# Do Chinese Firms Benefit from Undertaking China's Overseas Infrastructure Investment (Belt and Road Initiative)?

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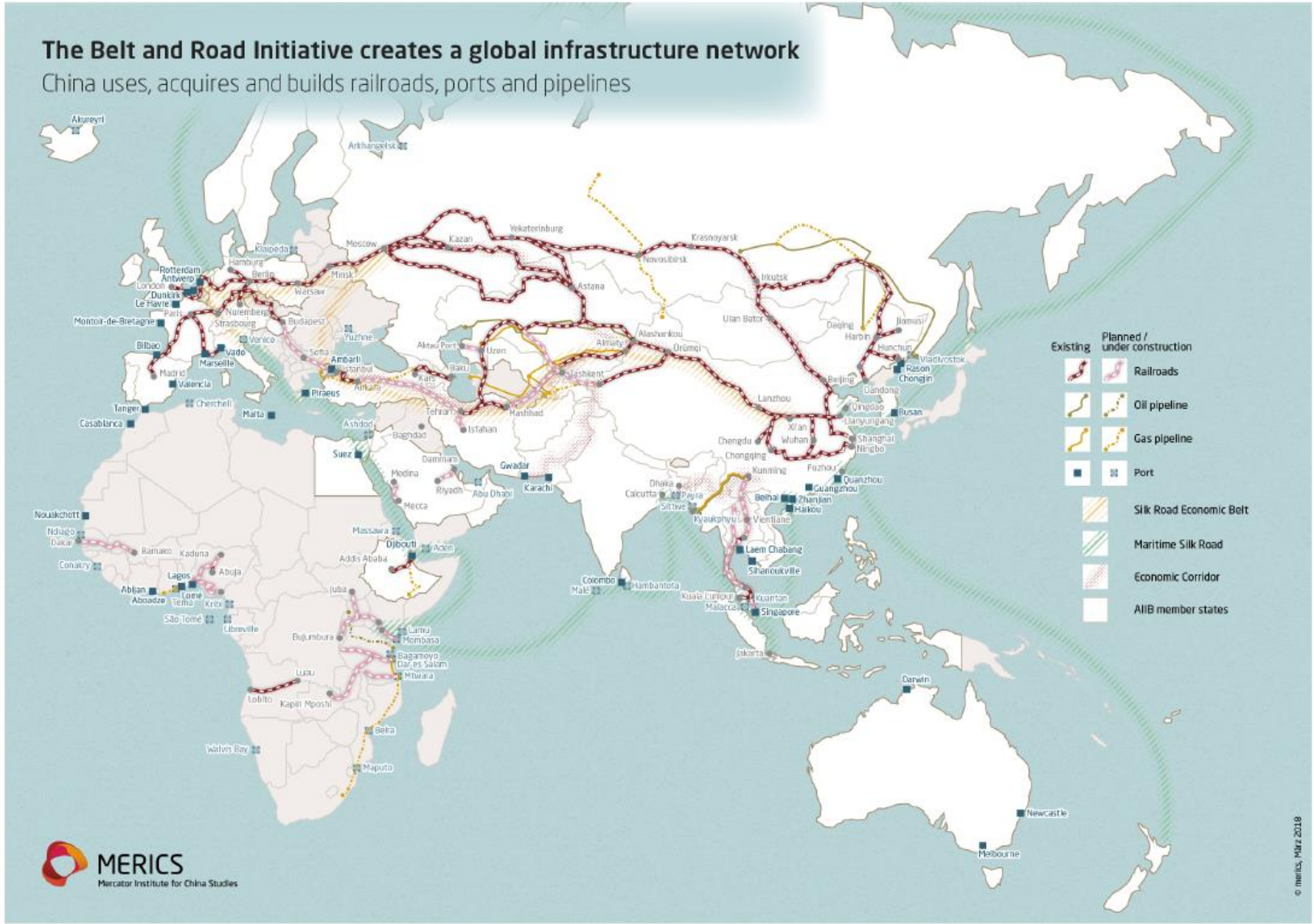
**Background**

## The Belt and Road Initiative

- President Xi announced the initiative during official visits to Kazakhstan and Indonesia in 2013. The plan was two-pronged: the overland Silk Road Economic Belt and the Maritime Silk Road.
- The original Silk Road arose during the westward expansion of China's Han Dynasty (206 BCE–220 CE). Those routes extended more than four thousand miles to Europe. Use of the route peaked during the first millennium, under the leadership of first the Roman and then Byzantine Empires, and the Tang Dynasty (618–907 CE) in China. But the Crusades, and advances by the Mongols in Central Asia, led to its decline.

# The Belt and Road Initiative (cont.)

- The China Maritime Silk Road or Maritime Silk Route refers to the historic maritime section that connects the historic Silk Road connecting Southeast Asia, China, the Arabian peninsula, Indian subcontinent, Europe, Egypt, and Somalia. This maritime route flourished between the 2nd Century BC and the 15th Century AD. The route is an ancient trade route that linked the western world with Asia and the Middle East.


The Belt and Road Initiative creates a global infrastructure network
China uses, acquires and builds railroads, ports and pipelines
Existing
Planned / under construction
Railroads
Oil pipeline
Gas pipeline
Port
Silk Road Economic Belt
Maritime Silk Road
Economic Corridor
AIIB member states
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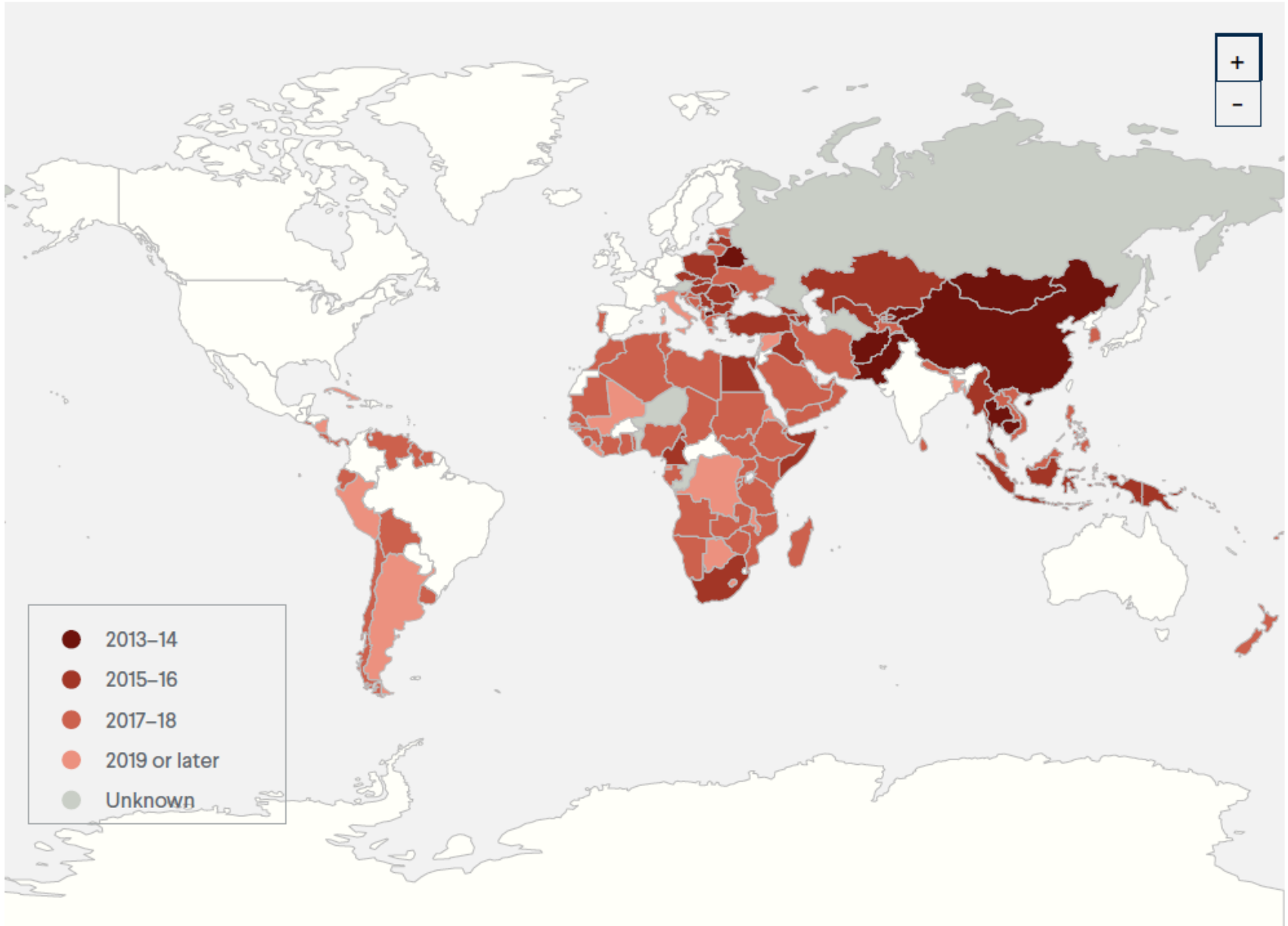
# The Belt and Road Initiative (cont.)

- By the end of 2023, 147 countries—accounting for two-thirds of the world's population and 40 percent of global GDP—have signed on to projects or indicated an interest in doing so.

- In total, China has already spent an estimated $1 trillion on such efforts. Experts have predicted that China's expenses over the life of the BRI could reach as much as $8 trillion though estimates vary.


+
-
2013–14
2015–16
2017–18
2019 or later
Unknown

The Belt and Road Initiative (cont.)

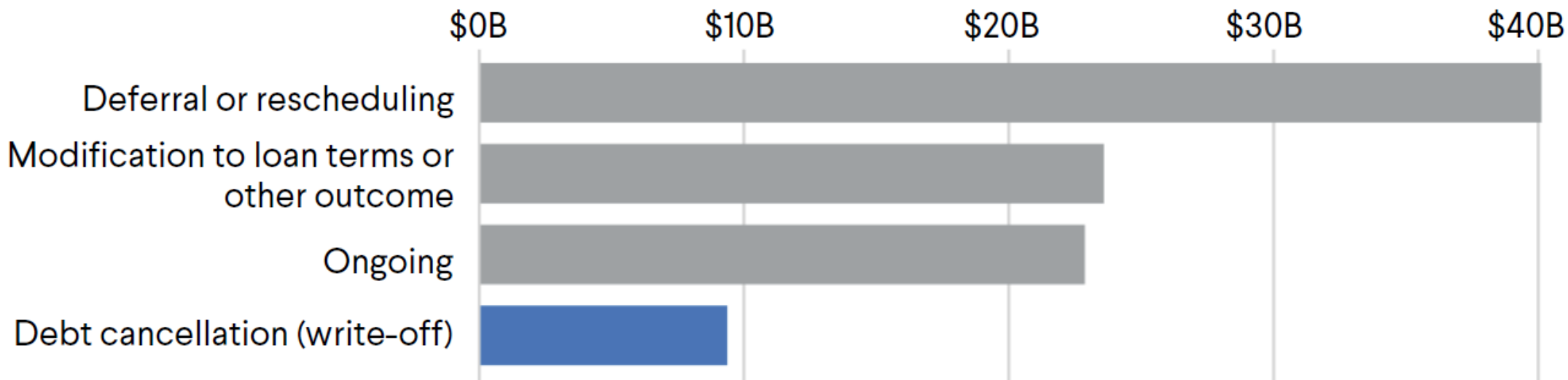
BRI is not without problems – to name two:

- Debt problems – many countries have become heavily indebted and China is a tough negotiator

- Environmental issues – more fossil fuel power plants have been financed and built than those based on renewables

# China Rarely Cancels Debt

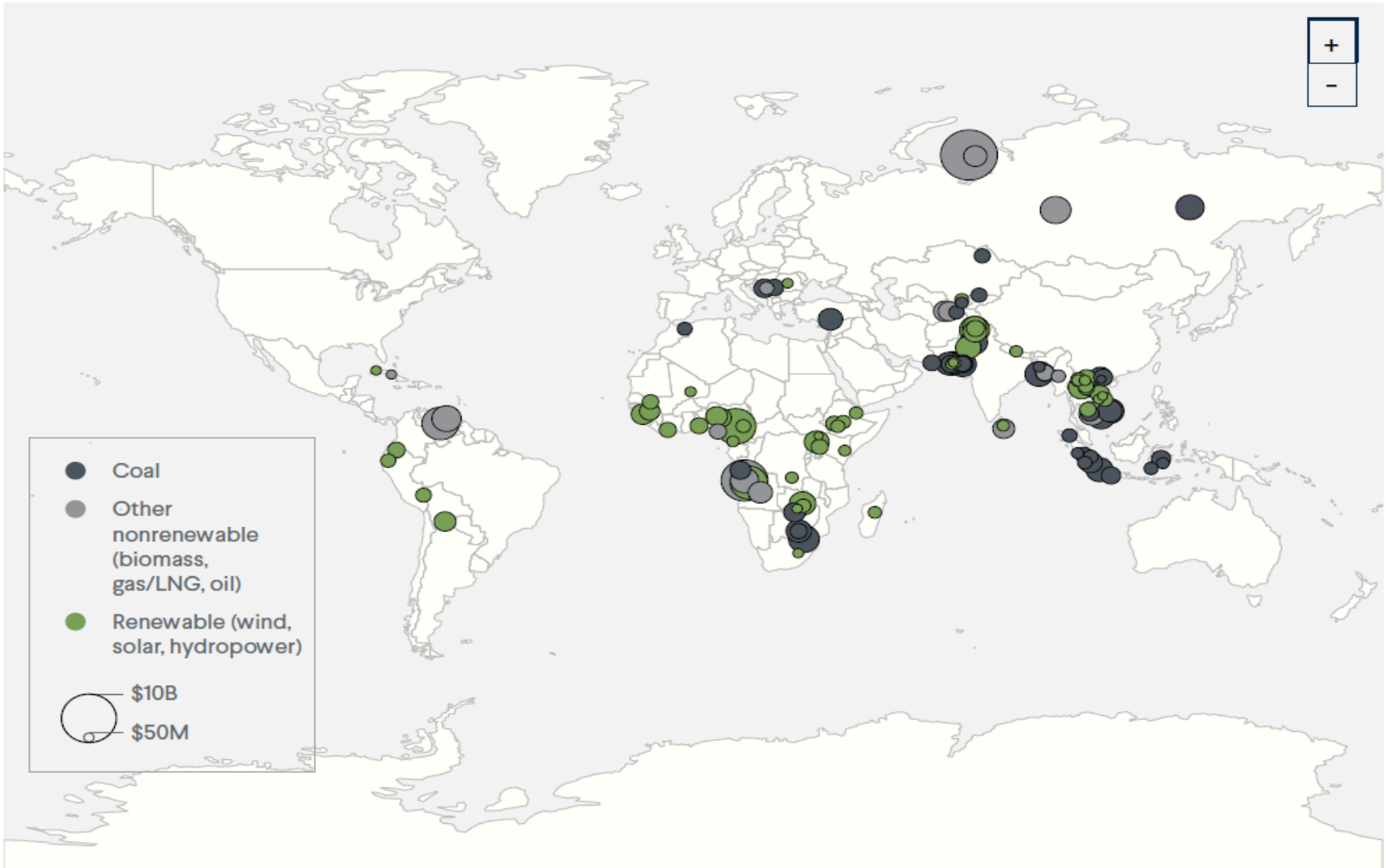
Renegotiated debt by outcome, January 2001 to November 2020




*Source:* Rhodium Group.

# Most of China's Energy Project Financing in BRI Countries Goes Toward Nonrenewables

Energy projects financed by state-owned Chinese banks in BRI countries since the initiative's launch in 2013



## The Belt and Road Initiative (cont.)

So, the BRI is very important and has massive potential to improve the Global South, particularly Africa.

It has been given very bad press in western countries.

Surprisingly little research has been done on it.

Our paper is a small step in trying to understand the operation of BRI.

## Introduction

- China's overseas economic operations after 2013 (the Belt and Road Initiative)
- Two types of Chinese Outward Foreign Direct Investment (OFDI): ordinary OFDI and Overseas Infrastructure Investment (OII)

(1) China's OII projects often involve bilateral debt financing from the Chinese government to host country governments

(2) The contractors of China's OII projects are dominated by Chinese SOEs, hence, OII contains objectives beyond maximising the profit of participating firms

(3) The destinations of China's OII projects are mainly emerging and developing economies

Our research focuses on China's OII (state-financing, SOEs, and emerging and developing economies)

## Motivations

- There are many studies on Chinese ordinary OFDI, but they cannot reflect the state-capitalist nature of China's OII
- Existing studies on China’s BRI-related operations (loans and investment) are mainly about the impact on host countries, little is known about how China’s OII affects the Chinese economy
- Some existing studies examine the impact of the BRI on China's regions and other firms rather than the firms undertaking OII projects

The focus of our research:  Chinese firms who are the OII project contractors, mainly Chinese SOEs

## Contributions

- New evidence on economic motivation of China's OII on the firm level
- New evidence on the behaviour and outcome of OII project contractors

  (there is no econometric evidence on this)
- New evidence on the channels through which China OII affects firms that undertake OII projects

  (there is no econometric evidence on this)

The above-mentioned evidence has significant policy implications for China, host countries, and international organisations

## Literature (1): Underlying Theories

- Internationalisation and firm performance

  The internationalisation-performance relation is inconsistent (e.g. Marano et al., 2016)

- Institutional theory: Home and Host country institutions

  Institutional theory has become the most frequently referenced theory as far as emerging-market multinational companies (EMNCs) are concerned (Meyer and Peng, 2016)

- State capitalism theory and the New-mercantilism argument

  SOEs pursue long-term energy and economic security and operate as capitalist foreign policy arms of their home country governments (e.g. Bass and Chakrabarty, 2014)

  SOEs' internationalisation may be driven by the home government motive of exercising power in the international sphere to raise the welfare of the home country, reflecting a mercantilist agenda (e.g. Clegg and Tardios, 2018; Cuervo-Cazurra and Li, 2021)

  Firm performance differs across varieties of state capitalism (differing degree of state ownership)(e.g. Musacchio, et al.,2015)

## Literature (2): China's BRI and Host Countries

- The trade effect: China's BRI projects have reduced trade costs and promoted host country growth (e.g., World Bank, 2019; De Soyres et al., 2020)
- The debt effect: China's overseas infrastructure financing has created debt overhang problems of host countries (e.g., Hurley, et al., 2019; Horn, et al., 2021; Bandiera and Tsiropoulos, 2020)

Gaps: Macro-level studies are mainly on the impact of BRI on host countries, evidence on what China gains from the BRI is scarce – Influence and future trade in the Global South?

## Literature (3): China’s OFDI and Chinese Firms

• Studies on China's OFDI before the BRI (2013)
Features: technology and strategic assets seeking in advanced economies
(1) Impact on domestic innovation (e.g. Dong et al., 2021)
(2) Impact on firm performance (e.g. Huang and Zhang, 2017)
Existing studies document an overall positive impact of China’s OFDI (before the BRI) due to reverse technology spillovers

•Studies on China's OFDI after the BRI
Features: resource and market seeking in emerging and developing economies, Chinese state-financed investment
(1)Firm level studies main examine whether the BRI promotes Chinese firms’ overseas activities (e.g. Li et al., 2019; Liu et al., 2020), but these firms are not OII project contractors

Gap: Firm level studies have not touched upon what the firms can gain from undertaking OII projects

## Literature (4): Channels through which firm overseas investment affects the firm's domestic activities and performance

- **The production channel**

Whether the firm's OFDI results in complementary or substitutional activities of its domestic production (Desai, et al. 2009; Goldbach, et al. 2019; Cravino and Levchenko, 2017; Bena, et al. 2022).

- **The internal capital market channel**

Whether the firm's OFDI competes for financing with the firm's domestic investment, or OFDI provides more sources of financing for the firm (Stevens and Lipsey, 1992; Desai et al., 2009)

The firm's internal capital market can facilitate the allocation of financing within the firm between its overseas and domestic activities, which leads to a lower average cost of financing for the firm (Egger, et al. 2014; Goldbach, et al. 2019)

- **The technology and efficiency channel** (e.g. Bertrand and Capron, 2015)
- **The taxation channel** (e.g. Goldbach, et al., 2019)

## Hypotheses

Hypothesis1: Undertaking China's overseas infrastructure projects improves firm long-term performance

Hypothesis2: Undertaking China's overseas infrastructure projects improves firm performance through sales

Hypothesis3: Undertaking China's overseas infrastructure projects improves firm performance through the firm's internal capital market

Hypothesis4: Undertaking China's overseas infrastructure projects improves firm performance through fixed investment (either sales-induced or financing-induced)

## Data (1): Firm level panel data

- We identify 61 Chinese OII project contractors during 2005-2021 based on *the China Global Investment Tracker (CGIT)* database. They are Chinese listed non-financial firms
- We identify industries of these 61 OII contractors and their infrastructure projects
- Following the corresponding industries, we identify Chinese listed non-financial firms that are in these industries but not the contractors of China's OII projects (the *China Stock Market and Accounting Research (CSMAR)* database)
- The Panel data set contains 1754 non-contactor firms and 61 contractor firms over 2005-2021

Treated firms: 61 OII project contractors

Control firms: 1754 non-contactor firms

## Data (2): Project level data (event study)

- The *CGIT* database contains the project level information, including the name of Chinese contractors, project size, year of the project, project destination (host country), industry of the project, and local counterparts in the host country, etc..
- We manually collected the information on the project announcement date. The event date is defined as the date on which the project is exposed to the public for the first time via media platforms, newspapers, or organizations
- We use the stock code of the project contractor to match the project information from *CGIT* with the firm's accounting and financial information from *CSMAR* for each identified infrastructure project
- Host country information is taken from various sources, including *World Bank Development Indicators*, *World Intellectual Property Organization*, and *Worldwide Governance Indicators*
- We identified 514 projects. Some project contractors do not have sufficient stock market information, therefore, 408 infrastructure projects are used in the event study

## Empirical Model (1)

- Panel data models: The Average Treatment Effect (ATE) model (Heckman,1976,1978; Manning, 2004)

$$Probability\,(Infra_{it} = 1) = \beta_0 + \beta_1 Size_{it-1} + \beta_2 Age_{it-1} + \beta_3 Sales_{it-1} + \beta_4 Leverage_{it-1} + \beta_5 State_{it-1} + \beta_6 Proximity_{it-1} + \varepsilon_{it} \quad (1)$$

$$Performance_{i,t+3} = \beta_0 + \beta_1 Infra_{it} + \beta_2 Size_{it} + \beta_3 Age_{it} + \beta_4 Sales_{it} + \beta_5 Leverage_{it} + \beta_6 State_{it} + \varepsilon_{it} \quad (2)$$

We use $Proximity$ as the *exclusive instrumental variable* in the treatment equation (1) $Proximity$ is the geographical distance between the firm's headquarters and a BRI city

We simultaneously estimate the treatment equation (1) and the outcome equation (2) by using the full information maximum likelihood procedure

## Empirical Model (2)

The Average treatment Effect (ATE) model to test the channels

The outcome equation becomes:

$$Performance_{i,t+3} = \beta_0 + \beta_1 Infra_{it} + \beta_2 Infra_{it} * Channel_{it} + \beta_3 Channel_{it} + \beta_4 Size_{it} + \beta_5 Age_{it} + \beta_6 Sales_{it} +$$

$$\beta_7 Leverage_{it} + \beta_8 State_{it} + \varepsilon_{it} \qquad (3)$$

Proxy for the channel: For **the production channel**, we use (a) sales; (b) fixed investment channel; for **the Internal capital market channel**, we use related party loans $(RPLs)$.

We argue that both **the technology and efficiency channel** and **the taxation channel** do not apply to China's OII

## Empirical Model (3)

- The event study model

$$Abnormal\ Returns_i = \beta_0 + \beta_1 ProSize_i + \beta_2 First_i + \beta_3 Runup_i + \beta_4 Sales_i + \beta_5 Leverage_i + \beta_6 State_i + \beta_7 GDP_i + \beta_8 Resource_i + \beta_9 Tech_i + \beta_{10} Risk_i + \beta_{11} Trade_i + \varepsilon_i \quad (4)$$

This model captures more information on the OII projects and host countries

Short-run Abnormal Returns: *CAR(-1, 1), CAR(-1,3), CAR(-2, 2), CAR(-3,5)*
Long-run Abnormal Returns: *BAHR12, BAHR24*

## Empirical Result (1): ATE Benchmark Results

(1) Treatment equation results show:

(a) larger firms, younger firms, firms with stronger demand, and less indebted firms are more likely to undertake China's OII projects

(b) Proximity to the BRI city does not matter

(c) State ownership matters a lot

(2) Outcome equation results confirm:

Hypothesis1: Undertaking China's overseas infrastructure projects improves firm long-term performance

## Empirical Results (2): ATE Results on Channels

Summary of the results on channels:

(1) There is no evidence in support of the sales channel

(2) Evidence supports the fixed investment channel, and it is financing-induced fixed investment

(3) Evidence supports the internal capital market channel (PRLs)

Interpretation of the main result: the internal capital market channel

The Chinese government directly organises financing for OII projects. Loans for undertaking infrastructure projects are allocated directly to project contractors (mostly SOEs). The project contractors have discretion in allocating OII project-related loans in the name of project procurement. They make use of these loans strategically, which is reflected by the related party loans transactions (RPLs).

## Empirical Results (3): Event Study

Summary of the event study results:

(1) In the short run, the stock market reacts negatively to the project announcement, but the long-term abnormal stock returns (two years post the announcement) are positively explained by the firm's undertaking of the infrastructure project

(2) Evidence (weak) shows that the stock market reacts positively to the announcement if the project is the first one the firm undertakes

(3) State ownership explains the longer-term abnormal stock returns in response to the announcement

(4) The stock market reacts positively to projects in host countries with richer natural resources and has a larger trade volume with China

(5) Host country economic performance (GDP), technology, and country risk are not important concerns

## Empirical Results (4): Robustness Tests

- Use the firm's 'new bank loans' as an alternative indicator of the internal capital market channel

(1) Re-do ATE estimation based on the whole sample for the internal capital market channel

(2) Re-estimate the $RPLs$ channel model for the two subsamples split based on the median of the new bank loans

- The Propensity Score Matching (PSM) analysis

We match the treated firms with firms in the control group based on four firm characteristics: firm age, sales, leverage, and state ownership. The outcome variables are firm performance indicators. (Treated firms: 61 OII project contractors; Control firms: 1754 non-contactor firms)

The PSM results show that :

(1) OII project contractors perform better than non-contractor firms

(2) Further evidence in support of the internal capital market channel

## Conclusions & Policy Implications

- Two key findings

(1) There is clear-cut evidence supporting the long-term positive impact of China's OII on the firms that undertake these projects

(2) The firm's internal capital market is an effective channel that conducts this positive impact

- Policy implications

(1) New insight is added to the debate on the economic motivation of China's OII

(2) Concerns may arise on possible capital allocation inefficiency and its implications for non-contractor Chinese firms and host country governments