

Research on the Fluctuations of the RMB Exchange Rate Based on the Gravity Model and Its Adaptability to the Trade Structure of “Belt and Road” Countries

Runxi Zhu

Jinan New Channel - JUTES High School, Jinan, 250000, China
cmszr1998@gmail.com

ABSTRACT

Based on the gravitational model, this paper explores the relationship between the fluctuation of the RMB exchange rate and the trade structure compatibility of the “Belt and Road” countries. Under the “Belt and Road” initiative, the trade volume between China and the countries along the route has expanded significantly, and the fluctuation of the RMB exchange rate has a significant impact. The paper analyzes the mechanism of its influence on trade commodities, regions and methods of structure, and proposes strategies such as stabilizing exchange rate expectations, optimizing trade structure, strengthening financial cooperation and deepening policy communication to promote the sustained and healthy development of trade.

Keywords: Gravity model; Fluctuations in RMB exchange rate; The “Belt and Road” Initiative; Adaptability of trade structure Influence mechanism.

1. INTRODUCTION

In the context of the deepening global economic integration, international cooperation has become a key force driving the economic development of various countries ^[1]. The Belt and Road Initiative is a major international cooperation initiative put forward by China. Since it was put forward in 2013, it has received positive response and extensive participation from countries along the route ^[2]. This initiative wants to use the historical symbols of ancient Silk Road to hold high the banner of peace and development, actively develop economic partnerships with countries along the route, and build a community of interests, destiny and responsibility together on the basis of political mutual trust, economic integration and cultural tolerance ^[3]. With the deepening of the construction of “Belt and Road”, our trade with countries along the route is becoming more and more frequent, and the trade scale is also expanding. This initiative not only provides opportunities for China enterprises to expand overseas markets, but also injects new vitality into the economic development of countries along the route. By strengthening trade cooperation, both sides can realize the optimal allocation of resources, give play to their respective comparative advantages, and promote industrial upgrading and economic restructuring ^[4].

The exchange rate of the RMB, as the relative price of the two currencies, is an important link and bridge that maintains economic and financial exchanges between countries and is an important research topic in economic and financial studies ^[5]. With the reform of the RMB exchange rate formation mechanism, the flexibility of the RMB exchange rate has been continuously increasing, and the process of RMB internationalization is also advancing steadily. The internationalization of the RMB is a requirement for China’s deepening reform and opening up and is also an inevitable choice in the current international economic background, which is of great significance for enhancing China’s international economic competitiveness and improving its international discourse power ^[6]. However, the fluctuation range of the RMB exchange rate has been continuously expanding and the fluctuations have become increasingly frequent, which has brought increasingly severe exchange rate risks to Chinese enterprises, which has had an important impact on China’s foreign trade, especially export trade ^[7]. In this context, studying the adaptability of RMB exchange rate fluctuations to the trade structure of “Belt and Road” countries has important practical significance.

The gravity model originated from the law of universal gravitation in physics and was later introduced into the social science field, especially in international trade research, becoming an important analytical tool ^[8]. It is based on Newton’s law of gravity and regards the trade volume or other interactive quantities between the two countries as proportional to the “mass” (such as economic scale) of the two countries and inversely proportional to the “distance” (such as geographical distance or other forms of distance) between the two countries ^[9]. Through the gravity model, it is possible to understand

and predict the trade volume between countries and its influencing factors more intuitively, providing an effective theoretical framework and analytical method for studying the adaptability of RMB exchange rate fluctuations to the trade structure of “Belt and Road” countries ^[10].

2. THE THEORETICAL FOUNDATION OF THE GRAVITY MODEL AND THE ADAPTABILITY OF TRADE STRUCTURE

2.1 The Basic Principles of the Gravity Model

The gravity model is analogous to the law of universal gravitation, suggesting that the economic or social interactions between two regions are proportional to their sizes and inversely proportional to their distances. In the field of international trade, its basic form can be expressed as the trade volume between two countries being proportional to their economic scales (such as GDP) and inversely proportional to the distance between the two countries (geographical distance or other forms of distance). This model was initially used to analyze the distribution of transportation and was later introduced into the field of economics to study trade flows. Its core assumption is that the larger the economic scale of a country, the stronger its production and consumption capabilities, and thus the greater its trade potential with other countries; while the greater the distance, the higher the transportation costs, information costs, etc., which will inhibit the occurrence of trade. Through the gravity model, various factors can be quantitatively analyzed to determine the degree of influence on trade volume, providing a basis for studying trade structure.

2.2 The Concept and Influencing Factors of Trade Structure

Trade structure refers to the composition of trade in a certain period, including trade commodity structure, trade mode structure, and trade region structure. The trade commodity structure refers to the proportion of various commodities in trade, reflecting the industrial characteristics and comparative advantages of trade; the trade mode structure refers to the proportion of various trade modes (such as general trade, processing trade, etc.) in trade; the trade region structure refers to the distribution of trade in different regions. There are many factors influencing trade structure, including economic scale, resource endowment, technological level, trade policies, exchange rates, etc. Countries with larger economic scales usually have more complete industrial systems and stronger production capabilities, and can participate in international trade in more fields, thereby influencing trade structure; differences in resource endowment determine the comparative advantages of each country in different products, which in turn affects the trade commodity structure; the level of technological development will affect the added value and competitiveness of products, promoting trade towards high-tech content products; trade policies such as tariffs and quotas will directly restrict or promote the trade of certain products, changing the trade structure; exchange rate fluctuations will affect the relative prices of goods, thereby affecting the scale and structure of trade.

2.3 The Intrinsic Relationship between the Gravity Model and the Adaptability of Trade Structure

The gravity model provides a theoretical framework and analytical tools for us to analyze the trade structure. Through the gravity model, we can study the influence of economic scale, distance and other factors on trade flow, and then analyze how these factors affect trade structure. For example, countries with large economies may be more likely to form intra-industry trade because their industrial structure and consumer demand are similar; Countries with close geographical distance may trade because of lower transportation costs, and the goods traded may be more concentrated in those products that are sensitive to transportation costs. At the same time, the change of trade structure will in turn affect those variables in the gravity model. For example, optimizing the trade structure may make a country's economic scale bigger and its competitiveness stronger, which will change its “quality” parameter in the gravity model and affect its trade volume with other countries. Therefore, studying the adaptability of gravity model and trade structure can help us understand the law and mechanism of trade development more deeply and provide theoretical support for optimizing trade structure and promoting trade development.

3. THE IMPACT MECHANISM OF RMB EXCHANGE RATE FLUCTUATIONS ON THE TRADE STRUCTURE OF “BELT AND ROAD” COUNTRIES

3.1 the impact of exchange rate fluctuations on the trade commodity structure

The fluctuation of RMB exchange rate will affect the relative prices of traded goods between China and “Belt and Road” countries, thus changing the structure of traded goods. When the RMB depreciates, the price of China's export commodities will be relatively lower in the international market, and improving their competitiveness will help expand the

export scale. For “Belt and Road” countries, the cost of importing goods from China will be reduced, which may increase the demand for goods from China, especially those products that are price-sensitive. For example, China’s labor-intensive products, such as textiles and clothes, will be more cost-effective when the RMB depreciates, which may make “Belt and Road” countries buy more of these products. At the same time, the depreciation of RMB will make the prices of things imported from China relatively high, which will reduce the quantity of imports. For resource-intensive products such as energy and minerals, China may import less, which will affect the commodity structure of trade. Conversely, when the RMB appreciates, the situation is just the opposite. China’s export commodity prices will become higher and its competitiveness will decrease, while the import commodity prices will decrease, which may prompt the commodity structure of trade to shift to importing more resource-intensive products and exporting more technology-intensive products.

3.2 the impact of exchange rate changes on the regional structure of trade

Changes in the RMB exchange rate will also affect our trade with different regions along the Belt and Road, thus changing the regional structure of trade. The “Belt and Road” countries have a large territory, and the level of economic development and industrial structure are also very different. The impact of RMB exchange rate changes on different regions is different. For those countries that are particularly dependent on exporting to China, with relatively small economic scale and simple industrial structure, the change of RMB exchange rate may have a greater impact on their trade. For example, some Southeast Asian countries mainly rely on labor-intensive industries, and their products compete with those of China. When the RMB depreciates, the products of these countries may face greater competitive pressure in the international market, which will affect their trade with China. For some Central and Eastern European countries, their industrial structure is more diversified, and they are complementary to China in technology and capital. The impact of RMB exchange rate fluctuations on their trade may be relatively small. Moreover, the geographical distance between different regions, trade policies and the fluctuation of RMB exchange rate will also affect each other and change the regional distribution of trade together.

3.3 Impact of Exchange Rate Fluctuations on Trade Mode Structure

The fluctuation of the RMB exchange rate will also have an impact on the trade mode structure between China and “Belt and Road” countries. When the RMB depreciates, Chinese export enterprises will have lower costs and increased profit margins, and may be more inclined to export goods through general trade methods, as general trade allows enterprises to operate independently and bear their own profits and losses, enabling them to better enjoy the benefits brought by exchange rate fluctuations. For processing trade, as it mainly involves incoming materials processing and incoming materials processing, the impact of the RMB exchange rate fluctuation on costs and profits is relatively complex. Enterprises may be more cautious in choosing the processing trade method. Moreover, the RMB exchange rate fluctuation may also prompt enterprises to adjust their trade strategies and increase investment in emerging trade methods such as cross-border e-commerce. Cross-border e-commerce has advantages such as low transaction costs, high transaction efficiency, and no restrictions by time and space. In the case of RMB exchange rate fluctuations, enterprises can more flexibly respond to market changes through cross-border e-commerce platforms, expand trade channels, and thereby affect the trade mode structure.

4. STRATEGIES FOR ENHANCING THE ADAPTABILITY OF THE RMB EXCHANGE RATE FLUCTUATION TO THE TRADE STRUCTURE OF “BELT AND ROAD” COUNTRIES

4.1 Stabilize RMB exchange rate expectations

The expectation of stable RMB exchange rate is very important to promote the trade development between China and “Belt and Road” countries. The government should strengthen macroeconomic policy control, maintain stable economic growth, and lay a solid economic foundation for the stability of RMB exchange rate. At the same time, it is necessary to strengthen communication with the market, timely and accurately transmit policy information, and guide the market to form a reasonable expectation of RMB exchange rate. In addition, it is necessary to further improve the RMB exchange rate formation mechanism, enhance exchange rate flexibility, make the RMB exchange rate better reflect market supply and demand, and reduce excessive exchange rate fluctuations. The company should also strengthen the management of exchange rate risk, which can be hedged by financial instruments such as forward settlement and foreign exchange options to reduce the impact of exchange rate fluctuations on our business.

4.2 Optimize the trade structure

China should speed up industrial upgrading and structural adjustment, improve the technical content and added value of our export commodities, and make the commodity structure better. We should increase investment in high-tech industries and high-end manufacturing industries, and encourage enterprises to carry out technological innovation and product research and development, so that the international competitiveness of our products will be stronger. At the same time, actively expand trade areas, strengthen cooperation with “Belt and Road” countries in service trade, e-commerce and other emerging fields, and promote diversified trade methods. In terms of trade regional structure, further strengthen trade cooperation with core countries and regions along the “Belt and Road”, leveraging the leading role of core countries to promote regional trade integration. At the same time, pay attention to the market demands of trade peripheral countries and regions, explore trade potential, and promote a more balanced trade regional structure.

4.3 Strengthening Financial Cooperation

Strengthening financial cooperation between China and “Belt and Road” countries can help reduce the impact of exchange rate fluctuations on trade and enhance the adaptability of the trade structure. On one hand, promote the internationalization of the RMB in “Belt and Road” countries, expand the use of the RMB in trade settlement and investment. Encourage financial institutions to set up branches in “Belt and Road” countries and carry out RMB business to provide more convenient financial services for enterprises. On the other hand, strengthen financial regulatory cooperation with countries along the “Belt and Road”, establish a sound financial risk early warning mechanism and emergency response mechanism, jointly prevent financial risks, and maintain financial stability. In addition, through the establishment of trade investment funds and other means, provide financing support for trade and investment projects, promoting the development of trade and investment.

4.4 Deepening Policy Communication

Deepening policy communication between China and “Belt and Road” countries is an important guarantee for enhancing the adaptability of the trade structure. The government should strengthen political dialogue and policy coordination with countries along the “Belt and Road”, establish a multi-level and wide-ranging policy communication mechanism. In terms of trade policies, actively promote trade liberalization and facilitation, reduce tariffs and non-tariff barriers, simplify customs procedures, and improve trade efficiency. In terms of investment policies, strengthen investment protection cooperation, improve investment dispute resolution mechanisms, and create a favorable investment environment for enterprises. At the same time, strengthen communication and coordination in industrial policies, science and technology policies, etc., promote industrial alignment and cooperation, and promote the optimization and upgrading of the trade structure.

5. CONCLUSION

This paper, based on the gravity model, conducts a study on the adaptability of the RMB exchange rate fluctuations to the trade structure of the “Belt and Road” countries. Through theoretical analysis, it elaborates on the intrinsic connection between the gravity model and the adaptability of trade structure, as well as the impact mechanism of RMB exchange rate fluctuations on the trade structure of the “Belt and Road” countries. The research finds that RMB exchange rate fluctuations will have a significant impact on the trade structure of the “Belt and Road” countries through influencing aspects such as trade commodity structure, trade regional structure, and trade mode structure.

In order to make our RMB exchange rate fluctuation better adapt to the trade structure of “Belt and Road” countries, this paper thinks of some ways, such as stabilizing people’s expectations of RMB exchange rate, optimizing trade structure, strengthening financial cooperation and deepening policy communication. The “Belt and Road” initiative has brought new opportunities as well as some challenges to the trade between China and countries along the route. The fluctuation of RMB exchange rate is an important factor affecting trade, and we need to pay special attention to it. By deeply studying how the fluctuation of RMB exchange rate adapts to different trade structures and adopting effective strategic measures, we can promote the sustained, healthy and stable development of trade between China and “Belt and Road” countries, and realize the goal of mutual benefit and win. Future research can also combine practical examples to see how and how different factors affect the adjustment of trade structure, which can provide a more scientific basis for formulating policies. At the same time, with the promotion of “Belt and Road” construction and the changes of the global economy, we need to continue to pay attention to the relationship between RMB exchange rate fluctuation and trade structure, and adjust and improve relevant strategies in time.

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