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Investment Destination Decisions of China's Enterprises Related the Belt and Road: An Empirical Study on Investment Risk Measurement

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Abstract: Foreign Direct Investment (FDI) is an important capital acquisition channel for emerging economies. In order to analyze the determining factors and preferences in the investment region selection of multinational corporations in China's "Belt and Road" initiative, we have focused on studying the countries that play a crucial role in this initiative. In our research, we have employed a comprehensive risk measurement framework to reveal the spatiotemporal distribution patterns and the extent of investment risk spillover effects in these countries. Through empirical analysis, we have established a nonlinear relationship between investment risk and the investment regions of China's Outward Foreign Direct Investment (OFDI), providing theoretical and empirical insights for these countries that are eager to pursue development in monitoring and mitigating potential investment risks.

1. Introduction

This study proposes a risk measurement framework for investment risks in Belt and Road countries. Investment risk can be explained as the possibility of losses in outward FDI, primarily attributed to political instability and macroeconomic fundamentals of host countries. We integrate various realistic factors of investment risks in Belt and Road countries, including political, economic, and cultural aspects. For instance, Teece (1986)[1] emphasizes the significant impact of political risk on joint ventures' outward FDI, while Becker et al. (2012)[2] argue that political risk has a greater influence. Lu and Yan (2011)[3] find that factors such as resource abundance, degree of industrial structure adjustment, difficulty in accessing natural resources, differences in host country conditions, and trade barriers influence China's regional choices for outward FDI. Combining "political instability" and "macroeconomic risks," we develop a risk measurement framework for investment risks in Belt and Road countries.

We examine the nonlinear impact of investment risks in Belt and Road countries on the regional choices of China's OFDI. Previous studies lack specific theoretical models and rely on general frameworks linking investment risks with outward FDI. Moreover, most empirical studies adopt linear or log-linear parametric econometric models without considering spatial spillover effects (Henisz, W. J., & Delios, A., 2001)[4]. These limitations may undermine the effectiveness of

empirical findings. In this study, we employ a semiparametric spatial lag model using macro-level data on China's OFDI to test the nonlinear effects of investment risks, policy instability, and macroeconomic risks on the regional choices of China's OFDI, as well as their spatial spillover effects. The study also analyzes heterogeneity between Belt and Road countries and countries at different stages of development to verify the indirect impact of policy instability on macroeconomic risks.

2. Data and Empirical strategy

2.1 Measurement of investment risks

We focus on the 64 countries related the "Belt and Road," as disclosed by “the China Belt and Road Network”. The time span for analysis is between 2009 and 2019. After removing invalid and missing values, a sample of 48 countries with complete data remained, which accounted for 83.0% of Chinese investment stock in all countries related the route as of 2019. This sample encompasses lower-middle-income, fast-growing income, and developed countries, making it highly representative of the overall situation related the "Belt and Road."

The sourced data come from the World Bank database and the US ICRG database. Missing data on individual countries were obtained from government and statistical department publications. For historical data with null values, mean value replacement was used to interpolate both ends. For missing data in the most recent year but with complete historical data, regression methods were employed for filling in. Prior to evaluation and calculation of sample data, the maximum standardization method was applied to eliminate differences in data units and index attributes. This dimensionless processing ensured that sample data values fell within the [0, 100] interval with consistent polarity.

2.2 Empirical model setting

Spatial econometric models can be broadly classified into Spatial Error Model (SEM) and Spatial Lag Model (SLM), based on the nature of spatial correlation. (Guo, J., Ye, A., & Chen, H., 2012)[5] Comparing LM test values (as shown in **TABLE 1**), we notice that LM (lag) and R-LM (lag) exhibit greater significance than LM (error) and R-LM (error). This finding suggests that the SLM outperforms the SEM.

Table 1: Test statistics and statistical values

	Test statistic (spatial weights for W)
LM (lag)	14.2701 ***
R-LM (lag)	16.9080 ***
LM (error)	1.8563
R-LM (error)	4.4943 **

Note: “***, ** and *” means significant at the 1%, 5% and 10% levels respectively.

This paper builds on the work of Qiu, L., & Ye, A. et al. (2019)[6] to construct a semi-parametric panel space lag model as follows:

$$\begin{aligned}\ln Ofdi_{it} = {} & \alpha_i + \rho W \ln Ofdi_{it} + \beta_1 \ln GDP_{it} + \beta_2 \ln Resource_{it} + \beta_3 \ln Labor_{it} \\ & + \beta_4 \ln Cgdp_{it} + \beta_5 \ln Open_{it} + \gamma_1 W \ln GDP_{it} + \gamma_2 W \ln Resource_{it} \\ & + \gamma_3 W \ln Labor_{it} + G(Risk_{it}) + \mu_{it}\end{aligned}$$

The non-parametric part in the formula $G(Risk_{it})$ represents $Risk_{it}$, which serves as the explanatory variable in the non-parametric component and represents the host country's investment

risk. $Ofdi_{it}$ indicates Chinese investment stock in countries related the route in a given year, while i represents spatial weight. GDP_{it} denotes the logarithmic gross domestic product of the host country, $Resource_{it}$ expresses the proportion of fuel, metal and ore exports to total level of exports, $Labor_{it}$ reflects the per capita GDP and employment in the host country, $Cgdp_{it}$ represents China's gross domestic product value, and $Open_{it}$ signifies the trade dependence of the host country. To investigate the impact of market size, resource endowment, and labor cost advantages in the host country on Chinese investment related the "Belt and Road," this study adopts the product of the three spatial weight matrices and control variables, namely $ln\,GDP_{it}$, $W\,ln\,Resource_{it}$ and $W\,ln\,Labor_{it}$ as the adjustment variable.

TABLE 2 provides the descriptive statistics for each variable. On average, Chinese investment stock in countries related the "Belt and Road" during sample period was 1,522.89 million U.S. dollars, while the investment risk value for these countries was 45.64. The gross domestic product (GDP) for the host countries averaged 274.1 billion U.S. dollars, with an average per capita net national income of 10,844 U.S. dollars. Additionally, the average degree of dependence on foreign trade was 51.2%, with fuel, ore, and metal exports accounting for 34.1% of all manufactured exports. Variable dispersion analysis reveals significant heterogeneity in the investment risk and development stage of countries related the "Belt and Road." This finding underscores the complexity of studying the relationship between investment risk in these countries and China's OFDI, indicating that a simplistic linear relationship cannot fully capture this complex dynamic.

Table 2: Variable descriptive statistics results

Explained Variable	Unit	Mean	SD	Max	Min
$Ofdi_{it}$	$ thousands	1522890	4066910	44568090	540
Explanatory Variable	Unit	Mean	SD	Max	Min
$Risk_{it}$	%	45.64	14.74	100	0
GDP_{it}	$ millions	274100	418700	2660400	6500
$Cgdp_{it}$	$ millions	7781500	1478400	10131900	5502000
$Open_{it}$	%	51.2	31.5	203.3	0.1
$Resource_{it}$	%	34.1	32.8	100.0	0.9
$Labor_{it}$	$	10844	11388	57662	7 10

In summary, the semi-parametric SLM model can accurately capture the non-linear relationship between investment risk in countries related the "Belt and Road" and China's OFDI, while effectively modeling the spatial spillover effect of these risks. This approach offers a non-parametric measurement advantage over previous research, which is limited by its parametric models. Consequently, this study provides valuable insights for investment and construction within emerging developing countries.

3. Measurement of investment risk index system

Drawing on relevant measurement methods, we screen 12 indicators that may impact investment risk from two perspectives: policy instability and macroeconomic risk. Subsequently, we investigate the level of investment risk in these countries, analyzing its temporal and spatial characteristics.

3.1 Composition of index system

The study compared the measurement results with characteristic facts, confirming more robust outcomes. **TABLE 3** presents the measurement outcomes as well as the ranking of OFDI issues in China. From 2009 to 2019, four out of the ten countries with the highest number of problematic

investment projects in China's OFDI corresponded to those having the highest level of investment risk or the most significant deterioration (top ten). Meanwhile, six out of the ten countries with the largest total investment amount in China's OFDI exhibited the highest level of investment risk or the most considerable deterioration. Overall, the investment risks measured in this study for countries related the "Belt and Road" align consistently with the reality of China's OFDI.

Table 3: Sustainable Development Level and Ranking of China's OFDI

Rank	Investment risk level		China's OFDI Problem Investment	
	Average	Most deterioration	Problematic investment projects	Total problem investment
1	Myanmar	Bahrain	Iran	Iran
2	Iraq	Egypt	Vietnam	Malaysia
3	Belarus	Lebanon	Russia	Myanmar
4	Pakistan	Turkey	Israel	Pakistan
5	Iran	Iran	India	Iraq
6	Lebanon	Qatar	Iraq	Kazakhstan
7	Egypt	Oman	Myanmar	Israel
8	Moldova	Slovakia	Philippines	Russia
9	Russian	Jordan	Mongolia	India
10	Kazakhstan	Iraq	Malaysia	Indonesia

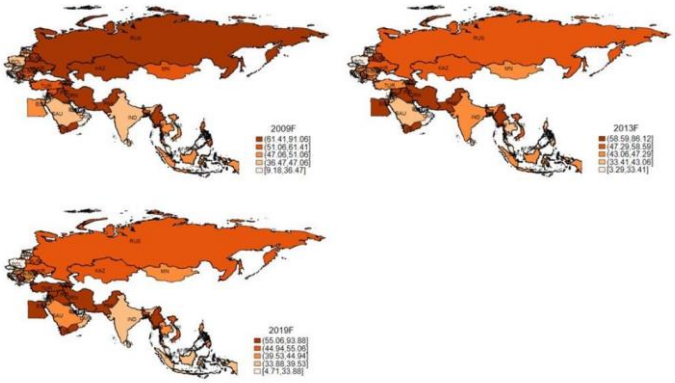
Data source: The problematic investment data comes from the "China Global Investment Tracking" database jointly released by the American Heritage Foundation and the American Entrepreneur Institute. For research purposes, this article selects investment failure projects caused by investment risks in the host country.

3.2 Temporal and spatial distribution characteristics

3.2.1 Investment risk distribution pattern and its evolution

To better illustrate the evolution of investment risk distribution among countries related the "Belt and Road," We employ a quintile chart based on a vector map to depict investment risk, policy instability, and macroeconomic risk in these countries.

FIGURE 1 presents the quintiles of investment risk in countries for the years 2009, 2013, and 2019. The darker shades on the map indicate greater investment risk. It is evident that the concentration of investment risk has been increasing over time. In 2009, the highest investment risks were mainly dispersed across the CIS (Commonwealth of Independent States), some countries in Eastern Europe, a few countries in North Africa and West Asia, and individual countries in Southeast Asia. By 2013, the highest investment risks were more concentrated, primarily present in some countries in North Africa and West Asia, as well as some countries in Eastern Europe and Southeast Asia. In 2019, regions with the highest investment risks were mainly concentrated in some countries in West Asia, North Africa, and certain individuals of Southeast Asia. Notably, South and Southeast Asia witnessed an overall decline in investment risks, thereby becoming the areas with the most significant improvement in investment risk.

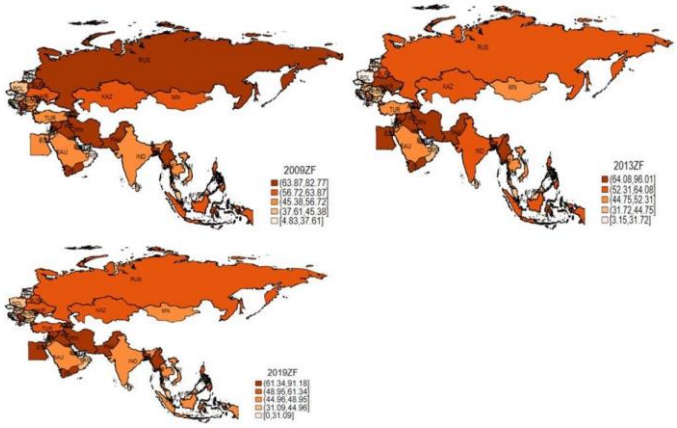


Where the darker the color, the greater theinvestment risk

Figure 1: The Quintile Of Investment Risks Of Countries along the "the Belt and Road"in 2009, 2013 and 2019.

3.2.2 Distribution pattern and evolution of policy instability

FIGURE 2 displays the quintiles of policy instability for 2009, 2013, and 2019. Darker shades represent stronger policy instability. In 2009, the regions with the strongest policy instability were mainly distributed across the CIS, some countries in North Africa and West Asia, individual countries in Eastern Europe, and some countries in Southeast Asia. By 2013, the regions with the most significant policy instability were more concentrated, primarily located in some countries in North Africa and West Asia, some countries in Eastern Europe, and a few countries in Southeast Asia. In 2019, the regions with the most unstable policies were mainly concentrated in some countries in West Asia, North Africa, and certain individual countries in Southeast Asia. Overall, the level of policy instability within each region has remained relatively stable from 2009 to 2019. However, there are notable variations in the degree of policy instability among different regions. Specifically, North Africa and West Asia have consistently exhibited high levels of policy instability, which have been increasing over time. Conversely, the Commonwealth of Independent States witnessed the most pronounced improvement in policy instability. Southeast Asia and Central and Eastern Europe maintained low levels of policy instability, making them the regions with the lowest policy instability.



Where the darker the color, the greater theinvestment risk

Figure 2: The Quintile of Policy Instability Of Countries along the "the Belt and Road"in 2009, 2013 and 2019

TABLE 4 presents the top ten countries related the "Belt and Road" for policy instability in 2019, including Yemen, Syria, Pakistan, Iran, Myanmar, Lebanon, Bangladesh, Egypt, and the United Arab Emirates.

Table 4: Ranking of top ten for policy instability in 2019

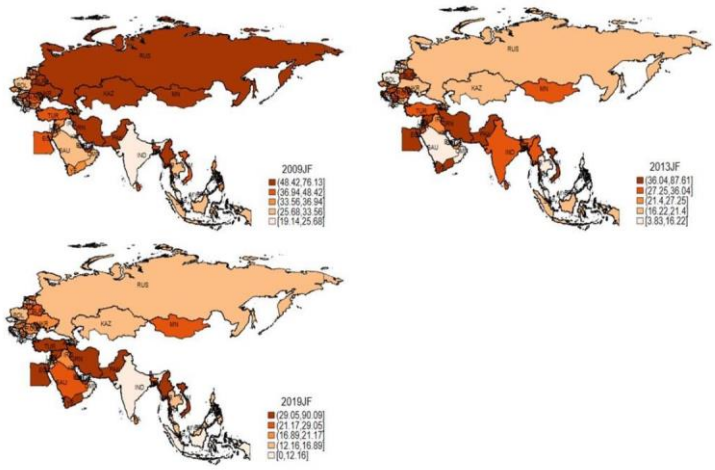
Rank	Political stability and corruption control	Government efficiency and regulatory quality	Rule of law	Exchange rate stability	Cultural difference	Policy Instability
1	Yemen	Yemen	Syria	Pakistan	Egypt	Yemen
2	Syria	Syria	Yemen	Türkiye	Latvia	Syria
3	Iraq	Iraq	Iraq	Kazakhstan	Israel	Iraq
4	Pakistan	Iran	Myanmar	Sri Lanka	Hungary	Pakistan
5	Lebanon	Myanmar	Lebanon	Myanmar	Jordan	Iran
6	Iran	Bangladesh	Belarus	Mongolia	Slovenia	Myanmar
7	Arab	Pakistan	Iran	Rome	Lithuania	Lebanon
8	Bangladesh	Lebanon	Russia	Hungary	Poland	Bangladesh
9	Myanmar	Egypt	Arab	Russia	Iran	Egypt
10	Egypt	Belarus	Pakistan	Poland	Estonia	Arab

The composition of policy instability indicators reveals that the shortcomings of policy stability in different countries are unique. Yemen and Syria, which rank among the top two in terms of policy instability, suffer from issues related to political stability, corruption control, government efficiency, regulatory quality, and the rule of law. Pakistan and Myanmar have both received significant China's direct investment, with their policy instability ranking fourth and sixth, respectively. Pakistan faces challenges related to political stability, corruption control, and government efficiency, while Myanmar struggles with frequent domestic political changes, poor government efficiency and regulatory quality, weak rule of law, and exchange rate instability. Despite these challenges, Myanmar boasts abundant natural resources, making it an attractive investment destination for China. Middle Eastern countries like Lebanon, Iran, and Iraq also experience high levels of risk related to political stability, corruption control, government efficiency, regulatory quality, and the rule of law. Sri Lanka, meanwhile, poses a unique geopolitical risk, with exchange rate stability ranking as its fourth-highest risk factor. Over half of China's enterprises' investments in countries related the "Belt and Road" are located in regions with distinct cultural differences, posing significant challenges. China's investment projects in Iran's energy industry suffered significant losses due to poor management, resulting in $25.2 billion in damages. Israel has placed restrictions on China's investment in its financial and insurance industries, leading to multiple project terminations in the region.

3.2.3 Distribution Pattern and Evolution of Macroeconomic Risks

The quintiles of macroeconomic risk for countries related the "Belt and Road" were determined for 2009, 2013, and 2019(**FIGURE 3**). Darker shades represent higher macroeconomic risk. In 2009, regions with the highest macroeconomic risks were dispersed across East Asia, the Commonwealth of Independent States, Central and west Asia, North Africa, Eastern Europe, South and Southeast Asia. By 2013, areas with the highest macroeconomic risks became more concentrated in some countries in North Africa and West Asia, certain nations in Central and Eastern Europe, as well as South and Southeast Asia. In 2019, the regions with the highest macroeconomic risks primarily concentrated in some countries in West Asia and North Africa, as well as a few nations in South Asia

and Southeast Asia. Broadly speaking, the macroeconomic risks between 2009 and 2019 demonstrated a "shift to the middle."



Where he darker the color, the greater theinvestment risk

Figure 3: The Quintile of Macroeconomic Risks of Countries along the "the Belt and Road" in 2009, 2013 and 2019

TABLE 5 displays the top ten countries related the "Belt and Road" in terms of macroeconomic risk measurement in 2019, including Yemen, Iran, Syria, Turkey, Egypt, Vietnam, Pakistan, Ukraine, Myanmar, and Belarus. The composition of macroeconomic risk indicators reveals inherent differences among countries. For instance, Yemen, Iran, Syria, and Turkey's macroeconomic risks mostly stem from economic growth stagnation and high inflation rates. Vietnam faces risks related to low investment freedom and government control over foreign investments. Pakistan's macroeconomic risks arise from stagflation due to poor security conditions, insufficient foreign exchange reserves, and high inflation. Egypt ranks fifth in macroeconomic risks due to low trade openness and weak financial strength, compounded by political turmoil since 2011. Nevertheless, Egypt's strategic location, connecting Asia and Africa via the Suez Canal, makes it a crucial node related the "Belt and Road." Ukraine's macroeconomic risks are linked to its civil war, with high average annual inflation rates and foreign debt ratios significantly impacting the country's economic fundamentals.

Table 5: Ranking of the top ten macroeconomic risks in 2019

Rank	Real GDP growth rate	Average annual inflation rate	External debt ratio	International settlement Ability	Investment freedom and convenience	The macro Economic risk
1	Iran	Yemen	Lebanon	Slovakia	Vietnam	Yemen
2	Syria	Iran	Latvia	Slovenia	Iraq	Iran
3	Yemen	Syria	Slovakia	Estonia	Saudi Arabia	Syria
4	Turkey	Turkey	Slovenia	Yemen	Bangladesh	Turkey
5	Russia	Egypt	Kazakhstan	Pakistan	Moldova	Egypt
6	Saudi Arabia	Ukraine	Bahrain	Lithuania	Lebanon	Vietnam
7	Lebanon	Mongolia	Ukraine	Syria	Thailand	Pakistan
8	Qatar	Pakistan	Hungary	Bahrain	Myanmar	Ukraine
9	Singapore	Myanmar	Moldova	Hungary	Iran	Myanmar
10	Azerbaijan	Belarus	Lithuania	Belarus	Serbia	Belarus

Source: Compiled by the author based on the calculation results of this article.

3.3 Spatial agglomeration effect

To comprehensively analyze the spatial spillover characteristics about the investment risk in countries related the "Belt and Road," we employed the Moran index scatter plot to measure the spatial correlation index.

3.3.1 Analysis of spatial agglomeration effect of investment risk

Using a geographical proximity weight matrix, this study presents the Moran index scatter plot of investment risk in countries related the "Belt and Road" for three representative years. The results reveal that the Moran's I value in 2009, 2013, and 2019 is 0.342, 0.252, and 0.398, respectively. Most countries along the route exhibit positive spatial correlation, with the correlation increasing from 2009 to 2019, confirming the evident and constructive spatial overflow characteristics of investment risk.

TABLE 6 highlights the High-High investment risk distribution areas that warrant attention. Countries with this type of investment risk include Moldova, Azerbaijan, Syria, Iran, Pakistan, and others. Ukraine, Turkey, Bangladesh, Iraq, and certain other nations are also high-to-high investment risk areas in some years. Dynamic trend analysis reveals that in 2009, Russia, Mongolia, Kazakhstan in Central Asia, Ukraine, Belarus, Moldova, and Rome in Central and Eastern Europe, Turkey, Azerbaijan, Syria, and Iran in West Asia and North Africa, and Pakistan and Bangladesh in South Asia were high-to-high investment risk countries. By 2013, Russia, Mongolia, Kazakhstan in Central Asia, Belarus, and Rome in Central and Eastern Europe, as well as Turkey in West Asia and North Africa, were no longer high-to-high investment risk countries. Instead, newly added nations like Albania, Armenia, Lebanon, and Iraq in West Asia and North Africa and Myanmar in Southeast Asia became high-to-high investment risk countries. In 2019, the number of high-to-high investment risk countries decreased further. Ukraine and Albania in Central and Eastern Europe, Armenia in West Asia and North Africa, Bangladesh in South Asia, and Myanmar in Southeast Asia are no longer high-to-high investment risk countries. However, Turkey in West Asia and North Africa re-emerged as a high-to-high investment risk country. Overall, investment risk concentration areas of countries related the "Belt and Road" gradually shift to West Asia and North Africa, forming a high investment risk area.

Table 6: Countries in 2009, 2013 and 2019 have high investment risks—high clusters

Year	Nation
2009	Russia, Mongolia, Kazakhstan, Belarus, Ukraine, Moldova, Rome, Turkey, Azerbaijan, Syria, Iran, Pakistan, Bangladesh
2013	Ukraine, Moldova, Albania, Armenia, Azerbaijan, Lebanon, Syria, Iraq, Iran, Pakistan, Bangladesh, Myanmar
2019	Moldova, Turkey, Azerbaijan, Lebanon, Syria, Iraq, Iran, Pakistan

Source of data: Compiled by the author based on the calculation results of this article.

TABLE 7 displays the distribution areas of high-high policy instability that require attention. Dynamic trend analysis reveals that in 2009, countries with high-high policy instability included Mongolia in East Asia, Kazakhstan in Central Asia, Ukraine, Moldova, Rome, Albania in Central and Eastern Europe, Turkey, Armenia, Azerbaijan, Syria, Iraq, Iran in West Asia and North Africa, Pakistan in South Asia, India, Bangladesh, Myanmar, and Thailand in Southeast Asia. By 2013, Ukraine, Rome, and Albania in Central and Eastern Europe, as well as Turkey and Armenia in West Asia and North Africa, were no longer high-high policy instability countries. Newly added Lebanon in Central, West Asia and North Africa became a high-high policy instability country. In 2019, the number of countries with high-high policy instability declined further, with Mongolia in East Asia, India in South Asia, and Thailand in Southeast Asia no longer being high-high policy instability

countries. However, Turkey in West Asia and North Africa re-emerged as a high-high policy instability country. From a distribution perspective, policy instability concentration areas along the "Belt and Road" gradually shift to the countries along the "SREB" forming an area with high policy instability.

Table 7: High Policy Instability—High Agglomeration

Year	Nation
2009	Mongolia, Kazakhstan, Ukraine, Moldova, Rome, Albania, Turkey, Armenia, Azerbaijan, Syria, Iraq, Iran, Pakistan, India, Bangladesh, Myanmar, Thailand
2013	Mongolia, Kazakhstan, Moldova, Azerbaijan, Syria, Lebanon, Iraq, Iran, Pakistan, India, Bangladesh, Myanmar, Thailand
2019	Kazakhstan, Moldova, Turkey, Azerbaijan, Syria, Lebanon, Iraq, Iran, Pakistan, Bangladesh, Myanmar

Source of data: Compiled by the author based on the calculation results of this article.

TABLE 8 presents the distribution areas of High-High or Low-Low macroeconomic risks in 2009. That year, countries with high-high macroeconomic risk clusters were Russia, Mongolia, Kazakhstan in Central Asia, Belarus, Ukraine, Moldova, and Rome in Central and Eastern Europe, as well as Bangladesh in South Asia. Meanwhile, low-to-low macroeconomic risk aggregation nations were Czech Republic, Croatia, Slovenia, and Serbia in Central and Eastern Europe, Albania, Saudi Arabia, Bahrain, Yemen, and Israel in West Asia and North Africa, India in South Asia, and Singapore, Malaysia, the Philippines, and Brunei in Southeast Asia. From 2009 to 2019, the value of Moran's I shifted from positive to negative, indicating that the spatial agglomeration effect of macroeconomic risks among countries related the "Belt and Road" correspondingly decreased during this period. This suggests that the concentration of macroeconomic risks significantly weakened.

Table 8: High -High or Low-Low Agglomeration of Macroeconomic Risks in 2009

Correlation	Nation
H-H	Russia, Mongolia, Kazakhstan, Belarus, Ukraine, Latvia, Moldova, Rome, Bangladesh
L-L	Czech Republic, Croatia, Slovenia, Serbia, Albania, Saudi Arabia, Bahrain, Yemen, Israel, India, Singapore, Malaysia, Philippines, Brunei

Source of data: Compiled by the author based on the calculation results of this article.

Our measurement above among countries related the "Belt and Road" establishes a foundation for subsequent analysis of investment region selection.

4. Selection of China's Enterprises' OFDI Investment Areas

We analyze OFDI regional choice based on three factors: investment risk, political instability, and macroeconomic risk. (Robock S. H. 1971., Simon, J. D. 1982)[7] [8]We employ the general OLS, spatial lag model, and semi-parametric spatial lag model for regression analysis. Our findings reveal that the semi-parametric spatial lag model has the most optimal fitting effect. We then proceed to analyze the empirical results.

As mentioned earlier, we employ different model to investigate the impact of investment risk, policy instability, and macroeconomic risk. We also incorporate non-linear effects into our analysis.

According to the Hausman test results presented in **TABLE 9**, all corresponding P values are smaller than 0.01, meaning the individual fixed effect model is a better choice. Besides, the results of the general panel regression model are unsatisfactory, with insignificant coefficients for multiple variables. The significance level of the coefficients improves in the spatial panel lagged model. However, the traditional spatial lag model fails to account for the spatial spillover effect of

explanatory variables, resulting in an inadequate fit to the actual situation. Incorporating spatial factors can enhance the model's credibility. Thus, we utilize the semi-parametric SLM to better elucidate the impact of various variables on Chinese investment in countries along the route.

Table 9: Empirical outcomes of Three Models

Explained Variable $lnOfdi_{it}$	model 1		model 2		model 3
	OLS		Spatial Lag Model		Semiparametric Spatial Lag Model
PANEL A: Investment risk	FE	RE	FE	RE	FE
$Risk$	0.0227 (1.54)	0.0181 (1.36)	0.0267*** (2.59)	0.0207** (1.97)	——
$Risk \times ln\,GDP$	-157.6322* (-1.65)	30.8607 (0.51)	-166.3217*** (-3.28)	-20.6096 (-0.48)	-61.6144*** (-5.29)
$Risk \times ln\,Resource$	0.7233*** (5.10)	0.5495*** (3.73)	0.7162*** (4.42)	0.6093*** (3.74)	0.3585** (2.26)
$Risk \times ln\,Labor$	17.5217 (0.66)	- 7.3782 (-0. 37)	-84.3012 *** (-9.02)	-71.9877 *** (-7.46)	- 59.8810*** (-5.13)
$W\ ln\,Ofdi$			-0.2360*** (-3.34)	-0.2361*** (-3.43)	0.2672 *** (3.75)
$W\ ln\,GDP$					-0.1485*** (-2.90)
$W\ ln\,Resource$					0.0046*** (2.64)
$W\ ln\,Labor$					-0.0472 (-0.62)
Control Variables	√	√	√	√	√
$Hausman$	96.4107***		163.9601***		
R^2	0.6150	0.5973	0.9597	0.9533	0.9731
PANEL B: Political instability	FE	RE	FE	RE	FE
$PRisk$	-0.0172 (-0.71)	-0.0165 (-1.21)	-0.0155 (-1.23)	-0.0122 (-0.93)	——
$W\ ln\,Ofdi$			-0.2360*** (-3.61)	-0.2361*** (-3.56)	0.0819*** (3.73)
Control Variables	√	√	√	√	√
$Hausman$	249.825***	141.3341 ***	141.3341 ***		
R^2	0.5917	0.5742	0.6993	0.6599	0.9730
PANEL C: Macroeconomic Risks	FE	RE	FE	RE	FE
$ERisk$	0.0900 (1.58)	0.1071*** (7.02)	0.0817*** (4.03)	0.0563*** (3.96)	——
$PRisk_{it} \times ERisk_{it}$	-4.6618*** (-4.57)	-5.3255*** (--5.84)	-1.5822** (-2.19)	-1.7968** (-2.44)	1.1937*** (12.67)
$CDistence_{it} \times ERisk_{it}$	-1.5161 (-0.35)	-2.2068*** (-3.92)	-2.0302** (-9.71)	-2.0729*** (-9.74)	-1.7670*** (-64.00)
$W\ ln\,Ofdi$			-0.2360*** (-5.06)	-0.2361*** (-4.98)	0.1423*** (21.79)
Control Variables	√	√	√	√	√
$Hausman$	51.5698***		45.2819 ***		
R^2	0.6965	0.6128	0.6429	0.6073	0.6672

Note: "***, **, *" represent the significance levels of 1%, 5% and 10%, respectively, and the t-values in brackets under the variable regression coefficients.

4.1 Investment risk

To visually illustrate the non-linear relationship between investment risk, policy instability, macroeconomic risk, and China's OFDI, we employ a partial derivative scatter diagram. The abscissa corresponds to the investment risk value ($Risk_{it}$) of countries related the "Belt and Road," while the vertical axis represents its partial derivative to China's OFDI, i.e., $\partial \hat{G}(\text{Risk}_{it})/\partial Risk$ denoting the difference in China's OFDI when the value of the explanatory variable increases by one unit, similarly hereinafter.

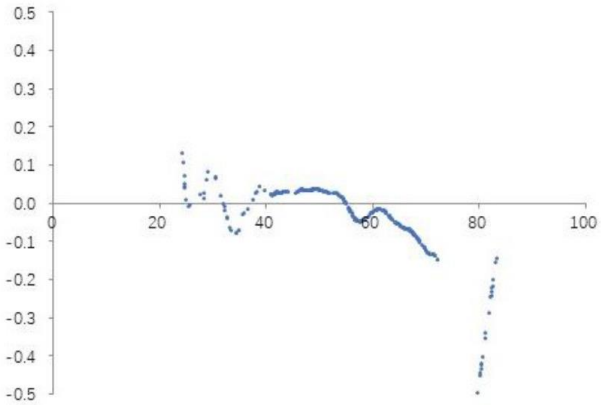


Figure 4A: Investment Risk

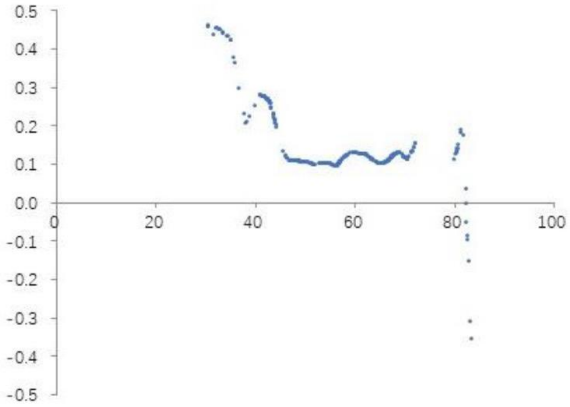


Figure 4B: Policy instability

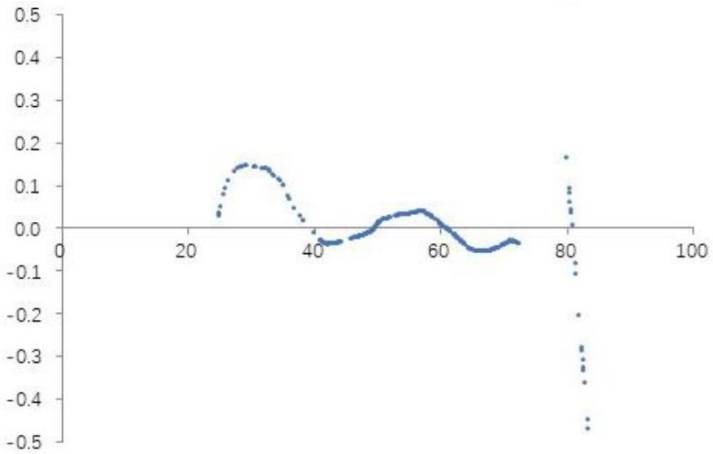


Figure 4C: Macroeconomic Risks

Figure 4A clearly indicates that when the investment risk level of countries related the "Belt and Road" is below 55, the partial derivative fluctuates around zero. At this point, the effect of investment risk on China's OFDI shows weak positive or negative direction, indicating that China's enterprises are not highly sensitive to investment risk. However, when the investment risk level exceeds 55, the partial derivative is negative and exhibits a gradual downward trend. The negative effect becomes increasingly stronger and inhibitory. Generally speaking, the negative impact of investment risk on China's OFDI among countries along the route outweighs the positive effect. When the investment risk level surpasses 80, the negative effect is at its strongest. This illustrates that investment risk exerts a negative influence. However, its impact varies across different stages. In fact, China's enterprise investments in high-risk regions, such as West Asia and North Africa, are not widespread. Investment coverage in the 19 West Asia and North Africa countries along the route is only about 60%. Investment flows concentrate in the United Arab Emirates, Saudi Arabia, and Israel, with annual

investment flows in other nations rarely exceeding US$100 million. Investment flow in countries like Lebanon, Syria, and Palestine is essentially nil.

The relationship between investment risk and investment region selection varies depending on different investment motivations. Specifically, (1) the cross-term coefficient of investment risk and market size is $\text{Risk} \times ln\,GDP$, which is negative significantly at the 1% level, revealing that investment risk and market size are in a substitution relationship. Seeking investment will limit the host country investment risk's impact on China's OFDI. (2) The cross-term $\text{Risk} \times ln\,Labor$ coefficient of investment risk and labor cost is significantly negative at the 1% level, implying that investment risk and labor cost advantage are substitutes. The investment motive of seeking low labor costs can effectively mitigate the host country investment risk's influence on China's OFDI. (3) The cross-term coefficient of investment risk and natural resource endowment is significantly positive at the 1% level, denoted as $\text{Risk} \times ln\,Resource$. This suggests that investment risk and resource endowment are accompanied by a relationship. Resource-seeking investment will also magnify the host country investment risk's impact on China's OFDI.

4.2 Policy instability

As depicted in Figure 4B : (1) When the policy instability value of countries related the "Belt and Road" is below 82, the partial derivative is positive and exhibits a gradual downward trend. This indicates a positive correlation between host country policy instability and China's OFDI, with policy instability promoting China's investment stock growth. This promotion effect weakens with increasing policy instability, aligning with the traditional theoretical perspective. (2) When the host country's policy instability value exceeds 82, the partial derivative shows a negative value that continues to decline. At this point, policy instability significantly hinders China's OFDI, with an increasing inhibiting effect tendency. Overall, the policy instability of countries along the route has a more substantial positive effect on China's OFDI than a negative effect. The positive effect is strongest when the national policy instability value is less than 40, while the negative effect is strongest when it is greater than 82. These findings demonstrate that at low enough policy instability levels, policy instability accelerates China's OFDI. Still, as policy instability reaches a certain threshold, it begins to inhibit China's OFDI.

4.3 Macroeconomic risks

Currently, the literature pays insufficient attention to the relationship between the host country's macroeconomic risk and China's OFDI, particularly its impact on Chinese investment in countries related the "Belt and Road." There is no established consensus on this issue. (Wang, Y., & Zhao, Q.2016)[9] Hence, our study addresses a significant research gap in this area.

As illustrated in Figure 4C: (1) If the host country's macroeconomic risk value is below 40, the partial derivative is positive, indicating a positive correlation between the host country's macroeconomic risk and China's OFDI. However, this positive effect soon weakens with increasing macroeconomic risks. (2) When the host country's macroeconomic risk value exceeds 40, the partial derivative fluctuates continuously between (-0.1, 0.1), suggesting that macroeconomic risk has both positive and inhibiting effects on China's OFDI. As the macroeconomic risk value approaches 80, the partial derivative rapidly turns from positive to negative, exhibiting a straight-line downward trend. At this point, the negative impact of macroeconomic risks on China's OFDI is strongest. Overall, the impact of the host country's macroeconomic risk value on China's OFDI in countries related the "Belt and Road" follows a general trend of "low risk promotion, high risk suppression, and medium risk continuous fluctuation."

5. Conclusion

Foreign direct investment (FDI) plays a significant part in the economic development and structural transformation of emerging developing countries, not only by providing capital but also by transferring technology, management expertise, market opportunities, and employment (Chen, Z., 2021)[10]. With the countries related the "Belt and Road" as our research subjects, we constructed and evaluated their investment risk system from the point of corporate investment, revealing the spatial-temporal distribution of investment risks related the "Belt and Road" recently. Furthermore, we analyzed the spatial aggregation effect and spillover effect of investment risk and utilized a semiparametric panel spatial lag model to examine the non-linear relationship between investment risk and regional choice using country-level macro data. By explicating the connection between investment risk and enterprises' transnational investment regional choices, our study not only provides a reference for multinational companies in deploying foreign investment strategies but also offers targeted measures for emerging developing countries to attract foreign capital and improve their business environment. Our findings provide a basis for constructing funds that facilitate the attraction of foreign direct investment.

References

[1] Teece, DJ (1986). Transactions cost economics and the multinational enterprise: An assessment. Journal of Economic Behavior & Organization, 7(1), 21-45.

[2] Becker, SO, Egger, PH, & Merlo, V. (2012). How low business tax rates attract MNE activity: Municipality-level evidence from Germany. Journal of Public Economics, 96(9-10), 698- 711.

[3] Lu, J., & Yan, S. (2011). Industry distribution of overseas direct investment: Characteristics, evolution and trends. International Economic Cooperation, (6), 22-26.

[4] Henisz, W. J., & Delios, A. (2001). Uncertainty, imitation, and plant location: Japanese multinational corporations, 1990-1996. Administrative science quarterly, 46(3), 443-475.

[5] Guo, J., Ye, A., & Chen, H. (2012). A study on regional agglomeration effect of technological innovation ability based on semi-parametric spatial econometric model. Science and Technology Management, 33(11), 62-70.

[6] Qiu, L., & Ye, A. (2019). Reverse technology spillover effect of foreign direct investment: Based on semi-parametric panel space lag model. Soft Science, 33(4), 29-33.

[7] Robock S. H. (1971). Political risk: identification and assessment. Columbia Journal of World Business, 6(4), 6-20.

[8] Simon, J. D. (1982). Political risk assessment: Past trends and future prospects. Columbia Journal of World Business, 17(3), 62-71.

[9] Wang, Y., & Zhao, Q. (2016). Risk preference, investment motivation and China's foreign direct investment: Based on panel data analysis. Financial Review, 8(4), 1-17+124.

[10] Chen, Z. (2021). Foreign Direct Investment and State Capacity in the Developing World: Theory and Evidence. Economic Management, 43(8), 5-20.