Original Paper

An Empirical Study of China-Australia Bilateral Trade Potential Based on Gravity Model

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Abstract

Based on the use of trade integration index and gravity model, this paper uses the bilateral goods trade data between China and Australia from 2000 to 2019 to analyze the trade status, trade complementarity and trade potential between China and Australia. The results of the study show that the trade scale, trade complementarity and trade potential between China and Australia are constantly expanding. However, from the perspective of trade balance, China has always been in the position of a deficit country, and the deficit is getting larger and larger, especially in terms of primary products. Judging from the trade integration index, China's trade integration with Australia generally shows an upward trend, indicating that the trade dependence between China and Australia is gradually increasing. Judging from the results of the trade potential analysis, the trade potential between the two countries has not been fully realized, and there is still much room for improvement in bilateral trade relations.

Keywords

gravity model, trade complementarity, trade potential

1. Introduction

Since the establishment of diplomatic relations in 1972, China and Australia have maintained close bilateral economic and trade relations. The bilateral trade volume between China and Australia increased from US $ 4.493 billion in 2000 to US $ 158.97 billion in 2019, a 35-fold increase. According to statistics from the Australian Bureau of Statistics, China-Australia bilateral trade volume in 2019 was US $ 158.97 billion, of which Australia's exports to China were US $ 10.39 billion, accounting for 38.2% of Australia's total exports; Australia's imports from China were US $ 55.07 billion, down 0.8 %, Accounting for 25.8% of Australia's total imports, an increase of 1.4 percentage

points. As of 2019, China is still Australia's largest trading partner, the largest export destination, and the largest source of imports. Overall, China-Australia trade relations have developed well.

First of all, the scale of Sino-Australian trade is constantly expanding. Since 2000, the scale of China-Australia trade has expanded rapidly, and trade relations have become increasingly close. In 2000, the total bilateral trade between the two countries was only 9.04 billion US dollars; by 2014, Australia's exports to China had reached 76.645 billion US dollars, and China's exports to Australia had reached 48.459 billion US dollars. 125.14 billion US dollars, China continues to maintain Australia's largest export destination and source of import status.

Second, China has long been in a deficit state. Since 2000, China has basically had a trade deficit with Australia, and the scale of the trade deficit has been rapidly expanding. In 2000, China's trade deficit with Australia was only 525 million US dollars; by 2014, China's trade deficit with Australia had reached 28.186 billion US dollars; of which only in 2004 China had 274 million The US trade surplus.

Finally, agricultural and mineral products occupy an important position in Sino-Australian trade. First, Australia is a resource-rich developed country with developed services, mining, and agriculture; China is a developing country with a large market and good manufacturing development. From the perspective of comparative advantage, China and Australia have strong industrial complementarities, which is also an important reason for the rapid expansion of trade between China and Australia after the establishment of diplomatic relations. However, such complementarity also leads to the majority of China-Australia trade being inter-industry trade. Intra-industry trade is relatively small. The trade between the two countries is based on the characteristics of complementary resources, and such a low-level horizontal division of labor is detrimental to the specialized division of labor, technology transfer, and technology spillovers between the two countries. Second, between 2000 and 2014, the scale of mineral products trade between China and Australia continued to increase, and the share of mineral products in Australia's total exports to China expanded rapidly, which also reflected China's mineral products from Australia Dependence.

In April 2005, to speed up the process of trade liberalization between the two sides, the negotiation of a bilateral free trade agreement between China and Australia was initiated. This is after China and South Korea's free trade agreement, between China and another important economy in the Asia-Pacific region free trade agreement negotiations. In November 2014, national leaders of China and Australia held talks in the Australian capital Canberra. The main topic of the talks was that the leaders of the two sides jointly confirmed the substantial conclusion of the China-Australia free trade agreement negotiations. Therefore, for both China and Australia, both in the Asia-Pacific region and jointly committed to the construction of regional economic integration, how to achieve comprehensive, high-quality and balanced economic and trade development goals in the future is worthy of our in-depth study.

In April 2005, China and Australia started the negotiation of bilateral free trade agreement, which lasted for ten years, after 21 rounds of consultation and negotiation. On June 17, 2015, China and Australia signed a bilateral free trade agreement covering ten years of goods, services, investment, etc.

Several areas are one of the free trade agreements that China has signed with the highest level of trade and investment liberalization. It is the first country to make a commitment to China's "negative list" approach in the field of service trade. The signing of a bilateral free trade agreement between large developed economies and the signing of the China-Australia Free Trade Agreement has important demonstration effects on other free trade zones under negotiation and free trade zones under study. According to the country trade report of the Ministry of Commerce, China has become Australia's largest trading partner for five consecutive years from 2009 to 2014, and Australia's trade status in China has also increased year by year. Therefore, studying the current status of China-Australia bilateral trade development and conducting an empirical analysis on the trade potential of the two countries will help realize the complementary economic advantages of the two countries, promote the in-depth development of bilateral economic and trade relations, smoothly implement the China-Australia bilateral free trade agreement, and accelerate the implementation of the China Free Trade Zone. Strategy to reduce the impact of the US-led TPP and TT 7P strategies on China's economic and trade development.

2. Literature Review

In recent years, the research on the economic and trade relations between China and Australia has mainly focused on the measurement of the level of intra-industry trade between the two countries, the construction of free trade zones and the trade of agricultural products. The research by Chen (2017) found that the China-Australia intra-industry trade index is low and has a downward trend. China-Australia intra-industry trade is mainly concentrated on the trade of some industrial manufactured goods. Chi's (2014) research shows that six of the nine China-Australia service trade projects are characterized by intra-industry trade, indicating that the service industry intra-industry trade has an important position in China-Australia service trade. The analysis of Yang et al. (2012) believes that there is obvious economic complementarity between China and Australia. The establishment of a free trade zone will improve the overall welfare of the two countries and the world. Australia's agriculture and industry will benefit. The benefits of the agricultural sector are greater than those of industry. In terms of sectors, China's profits all come from labor-intensive industrial sectors, while the agricultural sector will be affected to a certain extent. Hong (2017) studied the sustainable development of China-Australia economic and trade relations and analyzed the opportunities and challenges facing the sustainable development of China-Australia economic and trade relations. Obviously, most of the above studies have analyzed the intra-industry trade between China and Australia, the development of economic and trade relations, and the construction of free trade zones from a macro perspective. Few quantitative analyses of bilateral trade flows between China and Australia, and the focus of this article is to study the Sino-Australian bilateral trade structure and measure its trade potential, which will have great practical significance for promoting the healthy and healthy development of bilateral economic and trade cooperation.

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Regarding the dependence, competitiveness and complementarity of China-Australia trade, scholars have summarized their specific indicators and analyzed based on traditional trade statistics. He and Zhu (2014) calculated five indicators including international market share and demonstrative comparative advantage and analyzed the competitiveness and complementarity of China-Australia trade more comprehensively. Yu (2018) found that the factor endowment between China and Australia determines the special trade model of the two countries. Australia has a comparative advantage in agricultural and resource-based products while China has a comparative advantage in labor-intensive products. Comparative advantages are different. The research of Xie and Lai (2017) found that there is a big difference in the technical level of manufactured goods between China and Australia. The export of industrial manufactured goods in China has not exerted trade competition pressure on Australia Asymmetry. Gao (2019) analyzed China-Australia relations using the theory of interdependence and explored China-Australia interdependence from the perspectives of sensitivity and vulnerability and found that China's trade vulnerability to Australia is greater than Australia's trade vulnerability to China. However, most of the existing literature on the calculation of Sino-Australian trade relations is based on traditional trade data, and there is a clear lack of analysis under the global value chain division of labor.

Against the background of the deepening global division of labor, value-added trade has quickly become a research hotspot. Robert s (2019) research shows that the global value-added export rate has dropped from 85% in the 1970s to about 75% today, and there are more and more double-counted parts of global trade, and the traditional caliber is high. The degree of estimation is getting higher and higher. Traditional trade accounting methods can no longer accurately reflect the export scale among countries. The pattern of global trade imbalance is distorted and the distribution of trade income among countries is distorted. Guillaume Daudin et al. (2012) first proposed the concept of value-added trade on the basis of vertical specialization. The core of value-added trade lies in stripping out the value-added part of a country's export products that truly belongs to the country, thereby revealing the country's true export scale and trade gains, which can more accurately reflect global trade under the value chain division of labor. Subsequently, Koopman et al. (2015) proposed the total trade nuclear algorithm based on the basic concepts of value-added trade and the World Input-0utput Database (WIOD). Domestic scholars have used this method to measure and analyze China's foreign trade. Li and Xu (2016) recalculated China's external dependence and trade imbalance on the basis of value-added trade and found that existing GDP data and foreign trade-related data greatly exaggerated the scale of China's exports, Distorting China's trade situation. Therefore, the trade data under the traditional trade caliber shows that the analysis of the trade relationship between China and other countries is inaccurate.

The trade gravity model was first proposed by Tinbergen and Poyhonen in the 1960s. The model is guided by Newton's law of universal gravitation, which holds that the total bilateral trade between two countries or regions is proportional to the total economic volume of these two countries or regions. The spatial distance between the two is inversely proportional. After that, many scholars began to expand

the explanatory variables of gravitational models and conducted empirical research. Li (2019) used the gravitational model to predict the trade flow of China-ASEAN Free Trade Area. The study believes that the trade flow between member countries with similar demand structure and per capita income may increase, but the China-ASEAN Free Trade Area brings the trade creation effect is very small. Bongo (2004) used extended gravitational models to study internal and external trade flows in Africa, and showed that after excluding traditional gravitational model variables, economic policy failures, turbulent domestic political situations, and backward infrastructure have negatively affected African countries' trade flows influences. Mark (2012) used the results of the trade gravity model analysis to believe that the trade potential value between China and Chile in 2011 was 0.97, indicating that the two countries still have greater trade potential and room for development. Zhang's (2019) research believes that the bilateral trade between China and Russia is a "potential development" trade form, indicating that there is still some room for development in the bilateral trade potential between China and Russia. Wang (2015) used the results of the trade gravity model and fixed effect analysis to believe that the Sino-US agricultural trade is a "potential into a people type". In summary, the gravity model has now become a classic theoretical basis for studying bilateral or multilateral trade. Therefore, based on this model, this paper will also measure and study the potential of bilateral trade between China and Australia.

3. China-Australia Trade Status

For more than 40 years since the establishment of diplomatic relations between China and Australia, bilateral trade relations and scale have maintained a good momentum of development. This article will analyze China-Australia bilateral trade relations from four aspects: trade scale, trade balance, commodity trade structure and trade deficit.

3.1 China-Australia Trade Scale：

According to statistics from the Australian Bureau of Statistics, the bilateral trade volume between China and Australia in 2019 was US $ 158.97 billion with an increase of 10.9%. Among them, Australian exports to China were US $ 103.90 billion accounting for 38.2% of Australian total exports, while Australian imports from China were US $ 55.07 billion accounting for 25.8% of Australian total imports. In addition, Australian trade surplus with China was 48.83 billion US dollars increased by 51.1%. Basically, China remains Australian largest trading partner, largest export destination and largest source of imports.

In the 20 years from 1994 to 2013, the bilateral trade volume between China and Australia increased from US$4.493 billion to US$114.18 billion, an increase of 25 times. The total exports, imports and trade of the two countries have a steady increase in the number of people. From 1994 to 2013, China's exports to Australia and imports from US$ 1.488 billion and US$ 3.005 billion respectively. It rose to 37.554 billion US dollars and 76.464 billion US dollars, which increased by 25.24 times and 2.54 times respectively.

In addition, the trade deficit between China and Australia has continued to expand. In 2013, China's trade deficit with Australia was as high as 38.909 billion US dollars, an increase of 25.65 times that of 1994. The proportion of China-Australia trade in Australia's total trade increased from 4.62% in 1994 to 23.5300 in 2013, an increase of nearly 4 times. This shows that in Australia's foreign trade, China's trade status has increased one of the fast trading partners. The proportion of China-Australia trade in China's total trade increased from 1.90% in 1994 to 2.7400 in 2013, indicating that Australia is in a relatively stable position as China's trading partner in China's foreign trade.

Due to the impact of Novel Coronavirus Pneumonia epidemic and the prolongation of the Spring Festival holiday, Chinese import and export market in January and February 2020 decreased significantly. According to Chinese customs data: From January to February 2020, the total value of Chinese imports and exports of goods trade was 4.12 trillion yuan with a decrease of 9.6%. Among them, Chinese goods trade imports were 2.08 trillion yuan, down 2.4%; Chinese goods trade exports were 2.04 trillion yuan, down 15.9%.

3.2 China-Australia Trade Structure

Mineral products mainly including metal ores have been the main product of Australian exports to China. In 2019, its export value was 71.39 billion US dollars, accounting for 68.7% of Australian total exports to China. Moreover, the major Australian exports to China are followed by animal products and textiles, which account respectively for 4.0% and 2.4% of Australian total exports to China. As the share of mineral products is close to 70%, the performance of mineral products to China basically determines the overall performance of Australian exports to China. The rapid growth in exports of animal products, textiles and raw materials has further boosted the growth of Australian exports to China.

The import and export trade structure between China and Australia has the following characteristics: (1) Most of China's exports to Australia are capital or technology-intensive products and labor-intensive products. Among them, capital or technology-intensive products increased from US$ 347 million in 1994 to US$ 17.662 billion in 2013. The rate of population growth is fast, and the scale is large; labor-intensive products have increased from 10.87 in 1994 US$ 100 million increased to US$ 18.589 billion in 2013. This trade structure was created because China has abundant labor resources and a vast market space. It can export light industrial products, textiles, mechanical and electrical products and other labor-intensive products to Australia and can also provide high-tech services such as satellite launches. (2) China's imports from Australia are basically primary products or resource-intensive products. The trade volume increased from US$ 1.884 billion in 1994 to US$ 87.451 billion in 2013 and is mainly concentrated in meat and meat products and dairy and egg products, which is inextricably linked to Australia's developed animal husbandry industry. (3) The trade complementarity between China and Australia is relatively strong. The above data shows that China has a comparative advantage in the production of capital or technology-intensive products and labor-intensive products, while Australia has a comparative advantage in the production of resource-intensive products. There is a

strong complementarity between the trade products of the two countries Sex. Therefore, the two countries should use their comparative advantages to further expand the scale of trade between China and Australia.

The main commodities Australian imports from China are electromechanical products, textiles, furniture and toys, and miscellaneous products. In 2019, the import value of these products is 33.71 billion US dollars, accounting for 61.2% of Australian total imports from China. In addition to the above products, base metals and products, plastics, rubber, minerals, etc. are the main major commodities imported by Australia from China as well. However, their share in imports only exceeds or approaches 5%. Overall, Australian imports from China have declined slightly, which is in stark contrast to its continued high growth in exports to China.

3.3 China-Australia Trade Integration and Complementarity

The trade integration index is usually used to measure the interdependence of the two countries in trade. The trade integration index refers to the ratio of a country's exports to a trading partner to its total exports, and the ratio of the trading partner's total imports to the world's total imports. The trade integration index can comprehensively reflect the closeness of trade links between the two countries. If the trade integration index is greater than 1, it indicates that the two countries have close trade links. If the trade integration index is less than 1, it indicates that the two countries have loose trade links. According to the data compilation of the United Nations Commodity Trade Database, it can be found that between 2004 and 2013, the trade integration index of the two countries is greater than 1, indicating that China and Australia have close trade links, and the China-Australia trade integration index has been maintained at about 1.30. Australia The index of China's trade integration increased from 1.51 in 2004 to 3.14 in 2013, with an annual average of 2.33. The Australia-China trade integration index is greater than the China-Australia trade integration index, indicating that Australia is more dependent on Chinese market exports and China's position in Australia's import and export trade is rising. The specific calculation formula is as follows:

$$TCI_{ij}= (X_{ij}/ X_i)/(M_j/ M_w) \tag{1}$$

In the above formula, TCI_{ij} represents the trade integration index of country i to country j; X_{ij} represents the total export of country i to country j; X_i represents the total export of country i; M_j represents the total import of country j; M_w represents the total import of the world. If the value of TCI_{ij} is greater than 1, it indicates that the closer the two countries are in trade, the two countries are important export markets for each other; otherwise, the opposite is true. First, the two-way trade integration index between China and Australia, from 1994 to 2013, are both greater than 1, indicating that the two countries' trade ties are still relatively close; second, China's trade integration with Australia generally shows an upward trend, Indicating that China's trade dependence on Australia exceeds Australia's trade dependence on China.

The Chinese economy has continued to grow in recent years, while the demand for iron, oil, natural gas and coal has increased significantly. As a result, China began to strengthen its trade with

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resource-intensive countries, such as Australia. At present, one-third of Australian exports are directed to the Chinese market. In addition to exports, China is Australia's largest partner in terms of imports as well. Most Chinese goods purchased by Australians are telecommunications equipment, computers, furniture and other supplies. Therefore, China is Australia's first export destination and source of imports. The economic resources of the two countries are complementary and have great trade potential. Especially, Hong et al. (2017) pointed out that Western Australia is booming in trading minerals, agricultural exports and Chinese investment in Western Australia's resources sector.

In addition, Chi (2014) analyzed the relative HM index and believed that China's dependence on the Australian market is not high, while Australia's dependence on the Chinese market is increasing. If the current trend continues, Australia will become more dependent on China for trade by the end of 2020 than it is for USA. However, China has a certain dependence on Australian iron ore, which is the Australia's number one commodity exported to China.

3.4 China-Australia Trade Deficit

On the whole, China has always been on the side of a deficit in Sino-Australian trade, and in recent years China's deficit has shown an increasing trend. Figure 5 shows the change of China's trade deficit with Australia from 1995 to 2014, which can be simply divided into three stages according to the amount: the first stage is 1995-2003, and the trade deficit is lower in this stage, always at a level below US$2 billion; the second stage is from 2004 to 2007. In this stage, China's trade deficit with Australia began to expand significantly, and the amount quickly exceeded US$5 billion but was below the level of US$10 billion; the third stage That is, since 2008, China's trade deficit with Australia began to expand rapidly at this stage. After exceeding the US$10 billion mark, it continuously broke through multiple integer thresholds and reached more than US$60 billion. The main reason for this phenomenon is that the main commodities that China imports from Australia are mineral products, especially iron ore and copper ore sands. Since 2004, especially since 2008, China's demand for Australian mineral products has continued to increase. At the same time, the price of mineral products has risen rapidly, and there has been a so-called "both volume and price" situation, which has led to a faster increase in China's imports to Australia. Taking 2008 as an example, the price of Australian iron ore has increased by more than 95% on average. However, because Australian iron ore has a higher cost performance compared to other countries, and China has a rigid demand for iron ore, our country still Australia imports large quantities of iron ore. With the continuous rise of China's economy, the natural and mineral resources required are increasing day by day, and Australia has abundant natural and mineral resources, which will further increase China's trade deficit. With the establishment of the China-Australia Free Trade Zone, the trade volume between China and Australia will continue to expand, and the trade deficit will continue to increase in a certain period of time. How to develop China's advantaged resources and expand the scope of its exports to Australia to promote trade balance has become an important issue for the long-term sustainable development of China-Australia trade and economic cooperation.

4. The Empirical Analysis of China-Australian Bilateral Trade Potential

4.1 Gravity Model Construction and Variable Description

Based on the previous studies of trade gravity models by scholars, the author attempts to establish a gravity model that reflects the bilateral trade flow between China and Australia. Based on the Limmemann (1966) trade gravity model, this article expands the Limmemann model by introducing the virtual variables of UDP per capita in both countries, whether both countries are APEC member countries, and the distance between the two capitals. The trade flow estimation model is:

$$\ln TA_{ijt} = \beta_0 + \beta_1 \ln Y_{it} + \beta_2 \ln Y_{jt} + \beta_3 APEC + \beta_4 \ln DIST_{ij} + u_{ij}$$

Among them, β_0, β_1, β_2, β_3 and β_4 are regression coefficients, and μ_{ij} is the random error term.

See Table 2 for details about the explained variable, the meaning of the explained variable, the expected symbol, the source of the quantity and the basic statistical information.

This article selects sample data from 15 countries in Australia, Canada, Chile, South Korea, Mexico, Russia, Malaysia, Thailand, Argentina, Brazil, India, Turkey, Indonesia, Colombia and Nigeria from 2000 to 2019, with 300 effective samples. The selection of these countries as sample countries is mainly due to the following three considerations: first, most of these sample countries selected are China's main trading partners, which is conducive to the estimation and analysis of China's country's export potential; Second, these economies are located on all continents of the world and are very different from China, so the selected samples are more representative; third, China, as a member of emerging market economies, uses the above trade data to perform the gravity equation The regression is more representative, so that the simulation results of the trade potential are relatively accurate (Yu, 2019). Since the number of regression samples is 300 and the time interval is 20 years, the sample data structure of this paper is short panel data.

Table 1. Variable Meanings, Data Sources and Basic Statistical Information

Variable name	Expected symbol	Variable meaning	Data Sources	Mean	Standard deviation	Number of observations
ln TAijt		Bilateral trade volume, logarithm of bilateral trade volume between country i and country j in period t. (Unit: 100 million US dollars)	UNCOMTRADE	4.36785	1.73613	300
ln Yit	+	The logarithm of GDP per capita of country i in period t reflects the economic scale and supply capacity of the exporting country. (Unit: 100 million US dollars)	WDI	7.4205	0.81146	300
ln Yjt	+	The logarithm of GDP per capita in the t-th country j reflects the economic scale and demand capacity of the importing country. (Unit: 100 million US dollars)	WDI	8.51994	1.22028	300

APEC	+	The dummy variable, both parties to the trade are members of APEC, 1; otherwise, 0	Asia-Pacific	0.53333	0.49972	300
ln DISTij	-	Logarithmic spherical distance between the capitals of the two countries (unit: miles)	Geobytes	8.45099	0.79481	300

4.2 Analysis of the Bilateral Trade Flow between China and Australia

First, use the econometrics software STATA to perform the general mixed least squares (Pooled OLS) estimation of the above model. As can be seen from the data in the second column of Table 3, the adjusted R2 of the model is 0.7266. All the variables used in the gravity model can explain the changes in the bilateral trade volume between China and 20 sample countries to a degree of 72.66%, that is, the overall model is better. At the same time, since the F statistic is 0.000, the model is significant. In other words, the bilateral trade volume between China and trading partners can be well explained by the trade gravity model. After controlling for other variables, it can be seen that if China's per capita GDP increases by 1%, the bilateral trade volume between China and its trading partners will increase by 1.49%; The bilateral trade volume of trading partner countries will increase by 0.13%. If both China and trading countries are APEC member countries, the bilateral trade volume is 139% higher than that of non-member countries. When the distance between the two countries increases by 1%, the bilateral trade volume will decrease by 0.52%. Obviously, the estimated results of these variables according to the gravity model are consistent with our expectations.

Table 2. Regression Results of Bilateral Trade Gravity Model between China and 20 Sample Countries

	Pooled OLS	Fixed Effect	Random Effect
C	-3.866129	-7.849932	-3.873534
	-0.025	0	-0.004
ln Yit	1.489348	1.487028	1.487258
	0	0	0
ln Yjt	0.134633	0.138848	0.238464
	-0.003	-0.024	-0.002
APEC	0.877032		0.8715413
	-0.007		-0.005
ln DISTij	-0.5244992		-0.5253037
	-0.039		-0.035
Adjust R^2	0.7266	0.5704	0.7266
Number of regression groups	15	15	15
F statistics	0	0	0

Data source: sorted and calculated based on regression results.

Normally, we must decide whether to choose ordinary mixed least squares or random effects model. According to the above regression results, enter the test command in the STATA software, and the resulting P value is equal to 0.000 (less than 0.05). Therefore, the author chooses a random effect model for regression analysis. The Hausman test usually judges whether to choose a fixed effect model or a random effect model. Also based on the regression equation, the test command is also entered in the STATA software, and the test result obtained shows that the P value is equal to 0.9999 (greater than 0.05), so a random effect model should be selected for regression analysis of the gravity model. In summary, the author finally chose a random effects model to analyze the above estimation equation in an economic sense. The specific results are shown in Table 3. According to the regression results of the random effects model, the following trade gravity equation can be obtained:

$$\ln TA_{ijt} = -3.8735 + 1.4873 \ln Y_{it} + 0.1395 \ln Y_{jt} + 0.9715 APEC - 0.5253 \ln DIST$$

Obviously, after controlling for other variables, for every 1% increase in China's GDF per capita, the bilateral trade volume between China and trading countries will increase by 1.49%; and for every 1% increase in GDP per capita of trading countries, China's Trade volume will increase by 0.14%.

4.3 Estimation of Bilateral Trade Potential between China and Australia

Estimating the potential of bilateral trade flows between countries is an important use of our trade gravity model. Therefore, based on the specific trade gravity equation obtained above, we use the actual trade flow and the theoretical trade flow simulated by the gravity model. To estimate the development potential of bilateral trade flows between countries. The specific calculation formula is as follows: TPt=TVt/SVt.

Among them: TPt (Potential for Trade) represents the bilateral trade potential in period t; TVt (True Value) represents the actual value of bilateral trade in period t; SVt (Simulation Value) represents the simulated value of bilateral trade in period t. According to the classification of trade potential, when TPt≥1.2, it means that the trade potential between trading partners is very limited, and bilateral trade will only have a large room for development under the condition of developing new positive influencing factors; 0 .8<TPt<1.2, it means that there is still a certain trade potential between trading partners, and there is a certain room for expanding bilateral trade; TPt≤1.2, it means that the trading potential between trading partners is very large, and bilateral trade can be excluded Obstacles to promote the normal development of trade.

The results of the calculation of the bilateral trade potential between China and Australia using the random effect model selected above are shown in Table 3. The average value of the ratio between the simulated value and the real value of the double-sided trade volume between China and Australia from 2000 to 2019 is 1.126. The value in 2019 has been reduced to 0.912, indicating that the trade potential between the two countries has not been fully realized. There is still much room for improvement in bilateral trade relations. Especially since the free trade agreement negotiations between China and Australia started in 2011, the value of bilateral trade potential has declined rapidly, which shows that the establishment of a China-Australia free trade area has played a substantial role in promoting the

development of bilateral trade. Based on the substantive negotiation stage of the China-Australia Free Trade Zone, the construction of the China-Australia Free Trade Zone will continue to be accelerated.

Table 3. Calculation Results of Bilateral Trade Potential between China and Australia from 2000 to 2019 (Unit: 100 Million US Dollars)

Year	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Trade potential	1.304	1.217	1.213	1.205	1.175	1.164	1.182	1.166	1.167	1.134
Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Trade potential	1.162	1.142	1.098	1.089	1.057	1.028	1.029	1.015	1.083	0.912

Data source: sorted and calculated based on regression results.

5. Conclusion

Based on the above analysis, we can see that the trade scale, trade complementarity and trade potential between China and Australia are constantly expanding. However, from the perspective of trade balance, China has always been in the position of a deficit country, and the deficit is getting larger and larger, especially in terms of primary products. Judging from the trade integration index, China's trade integration with Australia generally shows an upward trend, indicating that the trade dependence between China and Australia is gradually increasing. Judging from the results of the trade potential analysis, the trade potential between the two countries has not been fully realized, and there is still much room for improvement in bilateral trade relations. To further promote the long-term and healthy development of bilateral trade relations between China and Australia, this article makes the following recommendations:

5.1 Based on Strong Bilateral Trade Complementarity, Further Enhance the Interdependence of China-Australia Economic and Trade Relations

According to the data calculated in this article, China's trade integration with Australia is generally on the rise, indicating that there is an increasingly close trade complementarity between China and Australia, which constitutes a good foundation for China-Australia trade cooperation. Due to the huge difference between China and Australia in terms of factor endowments and natural talents, China's labor resources are relatively rich, and it has a comparative advantage in the production of labor-intensive products, while Australia's mineral resources are relatively rich in the production of resource-intensive products. It has a comparative advantage; at the same time, China and Australia use information technology and other high-tech and institutional innovations to improve the industrial structure of the division of labor. These natural and late-established trade structures have a great complementarity. To a certain extent, promote the development of bilateral trade between the two countries.

5.2 Taking the Opportunity of Substantive Negotiations in the China-Australia Free Trade Area as an Opportunity to further Accelerate the Process of Bilateral Trade Liberalization between China and Australia

In November 2014, the national leaders of both China and Australia confirmed the substantial conclusion of the China-Australia Free Trade Agreement negotiations. The content of the substantive agreement of the China-Australia Free Trade Area mainly includes: the two sides agree to give zero-tariff treatment to the goods of the other country; the two sides agree to expand the opening of service areas; the two sides agree to liberalize new areas of investment, etc. For example, the establishment of the China-Australia Free Trade Zone is likely to have a certain impact on China's agriculture, mining and other industries. In this regard, China should make full use of the relevant domestic support policies allowed by the WTO to accelerate the adjustment of domestic industrial structure; on the other hand, it should strengthen support for domestic industries, research and formulate industrial damage compensation and trade adjustment assistance systems, and reduce China-Australia trade freedom. The negative impact of the globalization. In addition, from the development of China-Australia bilateral economic and trade relations in recent years, it can be seen that the two sides are facing many disputes on products such as agricultural products, textiles and clothing. Therefore, in order to ensure the realization of the efficient, balanced and fair objectives of the free trade zone, it is necessary for the two countries to refer to the relevant WTO rules and formulate a dispute settlement mechanism for the China-Australia free trade zone in accordance with the principles of conciseness, convenience and pragmatism in order to resolve related issues amicably.

5.3 Use the Multi-channel Dialogue Mechanism and Exchange Mechanism as a Platform to Further Create a New Situation in China-Australia economic and Trade Cooperation

As the complexity and intensity of China-Australia relations continue to change, it is necessary to strengthen political mutual trust. Not only should the high-level Chinese and Australian governments strengthen exchanges, but also the importance of business and private exchanges is becoming increasingly prominent. Strengthening the two-way exchanges between the official, business and ordinary people between China and Australia is conducive to promoting understanding between China and Australia and helping to eliminate misunderstandings, prejudices and estrangements between each other. 2014 coincided with China as the host country of the APEL meeting and Australia as the G20 chair. Both China and Australia should seize historical opportunities, make full use of these two internationally influential exchange platforms, carry out closer Sino-Australian economic and trade cooperation, and create a new situation in China-Australia cooperation through various forms such as tourism and cultural exchanges.

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