The Impact of the Belt and Road Initiative on Foreign Direct Investment from China and Other Countries

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Outline

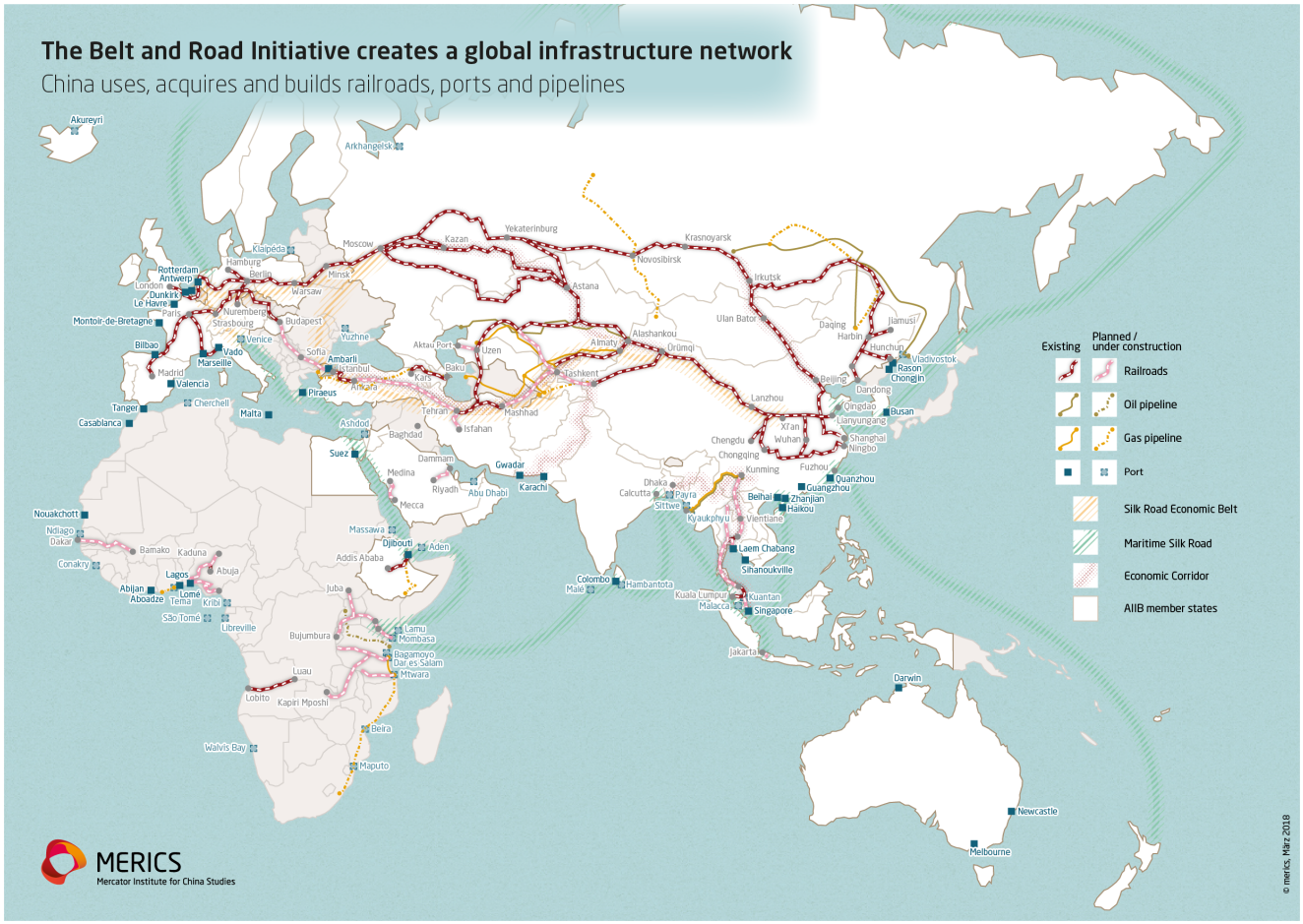
Belt and Road Initiative

- First announced by China's President Xi in 2013
- Silk Road Economic Belt and Maritime Silk Road

  (connecting China with Southeast, South, and Central Asia, the Middle East, Russia, Europe, and Eastern Africa)
- 5 major priorities (EBRD)
  - Infrastructure development
  - Unimpeded trade
  - Financial integration
  - Policy coordination
  - Connecting people
- Nearly 150 participating countries
- Nearly a trillion dollars in lending

Belt and Road Initiative

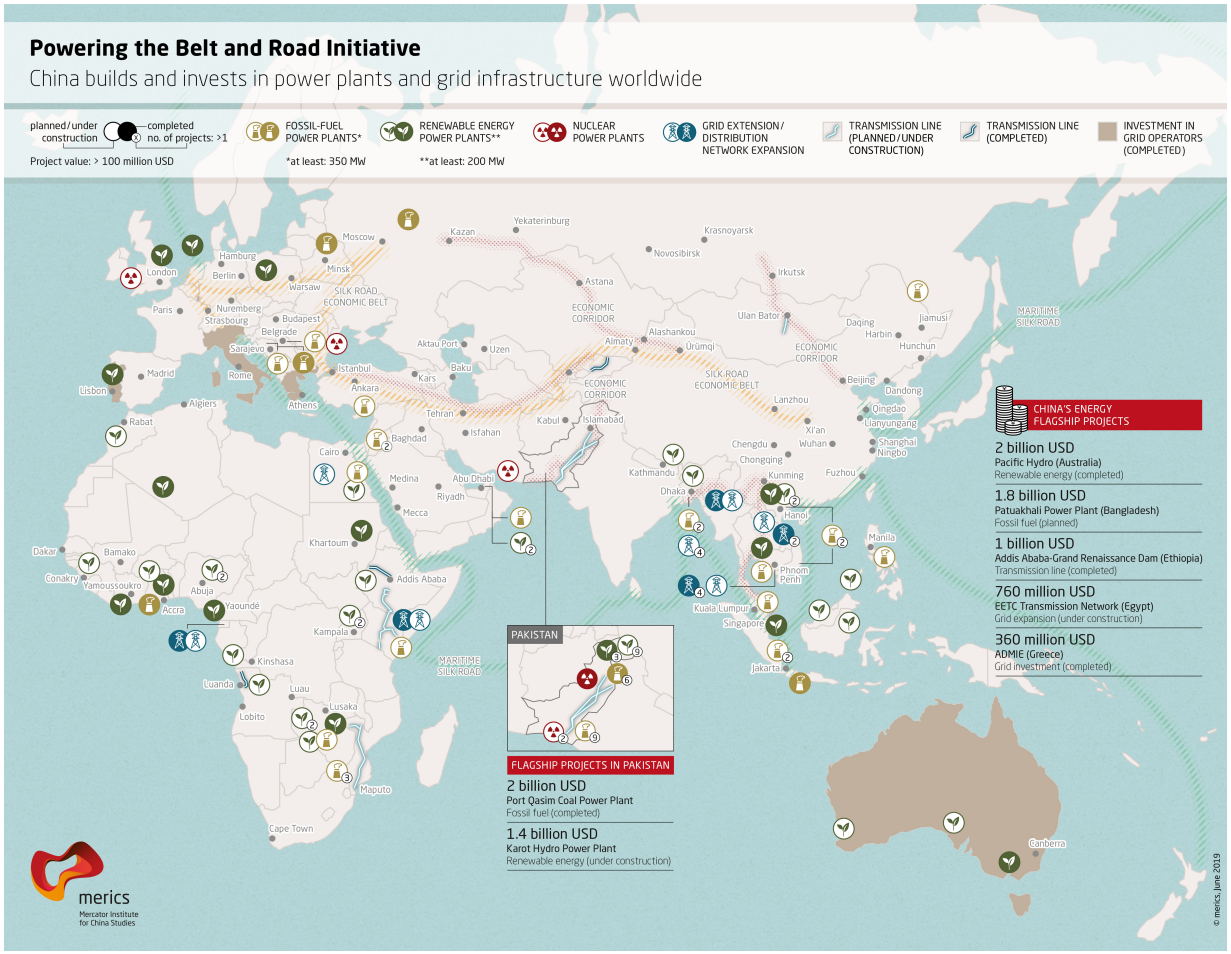
Transport infrastructure development by BRI



Source: Mercator Institute for China Studies

Belt and Road Initiative

Power and digital infrastructure development by BRI



Source: Mercator Institute for China Studies

Effect of BRI on foreign direct investment from China

Host-country specific channels (may also affect FDI from others)

- Infrastructure development
  - Major objective of BRI
  - Infrastructure reduces costs of search and production activities
- Income and productivity growth
  - Possible result of BRI and associated infrastructure
  - Larger markets and higher productivity attract FDI
- Policy coordination
  - Possible influence of China on partners' political institutions
  - Autocracy in partners attracts FDI from China

Country-pair specific channels (affect FDI from only China)

- More information flows between China and its partners
- Strong political links between China and its partners

Effect of BRI on FDI from countries competing with China, such as the US, Japan and India

- Host-country specific channels
  - Infrastructure development: positive
  - Higher income and productivity: positive
  - Autocracy: negative
- Competition with China in economic and security relations: positive or negative
  - US's Strategic Competition Act: "Promoting responsible development alternatives to the BRI" (Mardell 2021)
  - Japan's revised Official Development Assistance charter: encourage ODA for economic security

Literature review

DID estimations of the effect of BRI on FDI from China: Du and Zhang (2018); Yu et al. (2019)

- Using country-level data and setting a homogeneous treatment period (2013, the year of announcement)
- Heterogeneous results: positive effect on private FDI and FDI in infrastructure sectors
- Shortcomings: homogeneous treatment period; unclear mechanisms

Estimations of the effect of financial flows from China on official and semi-official financial flows from India: Asmus et al. (2021)

- Result: positive in some specifications
- Implication: financial flows can be politically motivated

Literature review

Effect of foreign aid on FDI: Harms and Lutz (2003); Selaya and Sunesen (2012)

- Using country-level data
- Heterogeneous effects: positive when recipient countries have good governance; positive for social and economic infrastructure aid

Effect of foreign aid on bilateral FDI using gravity models: Kimura and Todo (2010); Kang et al. (2011)

- Results: Japanese (Korean) aid attracts Japanese (Korean) FDI, but not FDI from others; others' aid does not attract FDI from any country
- Implication: country-pair specific factors (such as information flows) encourage FDI from the donor; recipient-country specific factors (such as infrastructure) do not encourage FDI.

Contributions of this study

- Using staggered DID event study models to incorporate heterogeneity of the effect of BRI across time
- Using panel data at the country-pair level to incorporate the effect of BRI on FDI from other countries
- Comparing estimations with and without country-year fixed effects to examine mechanisms
- Examining heterogeneous effects between democratic and autocratic countries

DID event study model

$$\text{arcsinh}(FDI_{ijt}) = \lambda_{ij} + \lambda_t + \sum_l \beta_{cl} D_i^c D_{jt}^l + \epsilon_{ijt}$$

- $\text{arcsinh}(FDI_{ijt})$: inverse hyperbolic sine of FDI from country i to j in year t (FDI_{ijt}) ($= \ln\left(FDI_{ijt} + \sqrt{1 + FDI_{ijt}^2}\right)$).
- λ_{ij}: Country-pair fixed effects (geographic and cultural distance)
- λ_t: Year fixed effects
- $D_i^c = 1$ if source country i is $c \in \{\text{China, US, Japan, India}\}$
- D_{jt}^l =1 if recipient country j signed a BRI MOU in year $t + l$ where $l \in \{..., -3, -2, 0, 1, 2, 3, ...\}$.

Interpretation of the coefficient

$$\text{arcsinh}(FDI) = ... + \beta_{cl} D + ...$$

$$\Rightarrow \frac{dFDI/FDI}{dD} = \frac{\sqrt{1 + FDI^2}}{FDI} \beta_{cl}$$

If FDI is sufficiently large,

$$\frac{dFDI/FDI}{dD} \approx \beta_{cl}$$

$\Rightarrow \beta_{cl}$: roughly effect of BRI on the rate of change in FDI.

Staggered DID event study model

$$\text{arcsinh}(FDI_{ijt}) = \lambda_{ij} + \lambda_t + \sum_{e=2013}^{2021} \sum_{l} \beta_{cel} D_j^e D_i^c D_{jt}^l + \epsilon_{ijt},$$

- $D_j^e = 1$ if country j joins BRI in year e (cohort dummies)

$$\beta_{cl}^{CS} = \sum_{e=2013}^{2021} \omega_e^{CS} \beta_{cel}$$

- β_{cl}^{CS}: Effect of BRI on FDI from country c l years after the participation averaged over cohorts
- ω_e^{CS}: augmented inverse-probability weighting (AIPW) of Callaway and Sant'Anna (2021)

Model with country-year fixed effects

$$\text{arcsinh}(FDI_{ijt}) = \lambda_{ij} + \lambda_{it} + \lambda_{jt} + \sum_{e=2013}^{2021} \sum_{l} \tilde{\beta}_{cel} D_j^e D_i^c D_{jt}^l + \epsilon_{ijt}.$$

$$\tilde{\beta}_{cl}^{CS} = \sum_{e=2013}^{2021} \omega_e^{CS} \tilde{\beta}_{cel}$$

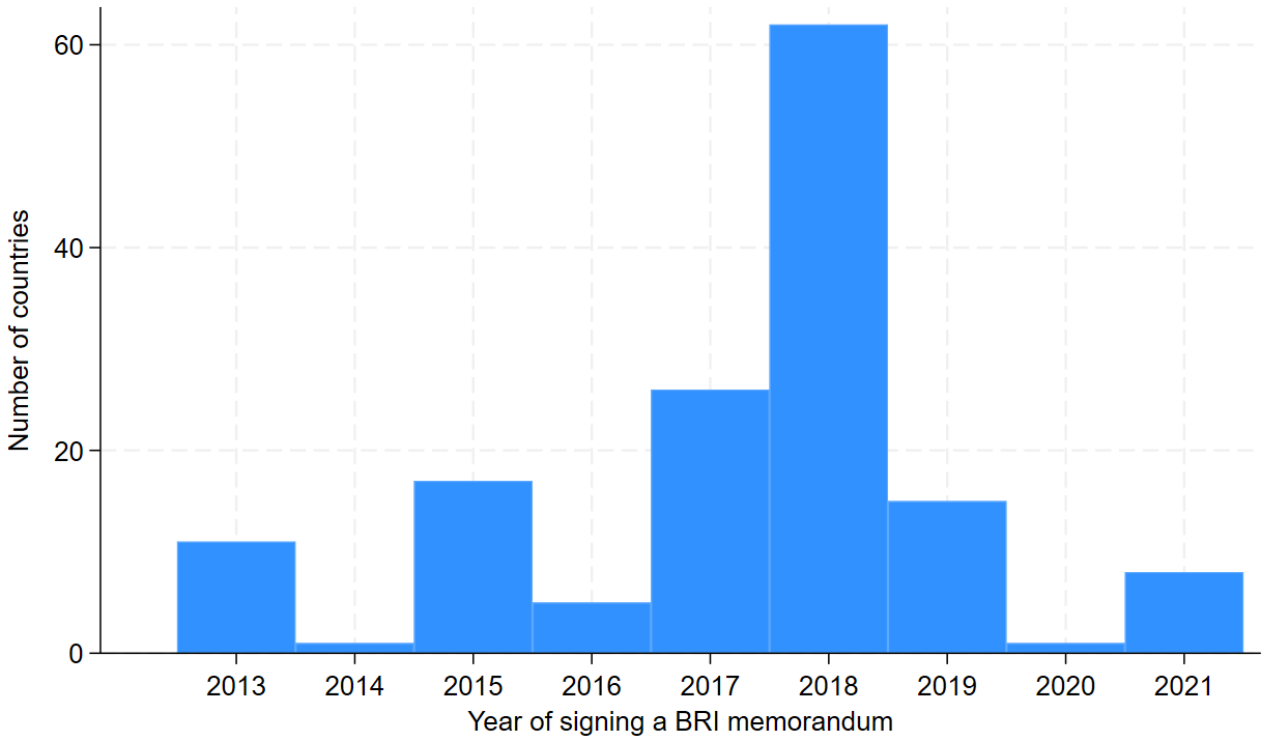
- Host country-year specific effects of BRI on FDI are absorbed in λ_{jt}.: infrastructure, income, and political institutions of the host country
- $\tilde{\beta}_{cel}$: effect of BRI on FDI through country pair-year specific channels (economic and political relationships between the two)

Data source

- Bilateral FDI: Coordinated Direct Investment Survey, IMF
  - Balanced panel from 2009 to 2021
  - 114,192 observations, 243 host & 129 home countries
  - Net FDI can be negative $\Rightarrow$ Use inverse hyperbolic sine of net FDI
- BRI: participation in BRI $\Leftarrow$ signing a BRI MOU (Wang 2022)
  - 152 countries participated in BRI by 2022.
  - The year of participation is unknown for 6 countries
    $\Rightarrow$ 146 BRI participants in the sample
- Democracy index: V-Dem
  - Mean of the 5 core democracy indices of V-Dem (0-1)
  - Sub-sample of democratic countries: democracy index in 2009 $\geq$ 0.5 (close to the mean)

Belt and Road Initiative

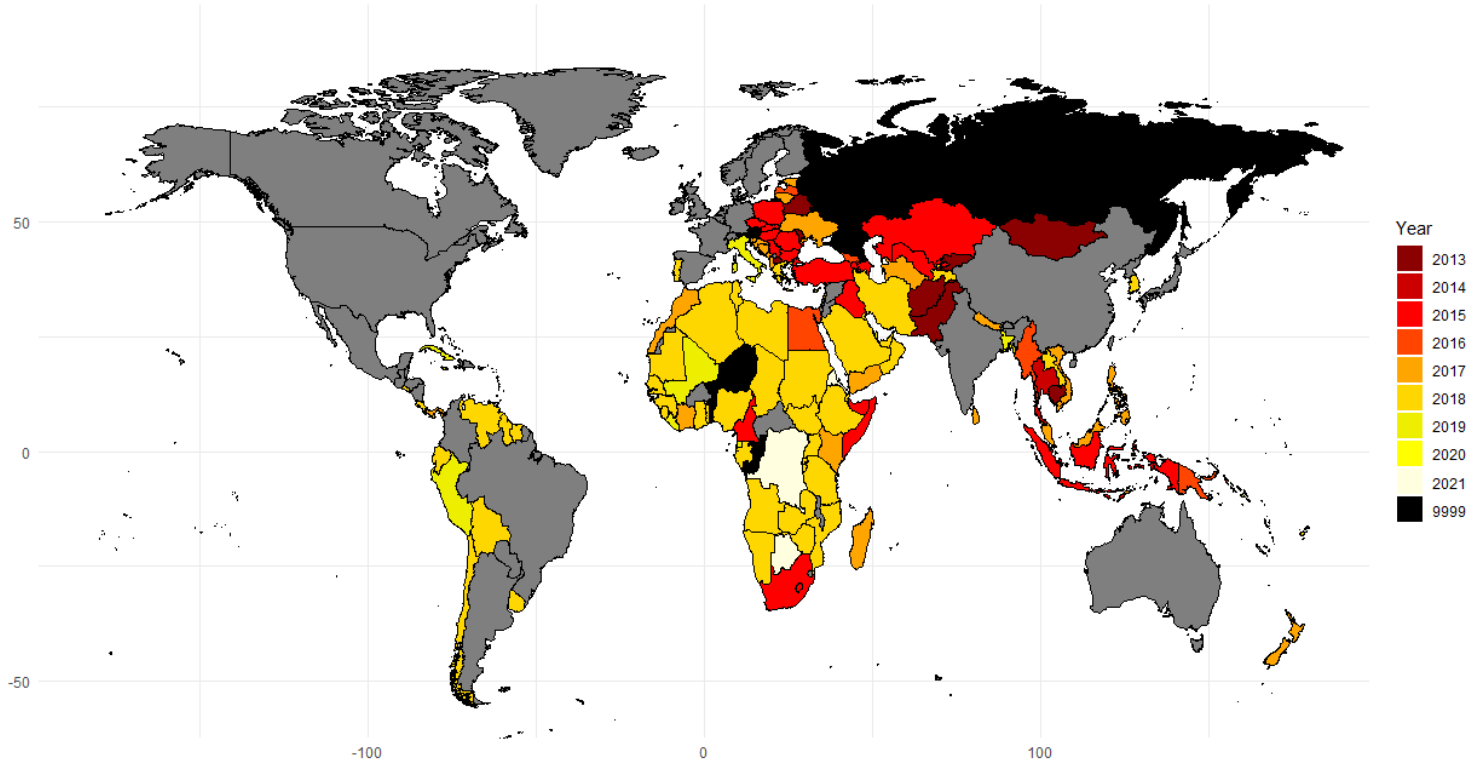
Distribution of years of signing a BRI memorandum.



Source: Wang (2022)

Belt and Road Initiative

Map of the year of signing a BRI memorandum by country.



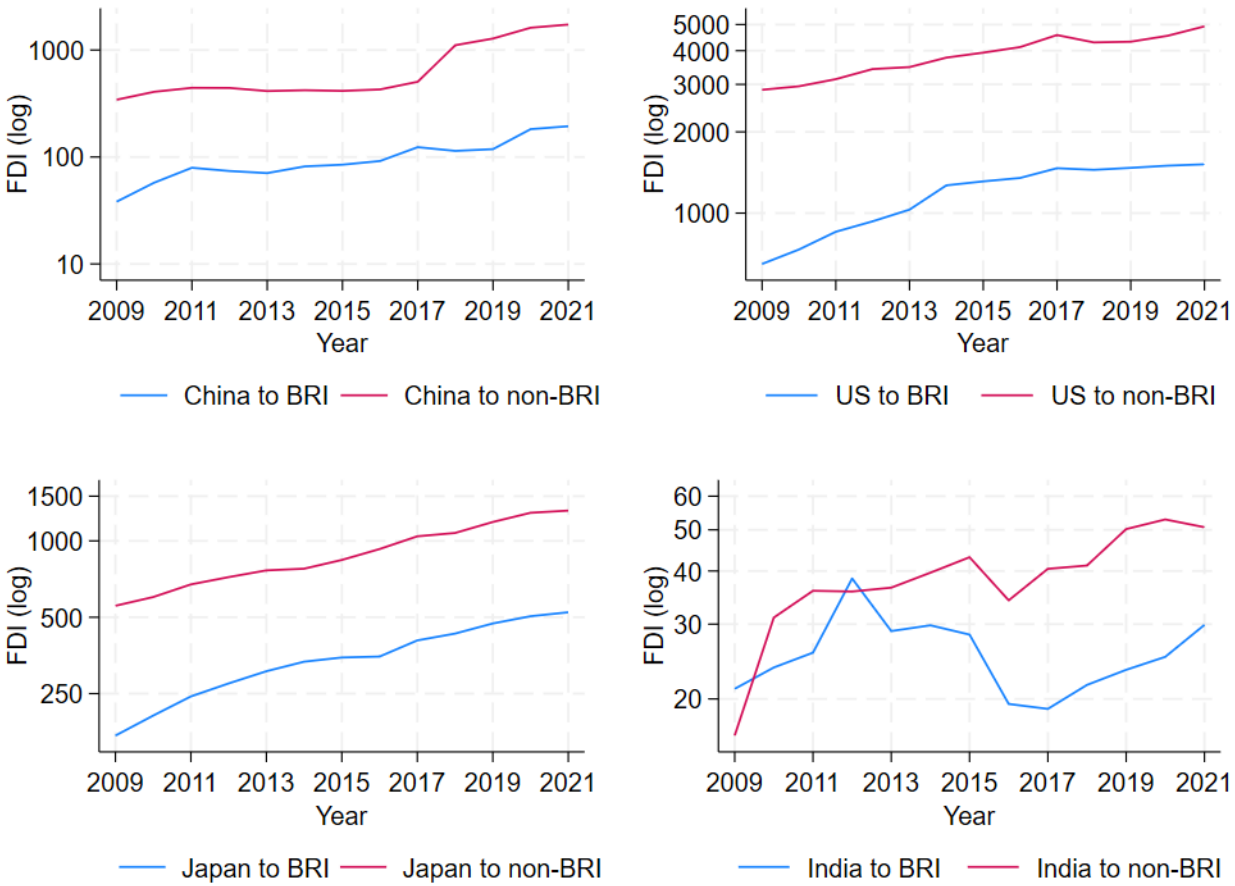
9999: year of signing a BRI memorandum is not available.

Countries in gray: not signed a BRI memorandum.

Source: Wang (2022)

Foreign direct investment

Total FDI to BRI and non-BRI countries (billion $)



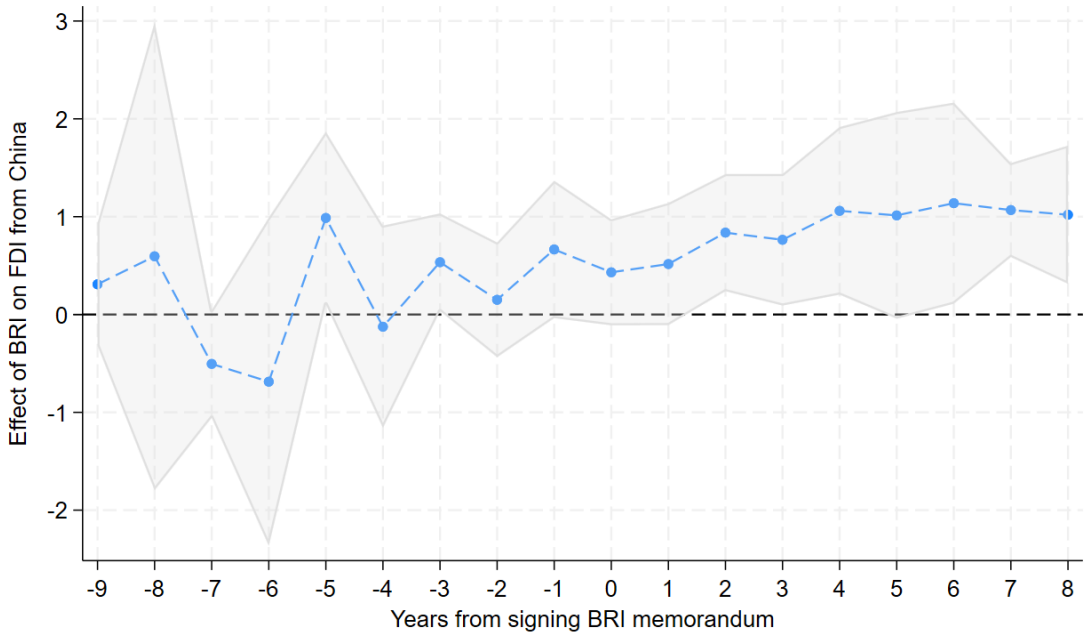
Summary statistics

	Mean	SD	Min	Med	Max	N
FDI (bilateral, million US$)	3422.52	30269.85	-3.2e+04	0.00	1.5e+06	114192
Inverse hyperbolic sine of FDI	2.46	3.61	-11.06	0.00	14.95	114192
Dummy for host country's BRI	0.26	0.44	0.00	0.00	1.00	114192
Democracy index of host country	0.47	0.25	0.05	0.46	0.86	95339

Source: IMF (2023), V-Dem (2023).

Results without country-year fixed effects

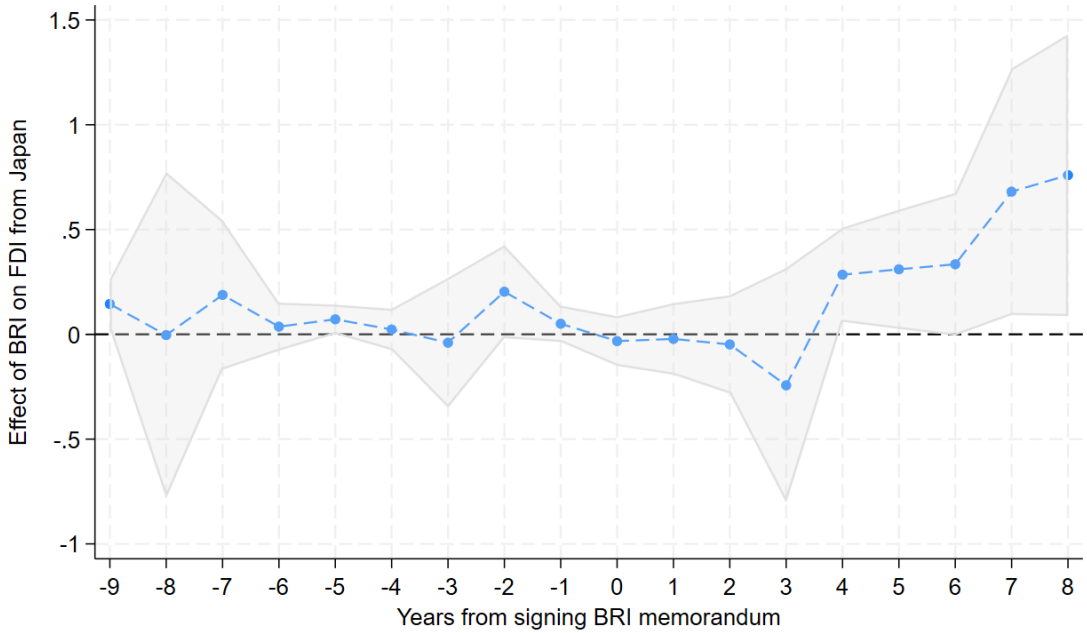
Effect of the BRI on FDI inflows from China



- Pre-treatment parallel trend satisfied (in most cases in this study)
- Positive and 5% significant effect of BRI on FDI from China after 2 years or later
- Large in size (roughly doubling FDI on average)

Results without country-year fixed effects

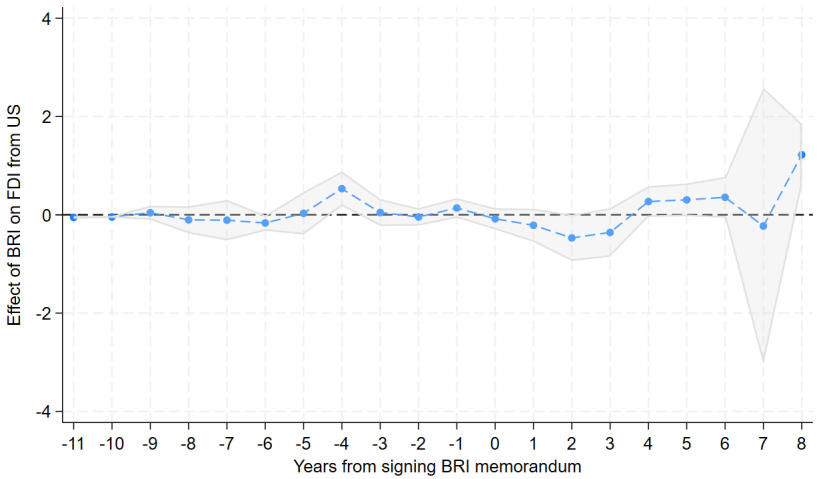
Effect of the BRI on FDI inflows from Japan



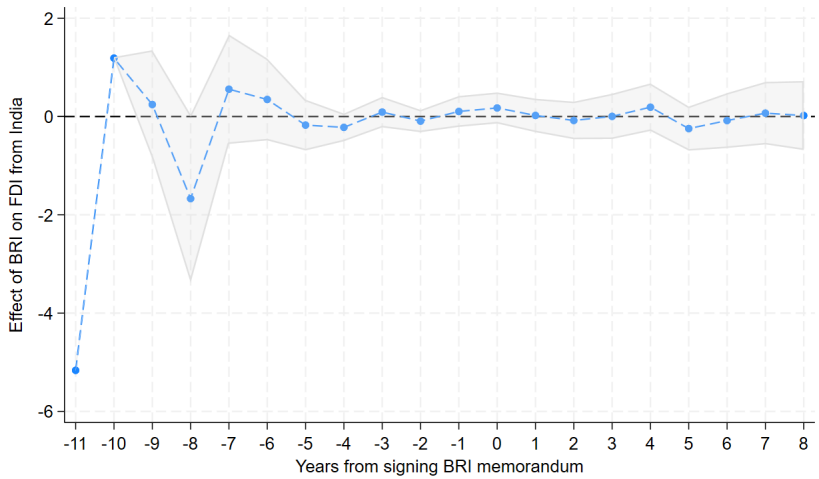
- Positive and significant effect of BRI on FDI from Japan after 4 years or later
- Smaller effect than that on FDI from China

Results without country-year fixed effects

Effect of BRI on FDI from the US



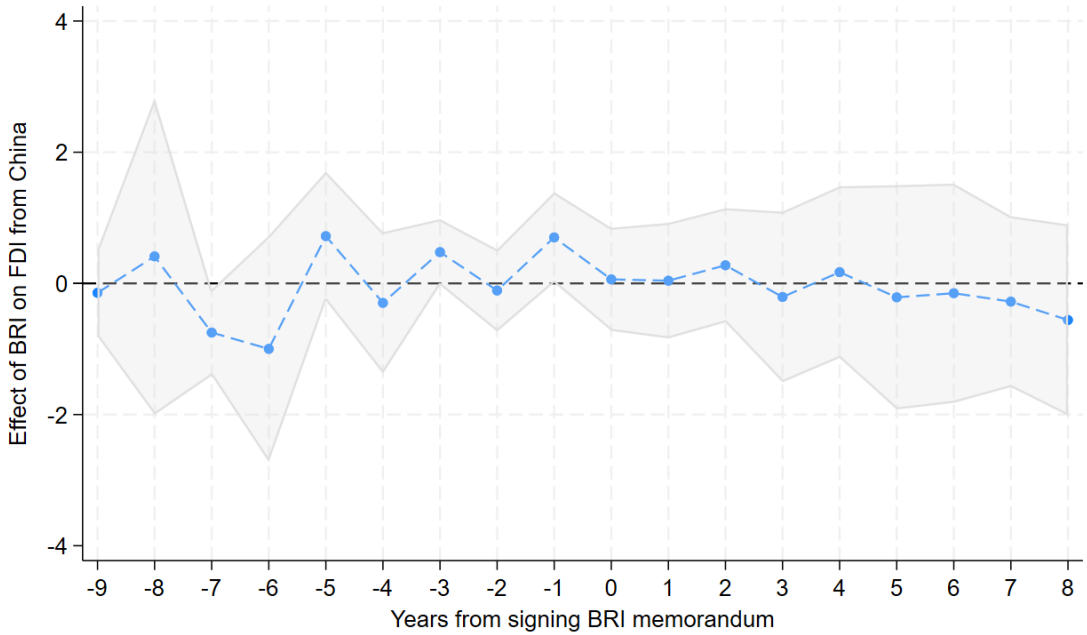
Effect of BRI on FDI from India



- No significant effect of BRI on FDI from the US or India

Results with country-year fixed effects

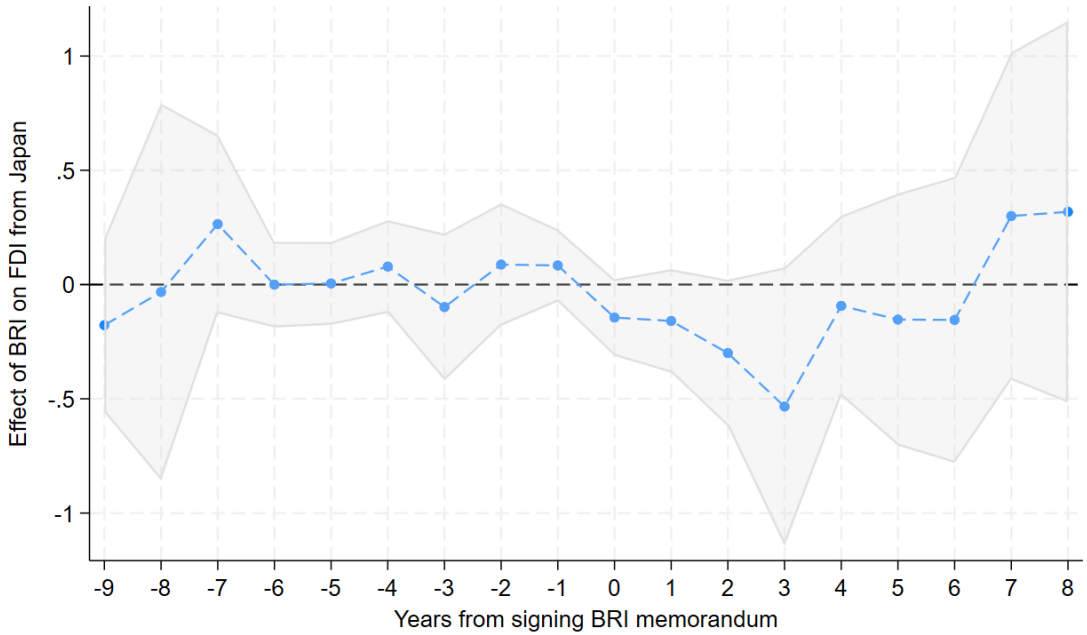
Effect of the BRI on FDI inflows from China



- No significant effect of BRI on FDI from China using country-year FE
- The positive effect of BRI previously found comes from time-variant factors of the host country (infrastructure, income, political institutions) absorbed in host country-year FE, not from time-variant factors at the country-pair level (information flows, political relations).

Results with country-year fixed effects

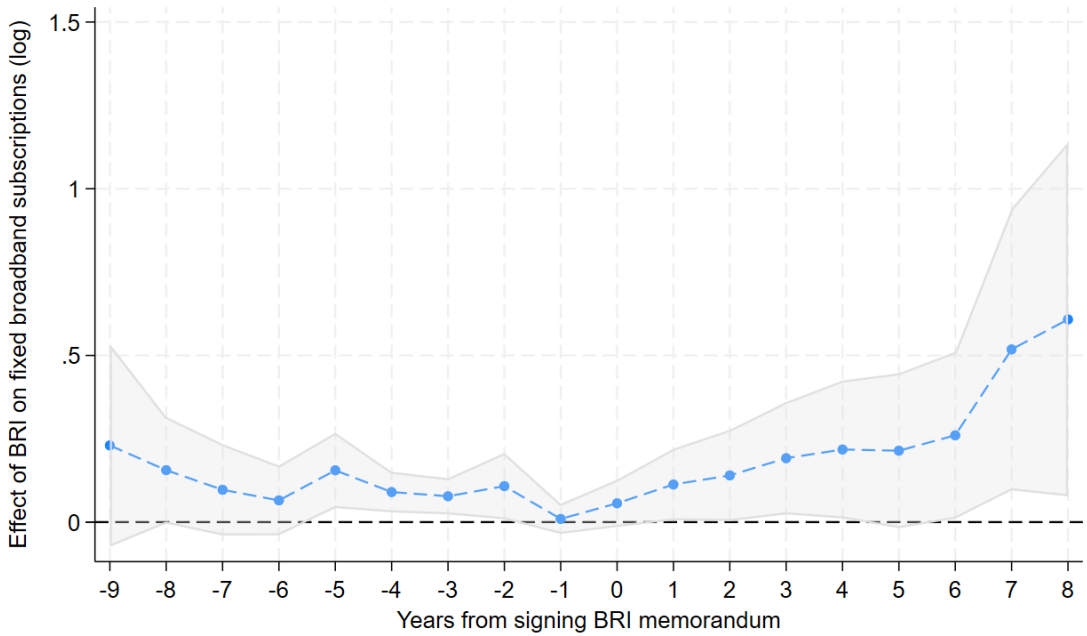
Effect of the BRI on FDI inflows from Japan



- No significant effect of BRI on FDI from Japan using country-year FE
- Japan's FDI may also be promoted by BRI-led host-country specific factors (infrastructure, income, political institutions)

Mechanism: Infrastructure

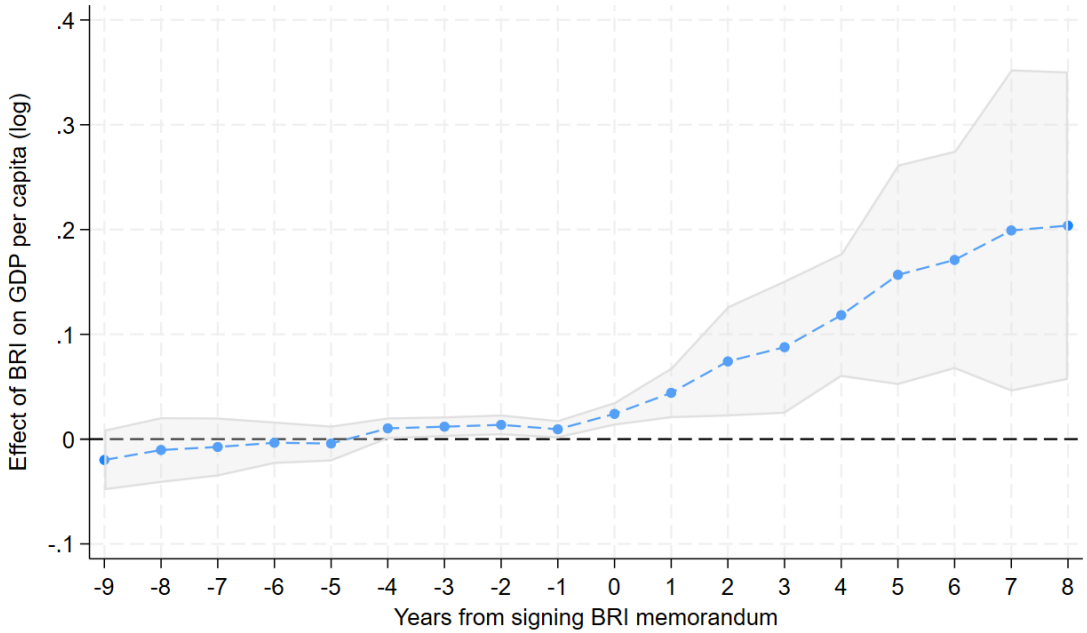
Effect of the BRI on Infrastructure development of partner countries



- Applying the staggered DID event study estimation to country-level data
- Positive effect of BRI on internet usages
  $\Rightarrow$ possible mechanism of the effect of BRI on FDI

Mechanism: Income and productivity

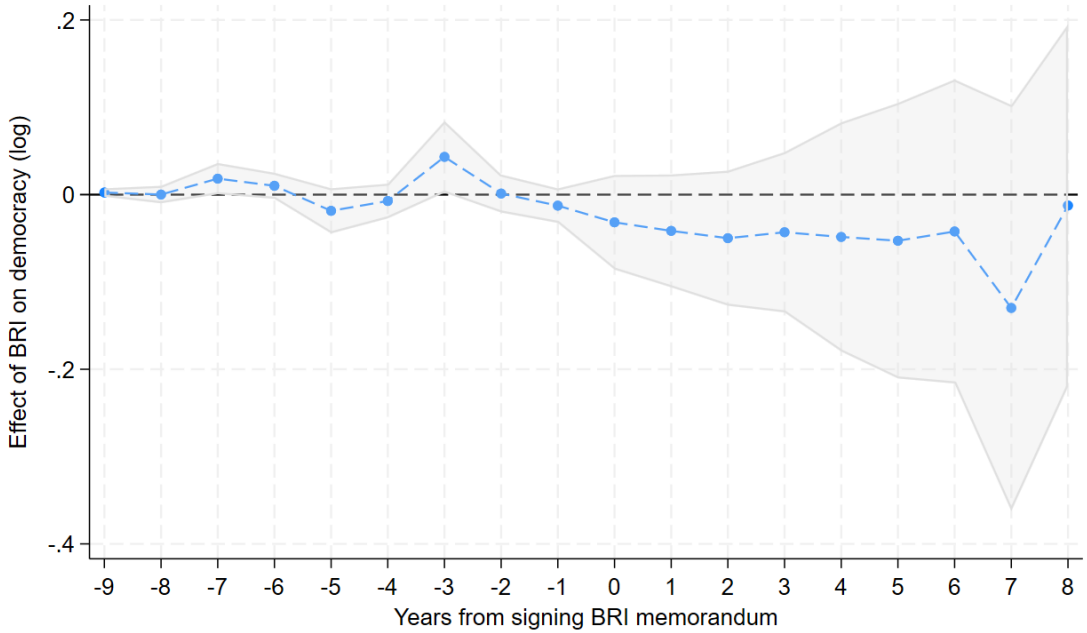
Effect of the BRI on GDP per capita of partner countries



- Large and highly significant positive effect of BRI on GDP per capita
  $\Rightarrow$ possible mechanism of the effect of BRI on FDI

Mechanism: Autocracy

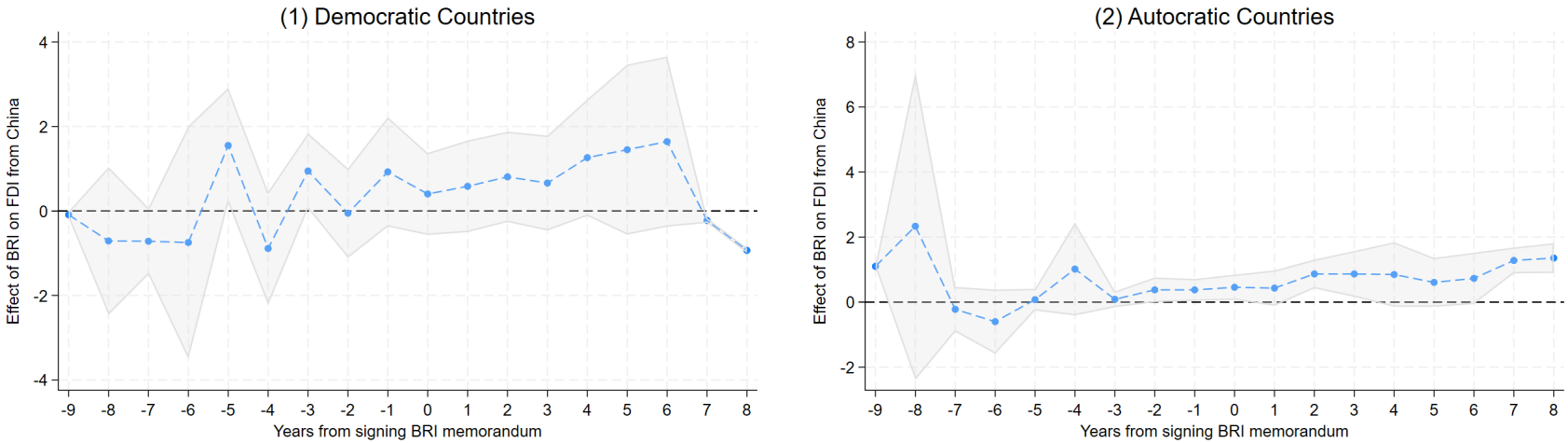
Effect of the BRI on democracy index of partner countries



- No significant effect of BRI on democracy
  $\Rightarrow$ changes in political institutions may not be a mechanism of the effect of BRI

Heterogeneity: Democratic versus autocratic countries

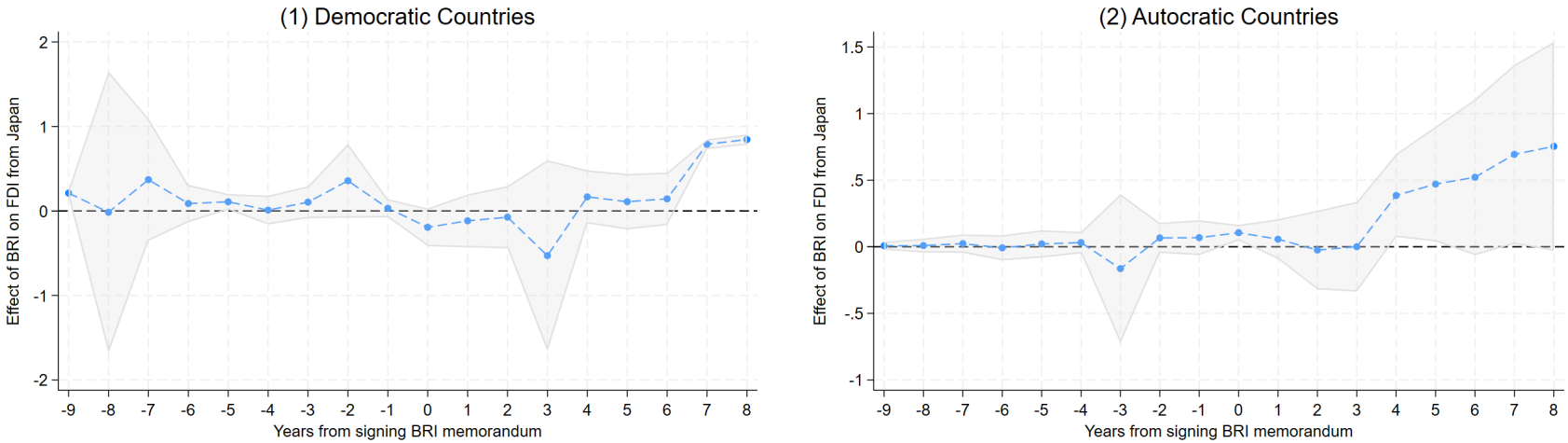
Effect of BRI on FDI from China to:



- More significant effect of BRI on FDI from China to autocratic countries than to democratic countries
- Political synergy enhances the effect of BRI on FDI from China

Heterogeneity: Democratic versus autocratic countries

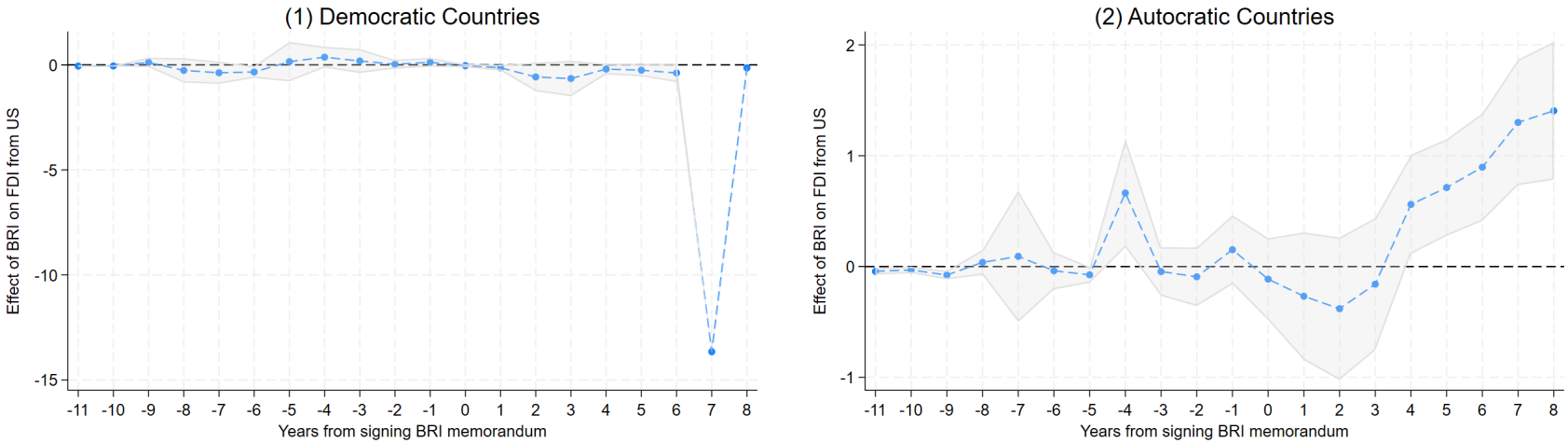
Effect of BRI on FDI from Japan to:



- Larger effect of BRI on FDI from Japan to autocratic countries than to democratic countries
- Possible effect of competition with China

Heterogeneity: Democratic versus autocratic countries

Effect of BRI on FDI from the US to:



- Positive and significant effect of BRI on FDI from the US to autocratic countries while no significant effect on FDI to democratic countries
- Possible effect of competition with China

Conclusions

- Positive effect of BRI on FDI from China
  - Possibly through development of infrastructure, income, and productivity caused by BRI
  - More significant for relatively autocratic countries
    possibly because of political synergy with China
- Positive effect of BRI on FDI from Japan and the US to autocratic countries
  - Also through infrastructure, income, and productivity promoted by BRI
  - Possibly because of political competition with China
- No significant effect of BRI on FDI from India
  - Relatively small amount of FDI from India