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The role of trade liberalization in promoting regional integration and sustainability: The case of regional comprehensive economic partnership

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Abstract

In globalization's era, the sustainability of a region is inseparable from the in-depth and close economic and trade cooperation of intra-regional countries to achieve complementary advantages, intra-regional and extra-regional positive economic cycles, and stable and balanced benefits distribution. For Asia-Pacific countries, the lack of deep cooperation in the past has affected their sustainability, but this can be made up for by the RCEP agreement aimed at achieving intra-regional trade liberalization. We adopt the Global Trade Analysis Project (GTAP) simulation analysis method to quantitatively analyze the impact of changes in macroeconomic and international trade indicators of several intra-regional countries after implementing the RCEP tariff reduction and exemption on the RCEP. Simulation results and comparative analysis based on international relations prove that despite the interference of trade benefits conflicts and international political factors, the RCEP can still exist in long term, and effectively promote regional economic integration and sustainability in the Asia-Pacific region. It is also a development opportunity for intra-regional countries and can also be used in the context of globalization providing references for integration and sustainability in other regions.

Introduction

Regional sustainability means ensuring the long-term and stable development of the regional economy (e.g., References [1, 2]). Intraregional economic cooperation would enable countries within a region to achieve resource complementarity and market diversification, thereby contributing to the independent development and sustainability within the region (e.g., References [3–13]).

Before World War II, most of these countries were backward colonial or semi-colonial countries, except Japan. (e.g., References [14–16]). After World War II, East Asian countries

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and Southeast Asian countries relied on sufficient manpower to form an economic structure dominated by export processing, which became a production link in the global division of labor (e.g., References [17–20]). In that process, Japan, South Korea, and Singapore have reached high development levels and become developed countries (e.g., References [21]). The position of Australia and New Zealand in the world energy and minerals trade has further improved (e.g., References [22, 23]). At the same time, other Asia-Pacific countries have also achieved different degrees of economic development (e.g., References [24–26]).

However, this economic model also has the drawback of relying heavily on the U.S. and European markets (e.g., References [27]). For example, although the electronics industries in Japan and South Korea are high-value-added, their supply chains and markets are deeply tied to the United States and Europe, and the degree of market diversification is significantly lower (e.g., References [28, 29]). Another example is that more than half of China's trade surplus comes from the United States (e.g., References [30]). Simultaneous, due to the lack of cooperation within the Asia-Pacific region and the low degree of industrial integration, there is a severe relationship between intra-regional industrial countries and resource countries. With the lack of consensus and common interests, unnecessary internal conflicts occur from time to time (e.g., References [31, 32]). For example, since 2018, as an industrial country, China has taken the initiative to sanction Australian coal due to international political disputes, which has exacerbated the shortage of domestic thermal coal for power generation (e.g., References [33]). The failure to integrate resources and industry has also made intra-regional countries subject to international politics, forcing intraregional countries to continue transferring economic benefits to the West, forming a passive cycle.

In summary, insufficient internal integration has severely increased the Asia-Pacific region's dependence on the outside world and severely restricted the region's sustainability showing that the Asia-Pacific region's sustainability cannot be separated from the intra-regional countries' integration of trade.

At present, the largest economy in the Asia-Pacific region is China, so the research on the integration and sustainability of the Asia-Pacific cannot be separated from China's factors (e.g., References [34, 35]). At the beginning of this century, China's successful accession to WTO included itself in the global industrial chain dominated by the United States (e.g., References [18]). China got a considerable amount of foreign exchange, whose hierarchy directed an open development based on the foreign exchange (as Fig 1 shown).

After 20 years of development, based on significantly enhanced economic strength, China has gradually supplemented the sore point of the existing system dominated by Western countries in trade, such as the Asian Infrastructure Investment Bank, The Belt, Road strategy, and other international cooperative projects (e.g., References [36–40]). These projects focus their investment in Central Asia, small countries in Southeast Asia, and others where great power in the West have little investment willingness. China's capital took the dominant place in those areas along with the comparative advantage of China has also found a raw material supplier of China's related industries, all of these have contributed significantly to the sustainability of the region (e.g., References [41–44]).

However, China has not always progressed smoothly in the integration and sustainability of all regions, and it cannot itself be insulated from the great power struggle for hegemony (e.g., References [45, 46]). As a tremendous political power, China's ambition seems higher than its strength, which has also led to constant conflicts between China and its neighbors: For instance, the Sino-Japanese Diaoyu Islands dispute (the Senkaku Islands dispute) has continued to heat up since 2010 and 2016 South Korea's introduction of the THAAD anti-missile system to resist the threat of Chinese missiles (e.g., References [46–50]). China's faintly displayed tendency to expand abroad has aggravated the concerns of neighboring countries.

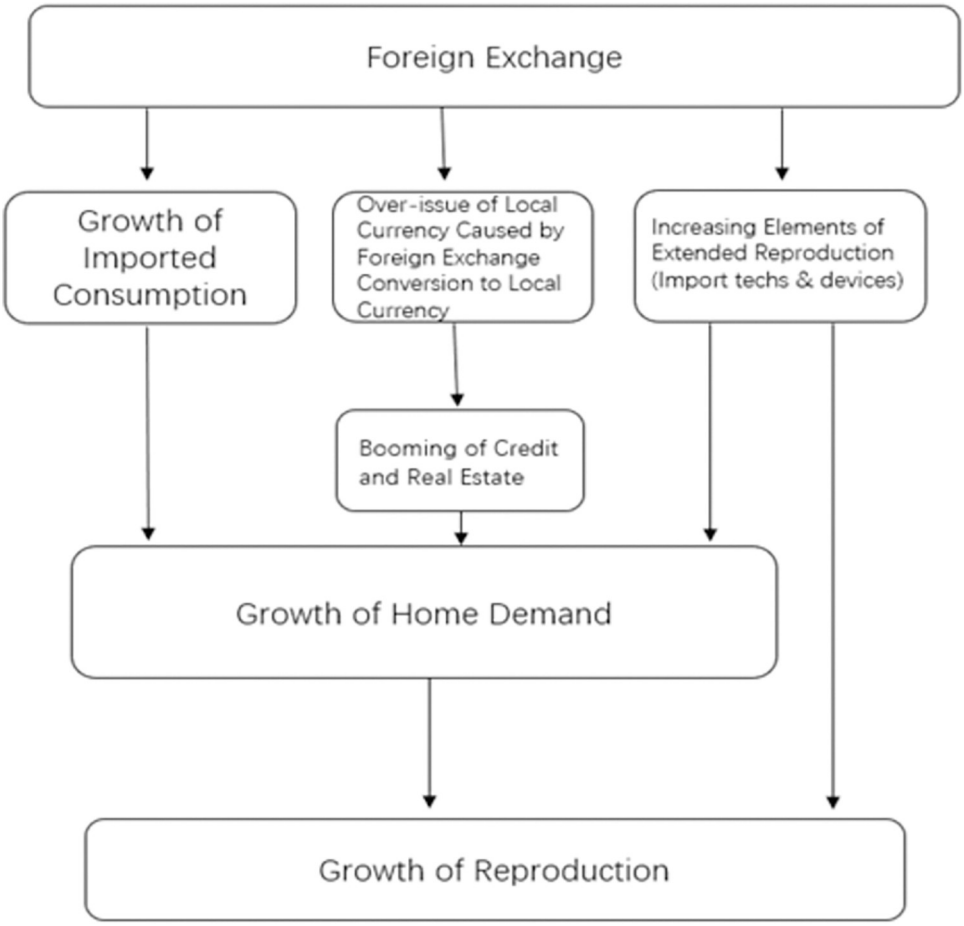

Fig 1. China's foreign trade dividend logic with the fuel of foreign exchange in the 2000s. As shown in Fig 1, China's massive inflow of foreign exchange has contributed to the expansion of the domestic market, the expansion of production factor inputs, and the prosperity of the financial and real estate markets.

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Hence, the China-Japan-Korea Free Trade Area began planning in 2002 since the geopolitical conflict had been on hold for a long time (e.g., References [51–55]). Concurrently, the international situation has also undergone significant changes with the U.S. President Donald Trump taking office in 2016, unilateralism once again rose in the United States, so the United States withdrew from the TPP to protect its interests (e.g., References [56]). The RCEP and TPP agreement have substantial overlaps, but RCEP hadn't stopped by CPTPP (e.g., References [60, 61]). Consequently, the RCEP agreement proposed by ASEAN in 2011 has become an ideal framework (e.g., References [57–63]).

The RCEP agreement is the Regional Comprehensive Economic Partnership. The ten ASEAN countries proposed the agreement at the 19th ASEAN Summit in Jakarta in 2011, and the invitation was formally initiated in 2012. The RCEP agreement has 20 chapters, including the essential characteristics of the free trade agreement, trade in goods, services, investment access, and corresponding. The rules cover e-commerce, intellectual property, competition policy, government procurement, and small and medium enterprises (SMEs) (e.g., References [64, 65]). Among them, in terms of trade in goods, the overall level of openness would reach more than 90%. More than 90% of goods would enjoy tariff cancellation or reduction treatment by trade liberalization (e.g., References [66]).

China, Japan, South Korea, Australia, New Zealand, India, and other economic systems of developed countries have participated in this agreement to reduce tariff barriers and build a unified market. Due to severe disagreements in India about whether to open the market to the outside world, this power in South Asia did not ap-prove RCEP (e.g., References [67, 68]). So far, Australia, Brunei, Cambodia, China, Indonesia, Japan, South Korea, Laos, Malaysia, Myanmar, New Zealand, Philippines, Singapore, Thailand, and Vietnam have approved the agreement. The total population of the agreement's member countries has reached 2.2 billion people, accounting for about 30% of the world's total population. In 2019, the total GDP of 15 member countries reached USD 25.6 trillion, accounting for 29.3% of the world's total economy. The total intra-regional trade volume reached 10.4 trillion U.S. dollars in the same year, accounting for 27.4% of the global trade volume, making this agreement have surpassed the TPP agreement and the CPTPP agreement, becoming the world's most significant free trade agreement (e.g., References [69, 70]).

Material and methods

Basic assumptions of the GTAP model

The fundamental assumptions of the GTAP model are as follows: First, the market is perfectly competitive, and the return to scale of production remains changeless; second, if the production costs of producers are minimized, then the benefits of consumers are maximized, and all commodity and input factor markets are cleared; third, five elements influencing marco economic and international trade are land, capital, technical labor, unskilled labor, and natural resources (e.g., References [71]). Moreover, the three actors are the private sector, the government sector, and manufacturers (e.g., References [71]).

Basic principles of the GTAP model

The GTAP model takes the country's production, consumption, and government expenditure as independent variables and reflects the countries' trade relations after conversion with coefficients. Equilibrium is reached when the production factor and commodity trading markets are clearing.

Data base

This research uses the GTAP 10 database, which contains the trade and macro-economic data of 2014 invented by Aguiar et al. (e.g., References [72]).

GTAP simulation analysis experiment description

This paper uses GTAP to conduct a macroeconomic simulation analysis of the nine central member states (or regions) of RCEP intra-regional under tariff reduction conditions. The nine selected countries and regions are China Mainland, Japan, South Korea, Australia, New Zealand, Indonesia, Thailand, Vietnam, and Singapore. This simulation sample includes almost all types of economies, the samples this study use with horizontal representativity of RCEP members, and they are all intra-regional economies with relatively developed, large populations or rapid development. Therefore, analyzing them has important guiding significance for studying the economic impact of RCEP: China Mainland and Japan is the two largest economies in Asia and is also full-industry chain economy (e.g., References [18, 21]), South Korea, Indonesia, Thailand, Vietnam, and Singapore are typical export-oriented economies (e.g., References [21, 27, 53]), and Australia and New Zealand are resource-based economies (e.g., References [31, 32]).

After the RCEP agreement is reached, the bilateral trade tariff exemptions that countries within the agreement can involve 92% of goods (e.g., References [73]). Therefore, the bilateral trade shock value entered into the GTAP software is -92%

The levy of tariffs on mutual trade between countries is relevant to the RCEP agreement. As early as 1998, some tariff reduction agreements were reached among ASEAN countries, and since 2001, tariffs among ASEAN countries have been kept below 5% (e.g., References [74]). Therefore, the tariff reduction effect of this batch of agreements is one of the most insignificant for them. At the same time, the trade agreement between China and ASEAN came into effect in 2010, and the free trade agreement with South Korea also came into effect in 2015 (e.g., References [75]). Therefore, the changes brought about by the agreement on the effect of tariff reduction and exemption on China-ASEAN and China-South Korea trade have also been quite limited. This study does not deal with China-ASEAN trade, China-South Korea trade, and trade between the sample countries in the ASEAN countries in the empirical process.

Realist international relations theory points out that the decisive factor of certain international relations is national interest (e.g., References [76, 77]). Therefore, discussing the sustainability of the RCEP agreement itself cannot be separated from its impact on the national interests of the contracting parties. For RCEP contracting parties, the national interests involved in the agreement are mainly economic and trade interests and these interests are directly related to the tariff rate and the rules of origin: some studies have confirmed the rules of origin in the RCEP agreement. The agreement has a promotion effect on the economic and trade interests of various countries (e.g., References [78]), and the following discussion on whether countries tend to stay in the agreement will also involve this factor.

This study uses GTAP software to simulate the changes in the sample countries and macroeconomic conditions under the 92% tariff reduction range, excluding the interference of other factors. The data collection objectives of the experiment are set as the GDP import value and export value of each sample country, as well as the increase in import value and export value. These factors can be used to measure the impact of tariff reduction on the sample countries that remain in the agreement in the future—influence of will.

This study uses shock simulation in the RunGTAP software to show the impact of 92% of the RCEP agreement on the trade balance and macroeconomic impact of the 92% commodity tariff reductions in the software. The accuracy of the software's shock-sensitive experiments has been verified by previous studies (e.g., References [79]).

Results

As Table 1 shown, the experimental results are as follows. After the implementation of RCEP, Australia's GDP increased by 0.13%, New Zealand's GDP increased by 0.04%, China's GDP increased by 0.06%, Japan's GDP increased by 0.10%, South Korea's GDP increased by 0.07%, Indonesia's GDP increased by 0.07%, It increased by 0.05%, Singapore did not change significantly, Thailand increased by 0.09%, and Vietnam increased by 0.13%. It can be seen that among the sample countries, except for Singapore's economic aggregate, which did not change significantly after the RCEP tariff reduction, all other countries showed a certain degree of slight growth.

In terms of import growth, Australia's imports rose by 2.97%, New Zealand's imports rose by 1.64%, China's imports rose by 1.15%, Japan's imports rose by 4.65%, South Korea's imports rose by 1.07%, and Indonesia's imports rose 0.61%, Singapore's imports fell 0.23%, Thailand's imports rose 0.42%, and Vietnam's imports rose 0.84%.

In terms of growth in total exports, after the RCEP agreement to reduce tariffs, Australia's total exports rose by 1.18%, New Zealand's total exports rose by 0.42%, China's total exports rose by 0.87%, Japan's total exports rose by 0.67%, South Korea's total exports rose by 0.67%,

Table 1. GTAP analysis results. These results were simulated by RunGTAP software, and the basic data and methods of the simulation are shown in the Data Availability Statement.

SAMPLE	GDP Change	Import Change	Export Change	Net Export Change
Australia	0.13%	2.97%	1.18%	-20.06%
New Zealand	0.04%	1.64%	0.42%	-775.28%
China	0.06%	1.15%	0.87%	-0.43%
Japan	0.10%	4.65%	0.67%	-317.38%
Korea	0.07%	1.07%	0.64%	-3.68%
Indonesia	0.05%	0.61%	0.85%	16.59%
Singapore	0.00%	-0.23%	0.13%	6.23%
Thailand	0.09%	0.42%	0.43%	0.62%
Vitenam	0.13%	0.84%	0.92%	-0.37%

Table Note. All of these data are predicted by RunGTAP.

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Total exports rose 0.64%, Indonesia's total exports rose 0.85%, Singapore's total exports rose 0.13%, Thailand's total exports rose 0.43%, and Vietnam's total exports rose 0.92%

Australia's trade surplus fell by 20.06%, New Zealand's trade surplus fell by 775.28%, China's trade surplus fell by 0.43%, Japan's trade surplus fell by 317.38%, South Korea's trade surplus fell by 3.68%, and Indonesia's trade surplus rose Singapore's trade surplus rose by 6.23%, Thailand's trade surplus rose by 0.62%, and Vietnam's trade surplus fell by 0.37%.

Sustainability discussions on the RCEP agreement itself

From the perspective of GDP, all the sample countries except Singapore have directly achieved a certain degree of economic growth through the reduction and exemption of tariffs in the RCEP agreement, especially for developed countries such as Japan and South Korea, with long-term economic growth in the region. In terms of (e.g., References [80, 81]), it is not easy to simply drive economic growth within 1% through an agreement. For resource-based developed countries such as Australia and New Zealand, joining such tariff reduction and exemption agreements is obviously beneficial to their expansion. In overseas markets, at the same time, the merger of the rules of origin in the agreement can also make products involving their supply chains and market players more likely to be judged as local products, thereby obtaining tariff reductions. Therefore, the tendency and motivation of Australia, New Zealand, Japan, and South Korea to continue to implement the agreement are evident in the sample countries only in terms of total GDP.

Singapore is an extraordinary sample in the RCEP agreement because Singapore achieved extensive free trade very early, but Singapore still levies tariffs on goods such as automobiles. This Singapore is an atypical free trade port; as far as the free trade port is concerned, it is still a batch of agreements signed, which has not brought many dividends to Singapore in terms of economic growth.

Developing countries in this area generally achieved a certain degree of economic growth through this agreement. China's economic aggregate has reached a specific scale to achieve 0.07 the economic aggregate growth rate. The achievement of % is a political capital for those in power related to the agreement; Vietnam may gain 0.38% economic growth through the agreement, and at the same time, Vietnam is an export-oriented country, which has led to the Vietnamese government. The incentive to stay in the agreement is also relatively high, and for Thailand and Indonesia, a certain length of economic growth brought about by the agreement will also be a catalyst for their rulers to decide to stay in the agreement.

From the perspective of total import volume, after the signing of the agreement, according to the tariff reduction and exemption policy, developed countries in the agreement, except for South Korea and Singapore, have experienced rapid growth in total import volume. It may be due to the developed countries having strong spending power, and the signing of the agreement has promoted the consumption of imported goods in these three countries. The impact of a large number of foreign commodities on the domestic market may cause the governments of these three countries to be apprehensive, thereby affecting the continuation of the agreement. For South Korea, which has a slight increase in imports, the danger of foreign commodities impacting the domestic market is not apparent.

Developing countries in the agreement also experienced a relatively strong impact of foreign commodities on their domestic markets, especially Vietnam, which suffered a 0.82% increase in imports. For Vietnam, this sharp increase in imports is not related to its exports: inconsistent-oriented policies could be an obstacle for the Vietnamese authorities to continue to implement the agreement in the next stage, and for Thailand and Indonesia, the reduction of the trade surplus due to the agreement may also be an obstacle for the governing authorities to slow down the implementation of the agreement. Nevertheless, for China, although China has endured a drastic 1.15% increase in imports, the Chinese domestic market is enormous, and the market space for local market players is already significant, so it has a certain tolerance for the impact of this magnitude. The Chinese authorities are attacking the domestic market for foreign goods. There is insufficient motivation to intervene in the implementation of the RCEP agreement.

Regarding exports and trade balance, the agreement's tariff reduction and exemption policy has had a specific export promotion effect on all countries except Singapore. Among developed countries, Japan's exports have increased by 0.69%, and South Korea's exports have increased by 0.69%. Exports increased by 0.65%, Australia's exports increased by 1%, 18, and New Zealand's exports increased by 0.42% for countries like Australia and New Zealand are resource-exporting. In other words, this increase in exports means more opportunities for economic growth. Therefore, the willingness of the two governments to continue to implement the agreement may be relatively strong. South Korea is also a country that is entirely dependent on exports. Exports have increased to a certain extent. After the agreement's implementation, South Korea's export growth rate is significantly lower than the import growth rate, which may lead to dissatisfaction among South Korean policymakers, thereby affecting the standard implementation of the agreement. For Japan, after the agreement's implementation, there may be a severe threat of foreign goods hitting the local market, so in terms of trade balance, domestic opposition to the agreement's implementation in Japan and South Korea is likely to emerge. Although the rules of origin revision may provide additional dividends for Japan's exports to South Korea, these may not offset the pressure of the weakening of South Korea's trade advantage in international trade competition under the influence of the tariff policy.

For Singapore, the implementation of the agreement has not had much impact on Singapore's trade balance, so it is challenging to infer Singapore's attitude towards the agreement from only the forecasted import and export growth and changes in the trade balance. Of course, changing the rules of origin could bring some additional benefits to Singapore.

For developing countries, although China's total export growth is smaller than the total import growth, this is in line with the policy orientation of the Chinese government for some time because the current Chinese government has weakened the trade surplus in the process of formulating foreign trade policies. After all, China is already the largest surplus country in the world (e.g., References [82]). For Vietnam, the implementation of this enterprise can generate an inevitable growth in Vietnam's exports, so there is a motive for the Vietnamese authorities to insist on the implementation of the agreement. Furthermore, revising the rules

of origin can still bring additional export dividends to China and Vietnam. Indonesia and Thailand can also gain more economic opportunities for local market players in export growth and trade balance improvement, so they are more likely to continue implementing the agreement in terms of exports and trade balance.

To sum up, all developed countries in the agreement except Singapore can achieve a certain degree of economic growth through the agreement, but the governments of Japan and South Korea may not be willing to accept the reduction of economic opportunities for local market players brought about by the agreement. For Australia and New Zealand the two countries themselves are keen to export natural resources in exchange for daily commodities, so they may not be sensitive to trade deficits. In addition, improvements to the agreement's rules of origin could bring more export benefits to both countries.

Singapore is the only country that participated in signing the agreement, but its interests have neither been significantly expanded nor significantly damaged. However, the Singaporean government has long attached great importance to the conclusion of free trade treaties with foreign countries or realizing its interests. Free trade environment; therefore, Singapore's determination to continue implementing the agreement remains very credible.

Among developing countries, China can gain economic growth in the agreement, and the impact of foreign goods on the Chinese market caused by the agreement is within the acceptable range of the Chinese government. At the same time, the rules of origin may also bring more export convenience to China, and the Chinese government's continued implementation of the agreement has a solid foundation of economic interests. There is no doubt that Vietnam, Thailand, and Indonesia, which can improve the trade balance and promote economic growth, will continue to implement the agreement.

The international economic impact and sustainability of the RCEP agreement

China's trade relations with Japan and South Korea

The signing of the RCEP agreement has brought the trade between China, Japan, and South Korea into a new stage (e.g., References [83]). Japan and South Korea's joining in this agreement increased their economic influence in East Asia and sought the market in Southeast Asian countries, turning out that Japan's hope for using India's participation aiming to reduce China's influence in the RCEP agreement (e.g., References [84]). However, due to India's objective reasons, it cannot meet the needs of the RCEP agreement (e.g., References [85]), pushing Japan to join the RCEP agreement and making Japan itself becomes the dominant country (e.g., References [86]). The free trade agreement established by China and Japan through RCEP is the first free trade agreement between China and one of the world's top 10 economies (e.g., References [87]). This agreement has increased the trade coverage between China and its free-trade partners from 27% to 35% (e.g., References [88]). Establishing trade relations would promote the development of in-depth economic cooperation between the two countries and significantly deepen regional integration and sustainability (e.g., References [89, 90]).

China and Japan's bilateral tariff inspection arrangement is a historic breakthrough. China may significantly reduce or exempt Japanese imports of aquatic, mineral, and machinery products (e.g., References [91]). In contrast, Japan's treatment of Chinese daily-use cosmetics imports alcohol and other products that can also enjoy the same treatment. In terms of the demographic structure, Japan and South Korea are experiencing increasing population aging, making them need more young and cheap labor forces to fill the labor shortage gap, but this problem can be alleviated by investing in China to build factories (e.g., References [92]). From

the perspective of industrial structure, the electronics manufacturing and automobile manufacturing industries of Japan and South Korea are highly complementary to China's domestic, and even China would become a destination for further industrial transfer of high-end industries in Japan and South Korea (e.g., References [93]). Therefore, the agreement would unprecedentedly strengthen the economic cooperation between China, Japan, and South Korea (e.g., References [94]). The three countries may sign additional regional free trade agreements based on the RCEP agreement, increasing regional trade liberalization and even the currency exchange scale (e.g., References [95, 96]). The drafting of the swap agreement attempts to enhance the internationalization of the two countries' currencies in the long-term to eliminate the dependence on the development path of OEMs for the United States and European countries to achieve economic sustainability (e.g., References [88]).

Trade relations between China and the association of Southeast Asian countries

Before this, the Association of Southeast Asian Nations (ASEAN) had signed several free trade agreements with China, Japan, South Korea, and other countries. After the RCEP agreement took effect, ASEAN can integrate many previous agreements to form a more efficient regional economic integration cooperation mechanism (e.g., References [97]), strengthening ASEAN's leading position in international economic cooperation. Unlike the original China-ASEAN Free Trade Agreement (CAFTA) (e.g., References [98]), it adds material clauses and standard unit clauses that impose restrictions on direct transportation and uses rules of origin. Back-to-back Proof of Origin perfected the verification procedures of these two rules. These innovative measures would promote trade between China and ASEAN (e.g., References [99]). ASEAN has also brought new impetus to China's trade opening as the main cheap labor supply base and product sales market in this agreement (e.g., References [100, 101]).

China's trade relations with Australia and New Zealand

As typical Western countries, Australia and New Zealand have been conducting foreign exchange activities under the guidance of the US-led diplomatic system (e.g., References [39]). However, the paradox is that Australia and New Zealand, as crucial raw material producers, are highly complementary and compatible with China's industrial great power (e.g., References [39, 40]). Therefore, China and Australia have previously signed a series of significant economic and trade cooperation agreements, including the "One Road" memorandum of understanding and its framework agreement, et cetera (e.g., References [40]). The cooperation between the two parties is a typical complementary advantage conducive to the acceleration of intra-regional economic integration and the expansion of both parties' foreign trade markets (e.g., References [38]), thereby helping both parties maintain their sustainability under the general trend of economic globalization. Australia's accession to RCEP aims to establish a more complete and convenient multilateral trading system and concurrently sign a free trade agreement with India. However, India's withdrawal made Australia's plan to no avail, allowing Australia to expand its free trade with other intra-regional countries (e.g., References [102]).

However, the cooperation between China, Australia, and New Zealand is not stable. For example, on April 21, 2021, the Australian Foreign Minister announced the abolition of the "Belt and Road" memorandum and framework agreement signed between China and the Victorian government of Australia (e.g., References [103–105]). This conflict also illustrates the uncertainty of the relationship between Australia, New Zealand, and China under the conflict of geopolitical interests. With the lessons learned from Japan's invasion of Oceania in World War II, the developed countries in Oceania are intensely vigilant against the expansion of the incredible power of East Asia.

Summary

The signing of RCEP means broader and deeper economic exchanges and more foreign trade dividends between intra-regional countries (e.g., References [105]), which would ultimately greatly promote the development of intra-regional integration (e.g., References [106]). Integration development is one of the critical promoting factors of regional sustainability. Integrating intra-regional is conducive to expanding the intra-regional national market and realizing the other precise matching of supply and demand (e.g., References [88]). This trend would improve the current situation of the Asia-Pacific developing countries as "world foundries" with relatively small profit margins. It can also reduce the intra-regional dependence of many developing countries on the U.S. and European markets to a certain extent and improve their ability to resist risks in the international market. Therefore, intra-regional developed countries are conducive to expanding the market for high-end products and providing more room for development beyond the saturated economic cooperation with the United States and Europe (e.g., References [107]). Concurrently, it can also realize positive interaction within Asia-Pacific countries. It can be seen that the regional integration process is of great benefit to the sustainability of the intra-regional economy.

From a global perspective, although the Asia-Pacific regional integration has aggravated the United States and other Western great powers' concern about China's expansion and has increased the intensity of the arms race between the U.S. and China in the Asia-Pacific region (e.g., References [108]). Therefore, the starting point is deterrence rather than direct war. The reciprocal deterrence between the two sides constitutes the basis of peaceful development with a terrorist balance of great consequence and uncertainty. This mechanism is like the US-the USSR nuclear deterrence balance of the last century. Furthermore, after signing the RCEP agreement, the United States, which has a significant investment in Japan and South Korea, can also benefit indirectly. China does not have to use force to fight for the external market. The common interests of China, the United States, and the European world have been strengthened, and the tacit understanding of peace between the two parties is more secure (e.g., References [109]), which would also become the international political foundation for the stable development of intra-regional. Moreover, maintaining these tacit forms a positive cycle of intra-regional economic integration, sustainability, international politics, and security stability.

Prospects and conclusions

After the RCEP agreement was officially signed in November 2020, the country's ratification process has been steadily moving forward. Currently, 9 of the 14 countries' authority has approved the agreement of RCEP. Moreover, RCEP is expected to be officially implemented in January 2022 (e.g., References [65–67]). These facts show that although the contracting countries have conflicts in geopolitics or some industrial interests, they have generally reached a consensus to actively promote intra-regional integration and achieve sustainability in the Asia-Pacific region, whose consensus is the basis for the existence and effectiveness of RCEP.

The signing and implementation of RCEP further integrate China with Northeast Asia, Oceania, and ASEAN, providing a more robust economic foundation and the international coordination mechanism foundation for the economic integration of intra-regional countries (e.g., References [98]). RCEP itself have the sustainability to existing in long term, and would help the Asia-Pacific region's industrial balance, trade balance, economic growth, and sustainability. It can also positively improve the current globalization system and is expected to provide a valuable reference for regional integration and sustainability in other regions.

Supporting information

S1 Dataset. Minimal dataset. This dataset includes the GTAP10 database, the source code and installed software for RunGTAP, i.e., trade, tariff and macroeconomic data and simulation methods for RCEP member countries used in this study.
(ZIP)

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