

Study on the Impact of Global Industrial Chain Supply Chain Reorganization on the Economies of Countries along the Belt and Road Route

Yang Chen

*Guangzhou Maritime University, Guangzhou, China
chenyang030708@qq.com*

Abstract. Global supply and industrial chains are transforming under globalization, driven by tech revolution and trade/investment trends. The reconfiguration boosts liberalization, with industrial collaboration shifting to integrated models. Trade/investment policies adapt to digital/green trends and foster a global business environment, while Belt and Road enhances connectivity. Strained trade and protectionism threaten chain stability. Studying reconfiguration impacts helps Belt and Road economies formulate policies. For China, it requires supply chain security via tech R&D and enterprise innovation. Chains now trend regional/localized with green focus, impacting nations like Vietnam differently; enterprises must adapt via diversified layouts and risk assessment.

Keywords: global supply and industrial chains, reconfiguration, belt and road, trade and protectionism, green focus

1. Introduction

Tensions in international trade, intensified geopolitical conflicts and the prevalence of trade protectionist measures have brought many negative impacts on the global economy and international relations, and the global industrial chain supply chain rearrangement may bring about intensified market competition, industrial hollowing out and Sino-US supply chain games[1]. The original cooperation mechanism for jointly addressing global challenges is difficult to operate effectively, and the global governance system is facing a severe test. It is of great significance to study the impact of global industrial chain supply chain rearrangement on the economies of countries along the “Belt and Road”. Countries along the “Belt and Road” can formulate corresponding industrial policies and enhance industrial competitiveness based on the results of relevant research. The global industrial chain supply chain reorganization is an inevitable trend of economic pattern evolution, with intensified U.S.-China strategic competition under the Biden administration[2], which is both a challenge and an important opportunity for China's transformation and development.

The global industrial chain supply chain has gone through multiple stages of change. Initially, a simple division of labor was formed based on resource endowment. Afterwards, the rise of multinational corporations promoted the global layout of industries, and the production links were refined to form a complex chain. With the advancement of science and technology, digitalization and

intelligence accelerated, the response speed of the supply chain improved, and the proportion of service links increased. Nowadays, affected by trade friction and geopolitics, the trend of regionalization and localization of supply chains is highlighted, enterprises pursue diversified supply and enhanced resilience, and green sustainable development has also become an important orientation, prompting the global industrial chain supply chain to change in the direction of more resilient, innovative and green. According to Guo Ruonan[3], the global industrial chain has gone through a development stage from “efficiency priority” to “balancing security and efficiency”.

Under the wave of globalization, the global industrial and supply chains are undergoing profound changes in science and technology, trade and investment: the new round of scientific and technological revolution and industrial transformation has accelerated their restructuring, while changes therein have further enhanced the level of trade and investment liberalization and facilitation and promoted the optimization, upgrading and synergistic development of industrial chains and supply chains. In terms of policies, efforts are being made to build an institutional and policy support system for strong trading nations, accelerate the reform of domestic and foreign trade integration and actively respond to the trends of trade digitization and greening in trade policies; continue to liberalize market access and create a first-class market-oriented, law-based and international business environment in investment policies; and take the high-quality construction of the "Belt and Road Initiative" as the lead to strengthen the "hard connectivity" of infrastructure and the "soft connectivity" of rules and standards with co-building countries in international cooperation policies. The rearrangement of global industrial and supply chains has different impacts on various countries, and this paper will analyze it for "Belt and Road" countries.

2. Literature review

Many scholars have conducted in-depth research on the global industrial chain supply chain rearrangement through literature analysis, data statistics and case studies, and have come up with a series of conclusions with academic value and practical significance.

Some scholars use historical analysis and political economy theory to sort out the development of the trade war. Yan Ying and Zhang Chen [4] analyze the policies of the United States “301 investigation” and the imposition of tariffs in 2017-2018, pointing out that the United States has launched a trade war at the economic level, restricting the movement of people and destroying the system of trade rules, with the intention of reshaping the framework of the global trade system. However, from the statistics, bilateral trade in goods in 2018 - 2019 fell from 635.706 billion U.S. dollars to 541.82 billion U.S. dollars, with U.S. exports to China falling by 11.3%, and imports from China falling by 16.2%; and under the impact of the epidemic in 2020, the volume of bilateral trade instead increased by 8.8%, and the U.S. trade deficit rose to the highest in 12 years. It can be seen that the trade war not only fails to realize the return of the U.S. manufacturing industry and solve the problem of trade imbalance, but also exacerbates bilateral conflicts and global economic uncertainty, highlighting the limitations of unilateralism in solving complex trade issues.

Against the background of global industrial chain supply chain rearrangement, the research on “Belt and Road” countries includes the following aspects. Taking China as an example, Yan Ying and Zhang Chen [4] use the trade gravity model to assess the trade potential between China and the countries along the “Belt and Road” through literature research, statistical data analysis, and model construction and analysis, etc. By setting total trade as the explanatory variable, and GDP, distance parameter, tariff parameter, etc. as the dependent variables, they analyze the impact of each factor on trade potential. By setting total trade as the explanatory variable, GDP, distance parameter and tariff parameter as the dependent variables, we analyze the influence of each factor on trade potential, and

study the influence of countries along the Belt and Road on China's export trade under the background of the trade war between China and the United States. It is found that the trade war has a significant negative impact on the import and export trade, GDP and welfare level of both China and the United States, and the import and export trade volume of the countries along the "Belt and Road" has been increasing in China's import and export trade, and the implementation of the "Belt and Road" initiative has, to a certain extent, offset the impact of the "Belt and Road" initiative on China's export trade. The implementation of the "Belt and Road" initiative has, to a certain extent, hedged the negative impact of the trade war between China and the United States. Taking Vietnam as an example, Shi Xueqin and Zheng Qingqing[5], by means of literature research, data analysis and case study analysis, utilize data on the import and export trade turnover of Vietnam, the United States, and Vietnam and China in 2018-2021, and analyze Vietnam's response to the U.S. Indo-Pacific Strategy and China's Belt and Road Initiative, and its relationship with China's Belt and Road Initiative. Through the examples of Vietnam's response to the US "Indo-Pacific Strategy" and China's "Belt and Road Initiative", and its cooperation with India, Japan and Australia, the paper examines its perception and response strategy in the strategic competition between China and the United States from Vietnam's point of view. The paper concludes that: economically, the industry chain transfer and export growth bring dividends, but also comes with risks such as origin fraud, most Vietnamese respondents are optimistic about the new opportunities brought by the trade war; politically, Vietnam believes that the US-China competition brings opportunities such as the consolidation of sovereignty, but there is also the risk of "choosing sides". The Vietnamese government and academics are actively urging enterprises to seize the opportunity to enhance their competitiveness and adopt a flexible strategy of stabilizing the economy internally and balancing it externally. From the perspective of the industry, the study found that ASEAN has become an important growth pole for the global automotive industry, with rapid growth in automotive production and sales in 2020 - 2022, and the automotive industry in Thailand, Indonesia, and Malaysia is particularly prominent. Wu Chongbo and Wu Yuhe [6]explored the characteristics of automotive policies and industrial development in different countries through comparative analysis and case studies, and found that ASEAN's automotive industry has grown significantly but unevenly within the region, pointing out that insufficient infrastructure and other obstacles are the main obstacles, and policy synergies are needed to promote development.

3. Theoretical analysis

The logic of the global industrial chain supply chain redistribution is no longer purely to pursue short-term benefits, and it has begun to shift to a development model that takes into account both security and efficiency.

3.1. Industrial layout based on factor endowment theory

In the past, the development mode was that countries carried out industrial layout based on factor endowment theory. The layout of the global industrial chain is a complex decision-making process in which many factors are intertwined. When enterprises build a global production network, they need to comprehensively consider multi-dimensional factors such as technology, economy, market, and policy, in order to realize the optimal allocation of resources and the construction of competitive advantages. Developed countries will be the first to invent new products and occupy the market based on their technological advantages. And labor-intensive industries will shift, often to countries with lower labor costs. Subsequently, the economy of scale effect prompts large enterprises in

developed countries to form an agglomeration production mode. In order to reduce unit costs, enterprises tend to concentrate production in specific areas, share fixed costs by expanding the scale of production, form industrial cluster effects, and enhance the cost and competitive advantages in the global industrial chain. At the same time, market location factors will also play a role. Market location factors guide enterprises to stay close to the demand layout, enterprises based on the market geographic location planning industry chain, by setting up factories or establishing warehousing and logistics centers near the consumer market, not only can quickly respond to customer demand, shorten the delivery cycle, but also reduce the transportation costs, enhance the market resilience and customer satisfaction. Policies and regulations also play a guiding role in the production decisions of enterprises. The significant differences in policies such as tax incentives, trade barriers and government subsidies among countries have become key variables affecting the layout of the industrial chain. Enterprises tend to favor policy-friendly regions to reduce operating costs and avoid trade risks. In addition, enterprises also need to integrate risk diversification, capital costs and environmental and social factors. These elements are interrelated and synergistic, together shaping the global industry chain layout strategy.

3.2. The global industrial chain supply chain under “reverse globalization”

During the period of 2018-2020, the change of global industrial chain supply chain is manifested as “anti-globalization”. The global industrial chain layout is undergoing profound changes, and multiple factors are intertwined to reshape the global production network. While pursuing the optimal allocation of factors, countries have to face the complex challenges brought about by geopolitics, epidemic impacts and technology iteration. Specifically, geopolitical conflicts have broken the logic of the original industrial layout. Events such as the trade friction between China and the United States and the United Kingdom's exit from the European Union have aggravated the uncertainty of the global economy, which may lead to supply chain rupture. Highly centralized supply chains have exposed fatal flaws under the impact of epidemics, prompting countries to accelerate the construction of geographically decentralized backup industry chain supply chains. In order to reduce risks, countries tend to establish production bases in politically and economically stable regions, promoting the transformation of the industry chain to regionalization and near-shore. Technological progress has reconfigured the pattern of industrial development. Breakthroughs in automation and intelligent technology have weakened the attractiveness of cheap labor to production layout. Enterprises in various countries are more inclined to locate in regions with high costs but stable political economy and perfect technological support, and utilize advanced technology to enhance production efficiency and supply chain resilience. This series of transformation is essentially the practical evolution of factor of production theory under the new geopolitical and regionalization trend.

3.3. Reconfiguration of the global industrial chain supply chain, with “security” outweighing “efficiency”

Since 2020, the global industrial chain supply chain has been undergoing restructuring, with “security” outweighing “efficiency”. Economic globalization once drove the global layout of industrial chain, and multinational enterprises used it to reduce costs and increase efficiency. However, trade friction, epidemic impact and geopolitical turmoil in recent years have exposed the vulnerability of over-reliance on the global industrial chain. In this context, the localization of

industrial chain and the friendliness of the coast have become the new direction of the strategy of each country, reshaping the global economic competition pattern.

First, the phenomenon of localization has emerged in some regions and countries, that is, more greenfield investments are directed to developed economies. Localization includes the following two features: First, developed economies have set off a wave of “re-industrialization”, trying to drive the return of manufacturing industries through policies. The United States and Europe have introduced industrial support policies to attract enterprises to relocate back to the United States with tax breaks and financial subsidies, and the European Union's Critical Raw Materials Act is a typical example, aiming to safeguard the autonomy and control of core resources. Secondly, developing economies are relying on low-cost advantages to undertake “friendly shore outsourcing” and become an important position in the industrial chain friendly shoreization. Vietnam, India and other countries through preferential policies to attract Apple, Toyota and other multinational enterprises to set up factories, not only to help their own industrial upgrading, but also for multinational enterprises to diversify risks and reduce tariff costs. The free flow of trade in the European Union's internal single market and the deep cooperation between Japanese car companies and Southeast Asian suppliers all show the potential of Yo-shoring to achieve win-win results through regional synergy. However, localization and yoshinization may constrain developing countries from catching up with developed countries. Developing economies face the dilemma of weak technological accumulation, and rely on external technology in high-end fields[7], making it difficult to build a complete and independent industrial chain; at the same time, the shortcomings of infrastructure and technology level constrain the improvement of production efficiency.

Secondly, the global industrial and supply chains are undergoing regionalization and near-shoring changes: trade protectionism has become the primary driver, with some economies frequently employing tariff barriers, import restrictions and technological blockades to protect local economies, bringing uncertainty to the global economy and prompting enterprises to shift their purchasing focus to neighboring or regional suppliers to avoid high tariff and long transportation costs, thus directly fueling chain regionalization; meanwhile, geopolitical conflicts such as China-US trade friction and the Russia-Ukraine conflict have broken the original global economic and trade balance, driving international economic and trade rules toward regional integration, and prompting enterprises to adjust global division of labor by withdrawing part of production chains to domestic markets or transferring them to neighboring economies to reduce geopolitical risks and ensure supply chain stability.

4. Analysis of the current situation

4.1. Impact of global industrial chain supply chain rearrangement on Belt and Road countries

The repositioning of the global industrial chain supply chain brings opportunities and challenges to the Belt and Road countries.

From the perspective of opportunities, the fruitful results of the joint construction of the “Belt and Road” have improved the infrastructure of the countries along the route, such as the China-Laos Railway and other projects, which have promoted regional connectivity, lowered the cost of trade, and pushed the expansion of trade scale. According to the report [8] from the Ministry of Foreign Affairs,, trade among participants increased by 4.1 percent. At the same time, it has attracted a large amount of investment, and the non-financial direct investment of Chinese enterprises in countries along the route has continued to grow, driving the local industrialization process and creating jobs.

But there are also challenges. Under the trend of global industrial chain supply chain reconstruction, trade protectionism, geopolitical conflicts increase trade uncertainty[9], and policy adjustments in some countries may affect the “Belt and Road” countries' exports and the introduction of foreign investment. Moreover, some “Belt and Road” countries have weak industrial bases, insufficient technology and talents, and face difficulties in integrating into the high-end links of the global industrial chain, making it difficult for them to quickly adapt to the new layout demands.

4.2. Impact of global industrial chain supply chain reformulation on China

Before the global industrial chain supply chain redistribution, China has become the global manufacturing center and “world factory” by virtue of its huge labor resources and perfect industrial system. A large number of labor-intensive industries gathered, deeply embedded in the global industrial chain relying on low-cost advantages, undertaking international industrial transfer mainly through processing trade, and continuously expanding the scale of exports. At the same time, through the introduction of foreign capital, technology and management experience, it has promoted the gradual upgrading of industries and formed strong competitiveness in fields such as electronic information and home appliances. As the pattern of the global industrial chain supply chain changes, China's share in the global manufacturing value-added, after rising from 8.6% in 2004 to 30.5% in 2021, will drop to 28.8% in 2023 due to the relocation of the industrial chain out of China, and the downward pressure remains in the future. Moreover, China's high-end industries in key areas of serious external dependence, such as automotive chip localization rate in 2023, although there is an increase, but the independent scale of only 4.5% of the world, and some of the chip external dependence is extremely high.

Next, this paper will analyze the current situation of China's industrial development under the change of the global industrial chain supply chain re-layout from the perspectives of “bringing in” and “going out”.

4.2.1. “Bringing in” development status

China has actively attracted direct investment and technological resources from multinational corporations through market liberalization and institutional innovation. China optimizes the business environment with openness and innovation, and the foreign investment in high-tech industry will reach RMB 499.4 billion (+28.3%) in 2023, and the layout of semiconductors and AI fields by Intel and Microsoft will increase the technology conversion rate by 25%. However, under the restrictions of the U.S. “Entity List”, chip imports amounted to 2.08 trillion yuan, and the dependence on high-end technology is high [10], and China's R&D investment in 2023 amounted to 3.3 trillion yuan (+10.4%), accelerating the breakthrough of the blockade.

However, the introduction of high-end technology is restricted by the technological blockade of some developed countries. The U.S. imposes investment restrictions on Chinese enterprises, and reviews and restricts the export of key core technologies or strategic materials to China, making it difficult for China to acquire some cutting-edge technologies.

4.2.2. Current development of “going out”

Before the reconstruction of the global industrial chain, Chinese enterprises' exports and greenfield investments were characterized by “developed countries as the main market and emerging markets

as the supplement”. In terms of exports, the EU, the U.S. and Japan are the main markets, with exports to them accounting for more than 40% of China's total exports in 2019, and the products are mainly electromechanical equipment, textiles, etc. Greenfield investment focuses on two types of regions: Southeast Asia, Mexico, and China. Greenland's investment focuses on two types of regions: Southeast Asia, Mexico and other regions with low labor costs to layout labor-intensive industries; Africa, Latin America and other resource-rich regions to carry out mineral and energy development and infrastructure cooperation. The proportion of investment along the “Belt and Road” is significant, with non-financial direct investment accounting for more than 50% from 2013 to 2019.

China's trade and investment pattern has accelerated after restructuring. Diversification of export markets, ASEAN has become the largest trading partner, the bilateral trade volume will be 6.52 trillion yuan by 2022, and the proportion of exports of the “New Three Kinds” will reach 25%. Greenland investment focuses on technology cooperation and supply chain security, and the number of R&D centers set up in Germany, Japan and other developed countries has increased by 30%; deepening production capacity cooperation along the “Belt and Road”, and the investment in electric vehicle industry chain in Indonesia, Saudi Arabia and other countries will increase by more than 40% in 2023, forming a new pattern driven by “technology + market”. “ drive a new pattern.

Chinese enterprises have accelerated the pace of “going out”, established R&D centers overseas, and carried out mergers and acquisitions, joint ventures and equity participation. Driven by the “Belt and Road” Initiative, domestic chain enterprises have been building regional value chains with countries along the routes, promoting the international expansion and extension of the domestic industrial chain. With the help of the RCEP cooperation framework, Chinese enterprises have strengthened production capacity cooperation with member countries and laid out the global medium- and high-end value chains. In East Asia, China cooperates closely with Japan and South Korea in the field of manufacturing, and by participating in the regional division of labor in production, Chinese enterprises have enhanced their position in the regional value chain and expanded their overseas markets.

However, in the process of overseas investment, Chinese enterprises face a complex international political and economic environment. The United States and other Western countries have pursued the strategy of “de-Chinaization”, interfering with the economic and trade cooperation between Chinese enterprises and other countries through policy measures, thus creating obstacles for Chinese enterprises to “go global”.

5. Conclusions and policy recommendations

As the international landscape evolves, the global industrial chain supply chain is transitioning from a factor endowment-based model to one that prioritizes both security and efficiency. This restructuring affects developed countries and Belt and Road nations differently. Based on this analysis, the paper offers policy recommendations.

First, To improve Sino-US economic and trade ties, China should maintain a strong position, seek dialogue, and adapt its export strategy within international rules to mitigate trade frictions. It should also encourage businesses to diversify into domestic markets to reduce reliance on foreign markets and stabilize against external demand shifts.

Secondly, Strengthen "Belt and Road" partnerships by negotiating FTAs to streamline trade, lower barriers, and boost liberalization. Tailor industrial collaboration to regional strengths: enhance manufacturing chains in Southeast Asia, energy development in Central Asia, and integrate agriculture, industry, and infrastructure in Africa to foster local upgrades and mutual benefits.

Finally, in the industrial response strategy, we need to break through the core technology bottlenecks, focus on the “neck” areas, and integrate resources to attack the problem. Enterprises should enhance their global operation capabilities, innovate cooperation models, and insist on synergistic upgrading between going out and bringing in. In terms of policy guarantee, improve system supply and strengthen ecological cultivation. Through the synergistic efforts of industrial technology attack, enterprise capability leapfrog and policy ecological optimization, China can realize the transformation from “passive adaptation” to “active leadership” in the reconstruction of the global industrial chain, and build a safe, efficient, open and inclusive modern industrial system.

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