

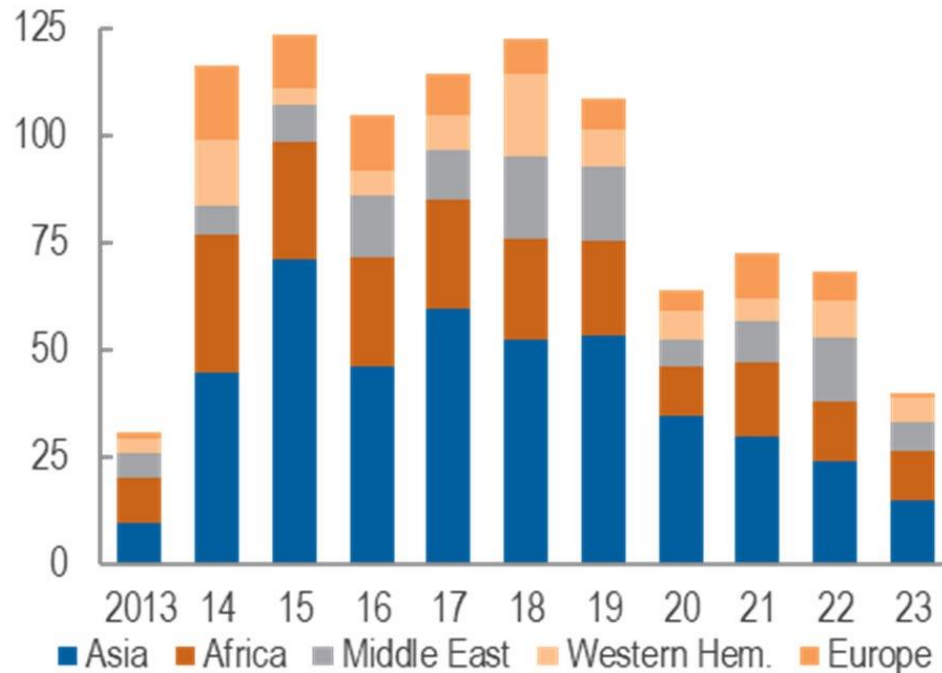
Sovereign risk and China's overseas infrastructure investment: Evidence from developing countries

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Introduction: China's overseas investment



(Billions of US dollars)

Figure1: BRI Engagement by Region, 2013–23

Sources: American Enterprise Institute, China Global Investment Tracker; and IMF.

- * China's overseas investment has fallen in all regions since 2020 (IMF, 2023)
- * From 2014 to 2021, Chinese cumulative ODI nearly tripled in value (IMF, 2023)
 - Over 150 countries have signed agreement with China under the Belt and Road Initiative (Nedopil, 2023)
- * Critics have raised concerns that BRI may lead to debt-trap diplomacy (Hurley et al., 2019); however, no evidence of debt trap is found in Africa (Bo et al., 2024).
- * Signing the memorandum of understanding is less costly and increases the possibility of the host nations reaping future economic benefits (Atkins, 2023).

The standard theory of FDI, as summarized in Dunning's eclectic paradigm, suggests three primary motivations (Dunning, 1977, 1993):

- Market-seeking overseas investors
- Resource-seeking overseas investors
- Efficiency (cost reduction) seeking overseas investors

Applying the standard FDI theory to emerging economies (Buckley et al., 2007):

- The institutional fabric of an emerging economy can determine the ability and will of domestic firms to invest abroad. *If an emerging economy has a policy that encourages overseas investment, its imperfections can provide the opportunities for home firms to invest abroad.*
- Given the extent of state control of the Chinese economy, the institutional environment is likely to have had far-reaching and profound effects on the internationalisation decision of Chinese firms.

Empirical literature 1: China's overseas investment

- Chinese firms appear more market-seeking and manufacturing-oriented (Benfratello et al., 2023)
- Chinese firms are resource-seeking (oil, copper, gas, and mineral ores, as well as agricultural land), especially in Africa (Zhang et al., 2013; Ross et al., 2015; Gold, 2022).
- Efficiency-seeking?
- Evidence on host countries' institutional Quality is mixed:
 - institutional quality has negative effect, suggesting that higher level of governance is associated with lower *China's overseas investment* Utesch-Xiong & Kambhampati (2022)
 - institutional quality is an important determinant of Chinese overseas investment (Shan et al., 2018; Gold, 2022).
 - Chinese FDI is impervious to host countries' governance standards (e.g., Munjal et al., 2022).

Empirical literature 2: China's overseas investment and risk

Public debt reached record high in developing countries in 2023 (UNCTAD, 2023).

Higher public debt-to-GDP ratios increase sovereign risk (Keyse & Paczos, 2023), Sovereign credit rating falls with higher public debt level (Cantor & Packer, 1996), and lower sovereign credit rating is associated with lower foreign investment (Cai et al, 2018)

Risk can become an important determinant of Chinese overseas investment in post pandemic-period due to the growing number of troubled Chinese investment (China Global Investment Tracker, 2024).

Due to the host governments' involvement in signing the agreement to work with China (Li et al., 2022), sovereign risk is more important to China than firm-level risk.

Hypothesis: Countries with higher sovereign risk have received less China's infrastructure investment than countries with lower sovereign risk since covid-19 pandemic.

Key variables and the study sample

The dependent variable

- The dependent variable is China's Overseas Infrastructure Investment (OII). We obtain the OII data from the **China Global Investment Tracker**.

Independent variable

- Sovereign risk (*SovRisk*), which is the primary independent variable, is measured as the 10-year government bond yields of the host countries. Sovereign risk is generally measured in the literature using the 10-year government bond yields (e.g., Bernoth & Erdogan, 2012; Afonso et al., 2018). The data is sourced from the Thomson Reuters **DataStream**.

Sample

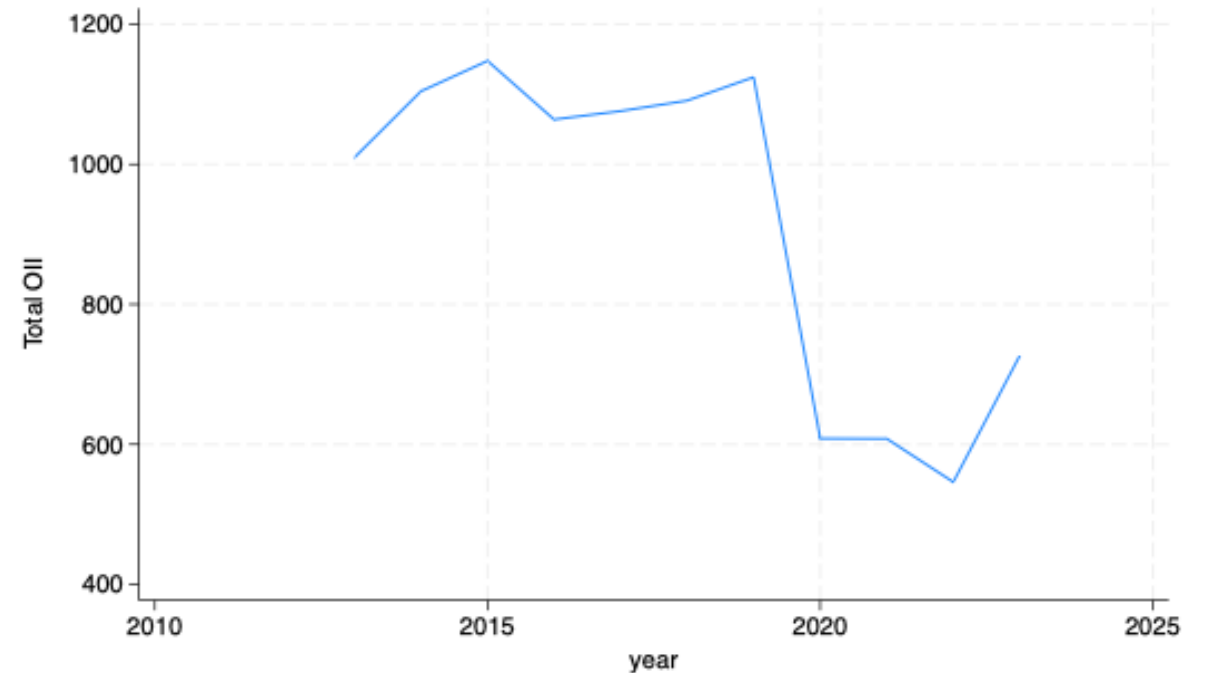
- 65 countries classified as low or middle income by the World Bank are included in the sample, and the period covered in the study is 2013 to 2023.

Control Variables

- Real GDP growth rate (*GDPgr*) for the market-seeking motive of Chinese investors
- Total natural resources rent to GDP (*NRRent*) for resource-seeking motive,
- Institutional quality (*InstQual*) is the average of the six governance indicators (political stability, control of corruption, rule of law, voice and accountability, government effectiveness, and absence of violence).
- Local infrastructure (*LocalInfrastr*) is measured as the broadband subscriptions per 100 people
- Host country's trade openness (*TO*) measured as the ratio of trade (exports+imports) to GDP,
- The real exchange rate (*Exch*)
- Financial development (*FinDev*), the financial access index provided by the World Bank.
- Government finances: Government expenditure to GDP (*GovtExpense*), and tax revenue to GDP (*TaxRev*).
- The source of data for the control variables is the World Development Indicators (WDI) database

Summary of data

Variable	Obs	Mean	Std. dev.	Min	Max
OII	715	916.07	1029.77	0.00	21140
SovRisk	715	8.29	6.90	0.06	57.17
FinDev	715	25.58	23.19	0.00	32.2
NRRent	715	4.68	2.21	0.00	35.26
GDPgr	715	2.89	1.81	-46.082	37.68
InstQual	715	34.96	18.78	0.00	77.15
Problem Investment	715	0.13	0.07	0.00	9.70
LocalInfrastr	715	6.13	5.72	0.00	33.81
TO	715	64.21	38.53	0.00	186.67
TaxRev	715	11.35	8.98	0.02	36.32
REER	715	41.51	37.59	0.00	741.70
DebtOverhang	715	0.02	0.15	0.00	1.00
GovtExpense	715	13.81	7.36	0.16	41.68



China's overseas infrastructure investment (OII)

Difference-in-differences specification

- $OII_{jt} = \alpha + \eta Treated_{jt} + \phi Post_t + \beta Treated_{jt} * Post_t + \sum_{k=1}^n \Pi_k X_{kjt} + \lambda_t + f_j + \varepsilon_{jt}$
-
- OII is the logarithm of China's overseas infrastructure investment in country j at time t .
- $Treated$ is a dummy variable which has a value of 1 if a country's sovereign risk in 2019 is below the median value of the sovereign risk distribution, otherwise 0.
- $Post$ is a dummy variable which equals 1 for year 2020 onward (2020 to 2023), otherwise 0.
- X is a vector of control variables.
- λ represents time fixed-effect, f is the country fixed-effect.

Effect of sovereign risk on China's overseas infrastructure investment 1

	<i>OII</i>	<i>OII</i>
Treated*post	0.0961*** (0.0256)	0.0791*** (0.0236)
Treated	0.1934** (0.0111)	0.1806** (0.0120)
Post	-0.2911*** (0.0080)	-0.2660*** (0.0081)
<i>NRRent</i>		0.0493*** (0.0040)
<i>GDPgr</i>		0.0075 (0.0022)
<i>InstQual</i>		-0.0230*** (0.0014)
<i>TO</i>		-0.0036 (0.0006)
<i>LocalInfrastr</i>		0.0581** (0.0034)
<i>Exch</i>		-0.0013 (0.0037)
<i>DebtOverhang</i>		-0.0301 (0.0138)
Constant	0.2800*** (0.0174)	0.2858*** (0.0192)
Observations	715	715
Time FE	Y	Y
Country FE	Y	Y
R-squared	0.5259	0.5209

Effect of sovereign risk on China's overseas infrastructure investment 2

	<i>OII</i>	<i>OII</i>	<i>OII</i>
Treated*post	0.0818*** (0.0221)	0.0781*** (0.0221)	0.0783*** (0.0230)
Treated	0.1641*** (0.0110)	0.1633** (0.0110)	0.1627*** (0.0090)
Post	-0.2511*** (0.0080)	-0.2512*** (0.0080)	-0.2500** (0.0081)
<i>NRRent</i>	0.0487** (0.0042)	0.0486** (0.0042)	0.0483** (0.0041)
<i>GDPgr</i>	0.0081 (0.0023)	0.0082 (0.0023)	0.0079 (0.0022)
<i>InstQual</i>	-0.0228** (0.0011)	-0.0228*** (0.0011)	-0.0230** (0.0010)
<i>TO</i>	-0.0033 (0.0006)	-0.0034 (0.0006)	-0.0038 (0.0007)
<i>LocalInfrastr</i>	0.0563*** (0.0034)	0.0563** (0.0034)	0.0509** (0.0033)
<i>DebtOverhang</i>	-0.0309 (0.0136)	-0.0309 (0.0136)	-0.0342 (0.0134)
<i>FinDev</i>	0.0001** (0.0003)		
<i>NPL</i>		-0.0063 (0.0034)	
<i>TaxRev</i>			-0.0190** (0.0028)
<i>GovtExpense</i>			-0.0043 (0.0016)
Constant	0.3055*** (0.0146)	0.2531*** (0.0199)	0.3280*** (0.0198)
Observations	715	715	715
Time FE	Y	Y	Y
Country FE	Y	Y	Y
R squared	0.5220	0.5220	0.5255

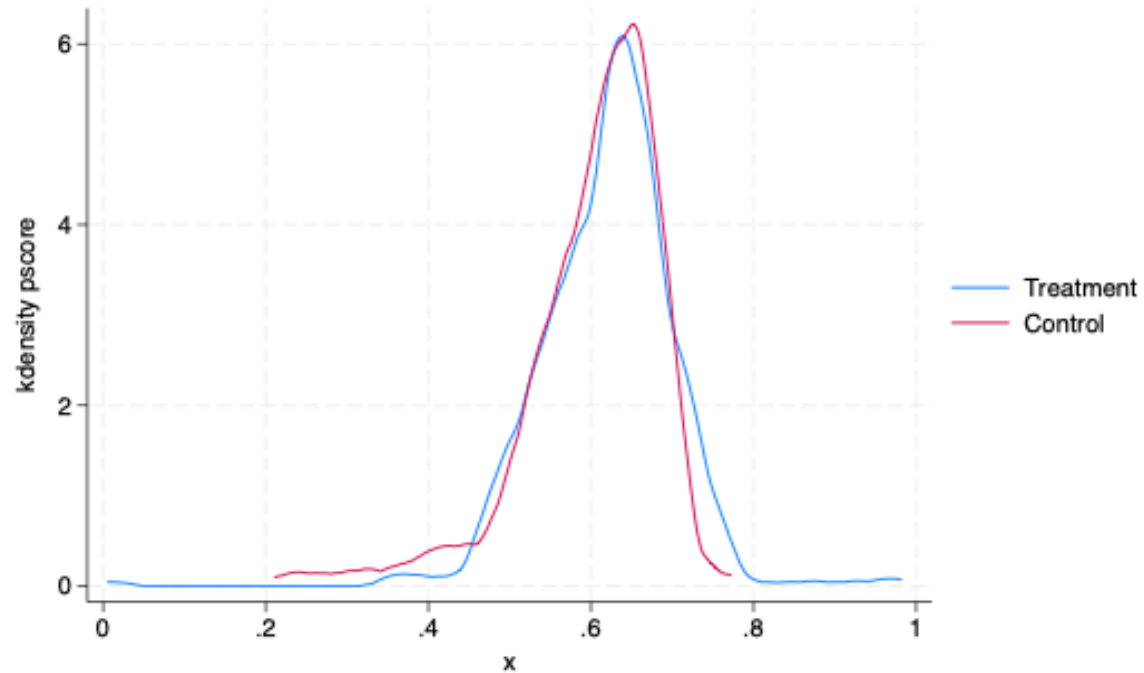
Sovereign risk and the quality of China's overseas infrastructure investment

	<i>Problem Investment</i>
<i>SovRisk</i>	0.03094*** (0.0016)
<i>NRRent</i>	0.0050 (0.0042)
<i>GDPgr</i>	0.0054** (0.0029)
<i>InstQual</i>	-0.0012*** (0.0002)
<i>LocalInfrastr</i>	-0.0024 (0.0014)
<i>DebtOverhang</i>	0.0049 (0.0037)
<i>FinDev</i>	-0.0008 (0.0003)
<i>TaxRev</i>	-0.0048*** (0.0028)
Constant	0.2987 (0.0714)
Observations	715
Time FE	Y
Country FE	Y
R-squared	0.3630

Effect of sovereign risk on China's Overseas Infrastructure Investment: The margins

	<i>OII Extensive Margin</i>	<i>OII Intensive margin</i>
Treated*post	0.0164*** (0.0241)	0.3201** (0.3202)
Treated	0.0144** (0.0831)	1.2610*** (0.2907)
Post	-0.0520** (0.1526)	-2.0243** (0.4741)
<i>NRRent</i>	0.0162** (0.0031)	0.0311** (0.0048)
<i>GDPgr</i>	0.0093** (0.0035)	0.0318** (0.0168)
<i>InstQual</i>	-0.0029** (0.0021)	-0.0120*** (0.0079)
<i>LocalInfrastr</i>	0.0006* (0.0031)	0.0136 (0.0133)
<i>DebtOverhang</i>	-0.0725 (0.0190)	0.1411 (0.0521)
<i>FinDev</i>	0.0039*** (0.0009)	0.0124** (0.0046)
Constant	0.7714*** (0.0734)	3.1708*** (0.2668)
Observations	715	715
Time FE	Y	Y
Country FE	Y	Y
R-squared	0.1664	0.1692

PS Matching difference-in-differences estimations

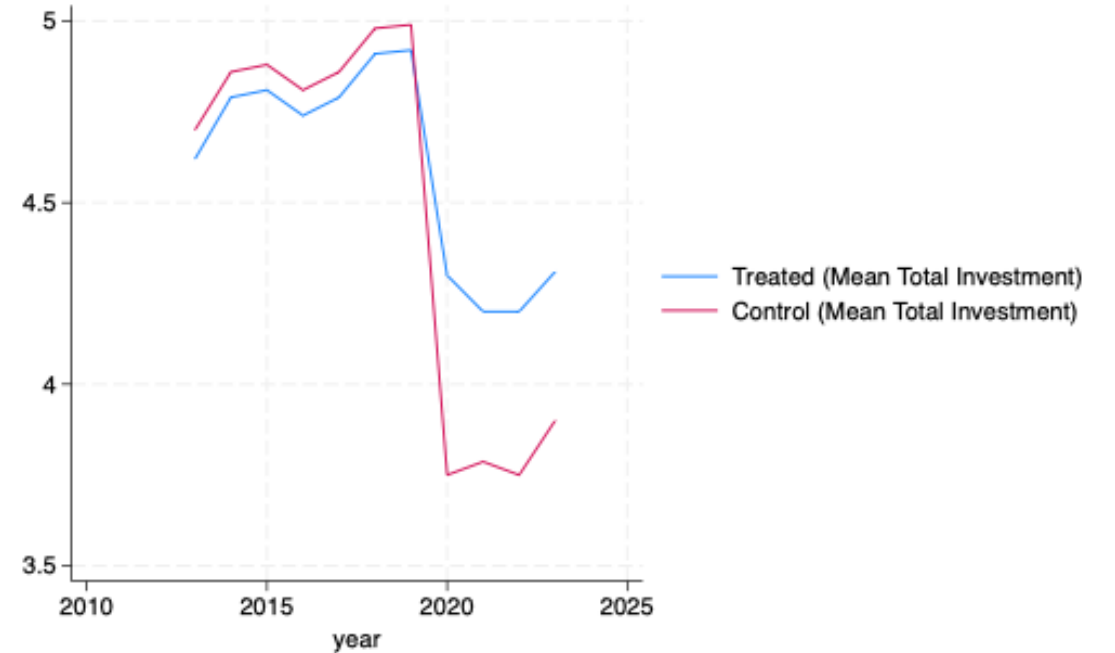


	<i>OII</i>	<i>OII Extensive margin</i>	<i>OII Intensive margin</i>
<i>Treated * Post</i>	0.0711*** (0.009)	0.0155*** (0.017)	0.3014** (0.132)
<i>R-squared</i>	0.32	0.35	0.37
<i>Observations</i>	713	711	711

The density plots of the propensity scores for the treated and PS-Matched control countries

The mean difference estimate for the treated and control countries based on the outcome variable in pre-pandemic period (2013-2019)

	<i>OII</i>
Treated	4.087
Control	4.106
Difference	-0.019
<i>p</i> -value	0.718



Mean total investment of the treated and control countries

Summary

- High sovereign risk countries have received significantly lower investment from China than countries with relatively low sovereign risk.
- Sovereign risk is associated with higher proportion of troubled China's overseas infrastructure investment.
- Investment has fallen at both the extensive and intensive margins, with higher reduction at the intensive margin, suggesting that China has reduced its investment in larger projects since Covid-19 pandemic.
- **Policy:** We encourage policymakers to pay attention to sovereign risk level if they are seeking investment from China.



Thank you