



# The Profound Changes Unseen in a Century: The Perspective of Overlapping Effect of Technological Revolution Cycle and Political & Economic Thought Cycle

Zhijian Hu<sup>a,\*</sup>, Mingxi Zhang<sup>a</sup>, Xinyue Zhu<sup>a</sup>

<sup>a</sup> Chinese Academy of Science and Technology for Development, Beijing 100038, China

## Abstract

The waves of technological revolution can lead to great differences in the economic and social structures of countries and have a destructive impact. The choice of political and economic thoughts can amplify or inhibit such differentiation and impact. Over the past 100 years, humankind has undergone three technological revolutions, and the mainstream political and economic thoughts have experienced a cycle from classical liberalism to various types of anti-liberalism and finally to neoliberalism. In the two liberal periods, the overlap of liberalism and a technological revolution caused sharp contradictions between the rich and the poor, leading to profound economic adjustment and great political and social turmoil worldwide. In the non-liberal period, however, the overlapping effects were relatively mild. Currently, the world is facing similar trends and risks as during 1914-1940. Whether humankind will repeat the same mistakes merits attention and vigilance. This study argues that it is necessary to oppose unilateralism, uphold multilateralism, and advance globalization and free trade under the concept of collaborative development and shared prosperity, as well as explore comprehensive and sustainable development. These are of great significance for human society to prevent risks, obtain advantages and avoid disadvantages, and maintain world peace and development.

## Keywords

profound changes unseen in a century; technological revolution; political and economic thoughts; polarization between the rich and the poor; risk response

\* Corresponding author at: [huzj@casted.org.cn](mailto:huzj@casted.org.cn)

## 1. Introduction

Today, the world is experiencing profound changes unseen in a century<sup>1</sup>. How these once-in-a-century changes are understood is a hot and difficult topic among both Chinese and international researchers. This study analyzes the relation between these once-in-a-century changes and the overlapping of technological revolution cycle and economic thought cycle as well as their possible evolution trends. The analysis results provide implications and reflections on coping with the possible risks and challenges in the future.

In this study, “profound changes unseen in a century” refer to the trends of great turmoil and adjustment that have recurred today in the global political and economic order, which are close to profound changes that happened nearly 100 years ago. Specifically, political populism, economic nationalism, trade protectionism, anti-globalization, and other political and economic phenomena are resurging worldwide. These profound changes are an inevitable reflection of great changes taking place in the objective basis of the human social structure. The resurgence of these changes indicates that today’s human social structure is similar to that of 100 years ago.

The changes in human social structure manifest in various aspects. This study investigates the changes in the income distribution structure or polarization between the rich and poor, because the latter reflects the differentiation in the economic foundation of social classes, and changes in the economic foundation will be, sooner or later, reflected in the superstructure. There is a wide and intricate variety of factors influencing the evolution of the income distribution structure in human society. Since it is impossible to analyze these factors comprehensively, we use only two factors – that is, technological revolution and economic development thoughts, as well as the overlapping effects of these two factors – to observe their relation with the historical evolution of the rich-poor structure in human society in the past 100 years. Then, we present a brief comparative analysis.

We choose these two factors because of the limitation of our research fields and the great importance of the two factors. Technological innovation involves creative destruction, of not only the economic structure but also the social structure. The winner-take-all rule leads to polarization between the rich and the poor. A technological revolution is the most drastic and fundamental technological innovation, and it also brings about the most intense contradiction between the rich and poor. The political and economic thoughts focus on efficiency and fairness, and the choice of a development path is directly reflected in the structure of social income distribution. The overlapping effects of these two factors can either cancel out each other or doubly magnify them.

The remainder of this paper is organized as follows. Section 2 analyzes the creative destruction characteristics of technological revolutions and introduces the division of the technological revolution cycle since industrialization. The cycle of global political and economic thoughts in the past 100 years is described in section 3. Section 4 discusses the rich-poor polarization brought about by the overlapping of these two factors, followed by a comparison of the consequences. Subsequently, the reflections and implications on coping with those profound changes are presented in section 5. Section 6 presents the conclusions.

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<sup>1</sup> Xinhua Headlines: Changes, challenges and choices -- China is driven by the path it takes. 2019. 8. [http://www.xinhuanet.com/english/2019-08/28/c\\_138345879.htm](http://www.xinhuanet.com/english/2019-08/28/c_138345879.htm)

## 2. Creative Destructiveness and Cycle Division of Technological Revolutions

Technological innovation is the source of economic development. Without technological innovation, economic development will fall into a stagnant and relatively static equilibrium trap. Entrepreneurs create new production functions through technological innovation. Through the market's "natural selection", differentiation and differences are formed among enterprises, industries, and economic sectors in terms of efficiency and competitiveness, which destruct the old economic structure. As a result, the equilibrium is broken, thereby achieving economic development. The competition between enterprises urges them to learn and imitate new technologies and production functions from each other. As time passes, different enterprises' production functions converge again, and economic development tends to enter a new equilibrium. The process by which the old economic equilibrium collapses and gradually develops into a new economic equilibrium constitutes an evolution cycle of technological innovation (Schumpeter, 1939; Nelson and Winter, 1982; Perez, 2003).

An evolution cycle of technological innovation can be simply divided into two stages. The first stage is characterized by the outbreak and growth of leading technology groups and emerging industries, and the second stage is characterized by their maturity and proliferation. In terms of economic development, the first stage witnesses the rapid growth of emerging industries and the expansion of existing industries. In this stage, the economy is prosperous and the rate of polarization between the rich and poor increases; however, economic prosperity conceals these contradictions and conflicts. In the second stage, the increasing maturity of the emerging industries and the structural adjustment of the old industries lead to economic depression and slowdown in the rich-poor polarization; however, the economic depression highlights the contradictions accumulated earlier. Economic prosperity and depression are two parts of a complete technological innovation cycle, like the front and back of a coin (Schumpeter, 1939). Prosperity is the cause of depression, and depression is the result of prosperity. The greater the expansion in prosperity, the more profound the adjustment in the depression later. The degree of technological innovation determines the extent of expansion in prosperity and polarization between the rich and the poor, profoundness of adjustment in the depression, intensity of social contradictions, and wavelength of the cycle. The so-called Kondratyev wave is the longest observable technological innovation cycle, and the technological innovation that stimulates this cycle is the most drastic and fundamental and has the greatest impact on social differentiation. This type of technological innovation is called a technological revolution.

From the perspective of the dissipative structure theory (Ilya and Stengers, 1984), the essence of a technological revolution is to adopt new technologies or methods that are more efficient than old ones. In this way, matter and energy with higher density and productivity can flow continuously to all domains, sectors, subjects, and even individuals in human society to foster an entropy-reduced, orderly, and structurally evolving human social system. A technological revolution results in the formation of a new order through new, significant economic and social divisions and disparities arising from random fluctuations. Such randomness and significant divisions and disparities cause great instability and destruction to the economic and social structures, thus imposing all-around impacts on the politics, economy, and society. This challenges the governance capacity of a country and even the world.

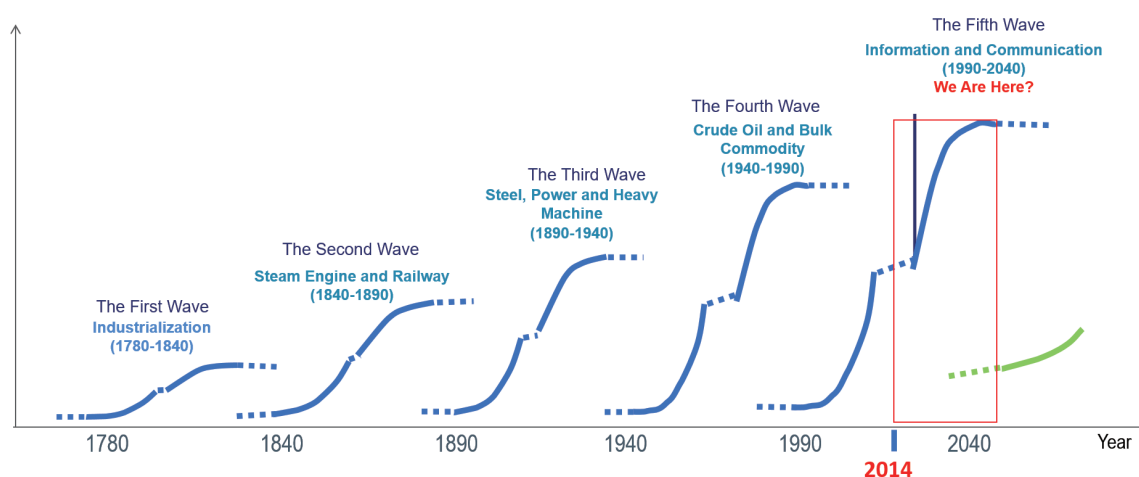
According to Kondratieff's long wave theory (Kondratieff, 1935) and studies of evolutionary

economists such as Freeman and Soete (1997), Perez (2003), and Schot and Kanger (2018), the world has experienced five technological revolution cycles since 1780 (Table 1 and Fig. 1).

**Table 1 Five techno-economic cycles**

Period	Popular name	Core country or countries	New technologies and new or redefined industries' investment	New or redefined infrastructures
From 1780 to 1840	Industrial production and machinery	The U.K.	Wrought iron and cotton	Canals and waterways
From 1840 to 1890	Age of steam and railways	The U.K. and spreading to the Europe and the U.S.	Iron and coal mining	Railway and steam ship
From 1890 to 1940	Age of steel, electricity, and heavy chemicals	Germany and the U.S. overtaking the U.K.	Steel and electrical equipment industry	Steel rail and steel ship
From 1940 to 1990	Age of oil, automobiles, and mass production	The U.S. and spreading to Europe	Oil, natural gas, and composite materials	Highway, airport, and radio
From 1990 to 2040 (?)	Age of information and telecommunications	The U.S. and spreading to Europe and Asia	Information, data, and chips	Internet, wireless network of the new generation, and Internet of Things

Source: Freeman and Soete (1997), Perez (2003), and Schot and Kanger (2017).



**Fig. 1 Five techno-economic cycles**

Note: Adapted from Freeman and Soete (1997), Perez (2003), Schot and Kanger (2017).

This study focuses on two technological revolution cycles that occurred in 1890-1940 and 1990-2040. These two cycles not only brought about great changes in eco-technical systems but also triggered two industrial revolutions – electrification and informatization. They both opened up a new era of industrialization for human society, and their huge impacts on human society are very similar in principle. Therefore, this study considers technological revolution as an important factor for the recurrence of the profound changes unseen in a century.

### **3. Cycle of Political and Economic Thoughts and Evolution of the World Pattern in the Past 100 Years**

Similar to the technological revolution cycle, political and economic thoughts have also experienced a cycle in the past 100 years. From the 1890s to 1940, classical liberalism characterized by globalization prevailed. Economic globalization, that is, international economic integration and free trade, is generally regarded as a matter of course in economic development, and it is an everlasting objective fact as well. Open trade relations, international finance, barrier-free international investment and immigration, and the common monetary order under the gold standard were the core organizing principles globally accepted during this period. This period is called the golden age of economic development (Frieden, 2007).

However, the outbreak of World War I in August 1914 destroyed the foundation of the economic globalization order. After the war, world economic and political leaders tried for many years to restore the order of economic globalization that existed before 1914. This, however, led to the economic crisis of 1929 and great depression of the world economy in the 1930s. Due to the severe economic disaster, countries began to regard economic globalization as a scourge as horrible as fierce beasts and floods, and cut off international economic ties, making themselves closed economies. Various ideologies and beggar-thy-neighbor policies led to a complete collapse of the international order and caused intense conflicts of international political and economic interests, thus triggering the outbreak of World War II.

In the 1940s, classical liberalism was theoretically negated completely before the end of World War II; meanwhile, it was considered the cause of the two calamitous wars. Economic globalization severely differentiated the economic sectors in various countries, causing sharp contradictions between interest groups, classes, and urban and rural areas. The risk and pressure of huge social contradictions and conflicts forced country rulers to shift the pressure and contradictions they faced to other countries. Consequently, the prevalence of populism, protectionism, and nationalism inevitably caused international conflicts and eventually led to a new world war.

Politicians and economists recognized then that globalization was not an objective fact but depended on people's value choices. After World War II, the necessity to explore a new development path to replace the old one under liberalism influence became the consensus. The world embarked on three different deglobalization paths: market intervention based on Keynesianism in Western countries, planned economy in socialist countries, and nationalist economy in developing countries. In the first 20-30 years, these three paths achieved varying degrees of success in the new wave of industrialization in general, especially for addressing rich-poor polarization and economic distribution inequality. In the 1970s, however, all the three paths encountered problems in terms of sustainability of economic development. The Western camp experienced economic stagnation, the socialist camp's economy was inefficient, and countries adopting the nationalism path got into huge foreign debts. Thus, the social differentiation and inequality brought about

by globalization were greatly eased because of deglobalization, but economic inefficiency became a severe issue due to the lack of freedom in economy and trade. Nevertheless, in the post-war history, apart from the U.S.-Soviet Cold War, the intensity of international economic contradictions was greatly reduced, no catastrophic world war occurred, and world peace was maintained on the whole.

In the 1980s, people began to miss the highly efficient economy of the golden age of classical liberalism, and various countries chose to open their doors again. The U.S. and Western Europe gradually resumed liberalism that is the so-called Washington Consensus or neoliberalism. Some developing countries began opening up to the outside world. Socialist countries managed a transition from centralized planned economies to open market economies. After nearly 80 years, globalization returned in the 1990s (Fig. 2). People generally chose to believe that humankind had learned the lessons from the previous round of liberalism and globalization, and thus the new round of globalization would not repeat the same mistakes. People only want globalization and peace, but not international conflicts and wars.

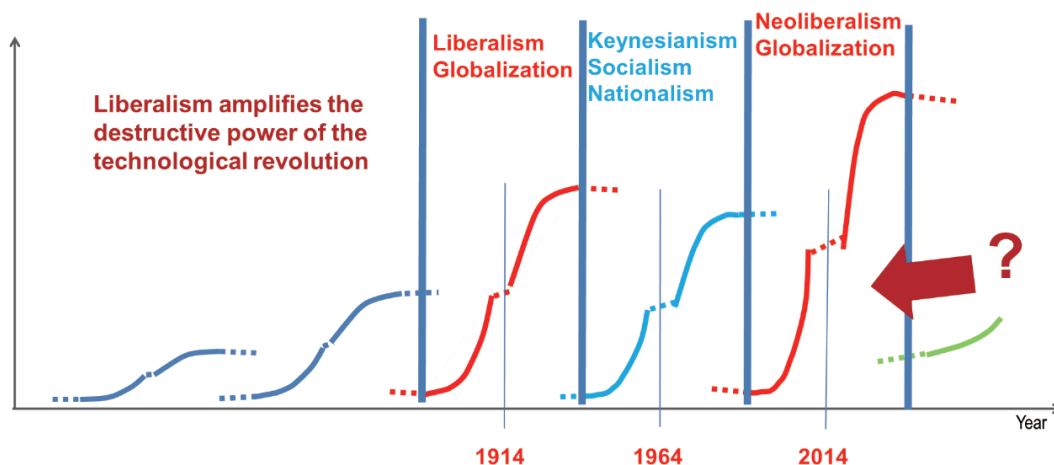
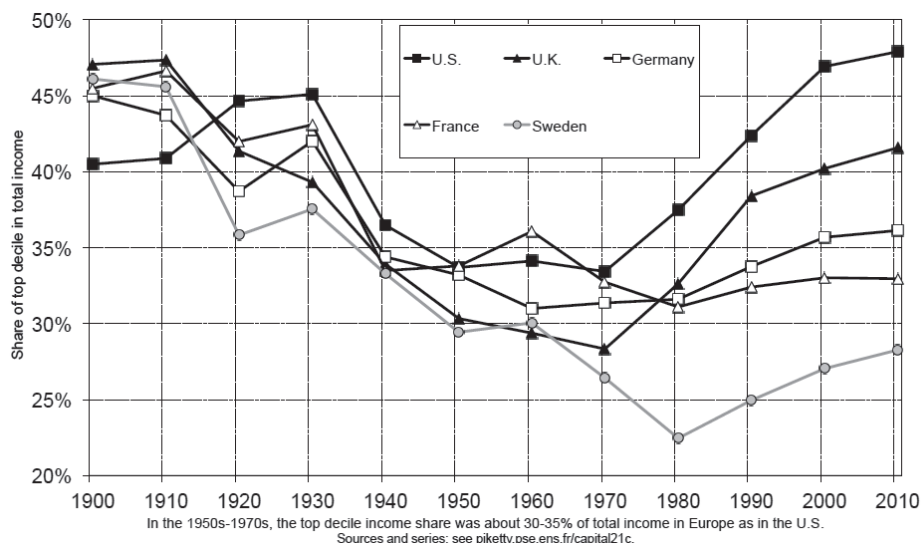


Fig. 2 Economic thought and the cycle of eco-technical systems

However, the outbreak of the 2008 financial crisis eventually shattered the myth that neoliberalism would not bring about a global economic crisis as the classic economic liberalism did. The financial crisis brought about a depression of the global economy and a tremendous downward pressure of adjustment. Economic recovery was weak for nearly a decade. The populism, protectionism, and nationalism that prevailed in the 1920s and 1930s resurrected around the world, giving a sign of the replay of the historical script from 1914 to 1940.

#### 4. Explanation of the Overlapping Effect of Technological Revolutions and Political and Economic Thoughts

According to the previous analysis, the evolution of technological revolutions is roughly synchronous with that of political and economic thoughts, as shown in Fig. 2. Therefore, we now overlap these two factors and conduct a comparative analysis with global rich-poor polarization. The study of Piketty (2016) provides historical data for our comparative investigation.

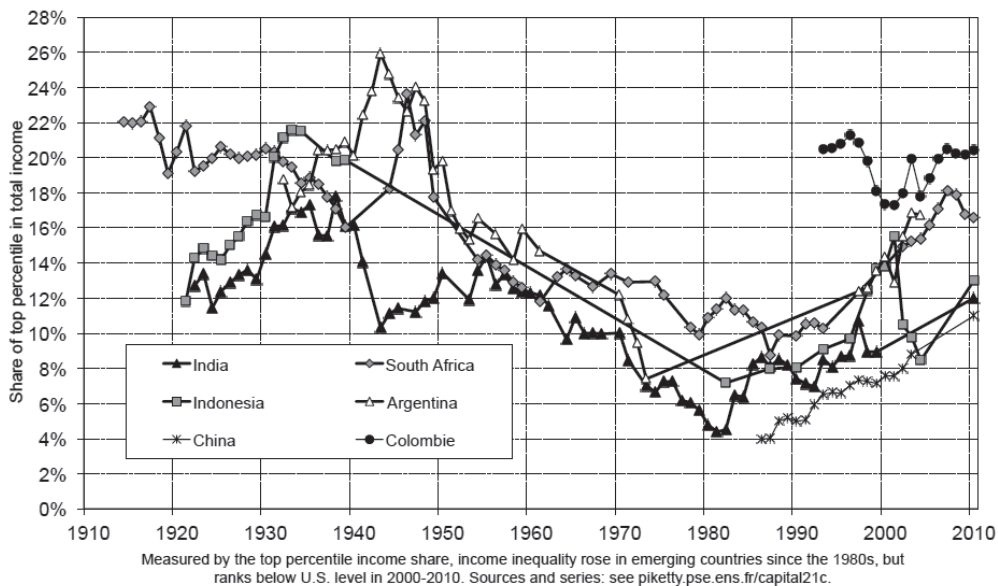


**Fig. 3 The top decile income share: Europe and the U.S., 1900-2010**

Fig. 3 shows the historical evolution of the proportion of the top-10% population's income in the national income of the U.S. and European countries during 1900-2010. Compared with the division of historical stages in Fig. 2, Fig. 3 clearly shows that apart from France and Sweden, rich-poor polarization gaps in Europe and the U.S. in 1910-1940 (a period when liberalism overlapped with a technological revolution) were quite similar to those in 1990-2010 (the second period when neoliberalism overlapped with a new technological revolution), and both gaps in the two periods were greater than those in the period of 1940-1990 when illiberalism overlapped with a technological revolution. Although Piketty's study only has data for 1900-2010 and does not cover the entire historical period presented in Fig. 3, the significant difference in rich-poor polarization is so obvious that our major judgment will not be stirred.

In the two periods of liberalism dominance, there was also a difference in rich-poor polarization between the U.S. and European countries. Before 1914, European countries generally experienced a more intense polarization between the rich and poor than that in the U.S. Since only the major countries had the power to disrupt the world order, this is possibly why the source of turbulence in the world order after 1914 was mainly found in Europe. In 2010 (or before 2014), however, the rich-poor polarization gaps of the U.S. and U.K. were significantly larger than those in continental European countries. This may explain the Brexit votes of the U.K. and election of a new president in the U.S. in 2016. This is also a possible reason why the U.S. adopted unilateralism to launch the trade war against the rest of the world in 2018, setting off a wave of turbulence in the world order.

Although it takes time for technological revolutions and political and economic thoughts taking place in developed countries to spread to developing countries, the shock and impact they bring about are only lagging behind, and the evolution cycles in developing countries will not differ too much from those in developed countries. Fig. 4 shows the proportion of the top-1% population's income in the national income of some major developing countries for 1910-2010. This reflects the general historical trajectory of income inequality in emerging countries. The trends in Fig. 4 are roughly similar to those in Europe and the U.S. in the same period as shown in Fig. 3. This can explain that the historical evolution



**Fig. 4** Income inequality in emerging countries, 1910-2010

trajectory of rich-poor polarization is globally universal and identical. This may be related to the pressure that some developing countries faced in terms of economic nationalism and trade protectionism.

The above analysis clearly shows that the objective foundation of the economic and social structures of rich-poor polarization or social distribution inequality was quite similar in the two 100-year-apart cycles, with an overlap between dominant liberalism thought and a technological revolution. This indicates that the political, economic, and social superstructure fields during the two cycles may also have similar trends. This explanation would inevitably lead people to expect that the future world pattern would show the same trail, as shown in Fig. 5.

A series of phenomena in the present world shows that the trends of the present profound changes are very similar to those of the global changes 100 years ago, and many global political and economic risk factors of 100 years ago are recurring.

First, economic nationalism has become increasingly strong. Years of 1914 and 2014 were midpoints of their respective technological revolution cycles. The world nowadays has entered the depression adjustment phase of the information technology revolution cycle. The world economy has turned from a moderate- and high-speed growth of nearly 6% before the international financial crisis to a decline of about 3%, and it is moving along a twisted path to recovery. Similar to the situation after 1918, people are generally nostalgic for the golden age of the economic boom of 1990-2008. Some countries have adopted various irresponsible nationalism and protectionism policies to pursue high economic growth, as in the past, or try to transfer domestic conflicts outward. In the past 10 years, the G20's efforts to coordinate and advance the structural reforms of various countries have basically failed, and the international economic and trade order is gradually collapsing.

Second, the trend of political polarization has manifested. The adjustment phase of economic depression is often a period of political and ideological polarization, which is a reflection of the society's general dissatisfaction with the rich-poor polarization exacerbated by the economic



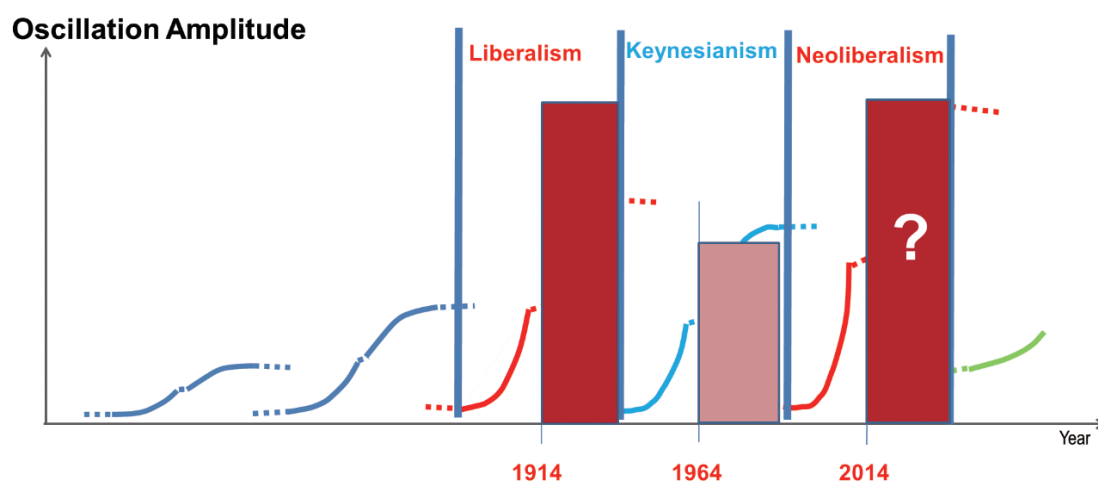


Fig. 5 Trend of political and economic thought cycle

depression. At present, the obvious populist tendency of the left and right wings of Western political parties and the fusion of extreme political parties and populism have accelerated polarization and fragmentation of Western politics. Politics is affected by short-term interests. The ruling party of a country clearly knows that social contradictions cannot be resolved through domestic structural reforms during its term of office. Therefore, it often transfers domestic contradictions to other countries, and even incites racism and seeks scapegoats in other countries, resulting in increasingly fierce international political, economic, and trade frictions.

Third, the gap in social income distribution is likely to continue to widen, and international political conflicts may intensify. The expansion under globalization and technological revolution at the first half stage of the cycle has led to significant differentiation in the income of different population groups in various countries. When it comes to economic structural adjustment in the second-half stage, structural unemployment will arise, and economic prosperity is no longer visible in short term, which may lead to further intensification of the rich-poor polarization and significant growth of social dissatisfaction. The data from the World Bank show that the gap in income distribution between countries is increasing. Most countries, whether developed or developing, are experiencing profound economic and social adjustments, and are facing tremendous political pressure from the widening of rich-poor polarization and transfer of domestic contradictions. It is difficult to resist the temptation to win the power through populism and extreme nationalism in political competition. When there is a conflict of interest between countries, there will be little room for coordination and compromise. If this trend is not stopped in a timely and effective manner and is allowed to develop, it may intensify and therefore spirally drive the international political and economic conflicts onto the path of no return.

## 5. Reflections and Implications of the Response to Once-in-a-Century Changes

According to the previous analysis, the profound changes unseen in a century have strong correlations with the nonlinear overlapping impacts of the two fluctuation forces: technological revolution and return of liberalism. Everyone who wants to maintain world peace and development

needs to think seriously about how to resolve risks and avoid repeating mistakes. Human society has entered an era of the global village. To cope with the profound changes, humankind needs to strengthen coordination and cooperation and make joint efforts. No country can cope with all the changes on its own. Especially, the major countries must shoulder major responsibilities.

We can observe from history that the continuous evolution cycles of technological revolutions have presented themselves as an objective historical process since the industrialization at the end of the 18th century. Its destructiveness is accompanied by human creativity and economic and social development. This historical process will continue in the future. If there were no technological revolution, there would have been no so-called modern industrial civilization and modernization. When humanity chooses to embark on this path, there is no turning back. It is impossible to maintain world stability and peace by stopping the evolution pace of technological revolutions just to avoid their potential destructive impacts. On the one hand, international economic competition has urged all countries to seize the development opportunities brought about by technological revolutions. On the other hand, even if developed countries choose to stop technological revolutions just to protect their invested interests, underdeveloped and developing countries would still eagerly pursue technological revolutions for rapid catch-up and development.

Compared with the objective process of technological revolutions, humanity can subjectively choose political and economic thoughts and paths, which would make it possible to change the direction of the world development. However, on the one hand, the choice of political and economic thoughts and paths is constrained by the objective economic foundation and condition of human society. For example, choosing populism and extreme nationalism is like quenching a thirst with poison, but such action can indeed transfer and alleviate the pains inflicted to the society by the polarization between the rich and poor, temporally eliminate the dissatisfaction and anger of the public, and win power for politicians. On the other hand, no set of existing, effective political and economic rules with an international consensus can be used as a tool to reverse the trend of the world. In the past 100 years, the world experienced liberalism, then denied liberalism, and now resumes neoliberalism, showing that the world has not yet really found a way to balance fairness and efficiency. The end of history claimed by Fukuyama (2006) has not yet arrived at all. The world still has a long way to go, and human society needs to work together to explore a sustainable path.

At present, to reverse the current dangerous trend of the world, it is just hopeless to wait for the emergence of new cure-all ideas and theories and form an international consensus on them. The international community must take effective measures as soon as possible to try to change the objective economic foundation of human society. In other words, reforms must be taken to ease the polarization between the rich and poor and solve the problem of severe inequality in income distribution.

First, the international community needs to vigorously practice the concept of shared and collaborative development. Doing this would correct the irresponsibility of liberalism. The basic assumption of liberalism that maximum benefits are always pursued based on selfish individual rationality to maximize social welfare should be questioned. From the perspective of the self-organization of complex giant systems, orderly development of any system in human society is accomplished through individual coordination and cooperation. The orderly development of the economy is actually achieved by the division of labor, collaboration, and cooperation at all levels including individuals, enterprises, and countries. Shared and collaborative development is the

objective reality for maintaining the relatively stable and orderly evolution of the human social structure, whereas liberalism is an outdated atomism that cannot explain the evolution of human social systems. The concept of shared and collaborative development is in line with holistic and systematic thinking. The political populism and economic nationalism emerging around the world is a reflection of the objective reality of global social differentiation, which is a miserable disease. This disease has occurred because the imbalance of domestic and international development prevails worldwide due to liberalism. To weaken populism and nationalism, it is necessary to improve the socio-economic foundations of countries. On the one hand, each country must attach importance to economic structural reforms, explore the path of shared development, improve the structure of income distribution, and narrow down the gap between the rich and the poor. On the other hand, more efforts should be made for international coordination, that is, for creating fair external conditions for the domestic reforms in various countries and for actively promoting the resolution of the international rich-poor polarization and inequality.

Second, the international community needs to resolutely oppose unilateralism, firmly uphold multilateralism, and improve global governance. Unilateralism is the manifestation of foreign expansion, pursuit of hegemony, selfishness, and beggar-thy-neighbor policies. It violates international justice and destroys all international coordination efforts. It is the source of the scourge of international conflicts and confrontation. Resolutely opposing unilateralism and firmly upholding multilateralism are the prerequisites for safeguarding the smooth progress of domestic and international reforms in various countries. The post-war international order based on multilateralism has made significant contributions to maintaining world peace and global governance. Practice has proved that multilateralism is the only correct choice for this diverse world to strengthen international coordination and cooperation, jointly address major human challenges and risks, and maintain world peace and development, and it is also an important way to achieve human social justice. However, the roles of existing multilateralism organizations, such as the United Nations and the World Trade Organization (WTO), have not been brought into full play, and they even face the danger of marginalization. This shows that these international organizations face problems in their institutional mechanisms. Since their reforms have not kept pace with the times, they have to speed them up.

Third, the international community needs to adhere to globalization and free trade. Globalization and free trade, not necessarily related to classical liberalism and neoliberalism, should resume the concept of shared and collaborative development of human society. Economic globalization and free trade would bring development opportunities to all countries. They meet the needs of human society to achieve collaborative development and increase more human welfare, and serve as important ties to strengthen mutual understanding, exchanges, and cooperation among countries and among citizens to avoid conflicts. Value is achieved through transactions, and globalization means the global division of labor and collaboration. Protectionism is a self-serving, shortsighted political strategy that would sow seeds of state-to-state conflicts. The WTO has achieved continuous development and growth because it acknowledges the differences between member countries on the whole, thereby promoting free trade. Considering fairness at the same time, it gives differential treatment to developing countries so that global imbalances are properly handled in multilateral rules. The world's major countries need to set an example in practicing the concept of shared and collaborative development in terms of globalization and

free trade, defend the multilateral trading system, and actively promote WTO reforms.

Fourth, the international community needs to advance comprehensive and sustainable development. Achievement of comprehensive and sustainable development of the economy, society, and environment is not only a major topic for human society, but also a great challenge that all countries face in making development choices. Comprehensive and sustainable development of the economy, society, and environment is in line with holistic and systematic thinking. The United Nations' 2030 Agenda for Sustainable Development and Paris Climate Agreement reached a global consensus on sustainable development. However, most countries lack coordination mechanisms and responsibility constraints in their actions. Some major countries even withdrew from the relevant agreements and refused to bear their due responsibility, thereby stimulating most nations to jointly differ with them. This means that a new supranational structure may be needed to ensure global coordination.

Finally, the international community should vigorously advance technological innovation. Modern industrial civilization is following a path of escalating energy resource intensiveness based on the assumption that resources are not absolutely scarce but relatively scarce. People dream that the universe's resources are infinite for humanity, and so sustainable development can be achieved. Market mechanisms deal with the issue of relative scarcity, while scientific and technological advances address the issue of absolute scarcity. However, the reality is that the pressure on the global energy, resource and environment is increasing, climate change is intensifying, and the role scientific and technological progress plays is far from being adequate. There is a serious shortage of science and technology investment, especially in the fields of energy, resources and environment protection. New international coordination and cooperation incentive mechanisms need to be designed to encourage science and technology innovation investments in these fields to address the global challenges.

## **6. Conclusions**

We drew the following conclusions from the aforementioned discussions:

The profound changes unseen in a century are closely related to the overlapping of the technological revolution cycle and the liberalism thought cycle. Both the technological revolution and liberal economic order would lead to polarization between the rich and the poor in society. If the two cycles overlap, the social differentiation and impacts caused by them may not simply add up, but interact to cause nonlinear magnification. Illiberalism, such as a planned economy and social intervention economy, may alleviate rich-poor polarization and inhibit the impact of the technological revolution, but it performs poorly on economic efficiency.

A technological revolution, with its historical process being objective and irreversible, is an inevitable requirement in the sense that humanity has chosen an industrialization path of continuously upgrading the energy resource intensiveness. The objective process of a technological revolution has no subjective responsibility or ethical awareness. Human society can regulate and guide technological revolutions through international cooperation to help promote comprehensive and sustainable development.

Political and economic thoughts require a new integration to explore a comprehensive and sustainable development path for the community with a shared future for humankind. The political

and economic theories throughout history, whether they were dominated by liberalism or illiberalism, all fell in the Newtonian paradigm and could not adapt to the evolutionary pattern of the complex giant system of human society. The development of political and economic thoughts requires a paradigm shift. The new paradigm should highlight the holistic and systematic thinking of human society, absorb the developmental results of evolutionary economics pioneered by Karl Marx and Joseph Schumpeter, and pay more attention to the community with a shared future for mankind.

International coordination and cooperation, instead of conflicts and confrontation, should be strengthened to cope with the current world risks. Major countries can play an important role in practicing the concept of shared and collaborative development in accordance with the international political and economic governance rules.

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