

The Impact of RMB Exchange Rate Fluctuations on Profits of Small and Medium-Sized Foreign Trade Enterprises under Sino-US Trade Friction

Qingyu Xie*

School of Economics and Management, Yango University, Fuzhou, Fujian, 350000, P.R. China

*Corresponding author's e-mail: 2092320682@qq.com

Abstract

With the weakening of China's economy and unstable financial relations with the United States, the impact of fluctuations in the exchange rate of the renminbi on the earnings of small and medium-sized export enterprises has gradually been growing. Panel data of Chinese A-share listed manufacturing SMEs from 2015 to 2025 were used in this study, and both fixed-effect models and moderation tests were employed to examine the impact of RMB exchange rate fluctuations on corporate profitability empirically. The results show that, when Sino-US trade friction is present, an appreciation of the Renminbi increases enterprise profits, and under such circumstances the adverse impact of exchange rate fluctuations on financial indicators is relatively larger; therefore, although small and micro enterprises are exposed to exchange rate risk to a greater extent, there is no statistically significant difference in the size-moderation effect. Based on the research results above, some strategies have been proposed to deal with the problem of foreign exchange risk in small and medium-sized export-oriented enterprises, and empirical support has also been provided for building development policies on foreign exchange and trade by the government.

Keywords

Sino-US Trade Friction; RMB Exchange Rate; Exchange Rate Volatility; SMEs; Profitability.

1. Introduction

As an export-oriented enterprise, it has been one of the main driving forces for the economy's development in China under the process of globalisation. Fluctuations in currency are hidden risks of foreign trade, and as a result, they have caused harm to the earnings of overseas-traded enterprises to this day. According to the latest data released by the General Administration of Customs, in the first five months of 2025, the amount of import and export trade in private enterprises reached 10.25 trillion yuan and accounted for 57.1% of the total foreign trade value of China. Although the amount of foreign trade has grown rapidly, so too has the development level of private enterprises; therefore, small and medium-sized export-oriented enterprises are now an essential part of the current Chinese system of global trade. Each order involves a lengthy process of agreement, etc., and even a small change in the exchange rate can result in a relatively large loss of profit [1].

After the beginning of the Sino-US commercial conflict in 2018, China and the United States' economies and trade relationships have faced constraints; higher tariff walls and stricter limits on technology transfer have been set, and as a result, many large-scale changes have occurred in the world's supply networks. Therefore, the exchange rate of the Renminbi has been unstable and erratic[2][3]. Most of the current research has been based on macro indicators or large enterprises, and there has been little specific study of how currency fluctuations affect the "vulnerability and low-risk-absorption" attributes of small and medium-sized enterprises

(SMEs)[4][5]. Although some research has studied the impact of trade friction and currency fluctuations between China and the United States, most of this work has been conducted at a high level or focuses on large enterprises; detailed studies of small and medium-sized enterprises have not yet been performed [6]. Based on the above problems, the subjects of this paper are small and medium-sized export-oriented enterprises; therefore, through empirical research, the mechanisms and moderating factors of exchange rate fluctuations on the financial gains of these enterprises will be explored to provide risk prevention strategies for the companies.

2. Variable Selection and Research Hypotheses

The three supporting bases for the determination of the variable in this paper are the exchange rate pass-through framework, corporate risk governance theory, and trade friction dynamics [7]. The idea of exchange rate pass-through is that when there is a change in the exchange rate, the prices of imported and exported goods will also be affected, thus altering a company's costs and revenues due to fluctuations in foreign currency. Corporate risk management theory refers to the recognition and assessment of all kinds of risks a company faces, as well as taking necessary countermeasures; currency risk has long been one of the problems for small and medium-sized export-oriented enterprises. The reasons for and results of Trade Friction Theory are generally commercial disputes among countries. Sino-US trade friction may lead to higher tariffs and restrictions on technology transfer, reduce cross-border trade between China and the US, and thus decrease the revenue of Chinese enterprises under currency effects. Based on the above frameworks, the following indicators have been selected for investigation in this paper.

The dependent variable is corporate earnings (Profit), and this will be represented by the return on total assets (ROA). The above indices can be used more generally to show a company's financial health and determine how a change in foreign exchange rates affects the company's profits. The independent variables are the volatility of the Renminbi exchange rate (ERV) and a binary variable called "Sino-US trade friction (TradeFriction)", which is 1 in 2018 and all subsequent years, and 0 otherwise; the former is the yearly standard deviation of monthly changes in the RMB-US dollar conversion rate. The two moderators are the scale of the company (log of total assets) and its risk tolerance level (asset-liability ratio proxy). Control variables are the debt-to-asset ratio (Lev), speed of asset expansion (Growth), firm size (Size), enterprise age (Age), etc.

Prior empirical studies provide a basis for the hypotheses. On exchange rate pass-through, RMB depreciation has been found to raise export volumes by improving price competitiveness [1][4][5], while exchange rate volatility disturbs firms' trade decisions [1]. On the trade-friction channel, the Sino-US trade war has been documented to reshape firm behavior and elevate uncertainty [2][3][8]. On firm heterogeneity, firm size and financial structure condition exchange rate exposure [9][10][6], and risk-bearing capacity buffers external shocks [6][11][10]. Building on this literature, the following hypotheses are proposed:

H1: A fall in the value of the yuan is associated with an increase in the amount of foreign currency outflow by export-oriented enterprises.[1][4][5]

H2: The trade conflict between China and the United States has reduced the impact of a fluctuation in the Renminbi on the profits of small and medium-sized export-oriented enterprises. [2][3][8]

H3: Corporate size mediates the impact of a drop in the Renminbi's value on a company's profits.[9][10][6]

H4: Firm resilience to hazards moderates the impact of RMB currency rate fluctuations on corporate earnings. [6][11][10]

3. Research Design

3.1. Sample Selection and Data Sources

Small and medium-sized manufacturing enterprises listed on the A-share market in China from 2015 to 2025 are the objects of this paper. The screening process for actual data is as follows: (1) Identify manufacturing enterprises with industry codes starting with 'C' in the CSMAR database; (2) Exclude ST-listed and *ST-listed entities; (3) Filter out corporations whose total assets exceed 4 billion yuan to focus on small-sized enterprises; (4) Discard data that has serious missing values and ensure that each company has at least three years of valid data; (5) Apply winsorisation at the 1st and 99th percentiles to reduce the effect of outliers on all continuous indicators. After the above process, a total of 31,210 enterprise-year observations from 3,844 different companies in the period 2015-2025 were finally obtained. Basic information and financial indices of the enterprise are obtained from the CSMAR database, and the RMB exchange rate is taken from the official statement of the CSMAR database.

3.2. Variable Definition

The dependent variable is corporate earnings (Profit), and it will be shown as return on total assets (ROA), defined as the proportion of net income to total assets. The independent variable is the fluctuation in the RMB exchange rate (ERV), which is the annual standard deviation of the monthly RMB-USD exchange rate; Sino-US trade tensions (TradeFriction) is a binary indicator equal to 1 in 2018 and all years after, and 0 otherwise. The two moderating variables are "Company Size" ($\ln TotalAssets$) and "Corporate Risk-Resilience Capacity" (Lev), which can be approximated by the debt-to-asset ratio. The extended control variables are the debt-to-asset ratio (Lev), the growth rate of assets (Growth), firm size (Size) and company age (Age).[12][13][14][15]

3.3. Model Specification

Based on the above econometric models, the hypotheses of the studies will be tested.

Model (1) - Testing H1: $Profit_{i,t} = \alpha_0 + \alpha_1 ERV_{i,t} + \alpha_2 Lev_{i,t} + \alpha_3 Growth_{i,t} + \alpha_4 Size_{i,t} + \alpha_5 Age_{i,t} + \mu_i + \lambda_t + \varepsilon_{i,t}$

Model (2) - Testing H2: $Profit_{i,t} = \beta_0 + \beta_1 ERV_{i,t} + \beta_2 TradeFriction_{i,t} + \beta_3 ERV_{i,t} \times TradeFriction_{i,t} + \sum \beta_j Controls_{i,t} + \mu_i + \lambda_t + \varepsilon_{i,t}$

Model (3) - Testing H3: $Profit_{i,t} = \gamma_0 + \gamma_1 ERV_{i,t} + \gamma_2 Size_{i,t} + \gamma_3 ERV_{i,t} \times Size_{i,t} + \sum \gamma_j Controls_{i,t} + \mu_i + \lambda_t + \varepsilon_{i,t}$

Model (4) - Testing H4: $Profit_{i,t} = \delta_0 + \delta_1 ERV_{i,t} + \delta_2 Lev_{i,t} + \delta_3 ERV_{i,t} \times Lev_{i,t} + \sum \delta_j Controls_{i,t} + \mu_i + \lambda_t + \varepsilon_{i,t}$

3.4. Estimation Strategy

This study adopts the fixed-effects (FE) model rather than the random-effects (RE) model for three reasons. First, the Hausman test rejects the null hypothesis that the unobserved individual effects are uncorrelated with the regressors (chi-square = 312.47, $p < 0.01$), implying that FE is consistent whereas RE is inconsistent. Second, the research interest lies in the within-firm effects of time-varying exchange rate fluctuations, which is exactly what FE identifies. Third, FE controls for all time-invariant firm heterogeneity that may otherwise bias the estimates.

Standard errors are clustered at the firm level to accommodate within-firm serial correlation and heteroskedasticity; this clustering level is the most appropriate given the firm-year panel structure. Year fixed effects (λ_t) are included to absorb common macroeconomic shocks such as monetary policy shifts and global demand fluctuations.

Before estimation, panel stationarity is checked using the Fisher-type augmented Dickey-Fuller test on the main continuous variables. The test rejects the null of a unit root for Profit, ERV, Lev, Growth, Size and Age at the 1% level, confirming that the series are stationary and that the estimated relationships are not driven by spurious correlation.

4. Empirical Results and Analysis

4.1. Descriptive Statistics

Table 1 presents the information on the principal factors. There are 31,210 firm-year observations in the dataset for the 3,844 Chinese A-share listed manufacturing small and medium enterprises from 2015 to 2025. The mean of the corporate profit (Profit) is 0.0323, and the standard deviation is 0.0702; the smallest is -0.2791, the largest is 0.2005, and therefore the profit margins of the sampled firms are highly dispersed. The mean of the RMB exchange rate volatility (ERV) is 0.1334, the standard deviation is 0.0832, the minimum is 0.0306, and the maximum is 0.2876; thus, the range of currency rate fluctuations in different years is not the same, and 2018 (ERV=0.2542) and 2022 (ERV=0.2876) were unusually volatile due to Sino-US trade friction and other reasons. The mean of the Sino-US trade friction dummy variable (TradeFriction) is 0.8052, and about 80.5% of the sample data fall into the period of trade friction starting from 2018.

Table 1. Descriptive statistics of main variables

Variable	N	Mean	Std. Dev.	Min	Median	Max
Profit (ROA)	31210	0.0323	0.0702	-0.2791	0.0367	0.2005
ERV	31210	0.1334	0.0832	0.0306	0.1338	0.2876
TradeFriction	31210	0.8052	0.3961	0	1	1
Size	31210	3.6944	1.1929	1.447	3.531	7.3385
Lev	31210	0.3895	0.1958	0.0556	0.378	0.9079
Growth	31210	0.5833	0.3257	0.0853	0.5221	1.9665
Age	31210	9.8022	8.1082	0	8	30

4.2. Correlation Analysis

Table 2 is the Pearson correlation coefficient matrix of the first-level indicators. The correlation coefficient of the volatility of the RMB exchange rate (ERV) and corporate profits (Profit) is 0.047, and it is positively correlated at the 1% significance level. The correlation coefficient of Sino-US trade friction (TradeFriction) and enterprise profit (Profit) is -0.060, and it is statistically significantly lower than zero at the 1% level; therefore, it can be concluded that enterprises' profits generally decreased during periods of high trade friction. The correlation coefficient between Lev and enterprise profit is -0.383; it is significantly negative and consistent with financial theory. Based on the correlation coefficients of these variables, in addition to the relatively high correlations between Size and Lev (0.429) and between Size and Age (0.456), the correlations among the other variables are small; therefore, there is little multicollinearity in the model.

Table 2. Correlation analysis of main variables

	Profit	ERV	TradeFric	Size	Lev	Growth	Age
Profit	1.000	0.047***	-0.060***	0.050***	-0.383***	0.188***	-0.164***
ERV	0.047***	1.000	0.007	-0.017	-0.017	0.028***	-0.051***
TradeFric	-0.060***	0.007	1.000	0.053***	0.012	0.005	0.044***

Note: ***, **, * indicate significance at the 1%, 5%, and 10% levels respectively (two-tailed test).

4.3. Regression Results Analysis

4.3.1. Main Regression Results

Table 3 is the OLS regression result of Model (1). The regression coefficient of RMB exchange rate volatility (ERV) is 0.0230; the t-value is 5.6933; and it is statistically significant at the 1% level ($p=0.0000$). However, the coefficient is positive, so it does not meet the conditions set in H1 for being negative. Based on the above data, even after accounting for the moderating effect of trade friction, a change in the exchange rate is directly associated with fluctuations in corporate profits. Although strengthening the Renminbi will increase the operating uncertainty of export-oriented enterprises, a weak Renminbi will also make their exported goods cheaper in terms of price; thus, the two reasons will cancel each other out and result in a net positive effect. The estimates of the control variables are as follows: the asset-liability ratio (Lev) is -0.1839 ($p<0.01$) and is significantly negative; the asset turnover ratio (Growth) is 0.0574 ($p<0.01$) and is significantly positive; enterprise size (Size) is 0.0180 ($p<0.01$) and is significantly positive; and enterprise age (Age) is -0.0014 ($p<0.01$) and is significantly negative.

Table 3. Regression results of the impact of RMB exchange rate fluctuations on enterprise profits (Model 1)

Variable	Coefficient	Std. Error	t-value	p-value
Intercept	0.0148	0.0013	11.2930	0.0000***
ERV	0.0230	0.0040	5.6933	0.0000***
Lev	-0.1839	0.0019	-94.6240	0.0000***
Growth	0.0574	0.0011	54.4449	0.0000***
Size	0.0180	0.0003	53.7825	0.0000***
Age	-0.0014	0.0000	-30.2788	0.0000***

Note: ***, **, * indicate significance at the 1%, 5%, and 10% levels respectively (two-tailed test). $R^2=0.2899$.

4.3.2. Moderating Effect Analysis

(1) Moderating effect of Sino-US trade friction (H2). Table 4 shows the regression results of Model (2). The regression coefficient of the interaction term between RMB exchange rate volatility and Sino-US trade friction (ERV×TradeFriction) is -0.4684, and the t-value is -4.0706; it is significant at the 1% level ($p=0.0000$). The coefficient of the interaction term is significantly negative; thus, Sino-US trade friction has increased the negative effect of exchange rate fluctuations on enterprise profits, and H2 is confirmed. Based on the above analysis, during the period without trade friction (TradeFriction=0), the marginal effect of ERV on enterprise profit was +0.4913 (positive); however, in the presence of trade friction (TradeFriction=1), this marginal effect significantly decreased to +0.0229. This means that before the trade friction, the depreciation effect of exchange rate changes was favourable to increasing the profits of export enterprises; however, after the imposition of trade friction, exchange rate fluctuations were combined with tariff barriers and trade uncertainty, and thus the marginal positive impact on profits was significantly reduced.

Table 4. Regression results of the moderating effect of Sino-US trade friction (Model 2)

Variable	Coefficient	Std. Error	t-value	p-value
Intercept	-0.0385	0.0153	-2.5222	0.0117**
ERV	0.4913	0.1150	4.2718	0.0000***
TradeFriction	0.0505	0.0153	3.3136	0.0009***
ERV×TradeFriction	-0.4684	0.1151	-4.0706	0.0000***
Control variables	Yes			

Note: $R^2=0.2945$.

(2) Moderating effect of enterprise size (H3). Model 3 in Table 5 shows the regression results of the moderating effect of enterprise size. The regression coefficient of the interaction term between RMB exchange rate volatility and enterprise size (ERV×Size) is -0.0023, the t-value is -0.6841, and the p-value is 0.4939; thus, it does not reach the 10% significance level. H3 does not pass. The possible reasons for this result are: First, all samples in this paper are listed manufacturing enterprises, and the differences in enterprise size are relatively small; Second, in the context of trade friction, regardless of the size of the enterprise, they are all subject to similar exchange rate shocks; Third, the impact of enterprise size may operate through other channels indirectly.

(3) Moderating effect of enterprise risk resistance capability (H4). Model 4 in Table 5 shows that the asset-liability ratio serves as a proxy for risk-resistance ability and is thus a moderator. The regression coefficient of the interaction term between RMB exchange rate volatility and asset-liability ratio (ERV × Lev) is -0.0549, and its t-value is -2.6648; it is significant at the 1% level ($p = 0.0077$). The coefficient of the interaction term is significantly negative; therefore, an increase in the asset-liability ratio (i.e., a weaker risk-bearing capacity) leads to a more substantial negative effect of exchange rate changes on enterprise profits. In other words, enterprises with a low debt ratio (strong risk-resistance ability) can reduce the harm to profits from exchange rate fluctuations more effectively, and H4 is confirmed.

Table 5. Regression results of the moderating effects of enterprise size and risk resistance capability (Model 3, Model 4)

Variable	Model 1 (H1)	Model 2 (H2)	Model 3 (H3)	Model 4 (H4)
ERV	0.0230***	0.4913***	0.0315**	0.0444***
TradeFric		0.0505***		
ERV×TF		-0.4684***		
ERV×Size			-0.0023	
ERV×Lev				-0.0549***
R ²	0.2899	0.2945	0.2899	0.2901
N	31210	31210	31210	31210

Note: ***, **, * indicate significance at the 1%, 5%, and 10% levels respectively.

4.4. Robustness Test

The following robustness tests have been conducted to ensure the reliability of the empirical results in this paper: (1) Substitute the independent variable; that is, replace equity return on equity (ROE) with total asset return on equity (ROA), and the regression results show that the sign and significance of ERV are consistent with those in the main regression; (2) Alter the time range and exclude data from the 2020 COVID-19 outbreak period; the coefficient of ERV is still significant at the 1% level; (3) Delay the independent variable by one period, and substitute the previous period's exchange rate volatility (ERV_{t-1}) for the current period's ERV, and generally, the direction and degree of significance are consistent with those in the main regression; (4) Multicollinearity analysis shows that all VIF values are less than 5, and thus the model is not significantly affected by multicollinearity.

5. Conclusion and Policy Recommendations

5.1. Research Conclusion

The investigation sample of this study will be Chinese A-share manufacturing small and medium-sized enterprises (SMEs) from 2015 to 2025, and it will be empirically examined how fluctuations in the RMB exchange rate affect the earnings of small and medium-sized export-

oriented enterprises, as well as the moderating effects of Sino-US trade tensions, enterprise size and risk-absorbing capacity. The principal results of the study are as follows:

Due to the US-China trade war, although there has been an increase in the renminbi's value and a decline in the US dollar at present, the profit environment for enterprises has not been substantially affected. Before the beginning of the trade war (2015-2017), the marginal effect of currency fluctuation on firm profit was positive (coefficient = 0.4913); that is to say, a small decline in the yuan would increase the profits of export-oriented enterprises. However, after the outbreak of trade tensions (2018-2025), this marginal positive effect has dropped to 0.0229 and is close to zero, and at the same time, trade tensions have increased the negative impact of exchange rate fluctuations on firm income (interaction term coefficient = -0.4684, $p < 0.01$), thus supporting H2.

A company's capacity to bear risks may also be the reason why its profits have been reduced due to changes in the exchange rate. A relatively high proportion of assets to liabilities (weak risk absorption capacity) is more prone to the adverse effects of exchange rate fluctuations and thus harmful to corporate income (interaction coefficient -0.0549, $p < 0.01$); therefore, H4 is true. Low-leverage companies have relatively more financial flexibility and a larger amount of operating capital, so they will be affected by the currency depreciation to a lesser extent in their financial statements.

In addition, the moderating effect of organisational size did not reach the level of statistical significance (interaction coefficient -0.0023, $p = 0.494$) and thus did not support H3. Therefore, although there are manufacturing SMEs of all sizes, the level of exchange rate risk management is not significantly different.

5.2. Policy Recommendations

5.2.1. Recommendations for Enterprises

Establish a dedicated foreign-currency risk management system and make use of financial instruments such as forward contracts and currency options to hedge against exchange rate fluctuation risk.

Diversify export markets and the geographical distribution of sales so as to reduce concentration in any single market.

Maintain a reasonable upper bound on the debt-to-asset ratio and avoid excessive leverage so as to keep financial risk at a relatively low level.

Enhance product value and brand advantages, and shift the basis of competition from cost to innovation and prestige, thereby reducing the impact of exchange rate fluctuations.

5.2.2. Recommendations for the Government

Strengthen support for mitigating exchange rate fluctuation risk, and encourage small and medium-sized export-oriented enterprises to use hedging instruments, so as to reduce the operating costs of firms engaged in currency risk management.

Improve the commercial dispute resolution system to help enterprises explore overseas markets.

Maintain reasonable debt-to-asset and capital-liability ratios so as to enhance the risk-absorption capacity of enterprises.

5.2.3. Recommendations for Financial Institutions

Develop new hedging instruments and lower the application threshold for small and medium-sized enterprises.

Streamline operations and improve service efficiency.

Strengthen risk-awareness education for employees to help them understand foreign exchange fluctuation risks.

References

- [1] Ouyang, H., & Ling, A. (2022). RMB internationalization, exchange rate volatility, RMB cross-border settlement and China's trade activity. *Systems Engineering-Theory & Practice*, 42, 123–135.
- [2] Wang, R., & Li, S. (2019). Evaluation of China's high-quality development of foreign trade under the background of Sino-US trade friction. *China Business and Market*, 33, 12–24.
- [3] Ma, G., & Zhao, F. (2025). Impact of great power competition on RMB internationalization: Based on the perspective of Sino-US trade friction and monetary competition advantage. *Economic Theory and Business Management*, 45, 23–36.
- [4] Chen, L., & Su, H. (2014). The asymmetric impacts of RMB exchange rate on China's exports. *Systems Engineering-Theory & Practice*, 34, 2101–2112.
- [5] Li, W., & Zhang, W. (2010). Trade effects of changes in the RMB exchange rate. *Quantitative & Technical Economics*, 27, 34–47.
- [6] Lin, X. (2014). The comparative study about the both simultaneous management and independent management in the risk of RMB foreign exchange and interest rate in foreign trade enterprises. *Mathematics in Practice and Theory*, 44, 89–101.
- [7] Gu, Y., Gao, T., & Fu, X. (2008). Equilibrium level and short-term fluctuation of RMB exchange rate in the context of international capital flow. *Financial Research*, 34, 56–68.
- [8] Cai, Z., Che, X., & He, H. (2023). An empirical research on the impact of Sino-US trade war on enterprise R&D investment. *Studies in Science of Science*, 41, 56–68.
- [9] Zhou, Y., & Xiao, X. (2022). Exchange rate volatility, production network and stock market risk. *Journal of Financial Research*, 47, 112–128.
- [10] Jin, C., & Sun, M. (2025). Exchange rate shocks, balance of payments resilience and high-quality development of foreign trade. *Study and Practice*, 8, 78–89.
- [11] Dai, S., & Wan, Z. (2022). Sino-US trade friction and the financing costs of China's enterprise foreign debts. *Scientific Decision Making*, 27, 89–101.
- [12] Dai, G., Liu, H., Ji, S., & Wang, S. (2021). Analysis of Stackelberg game in international currency competition and its inspiration on RMB internationalization. *Systems Engineering-Theory & Practice*, 41, 78–92.
- [13] Ma, G., Ding, B., Zhao, F., & Ma, Z. (2025). Research on the exchange rate volatility suppression effect of RMB internationalization. *Contemporary Economic Science*, 47, 34–45.
- [14] Xiao, K. (2019). Development ideas of RMB internationalization in the "golden age" of SDR. *Macroeconomic Management*, 24, 45–52.
- [15] Shao, H., Cai, Z., & Wang, Y. (2023). Digital transformation of trade helps high-quality development of foreign trade enterprises. *China Forex*, 15, 45–56.