Determinants of China–Japan Bilateral Trade under RCEP: Evidence from Trade Flows, Imports and Exports

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ABSTRACT

Under the Regional Comprehensive Economic Partnership (RCEP), recent policy frictions have increased the uncertainty level of the trade. Moreover, existing studies mainly focus on RCEP at the regional level or single determinant of trade, with less attention to how the trade factors jointly affect China-Japan bilateral trade across trade flow, imports and exports. To address this gap, this study uses annual data from 2010-2024 and applies ordinary least regression to examine the models for total trade flow, imports and exports separately. The core explanatory variables are trade openness, foreign direct investment and economic policy uncertainty, while GDP, inflation rate, population size and consumer price index are included as control variables. The results represent clear differences between China and Japan. For China, trade flow and exports are mainly driven by trade openness and foreign direct investment, while imports are mainly driven by GDP. These results indicate China plays as a outward-oriented trade patterns role under RCEP. For Japan, trade flow is effected by trade openness, foreign direct investment, GDP and economic policy uncertainty, while imports and exports are mainly driven by GDP. Moreover, economic policy uncertainty has effects on the bilateral trade, which being significantly negative for Japan's trade flow but insignificant for China. These findings indicate that under the processing of RCEP, policy uncertainty still constrains the bilateral trade performance, so more stronger coordination and more stable policy communication remain essential for promoting the trade between China and Japan.

Keywords: RCEP; bilateral trade; economic policy uncertainty; trade openness.

1. INTRODUCTION

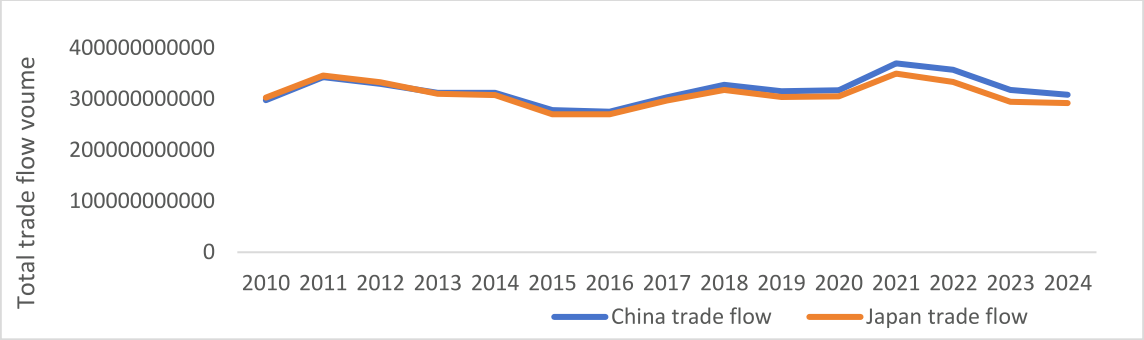
China and Japan are two of the most important economies in East Asia, their bilateral trade has been a key part of of the regional trade network. However, in recent years, this relationship has been shaped by two forces. On the one hand, RCEP has created the openness environment for the trading and facilitate the trade creation and welfare for the member countries, its impacts may become visible over time through the value-chain adjustment and deeper regional integration [42]. On the other hand, trade environment has been more fragile since the geopolitical tensions, it can be seen at Figure 1 below, after 2021, the trade flow between two countries had decreased. These issues have introduced new uncertainties into the bilateral trade. Japan's export control regulations have generated trade influence on exports to China, while broader geopolitical disruptions can fast disturb the supply chains and global trade arrangements [20] [17]. These cases suggest that, though RCEP has reduced trade barriers and strengthened the bilateral trade and regional value-chain integration, the trade between China and Japan is still increasingly exposed to uncertainty arising from export limitations, geopolitical tensions and policy changing. Therefore, the trade relationship between two countries should be viewed as the joint outcome of both regional corporation and fragile external environment. Based on this background, the determinant factors of the bilateral trade between China and Japan are worth to renew attention. The trade openness (TOG) remains essential because the more higher trade share in GDP is, the more stronger foreign markets integration is. Moreover, foreign direct investment (FDI) is also closely connected with the bilateral trade because the firms usually use investment and trade together into the production, expand markets and enlarge the goods exchange sectors. Recent evidences show that the FDI is positively associated with the export performance, which could influence the total trade performance [27]. In addition, economic policy uncertainty (EPU) has a significant negative effect on exports, unless the implication of adjusting of policy arrangements such as regional trade agreements [14].

This study contributes in three ways. First, we shifts the focus from broad regional analysis below RCEP to the specific trade case between China and Japan. Most of the recent literature examines at regional or sector level, but less focus on the shock of policies between China and Japan and the influence of EPU on both two countries' trade flows. Second, this

study brings TOG, FDI and EPU into one analytical framework rather than discussing them separately. Third, this study is not only focus on the total trade flows, but also deeply analysis exports and imports. By examining these, it provides a clearer exposed whether the same determine factors operate differently across the trade between China and Japan. This is really important because the trade integration effects can be different across sectors and structures, so only total trade flows may hide the essential differences [16].

Based on these considerations, this paper investigates the effects of TOG, FDI and EPU on bilateral trade between China and Japan under RCEP framework, while also controlling for other macroeconomic conditions. This study using annual data from 2010 to 2024, examining the trade flows and both exports and imports separately. The rest of the paper is organized as follows: Section 2 reviews the literature. Section 3 shows the institutional background and theoretical hypotheses. Section 4 introduces the methodology and data. Section 5 represents the empirical results and the final part is conclusion and future implications.

Figure 4. Total Trade Flow between China and Japan



2. LITERATURE REVIEW

2.1 Influence factors of bilateral trade between China and Japan

Bilateral trade is shaped not only by the price and market demand, but also by the institutional environment between two countries. As for China and Japan, the environment has changed under the RCEP, because the regional agreements may affect the market access, the policy coordination and cross-border trade [24]. RCEP has also been associated with trade creation and welfare gains for China and its trading partners. That makes it worth to examine the bilateral trade between China and Japan within a RCEP frame work [47].

Trade openness (TOG) is also one of the most direct influences on bilateral trade. When the trade accounts for a lager share of GDP, an economy is normally more deeply linked with the global markets [1]. This point is especially important for both China and Japan, because the bilateral trade between two countries relies on the manufacturing cooperation. Moreover, the trade openness is sensitive to the external instability, and geopolitical fluctuations can weaken the openness by increasing the uncertainty in the international trade [44].

As for the foreign direct investment (FDI), firms rarely separate the investment from trade, because investment could help the firm enter the global markets and increase the efficiency of resource allocating. This is the reason why stronger foreign direct investment links are often associated with lager bilateral trade flow [37]. The research on bilateral trade between Saudi Arabia and Jordan also shows that foreign direct investment as an important determinant of trade in both short run and the long run [2]. In addition, more deeper trade agreements may influence the bilateral value-chain corporation through foreign direct investment and higher specialization [23].

Economic policy uncertainty (EPU) needs to explicit attention in this study. The economic policy uncertainty plays an important role in bilateral trade. When the policy uncertainty increase, firms will become more cautions about sourcing, producing and exporting, and the trade become more fragile [34]. Uncertainty may also weaken the trade through production stage indirectly, because the firms become less willing to enter the global production under the circumstance of uncertainty increasing [35]. This point is important for both China and Japan, because the tensions reappeared, strategic rivalry and a more fragile bilateral environment. The relationship between China and Japan have been described as economically close but politically constrained under the growing geopolitical rivalry [39]. Moreover, the trade shocks linked to China can also spill over to Japanese exporters, witch further supports the inclusion of economic policy uncertainty in this study [31].

2.2 The impact of macroeconomic conditions on bilateral trade

Additionally, macroeconomic conditions are also important. GDP reflects the economic scale and demand capacity, while the population (PL) is related with the labour supply and market size. Inflation rate (IF) and consumer price index (CPI) affect the purchasing power and competitiveness, and therefore can effect both import and export performance [2]. Moreover, demographic change also has impact on trade patterns, which means the population should not be treated as a simple control variable [10].

2.3 Research gap

However, the existing literature still leaves a gap. Most of it discussion of RCEP focus on regional level, but does not focus on the bilateral case. Other studies examine only one or two influence factor, such as trade openness, foreign direct investment or uncertainty, without bringing these factors into one framework. In addition, the role of economic policy uncertainty in China-Japan bilateral trade remains underexplored, even though it has become relevant under the background of renewed tensions and strategic rivalry between two countries. This suggests that economic policy uncertainty should not be treated as a simple background condition, but as a core explanatory factors that may influence the bilateral trade outcomes. Therefore, this study integrates TOG, FDI and EPU into the frame work and deeply examine their effects on trade flow, imports and exports between China and Japan.

3. INSTITUTIONAL BACKGROUND AND THEORETICAL HYPOTHESIS

3.1 Theoretical hypothesis

First, TOG, FDI and EPU are expected to affect the bilateral trade between China and Japan. The TOG reflects the importance of trade in the overall economy and is used to measure the degree of trade openness. With the processing of RCEP, a high level of trade openness may promote the bilateral trade by reducing the trade frictions and strengthening the regional production linkages [18] [23]. FDI is also closely related to the trade because the global investment may improve the resource allocation and increase the exchange efficiency of intermediate and final goods. During the process of bilateral trade expansion and the entering of the foreign firms, foreign direct investment is closely connecting with the trade [30] [45]. However, the EPU expected to have a negative effect on bilateral trade. When the economic policy uncertainty increases, the firms may facing greater difficulty in forming the stable trade environment. As a result, investment, production and export maybe postponed, while the risks associated with global trade may rise. In particular, the policy uncertainty tends to weaken the trade performance and reshape the international sourcing and supply-chains [43] [15]. Based on the analysis above, we introduce the first hypothesis below:

H1: TOG, FDI and EPU have significant effects on bilateral trade between China and Japan.

Second, GDP, inflation rate, population size and consumer price index may also influence the bilateral trade through the border macroeconomic factors. GDP reflects economic scale and aggregate demand, it is associated with the trade performance. A larger economy normally has a stronger demand for the imports. Population size is related to labor supply and the market supply size of the countries and may influence the demand and supply sides of trade activities. Moreover, inflation rate and consumer price index reflect the domestic price and macroeconomic stability. The changes in inflation rate may affects the purchasing power and the international competitiveness. When the price environment changes, firms' import and export will also change accordingly. Therefore, economic scale, population size and price-related factors plays an important role on trade performance [46] [33]. Since China and Japan differ in economic size, population and the price levels, these control variables may also play a meaningful role in shaping the trade outcomes between two countries. Therefore, we introduce the second hypothesis:

H2: GDP, inflation rate, population size and consumer price index have meaningful effects on the bilateral trade between China and Japan.

4. METHODOLOGY

4.1 Model Construction

This study aims to test the the effect of the macroeconomic factors of the bilateral trade flows between China and Japan under the framework of the Regional Comprehensive Economic Partnership. In our model, the bilateral trade between China and Japan (TF) is taken as the dependent variable. The key independent variables include Trade openness (TOG), Foreign direct investment (FDI) and Economic Policy Uncertainty (EPU). Additionally, we also introduce some control

variables, including GDP, inflation rate (IF), Population size (PL) and the Consumer Price index (CPI), in order to control the broader economic conditions that may influence bilateral trade between two countries. The regression model is specified as follows:

$$TF_t = \alpha + \beta_1 TOG_t + \beta_2 FDI_t + \beta_3 EPU_t + \gamma_1 GDP_t + \gamma_2 IF_t + \gamma_3 PL_t + \gamma_4 CPI_t + \epsilon_t \quad (1)$$

TF means the trade flow between China and Japan, TOG represents the trade openness, FDI denotes the foreign direct investment, EPU represents the economic policy uncertainty. GDP, IF, PL and CPI are control variables representing economic size, inflation rate, population scale, and the consumer price index. α is the constant term. β and γ are the estimated coefficients, εt is the error term.

Furthermore, in order to deeply explore the relationship and characteristics of the bilateral trade, we decompose the trade flow into import (IP) and export (EP), and also construct the separate regression models and aims to analysis the determinants of exports and imports respectively. The extended models are expressed as follows:

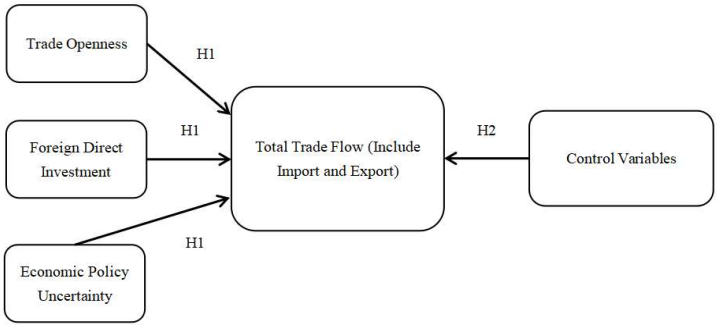
$$IP_t = \alpha + \beta_1 TOG_t + \beta_2 FDI_t + \beta_3 EPU_t + \gamma_1 GDP_t + \gamma_2 IF_t + \gamma_3 PL_t + \gamma_4 CPI_t + \epsilon_t \quad (2)$$

$$EP_t = \alpha + \beta_1 TOG_t + \beta_2 FDI_t + \beta_3 EPU_t + \gamma_1 GDP_t + \gamma_2 IF_t + \gamma_3 PL_t + \gamma_4 CPI_t + \epsilon_t \quad (3)$$

In these models, the IP represents the import volume and EP means the export volume.

Other variables are same as the Equation (1).

Figure 5. Research Framework



4.2 Variable Description

4.2.1 Dependent variables and independent variables

As shown in Figure 2, the core dependent variable in this study is the trade flows between China and Japan (TF). The trade flow normally reflects the intensity of economic exchanges between two countries and it is widely used in the empirical studies on international trade. Among the existing literature, bilateral trade flow is commonly measured by the total value of imports and exports between two countries, which can reflect the overall level of economic interaction between trading partners [5]. By following this method, our study use the total trade volume between China and Japan as the trade flow indicator.

To further explore the characteristics of bilateral trade, our study decomposed the trade flow into import and export, exports (EP) represents the export between China and Japan, while the imports (IP) refers to the import between China and Japan. By estimating the separate models for exports and imports, this study aims to provide a more detailed analysis of the determinant factors of bilateral trade under the RCEP framework.

The core independent variables in this study include Trade openness (TOG), Foreign direct investment (FDI), and Economic policy uncertainty (EPU). The Trade openness (TOG) is used to measure the degree of a country's integration into the global economy and is usually calculated as the ratio of total trade to GDP.

Foreign direct investment (FDI) reflects cross-border capital flows and plays an essential role in shaping the international trade through global production networks and multinational firm activities.

Economic policy uncertainty (EPU) is used to measure the degree of uncertainty in a country's economic policy environment. More higher policy uncertainty may increase the risks for firms and investors, thereby affecting international

trade activities. In this study, the economic policy uncertainty index developed by Baker et al. (2016) [7] is employed to capture the potential impact of policy instability on bilateral trade flows.

4.2.2 Control variables

In order to reduce the estimation bias caused by omitted variables，we introduce a set of control variables into the regression models based on the baseline trade flow models. These variables are introduced to capture other economic conditions that may influence bilateral trade between China and Japan. These selected control variables reflect some important aspects of economic development, including economic scale, price stability, and population factors. Based on Anderson & van Wincoop (2003) [4], we introduced GDP, inflation rate, population size and consumer price index as control variables

4.2.3 Data Sources and Processing

The data used in this study cover the period from 2010 to 2024 and focus on the bilateral trade between China and Japan.

To ensure the consistency of the data, all of the variables are organized in an annual time series data. All the variables are cleaned and ensure the reliability of the empirical analysis.

The definitions of the variables and their corresponding data sources are summarized in Table 1 below:

Table 1. Description of variables

Variable Type	Variable	Measurement	China observations	Japan observations	Source of data
Dependent variable	Trade Flow	The total trade volume between China and Japan, including both import and export. (Dollars)	15	15	UN Comtrade Data
	Import	The import volume between China and Japan. (Dollars)	15	15	UN Comtrade Data
	Export	The export volume between China and Japan. (Dollars)	15	15	UN Comtrade Data
	Trade openness	Calculated by $\frac{\text{Trade}}{\text{GDP}}\%$	15	15	World bank data
Independent variables	Foreign Direct Investment	Foreign direct investment in current U.S. dollars.	15	15	World bank data
	Economic Policy Uncertainty Index www.policyuncertainty.com.www.policyuncertainty.com.	Measures the uncertainty level of economic policy	15	15	www.policyuncertainty.com
Control variables	Gross Domestic Production	GDP is expressed in current prices and is expressed in United States dollars.	15	15	World bank data
	Inflation Rate	Inflation as measured by the consumer price index (base year 2015) (Dollars).	15	15	World bank data
	Population Size	Counts all residents regardless of legal status or citizenship.	15	15	World bank data
	Consumer Price Index	Index of the prices of consumption goods and services, as compared to a certain reference period (2010=100).	15	15	World bank data

5. FINDINGS

5.1 Correlation analysis

Based on the Eviews12 calculation, we could get 6 correlation table. Since this study not only examine the total bilateral trade flow between China and Japan, but also deeply investigate the imports and exports under the trade flows between these two countries, the correlation analysis is conducted separately for each three models based on their countries. Accordingly, the correlation results are divided into six tables: three for China trade flows, imports and exports, three for Japan trade flows, imports and exports. This classification allows a clearer observations of the relationship between dependent variables and independent variables and provides the preliminary evidence for the multiple linear regression analysis later.

Based on the correlation analysis results for China side, the relationship relationship between China's trade flow and the core independent variables show the certain differences, which indicate that the different trade indicators may affected by the variables in different ways. In addition, it is important to point out that the correlation analysis only provides a preliminary examination of the relationship between the variables. Since other potential influencing factors have not been controlled, the correlation results cannot direct imply the causal relationships. Therefore, further empirical tests using OLS regression are required.

The correlation results of China are showed below:

Table 2. Correlation Analysis (China Trade flow)

Correlation probability	TF	TOG	FDI	EPU	GDP	IF	PL	CPI
TF	1.0000							
TOG	0.0373	1.0000						
FDI	0.3160	0.4007	1.0000					
EPU	0.4242	-0.7315***	-0.2522	1.0000				
GDP	0.3734	-0.8125***	-0.4775*	0.7611***	1.0000			
IF	0.1268	0.6421***	0.5337**	-0.2629	-0.7092***	1.0000		
PL	0.2170	-0.9516***	-0.4129	0.8198***	0.9397***	-0.6647***	1.0000	
CPI	0.3069	-0.8671***	-0.4916*	0.8033***	0.9873***	-0.6793***	0.9677***	1.0000

Notes: * correlation is significant at the 0.1 level, ** correlation is significant at the 0.05 level, *** correlation is significant at the 0.01 level

For the China trade flow (Table 2), the correlation coefficients between trade flow and other independent and control variables are 0.0373, 0.3160, 0.4242, 0.3734, 0.1268, 0.2170 and 0.3069, respectively. Trade flow shows positive relationship with all both independent and control variables. However, none of them are statistically significant. This suggests that although the China's bilateral trade flow with Japan represents positive relationship with other variables, the relationships are relatively weak.

For the China import (This table are available for requesting), the correlation coefficients between imports and other variables are 0.2122, 0.5021, 0.3282, 0.0724, 0.3955, -0.0240, 0.0108, respectively. Imports is positively correlated with foreign direct investment. In contrast, the correlations between imports and other variables direct is relatively weaker except foreign, indicating that the relationship between these variables and imports are less significant at the correlation level and need further verification in the regression analysis.

For the China export model (This table are available for requesting), the correlation coefficients between exports and other variables are -0.2007, -0.0276, 0.4095, 0.6399, -0.2617, 0.4573, 0.5890, respectively. Exports represent relatively strong positive correlations with GDP, population size and CPI, all of which are significant at different levels. This suggests that China's exports to Japan are closely related with GDP, population and price levels. In addition, China's exports is negatively correlated with trade % of GDP, suggesting that the inverse relationship between these two variables and exports, but not significant.

Additionally, some variables show statistically significant correlations with each other. For example, TOG is strongly negatively correlated with economic policy uncertainty, GDP, population size and CPI, while the TOG shows a weak positively correlation with IF. In addition, the foreign direct investment is weakly correlated with GDP and CPI, while it is positively correlated with inflation rate. The EPU is significantly positively correlated with GDP, population size and CPI. GDP shows highly and positively correlated with population size and CPI, while it is strongly negatively correlated with IF. As for the inflation rate, it is strongly and negatively correlated with population size and CPI. Finally, the PL is significantly and positively correlated with CPI.

Moreover, the relatively high correlations among some variables are consistent with conventional macroeconomic theory. For example, GDP and CPI are closely related, this is because the economic growth is often associated with the increasing of the aggregate prices. GDP and population are also strongly correlated with TOG because the population size influence the labor supply, market scale and output capacity. EPU also represents strong correlations with GDP and PL, this is because during the economic transformation period, the policy changes rapidly. Additionally, TOG represents strongly relationship with GDP, CPI and PL, this is because TOG is measured by GDP. Hence, the relatively high correlations observed in the China sample are not entirely unexpected.

Table 3. Correlation Analysis (Japan Trade flow)

Correlation probability	TF	TOG	FDI	EPU	GDP	IF	PL	CPI
TF	1.0000							
TOG	-0.0367	1.0000						
FDI	-0.0364	0.2080	1.0000					
EPU	-0.0064	-0.5149**	0.2405	1.0000				
GDP	0.4723*	-0.8337***	-0.3867	0.5055*	1.0000			
IF	-0.1758	0.8906***	0.0705	-0.4663*	-0.7465***	1.0000		
PL	0.0540	-0.8846***	-0.3986	0.2831	0.7887***	-0.6947***	1.0000	
CPI	-0.2461	0.8575***	0.3749	-0.2725	-0.8367***	0.7246***	-0.9612***	1.0000

Notes: * correlation is significant at the 0.1 level, ** correlation is significant at the 0.05 level, *** correlation is significant at the 0.01 level

Based on the correlation analysis for Japan, the relationship between Japan's trade and the independent and control variables also exhibit some differences. Similar to the China case, correlation analysis only reflects the simple linear relationships between the variables. So the Japan case also still to use the OLS regression to examine the specific effects for the variables.

For the Japan trade flow (Table 3), the trade flow shows a statistically significant positive correlation with GDP at 10% level, which suggests that Japan's bilateral trade flow with China tends to increase with the expansion of economic scale. In contrast, the correlations between trade flow and other variables are relatively weak and not significant.

For the Japan exports, the exports show a moderately and positively correlation with GDP, suggesting that the Japan's exports to China are positively related with the economic growth. However, same as imports, other variables do not show the significant relationship with exports. In addition, some independent and control variables display relatively significant

correlations with each other. For instance, the TOG represents a significant and negative relationship with economic policy uncertainty, GDP and PL, and indicates a strong and positive correlation with inflation rate and CPI. Additionally, the EPU shows weak positive relationship with GDP and weak negative relationship with IF. Moreover, the GDP represents strong positive correlations with IF, PL and CPI, respectively. The IF also shows a significant correlation with population size and CPI. Finally, the PL represents a strong and negative correlation with CPI.

In addition, the relatively strong correlations among some macroeconomic variables in Japan are also consistent with the conventional economic theory. For instance, TOG shows a strong relationship with the control variables, same as China case, because TOG is measured by GDP, so it is highly correlated with GDP and GDP relative variables.

5.2 Unit root tests

In order to avoid the spurious problems caused by the non- stationary time series data, unit root tests are conducted before regression analysis. In this study, both Augmented Dickey-Fuller (ADF) test and Phillips-Perron (PP) test are used too examine the stationary of all the variables. The test results for the China side are represented in the Table 4, and for the Japan side are represented in the Table 5, corresponding to the trade flow model, import model and export model.

Table 4. Unit Root Test (China trade flow)

		UNIT ROOT TEST					
		ADF (AUGMENTED DICKEY-FULLER)			PP (Phillips-Perron Test)		
		AT LEVEL	AT 1st difference	AT 2st difference	AT LEVEL	AT 1st difference	AT 2st difference
Trade Flow (TF)	INTERCEPT	-2-1808	-3.5966**	-5.1420***	-2.2544	-3.9380**	-6.3437***
	TREND AND INTERECEPT	-2.6174	-3.3886	-3.5671*	-2.1005	-4.0737**	-6.6083***
	NONE	-0.0521	-3.7851***	5.4079***	0.1598	-4.2488***	-7.0552***
Trade % of GDP (TOG)	INTERCEPT	-3.9825**	-0.5200	-2.3729	-1.9355	-2.3744	-6.6086***
	TREND AND INTERECEPT	-1.1152	-3.3377	-2.0610	-0.0043	-5.4020***	-6.1380***
	NONE	-1.9982**	-0.7960	-5.4958***	-1.9982**	-2.1836**	-5.2298***
Foreign Direct Investment (FDI)	INTERCEPT	-1.8222	-3.134783**	-4.5741***	-1.1180	-3.2752**	-7.1360***
	TREND AND INTERECEPT	-3.2585	-3.1524	-4.2890**	-1.6497	-3.4548*	-7.0723***
	NONE	-1.0390	-3.0604***	-4.5718***	-1.0385	-3.0179***	-7.8963***
Economic Policy Uncertainty (EPU)	INTERCEPT	-1.1408	-4.5441***	-9.4484***	-1.2279	-2.3134	-5.2283***
	TREND AND INTERECEPT	-5.1604***	-12.7823***	-7.6797***	-1.2709	-2.2686	-8.6996***
	NONE	0.0425	-2.4194**	-7.2388***	-0.0650	-2.4194**	-5.4433***
GDP	INTERCEPT	-1.0176	-3.8835**	-1.3223	-1.7990	-6.5557***	-9.3989***
	TREND AND INTERECEPT	-3.1427	-2.0061	-0.3730	-2.9729	-6.5332***	-9.0018***
	NONE	3.1626	-0.5753	-1.4378	3.6830	-2.2819**	-9.6225***

Table 4. (continued) Unit Root Test (China trade flow)

		UNIT ROOT TEST					
		ADF (AUGMENTED DICKEY-FULLER)			PP (Phillips-Perron Test)		
		AT LEVEL	AT 1st difference	AT 2st difference	AT LEVEL	AT 1st difference	AT 2st difference
Inflation Rate (IF)	INTERCEPT	-1.8326	-7.6210***	-5.2026***	-1.8326	-7.1475***	-20.6313***
	TREND AND INTERCEPT	-3.2379	-7.2802***	-5.4538***	-3.2643	-6.8726***	-33.6222***
	NONE	-1.3968	-6.5933***	-5.5060***	-1.3585	-5.9314***	-21.3479***
Population (PL)	INTERCEPT	-4.4735***	1.0695	-3.1528**	-3.3274**	0.8520	-3.1528**
	TREND AND INTERCEPT	-0.8021	-2.9952	-2.3010	2.9547	-2.8594	-2.3010
	NONE	-2.2066**	-2.2365**	-1.8187*	2.8663	-1.0764	-1.8493*
Consumer Price Index (CPI)	INTERCEPT	-3.2155**	-3.1109*	-5.5697***	-2.9844*	-3.1109*	-5.5697***
	TREND AND INTERCEPT	-1.8613	-3.4178*	-5.2507***	-2.0240	-3.3980*	-5.2507***
	NONE	5.7125	-2.4031**	-5.4523***	5.0314	-2.5280**	-5.4523***

Notes: * correlation is significant at the 0.1 level, ** correlation is significant at the 0.05 level, *** correlation is significant at the 0.01 level

Regarding to the unit root results for China side (China trade flow results are refer to Table 4 and others are available for requesting), the results of ADF and PP tests indicate that most of the variables are non-stationary at their levels but become stationary after the first or second differencing., which represents that the variables are integrated of order one or two. For example, the variables trade flow, imports, exports, FDI, EPU, GDP, IF and CPI are failed to reject the null hypothesis of a unit root at level under most of the situations, while the null hypothesis can be rejected after the fist or second differences, as represented by the statistically significant test statistics.

Significantly, the results from both ADF and PP tests are largely consistent. Most variables represent the significant test statistics after differencing, indicating that the series are stationary after transforming. This consistency between the two tests further supports the reliability of the stationary results.

Table 5. Unit Root Test (Japan trade flow)

		UNIT ROOT TEST					
		ADF (AUGMENTED DICKEY-FULLER)			PP (Phillips-Perron Test)		
		AT LEVEL	AT 1st difference	AT 2st difference	AT LEVEL	AT 1st difference	AT 2st difference
Trade Flow (TF)	INTERCEPT	-2.6452	-3.5844**	-4.9415***	-2.1894	-3.9761**	-6.9797***
	TREND AND INTERECEPT	-2.6469	-3.4216*	-2.0054	-2.1550	-4.1696**	-6.4157***
	NONE	-0.2536	-3.7573***	-5.2454***	-0.3017	-3.9122***	-7.8219***
Trade % of GDP (TOG)	INTERCEPT	0.6059	-4.1086**	-6.6395***	-0.6524	-4.1567***	-6.8739***
	TREND AND INTERECEPT	-2.4637	-0.2124	-7.4902***	-1.8085	-4.4573**	-6.1493***
	NONE	1.8929	-3.3079***	-6.9463***	3.2802	-3.0363***	-7.4288***

Table 5. (continued) Unit Root Test (Japan trade flow)

		UNIT ROOT TEST					
		ADF (AUGMENTED DICKEY-FULLER)			PP (Phillips-Perron Test)		
		AT LEVEL	AT 1st difference	AT 2st difference	AT LEVEL	AT 1st difference	AT 2st difference
Foreign Direct Investment (FDI)	INTERCEPT	-2.1133	-5.7476***	-3.8942**	-2.0030	-5.7476***	-15.1285***
	TREND AND INTERECEPT	-2.4276	-6.0749***	-4.3852**	-2.4230	-6.6715***	-22.3859***
	NONE	-0.5127	-5.9568***	-9.0205***	-0.8913	-5.9568***	-14.8594***
Economic Policy Uncertainty (EPU)	INTERCEPT	-3.8524**	-3.7582**	-5.0147***	-4.6754***	-8.2837***	-11.8093***
	TREND AND INTERECEPT	-3.6914*	-3.4438*	-4.4666**	-5.2869***	-8.2587***	-11.3614***
	NONE	-0.6411	-3.9069***	-5.4095***	-0.7424	-7.8296***	-12.6022***
GDP	INTERCEPT	-0.9709	-3.6835**	-5.2497***	-0.9937	-3.7000**	-5.5255***
	TREND AND INTERECEPT	-4.7110**	-3.4938*	-2.5960	-2.0992	-3.5095*	-5.1026***
	NONE	-1.1906	-3.3116***	-5.4891***	-1.2002	-3.3332***	-5.8142***
Inflation Rate (IF)	INTERCEPT	-1.8366	-3.4942**	-3.7009**	-1.6725	-5.2041***	-8.5774***
	TREND AND INTERCEPT	-2.5994	-3.3476	-3.3696	-2.1205	-5.0266***	-8.0669***
	NONE	-1.0746	-3.3745***	-4.0411***	-1.0945	-4.0217***	-9.2687***
Population (PL)	INTERCEPT	0.9707	-9.1553***	-4.2277**	3.3167	-0.4586	-2.1708
	TREND AND INTERCEPT	-12.9529***	-8.2435***	-2.1506	0.7063	-1.6859	-1.9307
	NONE	-0.7119	0.6334	-5.0924***	-3.4950***	0.4299	-2.1325**
Consumer Price Index (CPI)	INTERCEPT	1.9840	-1.6626	-3.2584**	1.7203	-1.5395	-4.5285***
	TREND AND INTERCEPT	-1.9597	-2.0272	-3.1799	-0.1758	-1.9032	-4.4933**
	NONE	2.9315	-0.8620	-3.1899***	2.9315	-0.8672	-3.6897***

Notes: * correlation is significant at the 0.1 level, ** correlation is significant at the 0.05 level, *** correlation is significant at the 0.01 level

Based on the Unit root test result (Japan trade flow results are refer to Table 5 and others are available for requesting), from the level test statistics on Japan side, most of the variables fail to reject the null hypothesis of a unit root under the different models, representing that the original series are generally non-stationary, However, after taking the first and second difference, the majority of the variables become statistically significant at the conventional levels, indicating that after the differencing, the variables tend to become stationary.

In particular, most of the variables show the stronger stationary properties after the differencing, and the results of ADF and PP tests are consistent across different specifications.

Therefore, the unit root test results of both China side and Japan side suggest that the variables used in the empirical

analysis satisfy the stationary requirement after the differencing, which could help to avoid the regression problems. Based on above results, the variables can be used for the OLS regression analysis later.

5.3 Ordinary Least Square Results

To further study the determinants of the bilateral trade between China and Japan, this study employs the ordinary least squares regression. Since our study considers not only total trade flow, but also imports and exports separately, the regression results are represented for three models for each country. The regression results as shown below:

Table 6. Ordinary Least Squares analysis（China Trade flow）

Variable	Parameter	Coefficient	p-value
Constant	β_0	-2,120,000,000,000	0.2896
TOG	β_1	7,820,000,000*	0.0521
FDI	β_2	0.1180**	0.0391
EPU	β_3	40969009	0.5681
GDP	γ_1	0.0094	0.2117
IF	γ_2	6,990,000,000	0.1803
PL	γ_3	1619.747	0.2565
CPI	γ_4	6,990,000,000	0.4301

Notes: * coefficient is significant at the 0.1 level, ** coefficient is significant at the 0.05 level, *** coefficient is significant at the 0.01 level.

Table 7. Ordinary Least Squares Table

Model	R^2	F-statistic	Prob(F-statistic)
OLS	0.9154	10.8216	0.0028

The results for the China trade flow model are represented in Table 6 and Table 7. The dependent variable is the bilateral trade flow for China side, while the independent variables include TOG, foreign direct investment and economic policy uncertainty, the control variables include GDP, IF, PL and CPI.

Overall, the trade flow model exhibits the strong explanatory power. The R2 value is 0.9154, indicating that approximately 91.5% of the variation in the bilateral trade flow model can be explained by the independent variables. The adjusted R-squared is 0.8308, which also reflects a high degree of explanatory ability after adjusting the number of variables. In addition，the F-statistic is significant at the 1% level, which suggests that this trade flow model is statistically meaningful.

Based on the ordinary least square results (Table 6), the foreign direct investment has a positively and significantly effect on the bilateral trade flow at 5% level. This result represents that the increase of the for the foreign direct investment in China will help to increase the expansion of the bilateral trade flow between China and Japan. This funding supports the view that the multinational investment activities often stimulate the international trade through production networks and cross-border supply chains [22].

Moreover, the result also shows that the TOG is positively related with the bilateral trade flow, and it is significant at 10% level. This indicates that the higher TOG will increase the trade flow through increasing the openness of the countries.

However, other variables like EPU, GDP, IF, PL and CPI do not show the significant at conventional levels. Although these variables may influence the trade behaviour between two countries, their effects are not strongly influence the China trade

flow during 2010-2024.

The regression result for the China import model are are available for requesting. The adjusted R2 is 0.7872, which indicates that the import model has the strong explanatory power after adjusting the number of variables.

Under the import model, GDP represents a positively and significantly relationship with China imports, the level is 5%. This suggests that as China's economic volume expands, the demand for the imported goods tends to increase. Additionally, the foreign direct investment shows a positive effect, and it is significant at 10% level, indicating that the increase of the foreign direct investment will facilitate the growth of imports. So for China's import demand, the GDP and income elasticities play an important role in explaining import behavior [32]. Moreover, the EPU is positively related with imports and is significant at 10% level, which suggests that the firms in China will adjust the import volume in response to policy fluctuations. However, the CPI has a negative effect on imports level and is significant at 10% level, suggesting that when the price level increase, the China imports from Japan will reduce. By contrast, the TOG, IF and PL do not represent significant effects in the China import model.

The results for the China export model are are available for requesting. The adjusted R2 is 0.8119, suggesting that the model represents a strong explanatory power after controlling the number of variables.

Moving on to the explanatory variables results, only TOG shows a positive and significant effect at 5% level, indicating that only a higher degree of TOG will significantly facilitates the China's export to Japan, which highlights that the importance of reducing the trade barriers. This funding supports the view that the trade openness facilitates the export expansion by improving market access and enhancing the resource allocation efficiency [19] [36].

Table 8. Ordinary Least Squares analysis (Japan Trade flow)

Variable	Parameter	Coefficient	p-value
Constant	β_0	2,060,000,000,000	0.2610
TOG	β_1	4,790,000,000**	0.0431
FDI	β_2	0.6135**	0.0139
EPU	β_3	-610,000,000**	0.0232
GDP	γ_1	0.0632***	0.0004
IF	γ_2	-3,730,000,000	0.4915
PL	γ_3	-14254.52	0.2283
CPI	γ_4	-3,640,000,000	0.2288

Notes: * coefficient is significant at the 0.1 level , ** coefficient is significant at the 0.05 level , *** coefficient is significant at the 0.01 level.

Table 9. Ordinary Least Squares Table

Model	R^2	F-statistic	Prob(F-statistic)
OLS	0.9291	13.1132	0.0015

The regression results for the Japan trade flow model are presented in Table 8 and Table 9. The adjusted R^2 is 0.8583, suggesting that the Japan trade flow model has strong explanatory power after adjusting the number of variables.

As for the explanatory variables, several variables are significant based on the Table 8. TOG has positive and significant effect at 5% level, suggesting that 1% degree increase of the TOG will promote 4.79 billion increase in the Japan total trade flow. This suggests that the reduction of trade barrier will help the trade activities increase heavily. Moreover, the FDI also shows a positive and significant effect at 5% level, which means that with the increase of the foreign direct

investment, the Japan bilateral trade will also increase. This funding is supported by the complementary relationship between FDI and trade [8]. However, the EPU represents a negative and significant effect, and it is significant at 5% level, which suggests that the higher policy uncertainty may disturb the trade activity. This result is aligned with the study representing that the policy uncertainty can hinder the international flows [9] [13]. In addition, GDP represents significantly and positively relationship with Japan trade flow and it is significant at 1% level, suggesting that the economic scale expansion of Japan will strongly promotes the trade flows. In other terms, a 1% increase in GDP will cause approximately 0.063 increase in Japan trade flow. This funding is widely supported, where the economic size is identified as a key determinant of trade [3] [21].

The regression results for the Japan import are are available for requesting. The adjusted R^2 is 0.7698, which suggests that this model has relatively high explanatory power after adjusting for the independent and control variables.

Among all the independent and control variables, GDP represents significantly and positively effect, and is significant at 1% level, suggesting that with 1% expansion of GDP, the Japan imports from China will increase around 0.0224. This reflects the increases in income will lead to higher demand for foreign goods. Empirical evidence on Japan also suggests that imports are closely linked with the domestic economic activity, with GDP playing a key role in determining import demand through income effects and production needs [38]. In addition, FDI exhibits a positive effects and it is significant at 10% level, which suggests that foreign direct investment may have moderate influence on Japan trade import from China, indicating the complementary relationship between investment and trade flows [29]. However, only CPI shows a negative relationship with Japan imports, and it is significant at 5% level, indicating that when the price rising, the import demand will reduce, possibly due to the purchasing power reduction and domestic substitution goods increase, which is consistent with the findings on price effects on international trade [25].

The regression results for the Japan export model are available for requesting. The adjusted R^2 is 0.6079, indicating that the model is moderate explanatory power.

Among all the variables, only GDP represents a positive and significant effect, and it is significant at 1% level, this is same as the above Japan import model and Japan trade flow model. However, other explanatory variables do not show the significant with the Japan export, indicating that only GDP plays a key role in Japan export to China.

Moreover, a comparison between China and Japan trade activities reveals the differences in the effects of bilateral trade. For China, the trade flows are more associated with the TOG and FDI, while the exports are primarily driven by the external trade conditions. In contrast, the imports and exports for Japan are more closely linked with GDP, which indicates that the domestic economic scale plays a key role in shaping the trade activities.

This difference indicates that the China's trade activities are externally oriented, whereas Japan's trade behavior is more internally driven. Such asymmetry is consistent with the difference in demand composition and economic integration between emerging and advanced economies [11].

6. CONCLUSION AND IMPLICATIONS

6.1 Findings

This study based on bilateral trade between China and Japan during 2010-2024, and under the background of RCEP, constructing the trade flow, imports and exports model, using the multiple linear regression to analysis the effects between trade % of GDP, foreign direct investment, economic policy uncertainty and several macroeconomic variables with the bilateral trade. The main conclusion are as follows:

First, the driving factors of the bilateral trade between China and Japan exhibit distinct structure differences, and represent different adjustment paths under the RCEP frame work. From the China's perspective, the trade flows and exports are mainly driven by the trade openness and the foreign direct investment, indicating that under the background of RCEP implication for tariff reducing and the deep cooperation, China's trade with Japan has become more and more reliant on the deepening trade openness and integration into the global value chains. However, the Japan's trade flows are not only influenced by the trade openness and foreign direct investment, but also influenced by the GDP and economic policy uncertainty. In other words, Japan is continuously relying on the domestic economic scale and the stable policy environment in the process of regional integration. This findings are supported with the trade in developed economies relies more heavily on the domestic demand and economic scale, GDP growth typically drives increases in import and export volumes by expanding domestic demand and production capacity [26], while also indicating that the RCEP has

strengthen the regional linkages, it has not change the structural differences between different economies.

Second, China and Japan represent distinct external oriented and internal oriented characteristics, and exhibit the difference trade model under the RCEP framework. China,s exports are mostly driven by the trade % of GDP, suggesting that during the process of RCEP implication, China expanding the exports to Japan effectively through trade convenience and and improved the market access. In contrast, both Japan's imports and exports are typically influenced by GDP, indicating that its trade growth mostly relies on domestic economic scale. This difference reflects the different positioning within the regional trade value chains between the two countries.

Third economic policy uncertainty represents the large asymmetric gap between China and Japan, and shows the different paths under the RCEP intervention. Based on the empirical result, Japan's economic policy uncertainty remains low but has a significant and negative relationship with trade flows. However, China's economic policy uncertainty remains high but does not show the significant relationship with trade flows. This suggests that under the RCEP framework, the effectiveness of economic policy uncertainty still have differences between different countries. The economic policy uncertainty normally suppresses the trade activity by influencing the expectation of firms and investment strategies [9], but China has more stronger advantages on the policy buffering strategies in responding to the uncertainty circumstance, which can partly attributed to the institutional factors, such as the digital economy development [48]. This may be related to institutional or structural factors, which were not directly tested in this study, but the finding is still further illustrate the evidence that although RCEP could reduce the trade barrier between members, the influence of the uncertainty can not be totally eliminate and the policy shock on the trade activity still exists.

6.2 Recommendations

Based on the empirical findings above, the following policy recommendations are suggested to promote the bilateral trade between China and Japan:

First, the government should keep promoting the openness level, enhance the regional trade cooperation. The China's exports are mainly driven by the trade % of GDP, indicating that the openness is the core factor to facilitate the trade growth. Under the RCEP framework, the government should further reduce the transaction cost, enhance the rule cooperation and trade convenience, and finally releasing the capacity of regional cooperation. With the RCEP tariff deduction and integration of the countries cooperation, the growth rate of regional trade will increase and deepen the economic integration [12] [41].

Second, the foreign direct investment structure should be optimized, strengthen the link between investment and trade. The empirical results show that the foreign direct investment has a significant and positive impact on the trade flows between China and Japan, indicating that the cross-border investment has a strong relationship with the trade. Thus, the government should optimize the business environment, guiding the agglomeration effect of investment on high value-added industries, enhance the trade competitiveness. At the same time, under the process of RCEP, the deepening the regional cooperation of investment will help to further enhance the industrial linkages between China and Japan, and facilitate the trade growth [28].

Third, the policy coordination should be enhanced in order to reduce the uncertainty shocks on trade activities. Our study find that the economic policy uncertainty in Japan has a significant negative effect on trade, whereas China represents the ability of resilience, Therefore, Japan should enhance the stability of the policy and reduce the negative effect of uncertainty to the firm economic activities. At the same time, China should continue to leverage its institutional stability to maintain the trade resilience under the complex external environment. Related study also indicates that with the implication of RCEP, the regional trade agreements can finally promote the trade creation [40].

6.3 Limitations and Future implications

Future research could be further deepened in the following areas:

First, research could be conducted from the more detailed trade structure perspective. This paper analyzes the trade relations between China and Japan based on the aggregate data without distinguishing the product categories and different industries. However, the different industries may reflect the different effects on the trade flows. Existing studies have pointed out that the potential benefits of the RCEP will be overestimated if we ignore the origin of value added and measure the benefits by gross exports [41]. Future research could incorporate the value-added trade data to conduct the trade analysis between China and Japan. Second, more dynamic econometric method could be used. This paper primarily employs the OLS method. Although this method could reveal the correlations between variables, it still remains the limits on dynamic

adjustment and long-run equilibrium analysis. Future research could adopt nonlinear econometric approaches, such as the nonlinear ARDL model, to better capture asymmetric relationships between macroeconomic variables [6]. In addition, It should be acknowledged that the sample size of this study is limited, as only 15 annual observations are available, while the model incorporates several explanatory variables. This may affect the robustness of the estimates, and thus the results should be interpreted with caution.

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