



Symbiotic Economy and Zero-Sum Game in Ecological Perspective

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Abstract. This paper outlines the cooperation and confrontation between the Chinese and American in the 21st century. Based on the basic principles of ecology, it discusses the economic development strategies of China and the United States in terms of the principle of ecological niche, the characteristics of interspecific relationships, and the principle of symbiosis. It is pointed out that economics' benign competition actually does not conform to the basic definition of competition in ecology. Competition is when resources are limited, the ecological niche of species overlap, there will be competition. The essence of competition is to harm each other. At the same time, competition will lead to the synergistic evolution of species and reach to a symbiotic state. The essence of the "table menu theory" of the U.S. is actually predation among different species, not competition. The U.S. takes the world as a food chain, which violates the basic principle of species diversity. China and the U.S. are complementary in the multiple industries, and it is important to advocate China and the U.S. to return to the symbiosis policy. This is in the common economic interests of the two countries, also beneficial to economic globalization and prosperity in the world.

Keywords: China-U.S. Relations, Symbiotic Economy, Zero-Sum Game, Symbiosis, Competition, Predation.

1 Introduction

The principles of ecology are the fundamental laws that govern the study of all things on earth. The whole world is suffering from the current serious confrontation between China and the United States. This paper is intended to discuss the political and economic relations between China and the United States based on the basic principles of ecology. China and the U.S. seem to be two large dominant populations in the earth's ecosphere, and they play a pivotal role in the prosperity, security and order of the whole ecosphere. Because of their interests and survival, they cooperate as symbiosis at one time, and confront as competition, even predation, at another time, so that the whole ecosystem may undergo an unknown succession.

2 Cooperation and Confrontation

With China's accession to WTO in 2001, a country and market of enormous size was integrated into the international trading system. Through globalized trade and investment, factors of production flow freely and are allocated throughout the world, the international market order is gradually being established, and a broader globalized market is gradually taking shape. Global industrial division of labor, global allocation of resources, the world's development in a more open, inclusive and inclusive direction, the interdependence of the economies of all countries, and efforts to achieve win-win and symbiosis. Prof. Niall Ferguson of Harvard University (2007) put forward a new concept of "Chimerica", he believes that China and the United States have entered a "symbiotic era", China and the United States are completely complementary, both prosper and lose[1].

In 2010, China's economy surpassed Japan's to become the world's second largest, contributing 18% to global economic growth. The United States perceives this as a significant threat. The United States aspires to maintain the status quo and expects other countries to adhere to the prescribed "ecological niche," in accordance with the norms and standards set forth by the West.

In 2017, the U.S. released its National Security Strategy report, which positioned China as a "competitor" and a "revisionist country". In 2018, the U.S. imposed sanctions and tariffs on a large number of Chinese imports, strongly attacked China's low- and medium-end industries, and used friendly-shore outsourcing and near-shore outsourcing to force the industrial chain to move out of China. In terms of high-end industries, the U.S. has restricted and curbed China's development in these high-end industries through *The law of the Chip and Science Act* and other measures. China, on the other hand, has introduced export bans on rare earths, germanium, gallium and other semiconductor raw materials, and canceled a large number of U.S. trade orders, and counteracted the United States on food imports[2].

Since the commencement of the U.S.-China trade conflict, the total bilateral trade between China and the United States has exhibited a decline of approximately 10 percent. As reported by the China General Administration of Customs, in 2023, trade between the United States and China declined by 11.6 percent in comparison to the previous year. Among the sectors affected, China's exports to the United States declined by 13.1%, while China's imports from the United States decreased by 6.8%. As evidenced by data from the World Trade Report 2024, global trade in goods experienced 1.2% decline in 2023. U.S. foreign policy analysts have posited that the decoupling of China and the United States would result in a 7% reduction in global GDP, equivalent to 7.4 trillion U.S. dollars, which is the sum of the GDP of France and Germany[3]. The trade war between China and the United States has had a significant impact on the global industrial and supply chains, disrupting the demand and supply of the global market and marking a disruption in the global trade order. Additionally, the investment environment has deteriorated, and the symbiotic economy has been torn apart. The United States has endeavored to reconstruct the global economic and trade relations

and industrial chain with the objective of maintaining its dominant position at the pinnacle of the global economic hierarchy. The global economy has shifted from a symbiotic equilibrium to a competitive environment.

3 Basic Principles of Ecology

3.1 Ecological Niche Principle

The law of ecology represents the most fundamental discovery in the field of human ecology. The smallest basic unit of human ecological research is the species with a certain social organization, generally in the form of populations. The term "ecological niche" is used to describe the position occupied by a population in a given ecosystem with regard to time, space, and nutrition. This encompasses a range of ecological factors that are subject to adaptive variation and a functional relationship between the population in question and the role it plays within the ecosystem. Each population occupies a distinct range of ecological niches, and no two species possess completely overlapping niches.

3.2 Characterization of Populations

The fundamental law governing populations forms the basis of our study of urban and human ecosystems. Biological populations on Earth exhibit four primary interspecies relationships: competition, predation, parasitism, and symbiosis. These relationships are characterized as follows (Table 1).

Table 1. Interrelationships between populations of organisms.

Remarks	Type of interspecific relationship	Characteristics of relationship	Remarks
Populations with similar ecological niches or of the same species	Competition (- -)	Due to overlapping trophic relationships, etc., they compete for limited resources and harm each other	
	Symbiosis (+ +)	Ecological niches do not overlap and complement each other, so they benefit each other, and organisms usually evolve to a symbiotic state, surviving each other at minimal cost	Populations with different ecological niches
	Predation (+ -)	Population A feeds on population B, but generally does not actively kill each other. One species benefits at the expense of the other	
	Parasitism (+ -)	Population A parasitizes population B and harms it	

For populations of similar ecological niches, interspecific relationships include competition (- -) and symbiosis (+ +). In biology, there is no such thing as "healthy competition", which means mutual harm. It is defined as a situation where two species living

in the same area, due to overlapping ecological niches and utilizing the same resources, interact with each other, and the populations of both species decline.

Species with identical ecological niches cannot live together in the same place at the same time. For different species to achieve coexistence in saturated environments and competing communities, they must have certain ecological differences, or evolve to be different, or else one of them will perish. Competitive pressures lead to the evolution of organisms, which forces the other party to evolve as well, this is also called co-evolution. Organisms will always evolve in a direction that is beneficial to their survival, and in this sense, competition will ultimately cause the two surviving species to evolve into ecological niches that are different enough to be able to live together or coexist.

During the long evolutionary history of the earth, a large number of organisms have formed symbiotic relationships. Symbiosis is when two organisms live together and depend on each other for their mutual benefit. If they are separated from each other, both or one of them will suffer. It is a way for organisms to survive at the least cost. Therefore, competition leads to diversity rather than extinction. When resources are scarce, the likelihood of reciprocal coexistence increases[4].

Predation (+ -), parasitism (+ -) or symbiosis (+ +) can occur between different types of populations. Among these, predation (+ -) occurs readily between populations of higher organisms in systems of food chains. Predation (+ -) is when one species feeds on another, and the prey is often killed, but usually does not extinguish the entire population, but rather creates a dynamic, mutually constraining equilibrium.

All kinds of life are the product of long-term symbiosis and synergistic evolution between organisms and their environment; there is a great deal of competition, predation, and symbiosis among organisms, and between organisms and their environment. Among them, symbiosis will also dominate. Only through symbiosis can organisms obtain the highest survival rate at the lowest cost. For organisms at the same level of the food chain, competition is a short-term phenomenon, and symbiosis and co-evolution are common phenomena in ecosystems[5].

Competition and symbiosis are both fundamental forms and roles of interspecific relationships, and it is through their interactions that ecosystems develop. In this interactive process, competition leads to symbiosis, and symbiosis suppresses old competition and generates new competition. New competition triggers new symbiosis, thus advancing the ecosystem forward until it reaches a high level and orderly equilibrium[6].

4 Blinken's Zero-sum Game

Zero-sum game is a non-cooperative game. It means that the parties involved in the game will never cooperate with each other. One party's gain necessarily implies another party's loss, which is equivalent to "predation" in ecology. One party's gain is equal to the other party's loss, and the sum of the gains and losses of all parties in the game will always be "zero", and the interests of the whole society will not be increased by a single point, which is meaningless to the succession of the whole ecosystem.

In 2024, Blinken quoted an American slang at the Munich Security Conference, “In the international system, if you are not at the table, you will be on the menu”. This is a zero-sum game, a “predatory” relationship in the food chain. Blinken's “menu-dinner theory” is not really about competition. Competition generally occurs between populations of the same species, or between populations with overlapping ecological niches. Blinken's menu-dinner theory actually defines the relationship between the United States and China as a predatory relationship of different populations. The population competition relationship does not aim at destroying each other, but predation does. Therefore, the United States does not consider other countries to be equal to itself, nor does it consider itself to be of the same species as other nationalities; they are animals at the top of the food chain, and their logic is as follows (Figure 1):

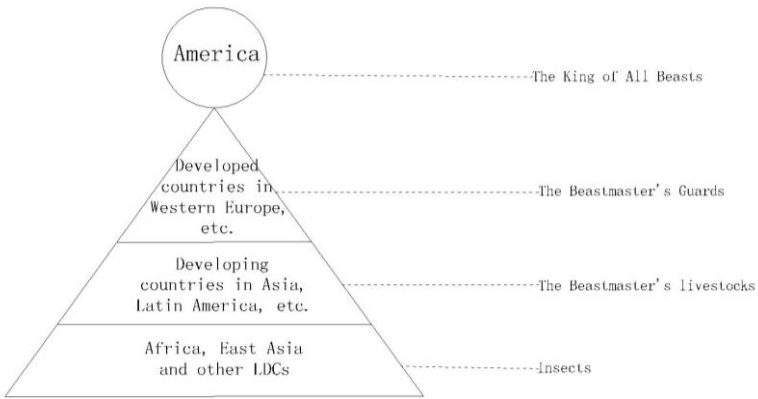


Fig. 1. The Pyramid of Food Chain in the United States.

Natural ecosystems have taught mankind the truths of “interdependence and mutual constraints”, “diversity leads to stability”, “everything in nature is connected to everything else, and all human activities reside in this connection”[7]. The whole of human activity resides in this connection”. Eliminating the other means cutting off one's own food chain. If the American concept of predation is applied to populations of the same size, even if it succeeds in locking up its dominant position, it will lead to serious harm to itself, and the whole ecosystem will lose the vigor of competition, lose its diversity, and die out on its own.

5 Mutually Beneficial Symbiosis and Symbiotic Economy

Competition is a norm for populations. It is an optimal choice shown by nature for populations to readjust their respective ecological positions in competition and evolve synergistically so as to achieve mutually beneficial symbiosis. The famous Japanese architect Kisho Kurokawa believes that the idea of symbiosis is the basic ideal of the age of life and will become the new order of the twenty-first century, and that economic symbiosis is the means and the necessary condition for realizing the aspiration[8].

China and the United States are differentiated in numerous fields of both scientific research and industry. From the 2023 National Bureau of Statistics bulletin, most of China's exports are concentrated in two aspects, one is low- and medium-end technology-intensive products such as computers, integrated chips, cell phones, automobiles and spare parts, and other labor-intensive products includes textiles, garments, bags and luggage, footwear, toys, furniture, plastic products, steel, etc. Although the total amount of exports is high, it is actually less profitable. It is shown in Table 2.

Table 2. Major export commodities in China in 2023.

No.	No. Commodity Name	Total Exports (\$ billion)
1	Computers and their parts	1846
2	Clothing and clothing accessories	15689
3	Cellular Phones	13717
4	Integrated circuits	1340
5	Textile yarns, fabrics and products	1324
6	Automobiles (including chassis)	1003
7	Plastic products	993
8	Household appliances	864
9	Automobile parts and accessories	863
10	Steel	830

*Data source: https://www.gov.cn/lianbo/bumen/202402/content_6934935.htm, 2023

The United States, on the other hand, has an absolute leading position in many high-end industries, most of which are at the top of the industry chain, belonging to “smart money” and “easy money”. The United States has dominance in top science and technology, such as high-end chips, AI intelligence, quantum computation, aerospace technology, bio-pharmaceuticals, gene technology and so on. In addition, the U.S. is No. 1 in the world in many areas includes financial services, electronics and IT (including semiconductors), medical devices and pharmaceuticals, military industry, agricultural processing, and construction machinery, among many other high-profit industries.

The 35th Global Financial Centers Index (GFCI, 2024) shows U.S. holds four of the world financial centers, and New York as the first global financial center in terms of overall competitiveness. According to ITIF, 2020, the U.S. is the global leader in the IT and information services industry, with a global market share of 36.4%. According to the Semiconductor Industry Association (SIA), the U.S. becomes the world's No. 1 market for chip sales in 2024, with a 50% share. The U.S. ranks first in the world in the pharmaceutical industry with a global market share of 28.4% (ITIF, 2020). The U.S. bags the top three biopharmaceutical manufacturing companies in the world, with a 41% share (Evaluate MedTech, 2021). The U.S. ranks first in the world in the gene sequencing industry (ITIF, 2020). In the household chemicals and cosmetics industry, the U.S. is the world's largest consumer of cosmetics, with a market share of nearly 19% (ITIF 2020). According to Sweden tech 2022 REPORT, the U.S. military industry has a global share of 51%. It has a significant advantage especially in high-end technologies and large-scale projects. The Yellow Table (2024) of the British KHL International Construction shows that the U.S. construction machinery accounts for 28.6%

of the world's share, of which only Caterpillar accounts for 16.8%. The U.S. leads the world in aerospace technology, with a share of about 57% (NASA, 2020). The U.S. ranks first in the transportation (aircraft) industry with a global market share of 34.5% (ITIF, 2020). It is also well known that the US is the world's largest exporter of agricultural products, accounting for about 40% of the world's soybeans exports. See Table 3 below.

Table 3. U.S. Top Ten Most Competitive Industries in the World.

No.	Commodity Name	Global Market Share
1	Financial Services Industry	1st(GFCI, 2024)
2	IT and information service industry	36.4%(ITIF, 2020)
3	Chip industry	50%(SIA, 2024)
4	Biomedical industry	28.4%(ITIF, 2020)
5	Medical Device Industry	41%(Evaluate MedTech, 2021)
6	Gene sequencing industry	19%(ITIF, 2020)
7	Military industry	51%(Sweden tech, 2022 REPORT)
8	Construction Machinery	28.6%(Yellow Table, 2024)
9	Aircraft industry	34.5% (ITIF, 2020)
10	Agricultural products	40%*

*Data source: <https://baijiahao.baidu.com/s?id=1734487088908336346&wfr=spider&for=pc>

Most of the economic ecological niches of China and the United States do not actually overlap, but are complementary and interdependent. China has a huge advantage in labor-intensive and technology-intensive manufacturing because of its huge population advantage and excellent labor costs, bringing a large number of inexpensive commodities to the world and lowering the cost of production and living consumption in various countries. And itself has also become the world's largest consumer market because of its population size and purchasing power, which has brought great opportunities and employment to the U.S. and world enterprises, and also promoted the development of related industries and technologies. And the U.S. has unrivaled advantages in high-end manufacturing, luxury goods, agriculture, finance and technology research and development that other countries can only follow. As shown below (Figure 2).



Fig. 2. Symbiotic and Complementary Diagram of U.S.-China Industries.

6 Conclusion

The United States and Europe do not share the same values. The United States lacks of reverence for life, nature and wholeness. It is timid and afraid of competition. Competition is a universal behavior in nature. Competition is what makes life so dynamic and fascinating. Competition makes civilization continues to move forward. The United States is afraid of competition, rejection of diversity, eliminating opponents by predation, interfering the free market, seriously undermining the economic order of the world, which has made a very bad impact on the world. A country that is always worried about being second best cannot stay in its place forever and cannot lead a new world.

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