

Unraveling the “New China Puzzle”: Exploring Global Value Chain Dynamics Using the GVC Participation Index

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Abstract

Global trade dynamics have undergone significant transformations, leading to the globalization of production processes, with global value chains (GVCs) playing a crucial role in this evolution. This study addresses the gap in understanding China’s position within these chains, particularly in the “New China Puzzle” context”. It aims to assess China’s current status in the GVC landscape, identify the factors influencing its integration, and analyze the contrasting economic developments of China and the United States. This study has leveraged secondary key statistical data analysis to achieve these objectives. Key data indicators include imports, exports, GDP growth rates, employment rates, trade, and investment patterns for China and the U.S. By examining these data, the study explores the dynamics of GVCs in both nations and investigates the trajectories of their economic development. The findings obtained from this study have highlighted the critical role of trade and various influencing factors in national development. Moreover, the study has also presented an analysis of trade policies. Ultimately, this study sheds light on the significance of GVC participation in developing China and the U.S., emphasizing China’s evolving role within these global networks.

Keywords

Globalization, “New China Puzzle”, Global Value Chain (GVC), Global Value Chain Participation, Employment Rate, GDP Growth Rate

1. Introduction

Globalization and its course have been questioned by the dramatic changes in the

global trade scene in recent years. Globalization has been revered as a major global economic strength. However, recent literature has witnessed a trend in how globalization may have affected the economy. One such piece of literature coined the term “New China Puzzle” (Subramanian et al., 2023), drawing significant attention to how globalization may have affected China’s commerce. The puzzle is that China’s worldwide export market share has increased; however, its internal trade-to-GDP ratio has significantly decreased. For instance, China’s exports account for 20.9% of its GDP in 2024, indicating a strong global trade position (World Bank, 2024). However, its trade-to-GDP stood at 37.32%, a significant drop since 2004’s 59.51% (Macrotrends, 2024). So, a near-halving internal trade coupled with close to doubling external trade (Subramanian et al., 2023). However, globalization was a means for the country’s economic growth through external trade, partially fulfilled by increasing external trade trends, as seen in China’s export data. However, China’s internal trade drop trend may not support globalization’s theory. This phenomenon demonstrates the complex interaction of domestic and international economic factors. Previously, some studies have explored such issues in the name of the “distance puzzle”, where globalization’s decreasing distance among countries has decreased domestic trends (Duan et al., 2023). Most of these studies have suggested GVC or global value chain for this phenomenon (Sass & Szalavetz, 2014). Therefore, this study revolves around GVC, China, and its apparent “China puzzle’s phenomenon”.

Global value chains (GVCs) have changed international trade and industry during the last three decades, making nations more economically interdependent. Currently, 70% of the international trade involves global value chains (Chawla & Kumar, 2023). This suggests how much GVC has been involved with countries and their trade in the past few decades. GVC helped countries to have that international trading route to leverage market opportunities. Similarly, China’s rapid economic rise has been largely attributed to GVC participation, establishing the nation as a major assembly hub for goods headed for the European and American markets. China’s involvement in GVCs has created new complications despite these benefits. Although its proportion of worldwide exports has increased, the domestic value contributed to exports has decreased due to its reliance on imported components (Kee & Tang, 2016). Furthermore, taking part in GVCs alone does not ensure long-term financial gains. Long-term benefits for a nation rely on its capacity to improve within the GVC framework, bolster its competitive advantage, and match trade with more general development objectives. The “China puzzle” draws attention to a new paradox: China’s growing percentage of global exports contrasts with a falling trade-to-GDP ratio, indicating changes in its involvement in the GVC. This study fills this gap using the Global Trade Analysis Project (GTAP) model and the GVC Participation Index to examine China’s changing GVC status. Although China’s involvement in GVCs has been previously studied, few studies have examined the variables influencing its GVC integration and the resulting economic effects. Some previous studies, like Duan et al.

(2023), have explored partially similar concepts like ‘the distance puzzle; however, it does not explain a clear relation among GVC, internal trade, and external growth. [Sass & Szalavetz \(2014\)](#) argued that current literature on the role of GVC in creating this paradox is ambiguous due to each having its methodologies and data set approaches. Still, the role of GVC is established in this paradox, so we need to evaluate how GVC has impacted economic domains in a country with a universal data set. GVC’s impact on China can be analyzed through the Global Trade Analysis Project (GTAP) database and global economic data to address this.

This study explores China’s changing role in global value chains (GVCs). The main focus will be on China’s existing place in GVCs, the reasons influencing its integration into these chains, and the effect of GVC involvement on China’s economic development using the Global Trade Analysis Project (GTAP) model.

The following are the key objectives carried in the study:

- 1) To highlight the current position of China in the global value chain from the “New China Puzzle” perspective.
- 2) To identify the factors affecting the integration of China into the global value chain.
- 3) To analyze the effects of the global value chain on China’s economic development using the GTAP model.

Hence, an extensive investigation of the “new China puzzle” is unique. As the concept termed by [Subramanian et al. \(2023\)](#) is relatively new, very few current research has comprehensively analyzed the contradictory trends in China’s trade dynamics. This study distinguishes itself by employing robust methodologies, such as the Global Trade Analysis Project (GTAP) model and the GVC Participation Index. Through this, its economic effects on China have been evaluated. The research identifies and evaluates China’s GVC integration factors to clarify the ambiguous relationship between GVC participation and economic outcomes. Amidst the discrepancy in literature and limited exploration of puzzle effects, a country-based analysis becomes essential to establish the current theory. Overall, there remains a lack of consensus on the role of GVCs in influencing economies ([Taglioni & Winkler, 2016](#); [Rigo, 2021](#)). This study seeks to address and clarify this gap in understanding. It should provide a more holistic understanding of how these GVCs have interacted with China’s economic development as of today.

2. Literature Review

Many studies and researchers of recent years have endeavored to highlight the production capacity enhancing GVCs advantages. According to the World Development Report 2020, increased involvement in GVCs has enhanced productivity and efficiency and facilitated technology transfer. However, these assertions are frequently debated, and there is no definitive evidence to conclusively state that value chain participation uniformly enhances the productivity of an economy. Nevertheless, substantial proof demonstrates that various facets of GVCs can profit economies.

2.1. GVC Framework and Policy Making

GVC framework emphasizes how value can be created through the strategic expansion of the supply chain (Gereffi, 2014). The global industries and Countries now have a holistic view of how they can trade. As globalization's intricacies and mixed consequences become obvious, the GVC framework is essential for comprehending these processes. It discusses emerging markets like China, Brazil, and India's role in driving GVCs, private regulations, fresh products and growing standards, and social and environmental enhancements (Mayer & Gereffi, 2010; Lee, 2010).

Over the past twenty years, many international development organizations have embraced the framework of GVC to enhance their insights into how countries can more effectively participate in trading globally (African Development Forum and World Bank, 2021; World Bank, 2020). Unlike traditional policies of industries, which focused on developing self-sufficient domestic supply chains, GVC-oriented industrial policy is more nuanced and adaptable to the complexities of globalized industries (Rodrik, 2007; Baldwin, 2014; Kaplinsky & Morris, 2016; Gereffi & Sturgeon, 2013). Conventional trade policy instruments, such as tariff bans, can have unintended and often adverse consequences. In contrast, GVC-oriented policies are designed to function within the intricate geographic and organizational structure of international industries, aiming to strengthen and deepen a country's integration into these chains and maximize the benefits derived from GVC participation over time (Gereffi et al., 2021). For instance, GVC's trade policies reduce tariffs and trade barriers to promote cross-border integration of production and supply chains, supporting GVC's expansion (Gereffi et al., 2021). Similarly, the GVC framework has FDI regulations that either promote FDI or limit it (Gereffi & Sturgeon, 2013). Contextually, GVC's FDI policies are based on protectionism principles to protect domestic industries against large international conglomerates (Head & Mayer, 2019). GVC has its re-shoring policies to relocate production closer to home or nearby regions, reduce dependency on long-distance supply chains, and improve supply chain resilience (Gereffi et al., 2021). Such policies ensure countries get economic benefits from GVC participation, thus helping strengthen their global trade presence and resilience.

Countries need growth, and these GVC policies ensure that every country has participation advantages. GVC policies also ensure that investment and trade in participating countries are at their highest. GVC policies promote international collaboration among governments and businesses (Gereffi, 2019). The synergies created by these policies ensure mutual benefits among participants. Technology transfer, knowledge sharing, and innovation, ultimately leading to increased productivity and growth, are some of the other development domains that GVC policy focuses on. GVC framework and policies are essential in generating development potential among countries.

2.2. Technology Capabilities Transfer in Global Value Chain

Today, intelligence has emerged as the main production driver, marking the

change from an industrial economy to a knowledge-based one as the centric exception for businesses in the twenty-first century (Garcia-Perez et al., 2019). The key factors for a successful transition include enhancing and fostering knowledge capacity, capabilities, and capital. Countries participating in GVC gain technologies and knowledge and advance innovation opportunities from global industry leaders. Technology transfer has been a major boosting factor for emerging countries. Development enterprises can interface with foreign firms and integrate with international standards through GVCs, improving technology spillovers and knowledge exchange. Rigo (2021) says that multinational companies transfer knowledge and technology to developing and emerging economies to ensure that traded goods have universal standards. However, domestic companies have to face competitive pressure from international quality demands. Still, technology transfer aspects of GVC have benefited domestic players in emerging markets.

LaFayette et al. (2019) noted that experts in economics have linked this transformation since the 1950s to the growing significance of services, the accessibility of knowledge, technological advancements, and a more skilled workforce, among other organizational and contextual factors. Over thirty years ago, Porter (1985) characterized firms as collections of technologies and argued that a firm's competitive advantage stems from the technologies embedded in its knowledge, expressed through its products or services. Today, it is widely acknowledged that knowledge is the critical element that enhances the value proposition of a firm's products or services (Kandampully, 2002).

Apart from inner knowledge capacity, capabilities, capital, and networks such as unification into value chains enable small and medium enterprises (SMEs) to approach external knowledge to learn and innovate through the participation of enterprises in chains. According to Fu et al. (2011), SMEs specializing in various functions must learn and innovate to meet the demands for quality and delivery time of products, process capacity, and compliance with labor, social, and environmental standards mandated by global value chains. Additionally, Roper et al. (2006) argue that firms must acquire the necessary knowledge to innovate and translate the information for new products and their processing so that they cannot damage the innovation to create value.

Through these efforts, firms can effectively compete with others where creativity, innovation, and continuous learning are integral to daily operations (Ferreira et al., 2020). Capabilities and knowledge are sourced from various origins and types, which serve as the crucial operational link that ties distinct innovations together within the value chain (Roper et al., 2008). Despite literature suggesting technology transfer in GVC is linked with benefits for the domestic markets and players, many emerging markets have seen domestic trade decline.

2.3. Export-Import and GVCs

Productivity gains are not solely derived from tangible sources; learning through exporting, importing, or participating in GVCs can also lead to significant

productivity improvements. Extensive literature highlights “Learning by Exporting” and “Learning from Importing,” where firms acquire knowledge and enhance productivity by engaging in international trade activities.

Learning by exporting involves developing relationships with foreign buyers, gaining insights into foreign markets, understanding consumer preferences, adopting better practices, and accessing superior technology and inputs (e.g., high-quality inputs). It also involves transferring technology and soft skills (Guadalupe, Kuzmina, and Thomas, 2012; Baldwin & Gu, 2004). Similarly, “Learning from Importing” allows firms to access advanced technologies and managerial practices, improving productivity (Guadalupe, Kuzmina, and Thomas, 2012).

Interestingly, firms can experience learning benefits even before actual exports begin. The decision to enter export markets often prompts firms to invest in new technologies, stimulating productivity enhancements (Alvarez and López, 2005). This learning dynamics also extends to participation in GVCs. According to Montalbano et al. (2018), integrating GVCs facilitates knowledge exchange and technology flows in Caribbean countries and Latin America, leading to productivity gains. UNESCAP reported on Asia-Pacific Trade & Investment (United Nations, 2015) that participation in GVCs enables manufacturers of developing countries to cater to international markets.

Necessitating adherence to global quality standards. This emphasis on quality and uniformity across diverse consumer bases contributes to productivity improvements driven by GVC participation.

2.4. Trade Inputs and GVC Participation

Literature reveals that an increase in the variation in available inputs of foreign can significantly enhance production within an economy (Topalova & Khandelwal, 2011; Halpern et al., 2015; Amiti & Konings, 2007). Access to previously unavailable inputs allows firms to improve production efficiency by reducing costs or upgrading input quality (Criscuolo, Johnstone, & Timmis, 2015). Bas & Strauss-Kahn (2015) demonstrate that relaxing import restrictions on inputs in China facilitated access to inputs of high-quality, thereby enhancing the quality of exports.

Moreover, input trade fosters competition within domestic markets (Pavcnik, 2002; Topalova & Khandelwal, 2011). Melitz & Ottaviano’s (2008) theoretical models suggest that trade liberalization heightens competition domestically, elevating aggregate productivity while increasing the risk of firm exit, particularly in larger economies. Pavcnik (2002) found evidence of productivity plants in Chilean manufacturing because of trade liberalization, attributing this to reallocating resources towards more efficient producers.

Foreign inputs contribute to product diversification and export expansion (Bas & Strauss-Kahn, 2015; Kasahara & Lapham, 2013; Goldberg et al., 2010). Kasahara, Liang, and Rodrigue (2016) explained how documenting importing inputs in Indonesia shifts demands toward skilled workers across various job categories.

Similarly, trade intensity correlates with the increased demand for educated labor in Latin American nations experiencing heightened import penetration (Sánchez-Páramo & Schady, 2003).

Furthermore, imported inputs often embody technological knowledge, fostering innovation through knowledge spillover and imitation (United Nations, 2015; Beaulieu & Wan, 2016; Connolly, 2003). Reijnders & de Vries (2018) indicate that technological advancements within GVCs drive demand for skilled jobs over unskilled ones.

In conclusion, participation in GVCs amplifies the benefits of trade in inputs, including enhanced productivity and innovation (World Development Report, 2020; Halpern, Koren, & Szeidl, 2015; Tajoli & Felice, 2018). Developing countries, particularly those importing inputs from advanced economies within GVCs, often experience positive impacts on Innovation and economic performance.

2.5. Foreign Direct Investment and Outsourcing

Outsourcing involves a firm procuring inputs from another related firm within the same country or internationally. Conversely, offshoring refers to relocating manufacturing sections to distinct geographic places, which can occur inside or outside the firm. In the context of vertical Foreign Direct Investment (FDI), International outsourcing specifically pertains to sourcing inputs internationally within the firm's structure.

Research indicates that productivity-enhancing spillovers occur when multinational corporations (MNCs) establish backward linkages. These linkages involve technology transfers from the main firm to their international outsources or partners, as documented by studies such as Alfaro et al. (2014) and Havranek & Irosva (2011). FDI also facilitates the transfer of soft skills such as organizational capabilities and management, further enhancing enterprise productivity (Guadalupe, Kuzmina, & Thomas, 2012; Arnold & Javorcik, 2009). Moreover, technology transfer indirectly through FDI has been observed, with evidence suggesting a positive correlation between the level of foreign investment in the city and the firm's productivity (United Nations, 2015).

Furthermore, offshoring and outsourcing benefits extend beyond recipient economies. Lead firms gain access to cheaper and higher-quality inputs while focusing on their core competencies, resulting in significant cost savings. For instance, Farrell et al. (2003) found that US firms achieved substantial cost reductions by outsourcing activities to India, enabling them to reinvest these savings into their operations. Grossman and Rossi-Hansberg (2008) also found and highlighted the cost-efficiency gains from offshoring in their theoretical framework.

2.6. Scale and Demand Effect from GVC

Increased productivity resulting from any form of trade, including that observed within Global Value Chains (GVCs), can be attributed to scale effects. Scale effects

arise from the specialization in producing an item as the size of the market expansion. Research indicates that highly productive firms within an economy typically cater to broader markets (De Loecker, 2007; Andersson, Loof, & Johansson, 2008; Van Biesebroeck, 2005). Castellani (2002) further underscores the growth of production in firms correlates positively with their level of engagement in exporting goods. When firms trade across multiple countries, they access larger markets for their products, encouraging investments in skills and technology. This, in turn, fosters greater division of labor, leading to enhanced productivity.

The production fragmentation within GVCs leads to highly specialized tasks, resulting in significant benefits from specialization (Antràs, 2020). Grossman & Rossi-Hansberg (2008) illustrate that the increased “trade in tasks” enhances production with all domestic factors, especially for those that can easily outsourced. The author argued that the ease of trading some fixed tasks improves, and the firm can easily focus on tasks where the firm has comparative advantages while outsourcing others.

According to the GVC very crucial role in improving the demand for skilled workers through specialization both across & within different sectors. Additionally, UNCTAD (2015) highlighted in a study that the global LED market is concentrated in 4 main regions, each specializing in different aspects of LED production and development: Europe and America specialize in general lighting, Japan displays backlit, Taiwan region and Korea Rep. are expertise in the backlight of LED monitors & backlights of LED-TV, and lastly, mainland of China is specialized in yellow, red and green lights of outdoor displays and also for advertisement screens.

3. Methodology and Data Collection

This research aims to explore China’s integration and influence within GVCs. It adopts a comprehensive methodology and incorporates a mixed-method research design.

The researcher collected from the data sources. The GTAP Database V11, which offers worldwide economic data for modeling China’s economy, and the GVC Participation Index are the main data sources for data gathering. Because of their significant significance in Chinese trade, focus sectors include textiles, electronics, and machinery. The database includes China’s exports, imports, GDP, and employment rates. The core framework was built upon China’s economic status. Therefore, the baseline indicators were GDP, trade flows, and employment. Another secondary source was existing literature on GVCs, their role, and related to provide a robust foundation for understanding the primary study. By incorporating trade and intermediate goods in GTAP, we model China’s participation in GVCs.

To study the impact of GVCs on China’s economic development, the researcher carried out an analysis in three key steps: first, the researcher quantified China’s position by highlighting the trade network through FDI status in China. Secondly,

the scenario was explained and highlighted the GVC's role in China's economic development. The collected data were analyzed to compare China and the US economic situation using GDP growth and indicators such as import, export, trade and investments, and growth and employment rates. This analysis highlights the broader economic scenario and growth of China and the U.S. This comparative analysis also highlights the differences and similarities in economic development. This comparison provides depth to understanding China's and the U.S.'s unique participation and significance in influencing the global economy.

4. Results and Interpretation

The global economic landscape has been significantly influenced by the escalating trade tensions between China and the United States in recent years. This confrontation, marked by tariffs, trade barriers, and geopolitical maneuvering, has created a complex environment for international trade. They analyze China's and US trade performance during 2013-2023, providing valuable insights into how such tensions impact the world's two largest economies and their trade dynamics. By examining key metrics such as the value of exports and imports, GDP growth rates, trade balance, and investment positions, researchers can better understand the resilience and adaptability of China's economy amidst these challenges. This analysis sheds light on the current Sino-American economic relations and offers a broader perspective on the potential future trajectories of global trade in an increasingly multipolar world.

4.1. Current Position of China in the Global Value Chain

Over the past few decades, the role of China in GVCs has evolved dramatically. Now, China is the 2nd largest world economy and a guiding force in manufacturing; China is the foremost exporter of high-tech products. Despite this, it remains heavily reliant on foreign capital and technology. To understand the position of China in GVC by using the lenses of the "New China Puzzle", the researcher explains the China puzzle first and also considers various facets of its economic and geopolitical strategies and how they intertwine with its complex internal dynamics.

At its core, the "China puzzle" describes a unique phenomenon where accelerated growth makes optimists more confident about the future while simultaneously making pessimists more concerned. The optimistic perspective is understandable as China grows and expands its global economic influence. On the other hand, the pessimistic view focuses on the increasing challenges to sustaining this growth, which are likely direct consequences of the rapid expansion. The graph in **Figure 1** represents the relationship between the Incremental Capital-Output Ratio (ICOR) (left Y-axis) and the Gini coefficient (right Y-axis) over time from 1985 to 2009 (X-axis). For example, the incremental capital-output ratio (ICOR) (Left vertical axes) indicates a general decline in investment efficiency. Despite some fluctuations, the ICOR is much higher than in the early 1990s and 1980s. Additionally, income inequality has steadily worsened, as evidenced by the rising Gini

coefficient. The right axes suggest that the Gini coefficient (in red) is a measure of income inequality, with values ranging from 0 (perfect-equality) to 1 (maximum inequality). From the trend, it can be seen a steady increase in the Gini coefficient over the years suggests a gradual rise in income inequality in China. Economic inequality surpassing international warning thresholds. This shared understanding shapes the optimistic and pessimistic assessments of China's economic future. Pessimists believe that accumulating imbalances and inefficiencies will eventually disrupt the growth trajectory. Optimists, however, trust that the government, given its strong track record in managing risks, will continue to address these challenges effectively (Huang, 2010).

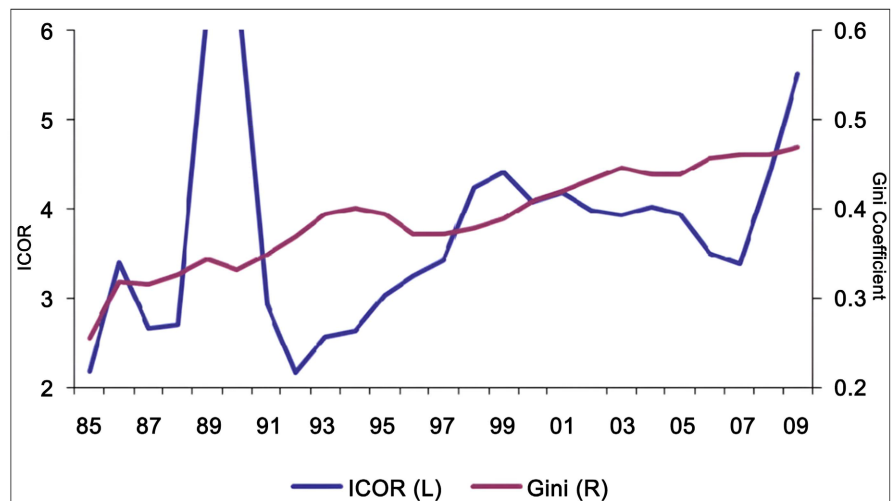


Figure 1. Incremental investment Output Ratio (ICOR) and Gini Coefficient, 1985-2009. Note: The Gini Coefficient is drawn mainly from Chen, Hou, and Jin (2008) and then updated with information from international organisations such as the World Bank. Source: CEIC data company, National Bureau of Statistics and Chen, Hou and Jin (2008).

Here are some key perspectives about China's position in GVC:

Regarding economic growth and manufacturing prowess, China has emerged as the world's second-largest economy, reflecting its robust economic growth and expanding global influence. Known as the "Factory of the World", China has become a global manufacturing powerhouse, leading the world in the export of high-tech products and maintaining a dominant position in producing goods across various sectors (Sun & Grimes, 2017).

Despite its manufacturing capabilities, China remains significantly dependent on foreign sources for capital & advanced technology. This reliance highlights China's challenges in achieving technological self-sufficiency and reducing its dependency on foreign innovations. China also played a leading role in medium and low-end manufacturing as China supplies 80% of the world-based medium and low-end manufacturing exports. Its deep integration into the global supply chain underscores its pivotal role in manufacturing and distributing various items. Inseparable position: Given its extensive and established manufacturing base, the

role of China in the global chain of supply is irreplaceable in the short term, making it a critical player in international trade and production networks (Wei, 2020).

China boasts a well-developed and complete industrial support system, positioning it at the center of the global supply chain. This infrastructure advantage allows China to maintain its lead over Southeast Asian countries, which lag in technological capabilities, industrial diversity, and policy frameworks. China's advancements in technology and automation further solidify its role in GVCs. Its focus on high-tech manufacturing and industrial automation enhances its efficiency and competitiveness in the global market (Wei, 2020). The Workforce Transition and Automation in China is effectively managing the transition of its workforce in the face of increasing automation. By investing in workforce training and gradually integrating automation technologies, China mitigates the potential negative impacts on employment, ensuring a balanced approach to industrial modernization (Stec, 2020).

China dominates mining and refining rare earth materials, crucial for numerous modern technologies, including electronics and renewable energy systems. This control over essential resources further secures China's strategic role in GVCs. While China has excelled in manufacturing, it faces challenges in shifting upward the value chain to become more competitive in technology & innovation. Achieving parity with the United States and other developed economies in high-tech sectors remains a key goal for China's economic strategy (Kee & Tang, 2016). As China continues to evolve, it aims to change from a production-driven economy to only one-centered economy with innovation & technological leadership. This shift requires overcoming existing hurdles and further developing its capabilities in research, development, and high-value industries.

In summary, China's significant improvements in its global value chain position underscore its strength as a manufacturing giant and its expanding role in high-tech sectors. However, the journey towards becoming an innovation-driven economy presents ongoing challenges, particularly in reducing dependency on foreign technology and achieving higher technological competitiveness. Despite these challenges, China's current capabilities and strategic investments ensure its secure rank in the GVC in the near term.

4.2. Factors Affecting the Integration of China into GVC

A myriad of factors has influenced the integration of China into the GVC. These range from China's domestic policies and economic reforms to international dynamics and technological advancements. Below are some key factors that have played a significant role in shaping China's integration into GVCs:

4.2.1. Economic Reforms and Openness

China's Journey of economic reform and integration into the global economy has been a carefully calibrated process aligned with its developmental needs at each stage. China has taken a phased experimental approach and strategic step-by-step

implementation since its reform and opening-up policy was introduced in 1978. From 1979 to 1992, foreign investment and technology were the most significant factors because of low output, a reliance on basic goods, a small part of world trade, and weak manufacturing skills. The basis for this occurrence was the Market-for-Capital and Accumulating Trade (Surplus) Modernization phase. From 1993-2001, China advanced towards a “radical Export-Oriented strategy”, prioritising export-led growth. With its abundant labour resources and good investment atmosphere, China became a world factory to increase exports substantially. During the second phase, from 2002 to 2012, China further opened its economy due to WTO accession. The “Liberalized Export-Oriented Strategy”, centred on extensive GVC integration and trade openness, absorbed significant FDI.

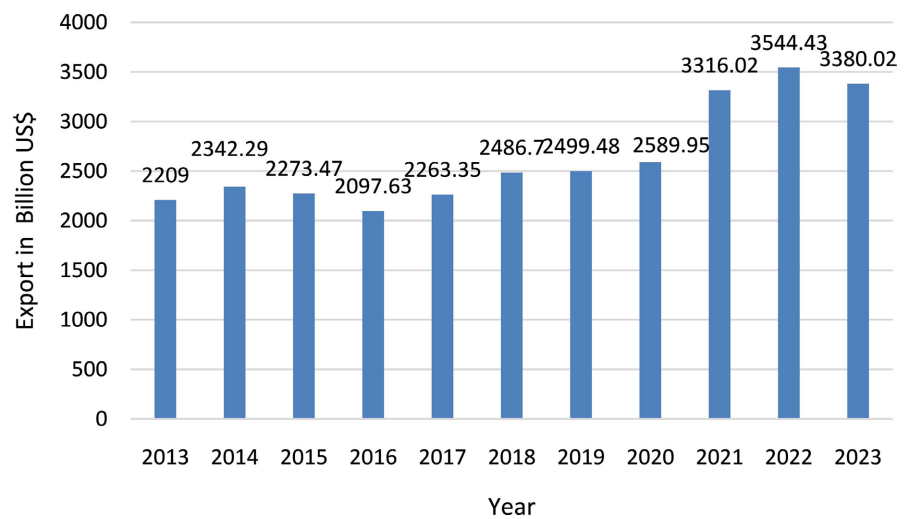


Figure 2. Value of export of goods from China (2013-2023). Source: (Ou, 2024) China: export of goods 2023|Statista.

Since 2013, China has pursued a more balanced approach with the “Two-way investment strategy,” emphasising exports, increasing imports, and encouraging outbound investments (Figure 2). This strategy reflects a more mature economic stance, aiming to diversify trade relationships and enhance global integration. Throughout these phases, China’s policy decisions have been deeply rooted in its domestic context, responding to internal developmental challenges and external opportunities. This adaptive and pragmatic approach has been instrumental in transforming China from a marginal player to a central force in the global economy.

Following 1992, China witnessed significant improvements in its overall development level and the self-sufficiency of its enterprises. This progress enabled a shift in the foreign trade strategy towards a more aggressive, export-oriented approach. During this phase, policies encouraging exports accelerated the upgrading of industrial structures and boosted production output.

By 2012, in response to the decrease in globalization resulting from the financial crisis and the challenge this posed to export-driven growth, China began to

implement a more balanced and comprehensive opening strategy. This strategy, which emphasizes equal importance to imports and exports and promotes two-way investments, was driven by several factors. These included the need to address insufficient supply to meet the rising demands of an upgrading consumer base and the opportunity presented by a new wave of scientific and technological advancements. This new technological revolution was also fostering a fresh wave of industrial transformation, necessitating a more integrated and multifaceted approach to the global economic participation of China (Wei, 2020).

4.2.2. Foreign Direct Investment (FDI)

FDI has been pivotal in transforming China's domestic industries and refining its integration into GVCs. This transformation has been facilitated through strategic adjustments in foreign investment policies and a progressive relaxation of restrictions on foreign capital. Initially, FI was directed towards the light textile manufacturing industry, but over time, China has systematically adjusted its investment focus towards industrial manufacturing and subsequently to high-tech industries. This shift had been guiding by revisions to the list of industries to motivate investment, which has progressively elevated the quality of foreign investments. As a result, the technological spillover effects from multinational corporations have significantly improved, enhancing the sophistication and efficiency of China's industrial structure.

Simultaneously, China has accelerated its pace of Outward Foreign Direct Investment (OFDI), further integrating itself into the global division system of industries. Along continuous advancements of its industrial base and the increasing competitiveness of its enterprises, China initiated the "Going Global strategy" in 2003. This strategy primarily focused on the establishment of cross-border zones, foreign economic and trade cooperation zones, and zones for border cooperation of economy. These zones serve as stage for facilitating China's global economic engagement.

In this cotemporary time, the Belt & Road Initiative (BRI) has been initiated to foster comprehensive development across multiple fronts, including infrastructure, policy, trade, finance and people-to-people connections. This initiative aims to create a conducive environment, both in term of physical infrastructure and regulatory frameworks, for Chinese enterprise to expand into developing countries. By doing so, China strengthens its role in regional value chains promoting continuous participation and integration.

China's approach combines both passive and active types of global chain participation. On one hand, it continuously enhances FDI quality which has ensured sustained passive integration into GVCs, leveraging external technologies and capital. On other hand, the proactive promotion of OFDI and initiatives like the BRI reflects a direct and active engagement in global value chains, this dual approach fosters a dynamic interaction where FDI and OFDI complement each other, driving China comprehensive and deepening involvement in the global economic system (Wei, 2020).

4.2.3. Labor and Cost Advantages

Over the last 4 decades, China has effectively leveraged its demographic advantages and actively engaged in the international division of labor through comprehensive market-oriented reform and strategies opening-up measures. During this period, China capitalized on its abundant and cost-effective labour force, bolstered by surplus agricultural labour. This provided a significant advantage for comparison in the processing, production, and assembly sectors, allowing China to become a key player in the global manufacturing transfer amidst economic globalisation (Figure 3).

By aggressively attracting FDI & Boosting exports, China embedded itself deeply into GVCs largely controlled by developing economies like those in the US, Europe and Japan. The reform period began in earnest in the late 1970s, as China transitioned to a demographic model characterised by low fertility, low mortality, and low growth rates. This demographic shift results in a rapid decrease in population dependency part and swift growth in the labor force, thereby accentuating China's competitive edge in low labor costs.

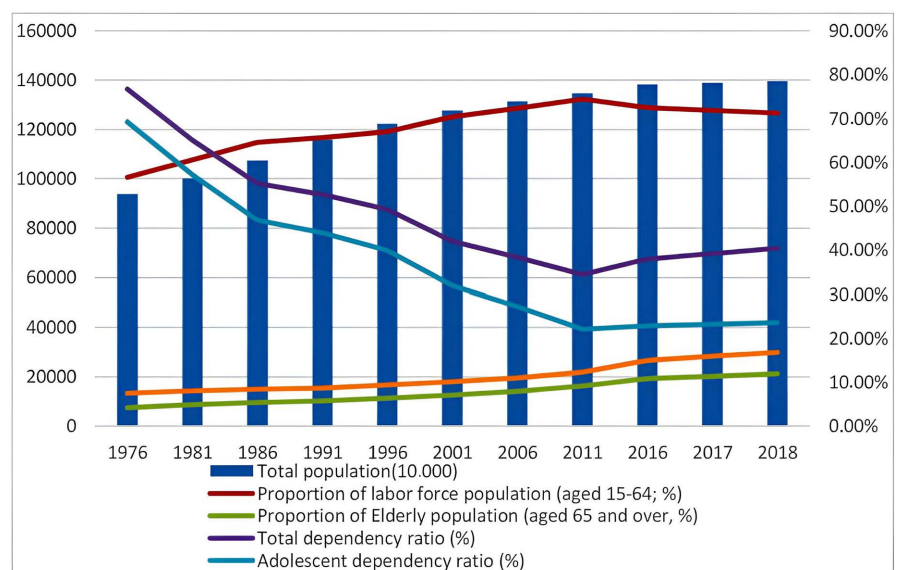


Figure 3. China demographic dividend. Source: Author's creation, collected data from Population (n.d.).

Concurrently, economic development in China was bolstered through increase in the availability of, capital, land & other production factors. The introduction of contract responsibility system of household revitalized agriculture production & facilitated the transfer of surplus labor in rural into non-agriculture sectors. Additionally, economic reforms enhanced the reallocation of labor and human capital from less productive state-owned enterprise (SOEs) for more dynamic and efficient private sector. These shifts were further energized by an export-oriented development strategy that invigorated market entities.

Particularly noteworthy is the period following China's accession to the World

Trade Organization (WTO) in 2001. This era saw a substantial release of the demographic dividend, driven by market-oriented reforms and an open economic strategy. Despite a gradual decline in the demographic dividend after 2011, China's business environment continued to improve. Policies focusing on supply-side structural reforms and high-quality development have further enhanced market dynamism and labor resource efficiency.

As a result, even as the demographic dividend waned, the position of China's in GVC continued to strengthen. The continuous improvement in business environment, combined with strategic economic policies, has cemented role of China's like a critical performer in the economy of global (Wei, 2020).

4.2.4. Technological Advancements

Since initiating the reform & opening up, China gets advanced rapidly in its industrial technology & bolstered its capacity for independent innovation through strategic measures such as importing advanced foreign technology, increasing investments in science, human capital, technology & steadily narrowing the gap in technological with developed nations.

Approach of China's to enhance its capabilities for innovation can be delineated: Initially, China led its scientific & technological endeavors with strategic foresight. From the outset of reform in 1978, recognizing the pivotal role of science & technology as productive forces, China adopted the directive that "economic development must rely on science and technology, and scientific research must serve economic construction." Subsequently, from 1998 to 2006, amid accelerated globalization, China pursued a strategy of national rejuvenation through science & education, emphasizing the integration of innovation & industrialization.

From 2006 onward, China articulated a policy framework focused on "independent innovation, targeted breakthroughs, supportive development, and leadership in future technologies." By 2012, China formalized an innovation-driven development strategy, setting ambitious milestones such as the "three-step" strategic goal to establish itself as a global leader in scientific and technological innovation by 2050. These policies charted a new course for the future trajectory of China's technological advancements.

In building its national innovation system, China has consistently emphasized the close integration of science, technology and the economy. It has empowered innovation stakeholders, nurtured scientific and technological personnel, and prioritized their training and development.

Secondly, China has advanced technological progress through its policies on foreign investment. Over the past four decades, changes in the direction of foreign investment policies regarding technology introduction have significantly enhanced enterprises' research and development (R&D) capabilities. These changes have evolved from conventional technology upgrades for introducing new, high-tech innovations, & subsequently to the self-development of basic technologies.

In the initial phase (1978-1986), policies primarily incentivized joint ventures

with reductions in income tax to facilitate the introduction of advanced global technologies. Over time, foreign investment policies began specifying requirements for technology introduction, consisting the adoption of updated tools & methods of scientific management, as well as the training of technical staff. However, these policies initially played a limited role in technology introduction.

With the developmental stage (1987-1993), high-tech development & special economic zones served as stage for introducing updated technologies of foreign through favorable fiscal measures. Within these zones high-tech enterprises enjoyed benefits such as tax reductions, streamlined import-export procedures, flexible pricing, and other advantages, significantly accelerating the pace of technology adoption.

In the improvement phase (1994-2001), policies were tailored to motivate foreign enterprises to undertake transformation of technological & upgrades it in China, taking into account variations in technology of production, quality standards & equipment sophistication across distinct industries. Following China's accession to the WTO (2001-2012), policies focused on the import, assimilation & innovation processes of technology while curbing indiscriminate and redundant imports. Concurrently, there was encouragement for the establishment of overseas Research & Development institutions and the formation of Research & Development alliances to develop technologies with independent intellectual property rights (IPRs).

In the current phase (2013-present), China focused on collaboration of R&D institutions & underscores independent research, development & IPRs protection. Guided by supportive policies, Chinese enterprises have transitioned from processing of supplied materials to prioritizing investments in R&D and safeguarding IPRs. This approach has continually bolstered enterprises' capabilities for independent innovation (Wei, 2020).

4.2.5. Industrialization and Moving Up

As a developing nation, swift integration of China into the GVC and its ongoing ascent to segments with higher value would not have been possible without its rapid industrialization. China achieved in a few decades what took developed countries centuries to accomplish in terms of industrialization. Since its opening-up, supported by concerted efforts from both the market and the governments, development in China industries has evolved from modest beginnings to robust growth. It has established a comprehensive industrial system, marketing a transformational journey from a primarily agrarian nation to powerhouse of industries.

In 1978, China was mainly an agrarian nation, with agriculture, industry, and services contributing 24.6%, 27.7%, & 47.7% respectively to the output value. Agriculture sector held a significant share, employing 70.5% of the population, while the total export & import volume was merely 9.7 percent of GDP. This was the early stages of development in industrial system.

Over the subsequent forty years (as shown in **Table 1**), secondary industry of

China achieved growth rate of 10.9% in average value-added. By 2018, secondary industry GDP had soared to 36.6 trillion RMB, a staggering 209-fold increase from 1978. China has since emerged as one of the few nations globally along with a comprehensive industrial system encompassing thirty-nine major industries, 191 medium categories, and 525 sub-categories. Concurrently, capacity of China in technological advancement has continued to strengthen. Currently, China supplies over eighty percent of the world's low & medium end manufacturing products, signifying its rapid advancement towards the later stages of industrialization (Wei, 2020).

Table 1. Economic structure of China (1978-2018).

Index	1978	1978	2018	2018	Index
	Employed people (10,000)	GDP, 100 million yuan (%)	Employed people (10,000)	GDP, 100 million yuan (% of weight)	Employment Index (2018/1978)
National	40,152	3678.7	77,586	900,309	1.93
Primary Industry	28,318	1018.5 (27.7%)	20257.7	64,734 (7.2%)	0.72
Secondary Industry	6965	1755.2 (47.7%)	21390.5	366000.9 (40.7%)	3.08
Tertiary Industry	4980	905.1 (24.6%)	35937.8	469574.6 (52.2%)	7.22
Per capita GDP		385	64644		

Source: Author's creation based on data collected from National Economy showed stable growth trend with positive factors accumulating in the first three quarters. National Bureau of Statistics of China (n.d.).

4.3. GVC Effect on the Economic Development of China

Massive foreign investment inflows have significantly fueled China's economic ascent, and it has increasingly become a key player in global outbound investment.

4.3.1. Status of Foreign Direct Investment in China

By 2020, China had emerged as a leading force in both inbound & outbound FDI globally. Later, when China combined with the World Trade Organization (WTO) in 2001, inbound FDI surged, with more than \$3 trillion flowing into the country over the past two decades, representing about 9 percent of FDI global flows (Patterson, 2021). Despite the economic disruptions caused by the global pandemic 2020, China attracted nearly \$150 billion in FDI, making it the 2nd largest FDI recipient after the US (UN Trade & Development, 2021). China was also the top country for outbound FDI in 2020, with investments amounting to \$132 billion (UN Trade & Development, 2021).

In the realm of trade, China has established itself as the world's leading exporter, totaling \$2.6 trillion in exports in 2020. It is also the 2nd largest importer, with \$2.1 trillion of imports, accounting for 11.5 percent of global value. In the past forty years, the share of China in the world merchandise trade has skyrocketed from virtually nothing to 15.2%, nearly equaling the combined share of the next 2 largest exporters, the U.S. (8.4%) & Germany (8.1 percent) (WTO, 2022).

In terms of imports, China is only surpassed by the U.S. (\$2.4 trillion, 13.5 percent), and its import volume is already twice that of Germany (6.6 percent) (WTO, 2022).

Trade of China is not confined to final goods; it is also a major player in the trade of intermediate goods, reflecting its participation as a key assembler in global supply chains. From 2005 to 2019, China's share of global imports of intermediate goods increased from 9.5% to 14.4%, while its share in intermediate goods exports grew from 6.7 percent to 13.4 percent (WTO, 2022). Beyond merchandise, China also achieved as a significant contributor of trade services globally, ranking as the 4th largest exporter of services of commercial lines (WTO, 2022).

China's trade masterhood spans various industries and trading partners. It is in the top 5 importers and exporters, extending from light manufacturing, such as textiles & apparel, to chemicals, heavy industry & automotive. China is also one of the largest importers of commodities, including mining, fuel & food products (WTO, 2022). As a prime partner in trading, China plays an important role in the export economies of many countries beyond its region and further afield. Countries such as the Democratic Republic of the Congo, Australia, Namibia, Myanmar, Brazil, New Zealand, Korea Rep., Vietnam, Japan, Indonesia, Uruguay, & Qatar send over 10 percent of their exports to China (UN Comtrade, 2022).

Growth of China's in global trade and investment has been nothing short of transformative. It has become a central hub in the global economy, deeply integrated into the fabric of international trade and investment networks, and a pivotal partner for many countries around the worldwide.

4.3.2. GVC Participation

To analyze the impact of GVC participation on economic development of China using dynamic GTAP model, a baseline scenario needs to be set up which describe how the world economy might move in the absence of policy effects, is important part of assessment of policy impact using dynamic model. This scenario also reflects the economic development of China by GVC participation.

The evolution of China in the global economy has been marked by distinct phases of development characterized as follows:

1) Industrialization in Export-Oriented

Following China's economic reforms and opening up, the nation emerged as a significant recipient of foreign direct investment (FDI). Its competitiveness was primarily driven by abundant labor and natural resources, bolstered by low wages, extensive shifting of workers from inland regions to coastal provinces, and expanding the scale of economies. In the late 1990s, foreign enterprises were responsible for approximately half of the exports in China. This proportion grew to 60% by 2006 (National Bureau of Statistics of China (NBSC), 2022).

2) Move Towards Local Markets & Investment

The global economic crisis of 2008 disturbed the model for export-oriented growth that had propelled China's economy for 3 decades. Slower global demand and changes in labor laws led to increased costs domestically, affecting the

manufacturing competitiveness of China in a contracting global market. Concurrently, China's local market matured, buoyed by rising purchasing power among consumers of China and strengthened domestic suppliers. These shifts were evident in reduced trade intensity, with the "trade-to-GDP ratio" declining from its top of 64 percent in 2006 to 34 percent in 2020 (World Bank, 2022). The relative importance of FDI in the economy of China was also minimized as domestic investment resources expanded. Although FDI inflows to China tripled exactly between 2002 and 2019, the share of China's total gross fixed capital formation diminished significantly from 10.3 percent to just 3 percent (Paterson, 2021). In 2019, foreign enterprises contributed only 39 percent of China's exports (NBSC, 2022).

3) Updated Manufacturing, Global Expansion & Indigenous Innovation of Chinese Leading Firms

By 2015, under the mentorship of President Xi Jinping, China embarked on initiatives to reduce its reliance on manufacturing low-cost, low-tech products. Instead, the focus shifted towards producing high-tech goods and services, particularly in the digital economy, emphasizing products designed in China and branded by Chinese companies. During this period, China significantly increased its expenses on Research and Development (R&D), reaching \$462 billion in 2018, marking about twelve-fold growth since 2000 (OECD, 2022). The firm in China also made substantial strides in global innovation rankings, accounting for 14.5 percent in the Global Innovation 1000 list published by PwC, up from 2.5 percent in 2012 (PwC, 2022). China filed nearly half of the world's patents; double of the US filed by 2020 (WIPO, 2020).

By 2019, China was nearly on par with the US regarding the total of firms listed among the world's largest multinational corporations, with 119 Chinese firms compared to 121 American firms (Mourdoukoutas, 2019). One-third of the world's "unicorns" (start-ups valued at \$1 billion or more), particularly those in the technical sector, were based in China, trailing only the US, which housed half of the "unicorns" globally (MGI, 2017). Prominent Chinese companies emerging from this innovation wave include global household named as Alibaba, Huawei, BYD, Midea, Didi & Shein. Furthermore, China has become one of the highest global investors for outbound, leveraging initiatives like the BRI launched in 2015 to facilitate FDI outbound into fresh markets and strengthen trade routes with established economies.

These phases illustrate China's strategic adaptation to the global economic landscape. It transitions from export-driven growth dependent on FDI to a more balanced approach that emphasizes domestic market expansion and increased self-reliance in investment and production capabilities.

4.3.3. Trade Overview

1) Export Trends

Table 2 below presents the export values of China and the United States from 2013 to 2023 in billions of US dollars.

Table 2. Value of export of goods (billion \$).

S.no	Year	Export of China	Export of US
1	2013	2209	2313.24
2	2014	2342.29	2392.27
3	2015	2273.47	2279.74
4	2016	2097.63	2237.92
5	2017	2263.35	2387.39
6	2018	2486.7	2539.38
7	2019	2499.48	2528.37
8	2020	2589.95	2134.44
9	2021	3316.02	2567.03
10	2022	3544.43	3039.41
11	2023	3380.02	3071.82

Source: Created by the researcher from Statista 2024 China (Ou, 2024) and US (Sabanoglu, 2024).

2) General trends

China: China's export value exhibits a generally increasing trend from 2013 to 2023. Starting at \$2209 billion in 2013, exports peaked at \$3544.43 billion in 2022. Despite a noticeable dip in 2016, when exports dropped to \$2097.63 billion, the values recovered and continued to rise steadily. Between 2021 and 2022, China's exports saw a significant increase of \$228.41 billion, marking a period of strong recovery and growth. However, there was a slight decline in 2023, with exports decreasing to \$3380.02 billion from the 2022 peak.

United States: The U.S. export values demonstrate a more fluctuating trend. Starting at \$2313.24 billion in 2013, the export values showed minor increases and decreases. The lowest export value was recorded in 2020 at \$2134.44 billion, likely due to the impact of the COVID-19 pandemic. Post-2020, U.S. exports recovered, rising to \$2567.03 billion in 2021 and further to \$3039.41 billion in 2022. In 2023, the export value slightly increased to \$3071.82 billion.

3) Comparative Analysis

Both countries had relatively close export values during the early years, with the U.S. consistently ahead of China. In 2014, U.S. exports peaked before 2022 at \$2392.27 billion, compared to China's \$2342.29 billion.

From 2016 to 2019, China's exports generally remained stable, with a slight increase towards the end of the period. The U.S. exports gradually increased after a dip in 2016, maintaining values above \$2200 billion.

In recent years, China's exports have grown significantly, especially from 2020 onwards, with the highest export value recorded in 2022. The U.S. also showed growth post-2020 but at a slower rate compared to China. By 2022, the U.S. export value had a notable increase to \$3039.41 billion, reflecting a recovery and growth

trend. In 2023, both countries experienced a slight increase (U.S.) or a decline (China), indicating a potential stabilization period.

4) Impact of Global Events

COVID-19 Pandemic: The pandemic significantly affected global trade in 2020. The U.S. experienced a notable drop in exports, while China showed resilience and quickly recovered in the following years.

Geopolitical Factors: The trade war and tensions between China and the U.S. likely influenced the fluctuating export values. Both countries' exports reflect adaptations to new trade policies and tariffs imposed during this period.

5) Key Insights

China demonstrated robust export growth, especially from 2020 to 2022, likely driven by its role in global supply chains and quick recovery from the pandemic. China's participation in GVCs has been characterized by its significant role in manufacturing and assembly, contributing to its strong export growth. The U.S. exports showed resilience with a significant recovery post-2020, surpassing the \$3000 billion mark in 2022, indicating strong performance in key export sectors. The U.S. participation in GVCs reflects its strength in high-value services, technology, and advanced manufacturing, contributing to the recovery and growth in exports.

Overall, the export data from 2013 to 2023 highlights the dynamic nature of trade between China and the U.S., and their participation in Global Value Chains (GVCs). Both countries faced challenges and showed resilience, with notable growth trends in recent years. China's export growth was particularly strong, surpassing the U.S. in later years, largely due to its central role in global manufacturing networks. The fluctuations in export values reflect broader economic conditions, policy changes, and global events impacting trade performance. The analysis of GVC participation reveals how both countries have leveraged their strengths to navigate the complexities of global trade and maintain significant roles in the global economy.

4.3.4. Import Trends

Table 3 provides the import values of goods for China and the United States from 2013 to 2023 in billions of US dollars.

Table 3. Value of import of goods (billion \$).

S.no	Year	Import of China	Import of US
1	2013	1949.99	2760.07
2	2014	1959.24	2876.41
3	2015	1679.56	2771
4	2016	1587.93	2719.09
5	2017	1843.79	2901.18
6	2018	2135.75	3119.32

Continued

7	2019	2078.41	3104.71
8	2020	2065.96	2811.13
9	2021	2679.41	3408.6
10	2022	2706.51	3984.17
11	2023	2556.8	3856.71

Source: Created by researcher from (Ou, 2024; Sabanoglu, 2024).

1) General Trends

China: The import value for China shows an overall increasing trend over the period, starting from \$1949.99 billion in 2013 and peaking at \$2706.51 billion in 2022. There was a noticeable dip in 2015 and 2016 when imports dropped to \$1679.56 billion and \$1587.93 billion, respectively, but values recovered and continued to increase steadily. From 2021 to 2022, China's imports saw a significant increase of \$27.1 billion, marking a period of strong growth. However, there was a slight decline in 2023, with imports decreasing to \$2556.8 billion from the 2022 peak.

United States: U.S. imports exhibit a consistent increasing trend. Starting from \$2760.07 billion in 2013, the values show steady increases throughout the period. The import value peaked in 2022 at \$3984.17 billion, reflecting a significant increase from the previous years. In 2023, the import value decreased slightly to \$3856.71 billion, indicating a potential stabilization after the peak in 2022.

2) Comparative Analysis

Both countries had relatively stable import values, with the U.S. consistently ahead of China. In 2014, U.S. imports were at their peak for the early period at \$2876.41 billion, compared to China's \$1959.24 billion. China experienced a decline in imports in 2015 and 2016, while U.S. imports remained relatively stable.

During these years, China's imports gradually recovered and increased, with a notable rise in 2017 to \$1843.79 billion. The U.S. imports saw a steady increase, maintaining a value above \$2700 billion, with a peak in 2018 at \$3119.32 billion.

China's imports showed significant growth post-2020, peaking in 2022 at \$2706.51 billion. The U.S. also showed strong growth post-2020, peaking 2022 at \$3984.17 billion. Both countries experienced a slight decline in 2023, indicating a possible stabilization or adjustment period after the significant growth in the previous years.

3) Impact of Global Events

The pandemic significantly affected global trade in 2020. Both countries experienced fluctuations in import values, with the U.S. seeing a drop in 2020 and a strong recovery in the following years. China's imports remained relatively stable in 2020, with a slight decline, followed by a strong recovery in the subsequent years.

The trade tensions and policy changes between China and the U.S. likely

influenced the import values. Both countries' imports reflect adaptations to new trade policies and tariffs imposed during this period.

4) Key Insights

China demonstrated robust import growth, especially from 2020 to 2022, highlighting its role in global supply chains and economic recovery post-pandemic. The U.S. imports consistently increased throughout the period, reflecting strong domestic demand and economic activity. The peak in 2022 at \$3984.17 billion indicates significant growth, with a slight decline in 2023 suggesting a potential adjustment phase.

Overall, the import data from 2013 to 2023 highlights the dynamic nature of trade between China and the U.S. Both countries faced challenges and showed resilience, with notable growth trends in recent years. China's import growth was particularly strong, showing recovery and increasing demand. The U.S. imports exhibited a consistent upward trend, reflecting strong economic performance and domestic demand. The fluctuations in import values reflect broader economic conditions, policy changes, and global events impacting trade performance.

4.3.5. Economic Indicators

1) Growth rate

Table 4 below highlights the year-on-year growth rates for China and United States.

Table 4. Growth rate of gross domestic product (GDP) (in percentage).

S.no	Year	GDP year-on-year change in China	GDP year-on-year change of US
1	2013	7.77%	2.1%
2	2014	7.39%	2.5%
3	2015	7.02%	2.9%
4	2016	6.85%	1.8%
5	2017	6.95%	2.5%
6	2018	6.75%	3%
7	2019	5.95%	2.5%
8	2020	2.24%	-2.21%
9	2021	8.45%	5.8%
10	2022	2.99%	1.94%
11	2023	5.24%	2.53%

Source: Created by researcher from Statista 2024 China (Statista, 2024a) and US (Statista, 2024b).

2) General Trends

China: China's GDP growth rate shows a general decline over the period, starting at 7.77% in 2013 and dropping to 5.24% in 2023. Despite this overall

downward trend, there were fluctuations, with significant drops in 2020 to 2.24% and a strong rebound to 8.45% in 2021. The lowest growth rate during this period was in 2020, likely due to the impact of the COVID-19 pandemic. Post-2020, China's GDP growth rate fluctuated but did not return to the high levels seen in the early part of the decade.

United States: The U.S. GDP growth rate fluctuated within a narrower range compared to China, starting at 2.1% in 2013 and ending at 2.53% in 2023. The U.S. saw a consistent upward trend until 2015, followed by minor fluctuations. In 2020, the U.S. experienced a significant contraction of -2.21%, reflecting the severe economic impact of the COVID-19 pandemic. The U.S. GDP growth rate rebounded strongly in 2021 to 5.8%, then normalized to lower levels in subsequent years.

3) Comparative Analysis

China's GDP growth rates were significantly higher than those of the U.S., reflecting its rapid economic expansion during this period. The U.S. showed a gradual increase in GDP growth rates, peaking at 2.9% in 2015.

China's GDP growth rates declined gradually, although they remained higher than the U.S. The U.S. GDP growth rates showed stability, hovering around 2.5% for most of these years. By 2019, China's GDP growth rate had fallen below 6%, indicating a slowdown in its rapid economic growth.

The COVID-19 pandemic had a significant impact on both economies, with 2020 showing a major drop in GDP growth for China and a contraction for the U.S. Both countries rebounded in 2021, with China experiencing a stronger recovery at 8.45% compared to the U.S. at 5.8%. Post-recovery, both economies stabilized, with China's growth rate at 5.24% in 2023 and the U.S. at 2.53%.

4) Impact of Global Events

The pandemic severely disrupted global economic activity in 2020, resulting in the lowest GDP growth rates for both countries in the decade. Both countries showed significant recovery in 2021, although the recovery was stronger in China compared to the U.S.

Trade tensions, particularly between China and the U.S., may have influenced the GDP growth rates, especially in the context of tariffs and trade policies affecting economic activity.

5) Key Insight

China's GDP growth rate shows a clear declining trend over the decade, reflecting a transition from rapid expansion to more stabilized growth. Despite the decline, China's growth rates remained higher than those of the U.S. throughout the period. The U.S. showed relatively steady GDP growth rates with minor fluctuations, highlighting a stable economic performance. The significant contraction in 2020 and subsequent recovery in 2021 reflect the resilience of the U.S. economy.

Overall, the GDP growth rate data from 2013 to 2023 highlight distinct trends for China and the U.S. China's growth rates, while higher, showed a declining trend, indicating a maturing economy transitioning from rapid growth to more

stable development. The U.S. demonstrated steady growth with less fluctuation, reflecting a stable and resilient economic environment. The impact of the COVID-19 pandemic was significant for both countries, leading to major disruptions in 2020 and strong recoveries in 2021. The data underscores the dynamic nature of both economies and their responses to global economic challenges and internal transitions.

4.3.6. Employment Rate

Table 5 provides the youth employment rates for China and the U.S. from 2013 to 2023

Table 5. Youth Employment rate (in percentage).

S.no	Year	Employment rate of China	Employment rate of U.S.
1	2013	10.34%	15.52%
2	2014	10.53%	13.4%
3	2015	10.71%	11.61%
4	2016	10.61%	10.41%
5	2017	10.47%	9.24%
6	2018	9.71%	8.61%
7	2019	10.73%	8.37%
8	2020	12.71%	14.87%
9	2021	12.41%	9.71%
10	2022	14.85%	8.1%
11	2023	15.9%	7.98%

Source: Created by researcher from Statista 2024 China (O'Neill, 2024a) and U.S. (O'Neill, 2024b).

The above table provides youth employment rates for China and the United States from 2013 to 2023, revealing distinct trends and challenges faced by each country. In China, the youth employment rate remained relatively stable from 2013 to 2017, fluctuating around the 10% - 10.7% range. However, starting in 2018, the rate began to increase, reaching its peak of 15.9% in 2023. This upward trend, particularly noticeable from 2019 onwards, suggests growing difficulties for young people entering the job market, potentially exacerbated by economic disruptions such as the COVID-19 pandemic.

In contrast, the United States experienced a steady decline in youth employment rates from 2013 to 2019, dropping from 15.52% to 8.37%. The rate spiked significantly to 14.87% in 2020 due to the pandemic's impact on the job market but then decreased again as the economy began to recover, reaching a low of 7.98% in 2023. This pattern indicates that while the U.S. youth employment rate has improved post-pandemic, it still faces challenges compared to the higher rates seen in earlier years.

Overall, these trends reflect broader economic conditions and structural issues within each country's labor market, influencing the employment opportunities available to young people. China's increasing youth employment rate points to rising hurdles in integrating young people into the workforce, while the United States shows signs of recovery but continues to grapple with youth employment challenges.

4.3.7. Gross Domestic Product (GDP)

The trade and investment relationship between the United States and China is substantial, reflecting intricate economic interdependencies between the two largest economies in the world.

The below **Table 6** presents the value of GDP at current price of China and US in billion dollars.

Table 6. Gross domestic product (GDP) at current price (in billion US dollars).

S.no	Year	China	US
1	2013	9624.93	16880.7
2	2014	10524.24	17608.1
3	2015	11113.51	18295.0
4	2016	11226.9	18804.9
5	2017	12265.33	19612.10
6	2018	13841.81	20656.5
7	2019	14340.6	21512.4
8	2020	14862.56	21323.0
9	2021	17759.31	23594.0
10	2022	17848.54	25744.10
11	2023	17662.04	27356.40

Source: Created by a researcher from Statista China (Statista, 2024c) and U.S. (O'Neill, 2024c).

1) Key observations

China's GDP has grown consistently over the years, with a significant increase from 2013 to 2023. The US GDP also shows growth, but at a generally slower pace compared to China.

China experienced steady growth, with notable increases, especially from 2013 to 2021, and then stabilizing. The US also shows growth, but with more moderate increases compared to China.

2) Comparison

China's GDP increased from \$9624.93 billion in 2013 to \$17662.04 billion in 2023. US GDP increased from \$16880.7 billion in 2013 to \$27356.4 billion in 2023.

China's GDP growth rate appears higher in percentage terms over this period than the US's, indicating a faster economic expansion.

China's economy has accelerated significantly over the decade, reflecting its rapid industrialization and economic reforms. While growing, the US demonstrates a more stable growth pattern, influenced by factors like technological advancements and consumer spending.

3) Implications

China's rapid GDP growth underscores its increasing influence on the global economy, potentially shifting economic dynamics and trade patterns. Despite China's rapid growth, the US maintains a higher nominal GDP throughout the period, maintaining its position as the world's largest economy.

Overall, the GDP data highlights China's rapid economic growth compared to the US, indicating significant shifts in global economic dynamics. China's growth rate outpaces that of the US over the period, reflecting its emergence as a major economic powerhouse.

4.3.8. Trade and Investment

Table 7 below presents a detailed overview of the U.S.-China trade and investment landscape for 2022, capturing key metrics and trends that underscore the bilateral economic relationship between the world's two largest economies.

Table 7. U.S.-China Trade and Investment for Year 2022.

S.no	Trade and Investments	Amount (Billion USD)	Change from 2021
1.	U.S. China trade (Goods and Services)	758.4	-
2.	U.S. Export to China (Goods and Services)	195.5	-
3.	U.S. Imports from China (Goods and Services)	562.9	-
4.	U.S. Trade Deficit with China	367.4	-
5.	U.S. Goods Exports to China	154.0	1.7% (\$2.6)
6.	U.S. Goods Imports from China	536.3	6.3% (\$32.0)
7.	U.S. Goods Trade Deficit with China	382.3	8.3% (\$29.4)
8.	U.S. Services Export to China	41.5	5.2% (\$2.1)
9.	U.S. Services Imports from China	26.6	24.1% (\$5.2)
10.	U.S. Service Trade surplus with China	14.9	-17.3%
11.	U.S. Foreign Direct Investment in China	126.1	9.0%
12.	China Foreign Direct Investment in U.S.	28.7	-7.2%

Source: Created by a researcher from United States trade representatives (The People's Republic of China. [United States Trade Representative \(n.d.\)](#)).

In 2022, the total trade in goods and services between the United States and China amounted to an estimated \$758.4 billion. U.S. exports to China were valued

at \$195.5 billion, while imports from China stood at \$562.9 billion. This trade dynamic resulted in a U.S. goods and services trade deficit with China of \$367.4 billion for the year.

U.S. goods exports to China in 2022 reached \$154.0 billion, marking a 1.7 percent increase (\$2.6 billion) from 2021 and a significant 39 percent rise from 2012 levels. Meanwhile, U.S. goods imports from China totaled \$536.3 billion, up by 6.3 percent (\$32.0 billion) from 2021 and up 26 percent from 2012. These exports to China constituted 7.5 percent of the total U.S. exports in 2022. Consequently, the U.S. goods trade deficit with China increased by 8.3 percent (\$29.4 billion) over the previous year, reaching \$382.3 billion.

The services trade between the two nations also showed notable figures. U.S. services exports to China were estimated at \$41.5 billion in 2022, reflecting a 5.2 percent increase (\$2.1 billion) from 2021 and a 39 percent rise compared to 2012. U.S. imports of services from China were estimated at \$26.6 billion, up by 24.1 percent (\$5.2 billion) from 2021 and nearly doubling (97 percent) since 2012. Leading sectors in U.S. service exports to China included travel, intellectual property, and financial services. Despite these strong figures, the U.S. experienced a services trade surplus with China of approximately \$14.9 billion in 2022, a 17.3 percent decrease from 2021.

Regarding foreign direct investment (FDI), U.S. investment in China was valued at \$126.1 billion in 2022, representing a 9.0 percent increase from 2021. Manufacturing, wholesale trade, finance, and insurance were the main sectors driving U.S. investment in China. Conversely, China's FDI in the United States was \$28.7 billion in 2022, a decline of 7.2 percent from 2021. China's investments in the U.S. were primarily focused on manufacturing, real estate, and depository institutions.

The deep participation of Chinese firms in GVCs has greatly promoted the rapid growth of Chinese exports to the USA and China's trade surplus with the USA.

5. Conclusion

Regarding global value chains, China is currently in a situation of both power and dependence. It has grown into a big producer and key player in global supply chains because it runs things well. Of course, the fact that it needs money and technology from other countries shows how difficult its plans are for the economy. The main goal for China is to make its business more innovative. The future of China in GVCs will change a lot because of this. To stay ahead in the global market and get even stronger, it will have to deal with the issues of not having to rely on outside technology and move up the value chain.

China has become a GVC member because it has planned changes to its economy, strong industrial policies, and the use of natural population and cost benefits. Due to a complicated mix of internal and foreign forces, the country went from being on the edges of the world economy to being in the middle. These include slow but steady economic changes, rules that bring in foreign direct

investment (FDI), plans that make the most of population gains, constant technological progress, and quick industrialization. China has grown into a major player in the world economy by making its rules more open and taking an active role in the world economy. It grows and changes all the time in GVCs.

The comparative analysis of China and U.S. economic indicators reflected the dynamic trade between China and the U.S., emphasizing their roles in GVC. Despite challenges, both countries showed resilience, with China's export growth surpassing the US, bolstered by its pivotal role in global manufacturing networks. Fluctuations in exports reflect economic conditions, Policy shifts, and global events. Similarly, import data reveals a dynamic relationship between China's import signaling recovery and the US maintaining consistent growth. GDP growth rates show China's shift to stable development, contrasting with the US's steady growth and resilience post-COVID-19 disruptions. These trends reflect broader economic conditions, influencing youth employment challenges. China's rising youth employment and rapid economic ascent underscore its emergence as a global economic powerhouse, reshaping global dynamics. This trade relationship underscores the economic interdependence between the two nations, shaped by complex factors such as global economic conditions, policy dynamics, and sector-specific developments.

Declaration

The "New China Puzzle" discussed in the paper "Trade Hyper globalization is Dead (Peterson Institute for International Economics, 2023)" refers to the paradoxical situation in China's trade dynamics following the Global Financial Crisis (GFC). The key aspects of this puzzle include: 1) Decline in Trade-to-GDP Ratio. 2) Increase in Global Export Market Share. 3) Inconsistent Internal and External Developments.

Data Availability Statement

The data that support the findings has been provided in the text.

Conflicts of Interest

The authors declare that they have no financial or personal relationship that may have inappropriately influenced them in writing this article.

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