Great Powers have a history of large overseas investments

Berlin—Baghdad Railway

Marshall Plan
Is China’s “project of the century” a financial success?
Our contribution: A financial evaluation of the Belt and Road Initiative

1. **Creditor losses**: First paper to systematically estimate “haircuts” for Chinese banks
   - New database on 48 sovereign debt restructurings with Chinese creditors
   - Haircuts are small in comparison to Paris Club and private external creditors

2. **Creditor returns**: First paper to estimate returns for China's lending portfolio
   - Contracted and realized rates of return for over 3,500 Chinese loans worth $1 trillion
   - Realized, real rate of return stands at 1.7% p.a.
   - Lending terms are more favorable (ex-ante) for projects with likely broader economic and political payoffs
Creditor losses ("haircuts")
Central contribution: We build a granular new database that tracks the terms of all debt restructurings between Chinese state-owned creditors and foreign sovereigns since 2000.

- Sources include existing academic work (e.g., Acker et al. 2020, Custer et al. 2021, Horn et al. 2022) and dozens of debtor-specific sources.
- Granular details and haircut estimates for 136 Chinese loans (48 different deals).

⇒ Most Chinese restructurings only extend the maturity (no face value write-offs).
Haircuts measure creditor losses in present value terms

Key idea: Compare the present value of the old and new debt (loan-by-loan)

Haircut = 1 − \( \frac{\text{Present value of new debt}}{\text{Present value of old debt}} \)

⇒ Consider characteristics of old and new debts, including changes in maturity and interest structure (e.g., Sturzenegger and Zettelmeyer 2006, 2008)

Discount rate: Follow established approach and use Market yields as well as Commercial Interest Reference Rate (CIRR) to discount contracted cash flows

\[
\text{Present value} = \sum_{t=0}^{T} \frac{\text{Debt service}_t}{(1 + r_{\text{discount}})^t}
\]
Haircuts of Chinese creditors are small

Note: The circle size reflects the amount of debt restructured in real US$.
Haircuts of Chinese creditors are small
Creditor returns
How have Chinese creditors fared?

Central idea: Calculate and compare contracted and realized portfolio returns

Internal rate of return (IRR) \Rightarrow 0 = NPV = \sum_{t=0}^{T} \frac{\text{Net cash flow}_t}{(1 + r_{\text{IRR}})^t}

Two ingredients:

1. Repayment profiles: Map commitments into outstanding debt and debt service flows

2. Haircuts and missed payments: Integrate debt restructurings (from first part) and missed debt service payments to Chinese creditors (from World Bank IDS)
Contracted debt service payments to Chinese creditors

Contracted debt service payments in billion US$
Realized debt service payments to Chinese creditors (so far)

Debt service payments in billion US$

Missed payments are small
Contracted (ex-ante) nominal returns of China’s BRI loan portfolio

Nominal return
- 6 to 8%
- 4 to 6%
- 2 to 4%
- 0 to 2%
- No data
The realized portfolio return is very similar.
China’s overseas loans versus other asset classes

- U.S. Treasury bond 10 years: 0.1%
- Chinese govt. bond 10 years: 1.4%
- China BRI Loans Realized return: 1.7%
China's overseas loans versus other asset classes

Real asset return in %

- U.S. Treasury bond 10 years: 0.1%
- Chinese govt. bond 10 years: 1.4%
- China BRI Loans Realized return: 1.7%
- Chinese equities Shanghai Composite: 4.6%
- EMBI bonds J.P. Morgan index: 6.2%
- Global equities MSCI World: 8.1%
Why are creditor returns low?
We exploit the large variation in ex-ante returns
The role of non-financial returns

Key idea: China’s overseas lending is state-driven, offering the possibility of direct political control and strategic lending

⇒ Test if Chinese creditors subsidize loans with positive non-financial externalities

1. Projects facilitating Chinese exports or foreign market access
   - Infrastructure projects
   - Chinese implementing agency
   - Loans denominated in Renminbi

2. Projects supporting China’s political influence abroad
   - Prestige projects
   - Military or security projects
   - Loans to public recipients
   - Leader favoritism
Which loans earn lower financial returns?

- Prestige project
- RMB denominated
- To political leader region
- Military or security project
- Trade infrastructure
- Chinese implementing agency
- Public recipient
- Energy sector
- Resources-for-loan project
- Emerging market recipient
- Private recipient

Difference to average BRI loan return (percentage points)

Lower returns

Higher returns

-2 -1.5 -1 -0.5 0 0.5 1
Loan terms favorable for projects with potential non-financial externalities

<table>
<thead>
<tr>
<th></th>
<th>Plain Model (1)</th>
<th>Plain Model (2)</th>
<th>Combined Model (3)</th>
<th>Leader Region (4)</th>
<th>Sovereign Rating (5)</th>
<th>Creditor FE (6)</th>
<th>Full Sample (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trade infrastructure</td>
<td>-0.52***</td>
<td>-0.34***</td>
<td>-0.27***</td>
<td>-0.21</td>
<td>-0.35***</td>
<td>-0.27***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.01)</td>
<td>(0.11)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td></td>
</tr>
<tr>
<td>RMB denominated</td>
<td>-1.63***</td>
<td>-1.16***</td>
<td>-1.15***</td>
<td>-1.22***</td>
<td>-1.18***</td>
<td>-1.18***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td></td>
</tr>
<tr>
<td>Chinese implementing agency</td>
<td>-1.05***</td>
<td>-0.52***</td>
<td>-0.69***</td>
<td>-0.37**</td>
<td>-0.47***</td>
<td>-0.25***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.02)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td></td>
</tr>
<tr>
<td>Prestige project</td>
<td>-1.62***</td>
<td>-1.29***</td>
<td>-1.21***</td>
<td>-1.35***</td>
<td>-1.20***</td>
<td>-1.36***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td></td>
</tr>
<tr>
<td>Military or security project</td>
<td>-0.60***</td>
<td>-0.23**</td>
<td>-0.26</td>
<td>-0.24*</td>
<td>-0.32***</td>
<td>-0.20**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.00)</td>
<td>(0.03)</td>
<td>(0.11)</td>
<td>(0.06)</td>
<td>(0.00)</td>
<td>(0.01)</td>
<td></td>
</tr>
<tr>
<td>To political leader region</td>
<td>-0.36***</td>
<td>-0.31**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.01)</td>
<td>(0.01)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sovereign rating</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-0.029</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.25)</td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>2,045</td>
<td>2,045</td>
<td>2,045</td>
<td>2,045</td>
<td>1,451</td>
<td>2,045</td>
<td>1,451</td>
</tr>
<tr>
<td></td>
<td>2,045</td>
<td>2,045</td>
<td>1,451</td>
<td>2,045</td>
<td>1,308</td>
<td>2,045</td>
<td>4,054</td>
</tr>
<tr>
<td>R²</td>
<td>0.13</td>
<td>0.23</td>
<td>0.17</td>
<td>0.14</td>
<td>0.13</td>
<td>0.33</td>
<td></td>
</tr>
<tr>
<td>Loan-level controls</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Year FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Recipient FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Creditor FE</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>
Conclusions

In narrow financial terms, the BRI so far is a “no gain, no loss” project

- Haircuts are close to zero
- Realized, real rate of return stands at 1.7% p.a.
- Return is driven down by low ex-ante returns for selected projects and recipients
  ⇒ Non-financial returns (market access and political externalities)

Looking ahead

- More defaults and haircuts likely (e.g., recent Zambia haircut of 50%) (lower returns)
- Current shift to state-owned commercial bank lending (higher returns)
Appendix
Focus on the creditor side of international lending

1. Literature on China’s overseas lending boom has focused on implications for debtors
   - Empirical lending characteristics (e.g., Horn et al. 2021, Dreher et al. 2022)
   - Welfare implications and debt sustainability (e.g., Kondo et al. 2022, Alfaro and Kanczuk 2022, Guler et al. 2022, Gamboa-Arbelaez 2023)

2. Financial returns on cross-border investments
   - U.S. capital exports (e.g., Gourinchas and Rey 2007, 2014, 2022, Bertaut et al. 2023) and from other countries (e.g., Lane and Milesi-Ferretti 2007, Hünnekes et al. 2023)
   - “Returns on empire” (e.g., Lewis 1938, Edelstein 1982, Davis and Huttenback 1986, Ferguson 2003, Brunnermeier et al. 2018)
Sovereign debt restructurings with Chinese creditors over time
Chinese haircut estimates with alternative discount rate

Note: The circle size reflects the amount of debt restructured in real US$.
Debt relief remains overall small across countries and time.
Debt relief with alternative discount rates
Assume complete loan disbursement over the grace period

Blue lines: Median and mean of grace period

Years from loan commitment to project completion

- Median
- Mean
## Chinese loan instruments and their repayment schedule

<table>
<thead>
<tr>
<th>Creditor</th>
<th>Loan instrument</th>
<th>Maturity</th>
<th>Grace period</th>
<th>Interest rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Export-Import Bank of China</td>
<td>Government concessional loan (GCL)</td>
<td>20</td>
<td>5</td>
<td>2 percent (p.a.)</td>
</tr>
<tr>
<td></td>
<td>Preferential buyer’s credit (PBC)</td>
<td>20</td>
<td>5</td>
<td>2 percent (p.a.)</td>
</tr>
<tr>
<td></td>
<td>Buyer’s credit loan (BCL)</td>
<td>15</td>
<td>4</td>
<td>6-month LIBOR plus 300 basis points (p.a.)</td>
</tr>
<tr>
<td>Unknown</td>
<td><strong>Low-income recipients</strong></td>
<td>20</td>
<td>4</td>
<td>2 percent (p.a.)</td>
</tr>
<tr>
<td></td>
<td><strong>Emerging market recipients</strong></td>
<td>15</td>
<td>4</td>
<td>6-month LIBOR plus 300 basis points (p.a.)</td>
</tr>
<tr>
<td>China Development Bank</td>
<td>All instruments</td>
<td>10</td>
<td>3</td>
<td>6-month LIBOR plus 340 basis points (p.a.)</td>
</tr>
<tr>
<td>Commercial banks and suppliers</td>
<td>All instruments</td>
<td>8</td>
<td>3</td>
<td>6-month LIBOR plus 360 basis points (p.a.)</td>
</tr>
</tbody>
</table>

**Note:** Based on 100 Chinese foreign lending contracts collected by Gelpern et al. (2022); AidData 3.0 (Dreher et al. 2022, Custer et al. 2023).
Composition of debt service payments to Chinese creditors over time

- Principal repayments
- Interest payments
Comparison of contracted and realized rates of return across countries
Comparison of contracted and realized rates of return across countries
Realized portfolio return under future default risk
Why are Chinese foreign lending returns low?

Main challenge: Selection effects

⇒ Leverage uniquely detailed return data in systematic regression framework:

\[ \text{Contracted return}_{i,t,r} = \beta \text{Trade}_{i,t} + \gamma \text{Political}_{i,t} + \delta X_{i,t} + \alpha_t + \eta_r + \epsilon_{i,t,r} \]

- Consider year fixed effects, recipient fixed effects, and creditor fixed effects
- Different sub-samples of loans