Original Paper

An Empirical Study on the Impact of RMB Exchange Rate Fluctuation on China's Outward Foreign Direct Investment —Based on Panel Data of 58 Countries along the "Belt and Road"

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Abstract

Since China first proposed the "The Belt and Road" Initiative in 2013, countries along the "The Belt and Road Initiative" route have gradually developed into important partners for China's "going global" strategy and regional cooperation. This paper constructs a two-way fixed-effects model based on panel data from 58 countries along the "The Belt and Road Initiative" route from 2010 to 2020 and conducts empirical tests to further analyze how fluctuations in the RMB exchange rate affect China's OFDI. The results show that RMB appreciation promotes China's OFDI, while RMB exchange rate fluctuations suppress it, and the effects of these two factors are heterogeneous across regions, income levels, and distances between countries. To promote the high-quality development of the "The Belt and Road Initiative" initiative, this article proposes feasible recommendations: At the national level, policy communication and coordination with high-income and low- and middle-income "The Belt and Road Initiative" countries in Central and Southeast Asia should be strengthened, the RMB exchange rate system should be improved, and exchange rate fluctuations should be reduced. At the enterprise level, enterprises should enhance their ability to cope with exchange rate risks, leverage the "The Belt and Road Initiative" investment preferential policies, optimize investment layout in "The Belt and Road Initiative" countries in South Asia and Central and Eastern Europe, and actively expand investment areas.

Keywords

RMB exchange rate fluctuations, OFDI, The Belt and Road Initiative, RMB exchange rate fluctuations,

bilateral real exchange rate

1. Introduction

On December 2, 2024, General Secretary Jinping Xi attended and provided guidance at the Fourth Symposium on the Construction of the "The Belt and Road Initiative" Route, emphasizing that: "In recent years, the world has entered a new period of turbulence and change, with a significant increase in unilateralism and protectionism, and frequent local conflicts and turmoil. Against this backdrop, to promote the high-quality development of the joint construction of the "The Belt and Road Initiative", we must properly respond to various risks and challenges, effectively overcome the impact of geopolitical conflicts, correctly handle the relationship between enhancing the sense of gain of co-construction countries and upholding our interests, and effectively safeguard the security of China's overseas interests." Among the various risks and challenges facing China's OFDI in "The Belt and Road Initiative" countries, foreign exchange risk induced by RMB exchange rate fluctuations is a risk that requires significant attention, yet few scholars have considered this factor. Therefore, this study of the impact of RMB exchange rate fluctuations on China's OFDI in "The Belt and Road Initiative" countries has important practical significance.

Since "The Belt and Road" Initiative was proposed by General Secretary Jinping Xi in 2013, China's direct investment in countries along the "The Belt and Road Initiative" route has increased from 12.63 billion US dollars in 2013 to 40.71 billion US dollars in 2023, achieving a steady annual growth rate of 11.80%. By the end of 2023, China has established approximately 17000 overseas enterprises in these countries, and the stock of direct investment has increased from 72 billion US dollars in 2013 to 334.84 billion US dollars, with an average annual growth rate of 15.74%, accounting for 11.3% of China's total stock of outward foreign direct investment. As of November 2024, China's non-financial direct investment in countries along the "The Belt and Road Initiative" route has reached 214.66 billion yuan, a year-on-year increase of 6.2%. Many domestic investors have regarded the countries along the "The Belt and Road Initiative" route as key target areas for overseas investment and are paying close attention to them. Based on this, this article will empirically analyze how changes in the RMB exchange rate affect China's direct investment in countries along the "The Belt and Road Initiative" route, in order to encourage enterprises to respond reasonably to exchange rate risks, make reasonable decisions on outward foreign direct investment in countries along the "The Belt and Road Initiative" route, and provide feasible suggestions for promoting the high-quality development of China's "The Belt and Road Initiative" route.

2. Literature Review

Exchange rate fluctuations can be categorized into horizontal fluctuations in the exchange rate level and vertical fluctuations in the exchange rate (Qiu Licheng & Liu Wenjun, 2006). Fluctuations in the exchange rate level refer to increases and decreases in the exchange rate, representing the appreciation

and depreciation of a country's currency (Brainard, 1993). Exchange rate volatility refers to fluctuations in the exchange rate over a certain period of time, i.e., exchange rate uncertainty (Qiao Lin, 2013). Based on the above distinction, this article will analyze the impact of exchange rate fluctuations on OFDI from both horizontal and vertical perspectives. Therefore, the exchange rate fluctuations studied in this article include both horizontal and vertical fluctuations.

The "promotion theory," represented by the relative cost theory and the relative wealth theory, holds that there is a positive correlation between exchange rate fluctuations (currency appreciation) and outbound direct investment. Zang Cheng et al. (2021) pointed out that the appreciation of the RMB boosts outbound investment by reducing the initial import costs of raw materials and technological equipment. Yan Yingen et al. (2022) found that RMB appreciation helps increase the relative wealth of enterprises, reduce financing costs, and thus promote outbound investment. However, some domestic and international scholars believe that exchange rate appreciation will increase the operating and financing costs of overseas investment (Wang Zhenli & Lin Jianyu, 2019) and may also expose enterprises investing overseas to currency mismatch risk (Liu et al., 2018), thereby inhibiting outbound direct investment.

The "inhibition theory," represented by actual options theory and risk aversion theory, holds that exchange rate volatility (exchange rate uncertainty) is negatively correlated with outbound investment. Li Xiaomeng et al. (2017) argue that exchange rate uncertainty is equivalent to an option whose expected return becomes increasingly uncertain with greater exchange rate volatility, thus hindering China's direct investment in host countries. Li Xinya (2024) used a bivariate GJR-GARCH model to study the impact of exchange rate volatility on investors' exchange rate risk exposure and found that sharp exchange rate fluctuations significantly increase investors' operating risk, thereby inhibiting their outbound investment behavior. However, some domestic and foreign scholars believe that increased exchange rate volatility may attract investors with higher risk appetite (Takagi & Shi, 2021), or may prompt investors to achieve export substitution through outbound direct investment (Ren Zhicheng & Zhu Wenbo, 2018), and may even be affected by policy support mechanisms (Tu Niansong & Cao Jianhui, 2019), thereby promoting outbound direct investment.

In summary, there is no definitive conclusion on how exchange rate fluctuations affect outward foreign direct investment (OFDI). Most studies examining the factors influencing China's direct investment in countries along the "The Belt and Road Initiative" initiative focus on factors such as institutional quality (Liu Junya, 2024), GDP size (Li Huiqing, 2024), geographic distance (Wang Hongshu et al., 2025), bilateral trade relations (Li Haiying et al., 2025), and infrastructure (Zhang Bin & He Jinyuan, 2019). Few consider exchange rate fluctuations, and the sample size of these studies is insufficient. Furthermore, most existing research examining the impact of exchange rate fluctuations on OFDI focuses solely on the vertical dimension (Dai Jinping & An Lei, 2018; Chen Lin et al., 2020). Studies examining the horizontal and vertical dimensions of exchange rate fluctuations are limited, and this research needs further development. Therefore, this paper examines the impact of RMB exchange rate fluctuations on China's OFDI, focusing on the horizontal and vertical dimensions of exchange rate fluctuations. We select

a sample of 58 countries along the "The Belt and Road Initiative" initiative to empirically examine the impact of RMB exchange rate fluctuations on China's OFDI and propose feasible recommendations based on the results.

3. Empirical Analysis of Data from 58 Countries Along the "The Belt and Road Initiative" Route from 2010 to 2020

(I) Variable Selection

1. Explained variable: stock of outbound direct investment (lnofdi)

The outward foreign direct investment (OFDI) stock indicator represents a country's true international investment competitiveness. This article selects annual data on China's OFDI stock in 58 countries along the "The Belt and Road Initiative" route from 2010 to 2020 (in US$10,000).

2. Core Explanatory Variables

(1) Changes in exchange rate level (lnlev)

Following the approach of Li Huiqing (2024), this paper selects the monthly exchange rates of the currencies of the "The Belt and Road Initiative" countries against the US dollar and the monthly exchange rates of the RMB against the US dollar under the indirect quotation method from 2010 to 2020, and calculates the monthly nominal bilateral exchange rate (NE) of the RMB against the "The Belt and Road Initiative" countries, which is used to express the number of RMB units exchanged for a certain number of "The Belt and Road Initiative" country currencies:

$$NE= \frac{e_a}{e_b} \tag{1}$$

In formula (1), e_a represents the monthly nominal exchange rate of RMB against the US dollar under the indirect quotation method. e_b represents the monthly nominal exchange rate of the currencies of the "The Belt and Road Initiative" countries against the US dollar. This article uses the CPI to represent the price index, primarily used to calculate the monthly real bilateral exchange rate. The specific calculation formula is as follows:

$$RE=NE\times\frac{CPI_C}{CPI_i} \tag{2}$$

CPI_c and CPI_i in the above formula both refer to price indices, the former for China and the latter for countries along the "The Belt and Road Initiative" route. Drawing on the practices of Qiao Lin (2013), Tu Niansong and Cao Jianhui (2019), the changes in the RMB exchange rate level are measured by the annual average of the actual bilateral exchange rate. The calculation formula is:

$$Lev = \frac{\sum_{i=1}^{12} RE}{12} \tag{3}$$

In formula (3), the larger the Lev value is, the more "The Belt and Road Initiative" national currencies can be exchanged for one unit of RMB, that is, the RMB appreciates.

(2) Exchange rate fluctuation (lnvol2)

This article follows the approach of Chen Lin et al. (2020), taking the logarithm of the monthly real

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bilateral exchange rate RE, performing the difference, and calculating the variance to obtain the annual exchange rate fluctuation value.

$$\Delta ln(RE_t) = ln(RE_t) - ln(RE_{t-1}) \tag{4}$$

$$Volatility = \sqrt{\frac{1}{12} \times \sum_{m=1}^{12}[\Delta ln(RE_t) - \overline{\Delta ln(RE_t)}]^2} \tag{5}$$

$$Vol2 = Volatility^2 \tag{6}$$

3. Other control variables (X)

This paper considers the impact of heteroskedasticity and logarithms the variables except the inflation rate. The description of the variables used for regression is shown in Table 1.

Table 1. Variable Description

Variable Type	Variable Name	Variable Description
Explained Variable	Outward foreign direct investment (lnofdi)	Annual Total Outward Foreign Direct Investment Stock
Main Explanatory Variables	Exchange rate fluctuation (lnlev)	Annual Average Real Bilateral Exchange Rate
	Exchange rate fluctuation (lnvol2)	Annual Variance of Real Bilateral Exchange Rate
Other Control Variables	Economic development level (lngdp)	GDP of The Belt and Road Initiative Countries
	Relative labor cost (lnrela)	Ratio of per capita GDP of countries along the The Belt and Road Initiative Route to China's per capita GDP
	Ability to attract foreign direct investment (lnnetinv)	Ratio of net foreign direct investment inflows to GDP of countries along the The Belt and Road Initiative Route
	Inflation rate (lnflation)	Annual Inflation Rate of The Belt and Road Initiative Countries Measured by the Consumer Price Index
	Market vitality (lnvita)	Annual Percentage of Service Sector Employment in Total Employment in The Belt and Road Initiative Countries
	Technological level (lntech)	Measured as the Ratio of High-Tech Exports to Manufactured Goods Exports in The Belt and Road Initiative Countries
	Economic Structure (Income Tax)	Ratio of tax revenue to GDP of countries along the The Belt and Road Initiative Route

(II) Data Description

This empirical analysis draws on five data sources. Data on China's outward foreign direct investment stock in countries along the "The Belt and Road Initiative" route from 2010 to 2020 are from the "Statistical Communiqué on China's Outward Foreign Direct Investment," which provides data on China's OFDI to 61 countries along the "The Belt and Road Initiative" route, excluding Bhutan, Palestine, and the Maldives. Data on the RMB/USD exchange rate and the exchange rates of countries along the "The Belt and Road Initiative" route against the USD from 2010 to 2020 are from the State Administration of Foreign Exchange's "Conversion Rates of Various Currencies to the US Dollar" table and the CEIC (China Economic Information Center) database. CPI data for each country used to calculate bilateral real exchange rates are from the IMF (International Monetary Fund) database. Because the World Bank Group database provides a wealth of global economic, social, and environmental data, this article obtains data on GDP, per capita GDP, net foreign direct investment inflows, inflation rates, employment, high-tech exports, and total tax revenue for each country. Data on national exchange rates, CPIs, and total imports and exports for Turkmenistan, Timor-Leste, and Syria are missing.

To ensure sufficient sample size and data accuracy, this paper excludes the six countries with missing data mentioned above and conducts a regression analysis on panel data from 58 countries along the "The Belt and Road Initiative." Descriptive statistics for each variable are shown in Table 2.

Table 2. Descriptive Statistics of Variables

Variable Category	Variable Name	Sample Size	Mean	Standard Deviation	Minimum	Maximum
Explained Variable	*lnofdi*	638	10.0309	2.6265	2.9957	15.6049
Explanatory Variables	*lnlev*	638	1.0885	3.2836	-5.8917	9.7404
	lnvol2	638	-3.5344	1.1684	-6.1454	1.8973
Control Variables	*lngdp*	638	25.1086	1.4899	22.1232	28.6733
	lnrela	638	-0.0906	1.1876	-2.9810	3.0689
	lntech	638	1.4251	1.8224	-6.7830	4.2054
	lntax	638	2.3092	1.1873	-6.9078	3.5205
	inflation	638	4.6004	6.1350	-12.5630	59.2197
	lnnetinv	638	0.8051	1.3589	-7.2027	4.6675
	lnvita	638	3.8756	0.5884	-1.6705	4.4431

The statistical results in Table 2 show that China's direct investment stock (lnofdi) in countries along the "The Belt and Road Initiative Route" varies significantly across countries or years. The standard deviation of RMB exchange rate fluctuations (lnvol2) is smaller than the change in the RMB exchange

rate level (lnlev), indicating that the RMB exchange rate fluctuated relatively little during the sample period. Descriptive statistical analysis reveals that the variable values determined in this study are realistic and can provide a reliable data foundation for subsequent in-depth analysis.

(III) Model Testing

This paper uses panel data regression analysis, drawing on the research of Li Xiaomeng et al. (2017) and Chen Lin et al. (2020), to construct the following baseline regression model to examine the impact of RMB exchange rate fluctuations on China's OFDI:

$$ln\,ofdi_{it} = \beta_0 + \beta_1 \cdot lnlev_{it} + \beta_2 \cdot lnvol2_{it} + \sum \gamma \cdot X_{it} + \theta_i + \mu_t + \varepsilon_{it} \qquad (7)$$

In formula (7), the subscripts i and t represent the countries along the "The Belt and Road Initiative" route and the year, respectively; lnofdi $_{it}$ represents China's OFDI stock in country i in year t; lnlev and lnvol2 represent the change in exchange rate level and exchange rate volatility, respectively; and X represents the set of other control variables. β_0 is the constant term, β_1 and β_2 are the core estimated parameters, θ_i is the country control effect, and μ_t is the time control effect. ε_{it} is the error term, representing the portion of the data not explained by the model.

The data of 58 countries along the "The Belt and Road Initiative" selected in this paper from 2010 to 2020 belong to the long cross-sectional form (wide and short). Its cross-sectional dimension is relatively large, while the time dimension is relatively short, which limits the scope of influence in the time dimension. Therefore, there is no need to conduct unit root and cointegration tests, but we should focus on in-depth tests of mixed effect models, fixed effect models, and random effect models. The F-test results show that the F-statistic is as high as 647.64, and its associated P-value is lower than the significance level threshold of 0.01, indicating that at the 1% significance level, we can firmly reject the null hypothesis and confirm that the individual effect model has obvious advantages over the mixed effect model. In addition, the Chi2 statistic obtained by the Hausman test is 117.48, and its P-value is also far lower than the significance level of 1%, which strongly proves that there is a significant correlation between the individual effect and the explanatory variables. In view of this, this paper decided to use the fixed-effect model for empirical analysis.

(IV) Baseline Regression Results

This paper uses a two-way fixed-effects model and performs a baseline regression with clustered standard errors controlling for year. The baseline regression results and their significance are shown in Table 3.

Table 3. Baseline Regression Results and Their Significance

	(1)	(2)	(3)	(4)
	lnofdi	*lnofdi*	*lnofdi*	*lnofdi*
lnlev	0.2858***		0.2864***	0.1222***
	(34.4394)		(34.4857)	(23.3053)
lnvol2		-0.0856	-0.1015	-0.2037***
		(-0.7657)	(-1.1725)	(-3.4336)
lngdp				1.0121***
				(29.6355)
lnrela				-0.4968***
				(-18.7242)
lntech				0.1259***
				(5.5794)
lntax				-0.3068***
				(-7.2291)
inflation				0.0326***
				(3.4650)
lnnetinv				0.1944***
				(5.0045)
lnvita				-0.2641***
				(-6.9494)
_cons	9.7198***	9.7283***	9.3605***	-15.0324***
	(1.1e+03)	(24.6212)	(30.3897)	(-15.8914)
Country	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
N	638	638	638	638
F	1186.07	0.59	617.46	647.64
R2	0.1939	0.0676	0.1956	0.5199
within. R2	0.1366	0.0014	0.1385	0.4858

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

Model (1) and Model (2) respectively regress the two core explanatory variables, RMB exchange rate level change (lnlev) and RMB exchange rate volatility (lnvol2), separately. Model (3) is the result of regressing the two core explanatory variables together. Model (4) adds all control variables, and all models control time effects. Since Model (4) contains all variables, this paper analyzes the regression results based on the representative Model (4).

First, the coefficient of exchange rate variation is positive and significant at the 1% level, indicating that for countries along the "The Belt and Road Initiative" route, the appreciation of the RMB will boost China's OFDI. This is because, on the one hand, an appreciation of the RMB means that companies can purchase more foreign currency assets with less RMB, thereby reducing investment costs and enhancing international competitiveness. On the other hand, an appreciation of the RMB will increase remitted profits denominated in RMB, thereby improving overall corporate profitability and further enhancing their enthusiasm and motivation for outbound investment. Furthermore, an appreciation of the RMB reflects the stability and strength of the Chinese economy, which will increase corporate investment decisions and confidence, making them more inclined to invest in overseas markets to gain more resources and market share.

Second, the coefficient of exchange rate volatility in the two-way fixed-effects model is negative and significant at the 1% level, indicating that exchange rate volatility has a suppressive effect on China's direct investment in countries along the "The Belt and Road Initiative" route. On the one hand, RMB exchange rate fluctuations increase the risk of Chinese companies' outbound direct investment in countries along the "The Belt and Road Initiative" route. On the other hand, RMB exchange rate fluctuations can lead to large-scale capital flows, which in turn can affect the stability of domestic financial markets and the investment environment. Furthermore, frequent exchange rate fluctuations can be seen as a signal of economic weakness, which can lead to a decline in host countries' confidence in Chinese companies and reduce the likelihood of Chinese companies investing outbound.

Finally, a brief analysis of the control variables is conducted: Economic development level (lngdp) shows a positive correlation at the 1% statistical significance level, indicating that the higher the economic development level of "The Belt and Road" Initiative participating countries, the stronger China's willingness to invest in them. The relative labor cost indicator (lnrela) shows a negative effect at the 1% significance level, indicating that rising labor costs in countries along the "The Belt and Road Initiative" route will have a suppressive effect on China's investment intentions, making China less willing to invest in them. Technology level (lntech) is significantly positive at the 1% level, indicating that China prefers to invest in countries along the "The Belt and Road Initiative" route with higher technological levels. Economic structure (lntax) is significantly negative at the 1% level, indicating that higher tax burdens in countries along the "The Belt and Road Initiative" route make it less conducive for China to invest in them. The inflation rate (inflation) is significantly positive at the 1% level. This may be because when inflation is high, domestic funds are relatively abundant, market competition becomes more intense, and risk-averse investors, seeking greater development space and market share, tend to invest overseas. The ability to attract foreign direct investment (lnnetinv) is significantly positive at the 1% level, indicating that the stronger the "The Belt and Road Initiative" region's ability to attract foreign direct investment, the more favorable it is for China to invest in it. Market vitality (lnvita) is significantly negative at the 1% level. This may be because the increase in service industry employment in countries along the "The Belt and Road Initiative" route will increase labor costs, intensify market competition, and worsen the

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investment environment, thus hindering outward foreign direct investment in China.

(V) Endogeneity Test

Considering that the aforementioned tests may not adequately address endogeneity issues arising from omitted variables and reverse causality in empirical research, this paper employs instrumental variables (IV) for re-estimation. Drawing on the research of Li Huiqing (2024), we consider the lagged effect of exchange rate fluctuations and select a lagged first-order variable of exchange rate fluctuations (Llnlev) as an instrumental variable. Endogeneity tests are conducted on the model using the two-stage least squares (2SLS) method. The test results are shown in Table 4.

Table 4. Endogeneity Test Results

	2SLS Estimation	
	Phase I	Phase II
Llnlev	0.9981***	
	(836.3360)	
lnlev		0.1109***
		(21.1364)
lnvol2		-0.0850*
		(-1.7252)
Control Variables	Yes	Yes
Country	Yes	Yes
Year	Yes	Yes
N	580	580
Kleibergen-Paap rk LM		9.946***
Cragg-Donald Wald F		7.0e+05[16.38]
Kleibergen-Paap rk Wald F		3.3e+05[16.38]
R2	0.9995	0.4808

Note. ***, ** and * indicate significance at the 1%, 5% and 10% levels respectively. The brackets in [ ] are the 10% critical value of the Stock-Yogo weak instrumental variable test.

According to the endogeneity test results, in the first-stage regression, the regression coefficient of Llnlev is significantly positive, and the instrumental variables meet the positive correlation assumption. In the second-stage regression, the Kleibergen-Paap rk LM statistic is significant at the 1% level, rejecting the null hypothesis of underidentification of the instrumental variables. The Cragg-Donald Wald F and Kleibergen-Paap rk Wald F statistics are greater than the Stock-Yogo F statistics, and the critical value of the F test for weak instrumental variable identification at the 10% significance level rejects the null hypothesis of weak instrumental variables. These test results indicate that the instrumental variables

selected in this paper are sufficiently reasonable and reliable. The estimation results show that the regression coefficient of exchange rate fluctuation (lnlev) is significantly positive at the 1% level, and the regression coefficient of exchange rate volatility (lnvol2) is significantly negative at the 10% level, indicating that the promoting effect of exchange rate fluctuations and the restraining effect of exchange rate volatility on China's direct investment in countries along the "The Belt and Road Initiative" route still exist.

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(VI) Heterogeneity Analysis

The geographical location, economic conditions, and spatial distance between different countries along the "The Belt and Road Initiative" route vary, which may affect China's investment costs and, therefore, affect China's OFDI. Therefore, this paper analyzes the heterogeneity of the "The Belt and Road Initiative" countries by region, income level, and geographic distance, helping to more accurately identify the impact of RMB exchange rate fluctuations on China's OFDI in different types of countries. This, in turn, provides more targeted and actionable policy recommendations for promoting the high-quality development of China's "The Belt and Road Initiative."

1. Regional Heterogeneity Analysis

Following the approach of Li Huiqing (2024), the countries along the "The Belt and Road Initiative" are divided into Asian, European, and African countries based on their geographical location. Asian countries are further divided into East Asia, Central Asia, South Asia, Southeast Asia, and West Asia. The European countries along the "The Belt and Road Initiative" are all Central and Eastern European countries. Since only Egypt and Mongolia are included in Africa and thus are not representative, this paper only conducts an empirical analysis of regional heterogeneity for countries in Asia (Central Asia, South Asia, Southeast Asia, and West Asia) and Europe (Central and Eastern Europe).

Table 5. Regional Heterogeneity Regression Results

	Asia				Europe
	Central Asia	South Asia	Southeast Asia	West Asia	Central and Eastern Europe
lnlev	1.0126***	-1.0807	0.1711***	-0.1763***	-0.0274
	(5.9676)	(-0.6257)	(3.5536)	(-15.9297)	(-1.0081)
lnvol2	-0.1304	0.0523	-0.0256	-0.1597	0.1448*
	(-1.2933)	(0.7725)	(-0.3495)	(-1.6538)	(2.0393)
Control Variables	Yes	Yes	Yes	Yes	Yes
Country	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes
N	44	55	110	187	220
F	1308.46	184.46	1397.24	4165.23	1899.28
R2	0.9702	0.9327	0.7866	0.6362	0.7907
within. R2	0.9535	0.9104	0.7401	0.6018	0.7691

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

According to the regression results, RMB appreciation will promote Chinese direct investment in Central Asian and Southeast Asian countries along the "The Belt and Road Initiative" route, while suppressing direct investment in South Asian, West Asian, and Central and Eastern European countries. RMB exchange rate fluctuations will suppress Chinese investment in Asian countries other than South Asia and promote investment in Central and Eastern European countries. This is because Central Asian and Southeast Asian countries (such as Kazakhstan, Singapore, and Malaysia) have relatively stable political environments and mature market economies. Furthermore, they have strong economic complementarity with China and close trade relations. RMB appreciation further reduces the investment costs of Chinese companies, increasing their investment in these countries. However, some countries in South Asia, West Asia, and Central and Eastern Europe (such as Israel, Iraq, Pakistan, and Ukraine) face significant geopolitical risks and economic uncertainty, making Chinese companies more cautious about investing in these regions. Furthermore, fluctuations in the RMB exchange rate increase uncertainty in overseas investment. Central and Eastern European countries, as key nodes along the"The Belt and Road" Initiative, provide Chinese companies with new market opportunities and cooperation opportunities, helping them diversify investment risks and improve investment returns.

2. Income Heterogeneity Analysis

Drawing on the classification of Chen Lin et al. (2020), countries along the "The Belt and Road Initiative" are categorized into high-, upper-middle-, lower-middle-, and low-income countries based on their income levels. Since Yemen and Afghanistan are the only low-income countries, which are not

representative of the sample, this analysis of income heterogeneity is limited to lower-middle-, upper-middle-, and high-income countries. The results are shown in Table 6.

Table 6. Regression Results of Income Level Heterogeneity

	High income	Upper-middle income	Lower-middle income
	lnofdi	*lnofdi*	*lnofdi*
lnlev	0.1528***	-0.0049	0.2905***
	(6.2923)	(-0.1587)	(13.9719)
lnvol2	0.1779*	-0.1849	0.0303
	(1.8133)	(-1.6872)	(0.3154)
Control Variables	Yes	Yes	Yes
Country	Yes	Yes	Yes
Year	Yes	Yes	Yes
N	209	187	220
F	1446.85	73310.16	248.82
R2	0.7656	0.8021	0.5185
within. R2	0.7418	0.7894	0.4701

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

According to regression results, both RMB appreciation and exchange rate fluctuations promote Chinese investment in high-income and lower-middle-income countries, while inhibiting investment in upper-middle-income countries. This is because high-income countries offer stable economies, favorable investment environments, low investment costs, and numerous opportunities for industrial upgrading, providing Chinese companies with mature investment platforms and technological cooperation opportunities. Lower-middle-income countries, with their high economic growth potential, abundant resources, and low labor costs, are expected to offer substantial market returns, thus attracting Chinese companies to invest in OFDI. In contrast, intensified market competition in upper-middle-income countries, with some facing the "middle-income trap" problem, significant pressure to transform their economic structures, and increased investment risks, has led Chinese companies to be more cautious in their investment decisions, thus inhibiting OFDI.

3. Analysis of geographical distance heterogeneity

This paper refers to the approach of Li Huiqing (2024) and divides the countries along the "The Belt and Road Initiative" into close and long distance samples based on the geographical distance to conduct distance heterogeneity analysis. The regression results are shown in Table 7.

Table 7. Distance Heterogeneity Regression Results

	Short distance	Long distance
	lnofdi	*lnofdi*
lnlev	0.2581***	-0.0752***
	(22.6926)	(-4.8888)
lnvol2	0.0766*	-0.1911***
	(1.8297)	(-3.2163)
Control Variables	Yes	Yes
Country	Yes	Yes
Year	Yes	Yes
N	286	352
F	4551.02	5613.62
R2	0.5942	0.7522
within R2	0.5410	0.7261

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

According to the regression results of geographic distance heterogeneity, RMB appreciation promotes Chinese investment in nearby countries while suppressing investment in distant ones. This is because nearby countries have close economic and cultural exchanges with China, leading Chinese companies to have a high degree of familiarity with their markets. The appreciation of the RMB further reduces investment costs and risks for these companies, making nearby countries along the "The Belt and Road Initiative" route more attractive for investment. Distant countries face high market uncertainty and trade costs, and RMB appreciation reduces the competitiveness of Chinese product prices in local markets, thereby suppressing Chinese OFDI. RMB exchange rate fluctuations and exchange rate level fluctuations have the same impact on China's OFDI, both horizontally and vertically, due to differences in economic development, technological levels, and foreign investment attraction among countries at different distances.

4. Conclusions and Policy Recommendations

This paper uses a two-way fixed-effects model to empirically analyze the impact of RMB exchange rate fluctuations on China's OFDI from both horizontal and vertical perspectives, using data on outbound direct investment stocks and bilateral real exchange rates for 58 countries along the "The Belt and Road Initiative" route from 2010 to 2020. The results show that RMB appreciation promotes Chinese direct investment in countries along the "The Belt and Road Initiative" route, while RMB exchange rate fluctuations inhibit Chinese direct investment in these countries. Furthermore, this paper conducts a heterogeneous analysis of countries across regions, income levels, and geographic distances, drawing the

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following conclusions: RMB appreciation promotes Chinese direct investment in Central and Southeast Asian countries along the "The Belt and Road Initiative" route, while RMB exchange rate fluctuations inhibit direct investment in countries outside of South Asia and Central and Eastern Europe. RMB appreciation has a more significant promoting effect on OFDI in high-income and lower-middle-income countries, while RMB exchange rate fluctuations have a relatively weaker inhibitory effect on middle- and high-income countries. Furthermore, RMB appreciation significantly promotes OFDI in nearby countries, while RMB exchange rate fluctuations significantly constrain Chinese direct investment in distant countries. The heterogeneous analysis of countries along the "The Belt and Road Initiative" route reveals diverse characteristics, which are closely related to multiple factors such as relative labor costs, technological level, economic structure, inflation rate, ability to attract foreign direct investment, and market vitality.

Based on the above research conclusions, this paper puts forward the following feasible suggestions:

At the national level, (1) policy communication and coordination with high-income and low-middle-income countries along the "The Belt and Road Initiative" in Central Asia and Southeast Asia (such as Singapore and Indonesia) should be strengthened. Investment costs and risks can be reduced by signing bilateral investment agreements, further promoting China's outward foreign direct investment; (2) the RMB exchange rate system should be improved and perfected to reduce exchange rate fluctuations, and infrastructure connectivity and trade facilitation should be strengthened with distant countries in South Asia and Central and Eastern Europe (such as Hungary and Slovakia), so as to enhance their investment attractiveness to Chinese companies.

At the enterprise level, (1) exchange rate risk management should be strengthened. Enterprises can use financial derivatives and optimize investment portfolios to reduce investment risks brought by exchange rate fluctuations. They can also consider direct investment in South Asia and Central and Eastern European countries (such as India and Poland) when exchange rates fluctuate. (2) They should understand the preferential investment policies of "The Belt and Road Initiative" and fully consider factors such as the economic development level and labor costs of countries along the "The Belt and Road Initiative". They should give priority to high-income or middle-low-income and nearby countries in Central Asia and Southeast Asia (such as Singapore and Vietnam) as investment targets and actively expand investment areas to achieve a higher rate of return on investment.

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