ_2'	F	R^2
Loss of bankruptcy resources	1.9732	-4.7363	66.7646	0.9051
Science and technology journal article	-0.0365	1.0968	33.6201	0.8486
Ore imports	4.6883	-0.9195	22.108	0.7107
GDP specific loss	15.7638	-1.9898	68.9848	0.9079

The results of the relationship between stock price and various indicators is shown in Fig.2.



(a)



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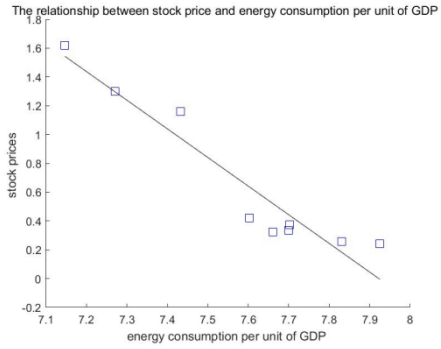

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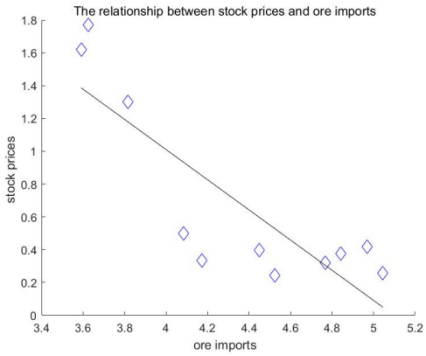

(d)

Figure 2 The relationship between stock price and various indicators

It is learned that the relationship between stock price and scientific research journal is positively related, that is to say, the number of scientific research journals and the global mineral stock price are the increase of global mineral stock price, so as to strengthen the economic transaction and circulation, so as to maximize economic benefits. The loss of mineral resources is negatively correlated with the stock price, and the negative correlation coefficient is the largest [6]. The remaining two factors are also negatively correlated, so the impact on the global mineral stock price is negative. Therefore, we should reduce these three factors.

To sum up, in order to better realize global equity, countries all over the world should strive to improve education levels, build top universities, invest heavily in research funds and increase the enthusiasm of publishing research papers [7]. At the same time, mining technology should be improved, reduce the loss and export of ore, and relevant regulations should be formulated to stabilize the development of local economy and reduce the loss of GDP.

4. Conclusion

This paper mainly studies the definition of global fairness and the factors that affect global

fairness, and predicts the future development of asteroid mining and the global development of asteroid mining, and builds a model to measure global fairness, allowing us to understand the development of globalization. The current situation has made us realize that the world should improve the level of science and technology and vigorously develop education. At present, many problems in the world are unfair, but the problems of our human beings continue to exist.

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