The Impact of RMB Exchange Rate Fluctuations on China's Tea Export Trade

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Abstract: This paper employs multiple linear regression and correlation analysis to investigate the impact of RMB exchange rate fluctuations on China's tea exports using annual data from 2002 to 2024. The findings reveal distinct stage effects. During 2005-2014, depreciation promoted export expansion; post the "811 Exchange Rate Reform" in 2015, the direct exchange rate effect diminished due to marketization, structural upgrading, and diversification. While strongly positively correlated with export volume, the exchange rate has a limited impact on export value, largely buffered by exporters' pricing strategies. Results also show export volume is the core driver of export value growth, while market demand indicators exert significant negative effects. We propose recommendations to enhance the high-quality development of China's tea exports.

Keywords: RMB Exchange Rate Fluctuations; Tea Export Trade; Stage Characteristics; Influencing Factors of Trade

1. Introduction

With the rapid growth of China's economy and the acceleration of globalization, fluctuations in the RMB exchange rate have become a key factor affecting China's foreign trade. As the world's largest tea consumer and second-largest tea exporter, China's tea exports hold an important position in the agricultural product trade sector. The main export markets for Chinese tea are concentrated in Europe, the United States, Asia, and other regions, where it faces intense competition with countries such as India, Sri Lanka, and Kenya. In recent years, the international market environment has become increasingly complex and variable. Shifts in market demand and price volatility have significantly influenced China's tea export trade.

Since the reform of the RMB exchange rate formation mechanism in 2005, the marketization process of the RMB exchange rate has accelerated, with a notable increase in both the range and frequency of fluctuations. Following the "811 Exchange Rate Reform" in 2015, the RMB exchange rate entered a phase of two-way volatility, further intensifying its uncertainty.

For tea export enterprises, exchange rate fluctuations bring a dual impact. An appreciation of the RMB raises export prices, weakening the price competitiveness of products in the international market. While a depreciation of the RMB may enhance price advantages, it simultaneously increases the costs of imported raw materials and equipment, thereby squeezing corporate profit margins. Additionally, exchange rate fluctuations indirectly alter the scale and structure of tea exports by influencing international market demand and consumers' purchasing power.

Concurrently, international trade friction continues to impact Chinese tea exports. In 2018, citing the "Section 301 Investigation," the United States imposed additional tariffs on Chinese goods, including certain tea products and packaging materials. This directly increased the sales costs of Chinese tea in the U.S. market and weakened its price competitiveness. In 2025, the Sino-U.S. trade tariff war escalated again as the U.S. expanded its list of goods subject to additional tariffs. This led to a significant rise in the price of Chinese tea in the U.S. market, a rapid contraction in market share, and triggered a series of chain reactions, including inventory adjustments and sales channel restructuring among U.S. tea distributors. The trade countermeasures taken by both China and the U.S. are also reshaping the tea trade landscape between the two

countries.

However, propelled by Belt and Road Initiative, tea export trade has welcomed new development opportunities. Against this complex backdrop, conducting an in-depth study on the impact of RMB exchange rate fluctuations on China's tea export trade is significant. It not only helps to analyze the mechanism through which exchange rate changes affect specific industries but also provides theoretical support and practical guidance for tea export enterprises in formulating effective exchange rate risk management strategies.

2. Review of Existing Research

2.1 The Impact of Tea Export Trade on China's Import and Export

In studies on the impact of tea export trade on China's import and export, existing literature has conducted analyses from various perspectives. You et al. noted based on 2024 data that China's total tea export volume reached 392,200 tons, a year-on-year increase of 2.3%, with an export value of 1.583 billion USD. Although the export value decreased by 17.3% year-on-year, China still ranked first globally. Meanwhile, imports showed significant growth, with an import value of 164 million USD, up 7.5% year-on-year, and an import volume of 55,600 tons, surging 36.24% year-on-year. This trade pattern indicates that tea trade occupies a certain share in China's foreign trade, and the combined scale advantage in exports and growth potential in imports form the basis for its overall impact on China's import and export situation [1].

In their study of long-term trends from 2001 to 2022, Zheng and Yu found that China's tea export trade has shown continuous growth, with its trade value consistently ranking first in the world. In 2022, China's tea export value reached 2.083 billion USD, maintaining its top global position, while the export volume was 375,700 tons, ranking second worldwide. Additionally, China’s share in the global tea export trade has been steadily increasing. This reflects the positive role of tea export trade in expanding the scale of China's foreign trade and enhancing its position in global trade. Its sustained growth trend has become one of the important pillars supporting Chinese overall export trade [2].

Zheng and Yu focused their analysis on China's tea exports to the European Union, a specific area of trade. They noted that from 2001 to 2022, China's tea exports to the EU showed continuous growth. In 2022, the export value reached 123 million USD, accounting for 5.88% of China's total tea export value. Despite issues such as the relatively small export scale and high market concentration, as a component of the economic and trade exchanges between China and the EU, changes in its trade scale and the characteristics of its market structure still influence the import-export balance and trade cooperation between China and the European region. This reflects the specific role of tea exports in China's regional trade [3].

These studies reveal the multifaceted impact of tea export trade on China's imports and exports from the perspectives of overall scale, long-term trends, and regional trade. They provide both theoretical and practical foundations at the trade background level for exploring the effect of RMB exchange rate fluctuations on tea export trade [1-3].

2.2 How Exchange Rate Changes Affect China's Foreign Trade Imports and Exports

In international trade, fluctuations in the RMB exchange rate have a notable impact on China's import and export activities. Numerous studies have explored this issue from various perspectives, providing a wealth of references for examining the effects of RMB exchange rate fluctuations on China's tea export trade.

Geng examined the impact of RMB exchange rate fluctuations on China's international trade in his research, affirming the significant role of exchange rate volatility in international trade [4]. Liu and Zhai focused on how the RMB exchange rate affects import and export trade, analyzing the mechanisms through which exchange rate fluctuations influence trade from multiple dimensions [5]. Chen further pointed out in his study that RMB exchange rate fluctuations have a substantial impact on China's foreign trade. A stable exchange rate is conducive to promoting international economic cooperation, while exchange rate fluctuations affect trade by influencing import and export costs, price competitiveness, and other factors. By applying a relevant data analysis model, he found that an appreciation of the RMB can lower import costs and optimize resource allocation, while depreciation can reduce export

costs and enhance price competitiveness. At the same time, exchange rate fluctuations also pose challenges such as export pricing pressure and import cost pressure [6]. Research by Guan and Wei indicates that in the short term, changes in the RMB exchange rate have limited effects on adjusting import-export trade and the trade balance. External demand plays a more significant role in exports, while domestic demand and commodity prices have a greater impact on imports. The time lag for exchange rate changes to affect the trade balance is approximately one year, with the J-curve effect being more pronounced for bilateral exchange rates. This is closely related to the high proportion of the US dollar in China's import and export pricing and settlement [7].

From the perspective of regional and bilateral trade, Ouyang and Ling constructed an equilibrium model of a two-country open economy and used empirical data of countries along the Belt and Road. They found that a higher level of RMB internationalization significantly improves import and export performance. This effect operates not through exchange rate levels or volatility risks, but via a "peer effect" generated by the rising share of RMB cross-border settlement. Exchange rate volatility shows no significant impact on Chinese trade with countries along the Belt and Road [8]. Focusing also on the Belt and Road context, Gu analyzed how the RMB exchange rate affects import and export trade with participating countries, offering a regional perspective for research on the exchange rate-trade nexus [9].

From firm and trade-type perspectives, RMB exchange rate fluctuations generate considerable micro-level heterogeneity and divergent transmission effects on China's imports and exports. Zhu et al. show that RMB real effective exchange rate appreciation significantly increases export product markups[10].This effect is stronger for differentiated products, competitive sectors, foreign-invested enterprises, and importing firms, operating mainly through product quality upgrading and lower marginal import costs. Appreciation also strengthens market selection and improves resource allocation efficiency among producers within the same product category. Using macro data, Wang and Li confirm that RMB depreciation strongly stimulates exports with a notable time-lag effect, whose magnitude intensifies over lagged periods. The exchange rate impact is further moderated by trade-type differences, foreign capital, and per capita GDP [11]. From a firm R&D perspective, Mu and Deng indicate that real effective exchange rate depreciation after the 2005 reform encouraged exporters to raise R&D investment. Large and highly subsidized firms responded more actively, whereas foreign-invested firms invested relatively less. Exchange rate movements shape the technological content of exports and trade structure via the innovation channel [12].

These studies examine the impact of RMB exchange rate fluctuations on import and export trade from various perspectives and scopes. They provide a multi-dimensional theoretical and empirical foundation for analyzing its effect on China's tea export trade [4-12].

2.3 The Impact of RMB Exchange Rate Fluctuations on Tea Exports

When examining the impact of RMB exchange rate fluctuations on China's tea export trade, multiple scholars have conducted in-depth analyses from various perspectives.

From the perspective of price transmission, Liu and Li pointed out that two-way fluctuations in the RMB exchange rate directly affect the pricing of Chinese tea exporters and exert a considerable impact on their international competitiveness. RMB depreciation lowers tea export prices and stimulates foreign consumer demand, whereas RMB appreciation raises export prices and tends to reduce foreign demand to some extent [13].

From the perspective of demand elasticity, Liu and Li also noted that the impact of exchange rate fluctuations on tea exports is related to the price elasticity of demand for exported tea. Since most Chinese tea exports are green tea and other primary bulk teas with low value-added, they exhibit weak international competitiveness when prices change [13].

Regarding trade costs and other factors, Zhang et al. mentioned the role of trade costs in exports within their trade efficiency analysis framework. Exchange rate fluctuations, as a key factor influencing trade costs, affect tea export efficiency indirectly by altering transaction costs. Particularly in dealings with different trading partners, exchange rate stability plays a significant role in maintaining trade efficiency [14]. Zhao and Guo, while analyzing export

issues, pointed out that the complexity of the international market environment, along with uncertainties such as exchange rate fluctuations, increases export risks. This indirectly highlights the potential impact of exchange rate volatility as an external environmental factor on tea export trade. Especially in export pricing and profit calculations, exchange rate fluctuations are a major risk that enterprises must address [15]. Chen et al. emphasized in their market environment analysis the influence of factors such as economic freedom on trade costs. Exchange rate volatility, as a key variable affecting international market transaction costs, indirectly impacts the flow of tea export trade by influencing corporate pricing strategies and market entry costs. Together with institutional environments and cultural factors, it forms a complex mechanism affecting exports [16].

This paper focuses on examining the impact of RMB exchange rate fluctuations on China's tea export trade from 2002 to 2024. It analyzes their phased characteristics, their combined effects with other factors, as well as the underlying mechanisms. Based on this analysis, recommendations are proposed at both the corporate and governmental levels.

3. Research Hypotheses and Model Development

3.1 Research Hypotheses

H1: Fluctuations in the RMB exchange rate have a significant positive impact on Chinese tea export volume.

According to the exchange rate transmission theory, exchange rate fluctuations influence the international competitiveness of export commodities through the price mechanism. For agricultural products such as tea with relatively high price elasticity of demand, price changes exert a more direct effect on export volume. Chinese tea products are highly homogeneous, and their international competitiveness relies mainly on price advantages. Compared with manufactured goods, tea exports are more sensitive to exchange rate fluctuations. Meanwhile, Chinese tea export markets cover many countries and regions including Morocco, the United States and Japan, with diversified settlement currencies. The price adjustment effect caused by exchange rate fluctuations can be fully transmitted to export volume, further strengthening the positive relationship between exchange rate volatility and tea export volume. Therefore, this hypothesis is proposed.

H2: Tea export volume serves as the core mediating variable linking exchange rate fluctuations to export value.

Fluctuations in the RMB exchange rate do not exert a significant direct impact on Chinese tea export value. Instead, they take tea export volume as the key transmission carrier and indirectly affect export value by influencing export volume. That is, the mechanism follows the path: exchange rate fluctuations → changes in tea export volume → changes in tea export value. Tea export volume plays a full or partial mediating effect between the two and is the core mediating variable.

3.2 Model Construction

(1) Data sources:

This study examines the impact of RMB exchange rate fluctuations on China's tea export trade. Therefore, China's tea export value is selected as the explained variable. Tea export value serves as a core indicator for measuring the performance of China's tea trade in the international market, directly reflecting the influence of exchange rate fluctuations on tea export trade. This paper utilizes annual data on China's tea exports from 2002 to 2024 as the sample. The data sources include the General Administration of Customs of China, the National Bureau of Statistics, and statistical reports from relevant industry associations.

The exchange rate volatility is used as the core explanatory variable to study the impact of RMB exchange rate fluctuations on China's tea export trade. This variable is defined as:

Exchange Rate Volatility:

$$\mathrm{exr_t} = \frac{R_t - R_{t-1}}{R_{t-1}} \times 100\% \quad (1)$$

Where exr_t represents the annual exchange rate volatility, Rt denotes the exchange rate of the current year, and Rt-1 represents the exchange rate of the previous year.

The impact of RMB exchange rate fluctuations on China's tea export trade is a complex economic phenomenon, influenced not only by exchange rate factors but also by various macro and micro economic elements. To more accurately analyze the effect of RMB exchange rate fluctuations on China's tea export trade, multiple control variables are introduced into the model.

First, in terms of macroeconomic factors, this paper selects GDP growth rate (gdp) and financial policy (police) as control variables. The GDP growth rate reflects the overall performance of China's macro economy and is typically positively correlated with export trade. A higher GDP growth rate indicates a more active domestic economy and enhanced production and consumption capabilities, which may, in turn, promote tea exports. Financial policy, as another important macroeconomic control variable, primarily influences corporate financing costs and the market environment through adjustments in fiscal and monetary policies. For example, accommodative monetary policy may reduce corporate financing costs and foster the growth of export trade. This paper uses a dummy variable to represent changes in financial policy, capturing its potential impact on tea exports. Among these, the reform of the RMB exchange rate formation mechanism on July 21, 2005, introduced a managed floating exchange rate system based on market supply and demand and with reference to a basket of currencies. On June 19, 2010, further reforms were implemented to advance the RMB exchange rate formation mechanism and enhance exchange rate flexibility. On August 11, 2015, the "811 Exchange Rate Reform" refined the quotation mechanism for the RMB-USD central parity rate.

In terms of micro economic factors, this paper considers firm size (size) and market demand (demand) as control variables. Firm size is one of the critical factors influencing export trade, as larger enterprises typically possess stronger production capabilities and market competitiveness, enabling them to better manage risks arising from exchange rate fluctuations. Scholars such as Yermack (1996) and Fama and French (1996) also consider firm size in their analyses, which is why this paper includes firm size (size) as a control variable. Therefore, firm size is incorporated into the model as a control variable.

Additionally, market demand is another key factor affecting tea exports. Changes in market demand directly influence the export volume and price of tea. This paper uses the economic growth rate of tea export destinations as a proxy variable for market demand to capture its impact on tea exports.

To mitigate the impact of heteroscedasticity and differences in measurement units on the regression results, logarithmic transformations were applied to certain variables:

After applying the logarithmic transformation, the coefficients of the variables can be interpreted as elasticities, which facilitates the analysis of their economic implications.

(2) Model construction:

A multiple linear regression model is employed to analyze the impact of RMB exchange rate fluctuations on China's tea export trade. The basic form of the model is as follows:

$$Export_t = \beta_0 + \beta_1 ExchangeRateVolatility_t + \beta_2 GDP_t + \beta_3 Policy_t + \beta_4 Size_t + \beta_5 Demand_t + \varepsilon_t \quad (2)$$

Where:

$Export_t$: China's tea export value in year t (dependent variable)

$ExportRateVolatility_t$: RMB exchange rate volatility in year t (core explanatory variable)

ε t: Random error term

4. Empirical Analysis

4.1 Descriptive Statistics

Based on the annual data of 23 observations from 2002 to 2024 as shown in Table 1, this paper lays a data foundation for investigating the impact of RMB exchange rate fluctuations on Chinese tea export trade through descriptive statistics of core variables.

Among the core variables, RMB exchange rate fluctuations exhibit notable characteristics: a mean value of 7.028, a median of 6.831, and a standard deviation of 0.713. The fluctuation range spans from 6.143 (RMB appreciation) to 8.277 (RMB depreciation). The relatively wide range provides sufficient data variation to support the analysis of exchange rate effects on tea exports.

Indicators of Chinese tea export scale show distinct features: export volume has a mean of 3.22e+05, a median of 3.23e+05, and a standard deviation of 37,831.448, with a relatively concentrated distribution and stable overall export trend. Export value has a mean of 1.19e+09, a median of 1.25e+09, and a standard deviation as high as 6.31e+08, indicating significantly greater volatility than export volume. Despite being affected by complex factors, the overall export scale remains on a stable foundation.

A preliminary insight can be drawn from their joint distribution: RMB appreciation (near 6.143) may suppress exports by raising export costs denominated in foreign currencies, while RMB depreciation (near 8.277) may stimulate exports by reducing such costs. The complete exchange rate fluctuation range provides conditions for testing the transmission mechanism.

Table 1. Descriptive Statistics of Each Variable

Var Name	Obs	Mean	Median	SD	Min	Max
Export volume	23	3.22e+05	3.23e+05	37831.448	2.52e+05	3.75e+05
Value of export	23	1.19e+09	1.25e+09	6.31e+08	3.32e+08	2.30e+09
Exchange rate	23	7.028	6.831	0.713	6.143	8.277
yield	23	2.00e+06	1.89e+06	9.41e+05	7.45e+05	3.74e+06
China growth rate	23	0.081	0.080	0.029	0.020	0.140
Us growth rate	23	0.020	0.023	0.019	-0.034	0.059
scale	23	2443.217	1550.000	1759.491	734.000	6100.000
requirement	23	4.58e+06	4.54e+06	9.66e+05	3.10e+06	6.50e+06

Variables including tea output, economic growth rates at home and abroad, industrial scale, and market demand offer supplementary support for the analysis. Among them, tea output underpins supply, and economic growth rates reflect the supply-demand environment, which together with the exchange rate affect tea exports.

Based on the above variable distributions, subsequent research will quantify the marginal effects of exchange rate fluctuations through econometric models. Regression equations will be constructed with export volume and export value as dependent variables, the exchange rate as the core explanatory variable, and relevant control variables included. This will allow accurate measurement of impact magnitudes, analysis of moderating effects, and systematic verification of the transmission mechanism through which exchange rates influence tea exports.

4.2 Correlation Analysis

According to the correlation analysis in Table 2, the RMB exchange rate is significantly negatively correlated with both Chinese tea export volume and export value, with correlation coefficients of −0.602 and −0.623 respectively. This indicates that RMB exchange rate fluctuations exert a notable restraining effect on Chinese tea export trade. Specifically, RMB appreciation significantly reduces both export volume and value, while RMB depreciation provides a positive boost to tea exports. This finding is consistent with the basic logic in traditional international trade theory regarding how exchange rate movements affect export competitiveness.

Table 2. Correlation Analysis

	Export volume	Value of export	Exchange rate	yield	China growth rate	Us growth rate	scale	requirement
Export volume	1							
Value of export	0.925***	1						
Exchange rate	-0.602***	-0.623***	1					
yield	0.951***	0.910***	-0.559***	1				
China growth rate	-0.728***	-0.784***	0.453**	-0.817***	1			
Us growth rate	0.069	0.052	0.128	0.057	0.255	1		
scale	0.905***	0.850***	-0.351	0.969***	-0.791***	0.086	1	
requirement	0.958***	0.903***	-0.603***	0.995***	-0.802***	0.038	0.948***	1

A further examination of the interrelationships among variables reveals that the RMB exchange rate is also significantly negatively correlated with tea export yield, with a correlation coefficient of −0.559. This suggests that exchange rate appreciation not only directly affects export scale but also reduces the profitability of tea exports through price transmission, intensifying operational pressure on export enterprises. Meanwhile, the RMB exchange rate is significantly positively correlated with China's economic growth rate (0.453), reflecting that as domestic economic growth drives RMB appreciation, Chinese tea export sector faces weakened competitiveness caused by currency appreciation. In addition, the correlation coefficient between the RMB exchange rate and export scale requirement is −0.603, further confirming the negative impact of exchange rate fluctuations on tea export trade.

Overall, RMB exchange rate fluctuation is a key variable affecting Chinese tea export trade. Appreciation of the RMB constrains tea exports across multiple dimensions, including export volume, export value, and profitability. Therefore, in the development of tea export trade, full consideration should be given to the impact of exchange rate movements. Negative effects arising from exchange rate volatility can be hedged through exchange rate risk management and the optimization of export

product structure, so as to ensure the stable development of tea export trade.

4.3 Regression Analysis

(1) Overall model fit

From the Table 3, we can see the R-squared value of the model is 0.920, which means the model explains 92% of the variation in China's tea export value. This shows that the overall model fit is good. The number of observations is 23, which provides a sufficient sample size to support the regression analysis.

Table 3. Regression Analysis

	(1)
VARIABLES	Value of export
Export volume	14,133.421***
	(3.13)
Exchange rate	-6.061e+07
	(-0.28)
yield	1,803.268
	(1.66)
China growth rate	-4.475e+09
	(-1.24)
Us growth rate	1.315e+09
	(0.42)
scale	-224,932.220
	(-0.74)
requirement	-1,436.437**
	(-2.13)
Constant	9.293e+08
	(0.36)
Observations	23
R-squared	0.920

(2) The impact of the RMB exchange rate on tea export value

Based on the regression results, the coefficient for the RMB exchange rate is -6.061e+07, with a t-statistic of (-0.28). First, looking at the sign of the coefficient, the negative value indicates a negative relationship between the RMB exchange rate and China's tea export value. This means that when the RMB appreciates, China's tea export value tends to decrease. Under the combined effect of the many variables included in the model, the impact of RMB exchange rate fluctuations on tea export value is not statistically significant. One possible reason is that tea exports are influenced by a variety of factors, such as export volume, production, domestic and foreign economic growth, industry scale, and market demand. These factors may weaken the separate effect of exchange rate changes on export value to some extent. Another possible reason is that tea, as an agricultural product with certain unique characteristics and stable demand, may have a delayed or cushioned response to exchange rate movements. As a result, the effect of exchange rate changes may not appear statistically significant.

(3) The influence of other variables

Export volume: The coefficient is 14,133.421, with a t-statistic of (3.13), and it is significant at the 1% level. This means that for each one-unit increase in tea export volume, tea export value increases significantly by 14,133.421 units. Export volume is a core positive factor influencing export value.

Yield: The coefficient is 1,803.268, with a t-statistic of (1.66). It is close to being significant at the 10% level. This suggests that an increase in tea production tends to have a positive effect on export value, as higher production provides more supply for export.

China growth rate: The coefficient is -4.475e+09, with a t-statistic of (-1.24). There is no significant statistical relationship. The impact of China's economic growth on tea export value is not clearly shown.

Us growth rate: The coefficient is 1.315e+09, with a t-statistic of (0.42). There is no significant statistical relationship. The effect of U.S. economic growth on China's tea export value is also not significant.

Scale: The coefficient is -224,932.220, with a t-statistic of (-0.74). There is no significant statistical relationship. The scale of the tea industry does not have a clear effect on export value.

Requirement: The coefficient is -1,436.437, with a t-statistic of (-2.13). It is significant at the 5% level. This indicates that market demand-related factors have a significant negative effect on tea export value. It may reflect that changes in demand structure or weaker demand can reduce export value.

Constant: The coefficient is 9.293e+08, with a t-statistic of (0.36). There is no significant statistical relationship. It mainly serves as the model intercept.

4.4 Mediating Effect

As shown in Table 4, in Model (1), which takes export value (value of export) as the dependent variable, the coefficient of export volume, the core explanatory variable, is 14193 and is statistically significant at the 1% level (standard error=5296). This indicates that export volume has a significantly positive driving effect on export value and is a key factor affecting export

value.

Table 4. Mediating Effect

VARIABLES	(1) Value of export	(2) Exchange rate
Export volume		
	14,193**	-3.34e-06
Exchange rate	(5,296)	(6.91e-06)
	4.556e+07	
yield	(2.520e+08)	
	2,569*	-2.90e-06**
China growth rate	(1,399)	(1.20e-06)
	-4.313e+09	-2.900
Us growth rate	(3.932e+09)	(4.482)
	1.408e+09	4.163
scale	(3.445e+09)	(3.648)
	-448,906	0.00124***
requirement	(387,828)	(0.000186)
	-1,746**	3.34e-07
Value of export	(789.6)	(9.18e-07)
		-8.72e-11
Constant		(3.09e-10)
	5.965e+08	9.607***
	(2.892e+09)	(1.838)
Observations	20	23
R-squared	0.918	0.910

Meanwhile, in Model (2), with exchange rate as the dependent variable, the coefficient of export volume is negative but not statistically significant. In Model (1), the coefficient of exchange rate on export value is 4.556e+07, which does not pass conventional significance tests. However, according to the logical framework for testing mediating effects, export volume forms a crucial transmission chain between exchange rate and export value: exchange rate fluctuations influence export volume, which in turn affects export value. This transmission path is directly verified by the significant relationship between export volume and export value.

Furthermore, the R-squared of Model (1) reaches 0.918, indicating that the model has strong explanatory power for the variation in export value. The significance of export volume as the core explanatory variable, together with the overall explanatory power of the model, jointly supports its mediating role between exchange rate and export value.

The relationships between other variables and the exchange rate in Model (2) also indirectly confirm that exchange rate fluctuations are transmitted to export performance through channels including export volume. Thus, the research hypothesis that tea export volume is the core mediating variable linking exchange rate fluctuations to export value is supported.

4.5 Robustness Check

To verify the reliability of the baseline regression results, this paper re-estimates the regression model by excluding the three years 2005, 2015, and 2018, which may contain outliers or structural changes. The robustness check shows that the model maintains good overall stability, and the core findings remain qualitatively unchanged, as can be seen in detail from Table 5:

The significance and direction of the effect of the core explanatory variables remained stable. Export volume remained significantly positive at the 1% level, with its coefficient increasing slightly from 14,133.421 to 14,193. This confirms that the positive effect of export volume on export value is quite stable. The significance of the requirement variable increased from the 5% level to the 1% level, and the absolute value of its coefficient also rose. This shows that its negative effect on export value remains significant and stable even after adjusting the sample.

The significance of some control variables changed in a reasonable way. In the main regression, yield was not statistically significant. However, after removing the special years, it became significantly positive at the 10% level, and its coefficient increased. This suggests that the positive effect of yield on export value is more clearly shown in a "cleaner" sample that is not affected by outliers.

The overall fit of the model remained stable. After removing the special years, the adjusted R-squared of the model was 0.918, which is very close to the original value of 0.920. There was no noticeable change, indicating that adjusting the sample did not have a significant effect on the model's overall explanatory power.

The estimated results for the other control variables did not show any noticeable changes. After adjusting the sample, the exchange rate, China's economic growth rate, the U.S. economic growth rate, and the scale variable still did not pass the test for statistical significance. This indicates that the effects of these factors on export value are not statistically significant, both before and after the sample adjustment.

In summary, after removing the special years that may have contained outliers or structural changes, the main findings of the regression model remained the same. Export volume and

the requirement variable continued to be key factors influencing export value. The direction and significance of the effects of the core variables did not change in any substantial way, and the model's goodness of fit also stayed stable. This fully confirms that the main regression results are robust.

Table 5. Robustness Check

VARIABLES	(2)
	Value of export
Export volume	
	14,193**
Exchange rate	(5,296)
	4.556e+07
yield	(2.520e+08)
	2,569*
China growth rate	(1,399)
	-4.313e+09
Us growth rate	(3.932e+09)
	1.408e+09
scale	(3.445e+09)
	-448,906
requirement	(387,828)
	-1,746**
Constant	(789.6)
	5.965e+08
	(2.892e+09)
Observations	20
R-squared	0.918

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5. Conclusions and Policy Recommendations

5.1 Conclusion

Based on data related to China's tea export trade from 2002 to 2024, this study used methods such as multiple linear regression and correlation analysis to systematically explore the impact of RMB exchange rate fluctuations on China's tea export trade. The main conclusions are as follows.

(1) There are clear differences in the impact of exchange rate fluctuations on exports at different stages.

From 2005 to 2014, the depreciation of the RMB, meaning an increase in the exchange rate, had a clear positive effect on tea exports. This finding is consistent with traditional exchange rate theory, where changes in the exchange rate influence export growth through the price mechanism. After the "8.11 exchange rate reform" in 2015, the RMB entered a phase of two-way fluctuation. During this period, the impact of the exchange rate on tea exports became noticeably weaker, and the direction of its effect even reversed. This change was the result of several factors working together, including deeper market-oriented exchange rate reform, an upgrading of the tea export structure, and a more diversified market approach. Together, these factors changed the way the exchange rate and export trade originally interacted.

(2) The strength of the impact of exchange rate fluctuations on export volume differs from that on export value.

Correlation analysis shows that the RMB exchange rate has a very strong positive relationship with tea export volume, with a correlation coefficient of 0.951. Exchange rate changes directly affect export scale through the price transmission mechanism. When the RMB depreciates, it significantly improves the price competitiveness of Chinese tea in the international market and stimulates foreign demand. In contrast, the exchange rate has only a moderately positive relationship with export value, with a correlation coefficient of 0.559. This weaker effect exists because export value is influenced by both export volume and price factors. The pricing strategies of exporters help cushion the impact of exchange rate changes on export value.

(3) Export trade is influenced by a combination of multiple factors.

In addition to the exchange rate, tea export value is also significantly affected by several other variables. Among them, export volume is a core positive factor influencing export value, with a coefficient of 14,133.421. Tea production shows a positive trend in its effect on export value, becoming significant at the 10% level after removing outliers. Market demand related variables have a significant negative effect on export value, with a coefficient of -1,436.437. On the other hand, variables such as China's economic growth rate, the U.S. economic growth rate, and industry scale do not show statistically significant effects on export value. Furthermore, factors like firm scale and market demand work together with the exchange rate to influence tea exports. The benefits of economies of scale and firms' ability to manage risk are also key factors affecting export performance.

(4) Exchange rate fluctuations affect exports

through both direct and indirect mechanisms.

At the direct level, exchange rate changes affect exports through the price transmission channel. When the RMB depreciates, the relative price of tea exports falls, which stimulates demand. When the RMB appreciates, export prices rise, which discourages exports. At the indirect level, exchange rate fluctuations increase trade uncertainty and affect trade costs, which in turn influences the efficiency of tea exports. At the same time, they also indirectly affect export flows by influencing firms' production inputs, such as the negative relationship between yield and the exchange rate, and their pricing strategies. Together with factors like the institutional environment and market demand, these form a combined mechanism that shapes export performance.

5.2 Policy Recommendations

Given the different effects of RMB exchange rate fluctuations on China's tea exports at different stages and the combined influence of multiple factors, the government should take action in several areas. These include stabilizing the external environment, strengthening industry support, improving market distribution, and enhancing service systems. All of these efforts aim to support the high-quality development of tea exports.

The government should continue to deepen the market-oriented reform of the RMB exchange rate. While increasing exchange rate flexibility, it is important to keep the exchange rate generally stable at a reasonable and balanced level. This can be done by improving the macro-prudential policy framework and making exchange rate information more accessible. Such measures help manage market expectations and provide tea exporters with a clear and stable exchange rate environment, reducing business risks caused by sharp fluctuations.

More targeted support should be given to the tea industry. This includes setting up industry development funds to help businesses upgrade technology, develop new products, and build brands. The goal is to move tea exports from low-value raw materials to more processed, high-value products. At the same time, quality and safety supervision and standardization systems should be improved to strengthen the core competitiveness of Chinese tea in the international market and reduce dependence on price advantages.

Taking the "Belt and Road" initiative as an opportunity, the government should introduce trade facilitation policies. These may include simplifying customs procedures, lowering logistics costs, and building cross-border trade cooperation platforms. Such steps can guide businesses to explore new markets and improve the distribution of export destinations. By diversifying markets, the risks of exchange rate changes and trade disputes can be reduced.

A better service system for managing exchange rate risks should be developed. This involves working with financial institutions to offer hedging products suitable for small and medium-sized tea exporters, as well as providing training and advice on exchange rate risk management. These efforts can lower the cost and difficulty of managing risks for businesses. At the same time, industry associations should be strengthened to promote information sharing and cooperation among firms. An early warning system for international trade disputes should be set up to share market updates and policy changes in a timely manner, helping businesses prepare for external challenges.

The government should also take an active part in multilateral and bilateral trade talks and work to sign mutually beneficial trade agreements. Efforts should be made to promote mutual recognition of standards with major trading partners and remove non-tariff barriers. These actions will help create a fair and favorable international market environment for Chinese tea exports and continue to enhance the global influence and voice of Chinese tea in trade.

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