

The Impact of Bilateral Currency Swaps on Outward Foreign Direct Investment

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Abstract. The outbreak of the 2008 international financial crisis caused many countries around the world to face exchange rate fluctuations and currency crises. At the same time, China's central bank creatively began to sign central bank currency swap agreements with other countries to stabilize exchange rates and avoid the risk of fluctuations in the US dollar. This article is based on panel data from 90 countries from 2000 to 2021, and uses empirical analysis methods to explore the impact of currency swap agreements on China's outward foreign direct investment. On this basis, the intermediary effect is applied to analyze the financial market mechanism of currency swap policy. Research has found that currency swap agreements have a significant positive impact on the scale of China's outward foreign direct investment (OFDI). Financing constraints are an important influencing mechanism for currency swap agreements to promote China's OFDI. In the context of economic globalization and complex international situations, this study has important reference value for China to further promote deepening cooperation in the financial field between countries and promote the internationalization of the renminbi to facilitate the domestic and international dual circulation.

Keywords: Currency swap agreement; investment; financing constraints.

1. Introduction

The emergence of the depletion of US dollar liquidity after the global financial crisis has made many countries aware of the potential risks of currency crisis caused by the singularity of international settlement currencies. They are implementing policies to oppose the hegemonic position of the US dollar, which has further deepened the trend of global de dollarization and brought opportunities for the internationalization of the renminbi [1]. In this context, the People's Bank of China actively promotes the signing of RMB currency swap agreements and pays more attention to their role in avoiding exchange rate risks in bilateral trade and expanding international trade. Central bank currency swap refers to an agreement between the central banks of two countries, aimed at resolving currency liquidity issues between the two parties, avoiding the risks caused by fluctuations in the US dollar exchange rate when settling in US dollars, and providing emergency foreign exchange reserve support when necessary.

Previous studies have mostly explored the economic significance of central banks signing bilateral currency swap agreements from the perspectives of anchoring exchange rates, promoting cross-border trade, advancing the internationalization process of the renminbi, promoting diversification of the international monetary system, and stabilizing the international stock market. The People's Bank of China and the swap agreement countries hold foreign exchange reserves in each other's currencies, eliminating the exchange rate risk of using third-party currencies (US dollars) in international trade and capital settlements [2]. The research by Huang et al. and Liu et al. found that bilateral currency swap agreements promote the growth of China's export trade by reducing the fluctuation of the RMB exchange rate, and increase the frequency and discourse power of the RMB in international trade, promoting the internationalization process of the RMB [3, 4]. Zhang found through research that the signing targets of the US led currency swap mechanism are mostly developed Western countries, and this currency swap agreement has exclusivity, ignoring the liquidity issues of more emerging

countries [5]. In contrast, the currency swap agreements signed by the People's Bank of China are more targeted towards emerging market economies [6].

In recent years, China has signed currency swap agreements with many countries with close economic and trade relations. According to the theory of money supply, after signing a currency swap agreement, China can obtain foreign currency from the corresponding country as an expansion of foreign exchange reserves. An increase in the supply curve in the IS-LM curve will lead to a nationwide decrease in interest rates, making it easier for enterprises from both countries to engage in credit financing. At the same time, foreign enterprises can also directly use RMB for exports to China or receive direct investment from RMB [7]. Empirical research has also found that bilateral currency swaps can promote the use of RMB settlement in cross-border economic and trade activities by the other country or region, and can drive the demand for RMB reserve currency in the host country to facilitate imports to China and overseas direct investment inflows from China [8, 9].

On the other hand, Foreign direct investment is an important way for China to participate in the global industrial chain led by multinational corporations and facilitate the domestic and foreign dual circulation. However, due to factors such as anti globalization trends and unfavorable investment policies, China's OFDI activities have been frequently hindered, resulting in a continuous decline in investment scale. Previous studies on the effects of currency swaps have mostly focused on the impact of currency swap agreements on trade, with less attention paid to the impact on investment effects. Lu and Wang conducted causal risk analysis on the signing of bilateral currency swap agreements and foreign direct investment (FDI), and found that bilateral currency swaps can more effectively attract FDI from countries with distant political relations with China to flow into China [10]. Yu confirmed the promotion of home country enterprise OFDI through bilateral currency swap agreements, and explores the impact mechanism of bilateral currency swap from two paths: home country interest rate level and exchange rate level [11]. However, the existing research on whether China's signing of currency swap agreements can still promote its OFDI is not fully understood in terms of impact mechanisms and theoretical analysis. The analysis of impact mechanisms is mostly limited to macro exchange rates and interest rates. Therefore, this article uses theoretical analysis and proposes research hypotheses, using panel data from 90 countries in China's outward foreign direct investment for 21 years to estimate the investment effects of currency swap agreements, and conducts a series of robustness tests to ensure the reliability of the research results.

2. Methods

2.1. Data Source and Explanation

This article selects A-share listed companies from 2000 to 2021 as samples, and the financial data used is from the CSMAR. The outward direct investment data is sourced from the BVD Zephyr database and FDI markets database. This article treats the original sample companies as follows: (1) exclude data from tax havens. (2) Excluding financial listed companies and enterprises with discontinuous and incomplete data. (3) Apply a 1% truncation to all data. This paper ultimately obtained data on 830 listed companies' outward foreign direct investment in 91 countries and regions from 2000 to 2021 (including 40 currency swap countries), totaling 4544 imbalanced panel data. The explanatory variables for the signing of central bank currency swaps are compiled from the official website of the People's Bank of China.

2.2. Indicator Selection and Explanation

Explanatory variable (Table 1): Currency swap agreement. The sample includes countries that have signed bilateral currency swap agreements with the People's Bank of China during the sample period. Based on the signing time, the number of posts in the experimental group with a year greater than or equal to the signing time is set to 1, the number of posts before the signing time is set to 0, and the number of posts in the control group is set to 0.

Explanatory variable (Table 1): Outward Direct Investment (OFDI), using the incremental amount of outward direct investment at the enterprise level of Chinese A-share listed companies from 2000 to 2021, and combining Greenfield Investment and cross-border mergers and acquisitions in the database to obtain new data on China's outward direct investment.

Control variables (Table 1): Referring to the literature of current scholars, this article controls a series of control variables at the national and corporate levels. Firstly, this article incorporates control variables at the national level, including the real GDP of each country, China's total import and export volume (Trade) to each country, inflation rates (Inflation), and the proportion of natural resource rents (Resource) expressed as the ratio of the total rent of natural resources such as oil, natural gas, and coal to GDP.

Control variables at the enterprise level include enterprise age, enterprise size, return on assets, cash holdings, enterprise taxes, and shareholder shareholding. The size of the enterprise is measured by the total assets of the company, and the logarithm is taken. The age of the enterprise is represented by the years of establishment, and the return on assets is Roe. The cash holdings of the enterprise are measured by Cash, and the company's tax expenses are measured by Tax. The shareholding of shareholders is measured by the combination of dual positions, the top 1 largest shareholder shareholding ratio, and the proportion of independent directors IND.

Table 1. Definitions and descriptions of variables

Variable name	Description of variables
Post	Signing status of currency swap agreements
OFDI	Incremental foreign direct investment by listed companies
SIZE	The total assets of the company
ROE	The return on assets
CASH	The cash holdings of the enterprise
Age	The years of establishment
TAX	The company's tax expenses
Dual	The shareholding of shareholders
TOP1	The largest shareholder shareholding ratio
IND	The proportion of independent directors
Resource	The proportion of natural resource rents
Inflation	Inflation rates
Trade	China's total import and export volume
GDP	The real GDP of each country

2.3. Method Introduction

In order to identify the impact of currency swap agreements on China's OFDI, this article examines the impact of currency swap agreements on China's OFDI by comparing the differences in China's level of direct investment in the host country between the two states of signing agreements and not. This article establishes a two-way fixed effect based on the signing of the agreement, and the established model is as Eq. 1 follows:

$$OFDI_{ijt} = \beta_0 + \beta_1 post_{jt} + \beta_2 control + \lambda_i + \theta_t + \varepsilon_{ijt} \quad (1)$$

Among them, the subscript i represents the enterprise, j represents the country that has signed a central bank currency swap agreement with China, and t represents the year. $OFDI_{ijt}$ represents the stock of foreign direct investment by enterprise i in country j in year t. $post_{jt}$ is a dummy variable that represents the signing status of the central bank currency swap agreement. If country i signs a central bank swap agreement with China in year t, the value during the agreement period is 1, otherwise it is

0. *control* a control variable at the national and corporate levels, ε_{ijt} is the error term. The regression also controlled for individual fixed effects and time fixed effects.

3. Results and Discussion

3.1. Descriptive Analysis

Table 2. Descriptive Statistics

Variable	Mean	SD	Min	Max
OFDI	0.610	14.600	0.008	616
post	0.344	0.475	0	1
SIZE	22.52	1.615	17.88	31.00
ROE	0.0847	0.992	-7.091	60.57
CASH	0.0487	0.0742	-0.650	0.608
BS	2.163	0.215	1.099	2.944
Age	2.752	0.419	0.693	3.989
TAX	0.0414	0.848	-0.351	61.37
Dual	0.264	0.441	0	1
1TOP1	35.22	15.52	3.003	89.09
IND	36.80	7.338	0	80
Resource	2.484	5.086	0	48.10
Inflation	102.7	104.0	19.56	442.6
Trade	2.771	4.517	-19.15	54.01
GDP	39069	23264	322.9	133600

Table 2 reports the descriptive statistical results of the main variables, and the complete sample includes data related to 4454 groups. The average OFDI of the enterprise is 0.610, indicating that the average OFDI is at a high level. The average value of the explanatory variable (i.e. market value management performance score) is 0.344, indicating that the proportion of countries conducting currency swaps in the total sample is relatively reasonable.

3.2. Benchmark Regression

Table 3. Benchmark Regression Result

VARIABLES	(1) OFDI	(2) OFDI
post	2.029** (0.954)	2.102** (1.060)
Constant	-0.034 (0.379)	4.635 (20.559)
Observations	4,968	4,544
R-squared	0.276	0.281
Control	NO	YES
Individual FE	YES	YES
Year FE	YES	YES
Country FE	YES	YES
r2_a	0.0928	0.0913

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

The first column shows the regression results without adding control variables (Table 3), and the coefficient of the central bank's currency swap post is significantly positive at the 5% level. The

second column in Table 3 shows the results of controlling for time effects, individual fixed effects, and variables at the corporate and national levels. The coefficients are significantly positive at the 5% level, indicating that the signing of the central bank's currency swap agreement has significantly improved the level of outward foreign direct investment by Chinese enterprises.

3.3. Mediation Effect

The (2) and (3) columns (Table 4) report the empirical test results of the impact of central bank currency swap agreements on outward foreign direct investment by reducing corporate financing constraints. Column (1) is a test of the overall effect of the central bank currency swap agreement as the explanatory variable and the enterprise OFDI as the dependent variable. The regression coefficient is significantly positive, supporting the hypothesis 1. Column (2) is a test of the mediating variable financing constraint SA and the explanatory variable currency swap post, examining the effect of the explanatory variable on the mediating variable. Among them, SA is the corporate financing constraint index, and the larger the value, the greater the corporate financing constraint. The coefficient in column (2) is significantly negative, indicating a significant negative correlation between currency swap and corporate risk. Column (3) is an overall test of the mediating variable, explanatory variable, and dependent variable. From the data in the table 4, it can be seen that after adding the corporate financing constraint SA as the control variable to the regression equation, the regression coefficient of the explanatory variable post is significantly reduced, and the coefficients of the mediating variable and the explanatory variable are both significant at the 0.01 level. Therefore, there is a partial mediating effect of corporate financing constraint on the impact of currency swap on OFDI. That is to say, currency swap has a positive effect on OFDI through direct effects, while another part indirectly improves OFDI by reducing corporate financing constraint.

Table 4. Mediation Effect Test

VARIABLES	(1) OFDI	(2) OFDI	(3) OFDI
SA		-8.705** (4.069)	
post	2.102** (1.060)	1.925* (1.063)	-0.020*** (0.004)
Constant	4.635 (20.559)	38.967 (26.074)	3.944*** (0.08)
Observations	4,544	4,544	4,544
R-squared	0.281	0.282	0.977
Control	YES	YES	YES
Individual FE	YES	YES	YES
Year FE	YES	YES	YES
Country FE	YES	YES	YES
r2_a	0.0913	0.0922	0.971

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

3.4. Robustness Test

In the robustness testing section, this article uses lagged explanatory variables (Table 5), proposed epidemic intervals, and replaced the dependent variable to test the robustness of the benchmark regression conclusion. Column (1) is the result of lagging the explanatory variable by one period. Due to the lag in the signing of monetary agreements, the improvement of corporate financing constraints and investment decisions may be manifested in the later time period. Therefore, the explanatory variable post is lagged by one year, and the test results are still positively significant at the 1% level, verifying the robustness of the benchmark regression results. Column (2) is to exclude the impact of the epidemic after 2020-2021 from the sample range. Due to the impact of the COVID-

19, there is a great impact on enterprises' foreign direct investment decisions, making governments and financial markets different from normalization, so the results after exclusion are more convincing. The test results are still significant at the 5% level, confirming the robustness of the benchmark regression results. Column (3) replaces the dependent variable with the amount of outward foreign direct investment by the enterprise, and the test results are still positively significant at the 5% level, which also verifies the robustness of the benchmark regression results.

Table 5. Robustness Test

VARIABLES	(1) OFDI	(2) OFDI	(3) OFDInum
L.post	3.254*** (1.077)		
post		2.547** (1.166)	1.365** (0.688)
Constant	17.901 (26.962)	1.127 (3.260)	3.009 (13.350)
Observations	3,322	3,927	4,544
R-squared	0.341	0.240	0.281
Country FE	YES	YES	YES
Individual FE	YES	YES	YES
Year FE	YES	YES	YES
Country FE	YES	YES	YES
r2_a	0.151	0.0303	0.0913

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

4. Conclusion

This article analyzes the policy effects of China's central bank's currency swap agreement based on panel data of 830 Chinese enterprises in 90 countries for outward foreign direct investment from 2000 to 2021, and tests the relevant mechanisms to investigate whether the purpose of promoting outward foreign direct investment by Chinese enterprises through currency swap policies has been achieved. This article first reviews previous research, then proposes research hypotheses through theoretical analysis, and empirically tests them using a bidirectional fixed effects model. The research findings indicate that:

Firstly, the currency swap agreement has significantly promoted foreign direct investment by Chinese enterprises. The benchmark regression results show that the coefficient of the currency swap agreement is significantly positive, and the robustness test ensures the reliability of the regression results. The signing of the central bank's currency swap agreement promotes the outward direct investment of Chinese enterprises. As the main body of China's outward foreign direct investment, enterprises need to choose their outward foreign direct investment destinations based on their own actual situation and business strategy, as well as considering the actual situation of the host country and relevant policies such as central bank currency swaps. Therefore, the overall positive impact means that currency swaps have indeed played a role in promoting outward direct investment.

Secondly, relieving corporate financing constraints is an important mechanism for currency swap agreements to promote OFDI in China. The intermediary effect test results show that the signing of currency swap agreements significantly reduces the cost and risk of corporate financing, while the reduction of financing constraints promotes outward direct investment by enterprises. The funds of a company are an important factor in determining its investment, especially in external investment. When enterprises can conveniently obtain low-cost financing from the capital market, there will be more opportunities for outward direct investment.

This study provides new evidence for a better understanding of the relationship between currency swap agreements and China's OFDI. In the context of repeated, stagnant, and even to a certain extent reversed globalization, China's signing of currency swap agreements with more countries is an important link in promoting the internationalization of the renminbi. The widespread use of the renminbi worldwide can not only promote the development of China's foreign investment and smooth the domestic and foreign dual circulation, but also promote the establishment of a more just and reasonable international economic order that is in line with the interests of all parties.

References

- [1] H.L. Li, S.K. Li, Strong US dollar cycle, de dollarization trend, and strategic adjustment of RMB internationalization, *Economist*. 5 (2019) 68-75.
- [2] Q. Yang, Foreign exchange reserves, bilateral currency swaps, and liquidity shocks, *Finance, Trade and Economics*. 39 (2018) 67-82.
- [3] X.W. Huang, Z.S. Zhang, Y. Bian, A Study on the Valuation of RMB Trade under the Background of "De dollarization": Based on the Perspective of Bilateral Currency Swap Agreements, *International Finance Research*. 01 (2024) 15-26.
- [4] Z.Q. Liu, J.M. Zhang, H.B. Zhang, Bilateral Currency Swap Agreements and China's Export Trade Growth: A Perspective Based on Exchange Rate Fluctuation Risk, *Asia Pacific Economy*, 02 (2021) 27-36.
- [5] F.L. Zhang, The China Effect of Global Monetary Governance, *World Economy and Politics*. 08 (2019) 96-12.
- [6] W.A. Wang, K.X. Cai, B. Yu B, Economic Policy Uncertainty, RMB Swaps and International Stock Market Stability, *Journal of Zhejiang University (Humanities and Social Sciences Edition)*. 53 (2023) 116-132.
- [7] M. Zhang, Global Currency Swaps: Current Status, Functions, and Potential Directions for International Monetary System Reform, *International Economic Review*. 06 (2012) 65-88.
- [8] F.H. Deng, T.J. Yang, W.D. Huo, Bilateral Currency Swap Agreements and Cross border Trade RMB Settlement: An Empirical Study Based on Capital Account Constraints, *International Trade Issues*. 06 (2020) 160-174.
- [9] M.N. Zhu, C.Y. Cao, Drivers of RMB reserve demand - empirical test based on the "the Belt and Road" initiative, *International Finance Research*. 06 (2019) 37-47.
- [10] K.J. Lu, X.F. Wang, Research on the Impact of Bilateral Currency Swaps on Foreign Direct Investmen, *Financial Market Research*. 12 (2023) 44-57.
- [11] G.C. Yu, C.Y. Wang, Currency Swap Agreements, Financial Markets, and China's Foreign Direct Investment, *Southern Economics*. 03 (2021) 19-35.