

Micro Behavioral Mechanisms Linking Geopolitical Risk and RMB Internationalization: Evidence from Belt and Road Countries

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Abstract. This article explores how geopolitical risks influence RMB internationalization based on a behavioral perspective introducing the theories of “limited attention” and “psychological account”. The research takes the monthly trade RMB settlement data of 15 countries along the “Belt and Road” from 2015 to 2023 as samples, and constructs a two-way fixed effects model. The research found that geopolitical risk plays a significantly positive role in promoting RMB use in the countries, indicating that against a backdrop of rising global political uncertainty, RMB has become an important choice for the countries to diversify their currency allocation. In addition, market risk aversion will restrict RMB use, but does not have a positive effect on the above relationship, reflecting the separation between political risk and market risk in the psychological account during the decision-making process. Furthermore, the heterogeneity analysis shows that countries with high trade dependence on China may turn to the traditional risk-aversion currency when the risk rises, while countries with low one may choose RMB as an alternative. This research integrates the behavioral finance and the currency internationalization theory, and provides policy implications for promoting RMB internationalization.

Keywords: Geopolitical Risk, RMB Internationalization, Risk Aversion, Psychological Account, Belt and Road Countries.

1. Introduction

Nowadays, rising geopolitical tensions and the weaponization of the U.S. dollar have intensified global concerns over currency security, encouraging many countries to diversify their currency allocation [1]. In this context, governments around the world began to seek “de-dollarization” and diversified currency allocation [2]. As the sovereign currency of the world's second largest economy, especially since the “Belt and Road” initiative (BRI) began, the use of RMB in Belt and Road countries has expanded significantly. Existing studies have mostly studied on macroeconomic fundamentals, exchange rate regimes and degree of openness of China’s financial market, while relatively ignoring the key exogenous impact of geopolitical risk and its behavioral transmission mechanism [3]. Behavioral finance suggests that under uncertainty, decision makers are influenced by limited attention and psychological accounts, making currency choice less than fully rational [4-6]. This article attempts to integrate the perspectives of international economics and trade and behavioral finance in order to explore how the government's monetary decision is affected by these behavioral factors and its influence mechanism when the local political risk rises.

The possible marginal contributions of this article are as follows: (1) at the theoretical level, the “limited attention” and “psychological account” theories are introduced into the research of RMB internationalization to build a behavioral analysis framework; (2) at the empirical level, the research identifies the separation phenomenon of market risk aversion and provides theoretical explanations; (3) at the policy level, the research provides suggestions from the perspective of behavior to promote RMB internationalization in the complex geopolitical environment.

2. Theoretical Analysis and Hypothesis

2.1. Explanation of Core Concepts

2.1.1. Geopolitical Risk Index (GPR)

Geopolitical risk refers to the realized and expected threats arising from international political conflict. The GPR index developed by Caldara and Iacoviello captures both realized geopolitical events and expectations of potential threats [7,8].

2.1.2. Risk aversion-CBOE Volatility Index (VIX) as a proxy

Volatility index is an expected index of market volatility compiled and released by the Chicago Board Options Exchange (CBOE) [9]. It reflects expected stock market volatility in the next 30 days. VIX is usually regarded as a key indicator to measure investor sentiment, market risk appetite and risk aversion demand.

2.1.3. Psychological account mechanism

Psychological account theory argues that decision makers mentally separate risks and resources into different categories, which shapes their behavioral choices [5]. In this framework, policy makers may place political risk and market risk in separate psychological accounts, causing these two dimensions to receive different weights in currency allocation decisions.

2.1.4. Limited attention mechanism

There is an upper limit to the cognitive resources available to decision makers when using existing information for analysis [10]. When local political risk events occur, the focus of media coverage occupies the attention of decision makers. They devote most of their attention to processing political risk information, and relatively ignore market fluctuation information. This change in attention distribution will affect the decision making of currency choice.

2.2. Theoretical analysis of behavior mechanism

When local political events break out, policy makers, like governments, will open two kinds of psychological accounts for political risk and market risk to assess respectively. Under limited attention, decision makers prioritize political threats, which amplifies political risk perception and weakens the role of market risk aversion.

Under the influence of the two mechanisms, the separation of political risk and market risk is formed in decision-making weight. Even if the global risk sentiment rises, its inhibitory effect has not significantly affected the positive effect of GPR on the use of RMB. This reveals the behavioral logic from the micro level that the RMB is favored due to its alternate attribute in the geopolitical turmoil.

2.3. Research Hypothesis

Based on the above theoretical framework, this article proposes the following hypotheses:

H_1 : Geopolitical risk (GPR) has a significant positive impact on the use of RMB in the belt and road countries.

H_2 : The impact of market risk aversion (VIX) on the use of RMB is characterized by separation.

H_{2a} : The rise of market risk aversion (VIX) has a direct inhibitory effect on the use of RMB;

H_{2b} : Market risk aversion (VIX) will not significantly change the role of GPR in promoting the use of RMB.

H_3 : Among countries that have established institutionalized currency cooperation with China, the relationship between geopolitical risk and the use of RMB has changed systematically.

3. Research Methods and Data

3.1. Samples and Data

According to the existing research and the tips of the “Belt and Road” official website, the relevant data of 15 major belt and road countries including Russia, Saudi Arabia, Singapore, Malaysia, Thailand, Indonesia, Vietnam, the Philippines, Pakistan, the United Arab Emirates, Turkey, Poland, Hungary, Kazakhstan and South Africa from January 2015 to December 2023 were selected [1,8].

Due to data availability, the sample does not cover all Belt and Road countries. However, the sample remains broadly representative in terms of geographic distribution, economic structure, and economic ties with China.

3.2. Variable Description and Descriptive Statistics

Table 1 reports the definitions and sources of the dependent, explanatory, moderating, and control variables.

Table 1. Definition, calculation method and data source of core variables

Variable category	Variable name	Variable symbol	Definition and calculation method	Data sources
Explained variable	RMB trade settlement scale	rmb_trade_billion	Monthly RMB cross-border trade settlement amount (100 million yuan)	General Administration of Customs of China
Core explanatory variable	Geopolitical risk index	gpr	Monthly index constructed by Caldara & Iacoviello (2022)	Caldara & Iacoviello (2022)
moderator	Market risk aversion index	vix	Chicago Board Options Exchange Volatility Index	Federal Reserve System
control variable	Sino US interest rate difference	rate_diff	China's 10-year Treasury bond yield US10-year Treasury bond yield (%)	Ministry of Finance, PRC Federal Reserve System
	Dollar index	dxy	Weighted exchange rate index of the US dollar against a basket of currencies	Federal Reserve System
Interaction item variable	GPR and VIX interaction items	gpr_vix	GPR×VIX(decentralized processing)	Calculated
Heterogeneity Analysis	Trade dependence on China	trade_dep_china	$\frac{Export\ to\ China + Import\ to\ China}{GDP}$	General Administration of Customs of China World Bank

The average of RMB trade settlement (rmb_trade_billion) is 1.765 billion yuan, and the standard deviation is 1.635 billion yuan, the minimum is 63 million yuan, and the maximum is 8.416 billion yuan, indicating that there are significant differences in the use of RMB in different countries and periods, with a high degree of dispersion. The average of geopolitical risk index (GPR) is 104.46, which exhibits substantial fluctuations during the sample period (58.42-318.95), and the standard deviation is 34.16, which reflects the instability of the international political environment during the research period, especially reaching the peak of 318.95 during the Ukrainian crisis in 2022. The average of the market risk aversion index (VIX) is 18.56, and the maximum is 57.74. It appeared in the period of global market panic caused by the COVID-19 in March 2020, showing significant volatility in market sentiment. In terms of control variables, the average of rate_diff_uscn is 0.83 percentage points, fluctuating between -2.10 and 2.43; The average of dollar index (DXY) is 114.84, which remains relatively high as a whole.

4. Model Estimation and Result Analysis

4.1. Model Setting

This article adopts the two-way fixed effects model of panel data, and the baseline model is as follows:

$$rmb_trade_billion_{it} = \beta_0 + \beta_1 gpr_t + \beta_2 vix_t + \gamma X_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (1)$$

Where, μ_i is the national fixed effect, λ_t is the time fixed effect, X_{it} is the control variable vector. To test the moderating effect of VIX, the multiplicative interaction model is introduced:

$$rmb_trade_billion_{it} = \beta_0 + \beta_1 gpr_t + \beta_2 vix_t + \beta_3 (gpr_t \times vix_t) + \gamma X_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (2)$$

All regressions used clustered standard errors at the national level to control potential within-group correlation.

4.2. Baseline Regression

Table 2 shows that GPR has a significantly positive effect on RMB trade settlement, supporting H1. The coefficient on market risk aversion (VIX) is significantly negative (column2: $\beta_2 = -1.885$, $p < 0.05$), indicating that the rise in global market risk sentiment will inhibit the use of RMB, which supports H_{2a} .

Table 2. Baseline results

VARIABLES	rmb trade billion	rmb trade billion	rmb trade billion	rmb trade billion
gpr	0.581*** (0.188)	0.182*** (0.061)	0.388 (0.249)	-0.007* (0.003)
vix		-1.885** (0.703)	-2.830 (1.742)	-0.145*** (0.034)
rate_diff_uscn			4.009 (4.944)	-0.485 (0.477)
dxy				0.291*** (0.072)
Constant	-34.108 (23.156)	46.524*** (10.206)	34.982*** (4.652)	3.252 (8.587)
Observations	1,620	1,620	1,620	1,620
R-squared	0.825	0.825	0.825	0.813
Number of country_i	15	15	15	15
country_i FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes

Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

4.3. Moderating Effect ($GPR \times VIX$)

As shown in Table 3, after adding the interaction term " $GPR \times VIX$ ", the coefficient on the interaction term is not significant ($\beta_3 = 0.010$, $p > 0.1$), indicating that market risk aversion has not adjusted the impact of geopolitical risks on the use of RMB, which supports H_{2b} . This result is consistent with the psychological account theory, which means decision makers put political risk and market risk in different psychological accounts, and there are priority differences in attention allocation.

Table 3. Moderating effect test results

VARIABLES	rmb trade billion	rmb trade billion	rmb trade billion
gpr	0.182*** (0.061)	0.034 (0.203)	-0.410 (0.402)
vix	-1.885** (0.703)	-3.081 (2.042)	-4.302 (3.996)
gpr_vix		0.010 (0.012)	0.025 (0.024)
rate_diff_uscn			-6.514 (7.717)
dxy			-0.570 (1.651)
Constant	46.524*** (10.206)	65.579* (33.569)	175.514 (246.376)
Observations	1,620	1,620	1,620
R-squared	0.825	0.825	0.825
country_i FE	Yes	Yes	Yes
Time FE	Yes	Yes	Yes
Interaction	No	Yes	Yes
Controls			Full

4.4. Robustness Test

Two robustness checks are conducted to test whether the baseline results are sensitive to alternative variable specifications. Firstly, in order to reduce the impact of the explained variables' heteroscedasticity and outliers, this article replaces the RMB trade settlement scale with its natural logarithm form ($\ln_rmb$) and re-estimates the model. The coefficient on geopolitical risk (GPR) is significantly positive ($\beta_1=0.009$) at the 1% level, the coefficient on market risk aversion (VIX) is significantly negative ($\beta_2=-0.071$), the coefficient on dollar index (DXY) is not significant but the direction is positive, and the coefficient on $GPR \times VIX$ is still not significant. The above results are highly consistent with the baseline model, indicating that the research conclusion is robust to the choice of variable function form.

Secondly, considering that different dimensions of geopolitical risk may affect the transmission mechanism, this article replaces the core explanatory variable from the overall GPR index with the GPR threat index (GPRT), which focuses more on threat perception [7]. The regression results show that GPRT still has a significant positive impact on the scale of RMB trade settlement ($\beta_1=1.108$, $p<0.01$), while the impact direction of market risk aversion (VIX) is consistent with the benchmark model, and the coefficient on the interaction term is not significant. This shows that the findings remain consistent under different geopolitical risk measures, which further conforms the applicability of the theoretical framework under different risk measures.

4.5. Heterogeneity Analysis

The heterogeneity results are shown in Table 4. The impact of geopolitical risk on the use of RMB is significantly different due to different countries' trade dependence on China, which supports the H_3 .

In the group of countries with high trade dependence, the coefficient on geopolitical risk is significantly negative ($\beta_1=-0.051$, $p<0.05$), indicating that the rise of geopolitical risk will inhibit the use of RMB; In the group of countries with low trade dependence, the coefficient is positive but not significant. Countries with high trade dependence may have established close institutionalized cooperation with China.

When geopolitical risk increases, decision makers may temporarily return to the use of traditional security assets such as dollar based on path dependence and risk aversion. In addition, the coefficient on dollar index (DXY) is significantly positive in both groups, and has a stronger effect on countries with low trade dependence, further indicating that the RMB plays a more prominent role as a "secondary safe-haven asset" in countries with weak trade links.

This finding suggests that in the process of promoting the internationalization of RMB, the government of China should implement different strategies for countries with different degrees of trade relevance, strengthen institutional resilience to buffer the risk impact for countries with high trade dependence, and highlight the alternative risk avoidance function of RMB for countries with low trade dependence.

Table 4. Heterogeneity test results

VARIABLES	High trade dependence group	Low trade dependence group
gpr	-0.051** (0.020)	0.026 (0.016)
vix	-0.108 (0.089)	0.124 (0.108)
dxy	0.326** (0.157)	0.863*** (0.195)
rate_diff_uscn	0.570 (0.804)	-2.383*** (0.826)
_cons	-16.357 (17.894)	-82.410*** (22.102)
N	804	816
R-sq	0.016	0.154
adj. R-sq	0.011	0.150

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

5. Research Discussion

From the perspective of behavioral finance, this article reveals how geopolitical risk affects RMB internationalization beyond traditional macroeconomic frameworks. The research findings show that geopolitical risk has a significant positive impact on the use of RMB in belt and road countries, while market risk aversion remains separate from political risk in decision-making.

Firstly, compared with Cai's research, this article introduces the theory of “Psychological account” and “Limited attention”, and explains that behavioral mechanisms help explain why decision makers may still choose RMB under rising geopolitical risk [3]. Secondly, the finding of this article—that market risk appetite does not significantly moderate the impact of geopolitical risks (GPR) on the use of RMB—diverges from the findings of Zhong Xuesi et al. In their study on the currency anchor effect, they identified an enhancement mechanism whereby geopolitical risks strengthen the RMB's anchoring role [8]. A possible explanation is that decision makers treat political and market risk separately in their psychological accounts.

Overall, incorporating behavioral mechanisms enriches the explanation of how geopolitical risk influences RMB internationalization. Future research may further test these mechanisms with micro-level data. Future research can further explore the decision logic underlying currency choice of different types of decision-makers under different risk scenarios by combining the micro subject behavior data.

6. Conclusion

Using monthly data for 15 Belt and Road countries from 2015 to 2023, this article examines the behavioral mechanism through which geopolitical risk affects RMB internationalization.

The results are shown as follows: Geopolitical risk significantly promotes RMB trade settlement in Belt and Road countries, suggesting that RMB is increasingly used as a diversified currency choice under political uncertainty. Although market risk aversion directly suppresses RMB usage, it does not significantly moderate this relationship, reflecting a psychological separation between political and market risks. Moreover, countries highly dependent on China tend to revert to traditional safe-haven currencies during heightened risk, whereas less dependent countries are more likely to adopt RMB as an alternative safe-haven asset.

For implications, the government and financial institutions should take the initiative to use the geopolitical risk window to strengthen the expectation of RMB as “safe asset”. In addition, governments should pursue differentiated strategies by consolidating local currency cooperation mechanisms for highly dependent nations and emphasizing the RMB's alternative hedging utility for those with lower dependence. Furthermore, policy makers can deepen the reform of the financial market and improve the liquidity of RMB assets and the convenience of cross-border use. Finally, policy communication should incorporate behavioral considerations and improve transparency.

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