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The US vs. China Regional Integration in International Trade of Manufactured Products

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Abstract

This study compares the global and regional performance of international trade in manufactured goods between the United States and China, and analyzes the level of trade integration between the two countries in their partner regions. Using gross export and import data, (i) trade activities in the form of exports, imports, and trade balances, as well as (ii) the level of regional integration in the trade of manufactured products, are examined. The regional integration of the US and China across manufactured products is analyzed using the regional trade introversion index (RTII). In line with global trends, both the US and China have experienced rapid growth in manufacturing exports. However, China consistently records a trade surplus both globally and regionally across all manufacturing product groups. Meanwhile, the US consistently records a trade deficit across the globe, and for every product group, despite its comparative advantage in high-skill, technology-intensive manufactured products, particularly in developed economies. The integration analysis, which produced a higher RTII US value in the trade of manufactured products, particularly medium/high-skill and technology-intensive products, indicates that China exports more final goods (as an assembler), while the US exports more intermediate goods that will be re-imported after being processed by partner countries. This phenomenon is reinforced by the US trade balance data, which shows a steadily increasing surplus in trade in services, whilst China is experiencing a deficit, particularly in the area of charges for the use of intellectual property, which have been rising consistently.

Keywords: global and regional trade, the US and China regional trade, exports in manufactured products, Export specialisation (TBI), regional trade introversion index (RTII).

1. Introduction

From the perspective of international trade, the world has undergone two waves of globalisation. Taking the definition of globalisation as internationalisation (across national borders), the first wave of globalisation began during the mercantilist era, before Adam Smith and David Ricardo introduced the concepts of absolute advantages and comparative advantages as the driving forces behind trade. Trade took the form of the exchange of goods in the form of finished products

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ready for use or consumption. The types of goods traded would reflect the socio-economic conditions of the countries participating in trade, which, according to the Heckscher-Ohlin model, would reflect the abundance of production factors in those countries: countries with an abundance of capital will export goods whose production process is capital-intensive, and countries with an abundance of labor will export labor-intensive goods, resulting in an inter-industry pattern of trade (Krugman et al., 2015; Salvatore, 2020; Tampubolon, 2024).

Globalization 2.0, termed by Baldwin (2006) as 'the second unbundling(s)', is taking place in an era of technology that has drastically reduced communication and coordination costs, giving rise to new patterns in international trade. In this era, what is traded is no longer merely goods (final product/ consumption goods) but also intermediate products for further processing, a phenomenon termed by Baldwin & Lopez-Gonzales (2015) as 'imports to exports' (I2E) activity. Trade patterns have shifted towards intra-industry trade, involving the import and export of components and parts within the same industrial sector or category. Industry 4.0, which incorporates robotics and artificial intelligence (Tampubolon & Nababan, 2022), has accelerated the third stage of Vernon's product life cycle—the maturity stage—where, to meet rising market demand, mass production is achieved through standardized manufacturing (with the aid of automation). Furthermore, production is fragmented across countries, with production stages allocated according to workforce competencies; production stages utilizing low-tech and low-cost processes are situated in countries with low-skilled and low-wage labor. This process is commonly referred to as offshoring, hollowing out, vertical specialization, and slicing up the value-added chain (Baldwin, 2008; Baldwin & Forslid, 2013; Byung-il & Rhee, 2014; Tampubolon, 2024). At this stage, it is no longer just goods that are traded, but also services and management (the international mobility of managerial and manufacturing know-how, according to Baldwin & Lopez-Gonzalez, 2015).

In a fragmented production pattern, each of a country's export goods contains components of production factors from other countries that were previously imported as intermediate goods; conversely, a country's import goods contain components of domestic production factors that were previously exported as intermediate goods. With the increasing trade in intermediate goods (Tampubolon, 2024), double counting in gross exports is unavoidable (Koopman et al., 2014). Consequently, this leads to misleading assessments of the trade balance, which in turn results in incorrect policy decisions (Contractor, 2025; Zhu et al., 2022), thereby casting doubt on the accuracy of gross exports alone as a measure of a country's trade performance (Wang et al., 2017). International trade performance should ideally be measured by the net value of exports and imports, a concept that has recently gained popularity under the term 'value-added trade' (UNIDO, 2019; WTO, 2019; Tampubolon, 2020).

The bias in assessing international trade performance based on gross export and import data is highlighted by Xing & Detert (2010), who show that when China exported an iPhone 3G priced at $179 to the US, this generated only $6.50 in value added for China (3.63%), whilst approximately $172 consisted of costs for imported inputs or other components from Japan, Korea, Germany and the US. Furthermore, when the iPhone enters the US from China, the

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largest component of the final selling price actually lies with the US, which enjoys the initial value added (research and design) and the final stage (branding and marketing), whilst the intermediate assembly process (in China) yields low value added, as explained by the smile curve theory (Baldwin & Ito, 2021). An even more extreme phenomenon occurs in US trade with countries from the group of developing economies, with sportswear (low-skill and technology-intensive manufacturing) serving as an example. Nike does not have its own manufacturing plants in the US. Nike's design, development, and brand strategy are primarily centered in Oregon, the US. At the same time, the company outsources most manufacturing to independent contract factories in Vietnam, China, and Indonesia. The 'factory gate' price is far below the final retail value, as assembly and stitching account for only 1–3% of the cost of shoes that sell for over $100 in the US (Gereffi, 1999; Locke, 2003; Oxfam, 2004).

This research is motivated by the trade conflict between the United States and China, one of the defining global economic disputes of the 21st century. It has contributed to a slowdown in global economic momentum, disrupting and reshaping the global supply chain by creating multi-polar supply hubs and replacing the previously US-China-centric system (Luo et al., 2025; Lederer, 2025; Kumar, 2026). The official start of the trade war was 6 July 2018, when the US imposed a 25% tariff on $34 billion worth of Chinese imports, to which China responded by imposing a 25% tariff on $34 billion worth of US goods, primarily agricultural and automotive exports such as soya beans, pork, and cars (Teekah, 2026). The main reasons for the US imposing tariffs, which escalated into a trade conflict, were the US trade deficit and allegations of unfair trade practices by China, such as currency manipulation (CFR, 2025). Globally, this tariff war is estimated to reduce economic growth by around 0.4% in 2025 and 2026 (Lederer, 2025).

This study aims to examine US and Chinese trade activities globally and regionally using gross export and import data. The study continues with an analysis of the regional trade integration of the two countries, which will reveal the extent to which they contribute to the production of manufactured goods in their trading partner regions. It will compare the development of international trade in manufactured products between the US and China, both in aggregate and by product group, by degree of manufacturing, namely labor/resource-intensive, low-skill technology-intensive, medium-skill technology-intensive, and high-skill technology-intensive manufactures, regionally based on the following regional divisions: Asia, Europe, Africa, Oceania, and America, as well as developing and developed countries. In summary, the objectives of this study are to compare the development of international trade in manufactured products between the US and China in terms of (i) exports, imports, and trade balance, and (ii) the level of regional integration in trade.

2. Methodology

International trade data includes exports and imports of manufactured products by product group and degree of manufacturing, obtained from UNCTAD (https://unctadstat.unctad.org/datacentre/dataviewer/US.TradeMatrix). Data is available for individual countries, country groups (regional), and trade agreement areas.

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International trade activity (exports and imports) is measured using the trade balance index (TBI) with the following formula:

$$TBIij = (Xij – Mij)/(Xij + Mij) \quad (1)$$

where Xij indicates the value of exports of product i by the observed country to region j and vice versa, Mij is the value of imports by the country in question from region j for product i. TBI basically indicates export specialization; if it has a value of 1, it means there are no imports, and if it has a value of -1, there are no exports.

To measure the level of trade integration between the US and China in various regions for various categories of manufactured products, the Regional Trade Introversion Index (RTII) is utilized. The RTII measures the relative intensity of regional trade versus trade with external parties by including the US or China in the observed regional economy and treating it as a single trading bloc. Intraregional trade intensity (Hii) and extra-regional trade intensity (Hei) are functions of the share of regional trade (trade bloc) in total external trade. The index ranges from -1 to 1. The index rises (or falls) if intraregional trade intensity grows faster (or slower) than extra-regional trade. If the index is zero, then the presence of the US or China in trade in that region is geographically neutral. If it is greater than zero, then the region's trade has an intraregional bias (there is a contribution from the US or China in the production process that increases the economic integration of the region for the manufactured products observed), and if it is less than zero, then the region's trade has an extra-regional bias (Iapadre, 2004; Plummer et al., 2011; Hamanaka, 2012; Hamanaka, 2015; Tampubolon & Nababan, 2022; Tampubolon, 2025). The formula for RTII is:

$$\text{Regional Trade Introversion Index (RTII)} = (Hii – Hei)/ (Hii + Hei) \quad (2)$$

where,
Hii = (Tii/Ti)/(Toi/To) and He*i* = [1 – (Tii/Ti)]/[1 – (Toi/To)]
Tii = exports of region *i* to region *i* plus imports of region *i* from region *i*.
Ti = total exports of region *i* to the world plus total imports of region *i* from the world.
Toi = exports of region *i* to outsiders plus imports of region *i* from outsiders.
To = total exports of outsiders plus total imports of outsiders.

3. Results

3.1. Overview of Trade in Manufactured Products

During the observation period, China's aggregate exports (total goods) and manufactured goods grew faster than those of the US. China's exports increased 12-fold (1219.20%) between 2001 and 2023, with an average annual growth rate of 13.55%. For the US, these figures were 417.80% and 3.30%, respectively. Differentiated by product group, China's highest export growth came from medium-skill and technology-intensive manufactures (1885.53% growth with

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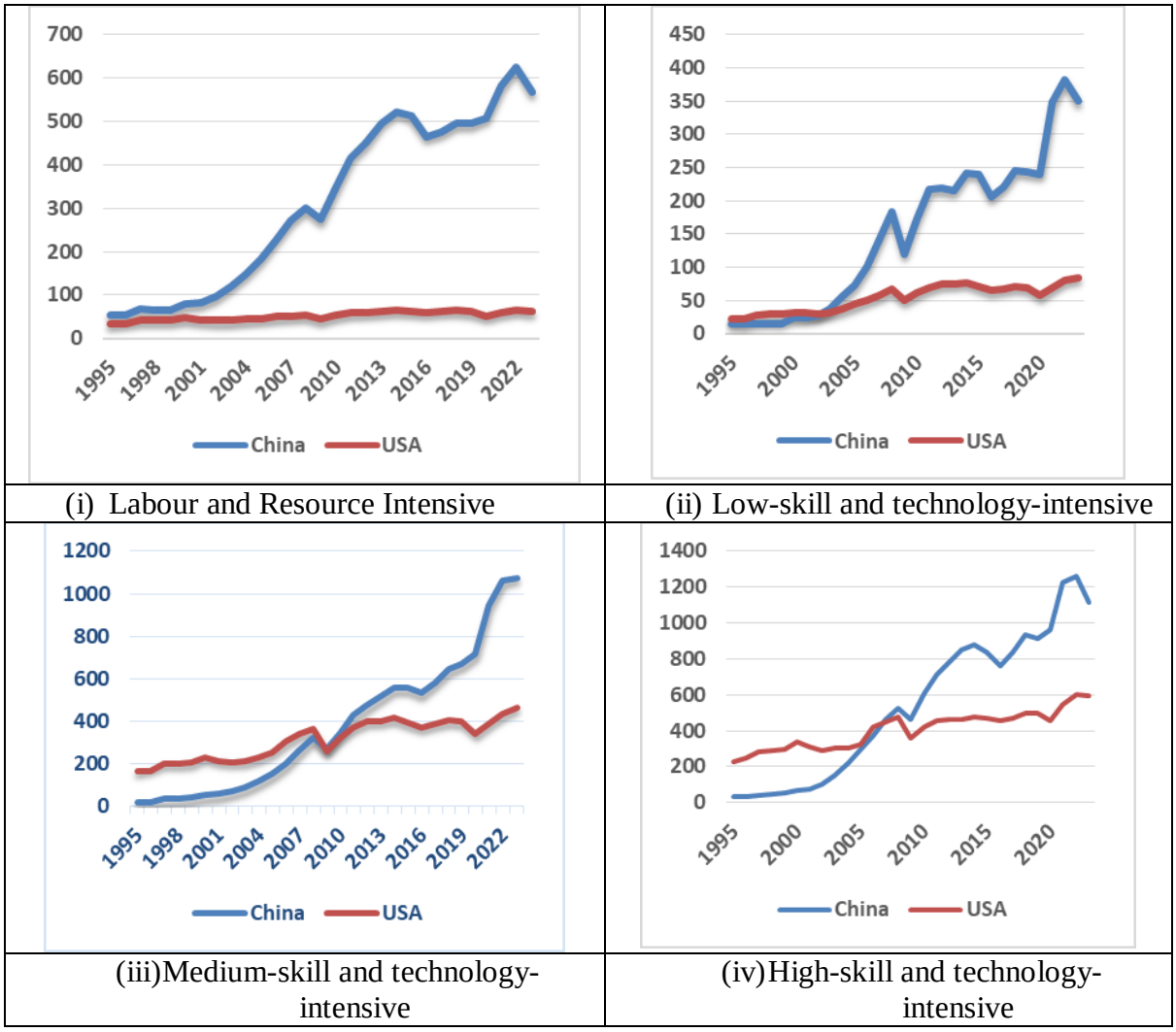
an annual average of 15.09%), while the US recorded the fastest growth in the low-skill and technology-intensive manufacture group (700% and 4.99% respectively).

Further observation reveals that before 2001, the US dominated global exports of manufactured goods, except for labor/resource-intensive manufacturing, which was dominated by China. In the first decade of the third millennium, China managed to catch up and surpass the US in exports of low-skill and technology-intensive products in 2003, medium-skill and technology-intensive products in 2009, and high-skill and technology-intensive products in 2007 (fig. 1).



(i) Labour and Resource Intensive

(ii) Low-skill and technology-intensive

(iii)Medium-skill and technology-intensive

(iv)High-skill and technology-intensive

Figure 1. Development of Chinese and US exports in the manufactured products group (in billion USD)
Source: Authors' calculation based on UNCTAD data

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While the United States and China experienced similar growth in export values, the same cannot be said for their trade balances. Until 2004, China recorded a deficit in the trade balance for high-skill and technology-intensive products, while other manufacturing groups always recorded a surplus. Until 2020, labor/resource-intensive manufacturing products were the main contributors to the trade balance surplus, but this was then taken over by medium-skill technology-intensive products, although the goods group showed an upward trend in its trade balance surplus. Meanwhile, the US has never recorded a surplus in its manufacturing trade balance. In fact, its trade deficit has widened from year to year, with the largest deficit coming from trade in medium-skill and high-skill technology-intensive manufacturing products (fig. 2).

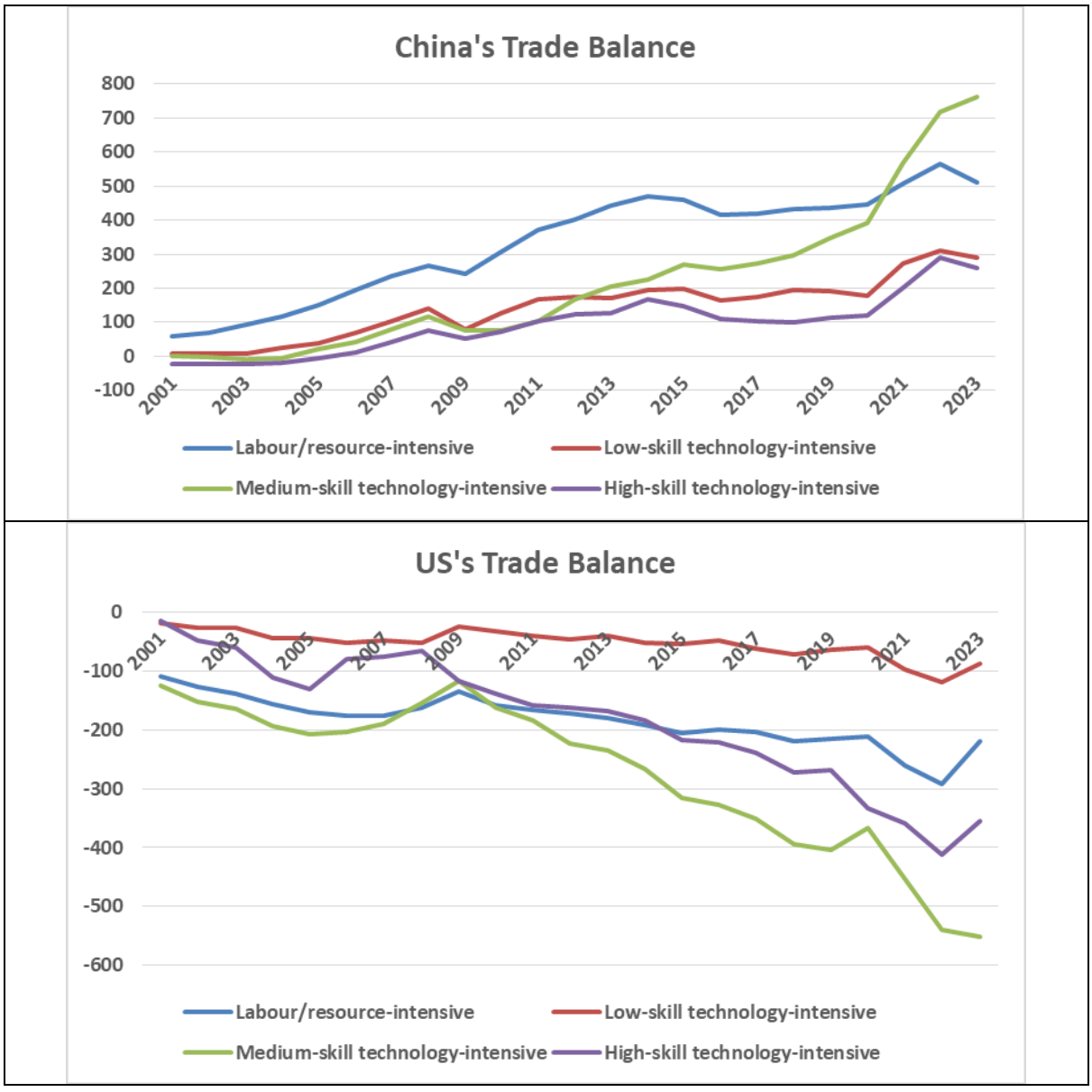

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Figure 2. The Development of the Trade Balance of Manufactured Products between China and the US (in billions of USD)

Source: Authors' calculation based on UNCTAD data

The US has never recorded a surplus in its manufacturing trade balance, either in aggregate or by product group, within the observation period. Globally, China is the market leader for all categories of manufactured products. The US only enjoys a leading position regionally in Africa and Oceania for medium-skill and technology-intensive as well as high-skill and technology-intensive manufacturing product groups. A complete comparison of the trade balance index (TBI) between the US and China globally and regionally, per manufactured product group, is presented in Table 1.

Table 1. Comparison of Trade Balance Index between the US and China by Region and Manufactured Product Group

Description	Global		Developing Economies		Developed Economies	
	US	China	US	China	US	China
Labour and resource-intensive manufactures						
2001-2005	-0.62	0.63	-0.71	0.52	-0.44	0.70
2006-2010	-0.62	0.78	-0.76	0.72	-0.26	0.82
2011-2015	-0.60	0.81	-0.75	0.78	-0.17	0.83
2016-2020	-0.64	0.79	-0.77	0.76	-0.24	0.81
2021-2023	-0.67	0.81	-0.79	0.81	-0.33	0.80
Low-skill and technology-intensive manufactures						
2001-2005	-0.32	0.24	-0.47	0.27	-0.20	0.22
2006-2010	-0.27	0.55	-0.43	0.70	-0.12	0.45
2011-2015	-0.24	0.67	-0.36	0.83	-0.13	0.51
2016-2020	-0.32	0.64	-0.46	0.75	-0.17	0.54
2021-2023	-0.39	0.68	-0.52	0.69	-0.23	0.66
Medium-skill and technology-intensive manufactures						
2001-2005	-0.27	0.00	-0.21	0.19	-0.30	-0.08
2006-2010	-0.20	0.16	-0.17	0.43	-0.23	0.03
2011-2015	-0.23	0.24	-0.20	0.55	-0.27	0.05
2016-2020	-0.23	0.33	-0.35	0.60	-0.30	0.17
2021-2023	-0.37	0.50	-0.43	0.70	-0.31	0.37
High-skill and technology-intensive manufactures						
2001-2005	-0.10	-0.07	-0.16	-0.12	-0.06	-0.03
2006-2010	-0.10	0.05	-0.17	-0.03	-0.03	0.13
2011-2015	-0.16	0.09	-0.22	0.08	-0.09	0.10
2016-2020	-0.22	0.07	-0.27	0.05	-0.16	0.09

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2021-2023	-0.24	0.12	-0.29	0.10	-0.19	0.14
	Asia		Africa		Oceania	
	US	China	US	China	US	China
Labour and resource-intensive manufactures						
2001-2005	-0.86	0.47	-0.77	0.98	-0.02	0.77
2006-2010	-0.88	0.64	-0.65	0.98	0.44	0.89
2011-2015	-0.87	0.70	-0.59	0.98	0.48	0.95
2016-2020	-0.88	0.69	-0.67	0.97	0.47	0.93
2021-2023	-0.91	0.74	-0.77	0.98	0.43	0.96
Low-skill and technology-intensive manufactures						
2001-2005	-0.72	0.01	-0.16	0.68	0.10	0.53
2006-2010	-0.67	0.41	0.08	0.81	0.19	0.88
2011-2015	-0.65	0.60	0.22	0.85	0.36	0.92
2016-2020	-0.70	0.57	0.02	0.84	0.22	0.86
2021-2023	-0.76	0.56	-0.31	0.88	0.12	0.88
Medium-skill and technology-intensive manufactures						
2001-2005	-0.56	-0.15	0.63	0.95	0.61	0.65
2006-2010	-0.48	0.02	0.66	0.98	0.75	0.81
2011-2015	-0.48	0.16	0.60	0.98	0.81	0.90
2016-2020	-0.55	0.24	0.59	0.99	0.78	0.95
2021-2023	-0.61	0.41	0.46	0.99	0.76	0.98
High-skill and technology-intensive manufactures						
2001-2005	-0.28	-0.25	0.62	0.67	0.63	0.77
2006-2010	-0.30	-0.18	0.56	0.80	0.51	0.89
2011-2015	-0.38	-0.08	0.47	0.88	0.47	0.95
2016-2020	-0.40	-0.11	0.30	0.90	0.42	0.93
2021-2023	-0.43	-0.06	0.17	0.91	0.38	0.96
	Europe			America		
	US	China		US	China	
Labour and resource-intensive manufactures						
2001-2005	-0.64	0.76		-0.33	0.89	
2006-2010	-0.51	0.85		-0.19	0.92	
2011-2015	-0.48	0.83		-0.10	0.93	
2016-2020	-0.54	0.78		-0.15	0.92	
2021-2023	-0.64	0.71		-0.21	0.93	
Low-skill and technology-intensive manufactures						
2001-2005	-0.34	0.22		0.04	0.74	
2006-2010	-0.31	0.58		0.14	0.78	
2011-2015	-0.37	0.57		0.21	0.82	
2016-2020	-0.38	0.56		0.12	0.79	
2021-2023	-0.45	0.65		-0.01	0.85	
Medium-skill and technology-intensive manufactures						

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2001-2005	-0.35	-0.20	-0.06	0.52
2006-2010	-0.29	-0.01	0.02	0.59
2011-2015	-0.41	-0.05	0.00	0.58
2016-2020	-0.42	0.10	-0.11	0.63
2021-2023	-0.46	0.33	-0.15	0.73
High-skill and technology-intensive manufactures				
2001-2005	-0.10	0.20	0.14	0.28
2006-2010	-0.08	0.43	0.16	0.48
2011-2015	-0.18	0.32	0.18	0.48
2016-2020	-0.27	0.24	0.15	0.51
2021-2023	-0.31	0.28	0.13	0.54

Source: Authors' calculation based on UNCTAD data

3.2. US and China Integration in the Regional Market for Manufactured Products

By assuming that developing and developed countries, and the regions of Asia, Africa, Oceania, Europe, and America, form a trading bloc, the interdependence between this trading bloc and the US or China can be measured using the regional trade introversion index (RTII) as presented in formula (2). If the RTII value is zero, then the presence of the US or China in the region is neutral, and if it is less than zero, then the presence of a third country in the region has an extra-regional bias.

The grouping of countries in the world into two categories, developing economies and developed economies, shows that each group has a very high level of interdependence within itself. For the high-skill and technology-intensive manufacturing product group, the presence of the US can increase the RTII value, which shows that the US is a catalyst in production in developing countries with a pattern of production fragmentation where developing economies import capital, intermediate products, and auxiliary materials to be processed domestically and then exported. The role of the US as a catalyst is also evident in labor and resource-intensive manufacturing products in developed economies. Furthermore, the presence of both China and the US provides positive RTII values in both groups of countries, with the influence of the US presence providing a high level of interdependence for all categories of manufactured products except medium-skill and technology-intensive manufacturing in developed economies, where China's role as a catalyst exceeds that of the US.

Figure 3 demonstrates the influence of the US and China in trade with countries in the developing and developed economies group for high-skill and technology-intensive manufactured products. Developed economies show very strong integration because historically, this group of countries, dominated by the European Union, has long formed a free trade area among themselves, reaching the highest level of economic union (Salvatore, 2019).

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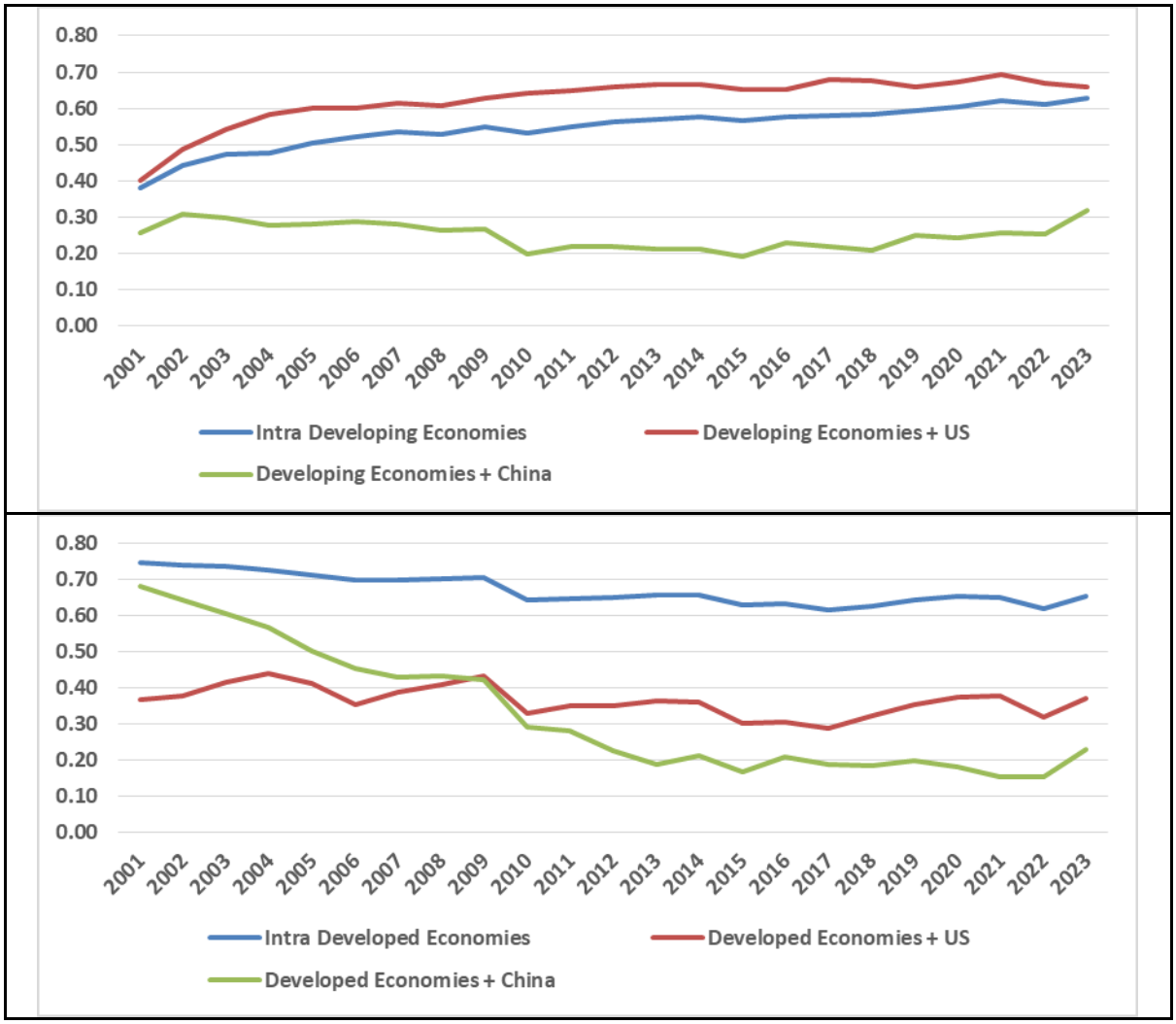

Figure 3. Trade Interdependence of Developing and Developed Economies with the US and China in High-Skill and Technology-Intensive Manufactured Products

Source: Authors' calculation based on UNCTAD data

Based on region, it appears that all regions have a high level of intra-regional integration for all commodity groups. Integration with the presence of a third country in the trading bloc (the US or China) produces different patterns between Africa and Oceania on the one hand and Asia, America, and Europe on the other. Africa and Oceania are relatively closed with very high intra-regional integration, so that including the US or China in the trading bloc results in a negative RTII value. Proximity in strengthening regional economic integration is confirmed, with China + Asia producing a higher RTII value than the US + Asia, just as the US + America produces a higher RTII value than China + America. Meanwhile, in Europe, there are variations: the RTII value of the US + Europe is higher than that of China + Europe for high-skill and technology-intensive products, but for the other three groups of manufactured products, the situation is

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reversed. Table 2 presents detailed RTII values that describe intra-regional integration and regional integration plus the US or China for the four groups of manufactured products.

Table 2. Intra-regional RTII Values and Regional Integration of the US and China in Manufacturing Product Exports

Description	Average			
	2001-2005	2006-2010	2011-2015	2016-2023
Labor and resource-intensive manufactures				
Asia:				
Intra-Asia	0.95	0.86	0.78	0.78
Asia + US	0.56	0.57	9.53	0.53
Asia + China	0.72	0.61	0.53	0.53
Africa:				
Intra-Africa	0.80	0.80	0.81	0.83
Africa + US	-0.76	-0.62	-0.55	-0.58
Africa + China	-0.45	-0.53	-0.59	-0.57
Oceania:				
Intra-Oceania	0.92	0.90	0.86	0.87
Oceania + US	-0.84	-0.79	-0.79	-0.85
Oceania + China	-0.51	-0.72	-0.82	-0.80
Europe:				
Intra-Europe	0.87	0.83	0.83	0.81
Europe + US	0.41	0.42	0.44	0.40
Europe + China	0.63	0.41	0.17	0.13
America:				
Intra-America	0.98	0.96	0.95	0.95
America + US	0.80	0.74	0.70	0.67
America + China	0.49	0.25	0.01	-0.02
Developing Economies:				
Intra-Developing Economis	0.34	0.36	0.34	0.33
Developing Economies + US	0.28	0.33	0.31	0.31
Developing Economies + China	0.08	-0.09	-0.32	-0.30
Developed Economies:				
Intra-Developed Economies	0.50	0.41	0.38	0.36
Developed Economies + US	0.55	0.51	0.47	0.46
Developed Economies + China	0.25	-0.03	-0.29	-0.34
Low-skill and technology-intensive manufactures				
Asia:				
Intra-Asia	0.79	0.82	0.85	0.87
Asia + US	0.52	0.56	0.55	0.56
Asia + China	0.70	0.68	0.67	0.68

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Description	Average			
	2001-2005	2006-2010	2011-2015	2016-2023
Africa:				
Intra-Africa	0.81	0.81	0.84	0.84
Africa + US	-0.58	-0.30	-0.17	-0.35
Africa + China	-0.20	-0.22	-0.19	-0.30
Oceania:				
Intra-Oceania	0.90	0.87	0.83	0.81
Oceania + US	-0.66	-0.57	-0.63	-0.69
Oceania + China	-0.40	-0.57	-0.63	-0.69
Europe:				
Intra-Europe	0.82	0.81	0.84	0.83
Europe + US	0.62	0.67	0.66	0.64
Europe + China	0.87	0.86	0.87	0.86
America:				
Intra-America	0.98	0.96	0.95	0.95
America + US	0.82	0.81	0.78	0.76
America + China	0.60	0.44	0.31	0.23
Developing Economies:				
Intra-Developing Economies	0.34	0.36	0.34	0.33
Developing Economies + US	0.28	0.33	0.31	0.31
Developing Economies + China	0.08	-0.09	-0.32	-0.30
Developed Economies:				
Intra-Developed Economies	0.50	0.41	0.38	0.36
Developed Economies + US	0.55	0.51	0.47	0.46
Developed Economies + China	0.25	-0.03	-0.29	-0.34
Medium-skill and technology-intensive manufactures				
Asia:				
Intra-Asia	0.77	0.80	0.83	0.84
Asia + US	0.34	0.45	0.41	0.38
Asia + China	0.71	0.70	0.67	0.62
Africa:				
Intra-Africa	0.82	0.74	0.77	0.78
Africa + US	-0.88	-0.75	-0.73	-0.81
Africa + China	-0.26	-0.40	-0.48	-0.57
Oceania:				
Intra-Oceania	0.82	0.77	0.73	0.68
Oceania + US	-0.87	-0.82	-0.82	-0.87
Oceania + China	-0.38	-0.63	-0.74	-0.77
Europe:				
Intra-Europe	0.86	0.84	0.82	0.81
Europe + US	0.36	0.45	0.38	0.35

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Description	Average			
	2001-2005	2006-2010	2011-2015	2016-2023
Europe + China	0.77	0.66	0.54	0.47
America:				
Intra-America	0.80	0.79	0.77	0.76
America + US	0.34	0.45	0.41	0.38
America + China	0.69	0.61	0.53	0.51
Developing Economies:				
Intra-Developing Economies	0.35	0.38	0.35	0.34
Developing Economies + US	-0.08	0.09	0.07	0.09
Developing Economies + China	0.20	0.15	0.04	0.03
Developed Economies:				
Intra-Developed Economies	0.83	0.74	0.67	0.66
Developed Economies + US	0.63	0.50	0.34	0.30
Developed Economies + China	0.79	0.64	0.47	0.42
High-skill and technology-intensive manufactures				
Asia:				
Intra-Asia	0.80	0.87	0.90	0.91
Asia + US	0.52	0.62	0.66	0.67
Asia + China	0.77	0.81	0.82	0.83
Africa:				
Intra-Africa	0.89	0.87	0.87	0.88
Africa + US	-0.87	-0.80	-0.75	-0.76
Africa + China	-0.58	-0.77	-0.82	-0.81
Oceania:				
Intra-Oceania	0.82	0.82	0.81	0.79
Oceania + US	-0.86	-0.82	-0.82	-0.83
Oceania + China	-0.86	-0.85	-0.89	-0.89
Europe:				
Intra-Europe	0.81	0.82	0.82	0.80
Europe + US	0.35	0.45	0.49	0.47
Europe + China	0.56	0.38	0.20	0.16
America:				
Intra-America	0.56	0.59	0.62	0.55
America + US	0.98	0.96	0.95	0.95
America + China	0.22	0.04	-0.10	-0.18
Developing Economies:				
Intra-Developing Economies	0.46	0.53	0.56	0.61
Developing Economies + US	0.10	0.27	0.34	0.38
Developing Economies + China	0.20	0.15	0.04	-0.03
Developed Economies:				
Intra-Developed Economies	0.73	0.69	0.65	0.64

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Description	Average			
	2001-2005	2006-2010	2011-2015	2016-2023
Developed Economies + US	0.40	0.38	0.35	0.34
Developed Economies + China	0.60	0.41	0.31	0.19

Source: Authors' calculation based on UNCTAD data

4. Discussion

The gross balance of trade in goods shows that the US has consistently run a deficit, both globally and regionally. In contrast, China has consistently recorded a surplus (positive TBI) in both cases. However, a more detailed analysis of the regional integration of each economy reveals varying results. Classifying the level of economic integration through trade, measured in RTII value, as very high (RTII > 0.80), high (0.61-80), medium (0.41-0.60), low (0.21-0.40), very low (0-0.20), and no integration (RTII < 0), it can be seen that the US contribution is more dominant in medium-skill and high-skill and technology-intensive manufactured product trade. In this category, China's position is at the low to no integration level in both developing and developed economies, while the US contributes positively in all regions (no RTII value < 0), as summarized in Table 3.

Table 3. Regional Comparison of Integration Levels between the US and China Across Manufactured Products

Region and Product	Level of Integration With	
	The US	China
Asia:		
Labour/Resource Intensive	Moderate	Moderate to high
Low-skill and technology-intensive	Moderate	High
Medium-skill and technology-intensive	Low to moderate	High
High-skill and technology-intensive	Moderate to high	High to very high
Europe:		
Labour/Resource Intensive	Moderate	Low to moderate
Low-skill and technology-intensive	High	Very high
Medium-skill and technology-intensive	Low to moderate	Moderate to high
High-skill and technology-intensive	Low to moderate	Low to moderate
America:		
Labour/Resource Intensive	High	Very low to moderate
Low-skill and technology-intensive	Very high	Low to moderate
Medium-skill and technology-intensive	Low to moderate	Moderate to high
High-skill and technology-intensive	Very high	Low to no integration
Developing Economies:		
Labour/Resource Intensive	Low	Very low
Low-skill and technology-intensive	Very low	Low to no integration
Medium-skill and technology-intensive	Low to high	Very low to no integration

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High-skill and technology-intensive	Low to moderate	Very low to no integration
Developed Economies:		
Labour/Resource Intensive	Moderate	Very low to moderate
Low-skill and technology-intensive	Moderate	Low to no integration
Medium-skill and technology-intensive	Low to high	Moderate to high
High-skill and technology-intensive	Moderate	Low to moderate

The integration analysis revealed that the role of the US is more prominent than that of China in trade with both developing and developed economies, and regionally, especially in Europe and America. A higher RTII value indicates that US manufacturing trade is stronger and more integrated into the production processes of partner countries. This may be because US manufacturing exports are dominated by capital goods (machinery), intermediate products, and auxiliary materials that will be further processed by partner countries. Meanwhile, Chinese exports are dominated by final products for direct consumption. This finding highlights a recent global phenomenon, namely production fragmentation (factory economy), where the stages of production are fragmented across various countries with the following pattern: production stages that require high skills are carried out in the head quarter country (the country of origin of innovation and technology with high wages), while assembly stages that do not require special skills are carried out in factory countries (countries with low labor wages). After assembly, the products are exported back to the headquarter country with a higher value, but the domestic components of the importing country in the imported products are high (Tampubolon & Nababan, 2022).

Thus, China still has the status of a factory rather than a headquarters in the context of global production fragmentation. This is reinforced by data showing that the US trade surplus in the services sector continues to grow globally, whereas China, although subject to relative fluctuations, generally runs a deficit; specifically, regarding charges for the use of intellectual property (IP), the deficit has risen consistently in line with the surplus recorded by the US (Fig. 4).

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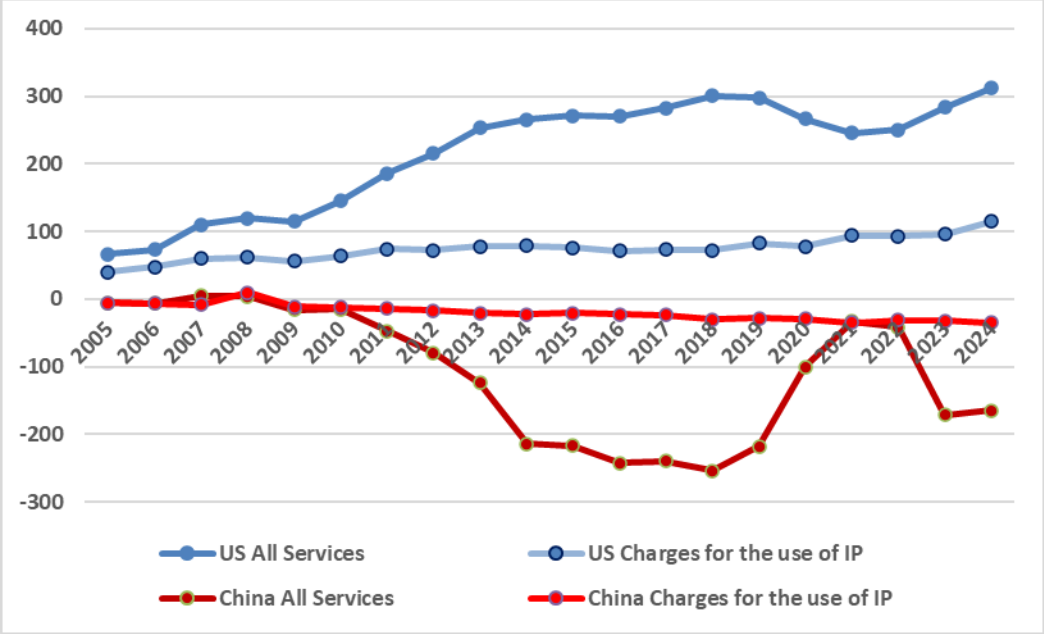

Figure 4. Balance of Trade in Services (in billion US$)
Source: *Authors' calculation based on UNCTAD data*

The research findings are consistent with observers' assessments that the current dispute between the two largest economies goes far beyond trade tariffs and tit-for- -tat reprisals, namely technological supremacy as well as global economic and geopolitical dominance, which can also be interpreted as an attempt by the US to maintain its hegemony amidst the global geo-economic and geopolitical shift from a unipolar structure controlled by the US to a multipolar one with the presence of China as a new power, particularly since China's admission as a member of the WTO in 2001 (Schneider-Petsinger et al., 2019; Vlados, 2020; Zreik, 2022; Gur & Dilek, 2023; Luo et al., 2025; Thakur, 2025; Teekah, 2026).

5. Conclusion

The results of this study show China's supremacy in the international trade activity of manufactured products. China's trade balance is in surplus globally and regionally across all product groups with the positive Trade Balance Index (TBI). However, a more in-depth analysis using the regional trade introversion index (RTII) shows that in some manufacturing product trading regions, the US is more integrated into the production process in its trading partner economy. This is especially true for medium- to high-skill, technology-intensive products in both developing and developed economies, particularly in Europe and America. These findings indicate that Chinese exports consist mostly of final products for direct consumption, while the US exports capital goods, intermediate products, and auxiliary materials. This allows the US to enjoy benefits at the early stages of the value-added chain (research and design) and at the final stages (branding and marketing), so that for every manufactured product imported by the US, the US enjoys a much greater share of the added value, as illustrated by the smiling curve model. This is partly evident in the US trade balance for services, which has consistently recorded a

surplus that has grown over time, whilst China has recorded a deficit that has consistently widened, particularly in relation to charges for the use of intellectual property. To obtain a more complete picture, analyses of trade balance, market position, and integration level should use trade in value-added data**.**

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