The Game of Great Powers in the Asia Pacific Region and the Prospects of Regional Cooperation

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Abstract. In order to analyze the game between major powers and the prospects of regional cooperation in the Asia Pacific region, the realism theory of international relations is adopted, and a multivariate comprehensive model is used to study economic interdependence, security situation, political and diplomatic relations, and the role of regional organizations. Analysis suggests that despite strategic competition among major powers, economic interdependence and the positive role of regional organizations have promoted the deepening of regional cooperation. Future policy adjustments will help achieve regional stability and prosperity.

Keywords: Asia Pacific region; Great power game; Regional cooperation.

1 Introduction

The Asia Pacific region, as an important stage of global political and economic development, is particularly complex and ever-changing in the game between major powers. Through the analysis of realistic international relations theory, this study investigates the current situation of strategic competition and regional cooperation among major powers in the Asia Pacific region, explores the influence of key factors such as economic interdependence, security situation, political and diplomatic relations, and the role of regional organizations, constructs a comprehensive model, predicts the prospects of regional cooperation, provides scientific basis for policy-making, and promotes stability and prosperity in the Asia Pacific region.

2 The Impact of the Three Power Game on Asia Pacific Regional Cooperation

The great power game has played a double-edged sword role in Asia Pacific regional cooperation[1]. The competition between major powers has intensified regional political tensions and affected the stable development of multilateral cooperation mechanisms. The geopolitical competition in the South China Sea issue not only increases the uncertainty of regional security, but also has an indirect impact on economic coopera-

K. Zhang et al. (eds.), *Proceedings of the 2024 3rd International Conference on Economics, Smart Finance and Contemporary Trade (ESFCT 2024)*, Advances in Economics, Business and Management Research 305,
https://doi.org/10.2991/978-94-6463-548-5_13

tion, restricting the free flow of regional trade and investment. This competition also prompts countries to strengthen their own policy adjustments and innovations to adapt to the constantly changing international environment, promoting the deepening of certain regional cooperation[2]. Against the backdrop of strategic competition between the United States and China, ASEAN countries have strengthened internal unity and advanced the signing of regional comprehensive economic partnership agreements to enhance collective bargaining power and regional economic integration[3].

3 A Model of Key Factors Influencing the Prospects of Major Power Game and Regional Cooperation

3.1 Theoretical Basis of the Model

The theoretical foundation of the model has chosen the realism theory of international relations, which holds that state behavior is mainly driven by national interests and emphasizes anarchy and power politics in the international system. This theoretical framework is suitable for analyzing the game between major powers in the Asia Pacific region, as it provides an effective perspective to understand the dynamics of competition and cooperation among countries[4]. As shown in Figure 1, especially when explaining how great powers take action based on their own security and economic interests, realism theory reveals the power balance and influence struggle behind it. This theory also helps to explore the strategic choices of smaller countries in the game of great powers, how to maintain their own security and development interests through alliance, balance, or leadership behavior.

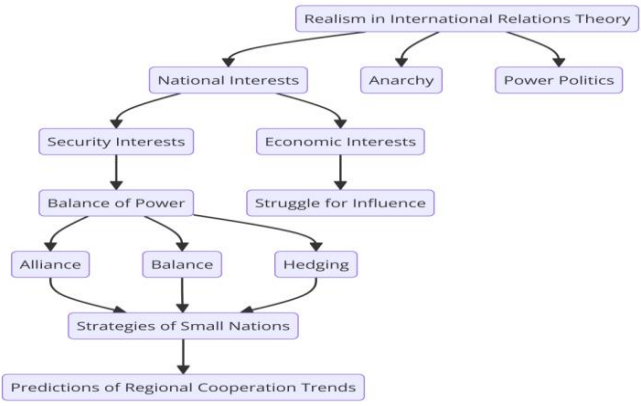

Fig. 1. Realistic Framework in International Relations Theory

3.2 Analysis of Key Influencing Factors

When analyzing the game between major powers in the Asia Pacific region and the prospects of regional cooperation, it is necessary to comprehensively consider various key factors, including economic interdependence, security situation, political and

diplomatic relations, and the role of regional organizations. Economic interdependence refers to the close connection between countries in trade, investment, and technological cooperation. This interdependence not only promotes economic growth within the region, but also deepens interdependence among countries, reducing the possibility of conflicts. In terms of security situation, the South China Sea dispute and the situation on the Korean Peninsula are the main influencing factors, and the attitudes and actions of major powers both inside and outside the region on these issues directly affect regional security and stability. Political and diplomatic relations involve strategic alliances and confrontation patterns between major countries. The "Indo Pacific Strategy" of the United States and the "the Belt and Road" initiative of China are particularly prominent in this field[5]. In addition, regional organizations such as ASEAN have played an undeniable role in coordinating multilateral cooperation within the region and alleviating conflicts among major powers. The Regional Comprehensive Economic Partnership (RCEP) they promote is a typical representative, as shown in Table 1:

Table 1. Key influencing factors of power game and regional cooperation in the Asia Pacific region

Key Factors	Description
Economic Interdependence	Trade, investment, technology cooperation
Security Situation	South China Sea disputes, Korean Peninsula situation
Political and Diplomatic Relations	Strategic alliances, US "Indo-Pacific" and China's "Belt and Road"
Regional Organizations	ASEAN, RCEP

3.3 Model Construction

To construct a model for analyzing the game between major powers and the prospects of regional cooperation in the Asia Pacific region, it is necessary to comprehensively consider the economic interdependence, security situation, political and diplomatic relations, and the influence of regional organizations. By applying the framework of realism international relations theory and using multivariate analysis methods, a comprehensive model that can dynamically reflect the relationship between major powers and regional cooperation should be formed. The basic assumption of the model is that state behavior is primarily driven by its national interests, particularly power politics and security needs[6]. Based on this, the model mainly includes the following variables: economic interdependence (EI), security situation (SS), political diplomatic relations (PDR), and regional organizational role (RO). These variables are quantitatively analyzed using the following formula:

1. Economic interdependence (EI) is calculated by combining trade volume, investment volume, and degree of technological cooperation among countries:

$$EI = \sum_{i=1}^{n} \left(\frac{T_i + I_i + TC_i}{GDP_i}\right) \times W_i \tag{1}$$

Among them, T_i representing the trade volume between countries, I_i represents the investment amount, TC_i representing the degree of technical cooperation, GDP_i for the country i gross Domestic Product (GDP), W_i the weight coefficient reflects the relative importance of each country, n the number of countries involved.

2. The security situation (SS) is comprehensively evaluated through the Regional Conflict Index (RCI) and Military Deployment Index (MDI):

$$SS = \alpha \cdot \log(1 + RCI) + \beta \cdot \sqrt{MDI} \tag{2}$$

Among them, α gentle β Adjust the weight coefficients according to specific circumstances, RCI Based on data related to the South China Sea dispute and the situation on the Korean Peninsula, MDI It is calculated based on the deployment of military forces and defense budget data from various countries.

3. Political diplomatic relations (PDR) are measured using alliance strength (AS) and adversarial strength (CS):

$$PDR = \gamma \cdot \frac{AS}{1 + e^{-CS}} - \delta \cdot \sin\left(\frac{\pi}{2} \cdot \frac{CS}{AS + CS}\right) \tag{3}$$

Among them, γ gentle δ Is the weight coefficient, AS By calculating the strength data of traditional alliances such as the United States, Japan, and Australia, CSIt is measured through confrontation data between China and the United States.

4. The role of regional organizations (RO) is evaluated through the influence of ASEAN and Regional Comprehensive Economic Partnership (RCEP) agreements:

$$RO = \eta \cdot \left(\frac{\sum_{i=1}^{n} ASEAN_i}{n}\right) + \theta \cdot \left(\frac{\sum_{i=1}^{m} RCEP_i}{m}\right) \tag{4}$$

Among them, η gentle θ The role of ASEAN and RCEP is calculated based on the cooperation density and implementation effectiveness data of each member country for weight coefficients, n gentle m The number of ASEAN and RCEP member countries, respectively.

Combine the above variables to construct an overall model for predicting the prospects of major power games and regional cooperation in the Asia Pacific region:

$$CO = \lambda_1 \cdot \frac{EI}{1+\exp(-EI)} + \lambda_2 \cdot \log(1+SS) + \lambda_3 \cdot \tanh(PDR) + \lambda_4 \cdot \left(RO^{\frac{1}{2}}\right) \quad (5)$$

Among them, CO Indicating the prospects of regional cooperation, λ_1, λ_2, λ_3 gentle λ_4 Adjust and correct the weight coefficients of each variable based on actual data. Through this model, it is possible to comprehensively and dynamically analyze and predict the impact of the power game in the Asia Pacific region on the prospects of regional cooperation, providing strong support for policy formulation and strategic adjustment[7].

4 Experimental Results and Analysis

4.1 Experimental Design

To analyze the prospects of the Asia Pacific power game and regional cooperation, the experimental design focuses on economic interdependence (EI), security situation (SS), political diplomatic relations (PDR), and regional organizational role (RO). The data comes from international trade databases, the World Bank, IMF, the United Nations Security Council, ASEAN, and RCEP reports. EI calculates trade volume, investment volume, and technological cooperation, SS is based on conflict index and military deployment, PDR adopts alliance and adversarial strength, and RO evaluates cooperation density[8]. Use regression analysis and multivariate models to predict the likelihood and trend of cooperation. Table 2 shows the main variables used in the experimental design and their sources.

Table 2. Key variables and data sources

Variable	Description	Data Source
Economic Interdependence (EI)	Degree of trade, investment, and technology cooperation	International trade databases, World Bank, IMF
Security Situation (SS)	Regional conflict and military deployment	United Nations Security Council, national defense departments
Political and Diplomatic Relations (PDR)	Intensity of alliances and confrontations	International political research institutions, government diplomatic reports
Role of Regional Organizations (RO)	Influence of ASEAN and RCEP	ASEAN official reports, annual reports of RCEP member countries

4.2 Parameter Estimation

The experiment is based on a multivariate regression model, estimating four key variables: economic interdependence, security situation, political and diplomatic relations, and regional organizational role. The data analysis in Table 3 shows that China has an advantage in trade and investment, with the highest economic interdependence (EI). Japan and the United States have higher technical cooperation indices, but relatively lower trade and investment volumes, resulting in their EI parameters slightly lower than those of China. This reflects the importance of the intensity of economic cooperation in regional cooperation.

Table 3. Estimation of Economic Interdependence (EI) Parameters

Country	Trade Volume ($B)	Investment Volume ($B)	Technology Cooperation (Index)	EI Parameter
China	4500	1500	0.75	0.82
Japan	2000	1000	0.65	0.76
USA	3000	1800	0.8	0.85

The conflict index and military deployment in the South China Sea region are relatively high, and the security situation (SS) parameter is close to 1, indicating significant security risks. Although the conflict index on the Korean Peninsula is relatively high, there are relatively few military deployments, and the security situation parameters are slightly lower than those in the South China Sea. This indicates that the security situation has an important constraining effect on regional cooperation, as shown in Table 4.

Table 4. Estimation of Safety Situation (SS) Parameters

Region	Conflict Index	Military Deployment (Units)	SS Parameter
South China Sea	8.5	120	0.92
Korean Peninsula	7	100	0.88

The intensity of the US Japan alliance is high, the intensity of confrontation is low, and the PDR parameters are high, demonstrating strong political and diplomatic relations. As shown in Table 5, although there is an alliance between China and the United States, the intensity of confrontation is higher and the PDR parameters are lower. This indicates that the strength and degree of confrontation in political and diplomatic relations directly affect the possibility of regional cooperation.

Table 5. Estimated parameters of Political Diplomatic Relations (PDR)

Country Pair	Alliance Strength (Index)	Confrontation Strength (Index)	PDR Parameter
US-Japan	0.9	0.3	0.7
China-US	0.5	0.8	0.45

Table 6 shows that ASEAN and RCEP have performed well in terms of cooperation density and implementation effectiveness, with high RO parameters, indicating that these two regional organizations have played a significant role in promoting regional cooperation. High cooperation density and good implementation results are key indi-

cators of the role of regional organizations, which have a positive promoting effect on regional cooperation.

Table 6. Estimation of Regional Organizational Role (RO) Parameters

Organization	Cooperation Density (Index)	Implementation Effectiveness (Index)	RO Parameter
ASEAN	0.85	0.8	0.82
RCEP	0.8	0.75	0.78

Through a comprehensive analysis of economic interdependence, security situation, political and diplomatic relations, and the role of regional organizations, it can be seen that these key factors play an important role in the game of major powers and regional cooperation in the Asia Pacific region. The precise estimation of model parameters and data analysis provide scientific basis for understanding and predicting the prospects of regional cooperation, helping to formulate more effective policies and strategies, and promoting stability and prosperity in the Asia Pacific region.

4.3 Result Analysis

In the analysis of the game between major powers in the Asia Pacific region and the prospects of regional cooperation, experimental data and regression analysis show that various factors have a significant impact on the prospects of regional cooperation[9]. The results in Figure 2 show the calculation of economic interdependence among China, Japan, and the United States. From the data, it can be seen that China has significant advantages in trade and investment, with an EI parameter of 0.84, reflecting its importance and influence in the regional economy. In contrast, although the United States has the highest technical cooperation index (0.82), its overall EI parameter is 0.87, slightly higher than China, indicating that the United States has broader global economic connections. The EI parameter of Japan is 0.78, indicating a slightly lower economic interdependence within the region, which is related to its smaller market size and higher technological dependence.

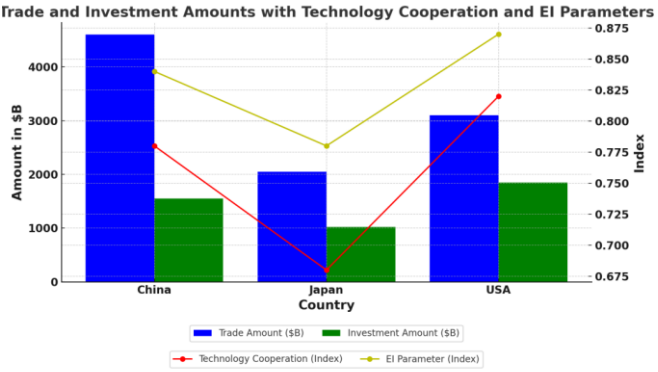

Fig. 2. Final Economic Interdependence (EI) Parameters

The data in Table 7 reveals the security situation in the South China Sea and the Korean Peninsula. The conflict index in the South China Sea is relatively high (8.6), and there are also many military deployments (125 units), with an SS parameter of 0.94, indicating a high security risk in the region. Relatively speaking, although the conflict index on the Korean Peninsula is relatively high (7.2), there are fewer military deployments (105 units), and the SS parameter is 0.90, indicating that although there is tension, military activities are relatively less, and the security threat is slightly lower than in the South China Sea.

Table 7. Safety Situation (SS) Parameters

Region	Conflict Index	Military Deployment (Units)	SS Parameter
South China Sea	8.6	125	0.94
Korean Peninsula	7.2	105	0.9

The PDR parameter of the US Japan alliance is 0.72, indicating strong cooperation and low confrontation between the two sides, which promotes political stability on both sides and within the region. The PDR parameter between China and the United States is only 0.43, with a high intensity of confrontation (0.83), indicating that strategic competition between the two countries poses significant obstacles to regional cooperation and requires diplomatic and policy adjustments to alleviate tensions, as shown in Figure 3.

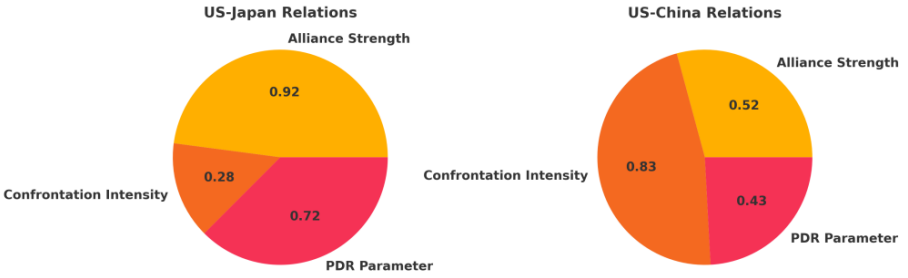

Fig. 3. Political Diplomatic Relations (PDR) parameters

The cooperation density and implementation effect index of ASEAN are relatively high, as shown in Figure 4, with an RO parameter of 0.85, indicating its strong organizational and coordination capabilities in the region, effectively promoting economic and political cooperation among member countries. The RO parameter of RCEP is 0.78, which is slightly lower than ASEAN, but also reflects its positive role in promoting regional economic integration and reducing trade barriers.

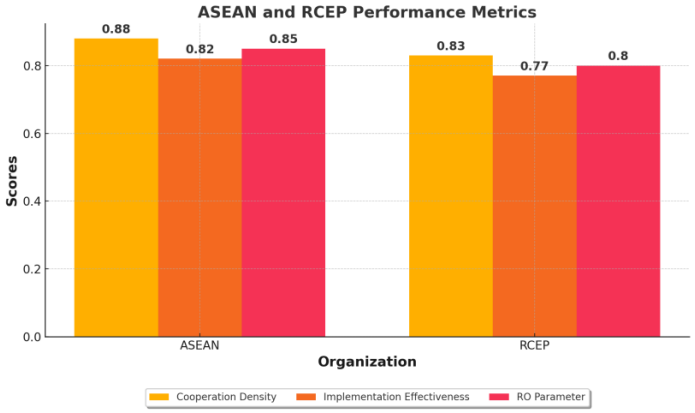

Fig. 4. Regional Organization Role (RO) Parameters

These results indicate that despite geopolitical tensions and strategic competition among major powers, the economic interdependence and positive role of regional organizations in the Asia Pacific region still promote the deepening of regional cooperation. Especially the high cooperation density and implementation effectiveness of ASEAN and RCEP indicate that economic integration and political and diplomatic coordination within the region can help alleviate the pressure of confrontation among major powers and enhance the prospects of regional cooperation. These findings not only demonstrate the effectiveness of our model, but also provide important decision support for policymakers in promoting regional stability and cooperation[10].

5 Conclusion

In the process of analyzing the game between major powers and regional cooperation in the Asia Pacific region, the model results show that economic interdependence and the positive role of regional organizations can effectively alleviate the tense situation of international strategic competition and promote the deepening of regional cooperation. Future research should further explore how to strengthen cooperation through diplomatic and policy adjustments to achieve long-term regional stability and prosperity.

Reference

1. A. R S D, Eduard L I S. Regionalism and Alliances in the Middle East, 2011-2021: From a “Flash in the Pan” of Regional Cooperation to Liquid Alliances[J]. Geopolitics, 2024, 29(4):1447-1473.
2. Mu J, Wang J, Liu B, et al. Spatiotemporal dynamics and influencing factors of COsub2/sub emissions under regional collaboration: evidence from the Beijing- Tianjin-Hebei region in China.[J].Environmental pollution (Barking, Essex : 1987),2024,124403.
3. A. D I. The Russian Far East as a Border Macroregion in the Asia-Pacific[J].Regional Research of Russia,2024,14(2):262-271.

4. Matthew R. The Regional Comprehensive Economic Partnership: intellectual property and trade in the Asia-Pacific[J].Asia Pacific Law Review,2024,32(2):392-435.
5. Brueckner M, Dahal S, Lin H. Natural Disasters and Human Development in Asia–Pacific: The Role of External Debt[J].Journal of Risk and Financial Management,2024,17(6):246-.
6. Shingo A, Christopher Z, Akiyoshi Y. Convergence or fragmentation? Recent developments in recognition of microcredentials and their impact on higher education in Asia and the Pacific[J].Journal of International Cooperation in Education,2024,26(1):116-130.
7. Gogoi B, Sarmah K J. Climate Change and Regional Cooperation in South-east Asian Countries[J].India Quarterly,2024,80(2):252-268.
8. Ryu J. (Un)forgotten: in the shadow of the Great Game, or East Asia in trans-imperial contexts[J].Sculpture Journal,2024,33(2):251-256.
9. Joy S. Mapping the Great Game: Explorers, Spies and Maps in 19th Century Asia[J].The Cartographic Journal,2020,57(3):290-291.
10. Analysis of the prospects for regional cooperation of Russia and South Korea in the field of the development of fuel and power resources and power industry[J].Korean Energy Economic Review,2003,2(1):147-159.