The Impact of the Exchange Rate on Enterprise's International Export Trade Sales during Economic Downturn Cycles

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Abstract. Research has shown that the exchange rate will affect the export volume of enterprises. The exchange rate significantly impacts a country's economy, including its foreign exchange and financial aspects. ordinary least squares (OLS) will be utilized in the research to assess the impact of exchange rates on export trade volume during economic downturns. Through regression equations, it was found that the exchange rates of major trading countries have an impact on export volume, while the exchange rate of the US dollar has no impact, but the exchange rate of the US dollar has an impact on gasoline engine sales. The main reason for this is that excessive exchange rate fluctuations can cause customers to be bearish on their currency value, so the country should formulate a stable monetary policy, companies should carry out digital risk management, and actively pay attention to changes in the international situation to cope with exchange rate fluctuations with a positive attitude.

1 Introduction

The downward phase in the economic cycle usually has a significant impact on an enterprise's international export trade sales, and exchange rate fluctuations are one of the key factors. Any change in the international situation directly impacts exchange rates and further affects the sales revenues of foreign trade enterprises. For example, an international trade war is an economic conflict between two countries that usually involves raising tariffs and imposing trade restrictions aimed at altering the trade relationship and economic interests of both parties. Geopolitics profoundly affects a country's security, economic, and diplomatic strategies, shaping its international status and regional influence. Factors such as leadership changes in neighboring countries, the construction of key infrastructure such as railroads and canals, and the situation in the Straits can significantly affect a country's foreign trade. The current tough international situation and geopolitical conflicts have had a significant impact on the RMB exchange rate, while fluctuations in the exchange rate may have both positive and negative effects on a company's sales revenue.

Exchange rate appreciation usually leads to an increase in the price of an enterprise's products in the international market, which reduces its competitiveness in the overseas market and decreases export sales revenue. On the contrary, the exchange rate depreciation

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may give enterprise products in the international market a price advantage and promote the growth of export sales revenue. Therefore, foreign trade enterprises need to pay close attention to exchange rate fluctuations, especially changes in major trading countries' monetary policies and economic situations, in the face of increasingly complex international situations and geopolitical conflicts.

This study will take the world's largest piston pump manufacturer as a case study, which has an annual output value of 200 million yuan, has more than 200 employees, and its products are sold to more than 10 countries worldwide. The product sales distribution is shown in Figure 1. By analyzing the enterprise's export sales data, this study aims to explore the specific impact of exchange rate fluctuations on the enterprise's export sales and provide suggestions on how the enterprise can cope with exchange rate risks.

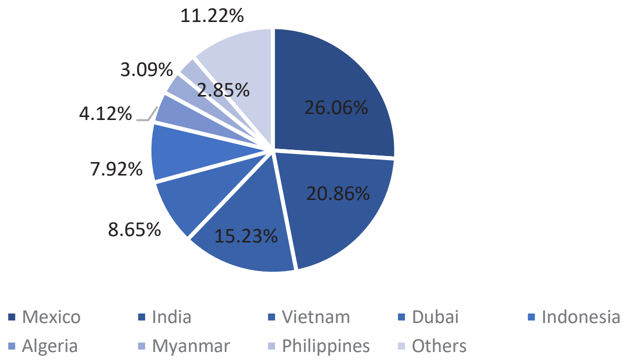

Fig. 1. The product sales distribution (Photo credit: Original).

2 Method

Ordinary Least Squares (OLS) will be utilized in the research, finding the P-value, R square, significance F, and their coefficients to assess their impact. The regression equation is as follows.

$$\text{Actual export trade volume} = a + b{*}\text{dollar1 exchange rate} + c{*}\text{dollar2 exchange rate} + d{*}\text{dollar3 exchange rate} + \cdots + res \quad (1)$$

$$\text{Actual export trade volume} = a + b{*}\text{American dollar exchange rate} + res \quad (2)$$

$$\text{Actual core product trade volume} = a + b{*}\text{American dollar exchange rate} + res \quad (3)$$

3 Results

As shown in Table 1, the P value of MXN/CNY and DZD/CNY is less than 0.05, meaning that the exchange of MXN and DZD has a significant impact on export sales volume.

Table 1. Regression results for MXN and DZD.

Dependent Variable: ACTUAL_TOTAL_K
Method: Least Squares
Sample: 1 37
Included observations: 37

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	59974.65	51914.65	1.155255	0.2594
MXN_CNY	130987.4	54824.62	2.389207	0.0251
DZD_CNY	-1273757.	598017.8	-2.129964	0.0436
AED_CNY	69921.20	50224.61	1.392170	0.1766
IDR_CNY	-1.00E+08	1.05E+08	-0.961667	0.3458
INR_CNY	-1180426.	751872.7	-1.569981	0.1295
KHR_CNY	-79285633	55769638	-1.421663	0.1680
LAK_CNY	16050796	21448142	0.748354	0.4615
MMK_CNY	3829881.	3604805.	1.062438	0.2986
MYR_CNY	7469.730	33825.44	0.220832	0.8271
PHP_CNY	451270.2	405592.7	1.112619	0.2769
THB_CNY	-185411.1	199759.1	-0.928174	0.3626
VND_CNY	2.16E+08	1.36E+08	1.596730	0.1234
R-squared	0.400622	Mean dependent var		9481.647
Adjusted R-squared	0.100933	S.D. dependent var		2607.623
S.E. of regression	2472.526	Akaike info criterion		18.73371
Sum squared resid	1.47E+08	Schwarz criterion		19.29971
Log likelihood	-333.5736	Hannan-Quinn criter.		18.93325
F-statistic	1.336793	Durbin-Watson stat		2.263766
Prob(F-statistic)	0.262218			

As shown in Table 2, the P value of USD/CNY is more than 0.05, meaning that the exchange of USD/CNY does not significantly impact export sales volume.

Table 2. Regression results for USD and CNY.

Dependent Variable: ACTUAL_TOTAL_K				
Method: Least Squares				
Sample (adjusted): 1 75				
Included observations: 75 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4505.985	9453.211	0.476662	0.6350
USD_CNY	400.8518	1392.024	0.287963	0.7742
R-squared	0.001135	Mean dependent var		7225.791
Adjusted R-squared	-0.012548	S.D. dependent var		3394.580
S.E. of regression	3415.812	Akaike info criterion		19.13652
Sum squared resid	8.52E+08	Schwarz criterion		19.19832
Log likelihood	-715.6196	Hannan-Quinn criter.		19.16120
F-statistic	0.082923	Durbin-Watson stat		0.771691
Prob(F-statistic)	0.774191			

As shown in Table 3 and Figure 2, the P value of USD/CNY is less than 0.05, meaning that the exchange of USD significantly impacts gasoline engine export sales volume. They are roughly proportional to each other.

Table 3. Regression results for USD and gasoline engine export sales volume.

Dependent Variable: ACTUAL_GASOLINE_ENGINE_K
Method: Least Squares
Sample: 1 51

Included observations: 51				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-7177.574	4358.484	-1.646805	0.1060
USD_CNY	1345.947	636.6989	2.113946	0.0396
R-squared	0.083577	Mean dependent var		2028.516
Adjusted R-squared	0.064875	S.D. dependent var		1299.173
S.E. of regression	1256.324	Akaike info criterion		17.14819
Sum squared resid	77339209	Schwarz criterion		17.22395
Log likelihood	-435.2790	Hannan-Quinn criter.		17.17714
F-statistic	4.468767	Durbin-Watson stat		0.985868
Prob(F-statistic)	0.039634			

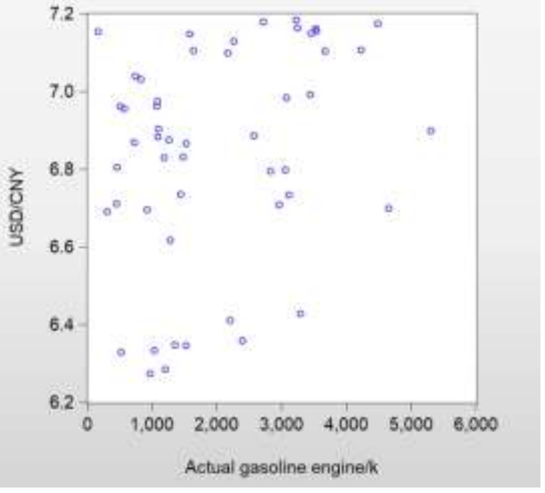

Fig. 2. Actual gasoline engine/k (Photo credit: Original).

4 Discussion

The exchange rates of major countries significantly impact sales, indicating that exchange rates impact sales, so the exchange rate changes of main sales countries should be carefully observed. The US dollar exchange rate is not significant for sales, which may be because the fluctuation of the US dollar exchange rate is too large, which leads to customers being bearish on the value of the Chinese yuan even if it falls. This lowers customers' psychological expectations, and they are not willing to place orders immediately but rather wait and see. This can be verified in actual bargaining. The US dollar exchange rate is significant for the sales volume of core products and gasoline engines, so the US exchange rate changes should be carefully observed.

The company's export sales revenue is affected by the international situation and geopolitical factors, especially in Southeast Asia, as well as part of the impact of the US dollar interest rate hike cycle and the China-US trade war. The Fed's interest rate cut cycle does not necessarily mean the renminbi will appreciate. During the first half of the third round of interest rate cuts by the Federal Reserve, there was upward pressure on the Chinese yuan. However, in the second half, due to the downward pressure on the domestic economy and the contagion effect of the Asian financial crisis, the renminbi came under pressure [1]. International and geopolitical factors significantly influence the company's export sales revenue. Especially the development of Southeast Asia, fluctuations in the US dollar interest rate cycle, and the ongoing impact of the US-China trade war on tariff changes play a crucial role. The international situation is dynamic, and any changes in the geopolitical landscape or countries' policies may lead to fluctuations in exchange rates. Border frictions, changes in neighboring country leaders, and critical infrastructure such as canal construction and strait conditions can affect the exchange rates of the two countries, further impacting their commercial exchanges. These exchange rate fluctuations, as well as changes in the value of the Chinese yuan relative to foreign currencies, have significantly impacted the company's export revenue. When the exchange rate between RMB and foreign currency changes, it is directly inversely proportional to the company's export sales revenue. Specifically, if the Chinese yuan appreciates against foreign currencies, it will make the company's products more expensive for buyers from other countries, which may lead to a decrease in export sales revenue. On the contrary, if the Chinese yuan depreciates against foreign currencies, the company's products will become cheaper for international buyers, which may increase export sales revenue. Therefore, exchange rate fluctuations are a key factor determining the performance of foreign trade companies in the international market, and foreign trade companies should closely monitor changes in the international situation, especially geopolitical news.

The country should prioritize developing and implementing a stable monetary policy to ensure economic stability and predictability. A well-structured and coherent monetary policy is crucial for maintaining economic confidence and creating a favorable business environment. The government department responsible for monetary policy must focus on formulating and implementing policies to minimize excessive fluctuations in currency value, especially the renminbi. Even in the case of a decline in the RMB exchange rate, the government should avoid causing significant volatility in the RMB because when a country's currency depreciates too much in a short period, foreign customers may be bearish on the prices of the target company's products and may not purchase them, but rather wait and see, which will have a negative impact on a country's foreign exchange income and affect its economic situation. Due to their respective characteristics, the impact of changes in industry trade-weighted exchange rates on domestic and international sales should be treated differently in different industries. The export volume of the textile and clothing industry is most affected by the appreciation of the RMB exchange rate, while the chemical industry is least affected [2]. However, the impact of exchange rates on sales is relatively small in some cases. The macroeconomic variables are moderately important in determining market share [3]. The excessive volatility of the Chinese yuan can lead to uncertainty in the financial market, affecting domestic and international economic transactions. Exchange rate fluctuations significantly impact the construction and development of a country's foreign trade and financial markets [4]. The fluctuation of the RMB exchange rate has many impacts on China's import and export trade and cross-border capital flows, especially leading to changes in the scale of international securities investment [5]. The stability of exchange rates supports international trade and investment by providing predictable institutional, regulatory, and customary frameworks for businesses. The RMB exchange rate index is significantly influenced by major international economies' price and interest rate levels [6]. A stable monetary policy should include measures to manage inflation, control interest rates, and intervene in the foreign exchange market when necessary to prevent sudden currency fluctuations. By implementing these policies, the government can help ensure that the renminbi remains within a controllable range, thereby protecting the economy from the adverse effects of extreme currency fluctuations. This method helps maintain economic stability, builds investor confidence, assists foreign trade enterprises in further development, and supports sustainable economic growth.

In addition, the risk control department within the company plays a crucial role in mitigating the impact of exchange rate fluctuations. The department should actively monitor and analyze geopolitical developments and policy changes, such as trade tensions between China and the United States or changes in the US presidential administration. These political factors will significantly affect the exchange rate and the company's import and export activities. Risk control departments should be prepared to adjust production and sales policies accordingly to cope with these geopolitical and economic changes. For example, suppose the trade friction between China and the United States escalates, leading to a possible depreciation of the renminbi. In that case, the company may need to reassess its pricing strategy or adjust its production plans to manage costs effectively. The risk control department can use the parameter, historical, and Monte Carlo simulation methods to calculate VaR and calculate the maximum possible loss the market may suffer under normal volatility. The exposure to exchange rate risk has a significant negative impact on financial performance, meaning that an increase in exchange rate risk exposure leads to a decrease in a company's economic performance. The size of exchange rate risk exposure affects a company's cash flow, and as a result, the company's financial performance is affected by exchange rate fluctuations [7]. A change in the leadership of the US President may bring about new trade policies or regulations that affect international trade dynamics. The optimal response of a firm's investment policy to movements in the exchange rate depends on various factors, such as the reliance on imported inputs and the share of foreign sales in total sales [8]. In this situation, the company should flexibly modify its strategy to reduce risks and seize opportunities.

Given the significant impact of domestic and international situations, exchange rate fluctuations, and the company's risk control department on international trade dynamics, foreign trade companies should closely monitor exchange rate fluctuations. We should further improve the exchange rate risk warning and control mechanism based on deepening the market-oriented reform of the exchange rate, provide more accurate exchange rate information and expected information for enterprises, enable enterprises to avoid risks in complex trade environments effectively, and thus have the ability to choose multiple transformation methods during transformation, making the digital transformation process of enterprises more benign [9]. To effectively manage this aspect, companies can leverage digitalization by integrating advanced digital platforms to monitor real-time exchange rate fluctuations. The company can input multiple quantitative formulas into the digital platform, including the exchange rates of various foreign trade countries and numerous risk factors that affect exchange rates, such as the International Political and Economic Uncertainty Index. The impact of the US EPU on the RMB exchange rate is significant [10]. The difference method can also be used to input changes in the company's institutional decisions into these formulas to calculate predicted and specific product sales revenue. Real-time data can be downloaded from the network and imported from internal company data to obtain the formula results. For these results, as well as the predicted sales revenue, adjustments can be made by dividing the inflation rate by adding the previous month's sales revenue to the independent variable of the formula to observe the relationship between sales revenue and exchange rate. These results will enable these platforms to provide valuable insights and predictions, helping companies more accurately forecast sales revenue. By utilizing this technology, businesses can make wiser decisions and adjust strategies to cope with currency fluctuations, thereby assisting in decision-making, supply chain management, and employee management, reducing risk costs, and expanding corporate profits.

By using digital quantification tools for real-time exchange rate monitoring and maintaining proactive risk management methods, foreign trade companies can better cope with the complexity of the global market and enhance their ability to withstand external pressures. This comprehensive strategy will ensure the company's financial performance and product output and support its long-term sustained growth and competitiveness on the international stage.

5 Conclusion

In summary, by analyzing the impact of exchange rate fluctuations on firms' international export trade sales during recessionary cycles, this study finds that exchange rate fluctuations in major trading countries have a significant impact on firms' export volumes, while the dollar exchange rate has no significant impact on overall export volumes but does have a significant impact on the sales of core products such as gasoline engines. This suggests that exchange rate fluctuations are not only related to the price competitiveness of firms, but also lead to a decline in customer confidence in the value of the currency due to excessive volatility. Therefore, the country should formulate a prudent monetary policy to reduce excessive exchange rate fluctuations, while enterprises need to establish a digital risk management system, pay close attention to changes in the international situation, and flexibly adjust their strategies. By applying digital quantitative tools and monitoring exchange rate fluctuations in real time, enterprises can improve their ability to cope with the complexity of the global market, enhance their international competitiveness, and ensure sustainable development in an uncertain external environment. This comprehensive strategy not only helps companies improve their financial performance and product output, but also ensures their long-term growth and competitive advantage in the international arena.

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