China-US High-Tech Competition, Trade Conflict and Development Rights

Chen Ziye (陈子烨)[1] and Li Bin (李滨)[2*]

[1] School of Government, Nanjing University, Nanjing, China
[2] School of Politics and International Relations, Tongji University, Shanghai, China

Abstract: *The power and interest of industrial manufacturers are determined by their status in the relations of production. At the international level, countries see their economic and political status rise only when they climb the ladder in the international division of labor. As the primary production forces, science and technology are the main drivers behind such change. As new technologies give rise to new industries and restructure the international division of labor, developed countries strive to enhance the protection of their intellectual property rights (IPR) and safeguard their monopoly over core technologies. For developed countries, technological prowess holds the key to their supremacy in the global supply chain and international relations. The 19th CPC National Congress makes clear the overarching goal in the new era is to rejuvenate the Chinese nation and turn China into a strong modern country. As an important material condition for achieving this goal, China must transition from being medium- and low-end links in the international division of labor to becoming high-end links. In this process, China will encounter backlash from developed countries that lead in the international division of labor. The recent China-US tussle over trade in high-tech goods is a case in point, and should be viewed through the lens of the relations of production and the international division of labor. The insights thus achieved will be of great significance to China's future development.*

Keywords: *international technology competition, international division of labor, China-US trade war, China's development rights*

JEL Classification Codes: F50, F51, F52, F59
DOI: 10.19602/j.chinaeconomist.2020.09.06

A key issue in the recent China-US, and to some extent China-EU and China-Japan, trade disputes is competition in the high-tech sector. Soon after the launch of Made in China 2025 - a 10-year plan to update China's manufacturing industry, Western media published a swathe of reports accusing China of forcing Western companies to transfer technology, "stealing" intellectual property rights (IPRs), subsidizing industries, and extending state support to homegrown innovations. Such acts, they argue, violate market rules and constitute "unfair" competition against Western companies. The West is worried about China's technological ascent because China is likely to break through the technological monopoly of Western companies that underpins their vested interests in the global supply chain. For this reason, they press China to enhance IPR protection and block Chinese companies from accessing Western technology. They even threaten China with a trade war and obstruct China's development of the high-

* Corresponding author: Li Bin, email: libin1963@sina.com

(C)1994-2023 China Academic Journal Electronic Publishing House. All rights reserved. http://www.cnki.net

tech sector and its forays into international markets.

The high-tech sector is at the forefront of international competition as it determines a country's position in the global supply chain. According to Immanuel Wallerstein (2004), the international division of labor is the geographical distribution of production activities including core and peripheral production activities; the fundamental difference among core, peripheral and semi-peripheral states lies in the extent to which they "absorb labor value, employ machines, and generate profits," as well as their ability to manufacture core products. A country's position in the international division of labor is not fixed, but instead is dependent on technological development and gains from trade relative to other countries. "No product is a core or peripheral product by its nature; such an attribute lasts only for a certain period." A country's technological performance and ability to manufacture core products are key determinants of its position in the global supply chain. A country's place in the global supply chain determines their political status and their share in the distribution of the world economy. Gowen (2010) argues that the international division of labor is a hierarchy or process of power. In today's world, countries are more intricately enmeshed in the global production chain than ever before, but core production links and products remain, and so does the hierarchy. Countries that lead in the high-tech sector and manufacture core products occupy the high-end, profitable links in the global supply chain.

As it is capital-intensive, with a long payback period and high risk profiles, the high-tech sector requires special state support. The State assures the mobilization of public resources in support of corporate R&D securing firms' access to the market and technological rents, as manifested in corresponding market and IPR systems. Like China, Western countries utilize state power to support homegrown tech firms. However compared to Western countries, China's state-led model has immense possibilities for technological development. Gowen (2010) predicted that "a huge challenge in the 21st century will be China's economic and political rise. China boasts unique potentials to tap into its phenomenal economies of scale and learning, upgrade production with state resources, and improve its status in the international division of labor." From this perspective, China-US trade frictions and high-tech bans imposed by the US and some other Western countries against China are inevitable.

1. High-Tech Sector's Status in the International Division of Labor and the Role of the State

A nation's status in international relations stems from its position in the international division of labor. According to Karl Marx and Frederik Engels, the "relations between nations depend on each nation's productivity, position in the division of labor, and internal interactions" (Marx and Engels, 1995). In the final analysis, a country's international status is determined by its position in the international supply chain. In this sense, international relations mirror the international relations of production. Without acquiring leadership in the international division of labor, a country cannot fundamentally alter its position in the international distribution of wealth and power.

Technology is the key determinant of productivity. As the catchphrase goes, "science and technology are the primary productive forces." The high-tech sector determines a country's place in the hierarchy of the international division of labor, its share in the distribution of the world economy, and its realm of influence in international relations. Given its strategic importance, the high-tech sector receives a great deal of state support in all countries - such support is necessary to a sector that is capital-intensive, risky, and entails a long payback period. Take the semiconductor industry for instance; an advanced semiconductor factory would cost more than one billion US dollars in the mid-1990s. It normally takes two to four years to launch a new product, five to six years to generate sales, eight to nine years to break even, and ten years to turn a profit. Such huge upfront and follow-up investments, together with the long payback period and high risks, deter most private companies from entering the realm of the high-tech industry.

(C)1994-2023 China Academic Journal Electronic Publishing House. All rights reserved. http://www.cnki.net

These characteristics make it difficult for companies in the high-tech sector to obtain credit capital from financial markets. Imperfections in the technology or the intangible asset trading market prevent firms from accessing cheap capital using technology as collateral (Schumpeter, 1961). Ordinary private companies cannot afford the costs and risks of entering the high-tech sector, where market-based mechanisms discourage fundamental research that takes years to bear fruit. High tech firms require human resources, raw materials, capital, and marketing networks. No company can create an entire market system on its own while turning a profit at the same time (Hausmann and Roderick, 2006).

That is why state support for the high-tech sector is vital. Aside from infrastructure and other material conditions, the State offers support to these high-tech industries in accessing capital, marketing, and IPR protection. Western countries have always provided such support to emerging industries. Take the US support for the homegrown semiconductor industry, for instance. From 1958 to the early 1970s, the US federal government directly or indirectly sponsored 40% to 45% of the industrial semiconductor R&D. By the late 1980s, the federal government's financial support for semiconductor research reached 500 million US dollars per annum, not to mention a host of tax credits. The US Congress enacted a bill to provide a 25% incremental tax deduction to semiconductor R&D (Flamm, 1996). Apart from financial support, the US government also offers marketing support to US companies. In the 1980s, US defense agencies procured more than 1/4 of the semiconductor products made in the US.

The US intervened in the international market to maintain its dominance. In the mid-1980s, Japan snapped up some 70% of the global semiconductor market share. In 1986, the US government forced Japan to accept the Semiconductor Trade Arrangement (STA). In 1991, the STA was extended for five years until 1996 in a slightly different but more explicit format. Since the end of 1986, the US Commerce Department has set the prices for dynamic random access memory (DRAM) and erasable programmable read-only memory (EPROM) manufactured by each Japanese chipmaker. Since March 1987, the US Commerce Department has set minimum prices for such products, not only in the US, but also in 19 other markets, including six European markets. It forced the Japanese government to grant 20% of Japan's domestic DRAM market share to foreign companies by 1992. US trade negotiators even asked the Japanese Ministry of Economy, Trade and Industry (METI) to restrict investment in new DRAM capacity before 1988 (Flamm, 1996).

In the past, only Western developed countries had the economic and political ability to support tech firms. It is such support that enabled Western multinationals to control the global supply chain with their advantages in foreign investment ownership, internalization and strategic locations. According to the eclectic theory of international production, a company will make an overseas direct investment only when it possesses the above-mentioned three advantages at the same time (see Table 1) (Dunning, 2001) - advantages that cannot be acquired without state support. For instance, state support plays a pivotal role in securing the patents, trademarks and marketing knack. A country's geopolitical strengths are vital

Table 1: Multinational Business Operation Mode and Strengths

Multinational business modes	Ownership advantage	Internalization advantage	Location advantage
Manufacturing with direct investment	√	√	√
Export	√	√	×
Technology transfer	√	×	×

Source: Compiled by authors.

(C)1994-2023 China Academic Journal Electronic Publishing House. All rights reserved. http://www.cnki.net

to helping its companies open up overseas markets. As a result, product cycle upgradations with the support of state allow Western multinationals to continuously manufacture core products. According to the product cycle theory (Vernon, 1966), firms tend to manufacture products in different countries amid cyclical changes from innovation to sophistication and standardization. Yet this theory does not reveal the State's role in the product manufacturing cycle. The State is often an important sponsor for corporate R&D and a key force in removing investment and trade barriers in host countries, opening up host country markets, and cajoling host countries to protect intellectual property rights.

Judging by the practice of developed countries, international systems serve as important avenues of state support for the high-tech sector. Only by analyzing current international systems, using international systems as the superstructure, can we gain insights into the strategies Western countries utilize in their support for the high-tech sector.

2. International Systems for Protecting the High-Tech Sector

Only economies of scale can compensate for the hefty R&D cost, which requires a huge open market based on an international trade system that ensures low-threshold market access for high-tech products. In addition, high-standard international IPR protection systems have been put into place to prevent the emergence of competitors and the loss of technological strengths and maintain long-term rents. With their leadership in the international division of labor, developed Western countries have created open market access systems for high-tech products and increasingly draconian IPR protection systems to support their high-tech sector.

In the post-war international trade system, most trade restrictions under the General Agreement on Tariffs and Trade (GATT) target standardized products. The three most restricted types of goods subject to trade remedies are textiles, shoes and steel, which account for three fourths of trade remedies, whereas industries in the high-tech sector tend to be subject to fewer trade restrictions. The most substantial tariff cuts have been those for high-tech products (Lipson, 1982). The WTO continues to maintain low-threshold access for high-tech products from developed countries. Industrialized countries have benefited from tariff cuts for IT and certain other products of from 50% to 100%. The Information Technology Agreement (ITA) inked in 1997 has gradually lowered tariff rates for IT products to zero, under the WTO framework. Such an international tariff system effectively promotes market openness in various countries and secures economies of scale for high-tech products.

The international IPR system also plays an effective role in securing profitability for high-tech firms. As cross-border manufacturing gives rise to technology diffusion, developed countries have resorted to excessive IPR protection under the international IPR system in a bid to maintain the dominance of Western multinational companies in the global division of labor.

(i) Some Western countries have sought to expand their exclusive rights and to broaden the scope of IPR protection from traditional patents, trademarks and copyrights to computer software, integrated circuit, trade secrets, and biotechnology, so much so that "natural products" such as business practices, network marketing modes and genetic sequences are embroiled in controversies over the scope of IPR protection;

(ii) Western countries, led by the US, have been attempting to extend the IPR protection period. For instance, the US insisted on the 12-year protection period for pharmaceutical patents in the Transpacific Partnership (TPP) negotiations, which is much longer than the normal five-year data exclusivity period in previous bilateral trade deals between the US and other countries. It was due to US insistence that TPP members finally agreed on an eight-year protection period;

(iii) As an international practice, IPR protection should be subject to jurisdictional limitations. Yet Western countries, led by the US, have been trying to unify IPR protection standards worldwide through international organizations. A typical example is the inclusion of the Agreement on Trade-Related

(C)1994-2023 China Academic Journal Electronic Publishing House. All rights reserved. http://www.cnki.net

Aspects of Intellectual Property Rights (TRIPs) upon the founding of the World Trade Organization (WTO) demanded by the US, which requires countries to commit to "a package of agreements" upon acceding to the WTO. "TRIPs imposed on the entire world the dominant intellectual property regime in the United States and Europe, as it is today" (Stiglitz, 2006). The extended periods of exclusive rights and protection and the removal of geographical limitations help increase technology monopoly rents and exact a greater cost to followers.

Excessive IPR protection allows some Western companies to reap much more profit from intangible property rights than any other factor of production, but impedes innovation and technology progress worldwide, to some extent, and does not contribute to human welfare. According to the World Intellectual Property Report 2017, intangible assets accounted for an average of 30.4% of the accrued revenue from the three types of production factors - tangible assets, intangible assets and labor - behind all merchandise manufactured and distributed worldwide from 2000 to 2014. This percentage is almost twice as high as the share of tangible capital. However, the excessive scope of IPR protection will cause R&D motivations based on existing innovations to diminish (Stiglitz, 2006). For instance, Myriad Genetics, a company with two human genetic mutation patent technologies that may influence breast cancer susceptibility, requires even nonprofit laboratories to pay for testing such genetic mutations. This requirement impedes the application of this testing technology and further research. Excessive IPR protection runs counter to the goal of enhancing human welfare. Under TRIPs, excessive pharmaceutical patent protection forces developing countries to pay exorbitant patent license fees for manufacturing patented drugs, leaving patients who cannot afford expensive drugs to die. Over-protection is an abuse of property rights. According to Nozick (1991), even classical liberalist John Locke, who advocates the sanctity of private property rights, has put forward the "Lockean Proviso," i.e. one may lawfully possess property without compromising the welfare of others. The international IPR protection system has gone too far to be conducive to innovation and human welfare. Both developing countries and visionary academics have been calling for revising the system. Joseph Stiglitz (2006) argued that if the possession of property rights reduces economic efficiency or infringes upon the welfare of others, the exercise of such power should be prohibited.

In stark contrast to the open market for high-tech products and increasingly draconian IPR protection, international systems seldom impose any limits on the extent to which countries may support the high-tech sector. Rarely is their "unfair" support to such industries ever mentioned. With China's development in recent years, however, the US, Japan and Europe have started to discuss reforms within the WTO framework to restrict countries from subsidizing specific domestic industries and distorting fair competition. To maintain their competitive advantage, Western countries attempt to set limits on countries with institutional strengths for industrial development.

3. China-US High-Tech and Trade Tussle: Fight between Rising and Incumbent Powers

In his economic development theory, Schumpeter (1961) argues that innovations that underpin economic development include the following five aspects: (i) The discovery of the new source of raw-materials. (ii) The presentation of a new product. (iii) The implementation of the modern method of production. (iv) The search of new markets. (v) The creation of monopoly or establishment of a new type of industrial organization."

Although Western economic theories seldom discuss the relations of production, Schumpeter's theory contends that economic development arising from the above-mentioned innovations will induce change in the distribution of individual and household economic interests and social power, as well as the underlying mechanism of personal wealth formation. When this theory is applied at the international level, a country's economic development stemming from the above five aspects of innovation will

(C)1994-2023 China Academic Journal Electronic Publishing House. All rights reserved. http://www.cnki.net

also induce restructuring in the international division of labor and change in international relations of production (power relations). Hence, "at the heart of economic development is a country's efforts to elevate its position in a hierarchical international division of labor ... That is the economic development momentum with which Schumpeter's theory is concerned" (Gowen, 2010).

China's high-tech sector generates innovations with respect to the five aspects. China's strength in new-generation 5G communication equipment means it is likely to launch important new products worldwide - products that drive AI-based manufacturing or the "Fourth Industrial Revolution." With such new products and the consequent new industrial division of labor, China's state-led innovation programs such as "Made in China 2025" are likely to break through the Western monopoly of semiconductor and related semi-finished goods. Considering the restructuring in the international division of labor and associated change in international relations, we should revisit China-US trade frictions from the perspective of international competition in the high-tech sector, and we cannot view such frictions simply from a trade imbalance point of view.

The China-US trade conflict boils down to the competition between rising and incumbent powers. The US launched a trade war with China to block China's ascent in the international division of labor that may threaten US vested interests and hegemony. The share of the China-US trade imbalance in the US economy is too small for the US to launch an all-out trade war with China. In 2017, the US trade deficit with China reached 375 billion US dollars, which is less than 2% of the US GDP. The real US intentions can be seen from the US demands raised during trade negotiations with China and various US attempts to throttle China's tech firms. In the negotiations, the US argued that the China-US trade imbalance stemmed from China's economic system and national behavior: Chinese companies including tech companies sharpened their competitive edge thanks to the sponsorship of the Chinese government and national banks; the Chinese government acquiesced to or supported China's "theft" of US technology and forced Western companies to transfer technology to strengthen China's competitive advantage; the Chinese government did not create a level playing field for Western companies, and allowed Chinese companies to thrive on China's huge market. The US hopes to structurally address such an imbalance. Aside from negotiations, the US resorted to state power to suppress China's tech firms by blocking China's access to international 5G markets, and even went so far as detain executives from China's tech firms. These practices are not simply intended to address the China-US trade imbalance, but are driven by intense political motivations. If the role of high-tech products is brought under the framework of the international division of labor, the real intentions behind US in the trade tussle with China become easier to discern.

The "structural reforms" demanded by the US are intended to sabotage China's institutional strength as a late-moving developing country and China's fundamental systems as a socialist country. These demands are, therefore, unacceptable to China. The 19th CPC National Congress called for achieving national rejuvenation and building a strong modern nation in the new era. The material foundation for fulfilling this grand vision lies in China's becoming a high-end link in the international division of labor. To become a strong, modernized nation, a country must rank high in the hierarchy of the international division of labor system and international relations of production. This conclusion is based on the basic principles of historical materialism and inspirations from recent world history.

From the perspective of historical materialism, people's primary needs of survival are food, shelter and clothing. As people organize for socialized production to meet these needs, the relations of social production between people come into play. Another manifestation of the relations of production is the social relationship of power (Cox, 1987). That is to say, whoever dominates the division of labor in social production holds a dominant position in the distribution of interest and power. As in the words of Karl Marx (1995) (to the effect), people enter into certain and inevitable relations independent of their will in a society in which they live, i.e. relations of production compatible with a certain development stage of their material productivity. The sum of these production relations constitutes the economic

(C)1994-2023 China Academic Journal Electronic Publishing House. All rights reserved. http://www.cnki.net

structure of a society upon which legal and political superstructures are erected and underpinned by a social ideology and a compatible material foundation. In the material life, the modes of production form the groundwork of social, political, and spiritual life. The principle that economic foundation determines superstructure and the corresponding class analysis of production applies to both the domestic and international communities. The only difference is that the class entity in the international community becomes the State.

Karl Marx (1995) said to the effect that the division of labor within nations will also emerge as nations interact with each other. Amid the international division of labor, countries form the international relations of production. Whoever dominates the international/global production system will benefit more from the distribution of the international production, i.e. cross-national value chain in today's world, dominate the international relations of production, and influence the international superstructure (international systems or global governance). According to Karl Marx (1995), just as it subordinated the countryside to cities, (the international division of labor) subordinated uncivilized and semi-civilized countries to civilized countries, subordinated farming nations to bourgeoisie nations, and subordinated the East to the West. With their technological supremacy established through the industrial revolution and capitalist development, Western countries dominate world political and economic affairs, shaping a global relationship of dependence. Dos Santos (1970) contends that such dependence was initially characterized by colonialist systems before taking on the forms of financial control and then technological control. Under dependent international relations, corresponding international systems have taken shape, including the above-mentioned international IPR system and trade openness systems for high-tech products. Under these systems, developing countries have been locked at the downstream links of the international division of labor and the global production chain with a meagre share in the international economic distribution.

Since technology is a key determinant of a company/country's status in today's international system, China must leapfrog development in the high-tech sector to transition from being a medium-low to becoming a medium-high-end link in the international division of labor system. Such development cannot be achieved without state support. Since reform and opening up, China has edged closer towards becoming a technological powerhouse with its unique institutional strength. In recent years, China's economic transition has shaken the West's core interest in the global division of labor system - technological monopoly. Western powers will never cede their core competitiveness without a fight. They will stop at nothing to keep their technological monopoly, and prevent late-moving countries like China from acquiring technological leadership. In the final analysis, the China-US trade conflict is typical of competition between a rising power and an incumbent one.

4. Concluding Remarks

Robert Gilpin (1987) said that "trade and war have always been the key in the evolution of international relations." From a historical materialism point of view, trade transforms international relations through the international division of labor (or international production process). Trade conflict is a manifestation of the possible transition of the international division of labor, which is accompanied by change in international relations, both economically and geopolitically. Countries that dominate the international division of labor will hold sway in international economic relations. Change in a country's status in the international division of labor is a manifestation of economic development. The five forms of innovation that drive economic development as identified by Schumpeter boil down to changes in the way in which production is organized in which technology plays a pivotal role as the primary productive force. China's trade frictions with some Western countries over the high-tech sector stem from China's ascent in the hierarchy of the international division of labor, i.e. frictions over whether China can take center stage in the international division of labor to transform its status in the international relations of

(C)1994-2023 China Academic Journal Electronic Publishing House. All rights reserved. http://www.cnki.net

production and fulfill its dream of building a strong nation.

Historically, restructuring of the international division of labor was often accompanied by war. A century ago, Western industrial powers fought each other over domination in the international division of labor. In today's world, China's development is likely to result in the restructuring of the hierarchy of the international division of labor. As a socialist country, China needs brand-new diplomatic ideas and concepts in pursuing its economic development while averting similar tragedies. No country can afford the consequences of war, which leaves no winners. In this context, the Communist Party of China (CPC) has called for a new type of international relations and a community of shared future for humankind - an ideological innovation of great significance.

References:

[1] Compilation Bureau of the CPC Central Committee.1995. *Anthology of Marx and Engels*. Beijing: People's Publishing House.

[2] Cox, Robert W. 1987. *Production, Power, and World Older*. New York: Columbia University Press.

[3] Dos Santos, Theotonio. 1970. "The Structure of Dependence." *American Economic Review,* 60(2):231-236.

[4] Dunning, John. 2001. "The Eclectic (OLI) Paradigm of International Production: Past, Present and Future." *International Journal of the Economics of Business,* 8(2):173-190.

[5] Flamm, Kenneth. 1996. *Mismanaged Trade? Strategic Policy and the Semi-Conductor Industry.* Washington, D. C.: Brookings.

[6] Genest, Marc. 2004. *Conflict and Cooperation: Evolving Theories of International Relations.* Belmont: Watsworth/Thomson Learning.

[7] Gilpin, Robert. 1987. *The Political Economy of International Relations*. Princeton: Princeton University Press.

[8] Gowen, Peter. 2010. "Industrial Development and International Political Conflict in Contemporary Capitalism." In *Marxism and World Politics* edited by Anievas, Alexander. London: Routledge Press.

[9] Hausmann, Ricardo, and Rodrik Dani. 2006. "Doomed to Choose: Industrial Policy as Predicament." Paper Presented at the Blue Sky Seminar, Center for International Development at Harvard University, September 9.

[10] Lipson, Charles. 1982. "The Transformation of Trade: The Sources and Effects of Regime Change." *International Organization,* 36(4):428-429.

[11] Nozick, Robert. 1991. *Anarchy State and Utopia*. Translated by He Haihong. Beijing: China Social Sciences Press.

[12] Schumpeter, Joseph. 1961. *The Theory of Economic Development: An Inquiry of Profits, Capital, Credit, Interest, and Business Cycle.* Cambridge: Harvard University Press.

[13] Stiglitz, Joseph. 2006. *Making Globalization Work*. New York: W. W. Norton & Company.

[14] Vernon, Raymond. 1966. "International Investment and International Trade in the Product Cycle." *Quarterly Journal of Economics,* 80(2):190-207.

[15] Vernon, Raymond. 1971. *Sovereignty at Bay*. New York: Basic Books.

(C)1994-2023 China Academic Journal Electronic Publishing House. All rights reserved. http://www.cnki.net