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All for One and One (Space) for All!

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Abstract: Global equity is the common pursuit of most people all over the world. Although fairness is not absolute, we should try our best to achieve global fairness in resource allocation and opportunity supply. But it's hard to make the distribution of the resources and development opportunities fair enough with the limited resources on the earth. With the depletion of the earth's resources, more and more people realize that the earth's resources are not enough for people to use permanently, so scientists have created a great idea of asteroid mining. With the limitation of technology and the economy, there is still a long way to go. After solving the problems above, it's still hard to achieve global equity while allocating mineral resources. Aiming at rationalizing the allocation of resources mined on the asteroids, we try to establish a global equity model. At the same time, we will also study the feasibility and vision of asteroid mining. The impact of variability and volatility factors on the model will be analyzed.

1. Introduction

1.1. Background

The United Nations aims to promote global peace and reduce inequality. This requires reducing extreme poverty caused by the existing global economic order and narrowing the gap between rich and poor between developed countries and developing countries in order to achieve global equity. But the depletion of the earth's resources is not enough to make global equity, so we try to explore the space for resources.

We have tried a lot to explore the space. As the basis of international space law, the outer space treaty provides the legal basis for promoting transnational projects into space, such as the international space station and the use of satellites to browse the Internet in the most remote areas. Nowadays, we design to do asteroid mining to get resources. In 1996, it was estimated that the cost of an asteroid mining activity was $100 billion. With the progress of robots and material technology, the cost has been greatly reduced. By 2012, this figure has dropped to $2.6 billion. According to NASA's valuation, if the asteroid 16 psyche is successfully mined, everyone on earth can get an average of $93 billion.

Therefore, we need to do asteroid mining to realize global equity. In other words, we should get resources from asteroids and keep global equity at the same time.

1.2. Problem Statement and Analysis

Asteroid mining needs to provide cutting-edge technology and high cost, and even risk failure. Obviously, not all countries have the ability to seek resources in outer space. However, adhering to the concept of the Outer Space Treaty of 1967, all mankind can share the achievements of asteroid mining. Therefore, it is an important challenge for all countries in the world to enjoy the resource dividend without harming the national interests of mining.

First, global equity should be defined. Besides, we need to find out how might asteroid mining impact global equity. Then, we find out how the conditions of asteroid mining change and how changes in the asteroid mining sector could impact global equity differently. We will predict variable factors affecting asteroid mining. Next, we need to use the results of our analyses to make justified policy recommendations so that asteroid mining might truly benefit all humankind. From the perspective of global equity, we will create new and sensible policies.

For better arranging our process of presenting the solution, we draw the flowchart of our work shown in Figure 1.

Figure 1. The Flowchart of Our Work

2. Notations

Here, we list the symbols and their definitions used in the paper, as shown in Table1.

Table 1. The Description of Symbols

Symbol	Description
EWM	Entropy weight method
X_c	The level of equity
W_1	The weight of the population
W_2	The Weight of natural resources depletion (% of GNI)
W_3	The Weight of GDP (Millions)
W_4	The Weight of proportion of the population with doctor's degree or above (%)
P_c	The Normalized value of the population of the country
N_c	The Normalized value of natural resources depletion of the country
G_c	The Normalized value of GDP of the country
E_c	The Normalized value of the proportion of population with doctor's degree or above of the country
GM	Grey Model

3. Data Pre-processing

Sufficient data is the most fundamental step for designing the Global Equity Model. We will collect data on the population (The population data of representative countries are from https://www.phb123.com/city/renkou/rk_6.html. And the population proportion data with doctor's degree or above are collected from World Bank Educational attainment, https://data.worldbank.org/indicator/SE.TER.CUAT.DO.ZS?end=2020&name_desc=false&start=2001&view=chart.,) economic reality (The data of GDP in some representative countries are retrieved from World Bank 2020 All Countries and Economies, https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?name_desc=false.) , natural resources (The data of natural resources depletion (% of GNI) are from World Bank Adjusted savings.

4World Bank Educational attainment, Doctoral or equivalent, population 25+, total (%) (cumulative): https://data.worldbank.org/indicator/SE.TER.CUAT.DO.ZS?end=2020&name_desc=false&start=2001&view=chart.), and education level4 in some countries around the world. We collect required data for eight countries all around the world from developed countries like the United States to developing countries like China, and among all continents like India in Asia, Mexico in North America, Brazil in South America, Denmark in Europe, Egypt in Africa and Australia in Oceania, etc.

Some data needs to be estimated. We have principles as follows.

(1) The latter digit of all numerical accuracy is rounded up.

(2) For population, GDP, education level of each country are changing all the time, we use the values of the in the last three years as representative values.

4. Definition and Relevant Factors of Global Equity

According to the definition of global equity, we will set up the global equity model to reflect global equity. We will use EWM to calculate the weight of each factor. Then we will validate the model in the view of history and region.

4.1. Definition of Global Equity

Global equity refers to the demand to reduce absolute poverty and narrow the gap between the rich and the poor between developed and developing countries caused by the existing global economic order. In the case of limited earth resources, if asteroid mining is to be carried out, factors such as the population, economic conditions, and mineral resources in the geographical location of each country need to be considered. The more the population is, the more resources the country needs. The better the economic situation is, and the richer the mineral resources in the geographical location are, the fewer resources the country needs.

4.2. Relevant Factors

4.2.1. Location and Mineral Resources

The minerals are generally divided into energy minerals (or fuel minerals) and non-energy mineral resources. Energy minerals refer to oil, natural gas, coal, uranium, etc. Non-energy mineral resources are divided into ferrous metal mineral resources (or iron, ferroalloy metal) resources, which refer to iron, radium, zinc, etc. According to the physical, chemical, value, and distribution in the earth's crust, non-ferrous metal mineral (or non-ferrous metal) resources are divided into five categories, namely heavy, light, precious, semi-metal, and rare metal. There are also non-metallic minerals, in which potassium salt, phosphorus, and sulfur are called agricultural mineral resources.

The general distribution characteristics of the world's non-energy mineral resources are very uneven, mainly concentrated in a few countries and regions. This is closely related to the geological structure, metallogenic conditions, and economic and technological development capacity of various countries and regions. The countries with the most abundant mineral resources are the United States, China, Russia, Canada, Australia, South Africa, etc.

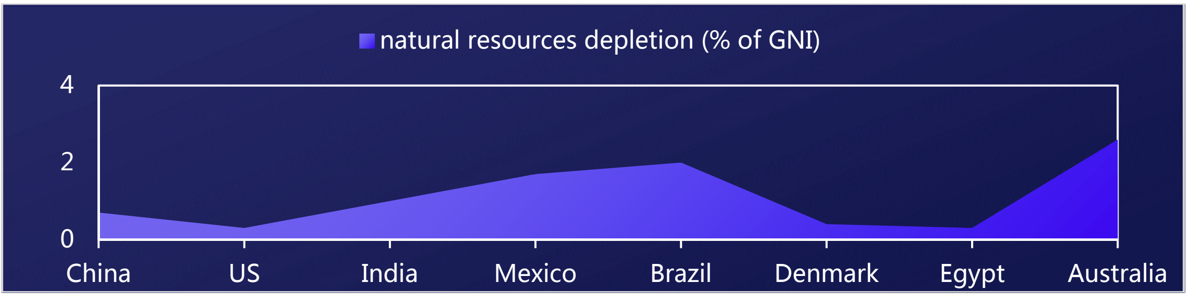


Figure 2. Natural Resources Depletion (% of GNI)

The mineral resources owned by a country are certainly important, but the country's resources consumption is more important.

The more resources a country consumes, the more mineral resources it needs.

In order to better reflect the degree of resource demand, we use the depletion of the natural resources (% of GNI) shown in Figure 2, which is more comprehensive and all-round including mineral resources.

4.2.2. World Population Distribution

The geographical distribution of world population is the geographical distribution of population in various regions of the world within a certain period of time. The geographical distribution of the world's population is the result of thousands of years of long-term evolution and the comprehensive effect of various complex natural, social, economic, political, and other factors. Overall, the world population distribution is unbalanced, which is reflected in:

(1) The population is concentrated in areas with superior natural environmental conditions.

(2) The population is concentrated in urban areas. After the industrial revolution, the urbanization of all countries in the world increased the proportion of the urban population and developed faster in the 1950s. The total area of all urban residents in the world is only 5.0 × 105 square kilometers, accounting for 0.4% of the earth's land area, but it concentrates 40% of the world's total population, while the vast rural population distribution is relatively small.

(3) The trend of concentration to the coast is obvious. The population of all continents in the world has an obvious tendency to concentrate on the coast. For example, the Pacific coast and the Atlantic coast are the world population concentration areas, which are mainly affected by the trend of the world productivity distribution pointing to the coast.

(4) The population is concentrated in low and flat areas. A large number of people in the world are mainly concentrated in places below 200 meters above sea level. Most of them are plains and hills. The terrain is low and flat, the land utilization rate is high, the load is large, and the population is often concentrated.

Table 2. The Population of Representative Countries

Country	Population	Country	Population
China	1,411,780,000	**Brazil**	210,867,954
US	326,766,748	**Denmark**	5,754,356
India	1,354,051,854	**Egypt**	99,375,741
Mexico	130,759,074	**Australia**	24,772,247

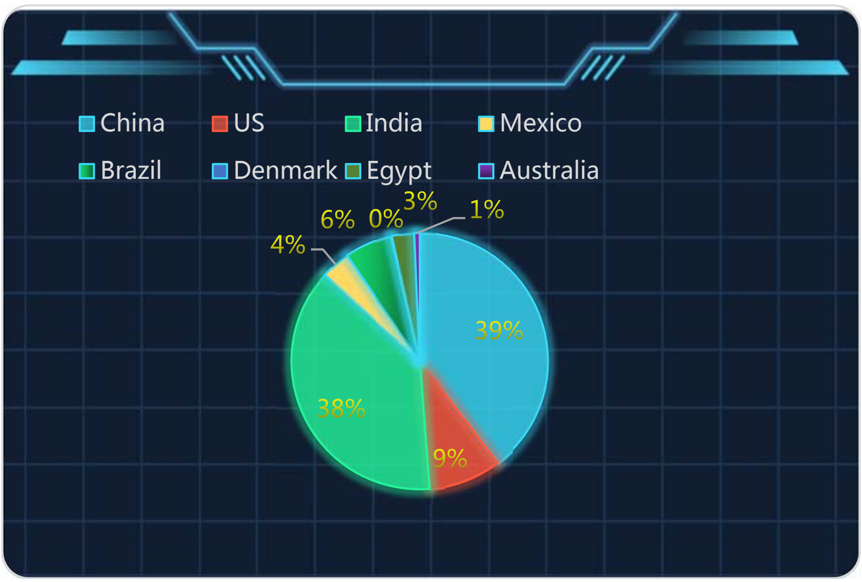


Figure 3. The Pie Chart and Form of The Population of Representative Countries

4.2.3. Economy Development

Differences in the current economic situation of countries around the world are an important manifestation of global inequity. In order to simplify the measurement of the economic status of each country, we take GDP as the primary indicator.

GDP (gross domestic product) is the final result of the production activities of all permanent residents of a country (or region) in a certain period of time. GDP is not only the core indicator of national economic accounting but also an important indicator to measure the economic situation and development level of a country or region. We collected the GDP of representative countries shown in Figure 4.

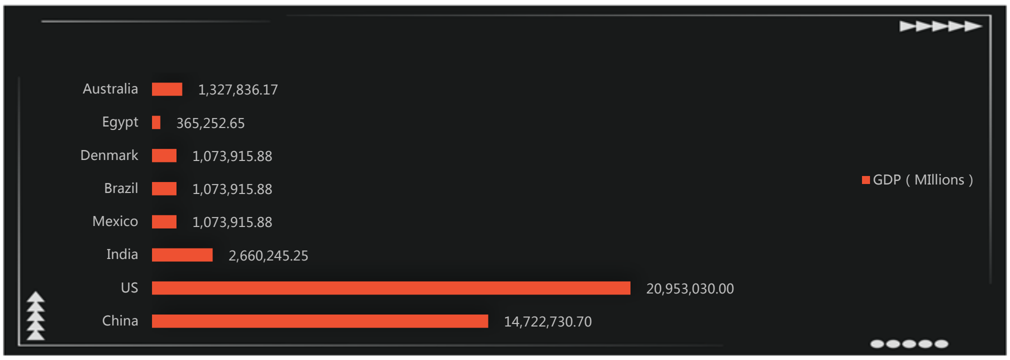


Figure 4. The Bar Graph of GDP of Representative Countries

4.2.4. People's Education Level

Modern education is a systematic project with a long cycle. The investment in education can reflect the state's attention to education. The level of education reflects the quality of a country's population. Education level is the result of education investment.

There are many factors that can reflect the educational level of a country. For example, the gross enrollment rate of colleges and universities, the number of highly recognized awards such as the Nobel Prize, and the national literacy rate.

To realize asteroid mining, most researchers are highly educated Here we chose to use the proportion of the population with a doctor's degree or above (%) to reflect a country's education level which is shown in Figure 5.

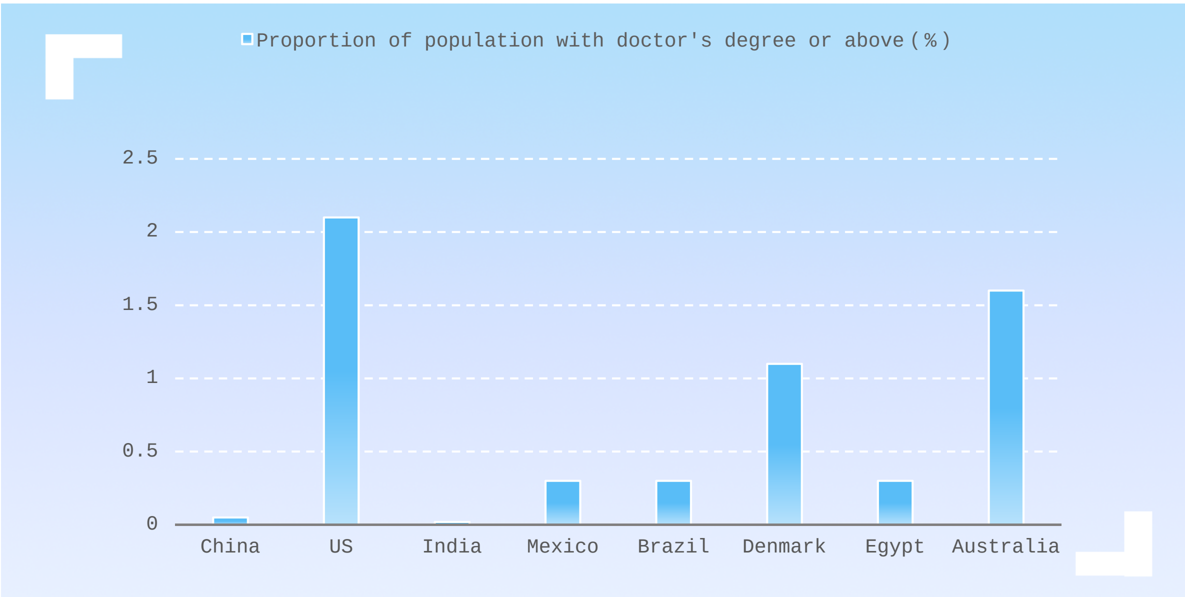


Figure 5. Education Level of representative countries

4.3. Weights of indicators

4.3.1. Entropy Weight Method (EWM)

EWM is according to the definition of information entropy, for an index, the entropy value can be used to judge the dispersion degree of an index. The smaller the information entropy value is, the greater the dispersion degree of the index is, the greater the impact (i.e. weight) of the index on the comprehensive evaluation. If the values of an index are all equal, the index will not play a role in the comprehensive evaluation. Therefore, information entropy can be used to calculate the weight of each index, so as to provide basis for multi-index comprehensive evaluation. The calculation process is as follows：

Step1 Data normalization

$$z_{ij} = \frac{x_{ij}}{\sqrt{\sum_{i=1}^{n} x_{ij}^2}}$$

Step2 Calculate the proportion of the sample of the index:

$$e_j = \frac{1}{\ln n} \sum_{i=1}^{n} p_{ij} \ln\left(p_{ij}\right), \quad j = 1, 2, \cdots, m$$

Step3 Get the entropy weight of each index according to the following formula

$$W_j = \frac{1-e_j}{m-\sum_{j=1}^{m} e_j}$$

Step4 Calculate the sample's score

$$score_i = \sum_{j=1}^{m} x_{ij} w_j$$

Subsequently, the weights of four comprehensive evaluation indicators can be calculated by the entropy weight method: mineral resources, population, GDP, and people's education level.

4.3.2. The Weight of Each Indicator

By using Python, we got the results in Table 3.

Table 3. The Result of EWM

EWM			
Term	Information entropy	Information utility value	Weight
Population	0.655	0.345	26.16%
Natural resources depletion (% of GNI)	0.73	0.27	20.49%
GDP (Millions)	0.566	0.434	32.91%
Proportion of population with doctor's degree or above (%)	0.731	0.269	20.44%

4.4. Design Global Equity Model

According to the results of EWM, we decided to set up a global Equity Model for fairer, better, and more sensible distribution of asteroid mining.

$$X_C = W_1 P_C + W_2 N_C + W_3 G_C + W_4 E_C$$

By comparing the differences between the values of X_c, we can have a better understanding of global equity. The higher the value is, the more mineral resources from asteroids mining the country needs, so they will be given more space and higher frequency to do the asteroid mining. Similarly, the lower the value is, the fewer mineral resources the country needs, so they will be given less space and lower frequency to do the asteroid mining.

4.5. Verification The Model

We need to design a model that is feasible and stable.

By analyzing the data and using EWM, it is feasible and sensible as is shown in Figure 6.

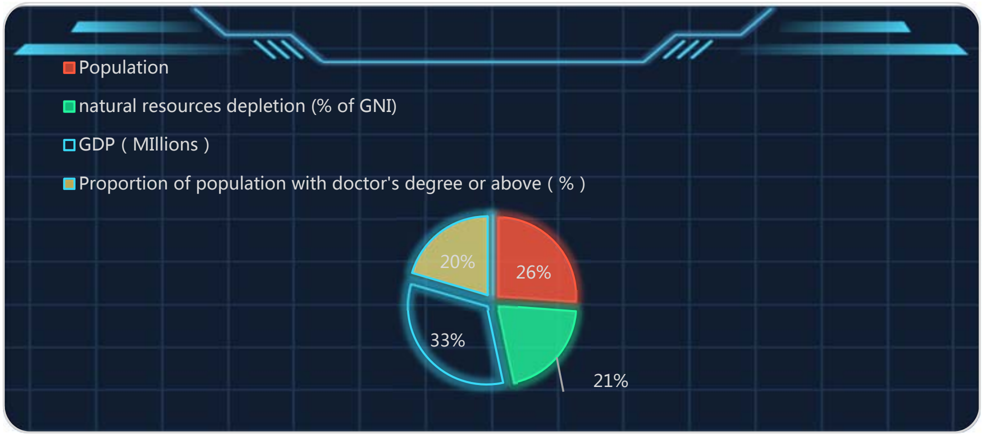


Figure 6. Weight of Every Factor

From the development process of various countries in the world, whether a country can seize the opportunity and accelerate development is the key to whether a country can win the initiative, advantage, and victory. In the critical period of historical development, if we seize the opportunity, the backward countries and nations may achieve leapfrog development and become the trendsetter of the times; If the opportunity is lost, the originally strong country and nation will also fall behind if they do not advance and become a laggard in the development of the times. In this view, history is a decisive factor of a country's economy, population, and so on. History is stable absolutely, so the factors it impacts are relatively stable.

The history of a country determines its spiritual civilization and culture. As a spiritual force, culture can be transformed into a material force in the process of people's understanding and transforming the world and has a profound impact on social development. This influence is not only reflected in the history of the country, but also the performance of the nation.

Without culture, there will be no direction, and without thought, it will grow wildly. Culture is the accumulation of thinking and practice.

From the point of the region, we can also analyze its stability. The natural geographical environment is the eternal necessary condition for the survival and development of human society and the natural basis for people's life and production.

Importance of geographical location to economic development: (importance of ports) in the process of globalization, sea transportation is the main mode of transportation in international trade, and its cost is significantly lower than land transportation or air transportation. The layout of the manufacturing industry near large ports can reduce the transportation cost of international trade. The closer you get to the large harbor, the closer you are to the international market. Therefore, the higher the level of economic development and the higher the labor productivity and wage level in an area with a good geographical location. In the process of economic growth, geographical conditions are important determinants in both the short and long term.

From the above, we can conclude that geographical location can not be ignored in restricting and promoting the historical process of countries (and regions), but we must not go into a misunderstanding, that is, like the butterfly effect, trying to connect all events in history with the geographical location directly or indirectly. It is easier to understand in Figure 7.

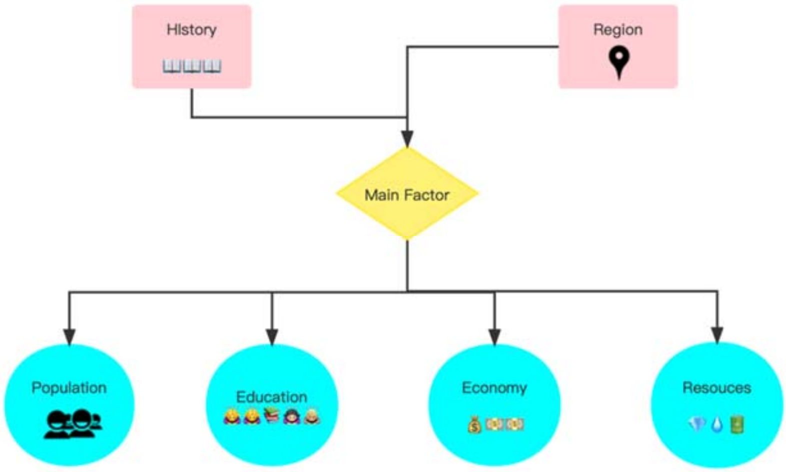


Figure 7. Main Factors Influencing The Stability of the Model

5. Feasibility, Miner and Methods of Asteroid Mining

5.1. Feasibility Analysis

According to the United Nations Population Fund, the number of people in the world will increase every year to more than 86 million, and by 2050 the world population will reach 9.7 billion, and the demand for energy resources will be increasing [1]. Manganese, chromium), heavy metal (copper, zinc, lead), light gold (such as aluminum, magnesium), rare gold minerals (such as tungsten, molybdenum, niobium, tantalum), precious gold minerals (such as gold, silver, platinum) and diamond mineral resources are also very limited, with the increasing intensity and demand of mining will face depletion [2]. The famous British physicist Hawking once predicted: "In the next hundred years, human beings must leave the earth for survival. Go to space to search for a new home" [3].

When the earth's resources are exhausted, humans can go to other planets to mine. This sounds like a plot in an American science fiction film, but now, this dream is likely to come true.

Asteroids are the remnants of the early formation of the solar system, which widely exist between the orbits of Mars and Jupiter, near-earth, and points L4 and L5 of Jupiter. Near-Earth asteroids have relatively lower detection cost due to their proximity to the earth, which is conducive to the implementation of planetary science and space resource utilization exploration missions. At the same time, near-Earth Asteroids also have the risk of hitting the earth. Therefore, asteroid exploration has attracted the extensive attention of various space agencies in recent years. So far, astronomers have found more than 12000 near-Earth Asteroids, and the number is increasing at the rate of more than 1000 every year. Almost all these asteroids near the Earth contain water, many of which are also valuable heavy metals like nickel, platinum, and gold. Space resources are abundant [4].

So far, more than 750000 asteroids have been discovered. According to the report released by NASA in September 2016, there are 711 known asteroids with a market value of more than $100 trillion.

What’s more, the solar system is numerous and rich in abundant mineral resources with very high mining value. However, considering the long distance of the main belt asteroid and the complex space environment, it is not recommended to exploit the mineral resources on it at this stage. Although the number of near-Earth asteroids is not as large as that of main-belt asteroids, their orbits are relatively close to the Earth, the space environment is easy to detect, and more than 1500 of them have very high mining value and recoverability. Therefore, based on the existing technology and mining value, it is very feasible to mine mineral resources on near-Earth asteroids, and it will reduce the risk of some asteroids hitting the Earth.

5.2. Miner and Methods of Asteroid Mining

Aiming at the micro-gravity problem of off-site mining, carry out the research on the attachment and anchorage technology of mining robots on the planetary surface and the crushing and cutting technology of hard minerals on the planetary surface under the restriction of low drilling pressure. The Asteroid programs currently being implemented by the United States and Japan are, respectively OSIRIS-Rex and Hayabusa–2, both targets are sample returns. As a major research country in the field of asteroids, the main promoters of its recent near-Earth asteroid program are NASA and commercial space companies. The long-term planning of commercial space companies PR and DSI highlights the economic value of asteroid exploration, and the collection plan for asteroids with higher economic value is carried out through low-cost upfront asteroid mineral exploration. NASA proposed arm (Asteroid Redirect Mission), which plans to capture asteroids with a diameter of several meters and redirect them into retrograde orbits of the moon, and then astronauts will carry out sampling missions and bring samples back to Earth.

Aiming at the urgent needs of resource exploration and mining in space micro-gravity environment, and aiming at the bottleneck problems such as exploration, development, and sorting of buried resources in space micro-gravity environment, carry out non-contact electromagnetic resource exploration in microgravity environment, intelligent and accurate mining technology and equipment of buried resources in the micro-gravity environment, sorting mechanism and complete set of equipment of diversified resources in space micro-gravity environment Research on key technologies such as the cooperative working mechanism of intelligent mining and sorting of space resources, and form a "Trinity" technical system of accurate exploration, intelligent mining, and sorting of space buried resources.

DSI was established on January 23, 2013. Its main purpose is to provide "water, propellant and building materials" for the space market. DSI's long-term strategic planning is divided into four stages: Exploration and harvest of near-Earth Asteroids, refining, and manufacturing of raw materials. In the 2016 plan, DSI is studying two micro-Satellites models: prospector-x and prospector-1. In the follow-up development plan, DSI has basically completed the conceptual design of the harvest link.

Facing the characteristics of deep space missions, solar electric propulsion is widely used in the cruise section. Nuclear propulsion technology has great potential, but there is still a large technical bottleneck. Nuclear propulsion mainly includes nuclear thermal propulsion, nuclear power propulsion and nuclear explosion propulsion. The application prospect of nuclear power propulsion technology is good. It has the characteristics of high efficiency, high-speed increment, extremely high specific impulse (up to 10000 s) and long service life. It can greatly shorten the task cycle and improve the payload ratio. There are two main types of nuclear power sources commonly used in deep space missions: radioisotope temperature difference power supply and nuclear reactor power supply. The development of radioisotope thermoelectric power supply needs to solve the selection and preparation of radioisotopes, thermoelectric converter technology, isotope heat source unit and nuclear safety technology. The technical threshold is high, and the preparation cycle of high-purity radioisotopes is long, up to 10 years. At present, many types of research at home and abroad on how to improve the thermoelectric conversion efficiency and mass-specific power of reflective isotope thermoelectric power supply are of great significance to the research of small satellites, microsatellites and propulsion methods of spacecraft.

5.3. Stakeholders and Influences

Impact on Global Equity: the prospects for asteroid mining are disturbing.

Many countries with advanced space technology are not among the 16 countries that have signed the space treaty, but they should reach some kind of fair agreement because the international competition for space natural resources is likely to evolve into armed conflict. Some natural resources on earth will be increasingly scarce, such as platinum series metals. Mining companies have found about 100000 cubic tons of platinum series metal minerals worldwide, mainly distributed in South Africa and Russia. According to the data of the US Geological Survey, the global platinum production is worth the US $10 billion every year. If people's demand for platinum production does not rise significantly, the platinum series metals mined in South Africa and Russia can last for decades.

Planetary resources and deep space industry companies and several other wholly-owned and joint ventures in the United States began to compete for control of valuable space minerals. In the future, there may be continuous technological upgrading of armed man-made satellites and competing for "extraterrestrial surface mining". The platinum series of metal elements in space may be equivalent to the earth's oil resources, which may expand the geopolitical struggle to the astro-political struggle.

Since the current United Nations legal system on outer space, represented by the 1967 outer space treaty, was born in the 1960s and 1970s, many institutional norms only established some vital basic principles based on the conditions at that time, lack of implementation mechanism and weak operability. At present, for various reasons, there are many difficulties in formulating a new outer space convention within the framework of the United Nations or promoting the landing (or appropriately modified landing) of the 1979 moon agreement. Under the situation that the earth's resources are increasingly facing tension and even gradually exhausted, the development and utilization of extraterritorial resources of the earth is the general trend. How to ensure the peaceful, orderly, safe and sustainable development of such resources in terms of institutional arrangements, so that investors can obtain reasonable returns while innovating and undertaking business and taking risks. National Aerospace legislation should not only keep pace with the times but also maintain coordination with the general principles and norms of international law. This will be a new topic that the international community needs to face together to improve the space governance system and maintain the order of space activities. The United Nations is an important platform for the international community to formulate and improve the international space legal system.

5.4. Changes and fluctuation

Everything in the world will change, even a stone will be weathered, and the development of the universe follows the law of entropy. Can be entropy, entropy is the degree of chaos. The greater the entropy, the more chaotic the universe is. That is to say, in the end, the universe tends to be infinite chaos, so there can be no stable matter.

One more thing, we seem to have a stable matter, which can't exist forever. We should know that the most basic particle of matter is an atom, and the important material of an atom is a proton. The decay period of protons is about 6000 years, which means protons also have a lifetime. Therefore, the universe cannot be composed of stable matter.

The stability of the universe determines the stability of mineral resources on asteroids.

There is a saying that the universe has the characteristics of expansion and contraction. The inverse process of cosmic expansion is cosmic contraction. On the contrary, the inverse process of cosmic contraction is cosmic expansion. The big bang theory corresponding to big expansion and the big squeeze theory corresponding to big contraction form the theory of cosmic cycle on the basis of the complementary principle and transformation principle of the philosophy of science. The denial of the steady-state cosmic structure by large expansion and contraction conforms to the equivalence principle of negation in the philosophy of science. Some unknown dark energy caused the instability of the static universe in the process of cosmic expansion; The known matter gravity and some unknown dark matter gravity also caused the instability of the static universe in the process of the great contraction of the universe. The steady-state universe lost its stability, while the expanding or contracting universe ensured its stability.

To some degree, though everything is changing all the time, there is a balance of everything. In conclusion, the changes and fluctuations of space have little influence on asteroid mining as well as global equity.

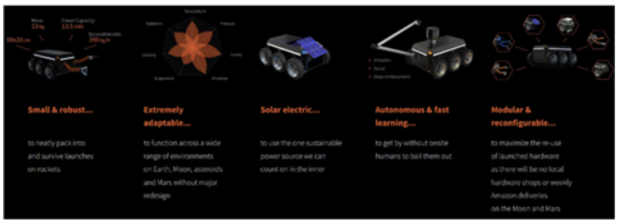
5.5. Future Development and Vision

With the depletion of the earth's mineral resources, the increasing human demand for mineral resources and the progress of science and technology, the development and utilization of space resources are changing from science fiction to reality. With the support of the national government, private companies and scientific research institutes, asteroid mining has ushered in unprecedented development opportunities.

There also many types of research showing the good future of asteroid mining.

"We are developing a new generation of universal industrial robots to do the heavy lifting on Earth, Moon, asteroids and Mars." OffWorld sees the coming Alderamin boom that asteroid mining is and has wisely inserted itself in the much-needed area of robotic mining processing. The people that are first to develop these approaches will know unlimited success as every operation in the world comes to them for this kind of rarefied know-how. According to OffWorld, their master plan is stated as: "We envision millions of smart robots working under human supervision on and OffWorld, turning the inner solar system into a better, gentler, greener place for life and civilization." Ambitious visions of a group just getting started, we hope to see more from OffWorld soon!

We will have more suitable tools and miners to do the asteroid mining in the future, like these ones in Figure 8.



The interstellar navigation platform program will utilize the orbit of asteroids. The idea is to let the probe land on the asteroid surface, or sleep or carry out exploration, during which the asteroid will be used as a ferry platform. When the asteroid reaches the right position, the probe will fly to the deep space target. This can reduce the propellant demand of the detector, reduce the size of the detector or expand the detection distance. In the future, humans can also establish a closed large-scale ecological cycle system on asteroids and use the energy collection and supply of asteroids to maintain the operation of the system; The centrifugal force generated by the rotation of small celestial bodies is used to simulate the earth's gravity environment, so as to meet the living requirements of astronauts and form space mobile homes.

If asteroid mining has a good future, it is clear that we get closer to global equity.

5.6. Revalidation of The Global Equity Model

Here we use Grey Correlational Mode to revalidate the global equity model by using SPSS.

5.6.1. Introduction of Grey Correlational Mode

For the factors between two systems, the measure of the degree of correlation that changes with time or different objects is called correlation degree. In the process of system development, if the changing trend of the two factors is consistent, that is, the degree of synchronous change is high, it can be said that the degree of correlation between the two is high; On the contrary, it is lower. Therefore, the grey correlation analysis method is a method to measure the degree of correlation between factors according to the degree of similarity or difference in the development trend between factors, that is, "grey correlation degree".

5.6.2. Process of Revalidation

First step We calculate Xc of the representative countries According to the global equity model we designed:

$$X_C = W_1 P_C + W_2 N_C + W_3 G_C + W_4 E_C$$

We got the results in Table 4.

Table 4. Results of X_c

Country	X_c	Country	X_c
China	0.59	Brazil	0.67
US	0.58	Denmark	0.41
India	0.58	Egypt	0.51
Mexico	0.85	Australia	0.55

Second Step Because GDP and education level really count for showing the development of a country, we use the results of X_c as the key factor to analyze whether X_c can reflect a country's development so that we can know if we've got the valid global equity model.

5.6.3. Results of Factor Analysis

Table 5. Results of Grey Correlational Mode

Country	GDP **(Millions)**	The proportion of population with doctor's degree or above **(%)**	Country	GDP **(Millions)**	The proportion of population with doctor's degree or above **(%)**
China	0.5104	0.5067	Brazil	0.7595	0.7303
US	0.3687	0.3687	Denmark	0.47009	0.9572
India	0.7792	0.8516	Egypt	0.525	0.5353
Mexico	0.95	1	Australia	0.6028	0.5238

As the data in Table 6 are mostly more than 0.5, the model can truly reflect the development of a country.

Table 6. Correlation Degree

Term	Correlation degree
Proportion of population with doctor's degree or above (%)	0.684
GDP (Millions)	0.621

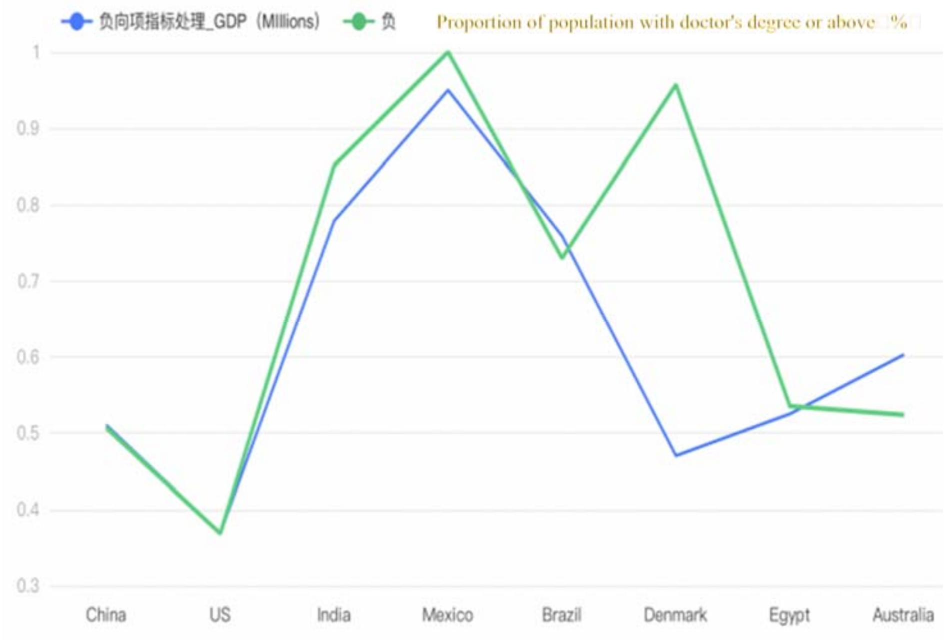


Figure 9. Correlation Degree Line Chart

From the above analysis, we can conclude that the global equity model we have established is reasonable and feasible.

6. Future Policy

The policy is important because it is authoritative. This means that premature policy action will establish more advantages for the realization of global equity.

(1) Institutional arrangements should be made to ensure the peaceful, orderly, safe and sustainable development of such resources so that investors can obtain reasonable returns while innovating and undertaking business and taking risks. National Aerospace legislation should not only keep pace with the times but also maintain coordination with the general principles and norms of international law.

(2) In the process of construction, the cost is shared according to the economic strength of all countries, the voting system is implemented, and the "basic principle of one country, one vote" and the decisive role of the member states on major issues play a role together.

(3) Using the global equity model we have designed to calculate Xc of each country around the world, the higher the value, the more mineral resources the country needs. So all countries allocate minerals derived from asteroid mining in proportion to the value.

(4) At the same time, a considerable part of the final total benefits will be allocated to build poor developing countries, and the remaining shares can be obtained by auction.

(5) In order to benefit the development of all mankind, all countries should provide funds within their capabilities for the development of global space exploration.

(6) Each country should motivate people to work hard to explore the space by provide awards.

(7) Fight for mineral resources must be banned. All countries need to work together for a shared future.

The policies are shown in Figure10 for better understanding.

Figure 10. World Policy

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