Proceedings of the 2nd International Conference on Financial Technology and Business Analysis
DOI: 10.54254/2754-1169/52/20230726

Impact of the Sino-US Trade War on Factor Endowment in the China's GBA: A Theoretical Analysis from the Perspective of Factor Endowment Theory

Kuo Bao [1,a,*]

[1]*RCF experimental school, 10020, Chaoyang, Beijing*
a. baokuo@rdfzcygj.cn
**corresponding author*

Abstract: Since the Sino-US trade war began in 2018, the two countries and other trading partners have been greatly affected. China's regional economic development has been affected by trade barriers, among which the Guangdong-Hong Kong-Macao Greater Bay Area (GBA) is more serious. On the premise that factor endowments determine trade has been proven, this study puts forward the potential impact mechanism of trade on regional factor endowments and takes GBA as an example for theoretical analysis based on factor endowment theory. The results show that due to the decrease in GBA export demand, the labor endowment will decline, the capital endowment will change oppositely to the labor due to the substitution effect and innovation pressure, and the land endowment will decline steadily. However, the movement of factors of production is limited by trade deflection and the restrictive policy. Future mathematical induction based on Heckscher-Ohlin model is needed to prove the results, and the corresponding empirical analysis will verify the relevance and implication.

Keywords: factor endowment theory, Greater Bay Area, Sino-US trade war

1. Introduction

In the contemporary landscape of global trade, the interactions between major economies hold significant implications for regional economic dynamics. The intricate relationship between China and the United States has garnered particular attention, given its potential to shape various facets of economic development. In December 2017 the U.S. passed the National Security Strategy. This is the beginning of the Sino-US trade war. The U.S. trade policy is primarily aimed at opposing the World Trade Organization's 2017 recognition of China's market economy [1]. A 25% tariff on 818 Chinese products has been established by The U.S. in the July 2018 and China implemented a policy of retaliation respectively. The trade barriers keep rising till January 2020 2 countries signed the first-phase agreement, this eventually eased trade tensions.

The impact of the trade war on the U.S. is reflected that China's retaliation has affected the supply chain in the U.S. and the world, the import of raw materials for U.S. producers has been hit [2]. For China, rising unemployment rate and slowing economic growth show the consequences of trade barriers [3]. This shows that the Sino-US trade war has created a 2-loser situation, since both

DOI: 10.54254/2754-1169/52/20230726

economies have been shocked [4]. The trade war not only affects both sides, but also brings income inequality to other trading partners.

China's GBA has been greatly affected in the trade war. As one of China's major trade areas, the GBA has rich factor endowments. Based on the factor endowment theory, this study proposes an impact mechanism between trade and factor endowment. The existing literature mainly proves factor endowment theory. In the contrary, this study will explore the impact of Sino-US trade war on GBA factor endowment.

2. Literature Review

2.1. Factor Endomwnent Theory

Existing theories about international trade, factor endowment theory, are based on comparative advantage theory and consider more complex conditions. Apart from this, product life-cycle theory proposes that emerging industries will start production in developing countries and eventually be produced in developed countries. The new trade theory points out that economies of scale and product differentiation are the main factors that form the trade. Geographical Economics Theory explains how trade between regions is influenced by locational advantages in transportation costs. Since the research object of this study is the regional factor endowment, the factor endowment theory will be more appropriate. The theory mainly expounds that the basis of international trade is the difference in the relative price of the same commodity, this is caused by the difference in the relative price of the factor due to the difference in the factor endowment of the two countries, thus the factor endowment is the main factor in determining trade. From the perspective of regional economy, the region should export corresponding intensive product with higher factor abundance. Moreover, existing research has proved the feasibility of factor endowment theory in exploring international trade, and the theory comprehensively explains the trade pattern brought about by regional advantages of factors of production [5]. Based on the existing research, this study finds that the consequences of trade war on the regional economy can be attributed to its impact on regional factor endowments.

Based on comparative advantage theory, the existing literature considers the impact of factors of production on prices, thus linking up with the factor endowment theory. This suggests that the Heckscher-Ohlin model is accurate in analyzing more complex scenarios involving three factors of production [6]. However, another research refuted this point, assessed on the cases of different countries, economies tend to give priority to innovation activities in industries without factor advantages [7]. Therefore, these industries tend to have comparative advantage due to the advance technology in the long run, while the industries that are initially rich in factors of production maintain stable production costs. Loosely speaking, the issue of lack of innovation in certain industries may be generalized as the factor contributing to the decline in exports, however, the later study may have overestimated the impact of long run innovative activities on regional trade pattern, since this will only be valided if policymakers are willing to diversify exports.

2.2. Research Comparison

Trenchant debates have been incurred between different schools on whether the Sino-U.S. trade war affects the regional development of the two economies, with the major stances accentuating that there will be consequences for instance unemployment and recession in China, U.S., as well as other courtiers, since the trade barrier slowed economic activity significantly [8]. Whereas the others focus on the point that the trade barrier would not create great impact on the economic development of China since there is a trend of trade deflection in a wide range of industries except steel [9]. There will be a slight impact on the regional development logically since there is no trial of trade depression

DOI: 10.54254/2754-1169/52/20230726

within China. However, the latter view is based on the fact that China's trade as a whole has not been affected, not all regions can survive the trade war.

Of all included articles, researchers including Xiong and Nugroho have found that trade war will significantly raise income inequality among economies [10]. Especially the difference in the trade pattern caused by the uneven distribution of factor endowment, which is the main factor of income inequality. Affected by trade barriers, trade pattern as well as the benefit will not only be affected by factor endowments but also by regional trade barriers. This transfer of regional trade advantages during trade war will also lead to changes in regional factor endowments. The region with low trade barriers will be attractive for factors of production. Additionally, the body of existing literatures have shed light on the impact on financial market that under the background of the trade war, the investment of the capital will become tough [11].

Based on the discussion above, a more plausible explanation may be trade wars will have an impact on regional economic development, and it can be interpreted as changes in regional factor endowment. In the later section, the argument obtained above will be applied to the case of GBA for analysis.

3. Theoretical Analysis

3.1. Regional Production

In line with the hypothesis by the previous research, it can be extended in terms of the aspects on impact of trade war GBA regional development that rising trade barriers will weaken demand for the region's products. The original advantages of the GBA as a free trade area have gradually faded. Since the U.S. trade policy is intended to protect the development of its local industries, the exports of the GBA have been greatly affected. The tariffs imposed by the U.S. on the GBA are implemented for a wide range of products, which has reduced the demand for most commodities in the region and caused the region to slump. These items are mainly labor-intensive products, high-tech products, and electronic and mechanical products. Since the GBA has great technological advantages in China, a large number of high-tech and talents are concentrated in this region, so the U.S. protective policy against China focuses on restricting the export of product that the GBA region has advantages of factor endowment. Restrictions on these products by protective policies will naturally lead to changes in the corresponding factor endowments in the region. This may be due to the implementation of redistributive policies of regional factor endowments to better deal with trade wars by China government, or it may be spontaneous by factors of production.

3.2. Changes in Factor Endowment

This research mainly discusses the three factors of production involved in the factor endowment theory: land, capital, and labor. These factor endowments may all be affected in the GBA region since the U.S. protective policy is treated the exports of GBA unevenly, the three factor endowments are affected to different degrees.

Since the protective policies are aimed at labor-intensive products and high-tech products, this is a negative signal for the low-cost labor force and high-tech talents in the GBA region. This impact will allow labor to leave the GBA and go to areas less affected by the trade war to stabilize their income levels. However, due to the agglomeration effect of resources and industries in the GBA region, there is a small probability that low-cost labor force will increase their income after relocation, while high-tech talents are the opposite. In addition, enterprises will choose to reduce production or pay more attention to the domestic market in order to maintain profits during the trade war without relocating. This will reduce the demand for labor and force labor to relocate.

Changes in capital endowment may depend on changes in labor endowment. Since high-tech products are affected by trade barriers, the pressure on enterprises to innovate products will be

DOI: 10.54254/2754-1169/52/20230726

increased. In this case, if the regional labor endowment declines, capital endowment will be stable due to the substitution effect between capital and labor [12]. Therefore, the change of GBA's capital endowment will depend on the mobility of regional labor force. If the mobility is high, the capital endowment will at least maintain the same level or increase. While GBA concentrates a large number of high-tech and professional talents that makes the increase in capital endowment have great possibility.

Since trade barriers will reduce GBA's exports, certain companies may also consider relocation while considering production reduction. However, land endowment will not show major changes, at least in GBA. Since the land cost of GBA is extremely high compared with other regions in China, and the transaction of land is more procrastinating than that of the labour and capital, even if the trade war affects GBA's trade position in China, the cost of land will not change in the short run. Therefore, the land endowment will show a slow decline trend. This trend will also depend on the success of enterprise innovation activities. If it can break through the increased export cost, the land factor endowment may show the opposite change.

3.3. Redistributive Policy

Apart from the spontaneous changes of factors, China's redistributive policy may also bring same trend of factor endowments. Trade barriers against the GBA deprive the region of its export advantage, prompting the government to shift the factor endowments to other regions, thereby reducing the impact of the economy on trade wars and possibly reducing income inequality. Through this policy, the government increases factor abundance in other regions, and ultimately increases trade with other countries to avoid U.S. trade barriers. Besides, the improved regional factor endowments will also help boost domestic demand, finally reducing the economy's dependence on international trade. In summary, redistributive policies will promote changes in factor endowments in the same direction as above.

4. Discussion

4.1. Trade Deflection

Although the above theoretical analysis is consistent with the factor endowment theory, the situation may also be contrary to it. As mentioned above, due to trade deflection, China has not depressed in the trade war, and there is no inventory overstock since these products have been successfully exported to markets of other trade partners. The trade pattern will not change if the foreign demand for GBA's products has not been shaken, and regional factor endowments will not change significantly. The argument can be confirmed by the data of the World Bank below.

DOI: 10.54254/2754-1169/52/20230726

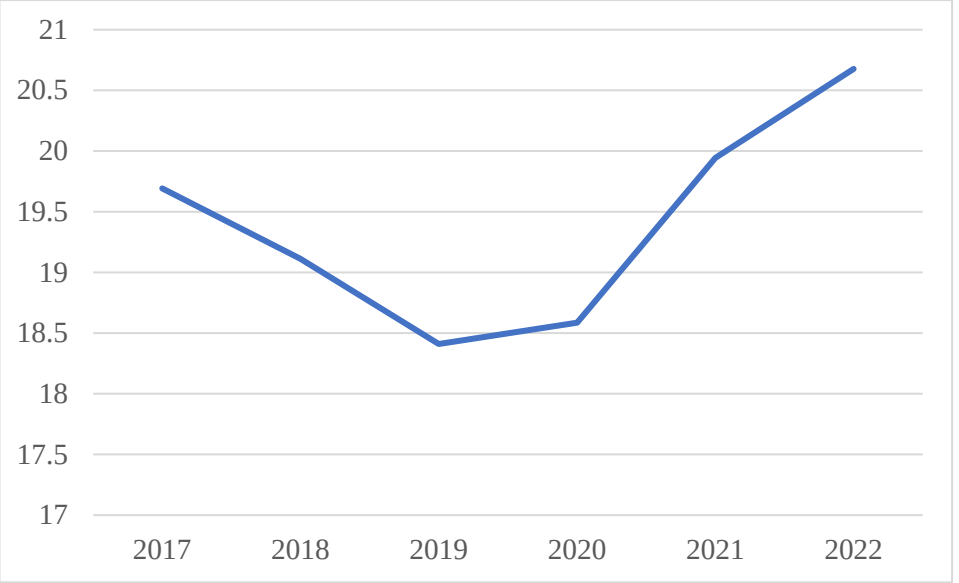

Figure 1: Export of goods and services (% of GDP) China (Data comes the World bank, accessd by https://databank.worldbank.org/reports.aspx?source=2&series=NE.EXP.GNFS.ZS&country=#).

As shown from figure the percentage of China's exports to GDP decreased by 0.7% in 2019, and it gradually increased thereafter until 2022. However, based on the data provided by PETERSON INSTITUTE FOR INTERNATIONAL ECONOMICS, the trade barriers gradually increase from 2018 until two countries signed the first-phase agreement in January 2020. Nevertheless, the World Bank's data cannot precisely reflect the impact on the GBA. Due to the particularity of the restricted commodities, the U.S. market has a certain irreplaceable position in consumption, thereby the data may underestimate the extent to which the GBA is affected.

4.2. Restrictive Policy

In addition to trade, the restrictive policy has a great impact on regional factor endowment. It could be attributed to the changes in policy focus and the restricted factor movement due to epidemic prevention policy. In order to revive the economy, starting from 2018, the focus of policy has shifted from demand-side to supply-side, which has redistributed regional factor endowments [13]. In addition, according to the World bank’s data the final consumption expenditure percentage of GDP dropped by 0.7%. after the outbreak of epidemic. To control the spread of epidemic, the government has implemented restrictive policies, which affect the mobility of labor [14]. The revive policy that deal with sluggish domestic demand and the epidemic prevention policy limited the spontaneous movement of factors of production, therefore, the above theoretical analysis results may be invalid.

5. Conclusion

In conclusion, the findings of this study shed light on the impact of trade barriers on GBA factor endowments. According to the characteristics of the commodities that the U.S. has set tariffs on China, this study analyzes that the labor endowment will decline, the capital endowment will show the opposite change to the labor endowment due to the increased innovation pressure and the substitution effect, and the land endowment will not change significantly but decrease overall. However, this change may be restricted by trade deflection and restrictive policies, thus making the change of factor endowments inconspicuous.

DOI: 10.54254/2754-1169/52/20230726

Based on the factor endowment theory, this study proposes a potential impact mechanism between trade and regional factor endowments and takes the GBA as an example for theoretical analysis. The results provide a new perspective for the study of regional economic development. The impact on the regional economy can be effectively predicted according to the trade pattern because of the induction of impact mechanism. However, this study lacks the derivation of mathematical models that can support the theoretical analysis results, which will make it more credible. Further research needs to use mathematical induction methods to prove the results based on the H-O model, and more empirical research must be carried out to ensure the relevance and implication.

References

[1] *Larisa, K., Ludmila, L., Yakov, S., and Andrei, D. (2020) US-China Trade War: Causes and Outcomes. SHS Web of Conferences, 73, 01012.*

[2] *Marcus, N. (2018) US Trade Policy in the Trump Administration. Asian Economic Policy Review, 13, 262-278.*

[3] *Terence, T. and Xiaoyang, L. (2019) Understanding the China–US trade war: causes, economic impact, and the worst-case scenario. Economic and Political Studies, 7, 185-202.*

[4] *Chunding, L., Chuantian, H. and Chuangwei, L. (2018) Economic Impacts of the Possible China–US Trade War. Emerging Markets Finance and Trade, 54, 1557-1577.*

[5] *Elhanan, H. (1981) INTERNATIONAL TRADE IN THE PRESENCE OF PRODUCT DIFFERENTIATION, ECONOMIES OF SCALE AND MONOPOLISTIC COMPETITION. Journal of International Economics, 11, 305-340.*

[6] *Roy, J.R. (1988) The Missing Link: The Ricardian Approach to the Factor Endowments Theory of Trade. The American Economic Review, 78, 759-772.*

[7] *William, H.D. (1979) FACTOR ENDOWMENT, INNOVATION AND INTERNATIONAL TRADE THEORY. Kyklos, 32, 764-774.*

[8] *Miaojie, Y. (2019) Introduction to the Special Issue on Understanding the Current China-U.S. 'Trade War'. China Economic Journal, 12, 97-99.*

[9] *Piyushi, C. (2016) Impact of temporary trade barriers: Evidence from China. China Economic Review, 38, 24-48.*

[10] *Yanyan, X. (2020) International Trade, Factor Endowments, and Income Inequality: Evidence from Chinese Regional Data. Emerging Markets Finance and Trade, 56, 3405-3424.*

[11] *Larry, D.Q., Chaoqun, Z. and Xing, W. (2019) An analysis of the China–US trade war through the lens of the trade literature. Economic and Political Studies, 7, 148-168.*

[12] *Robert, R. (1999) Unemployment, wage bargaining and capital-labour substitution. Cambridge Journal of Economics, 23, 413-425.*

[13] *Kerry, L. (2020) China's Policy Response to the China US Trade War: An Initial Assessment. The Chinese Economy, 53, 158-176.*

[14] *Yu, P. and Sylvia, Y.H. (2022) Analyzing COVID-19's impact on the travel mobility of various social groups in China's Greater Bay Area via mobile phone big data. Transportation Research Part A: Policy and Practice, 159, 263-281.*