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RMB RESILIENCE STRATEGIES TO DRIVE BUSINESS PERFORMANCE AMID THE GLOBAL CRISIS

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Abstract. The purpose of this article is to examine the impact of RMB exchange rate fluctuations on the strategic decisions of Chinese companies in the context of their export activity in the foreign market. The research methodology is based on integrated annual customs data for the period 2014–2021 and econometric analysis. The upward fluctuations in the level of the real effective exchange rate of the RMB encourage companies to withdraw from foreign markets and lead to a significant slowdown in companies' export market entry. At the same time, companies with foreign capital are able to cope with currency risks to a much greater extent than companies with state and private participation. The analysis of company characteristics based on the principle of differentiation shows that company performance, profit volume, business scale, and export experience of a company can lead to a delay in the favorable effect of RMB appreciation for companies leaving export markets. This article provides valuable guidance for companies on strategies to avoid currency risks and make effective management decisions in the context of exports.

Keywords: business, foreign exchange market, export, modelling, money supply, strategy.

JEL Classification: G14, G18, H10.

Introduction

Under a mixed economy, China's government plays a key role in economic planning to make sure that the economy is heading in the right direction, while the economy is regulated by the market. Seventy years of hard work and forward-looking decisions have made China the world's second most powerful economy. China's development over the past 20 years has been remarkable. If one takes a retrospective look at the GDP of the top 5 largest economies, it will become immediately evident that China has almost tripled its GDP since the world crisis in 2008. The adoption of competent economic reforms and the presence of a sound long-

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term plan led to success as China's annual growth rate was around 10%. Due to the rapid growth of China's economy, the International Monetary Fund added the yuan or renminbi (RMB) to its basket of reserve currencies. At present, special drawing rights (SDRs) of the yuan are almost 11%, which makes the yuan the third most important currency after the dollar and the euro (Kan, 2017). A decision to include yuan in the SDR basket is reasonable enough given the fact that the yuan is one of the world's richest currencies and that China's foreign exchange (forex) reserves grew at a rapid pace in the period from 2000 to 2019 (Wang et al., 2021).

The Chinese government seeks to liberalize the economy by establishing free trade zones and issuing more favorable foreign exchange, international trade, and capital flow laws for successful business operation and development (Buckley, 2020). Some restrictions are in effect only in areas outside the free trade zone. In special economic and free trade zones, foreign trade and investment activities are generally liberalized. There, no restrictions on international payments and transfers of funds for current operations are in force, but foreign companies are subject to registration with the currency control authorities in a fast-track procedure when making foreign direct investments. Also, in the experimental free trade zones, simplified currency regulation and control regimes can be applied. As of 2021, there were 21 special zones throughout China, including in the most economically active provinces and municipalities (Guangdong, Shandong, Shanghai, Beijing, and others) (Chen et al., 2022). Unfortunately, the current state of financial infrastructure for yuan payments is inferior to the organization of dollar-denominated transactions available everywhere. In addition, given the yuan's continued managed float regime and lack of full convertibility, managing the level of currency risk in yuan transactions is harder than in the case of dollar transactions. The share of yuan in international trade settlements is 2.05%, and in international reserves: about 2%; it is used by more than 100 countries and more than 2,200 financial institutions (Hao et al., 2022; Rao, 2021; Zhou et al., 2020). Hence, already in 2015, China launched its own Cross-Border Interbank Payment System (CIPS) as an alternative to SWIFT to facilitate the yuan settlement process (He et al., 2021; Louie & Wang, 2021).

China's success has been largely due to the flexibility of its economy and a well-thought-out monetary policy. However, there are nuances around the recent mechanisms and motives underlying the monetary policy of China. Historically, these mechanisms and motives have been far from being standard and straightforward, and the economic reforms were implemented gradually and deliberately. At present, China is increasingly integrating into the world economy and currency management in this context is of great importance for supporting Chinese producers and protecting the national market, one of the world's largest markets at that (Peng & Kang, 2020). The recent crisis infecting the international financial markets proves how urgent these problems are. Many economies are currently facing a situation where central banks conduct effective monetary policies to stabilize the exchange rate, resulting in massive devaluations of national currencies. The consequences necessitate the need to reform the existing monetary system and renovate the international financial architecture. In such conditions, it is important to clarify the role currency exchange rates play in the formation of global imbalances and to determine factors that cause the instability of exchange rates to ensure efficient business operations (Gunay, 2021).

The hypotheses of this study are based on consideration of strategies for the sustainability of the yuan in a turbulent economic environment. Fluctuations in exchange rate differences directly affect the business decisions of enterprises that have taken the path of internationalization. In the context of the developing economy of China, the main exports are goods with low added value, thus we can say that exchange rate fluctuations will affect the volume and quality of exports.

Thus, the hypothesis of this study can be formulated as "confirmation or rejection of the relationship between fluctuations in the yuan exchange rate and the export strategies of industrial companies in China."

This is what our study will be devoted to, where both the theoretical background of the problem, the specifics of the methodological tools will be revealed, and a three-dimensional model will be implemented through which the main testing of the hypothesis will take place.

1. Theoretical background

The outflow of capital from China can be explained by a number of objective reasons, such as the search for new technologies, shortage of natural resources, access to new markets, the rising cost of production factors inside the country, and the appreciation of the yuan. The intensification of this process comes from the active participation of Chinese investors in business projects related to energy and mining, trade, forestry, construction, infrastructure projects, and services (Wang & Gao, 2019).

In the international business arena, China's undervalued currency has long been viewed by the United States as one of the most robust protectionist measures promoting Chinese exports to the U.S. market and a kind of restriction on the admission of foreign products and services to China (Bernal-Ponce et al., 2020; Wang et al., 2021). On the other hand, the U.S. has a clear understanding that the Chinese economy is interested in the inflow of foreign investment, and the maintenance of the undervalued yuan is a factor of savings and cost reduction when placing foreign orders on Chinese enterprises or when placing foreign production facilities within the country (Morrison, 2019). At present, the main reason for the yuan devaluation by the People's Bank of China is the trade war with the United States, in which China is trying to win back higher tariffs by weakening the national currency (Lo, 2021; Petry, 2020).

In China, companies, banks, and individuals must follow a "closed" capital account policy. This means that money cannot be freely moved into or out of the country unless they comply with strict foreign exchange rules (Davis et al., 2021). In addition, the government restricts capital outflows by taxing income from foreign assets and capital inflows by taxing foreign investors on repatriated income (Liu, 2021).

Given China's restrictions on foreign currency exchange, companies should strategically approach their funding plans early in the pre-investment stage. A common slip for foreign companies is underestimating their costs and overestimating their profits, resulting in a capital shortage. Another issue companies face is that exporting capital or profits from China is subject to increased government inspection and security demands due to record levels of outbound direct investment in recent years (Biswas et al., 2022). The Chinese government

introduced new capital controls through the introduction of a number of regulations, e.g., on Procedures for the Examination of Foreign Trade Transaction Documents by Banks issued by the SAFE of the People's Republic of China on April 4, 2017. The regulations indicate that certain outbound transactions would not be approved unless given specific approval (Xu, 2020).

Based on the new and previously introduced regulations, it is possible to highlight the main features of currency regulations companies face when conducting their activities in China. Firstly, it is a ban on payment transactions in foreign currencies within China. Foreign currency income from standard foreign trade transactions must be converted into yuan or deposited into a foreign currency account in an authorized bank. Special documents confirming the intended use of the currency are mandatory (Allen et al., 2022; Li & Zhong, 2020). When transferring foreign currency abroad, legal entities should obtain additional permission from the SAFE. When a legal entity receives foreign currency transfers without a foreign currency account, the bank independently converts the currency into yuan at the current exchange rate (Ramaswamy, 2022). Foreign currency profit transfers for domestic businesses over $50 thousand are subject to separate control by currency regulators. Foreign exchange earnings from transactions in financial instruments (foreign direct and portfolio investment, foreign loans, securities transactions, etc.) are subject to repatriation in China. When paying through a bank for imported goods (services) with an amount less than $100 thousand, the bank has the right to independently decide on its confirmation based on reliable information about the client's reputation, reliability, business, and the circle of its counterparties. If the amount exceeds $100 thousand and the authenticity of the transfer is suspected, the bank sends a request to an electronic database to verify the import customs declaration (Avi-Yonah, 2020).

All this requires companies to be more flexible, to look for ways to internationalize and adapt operational strategies. Our study is designed to directly and transparently assess the impact of currency fluctuations of the yuan on the export activities of Chinese enterprises, and the article will fill this theoretical gap.

2. Materials and methods

The company's export choice behavior is now represented by a binary dummy variable. Included in this is whether the company enters or leaves export markets. As a result, the probit model is used in this study to examine how export decision-making by businesses is affected by exchange rate variations. The following is the model for this paper:

$$probit\left(IndEn_{ijnm}=1\right)=F\left(a_0+a_1\ln er_{ijnm}+X_{ijnm}+\varphi\right),$$

where the subscripts *i*, *j*, *n* and *m*, respectively, stand for the company, the product, the destination country, and the year. If the company chooses to leave export markets, it will be indicated by the $IndEx_{ijnm}$ command; if it chooses to enter export markets, it will be indicated by the $IndEn_{ijnm}$ entry command. This study assumes to use the $F()$ function as the normal cumulative function for the distribution of the probability of a company entering or

leaving the export market. The actual effective exchange rate at the company level is given by the expression $\ln er_{ijnm}$. A number of control variables are given by X_{ijnm} and the random disturbance term is given by φ. The probit model calculates the likelihood that a business will leave or enter foreign markets.

Variation in exchange rates. This study involves estimating the variation in the RMB exchange rate for companies in a benchmark rate regression (Avdjiev et al., 2019; Liu, 2020) according to the following calculating formula:

$$er_m = \prod_{j=1}^{k} \left(E_{im} \times \frac{ICP_m}{ICP_{jm}} \right)^{w_{jm}},$$

$$\sum_{j=1}^{k} w_j = 1 \text{ for each } m,$$

where *j* denotes various nations, *m* denotes time, *k* denotes the current year, and er_m denotes the real effective exchange rate that businesses must deal with after taking the price level into account. E_{im} indicates the value of the currency against the RMB in the period m, which is determined on the basis of an indirect quotation. w_{jm} – trade weighting. ICP_m is the index of consumer prices for China throughout period *m*. ICP_{jm} – provides the index for consumer prices of nation *j* in period *m*. Therefore, the increase in the chart shows the appreciation of the RMB currency rate that businesses must deal with, while the decrease in the chart shows the depreciation of the RMB exchange rate that businesses must deal with.

This analysis considers the export component of companies' activities during period *m* – 1 and subsequent period m for companies leaving or entering the export market. Only individual export segments remain from the sample for the period, because according to the dataset structure, the export segment of companies, products and export destination country forms a three-dimensional configuration "company-product-destination" according to the principle of one-to-one correspondence. As a result, this study establishes the following definition: if the identical export segment does not exist in period $m-1$ but does exist in period $m(m \geq 1)$, it indicates that the company joins the export market; otherwise, the value is "0". The company departs export markets $(IndEx)$, and the value is "1"; otherwise, it is "0" if the company had an export in period m but did not have one in period $m(m \geq 1)$. Company entry and exit from the export market are now binary dummy variables. It is important to clarify that the first period is not entering export markets during the last period and vice versa owing to the absence of left and right difficulties. The data on the year in the actual regression will be eliminated because the sample period used for this article is from 2014 to 2021.

This article classifies the control variables in a multi-level manner to regulate more diverse qualities as much as feasible. Country size, economic development and bilateral trade distance are among the parameters of national features (variables) that are similar to those of the standard trade balance model. These variables largely determine the GDP of the country (export destination) (lnGDP) and GDP per capita (lnGDPpc) of the recipient country (export destination) and the "distance" of trade activity (lnTD). Company characteristics include total productivity (TP), company profit margin (PM), company size $(\ln CS)$, company age

($\ln CA$), company export experience (CEE), and other factors that mostly relate to how well a company is working and producing. The semi-parameter estimation approach is used to estimate total factor productivity (TP). The ratio of a company's operational profit to its revenue is known as its profit margin. The stock of fixed assets serves as a proxy for company size, or $\ln CS$. The amount of time since the start of the business is used to calculate its age ($\ln CA$). Company's export experience (CEE) is a binary dummy variable that has a value of "1" if the company has previously exported the same product and a value of "0" otherwise. The values of the volume of merchandise exports (ln PE), the export share of goods (PES), and the product range are the key variables of the product parameters ($\ln var$).

This study is based on the results of annual comparative data on the export activities and customs performance of industrial Chinese companies from 2014 to 2021. All import and export companies in China are included in the China Customs database, together with their foreign trade types, categories and volumes of imported and exported goods, as well as information on the company's ownership and export destinations. This accounts for about 95% of China's industrial output. Second, when the missing value has been removed, the export pieces of the combined Chinese companies are built using the "enterprise-product-destination" three-dimensional structure. In the end, 4388743 export pieces in their whole were saved. The database of global financial statistics maintained by the International Monetary Fund contains information on exchange rates. The database of China's industrial companies is where the data for the company characteristic variables came from. Table 1 displays descriptive statistics for the primary variables.

The correlation analysis between two variables is measured in Table 2. The correlation coefficient avoids the multicollinearity that can be observed in regression and confirms the existence of a significant relationship across variables.

Table 1. Main variable descriptive statistics (source: formed by the authors)

Variables	Obs	Mean	Std. Dev.	Min	Max
$IndEx$	4 388 743	0.3826	0.4865	0	1
$IndEn_{ijnm}$	4 388 743	0.6105	0.4792	0	1
$\ln er$	4 388 743	1.2738	1.81175	0.0346	8.0122
$\ln GDP$	4 388 743	27.2841	1.8273	18.6105	30.3361
$\ln GDPpc$	4 388 743	9.8243	1.1804	5.2638	11.6185
$\ln TD$	4 388 743	8.5438	0.7512	6.8481	9.8314
TP	4 388 743	6.4228	0.9776	2.1528	8.5392
PM	4 388 743	0.0325	0.0717	–0.5446	0.3028
$\ln CS$	4 388 743	9.0694	1.6046	4.3041	12.7162
$\ln CA$	4 388 743	2.0418	0.7124	0	5.5904
CEE	4 388 743	0.5252	0.4991	0	1
$\ln PE$	4 388 743	9.4329	2.5109	0	20.7038
PES	4388743	0.2731	0.3687	0.824	1
$\ln var$	4388743	2.5228	1.4235	0	6.9277

Table 2. Main variable correlation analysis

Factor	*IndEx*	*IndEn*	ln*er*	ln*GDP*	ln*GDPpc*	ln*TD*	TP	PM	ln*CS*	ln*CA*	CEE	ln*PE*	share	ln*var*
IndEx	1.000													
IndEn	0.026	1.000												
ln*er*	0.023	0.012	1.000											
ln*GDP*	(0.037)	(0.082)	(0.148)	1.000										
ln*GDPpc*	(0.032)	(0.061)	(0.381)	0.583	1.000									
ln*TD*	0.015	0.028	(0.463)	0.049	(0.028)	1.000								
TP	0.062	(0.094)	(0.019)	(0.092)	(0.053)	0.059	1.000							
PM	(0.038)	0.056	0.087	(0.012)	(0.085)	0.062	0.238	1.000						
ln*CS*	0.075	(0.185)	0.069	(0.058)	(0.062)	0.028	0.471	0.088	1.000					
ln*CA*	0.069	(0.143)	0.082	(0.029)	(0.024)	0.013	0.118	(0.043)	0.429	1.000				
CEE	0.042	(0.462)	(0.045)	0.016	(0.011)	0.028	0.219	(0.046)	0.154	0.328	1.000			
ln*PE*	(0.154)	(0.388)	0.028	0.295	0.024	0.005	0.058	(0.006)	0.182	0.081	0.264	1.000		
PES	(0.069)	(0.206)	(0.001)	(0.054)	(0.067)	0.165	(0.083)	(0.001)	0.078	0.029	0.278	0.392	1.000	
ln*var*	(0.192)	0.147	(0.042)	(0.071)	0.048	(0.064)	0.039	0.072	(0.064)	(0.083)	(0.312)	(0.386)	(0.615)	1.000

3. Methodological limitations

In order to reduce the endogeneity factor, we use a three-dimensional model "enterprise – product – destination". However, since we are assessing a macro-phenomenon, it is extremely difficult to take into account the endogeneity parameter as correctly as possible due to the scale of the processes under study.

4. Results

The impact of RMB exchange rate fluctuations for companies leaving the export market is presented in Table 3 as the resultant indicators of regression analysis. Probit 2–4 are the resulting indicators from the regression analysis when control variables such as country characteristics, company parameters and product properties are consistently introduced.

Table 3. Exchange rate variations' regression effects on businesses leaving export markets (in correlation units) (source: formed by the authors)

Factor	Probit 1	Probit 2	Probit 3	Probit 4	Probit 5	Probit 6	Logit
ln*er*	0.0149***	0.0143***	0.0146***	0.0144***	0.0143***	0.0073***	0.0277***
	(0.0006)	(0.0007)	(0.0008)	(0.0006)	(0.0012)	(0.0014)	(0.0012)
ln*GDP*		−0.0630***	−0.0648***	−0.0522***	−0.0268***	−0.0209***	−0.0886***
		(0.0006)	(0.0008)	(0.0007)	(0.0008)	(0.0012)	(0.0011)
ln*GDPpc*		−0.0034***	−0.0043***	−0.0213***	−0.0174***	−0.0187***	−0.0373***
		(0.0011)	(0.0013)	(0.0012)	(0.0016)	(0.0025)	(0.0020)
ln*TD*		0.0457***	0.0582***	0.0671***	0.0448***	0.0275***	0.1137***
		(0.0017)	(0.0016)	(0.0016)	(0.0021)	(0.0032)	(0.0025)
TP			−0.0029***	−0.0042***	0.0017	0.0129***	−0.0084***
			(0.0012)	(0.0011)	(0.0014)	(0.0022)	(0.0018)
PM			−0.4943***	−0.4361***	−0.5806***	−0.7417***	−0.7345***
			(0.0118)	(0.0114)	(0.0173)	(0.0271)	(0.0208)
ln*CS*			−0.0286***	−0.0156***	−0.0072***	−0.0115***	−0.0274***
			(0.0006)	(0.0006)	(0.0008)	(0.0014)	(0.0011)
ln*CA*			0.1359***	0.1014***	0.0535***	0.0469***	0.1695***
			(0.0016)	(0.0013)	(0.0022)	(0.0036)	(0.0023)
CEE			−0.2086***	−0.1329***			−0.2202***
			(0.0020)	(0.0019)			(0.0036)
ln*PE*				−0.1413***	−0.1212***	−0.1103***	−0.2365***
				(0.0005)	(0.0007)	(0.0009)	(0.0007)
PES				−0.4392***	−0.2461***	−0.1705***	−0.7348***
				(0.0028)	(0.0036)	(0.0059)	(0.0052)
ln*var*				−0.0441***	−0.0672***	−0.0774***	−0.0737***
				(0.0010)	(0.0013)	(0.0021)	(0.0016)

End of Table 3

Factor	Probit 1	Probit 2	Probit 3	Probit 4	Probit 5	Probit 6	Logit
Cons	0.2521***	1.6416***	1.5904***	2.8862***	1.6428***	1.3612***	4.8313***
	(0.0032)	(0.0226)	(0.0211)	(0.0223)	(0.0279)	(0.0456)	(0.0358)
N	2 948 116	2 948 116	2 948 116	2 948 116	988 635	425 791	3 091 342
Log likelihood	–2 038 147.4	–2 027 672.9	–1 904 692.7	–1 864 806.4	1 098 347.7	411 594.2	–1 609 352.5
Wald Chi^2	36 057.85	49 568.32	69 404.49	242 829.81	85 422.36	37 054.48	206 463.08
Prob>Chi^2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Probit 1 refers to the direct impact of exchange rate fluctuations on companies leaving the export market. The regression findings reveal that the RMB real effective exchange rate's regression coefficient ($\ln er$) has been considerably positive, which suggests that the likelihood of businesses abandoning export markets is significantly increased when the RMB real effective exchange rate appreciates. This is so that businesses' ability to conduct trade will be restricted when the value of the local currency increases and the nominal price of the goods they export to the global market rises. Businesses may decide to temporarily halt exports or give up on export markets as a result of a decline in export market demand, which will modify their export behavior. In addition, exchange rate parameters may be subject to endogenous influences because the exchange rate measurement procedure uses data for several countries, and in terms of the formation of the indicator system, changes in the exchange rate will affect the weight of trade. Probit 5–6 re-estimated the regression findings using the Probit 5–6 instrumental variable technique to address any potential endogeneity. The results of the estimation using the instrumental variables in Probit 5–6 show that the RMB exchange rate still has a positive impact and meets the significance test with the 1% level. It demonstrates that the likelihood of businesses leaving the export market will in fact grow as a result of the appreciation of the RMB real effective exchange rate, which is compatible with the analysis of basic regression. The outcome of the logit model regression is shown in logit model. The impact of characteristic factors on businesses leaving export markets may be observed in Probit 2–4 as for other control variables. The regression coefficients for national size ($\ln GDP$) and economic development level ($\ln GDPpc$) among the national characteristic variables are significantly negative, as shown in Probit 2 of Table 3, indicating that the likelihood of export companies leaving the export market decreases with increasing national size and economic development level of the destination countries. The coefficient of trade distance ($\ln TD$), which shows that the likelihood of businesses leaving export markets increases with distance, is also notably positive. This agrees with the findings of conventional trade gravity models. Modelling results for company individual characteristics are added in Probit 3. The results show that the factors of production efficiency (TP), company profitability (PM), company size (lnCS), and level of export presence (CEE) had significant inverse effects. This is due to the fact that productivity growth, increase in profit margin, and expansion of company scale are correlated with the growth of its managerial capacity. According to the companies' export history, there is a significant commitment to exporting

in the companies' relationships with their target market environment. It is important to note that the regression model of company age ($\ln CA$) is considerably positive, indicating that the likelihood that a business would leave export markets increases with age.

$\ln GDPpc$ are strongly negative, indicating that the likelihood of export companies leaving the export market is decreased with increasing national size and economic development level of the recipient nations. The coefficient of trade length ($\ln TD$), which shows that the likelihood of businesses leaving export markets increases with distance, is also notably positive. The outcomes of conventional trade gravity models are consistent with this. Regression results for variables related to company characteristics are added in Probit 3. The coefficients for total factor productivity (TP), company profitability (PM), company size ($\ln CS$), and export experience (CEE) seem to have been significantly negative, according to the results. The reason is that increased productivity, profitability and business expansion indicates the effectiveness of the company's management team. Last but not least, after accounting for the item characteristic variables, the results of $\ln PE$, lnPES and $\ln var$ are also all negative overall, indicating that the likelihood that the company will withdraw from export markets decreases with increasing export value, export share, and export variety.

Table 4 allows determining the results of modeling the impact of RMB exchange rate fluctuations on companies seeking to enter international markets. The predicted results are presented in the Probit 1 model through the Logit model. Probit 2–4 are simulation results by sequentially introducing control factors such as country characteristics, company parameters, and product properties.

Table 4. Regression analysis of the impact of changes in the RMB exchange rate on companies developing foreign markets (conventional units of relationship between parameters) (source: formed by the authors)

Factor	Probit1	Probit2	Probit3	Probit4	Probit5	Probit6	Logit
$\ln er$	−0.0079***	−0.0037***	−0.0259***	−0.0215***	−0.0063***	−0.0182***	−0.0236***
	(0.0006)	(0.0005)	(0.0007)	(0.0006)	(0.0017)	(0.0026)	(0.0014)
$\ln GDP$		0.0618***	0.1472***	0.0824***	0.0092***	0.0067*	0.1681***
		(0.0005)	(0.0006)	(0.0008)	(0.0015)	(0.0024)	(0.0016)
$\ln GDPpc$		0.0625***	0.0502***	0.0488***	0.0028	0.0073	0.0834***
		(0.0012)	(0.0011)	(0.0014)	(0.0034)	(0.0048)	(0.0024)
$\ln TD$		−0.0609***	−0.2571***	−0.1855***	−0.0007	−0.0042	−0.4362***
		(0.0011)	(0.0016)	(0.0017)	(0.0032)	(0.0054)	(0.0024)
TPlp			0.0231***	0.01872***	0.0248***	0.0524***	0.0318***
			(0.0010)	(0.0012)	(0.0026)	(0.0038)	(0.0023)
PM			0.4156***	0.3261***	0.2853***	0.5179***	0.5294***
			(0.0142)	(0.0127)	(0.0285)	(0.0671)	(0.0412)
$\ln CS$			0.0369***	0.0043***	0.0442***	0.0508***	0.0072***
			(0.0006)	(0.0008)	(0.0016)	(0.0022)	(0.0013)
$\ln CA$			−0.0471***	−0.0328***	0.0283***	0.0572***	−0.0704***
			(0.0016)	(0.0015)	(0.0036)	(0.0061)	(0.0026)

End of Table 4

Factor	Probit1	Probit2	Probit3	Probit4	Probit5	Probit6	Logit
CEE			2.4825***	2.5435***			4.7582***
			(0.0036)	(0.0029)			(0.0082)
ln *PE*				0.1693***	0.0004	0.0005	0.3615***
				(0.0006)	(0.0014)	(0.0016)	(0.0009)
PES				0.0062	0.0738***	0.0396***	0.0014
				(0.0029)	(0.0079)	(0.0163)	(0.0074)
ln *var*				0.0042***	–0.0358***	–0.0427***	0.0069***
				(0.0012)	(0.0026)	(0.0038)	(0.0052)
Cons	0.9835***	2.6841***	4.4379***	5.0732***	–0.9105***	–1.2632***	9.1081***
	(0.0016)	(0.0157)	(0.0278)	(0.0484)	(0.0534)	(0.0751)	(0.0359)
N	4 134 502	4 134 502	4 134 502	4 134 502	1 401 560	648 573	4 238 072
Log likelihood	–2 208 562.4	–2 193 362.5	–1 598 247.3	–1 529 644.7	2 106 395.4	698 342.6	–1 524 911.8
Wald Chi^2	106 729.5	141 205.6	511 956.4	598 342.8	23 766.2	12 008.4	523 782.6
Prob> Chi^2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

The decisions made by businesses to enter or leave export markets are very distinct from each other, and the same reasons have completely different effects on businesses making these decisions. Therefore, the focus of the next section will be on RMB actual effective exchange rate heterogeneity study on companies leaving export markets.

Following the distinction of company ownership and geographical variations, Table 5 displays the heterogeneous regression's findings. As a result of varying company ownership, the regression findings are reported for foreign-owned, private and state-owned companies. Businesses from various areas are presented as regression results in East, Middle and West of China.

Table 5. Regression findings for various company ownerships and across various geographies (conventional units of relationship between parameters) (source: formed by the authors)

Factor	Foreign-owned companies	Private companies	State-owned companies	East	Middle	West
ln *er*	0.0089***	0.0069***	0.0174***	0.0138***	0.0019	0.0048
	(0.0008)	(0.0043)	(0.0013)	(0.0006)	(0.0029)	(0.0038)
ln *GDP*	–0.0721***	–0.0348***	–0.0372***	–0.0538***	–0.0792***	–0.0604***
	(0.0007)	(0.0032)	(0.0012)	(0.0007)	(0.0033)	(0.0042)
ln *GDPpc*	–0.0068***	0.0205**	–0.0378***	–0.0249***	–0.0043	0.0279***
	(0.0016)	(0.0054)	(0.0026)	(0.0014)	(0.0048)	(0.0065)
ln *TD*	0.0258***	0.0397***	0.0685***	0.0698***	0.0403***	0.0263**
	(0.0025)	(0.0082)	(0.0018)	(0.0014)	(0.0069)	(0.0205)

End of Table 5

Factor	Foreign-owned companies	Private companies	State-owned companies	East	Middle	West
TP	−0.0241***	−0.0704***	0.01692***	−0.0043***	0.0082	−0.0165**
	(0.0016)	(0.0054)	(0.0014)	(0.0012)	(0.0052)	(0.0068)
PM	−0.7249***	−0.6002***	−0.3854***	−0.3982***	−0.3285***	−1.0837***
	(0.0371)	(0.0728)	(0.0253)	(0.0132)	(0.0624)	(0.0801)
ln*CS*	0.0211***	0.0184***	−0.0386***	−0.0256***	0.0007	0.0642***
	(0.0012)	(0.0038)	(0.0008)	(0.0006)	(0.0036)	(0.0039)
ln*CA*	0.0528***	0.0472***	0.1183***	0.1147***	0.0738***	−0.0282***
	(0.0018)	(0.0058)	(0.0021)	(0.0016)	(0.0056)	(0.0078)
CEE	−0.1110***	−0.1326***	−0.1648***	−0.1287***	−0.0704***	−0.0892***
	(0.0028)	(0.0148)	(0.0026)	(0.0018)	(0.0123)	(0.0126)
ln*PE*	−0.1782***	−0.1508***	−0.1249***	−0.1452***	−0.1396***	−0.1571***
	(0.0007)	(0.0031)	(0.0007)	(0.0003)	(0.0029)	(0.0032)
PES	−0.5268***	−0.3482***	−0.4205***	−0.4394***	−0.4739***	−0.4638***
	(0.0039)	(0.0178)	(0.0042)	(0.0036)	(0.0160)	(0.0238)
ln*var*	−0.0502***	0.0728***	−0.0439***	−0.0512***	−0.0442***	−0.0681***
	(0.0012)	(0.0051)	(0.0014)	(0.0012)	(0.0080)	(0.0061)
Cons	3.3644***	2.2483***	2.5852***	2.8245***	3.1172***	2.8639***
	(0.0406)	(0.1254)	(0.0298)	(0.0247)	(0.1159)	(0.1681)
N	1 364 290	90 658	1 432 366	2 733 383	94 700	59 231
Log likelihood	−848 564.8	−53 677.2	−893 493.9	−1 706 557.7	−58 120.1	−36 309.6
Wald Chi^2	105 303.1	7524.5	120 887.9	216 187.0	7382.8	4750.2
Prob>Chi^2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

According to the data on the registered capital of the surveyed companies, their ownership is divided into public, private and foreign, including companies in Hong Kong, Taiwan and Macau. The regression results show that when the RMB strengthens, state-owned companies are more susceptible to going out of business, unlike private companies. Additionally, foreign-owned businesses have a larger level of factor price distortion than both state-owned and privately held businesses, which is more advantageous for business export. Private businesses, however, frequently operate on a modest scale. They are less exposed to the risk of withdrawal from foreign markets, because from the perspective of the company's future development strategy, it is the large export market that is a priority for them, as opposed to the volume of profits made. In spite of this, there are often strictly defined principles in the structure of state business, and profit extraction is not decisive for them. Under their control remains the domestic market, which has a situation of monopolization and low cost of borrowing. Given that in the domestic market a state-owned company has the opportunity to generate additional income, it is practically not attracted to exports. In this regard, it is easier

for state-owned companies to leave the foreign market when the yuan appreciates. As a result, most exporting companies are concentrated in the east, which is internationally oriented and more vulnerable to the impact of exchange rate changes. At the same time, due to their territorial location and lower level of globalization, businesses in the central and western regions are not as vulnerable to the effects of exchange rate changes. In addition, another important aspect is that, like the bulk of the sample used for this study, most export-oriented companies in China are concentrated in the more developed provinces of the eastern part of the country. Due to the smaller sample size, companies in the central and western regions may be statistically insignificant. All this can become a reasoned typology of the behavior of companies in the market in conditions of exchange rate fluctuations.

The results obtained have direct practical significance for a more sustainable, long-term vision of the market and its regulation. The vision of strategies undertaken in the future by companies of different types allows for the formation of more flexible market management, its softer self-correction regarding financial and economic shocks. All this allows us to talk about the prospect of reducing the negative social effect of changes in the market and a more correct government policy regarding exporting entrepreneurs. The assessment of the impact of exchange rate fluctuations on the export strategies of industrial companies is of practical importance in the formation of foreign exchange policy in the context of the macroeconomic goals of industries and the country as a whole.

5. Discussion

The analysis of long-run dependencies revealed a direct relationship between the volume of foreign currency sales and budget receipts. The nature of this relationship is practically independent of the time studied, although the statistical significance of the obtained regression coefficient slightly reduced. The resulting dependence is easier to explain by the need to fulfil tax obligations (Corbet et al., 2021). Another explanation concerns the sale of foreign currency amid the economic growth, as a concomitant increase in household income usually comes with an increase in budget receipts (Zhang, 2017). It is also possible that the increasing demand for the yuan during the period of economic growth encouraged Chinese people to sell their leftover foreign currency (Fang & Cao, 2021).

The advantage of this study is that it explores the connection between the volume of foreign currency sales (or purchases) and the volume of government expenditures. This approach allows issuing a forecast under which the emerging pessimistic expectations hold back the sale of the foreign currency. At the same time, the growth of forex demand suggests that negative expectations can serve as a tool for influencing the behavior of market participants after an increase in government expenditures (Funke & Tsang, 2020).

This study proves that the act of yuan devaluation only affects the demand for foreign currency. The negative coefficient of regression, in this case, was an expected finding. The effect of private transfers from those working abroad was similar to the effect of the exchange rate, but their mechanisms of influence are substantially different (Guo et al., 2021; Li, 2019). If the inverse connection between yuan devaluation and forex demand can be explained by the rise in the forex price, then in the case of private transfers, the increase in the share of

forex assets will lead to a decrease in the corresponding demand (Hurley & Papanikolaou, 2018). Using vector autoregression in this study allowed checking the stability of the obtained 2SLS estimates. With the presence of two cointegration vectors, it may be better to conduct empirical estimation though; according to the results of the Johansen's test, this could be the current study's case, but the evidence is not strong (Yang & Lee, 2021).

The limitations of this study are associated with the fact that government expenditure affects the volume of the foreign currency sold by the population and thus determines its buying volume. This sequence seems to be believable given the recognized priority of forex receipts, which later become a source of demand (Jia et al., 2021). Comparing with the 2SLS estimates, it becomes possible to analyze a dependence between the buying and selling volumes in the forex market, which may be associated with how the foreign currency is used. For instance, the increasing sale of foreign currency may not only reflect the need to fulfil tax obligations, but also facilitate the growth of budget receipts. Tax liabilities may require business entities to sell foreign currency. On the other hand, an increase in government expenditure can affect both the purchase and sale of foreign currency. If government spending creates uncertainty about the budget balance, one can likely expect a downward adjustment of the value of the currency, followed by increasing demand for foreign currencies, including the U.S. dollar (Wei et al., 2020). Hypothetically, the increased sale of foreign currency could occur because of the labor outflow, encouraged by a rise in government spending and yuan devaluation expectations. In this case, foreign currency is sold as a means of financing household needs. The monetary overhang could result from several endogenous shocks in the current period (Song & Zhou, 2020).

The increase in tax receipts is likely to reduce the need for borrowing in the public sector and thus reduce the money supply. The opposite effect is to be expected with the rise in government spending. Even if there is no need to indirectly finance the budget deficit by purchasing government bonds in the secondary market, central banks will strive to support the fiscal policy by lowering the interest rate (Funke & Tsang, 2020).

Conclusions

This research is of an exclusively applied nature. During the completed operations, the hypothesis about the direct connection between the strategies of exporting companies and currency fluctuations of the yuan was confirmed. It has been proven that an increase in the RMB exchange rate encourages companies to exit the foreign market and discourages new companies from entering the export market. The results showed that the specificity of the dependence is directly reflected by the form of ownership of the companies: it was found that, faced with an increase in the actual exchange rate of the yuan, enterprises with foreign capital leave with less risk, in contrast to private and state-owned companies. There is also a regional influence: companies in the central and western regions are less susceptible to the negative consequences of changes in the yuan exchange rate, while enterprises in the eastern region are more sensitive to the negative consequences of the yuan appreciation. Thus, we can say that the contribution of this study lies in confirming the connection between the above parameters, as well as developing an applied typology of "enterprise behavior" in the

market under conditions of currency turbulence. This can be used as a tool for forecasting the market situation in the medium and long term, as well as a variable scale of socio-economic consequences when adjusting monetary policy in one direction or another.

The immediate limitations of the area of application of the results of this study include the fact that the array subjected to processing dates back to 2014–2021, which for the actively developing Chinese market may be quite a distant experience, because the market is actively transforming. In turn, such a temporary limitation can be considered an impetus for further research and assessment of the relationship between exchange rate fluctuations of the yuan and the "behavior" of exporters in 2022–2023, when a significant share of China's export operations changed vector against the backdrop of geopolitical upheavals and military conflicts.

However, given China's high involvement in international trade, the size of its economy and the steps taken to internationalize the national currency, we can talk about the increasing role of the yuan in foreign trade, stimulating the need for the Chinese currency in the world. Also, the potential expansion of trade relations under the One Belt, One Road project will create additional demand for the financial infrastructure built by China and, as a result, for the Chinese currency, which will reduce fluctuations against Chinese exporters.

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