Computer Fraud and Security
ISSN (online): 1873-7056

# Economic Growth and Its Dynamics based on Resource Allocation

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**Abstract:**

Global economic growth is deeply mired in weakness and has become the world's most pressing challenge. From the perspective of resource allocation, economic growth prerequisites include factor utilization efficiency and factor combinations that align with technical-economic relationships between production factors constituting products. The driving forces of economic growth stem from population growth and optimal resource allocation in open economies under the dual pressures of resource scarcity for human survival and development, along with technological expansion. The root causes of cyclical economic growth lie in the alienation of prices, technology, and capital. This paper's conclusions provide insights for breaking through the constraints of cyclical economic growth and achieving high-quality sustainable economic development.

**Keywords:** Resource Allocation; Economic Growth; Economic Growth Drivers

The United Nations Conference on Trade and Development (UNCTAD) "Trade and Development Report 2023" indicates that global economic growth is expected to slow to 2.4% in 2023 and slightly rise to 2.5% in 2024, signaling a global economic recession. Since 1991, world economic growth has largely maintained around 3%, with developed countries consistently below 2.5%, while developing countries have gradually declined from around 5% initially to 3.9%①. The sluggish global economic growth and weak recovery have become the main challenges facing the world economy today.

In response, several major international economic conferences have been held in recent years, including the Boao Forum for Asia, the Belt and Road Forum for International Cooperation, the World Economic Forum (Davos Forum), G20 Summit, B20 Summit, UNCTAD Conference, Global Economic Outlook, and International Trade Ministers' Meeting. All these forums have identified promoting global economic recovery and achieving sustainable economic development as the most urgent challenges.

However, there is currently no global consensus on how to accelerate the world economy's recovery from its downturn and achieve long-term economic growth. Many countries, particularly developing nations, advocate promoting world economic growth through economic globalization and international economic cooperation[1], while some developed economies attempt to focus on product and factor mobility to stimulate their domestic economic growth. Against this background, this paper explores economic growth and its driving forces from the perspective of resource allocation, and further analyzes the causes of economic cycle growth, which has significant implications for promoting global economic recovery and achieving long-term economic growth.

## 1 General Theory of Economic Growth

Economic growth refers to a continuous increase in total output with fluctuating growth rates. As a core and eternal topic in economic research, economic growth theory runs throughout the history of economic development. This includes classical economics theories such as Adam Smith's theory of division of labor promoting economic growth, David Ricardo's theory of distribution, Malthus's population theory, and Marx's two-sector reproduction theory. It extends to neoclassical economics theories like Schumpeter's innovation

① The data is sourced from the United Nations Conference on Trade and Development (UNCTAD) *Trade and Development Report 2023*.

theory and Allyn Young's Smith theorem, and further to modern economic growth theories beginning with Frank Ramsey's mathematical savings model and the Harrod-Domar growth model.

Modern economic growth theory is rooted in the equilibrium analysis framework, emphasizing the concept of "equilibrium" in economic growth. The equilibrium concept constitutes the most fundamental and core concept in mainstream economics. In the 1940s, Harrod and Domar devoted themselves to dynamizing Keynes's short-term analysis, proposing a neoclassical analytical framework based on agent optimal decision-making and dynamic time series, emphasizing the core role of capital accumulation in economic growth. In the mid-1950s, Solow and Swan established the neoclassical growth model, which not only revealed the impact of capital and labor on economic growth but also clearly highlighted the contribution of technology to economic growth. Subsequently, scholars led by Chenery incorporated structural variables into the neoclassical growth model, thus clarifying the intrinsic connection between structural change and economic growth. In the 1980s, scholars represented by Romer and Lucas emphasized the key role of human capital in economic growth and incorporated technological progress as an endogenous variable in economic growth research. Meanwhile, institutional economists such as North and Coase viewed institutional factors as another key endogenous variable affecting economic growth, using transaction costs to explain and compare different institutional efficiencies, thereby exploring the profound impact of institutions on economic growth.

Theory originates from practice and is a summary and sublimation of practice. The evolution of economic growth theory reflects the transformation of wealth-creating factors. Economic growth theory has evolved from the theory that land is the mother of wealth, through labor source theory and capital determinism, to technological progress theory and human capital theory, and further to new growth theory, structural theory, and institutional theory. Based on this, the following conclusions can be drawn: First, there are many factors affecting economic growth; Second, the factors influencing economic growth have evolved from land, labor, and capital, to technological progress determined by human capital and R&D capital, and further to economies of scale, structural changes, and institutional transitions; Third, the driving forces of economic growth are developing towards improving factor productivity.

Therefore, from a theoretical perspective, classical economic growth theory emphasizes the importance of labor and capital, highlighting that improvements in labor productivity and capital accumulation are the main sources of economic growth; modern economic growth theory emphasizes the decisive role of technological progress in economic growth, and shifts the study of technological progress from an exogenous to an endogenous variable in economic growth. From the practice of economic growth, before and after the First Industrial Revolution, the mode of economic growth displayed characteristics of extensive economic growth primarily driven by labor and machinery input; after the Second, and especially the Third Industrial Revolution, the mode of economic growth has transformed into intensive economic growth characteristics with modern technological progress as the primary driving force.

Entering the 21st century, most scholars have conducted in-depth research on factors affecting economic growth based on modern economic growth theory paradigms. For instance, Lin Yifu (2010) proposed the theoretical framework of New Structural Economics, arguing that economic structure is endogenously determined by factor endowment structure[2]. Yahyazadehfar, M. et al. (2018) emphasized that R&D investment and labor quality are effective factors in economic growth[3]. Wang Wei et al. (2020) discussed how, under the public education financing model, increased life expectancy primarily promotes human capital accumulation and economic growth by increasing per capita education time[4]. Zhao Ran et al. (2020) used the spatial Durbin model to examine the spatial effects of higher education and human capital quality, finding that advanced human capital, represented by higher education and urban labor income index, can indirectly promote local economic growth through technological innovation[5]. Tao Ketao et al. (2021) pointed out that from a long-term perspective, relatively tight fiscal policy and prudent monetary policy can strengthen economic growth momentum by enhancing human capital, thereby promoting economic development[6]. Pasichnyi et al. (2021) examined the relationship between population and economic growth using unbalanced panel data, concluding that significant increases in life expectancy are unfavorable for real GDP per capita growth[7]. Mohsen Ahmadi's (2021) priority substitution criteria results showed varying impacts of technological foundation, labor structure, trade, and capital on economic growth, with technology-related indicators having the greatest

impact[8]. Hu Houquan (2022) explained the importance of entrepreneurial spirit continuation in regional path dependency of economic growth from a historical inheritance perspective[9]. Erkam Emin Ayvaz & Didem Över (2023) analyzed the impacts of carbon dioxide emissions, technological progress, and renewable energy on economic expansion from the perspective of long-term sustainable development and environmental protection[10]. Han Yonghui et al. (2023) emphasized that reasonable division of labor and deep collaboration among labor-intensive, capital-intensive, and technology-intensive industries in different regions are key to forming a domestic circulation growth model[11].

In summary, most current scholars believe that factors affecting economic growth include the following aspects:First, capital accumulation, including increased domestic savings and appropriate foreign investment, constitutes the prerequisite and foundation for economic growth. Technological updates, improvements, or disruptive breakthroughs cannot be achieved without corresponding financial support. Expanding capital accumulation and investment is key for developing countries to achieve economic takeoff, while ensuring investment efficiency to obtain maximum economic output from limited capital input.Second, labor force is a key driver of economic growth. For developing countries with abundant labor resources, the key to economic growth lies in increasing labor force participation in economic activities and improving labor quality, transforming labor from a social burden into an important source of national wealth creation.Third, technological progress and innovation are playing an increasingly important role in economic growth. It is necessary to both make encouraging technological innovation, promoting R&D, organizing technological breakthroughs, and introducing cutting-edge technology as the core of economic policy, while also transforming the economic growth model from resource-dependent extensive growth to innovation-driven intensive growth.Fourth, the rationality of resource allocation affects economic growth. Resources, especially labor, must be continuously transferred from low-efficiency sectors to high-efficiency sectors. The primary task is to shift resources from the agricultural sector to industry and services, while gradually shifting focus to high-tech industries represented by information technology, to improve resource allocation efficiency and promote economic modernization.

## 2 Quantity and Quality of Economic Growth

### 2.1 Evolution of Economic Growth Patterns

Economic growth pattern refers to the sum of paths, approaches, methods, and forms of economic development. From the perspective of resource allocation, economic growth pattern refers to the utilization and combination of various production factors in economic growth. Its connotation encompasses the growth sources that economic growth depends on, namely the structure of factors (composition and quantitative proportional relationships of factors), growth mechanisms, and their pathways.Economic growth patterns are typically classified into two types: extensive and intensive growth. Extensive growth relies on the quantitative expansion of production factors to drive economic growth, characterized mainly by high input, high consumption, high emissions, and low efficiency. Intensive growth achieves economic growth through improving the quality of production factors, namely through enhancing labor quality, technological progress, institutional innovation, and increased production efficiency. It is characterized primarily by low input with high output, low consumption, and sustainability.

The transformation of economic growth mode refers to the shift from extensive growth to intensive growth. Generally, under an extensive economic growth mode, when the quality and combination of production factors remain unchanged or change slightly, the input of production factors is a repetition or accumulation based on the original technical level. New machinery and equipment are not more advanced than the original ones, and the quality of new workers is not higher than the original ones, sometimes even lower.The productivity of newly invested production factors, compared to the existing ones, shows no improvement, remains stagnant, or even declines. This results in high energy and material consumption, low product qualification rates, and serious waste of resources. Under the extensive economic growth mode, the increase in economic growth rate mainly comes from the quantitative expansion of production factors. Due to poor product quality, weak competitiveness, high scrap rates, increasing costs with production scale expansion, diminishing returns, and declining economic benefits, it may even lead to negative economic growth in extreme cases.

The transformation of economic growth mode aims to adapt to socio-economic changes by altering the combination and utilization methods of production factors to achieve increased output and better meet human survival and development needs. The transformation of economic growth mode generally includes:(1) Improving the quality of production factors, especially enhancing labor quality and the technological level of machinery and equipment.(2) Optimizing the combination of production factors by organizing production based on the technical and economic relationships between factors in product manufacturing.(3) Improving the allocation of production factors, including rational distribution among enterprises, industries, and regions.(4) Maximizing the potential of production factors to increase output with the same factors and combinations.

The production of qualified products is a basic assumption for wealth creation. The efficiency of factor utilization and factor combinations that conform to the technical and economic relationships between production factors are prerequisites for economic growth. The intensive economic growth mode is more conducive to optimal resource allocation and wealth realization (normal conduct of commodity exchange).

**2.2 Effective Utilization and Evolution of Production Factors**

The satisfaction of human survival and development needs depends on the advancement of productive forces and improvement of production efficiency, which in turn relies on the effective utilization of production factors and transformation of production methods. In the historical process of wealth creation, initially, when land (natural resources, including land and its attachments) was abundant, labor was the sole factor of wealth creation. Subsequently, as population increased at a rate far exceeding economic growth, land development reached its limits and became a scarce commodity and an important factor of wealth creation. With unprecedented population expansion, economic growth became more dependent on scientific and technological breakthroughs, making technology an important factor of wealth creation. As specialized division of labor deepened, with refined labor division and close collaboration, and product varieties multiplied, the optimal integration of land, labor, and technology became more complex. The position and role of capital (wealth that creates wealth) as a scientific and effective integrator of various production factors became increasingly prominent, and capital, with its scientific and effective organizational function, emerged as an important factor in wealth creation.

Labor creates wealth. However, with population growth, wealth generated from labor acting directly on land can no longer meet human needs. Humans sought changes, improved labor skills, practiced intensive cultivation, and developed auxiliary production tools, leading to the first alienation of labor. Labor transformed from directly acting on labor objects to using simple tools to act on labor objects, marking the emergence of science and technology.

Science and technology is the primary productive force. With the widespread application of production tools and mechanical equipment, humans were liberated from heavy physical labor, leading to the second alienation of labor. More attention was focused on scientific and technological inventions, improvements in production processes, and management.

Thus, from the perspective of long-term economic growth, the evolution of production factors follows these objective laws:In terms of productive forces, there has been an evolution from labor directly acting on labor objects or using simple tools (labor) to operate on labor objects, to labor operating tools or CNC machinery (mechanical technology) acting on labor objects, and further to intelligent machinery (intelligent technology) directly acting on labor objects.Regarding the elements constituting product entities (use value), there has been an evolution from land (natural resources) to products (such as components, products requiring further processing, and products serving production), and further to new materials (such as synthetic materials).

**2.3 China's Economic Growth Practice**

China's 70-plus years of economic development since its founding has fully demonstrated the objective law of factor transformation. From 1952 to 2022, as shown by the proportion of three industrial sectors in Gross Domestic Product (GDP) (Figure 1), the employment growth rate and composition of three industrial sectors (Figure 2), and the annual growth rate of fixed asset investment and composition of three industrial sectors (data before 2002 is missing, as shown in Figure 3), China has experienced three social forms - agricultural society,

industrial society, and modern society - over these 70 years, developing from a traditional agricultural country into a modern nation with the world's second-largest economy.

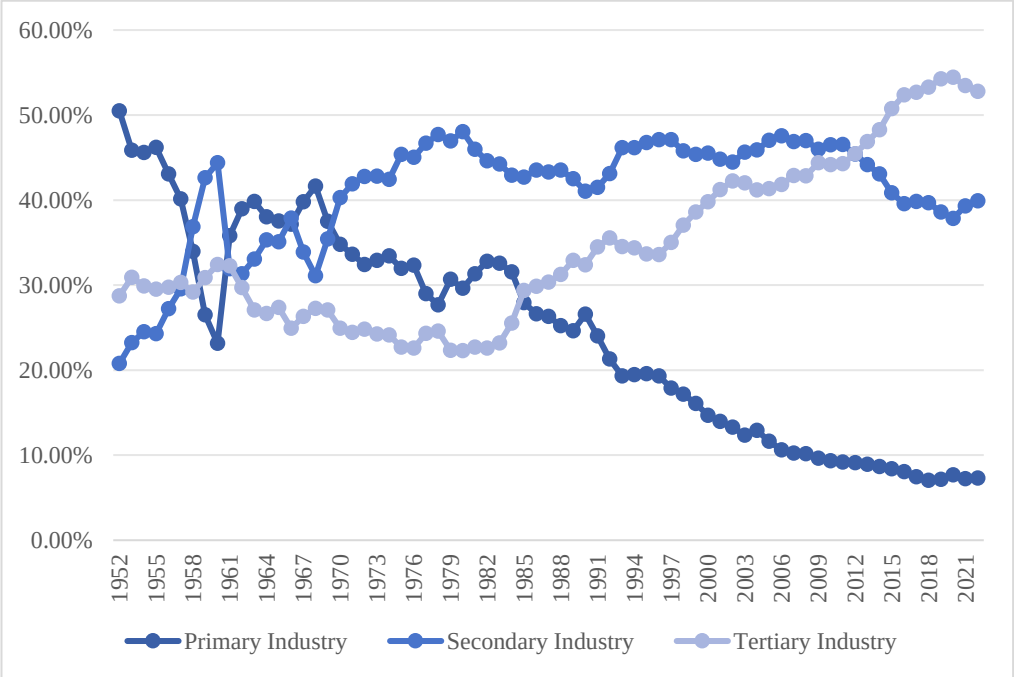


**Fig.1** The Composition Ratio of the Three Industries in Gross Domestic Product (GDP) from 1952 to 2022 (%)

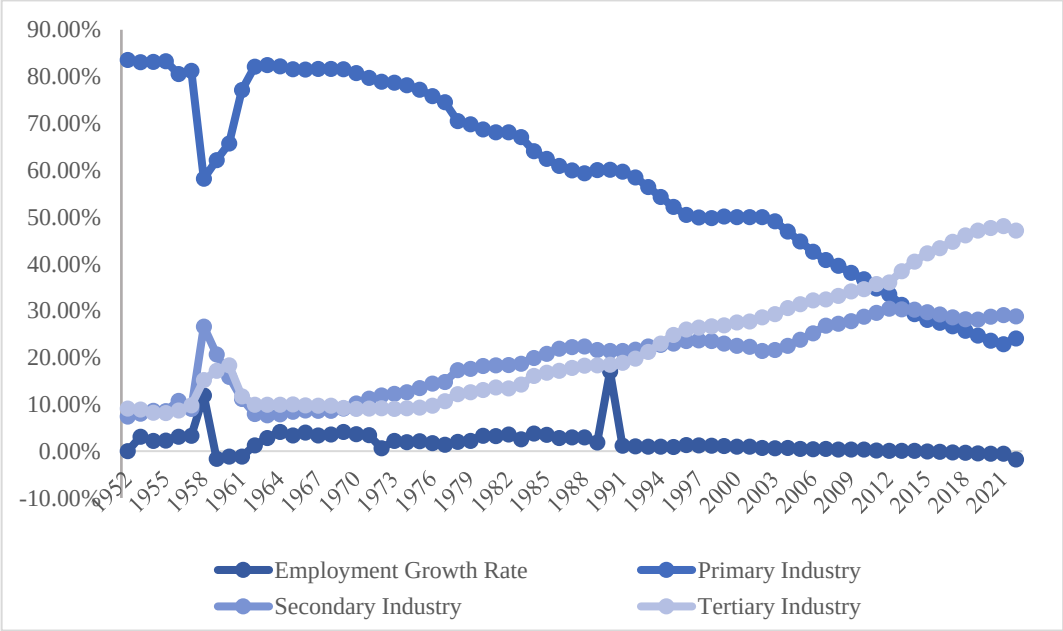


**Fig.2** Employment Growth Rate and the Composition Ratio of the Three Industries from 1952 to 2022 (%)

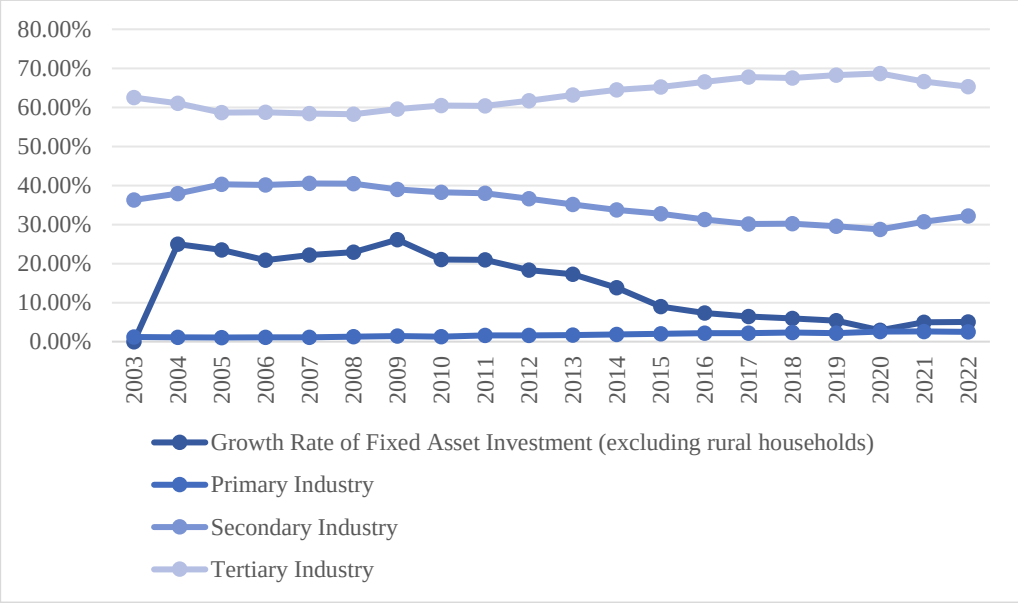


**Fig.3** Annual Growth Rate of Fixed Asset Investment (excluding rural households) and the Composition Ratio of the Three Industries from 2003 to 2022 (%)

Based on the changes in the proportion of GDP composition across three industries from 1952 to 2022, as shown in Figure 1, this period can be roughly divided into three stages: the agricultural society from 1952 to 1969 where the primary industry dominated, the industrial society from 1969 to 2012 where the secondary industry dominated, and the modern society from 2012 to 2022 where the tertiary industry dominated.

(1) The agricultural society was typically a self-sufficient natural economy, where labor directly acted upon land (natural resources) and natural forces to create wealth. The improvement of labor skills mainly came from practical experience and summarization, and the development of handicraft industry was an important supplement to the agricultural economy. From 1952 to 1969, in terms of China's GDP composition across three industries, except for fluctuations in individual years due to special events (such as natural disasters), the primary industry maintained the highest proportion. By 1969, the proportion of the secondary industry (35.42%) gradually approached that of the primary industry (37.52%), and began to exceed it in 1970 (40.27% and 34.80% respectively).

Throughout this period, the tertiary industry developed with gentle fluctuations, with its GDP proportion fluctuating within an 8% range, reaching its highest at 32.43% (1960) and lowest at 24.94% (1966). Due to these mild fluctuations, it better illustrates the patterns of effective utilization and transformation of factors in the primary and secondary industries.

Based on this, according to the GDP proportion relationships among the three industries, this period can be further divided into three stages. The first stage was from 1952 to 1957, during which the secondary industry's GDP proportion was not only far below that of the primary industry but also lower than the tertiary industry. By 1957, the GDP proportions of the three industries were 40.13%, 29.55%, and 30.32% respectively. The second stage was from 1957 to 1965, during which the secondary industry's GDP proportion exceeded that of the tertiary industry and gradually approached the primary industry (except for the three years of natural disasters starting from 1960, which mainly affected the primary industry). The third stage was from 1965 to 1969, during which the secondary industry's GDP proportion exceeded the tertiary industry and gradually approached the primary industry with occasional surpassing. The GDP proportions of the primary and secondary industries were 37.55% and 35.09% respectively in 1965, and 37.18% and 37.88% respectively in 1966.

From 1952 to 1969, the employment composition ratio across the three industries remained largely unchanged. The primary industry accounted for over 80% of employment, while the secondary and tertiary industries each maintained approximately 10% of the workforce. Combined with the analysis of GDP composition changes across the three industries, this period represents a typical agricultural society. Its main

characteristics include direct labor on work objects or the use of simple tools on work objects. The products constituting wealth were primarily basic products formed through direct labor on work objects or primary industrial products created through simple processing of basic products.

(2) Industrial society is a socio-economic formation dominated by large-scale specialized social production centered on the use of large-scale machinery, characterized by advanced science and technology and improved production efficiency. The primary pathways for economic growth include the enhancement of labor efficiency, technological upgrades and efficiency improvements of machinery/equipment, optimal matching between labor and machinery (technology), as well as effective utilization of natural resources (land, particularly raw materials) and resource integration.

From 1969 to 2012, China was mainly in an industrial society phase, characterized by the secondary industry's dominant position in the national economy, maintaining the largest share of GDP. Starting from 1969, when the primary and secondary industries had similar GDP shares, the secondary industry's share rose from 35.42% in 1969 (while primary industry was 37.52%) to 40.27% in 1970 (primary industry at 34.80%), and continued increasing to 48.06% in 1980. It then began to decline, reaching a bottom of 41.03% in 1990, after which it slowly rose again, hovering around 45% until 2012 (45.42%).The primary industry has been declining since 1968, with its GDP share dropping from 41.64% in 1968 to 9.11% in 2012, and continued to decline thereafter. During the early stages of Reform and Opening-up, the implementation of the household responsibility system in rural areas liberated agricultural productivity. The primary industry's GDP share briefly increased from 27.69% in 1978 to 32.57% in 1983, but subsequently declined continuously, reaching 7.30% in 2022.The tertiary industry's GDP share, after a long period of fluctuation, began steadily rising from 1980 (22.34%) and reached 52.78% in 2022.

The entire industrial social formation from 1969 to 2012 can be roughly divided into three phases:The first phase was from 1969 to 1983. During this period, the tertiary industry's proportion of GDP continued to hover and slightly declined; the secondary industry's proportion of GDP continuously increased but slightly decreased in the later period (1980-1983), which was absorbed by the primary industry; correspondingly, the primary industry continuously declined but slightly increased in the later period (1980-1983). This phase completely conforms to Petty-Clark's labor transfer theory, and it seems that only this phase in China's entire industrialization process follows this pattern.The second phase was from 1983 to 2002. The changes in GDP composition during this period were: continuous decline in the primary industry, fluctuation in the secondary industry, and the tertiary industry began to gain momentum with continuous growth.The third phase was from 2002 to 2012. The changes in GDP composition were basically similar to the second phase, except that the growth rate of the tertiary industry slowed down and showed a hovering upward trend.

From 1969 to 2012, the changes in the proportion of employment across the three industrial sectors were similar to the changes in GDP composition throughout the industrial society. During this period, the proportion of primary sector employment continuously declined, while the proportions of secondary and tertiary sector employment steadily increased. In 1994, the employment share of the tertiary sector reached 23% (while the secondary sector was at 22.70%), surpassing the secondary sector for the first time. By 2011, the tertiary sector employment share reached 35.68% (while the primary sector was at 34.74%), exceeding the primary sector. This indicates that after 1994, there was a net transfer of labor force from the primary sector to the tertiary sector.

Throughout China's industrialization process, industrial technology has consistently been in a state of technology import, learning, absorption, and imitative innovation. The dominant position of the secondary industry has been unstable, especially in the later period (after 2002), when the GDP proportions of secondary and tertiary industries were comparable, making similar contributions to economic growth.

Similar to the industrialization process in Western developed countries, China's industrialization has been characterized by high input, high consumption, high emissions, and low efficiency in resource utilization. The negative effects of industrialization are manifesting in various aspects: waste pollution, global warming, water depletion, land desertification, flash floods, excessive PM2.5 levels, species extinction, etc. The destruction of the natural environment and the abuse of natural resources by industrialization have severely hindered economic growth.

Based on this, since 2002, China has actively explored countermeasures to address environmental degradation, strengthened environmental governance, supported and encouraged high-tech development, accelerated the transformation of economic growth patterns, and proposed concepts of low-carbon, green, shared, and high-quality development, actively promoting the process of social and economic modernization.

(3) Modern society is an economy-driven society based on technological production. Its notable characteristics include modern service industries centered on scientific and technological research and development, productive services, and financial services becoming the main drivers of economic growth, high-tech industries becoming the leader of economic development, and high-quality development permeating all aspects of economic development. In 2012, the tertiary industry accounted for 45.46% of GDP, while the secondary industry accounted for 45.42%. The tertiary industry began to surpass the secondary industry, becoming the dominant force in economic growth. Subsequently, the gap between the two continued to widen. In 2022, the tertiary industry accounted for 52.78% of GDP, while the secondary industry accounted for 39.92%.

In 1994, the employment share in the tertiary industry reached 23%, surpassing the secondary industry (22.70%). Later, in 2011, it exceeded the primary industry (35.68% versus 34.74%), and continued to rise, gradually widening the gap. By 2022, it reached 47.15%, while the secondary industry's employment share was 28.77% and the primary industry's was 24.08%.

Since 2012, the employment share in the secondary industry has remained relatively stable, hovering around 29% with fluctuations not exceeding 2%. The primary industry's employment share has steadily declined, falling below the secondary industry in 2014 (29.30% for primary and 30.20% for secondary), and dropping to 24.08% by 2022.

Regarding the composition of total fixed asset investment (excluding rural households) from 2012 to 2022, the tertiary industry's share has consistently remained around 65%, the secondary industry's share has stayed around 33%, and the primary industry's share has remained around 1%.

Since 1949, China began its economic development from scratch and has spent over 70 years completing the historical transition from an agricultural society to an industrial society and entering the modern society - a process that took Western countries more than 200 years. China has become the world's second-largest economy and has established a relatively complete modern industrial system, as well as a relatively independent scientific and technological system centered on wireless communication network technology, e-commerce network technology, and aerospace technology.Unlike China's entire industrialization process, where industrial technology was consistently in a state of technology import, learning, absorption, and imitative innovation, upon entering modern society, China's economic development no longer has a reference system. It can only rely on self-reliance and independently explore the path of high-quality economic development.

**2.4 Drivers of Economic Growth**

Economic growth stems from the creation and accumulation of wealth. Wealth creation depends on labor and technology (including tools and machinery). When labor-produced products can only meet one's own needs, it threatens human survival and development. Only when surplus products from labor emerge can the normal survival and development needs of humanity be met.Wealth accumulation depends on the surplus of labor products, which can be divided into current consumption and savings. Current consumption meets the survival and development needs of people other than workers, while savings meet future human survival and development needs. Accumulation prepares for future wealth creation, such as training reserve labor force and technological research and development.

In pre-agricultural societies, land (natural resources, including land and its attachments) was abundant, and labor was the only factor in wealth creation. The creation and accumulation of wealth depended on improvements in labor efficiency, enhancement of labor skills (the use of simple tools is categorized as labor skills), and the combination of labor quantities under social division of labor.In agricultural societies, population increased rapidly, with population growth rate far exceeding economic growth rate. Land development reached its limit and became a scarce commodity and an important factor in wealth creation. Economic growth depended not only on the optimal allocation of labor but more importantly on land development and rational utilization,

optimal land allocation under specialized division of labor, optimal allocation between labor and land, and the development of handicrafts (application of simple tool technology in the early stages of science and technology).

In industrial society, with unprecedented population growth, economic growth increasingly relies on scientific and technological breakthroughs, with technology becoming an important factor in wealth creation. With the deepening of professional specialization, refined labor division and close collaboration, the diversity of products, and more complex optimization and integration of land, labor, and technology, capital (wealth that creates wealth) - as a scientific and effective integrator of various production factors - has become increasingly prominent in its status and role. Capital, with its scientifically effective organizational function, has become an important element in wealth creation.

In contemporary society, service industries centered on scientific and technological research and development, productive services, and financial services have become the main drivers of economic growth. High-tech industries have become the pioneers of economic development, with high-quality development permeating all aspects of economic development. The complexity of science and technology, the complexity of factor optimization combinations, the complexity of product series and production systems, and the complexity of production service systems form a complex network of the entire socio-economic system, where capital's factor organization function is insufficient to handle such complexity. Only breakthrough technology applications in high-tech industries, network technology breakthroughs in e-commerce-based network economy, environmental optimization and remediation in green economy, and efficient utilization and precise combination of factors in digital economy are the sole sources of economic growth.

The driving force of economic growth stems from population growth and the impetus of optimized resource allocation in an open economy under human survival and development pressures, as well as technological expansion. Under resource constraints, explosive population growth leads to serious human survival crises.

In agricultural societies, the main way to resolve this crisis was through warfare. On one hand, wars caused casualties and reduced population, which could alleviate human survival pressure. More importantly, through the plunder of resources and wealth in warfare, societies could meet their survival needs. Examples include the wars between European countries in the Middle Ages and the historical southward plundering by northern ethnic minorities in China.

In industrial society, breakthrough developments in science and technology provided vast space for resource optimization and wealth creation. Focusing on economic construction could basically meet the pressure of human survival and development brought by population growth. Due to the cyclical nature of technological development and increased difficulty in new product development, the economy showed cyclical development. Once technological stagnation and economic crisis occurred, the pressure on human survival and development increased. Humanity's conventional approach to resolving these pressures remained through warfare, as evidenced by the technological stagnation under the traditional scientific and technological system in the 1930s, the worldwide economic crisis beginning in 1929, and the subsequent Second World War.

In modern society, the high development of science and technology, and the emergence of new economic forms such as internet economy and digital economy have brought strong momentum to economic growth. Human survival crises have been resolved, and the pressure on human survival and development has been effectively alleviated. Similarly, technological stagnation and economic crisis under the modern scientific and technological system have emerged, and humanity faces the danger of a third world war. War brings massive destruction to Earth's resources and wealth; it endangers human life, directly threatens human survival and development, and cannot truly solve the survival crisis brought by explosive population growth.

Economic growth is the fundamental way to meet human survival and development needs. Accelerating the pace of wealth creation and producing more and better products is the fundamental solution to the pressure of human survival and development. Under enormous population pressure, China made its own choices. In the early stages of China's industrialization, on one hand, the population grew rapidly - from 540 million in 1949 to

830 million in 1970, exceeding 1 billion in 1981, creating massive survival pressure. On the other hand, everything needed to be rebuilt, and economic construction tasks were heavy. To resolve this contradiction, China actively sought balance between accumulation and consumption, made scientific decisions, and while focusing on developing heavy industry, promoted agriculture, light industry, and heavy industry simultaneously, initially establishing an industrialization system. In the early stages of reform and opening up, China strictly implemented family planning policies to control population growth while actively promoting economic system reform, liberating productive forces, accelerating the pace of wealth production and accumulation, and striving to meet human survival and development needs.

## 3 Discussion on Economic Cycle Growth

The harmful effects of economic crises are evident, resulting in massive waste and loss of resources. Generally, economic growth is a long-term continuous process. In practice, the economy shows cyclical growth characteristics. Marx attributed this to technological progress and the cycle of fixed asset renewal and replacement. Market economic theory considers it to be caused by market failures leading to resource misallocation, and proposes a package of solutions. However, the subsequent economic stagflation indicates that these solutions cannot solve the problem. Other theoretical analyses and solutions are proposed within the framework of market economic theory, and their effectiveness remains to be examined.

The cyclical nature of technological development does not equal the cyclical nature of economic growth. The cycle of individual technologies (products) can be replaced by continuously emerging new technologies and new products centered on these technologies, which can eliminate economic stagnation caused by cyclical technological development and promote long-term economic development.

In the production process, improved labor efficiency, technological advancement, and economical use of natural resources can increase output and social wealth. Effective integration of factors (resources) at enterprise (industry, regional or national) level can save resources, improve comprehensive resource utilization efficiency, and promote economic growth. Under unified (or open) markets, resource optimization will fully leverage resource advantages, enhance overall production efficiency, and promote economic growth. In practice, resource integration and optimization is a continuous process. Integration refers to the comprehensive utilization of existing enterprise resources; optimization builds upon existing resource integration, complementing strengths and weaknesses through competitive exchange, mergers, or cooperative development in unified (or open) markets to achieve higher-level resource allocation.

Theoretically, from a resource optimization perspective, long-term economic growth goals can be achieved through technological and production expansion. In practice, enterprises focus on price competition to maximize profits, leading to directional resource concentration and resulting in economic crises of overproduction. Nations focus on capital risk investment to maximize returns, neglecting capital's role in resource integration and the role of science and technology in wealth creation, resulting in resource misallocation, weak technological expansion, and cyclical economic growth.

### 3.1 The Price Measurement Function Has Been Alienated into an Important Means of Wealth Distribution

Price, as a benchmark measure for commodity exchange, should possess objective, fair, and just characteristics. The objectivity of commodity prices demonstrates the objective existence of resources consumed in producing goods; the measurement of this objective existence should be fair and just, unaffected by any other external factors. From the perspective of optimal resource allocation, the benchmark measure for commodity exchange should be determined by the technical and economic relationships between the elements constituting the commodity under average social production levels.

In classical economics, exchange value initially measured the proportional or relational quantities between different use values, and later referred to the exchange relationship between commodities and money. Whether dealing with use value or commodities, there exists the issue of utility comparison. Utility is a psychological sensation, and different people experience different levels of satisfaction from using the same commodity, thus

having typical subjective attributes. Combined with the influence of resource scarcity (rarity makes things precious), this exchange value determination based on competition lacks objective, fair, and just characteristics.

Equilibrium price theory originates from classical economics' market competition determining exchange value, where market prices are established through the equilibrium of supply and demand competition. Based on this, resource optimization is achieved through price competition, yet prices still lack objective, fair, and just characteristics. Moreover, theoretically, it is logically inconsistent to claim that optimal resource allocation can be achieved through price competition based on equilibrium prices formed by competition between supply and demand that lacks objective, fair, and just characteristics.

The competitive price mechanism leads to serious deviations between commodity prices and values, resulting in businesses focusing more on competitive behavior, resource misallocation, and insufficient production motivation, among other issues. Insufficient competition leads to excessive concentration of wealth and moral hazards, fundamentally affecting the effective operation of competitive mechanisms and normal exchange processes. More importantly, the competitive mechanism of commodity value determines that wealth growth will become detached from wealth creation, and fluctuations in commodity values cause wealth to flow without compensation between trading parties, such as the portion of auction prices exceeding the actual value of auctioned items, and demographic dividends in international trade, etc. Price has become an important means of wealth distribution.

The alienation of pricing mechanisms harbors significant risks. In the basic production model $\pi = pq - (F + V)$, where $\pi$ represents profit, p denotes price, q stands for output, F indicates fixed costs, and V signifies variable costs, the pathways to profit maximization fundamentally involve raising prices, increasing output, or reducing costs. When prices are determined through competitive mechanisms, enterprises tend to prioritize price competition over other strategies. Compared to output expansion and cost reduction, price competition often appears as a more accessible route to achieving (or exceeding) profit maximization targets.When price competition becomes the dominant approach to profit maximization, it triggers multiple systemic distortions: resource misallocation within enterprises, technological stagnation, weakened incentives for developing core competencies, moral hazards in transactions, excessive wealth concentration through exchange outcomes, cyclical economic growth patterns, overproduction crises, and a cascade of associated social problems.

### 3.2 Technology Alienation into Capital

Scientific technology is the primary productive force and has been the greatest driving force for economic growth since the industrial society. Science and technology permeate the entire process of wealth creation and have become the most important production factor after labor and land. As a crucial production factor, scientific technology first appears in the form of machinery equipment or combinations of machinery (such as production assembly lines), directly acting on labor objects to create wealth①.Meanwhile, in wealth creation, workers improve their productivity through learning scientific and technological knowledge, enhancing labor skills, and increasing labor efficiency. Technological progress itself will improve productivity through technical upgrades of machinery and production tools, enhancing their utilization efficiency. Technical improvements in production processes will improve product quality, reduce defect rates, and increase resource utilization efficiency. Technical modifications of raw materials and other resources, along with the development of new materials, facilitate comprehensive resource utilization and optimization, among other benefits.

The alienation of technology into capital first appeared in classical economics through Say's theory of three factors of production and his production cost theory. Say proposed the famous trinity formula, replacing technology with capital in wealth creation processes, providing productive services, and obtaining interest income as compensation for its consumption. Subsequently, many market economy theories built upon this foundation to explore economic models, laws, and theories, such as the Cobb-Douglas function, total factor productivity, and endogenous growth theory.

① The essence of science and technology lies in the discovery or invention of the relationships between things in human productive practice, and applying these discoveries or inventions to production practice. It is the accumulation of human labor. Therefore, science and technology, as the primary productive force creating wealth, is not in conflict with labor as a source of wealth creation.

The substitution of technology with capital in wealth distribution exaggerates the functional role of capital, distorts distribution theory mechanisms, and further affects enterprise resource optimization allocation and production processes, controlling the methods and direction of wealth creation. Competitive wealth realization accelerates the pace of capital alienation, becoming an important tool for wealth distribution①. Meanwhile, excluding scientific technology as a crucial production factor from wealth distribution functions means that investments in scientific and technological research and invention receive no returns. This leads to a lack of motivation for technological innovation, insufficient economic growth momentum, and results in cyclical economic growth.

### 3.3 The Capital's Resource Organization Function Has Been Alienated into a Wealth Distribution Function

Enterprises are the basic units of profit-oriented microeconomic activities and wealth creation, serving as a mechanism for capital to organize resource allocation. Classical economics positions capital as wealth that creates wealth. The relationship among enterprise, capital, and resources is: enterprises are capital aggregators and resource organizers, creating wealth through capital-organized resources. Generally, enterprises should follow the laws of economies of scale and scope, cultivate core competencies, optimize resource allocation, expand orderly, and achieve long-term economic growth.

Under the market price competition resource allocation mechanism, capital's rate of return has increased, becoming the major contributor to enterprise profit maximization goals. Capital will dominate the scale and direction of resources. Capital replaces technology in wealth distribution, shifting enterprises' focus from technological advancement for wealth creation to market price competition for profit maximization. This shift results in weak economic growth, as seen in the 'technology-industry-trade' debate.

Under the market price competition resource allocation mechanism, as capital returns increase, they become the main contributor to enterprise profit maximization goals, with capital dominating resource scale and direction. Capital replaces technology in wealth distribution, shifting enterprises' resource allocation focus from technological advancement for wealth creation through production processes to market price competition for wealth distribution to achieve profit maximization goals, resulting in weak economic growth, as seen in the "technology-industry-trade" debate.

In the production process, this goal-oriented shift in resource allocation focus leads to disorderly enterprise expansion, resulting in survival at a low level lacking core competencies and weak economic growth②. Examples include oil refining companies and steel enterprises engaging in agricultural products operations, and machinery manufacturing enterprises developing real estate.

The alienation of capital leads to both the alienation of enterprises' profit maximization pathways and the alienation of enterprises themselves. Enterprises transform from basic economic units of wealth creation to economic organizations participating in wealth distribution through wealth creation, and further to social organizations directly participating in wealth distribution. For instance, enterprises directly engage in short-term securities market trading, with investment departments becoming their largest profit source.

Resource allocation is a dynamic process. The alienation of price, technology, and capital leads to shifts in enterprise resource allocation focus, changes in resource scale and direction of product production, and product structure imbalances. This results in the coexistence of excess and scarce products meeting demand. The market price competition mechanism for wealth realization intensifies this process, leading to economic cycle growth.

## 4 Conclusions and Implications

This paper explores economic growth and its driving forces from the perspective of resource allocation, proposing the core prerequisites for economic growth, sources of growth momentum, and fundamental causes of economic cycles. The research conclusions are as follows:

① The competition mechanism based on the theory of evolution is a reactionary force against the progress of human civilization.

② This gives rise to the diversification theory of risk-sharing and the theory of the business life cycle.

First, in the historical process of wealth creation, production factors have naturally transitioned from labor alone, to labor and land, and then to labor, land, technology and capital. This transition follows objective laws in both productive forces and the factors constituting physical products. China's economic development over 70+ years since its founding has fully demonstrated this objective law of factor transition.Second, based on the four factors in wealth creation, under resource allocation, the prerequisites for economic growth lie in factor utilization efficiency and factor combinations that align with the technical-economic relationships between factors constituting products. Economic long-term growth can only be achieved by improving factor quality, optimizing factor combinations, enhancing factor allocation, and stimulating factor potential to produce more, higher-quality and newer products, thereby accelerating wealth creation and accumulation.Third, the driving forces of economic growth come from population growth and the thrust of optimizing resource allocation in an open economy under the pressure of human survival and development, as well as technological expansion.Fourth, the root cause of economic cycles lies in the alienation of price's measurement function into a means of wealth distribution, the alienation of technology into capital, and the alienation of capital's resource organization function into a wealth distribution function. These alienations of price, technology, and capital lead to shifts in enterprise resource allocation focus, changes in resource scale and direction of product production, product structure imbalance, and coexistence of product surplus and scarcity. The market price competition mechanism for wealth realization intensifies this process, resulting in cyclical economic growth.

The research conclusions of this paper provide important references for breaking through economic cycle growth and achieving sustainable economic development. The realization paths of micro-enterprise objectives and macro-economic objectives should be unified in optimizing resource allocation. Enterprises focus on cultivating core competitiveness in product quality and enterprise value enhancement to maximize profits, leading to improvements in factor quality, especially in labor skill levels and breakthrough technological innovations, improvements in factor combinations and quantitative proportional relationships, resource conservation, and enhanced resource allocation efficiency, achieving supply-demand matching. The state focuses on economic structural optimization for economic growth, adjusting inter-industry factor inputs or factor allocation based on allocation efficiency, incentivizing and guiding factors to flow from low-efficiency industries to more efficient ones, balancing marginal productivity across different industries, improving factor reallocation efficiency, and enhancing overall economic efficiency. With the digital wave of artificial intelligence, big data, cloud computing, etc., the measurement of factor combinations and quantitative proportional relationships will become more precise, objective, and scientific, increasingly conducive to optimal resource allocation, breaking through economic cycle growth, and achieving high-quality sustainable economic development.

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