The Belt and Road Initiative's impact on Foreign Direct Investment from China and its Competitors*

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Abstract

This paper investigates the impact of the Belt and Road Initiative (BRI) on foreign direct investment (FDI) from both China and other countries, such as the United States, Japan, and India. We apply staggered difference-in-differences (DID) event-study estimations to a gravity model. The inclusion of the indirect effects of the BRI on FDI from countries other that China and the use of the staggered DID event-study model fill a gap in the existing literature. Our results using fixed effects at the country, year, and country-pair levels shows that BRI membership significantly affects FDI from China to the member country, being consistent with results from the existing literature. We also find a weaker positive effect of BRI membership on FDI from Japan using this specification, while finding no significant effect on FDI from the US or India. However, when host country-year and source country-year fixed effects are controlled for, we find no significant effect of the BRI membership on FDI from China, Japan, or any other country. Because the host country-year fixed effects include the effect through infrastructure development, economic growth, changes in political institutions in the host country caused by the BRI, our results indicate that the positive effect of the BRI on FDI from China attributes to these three channels. However, a weaker or insignificant effect on FDI from other countries implies that a positive effect of the BRI through infrastructure development or economic growth is cancelled out by its negative effect through changes in political institutions. In addition, we find that the effect of the BRI on FDI from China, the US, and Japan is positive and significant for autocratic countries but not for democratic countries.

Keywords: Belt and Road Initiative, foreign direct investment, gravity models, staggered DID, event study

JEL Codes: F21, F35, F50

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1 Introduction

In September 2013, China's President Xi Jinping announced the Belt and Road Initiative (BRI), or its literal translation One Belt One Road. Sometimes also referred to as the New Silk Road, the BRI's goal is to develop infrastructure throughout west Asia along the historical trade route. Soon after its announcement, the BRI expanded to include maritime infrastructure across south and southeast Asia. The BRI has since grown to include nearly 150 participating nations across the world (Wang, 2022). Having reached nearly a trillion dollars in lending, the scale of the BRI has transformed the investment landscape of many countries (Parkin and Cornish, 2022; Abi-Habib, 2018).

Because the BRI is supposed to strengthen economic ties between China and participating countries, including trade and foreign direct investment (FDI) between them. Several studies have shown that BRI membership has a positive effect on the level of Chinese FDI to the member country, applying difference-in-differences (DID) estimations to gravity models (Du and Zhang, 2018; Yu et al., 2019). These studies find that overall Chinese FDI, including mergers and acquisitions (M&As), to BRI members increased more significantly than to other developing countries. However, the effect of the BRI is found to be heterogeneous. For example, being targeted as a BRI member is negatively correlated with Chinese investment for advanced economies (Yu et al., 2019).

In addition to FDI from China, the BRI membership may influence FDI from other countries due to changes in infrastructure, politics, and Chinese outward FDI that result from the BRI. For example, BRI-related infrastructure development could encourage FDI inflows regardless of the source country (Donaubauer et al., 2016). On the other hand, BRI membership also signals closer alignment with China, possibly discouraging FDI from certain countries that politically compete with China, such as the United States. Alternatively, the same signals may promote FDI from other countries so that they can obtain higher political presence in the BRI-member country. However, whether or not BRI membership influences FDI from countries other than China has not been studied in the literature.

Another limitation of the current literature (Du and Zhang, 2018; Yu et al., 2019) is that it relies on DID estimations assuming homogeneous timing of the treatment. In other words, these studies assume that all BRI member countries participated in the BRI in a particular period and compare FDI from China between the pre- and post-participation periods. However, in practice, countries participated in the BRI in different time periods, as we will show in detail later. Therefore, estimations assuming homogeneous timing of the treatment may lead to biased results. In addition, the recently growing literature on staggered DID argues that standard DID estimations can be biased when the treatment effect is heterogeneous across treated periods (Sun and Abraham, 2021; Roth et al., 2023; Callaway and Sant'Anna, 2021; Goodman-Bacon, 2021).

This paper makes a novel contribution to the literature by filling these two gaps. First, in addition to looking at the direct effect of the BRI on FDI from China to BRI-member countries, we also estimate

its effect on FDI from the US, Japan, and India that are likely to compete with China in economic and political relationships with the BRI countries. Second, we use an event study model of staggered DID developed by Sun and Abraham (2021) that accounts for heterogeneous effects to more accurately estimate how membership in the BRI affects FDI from China and the three countries over time.

2 Related Literature

The existing literature on the relationship between BRI membership and FDI primarily focuses on the direct effect on outward investment from China using DID estimations. In some cases, BRI membership is shown to come with an increase in Chinese investment. However, in some other cases the reverse is true, highlighting the complex nature of the relationship between international finance and government policy.

Du and Zhang (2018) on the BRI's effect on the number and amount of M&As of firms in BRI countries by Chinese firms demonstrate the subtleties involved. They apply DID estimations to a gravity model, using data for bilateral M&A during the period 2005-2015 where source countries include China six other major countries and defining BRI countries as targets listed by the Chinese government and the treatment period as the announcement of the BRI in 2013. Then, they find a significantly positive effect of the BRI announcement on M&As in BRI countries by Chinese firms. However, their further analysis reveals that the effect of the BRI is quite heterogeneous. For example, the BRI announcement has a positive effect on M&As in all sectors by Chinese private firms but no significant effect on those by Chinese state-owned enterprises (SOEs). Yet, Du and Zhang (2018) find a positive effect of the BRI on M&As in infrastructure-related sectors, such as the energy and power, transportation, telecommunication, and construction sectors, while their positive effect on M&As by private firms mostly stems from those in non-infrastructure sectors. The results are consistent with the standard understanding that SOEs are more likely to pursue national objectives and to play a larger role in infrastructure development.

Yu et al. (2019) also find mixed results in the BRI's effect on Chinese outward FDI. They use data for FDI from only China during the period 2000-2015 and a DID framework defining the treated period as years after 2013 when the BRI was announced. In addition, Yu et al. (2019) define BRI countries in two ways: countries on the target list of the Chinese government as in Du and Zhang (2018) and those that participated in the the first Belt and Road Forum (BRF) in 2017. It is important to note that being on the target list does not demonstrate any willingness to participate in BRI-related projects. They find an insignificant effect of the BRI on Chinese FDI to BRI countries defined as those targeted for the BRI, although its effect on FDI to BRI countries defined as participants in the first BRF is found to be positive and significant. The different results from the different definitions suggest that countries on the target list may not be appropriately defined as BRI countries. In particular, when the sample is divided

according to the income level, Yu et al. (2019) find that the effect of the BRI announcement on FDI to advanced countries on the target list is negative and significant, suggesting that these countries are unwilling to participate in the BRI although they are listed by China. Overall, the comparison between results from the two definitions of BRI countries suggests that studies on the effect of the BRI should be carefully define BRI countries.

Several limitations of the two studies (Du and Zhang, 2018; Yu et al., 2019) are noted. First, both define the treatment period as years after 2013 when President Xi officially announced the BRI and apply DID to data up to 2015. In other words, they simply compare FDI from China between the pre- and post-2013 periods. However, because not all BRI countries participated in the BRI immediately after its announcement, fixing the treatment period in 2013 may lead to biased results from DID. Second, although it seems reasonable to assume that participation in the first BRF used in Yu et al. (2019) signals active interest in participating in the BRI, the BRF's attendees list included the US, Japan, Germany, the UK, and several other countries that have not signed any BRI-related agreement and have implemented trade and FDI policies against China. Provided these limitations in the existing literature, this study define BRI membership of a country and its initial period by signing a memorandum with China to cooperate with the BRI.

While the effect of BRI membership on FDI from countries other than China is not well studied, Asmus et al. (2021) investigates a related question: whether or not India uses finance to compete with China. They use loan data from India's Ministry of External Affairs (MEA), which primarily provides politically-motivated development aid, and from the Export-Import Bank of India (Exim), which engages in more commercially-focused lending. The study's results show that Exim is more likely to provide lending for a project in subnational regions that hosted a Chinese-financed project in the previous year. The effect was less pronounced at the national level. Exim lending was also more likely in countries where public opinion had recently shifted to a relatively more favorable view of China. MEA lending only showed an increase following Chinese projects in India's immediate neighbors. The authors interpret these results as evidence that India is using finance to compete with China in economic influence, but not necessarily for wider geo-political influence. However, politically-motivated lending by India to its immediate neighbors should not be ignored as statistical noise. For example, in 2022, the Sri Lankan government hired Indian companies for a series of energy projects, replacing the previous Chinese developers following pressure from New Delhi over security concerns (Parkin and Cornish, 2022). This anecdote suggests that countries competing with China in international politics and national security may try to promote FDI to BRI countries in order to be dominant over China.

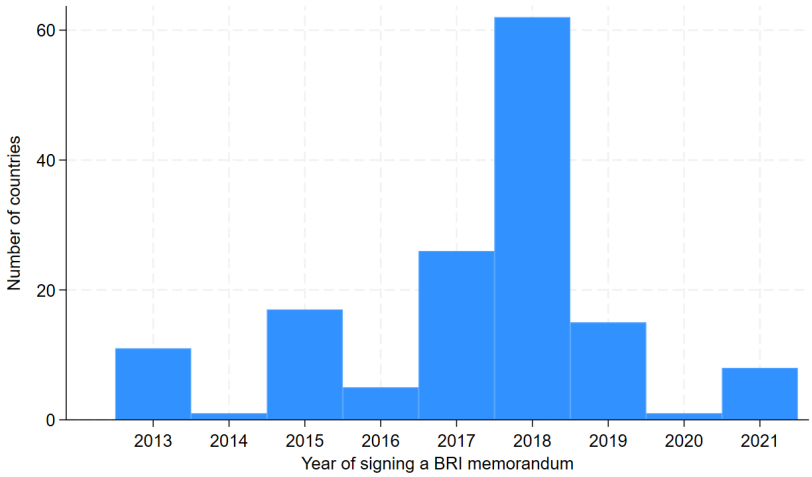
3 Data

We employ bilateral FDI data taken from the International Monetary Fund's Coordinated Direct Investment Survey, which contains data from 2009 to 2021 (Fund, 2023). This dataset is made up of both outward FDI reported by the source country and inward FDI reported by the receiving country. The amount of bilateral FDI from a country to another used in this study is given primarily by outward FDI reported by the source country but by inward FDI reported by the host country in cases where outward FDI is unavailable. All data are denominated in nominal US dollars. We create a balanced panel for the period 2009–2021, although we check the robustness of the results using an unbalanced panel. As a result, the number of country pairs in the benchmark estimation is 8,784, whereas the number of observations for the 13-year period is 114,192.

This paper defines BRI members as nations that have signed a memorandum of understanding (MOU) with China to cooperate with the BRI. For a list of BRI member countries, and which year those countries joined the initiative, we use the Green Finance & Development Center's dataset, which contains join dates for 148 countries, up to 2022 (Wang, 2022).

Figure 1 illustrates the distribution of the year of signing a BRI memorandum. Although 146 countries signed a BRI MOU between 2013 and 2021 in total, years of participation in the BRI substantially vary. This figure highlights the inappropriateness of the single treatment year for participation in the BRI as used in the previous studies (Du and Zhang, 2018; Yu et al., 2019) and the need for an estimation model that accounts for heterogenous treatment periods.

Figure 1: Distribution of years of signing a BRI memorandum.

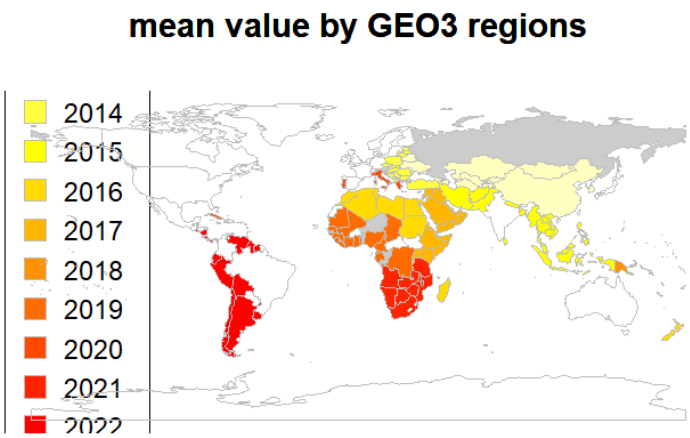


Source: Wang (2022)

In addition, Figure 2 shows the geographic distribution of the BRI countries colored by the year of signing a BRI MOU. This map clearly shows that the timing of the treatment (singing a BRI MOU)

is closely related to the distant from China, emphasizing the importance of controlling for country-pair fixed effects that can control for the effect of distance between countries.

Figure 2: Map of the year of signing a BRI memorandum by country.



Source: Wang (2022)

Table 1 describes the timing of the treatments.

Table 1: Description of Treatments.

Number of cohorts	8
Number of observations	
Never treated	113646
Treated in	
2013	91
2014	13
2015	156
2016	13
2017	91
2018	143
2019	39

Source: Wang (2022). Note: Observations are at the country-pair level.

Table 1 summarizes net FDI flows in the balanced panel. Because the amount of bilateral FDI can be negative when previous investments are withdrawn, the empirical model described in the following section uses the inverse hyperbolic sign of FDI. In 26% of country-pair observations, the host country

has already signed a BRI MOU. In the heterogeneity analysis after the benchmark regressions, we divide host countries into two groups, depending on the level of democracy measured by the average of the core democracy indices of V-Dem Institute (2023). These indices take a value from 0 to 1, a higher value indicating a higher level of democracy. The last row of Table 2 shows summary statistics of the democracy level of the host country.

Table 2: 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: Fund (2023), V-Dem Institute (2023).

4 Empirical Methodology

4.1 Conceptual framework

There are three major channels through which the BRI promotes FDI inflows. First, the main objective of the BRI is to construct transport and ICT (information and communication technology) infrastructure in the host countries in order to strengthen China's economic ties with them (Liu et al., 2020). Such infrastructure development can enhance efficiency of economic activities in the host countries and can facilitate FDI inflows. Through this infrastructure channel, the BRI by China may encourage FDI from countries other than China, if the use of infrastructure developed by China is available to any foreign-owned firm. However, the effect of the BRI through infrastructure is limited if its use is prioritized by Chinese firms. This is likely to be the case for sea ports and ICT facilities.

Second, the BRI may affect FDI from China and other countries through changes in political and information linkages between China and the host countries. Because the BRI agreements strengthen political ties and information flows between China and its partner countries and thus reduces risks of FDI in the partners by Chinese firms, FDI from China in particular is promoted. Kimura and Todo (2010) that examine the effect of foreign aid on FDI find that aid for infrastructure development from Japan increased FDI from Japan to the recipient country but did not necessarily increase FDI from any other country. This result implies that infrastructure development may improve political and economic relationships and information flows between the two countries that are found to be critical to FDI (Mody et al., 2003).

Finally, the strengthened political ties between China and the BRI partners may also affect FDI from

other countries, in particular those that compete with China in economic and political fields. In particular, because the US is currently competing with China over hegemony, the US government may encourage US firms to invest in BRI countries to prevent the over-presence of China. The Japanese government, a close ally of the US, provides Japanese firms subsidies to investment in ASEAN (the Association of Southeast Asian Nations) countries in order to diversify supply chains that largely concentrate in China. India, which is a core country of the Global South and has a territorial conflicts with China, may also have an incentive to minimize China's presence in BRI countries, particularly those geographically and politically close to India, and increase FDI to them. In this study, we specifically examine the effect of the BRI on FDI from the US, Japan, and India for the reasons above.

4.2 Staggered DID event study model

This paper apply a DID event study estimation to a gravity model in order to examine the effect of BRI membership on bilateral FDI from China, the US, Japan, and India. Specifically, we estimate the relative-period effects for each country of interest, using the following specification:

$$\text{arcsinh}(FDI_{ijt}) = \lambda_{ij} + \lambda_t + \sum_{l=-3}^{3} \beta_{cl} D_i^c D_{jt}^l + \epsilon_{ijt}, \tag{1}$$

where $\text{arcsinh}(FDI_{ijt})$ is the inverse hyperbolic sign of FDI from country i to country j in year t (FDI_{ijt}) defined by

$$\text{arcsinh}(FDI_{ijt}) = \ln\left(FDI_{ijt} + \sqrt{1 + FDI_{ijt}^2}\right). \tag{2}$$

λ_{ij} and λ_t are fixed effects at the country-pair and year level, respectively. The country-pair fixed effects account for time-invariant and country-pair specific factors of bilateral FDI, such as geographic barriers and cultural distance, whereas year fixed effects capture unobservable global effects in each year, such as shocks by global booms, recessions, and pandemics. D_i^c is a dummy variable that takes a value of one if source country i is country $c \in$ {China, the US, Japan, India}, whereas D_{jt}^l is equal to one if recipient country j signed a BRI agreement in year $t + l$ where $l \in$ {..., -3, -2, 0, 1, 2, 3, ...} and zero otherwise. The set of relative periods excludes -1, following the standard in the event study literature, and contains lead and lag bins for relative years at a distance smaller than four years from the treatment.

The key coefficient, β_{cl}, indicates the effect of a country's signing a BRI agreement on FDI from country c l years after signing it. To provide a clear understanding of the interpretation of the coefficient, let us differentiate equation 1 with respect to $D_{ijt} \equiv D_i^c D_{jt}^l$, using equation 2 and omitting subscript ijt for simplicity:

$$\beta_{cl} = \frac{d\text{arcsinh}(FDI)}{dD} = \frac{d\text{arcsinh}(FDI)}{dFDI}\frac{dFDI}{dD} = \frac{1}{\sqrt{1 + FDI^2}}\frac{dFDI}{dD}. \tag{3}$$

Rewriting this, we obtain

$$\frac{dFDI/FDI}{dD} = \frac{\sqrt{1+FDI^2}}{FDI}\beta_{cl}. \tag{4}$$

Because FDI_{ijt} in our data is expressed in million US dollars and thus usually substantially larger than one (the mean is 813.7, as shown in Table 2), $\sqrt{1+FDI^2}$ is approximately equal to FDI in most cases. Assuming this, we obtain from equation (4)

$$\frac{dFDI/FDI}{dD} \approx \beta_{cl}. \tag{5}$$

Equation (5) indicates that β_{cl} can be interpreted as the effect of participation in the BRI on the rate of change in FDI inflows from country c l years after the participation.

The recently growing literature on staggered DID finds that standard DID estimations using equations such as (1) that ignore the heterogeneity of the treatment effect across cohorts that are treated in different periods are most likely to be biased (Sun and Abraham, 2021; Roth et al., 2023; Callaway and Sant'Anna, 2021; Goodman-Bacon, 2021). In our study, treatment periods, or years of participation in the BRI, are heterogeneous, as shown in Figure 1. Moreover, the effect of participation in the BRI is likely to be heterogeneous depending on the year of participation. For example, its effect on FDI to earlier participants may be larger than that on FDI to later participants because of strategies of China.

Therefore, we further use the staggered-DID event-study estimator developed by Sun and Abraham (2021) that incorporates heterogeneous treatment effects across treatment periods and is robust to the heterogeneity. In this method, the treatment effect is first estimated for the cohort treated in each period for each relative period before or after the treatment. These coefficients are then aggregated over cohorts as a weighted sum, where the weights are based on the size of each cohort. After normalization, this process creates weights that are non-negative and sum to one, allowing the coefficients to be more interpretable.

Specifically, our staggered DID event study estimations rely on the following equation, based on Sun and Abraham (2021):

$$\text{arcsinh}(FDI_{ijt}) = \lambda_{ij} + \lambda_t + \sum_{e=2013}^{2021}\sum_{l=-3}^{3} \beta_{cel} D_j^e D_i^c D_{jt}^l + \epsilon_{ijt}, \tag{6}$$

where $c = \{China, US, Japan, India\}$, and D_j^e is a dummy variable that indicates the cohort of recipient country j and takes a value of one if country j signs a BRI agreement in year e. In this equation, the effect of the BRI on FDI is represented by β_{cel}. Specifically, β_{cel} indicates the effect of a country's signing a BRI agreement in year e on FDI from country c l years after signing it. After the above model is estimated, the β_{cel} coefficients are aggregated by cohort e and source country c, using the augmented

inverse-probability weighting (AIPW) developed by Callaway and Sant'Anna (2021):

$$\beta_{cl}^{SA} = \sum_{e=2013}^{2021} \omega_e^{SA} \beta_{cel} \tag{7}$$

where w_e^{SA} is the weights for cohort e. The aggregated coefficient β_{cl}^{SA} indicates the effect of participation in the BRI on FDI from country c l years after the participation averaged over different timings of participation.

4.3 Model with country-year fixed effects

In equation (6), we do not include source country-year or host country-year fixed effects that capture time-varying attributes of each of the two countries, including GDP, population, GDP per capita, and policies related to FDI and international trade, and thus are often included in recent gravity models. The primary reason for this is that if we include these fixed effects, particularly host country-year fixed effects, the effect of infrastructure development in the host country which may be due to the BRI is absorbed in the host country-year fixed effects. Because the major source of the effect of the BRI on FDI inflows is infrastructure development (Section 4.1), we drop the country-year fixed effects from the benchmark equation (6).

However, we further employ country-year fixed effects, following the standard gravity models, as follows:

$$\text{arcsinh}(FDI_{ijt}) = \lambda_{ij} + \lambda_{it} + \lambda_{jt} + \sum_{e=2013}^{2021} \sum_{l=-3}^{3} \tilde{\beta}_{cel} D_j^e D_i^c D_{jt}^l + \epsilon_{ijt}. \tag{8}$$

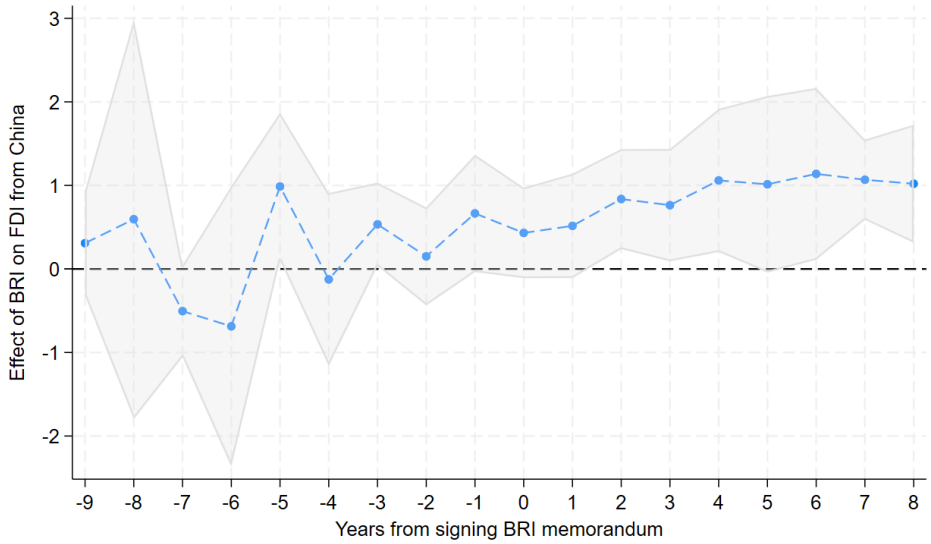
In this equation, because the effect of the BRI on FDI through infrastructure development is captured by λ_{jt}, the coefficient of the treatment, $\tilde{\beta}_{cel}$, indicates the effect of the BRI on FDI from the source to the host country through specifically political and information linkages (Section 4.1).

5 Results

5.1 Benchmark Results

We first examine the effect of the signing a BRI memorandum on FDI inflows from China, applying the staggered DID event study estimation of Callaway and Sant'Anna (2021) to equation (6), i.e., assuming heterogeneity of the effect across cohorts. Figure 3 displays the estimated effect, along with 95% confidence intervals, for each year before and after signing a BRI memorandum. For example, the value on the horizontal axis is two, the point above indicates the estimated effect of the effect of the BRI two years after signing the memorandum averaged over all cohorts whereas the associated shaded areas show its 95% confidence interval.

Figure 3: Effect of the BRI on FDI inflows from China.



The left half of Figure 3 shows that on average, FDI from China to BRI countries before signing a BRI memorandum is not significantly different from Chinese FDI to countries that did not signed any BRI memorandum during the period examined, except for the effect 3 and 5 years before the memorandums that is positive and significant at the 5% level. These results suggest that a parallel trend is mostly satisfied between the treatment and control groups in the pre-treatment period.

By contrast, the right half of Figure 3 illustrates that after signing a BRI memorandum, the average value of FDI from China to BRI countries increased, compared with non-BRI countries. The estimated effect averaged over cohorts is positive and statistically significant at the 5% level two years after signing a BRI memorandum or later, except for the effect five years after the memorandums for which the p value is 6.0%. The size of the coefficient ranges from 0.76 (three years after a memorandum) to 1.13 (six years). As equation (5) indicates, the estimated coefficient is approximately equal to the effect of the BRI participation on the change rate in FDI. Therefore, we conclude that the effect of the BRI on FDI inflows from China is quite large in size and persistent, because it indicates that FDI from China to a country increases by 76-113% after signing a BRI memorandum and remains high for a long period of time.

In Figure 3, we also see that the confidence intervals increase with negative/positive time length from joining the BRI. This is likely because for more distant treatment effects, there are fewer treated observations in the given time period. For example, because our data is from 2009 to 2021, the treatment effect eight years after the treatment is based on only one cohort that signed a BRI memorandum in 2013. This pattern of the increasing confidence intervals is also present in the following analyses. Therefore, we mostly focus on the pre-treatment effect not long before the treatment and the treatment effect not long after the treatment.

The estimated effect of the BRI on FDI from the US, Japan, and India is shown in Figures 4-6. Figures 4 and 6 show that FDI from the US or India is not affected by the host country's participation in the BRI. In contrast, according to Figure 5, the participation in the BRI increased FDI from Japan four years after the participation and later. The average effect is significant at the 5% level, except for the effect six years later for which the p value is 0.054. Further, the effect increases over time after the participation from 0.28 four years later to 0.76 eight years later, although we should be cautious when we interpret the effect long after the treatment, as we mentioned earlier.

Figure 4: Effect of the BRI on FDI from the US.

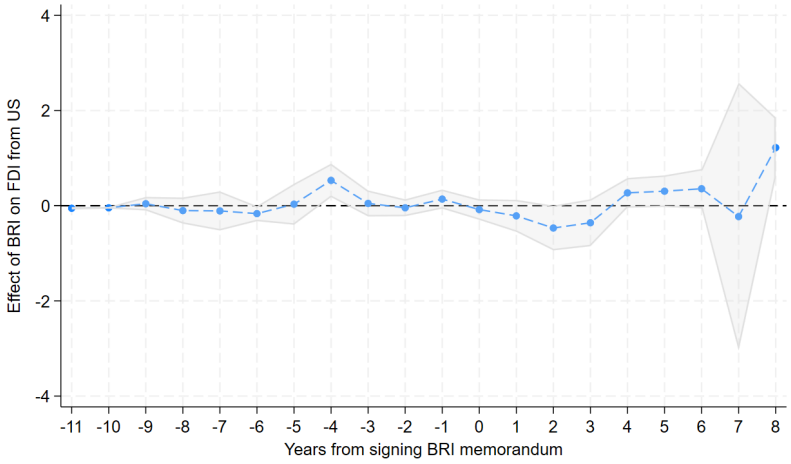
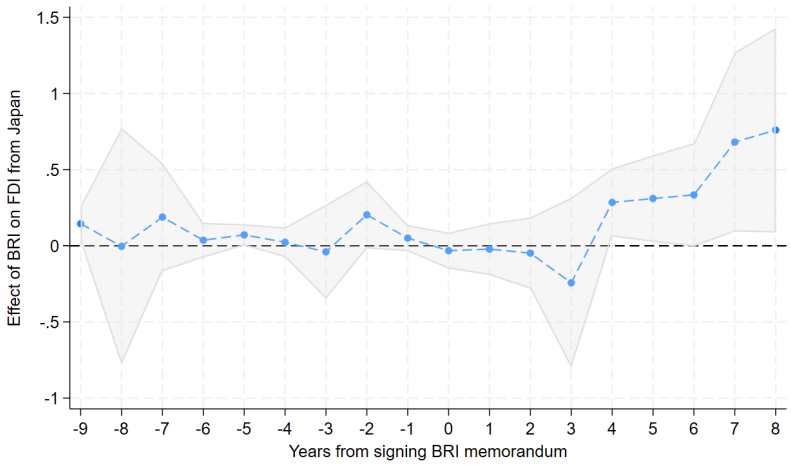


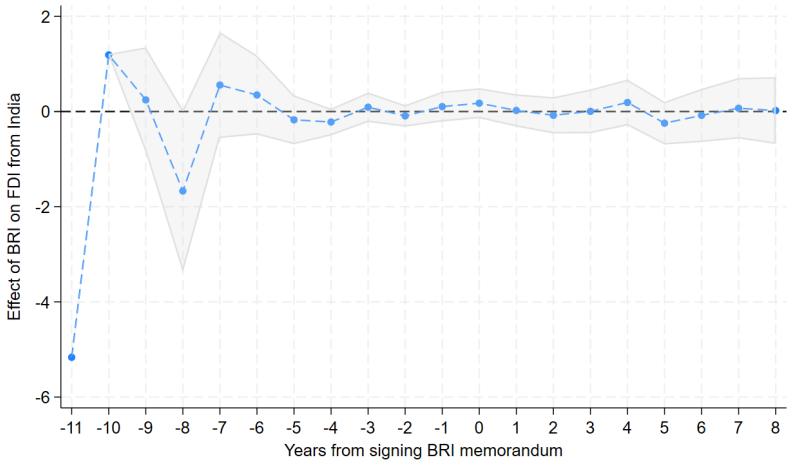
Figure 5: Effect of the BRI on FDI from Japan.



5.2 Results using country-year fixed effects

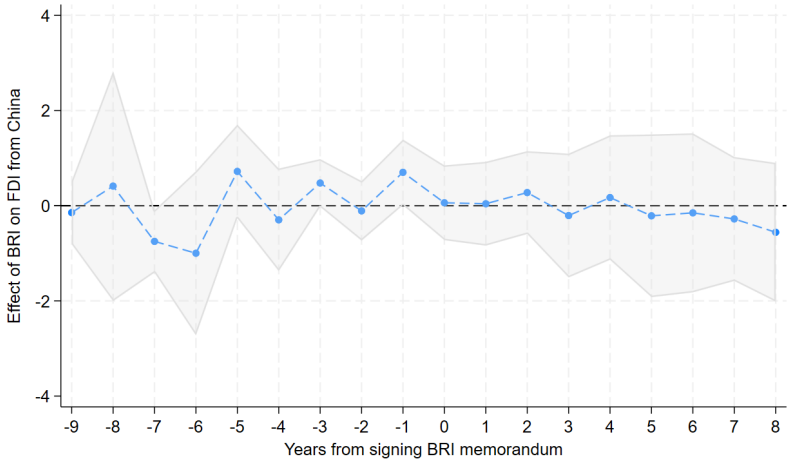
Next, we incorporate source country-year and host country-year fixed effects into the empirical model and estimate equation (8), rather than (6) as in the benchmark estimations in the previous subsection.

Figure 6: Effect of the BRI on FDI from India.



The results shown in Figure 7 indicate that signing a BRI MOU has no significant effect on FDI from China in any year after the MOU.

Figure 7: Effect of the BRI on FDI inflows from China Using Country-Year Fixed Effects.

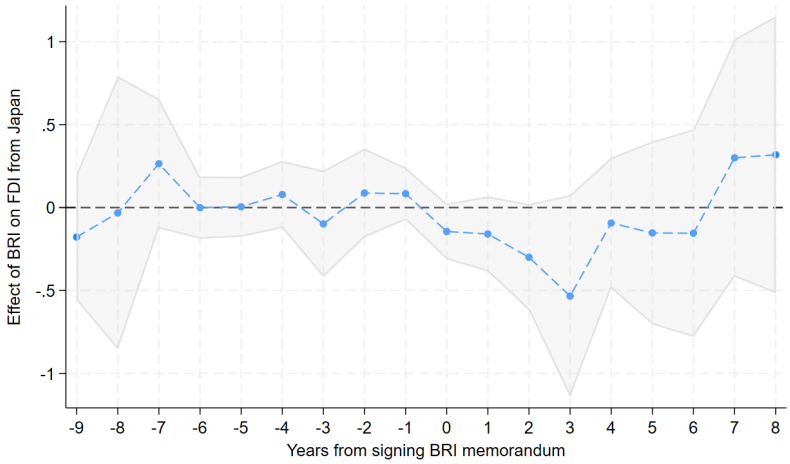


Using this specification, we find no significant effect of the BRI on FDI from other countries than China, i.e., the US, Japan, or India. Figure 8 shows the results for FDI from Japan, whereas those for FDI from the US or India are omitted because of simplicity of the results.

The stark difference between the results using country-pair and year fixed effects (Figure 3) and country-pair and country-year fixed effects (Figure 7) suggest that the effect of the BRI on FDI from China observed in Figure 3 mostly stems from unobservable factors at the host country-year level that are correlated with the country's participation in the BRI. There are several possible factors.

First, the amount of infrastructure developed by the BRI (Liu et al., 2020) is not observed in equation 6 but included in the host country-year fixed effects in equation 8. Therefore, development of transport

Figure 8: Effect of the BRI on FDI from Japan Using Country-Year Fixed Effects.



and ICT infrastructure by the BRI that improves the efficiency of production activities and logistics is likely to be a source of the effect of BRI on FDI from China.

Second, in addition to infrastructure development, joining the BRI may activate economic activities of the partner country and increase its GDP and income level. This may also be a source of the effect of the BRI on FDI from China in Figure 3

Finally, another possible factor is changes in political institutions in the host country. China is one of the most autocratic countries in the world: based on the average of the seven core indices of the democracy level of V-Dem, China is the worst seven among 179 countries. Therefore, a country's close tie with China through the BRI may affect political institutions of the partner country, which would further affect FDI from China.

All of the three channels should increase FDI from China to the host country. However, when host country-year fixed effects are included in the model, their effect is absorbed in the fixed effects, although models without host country-year fixed effects should yield a positive effect of the BRI on FDI from China. Therefore, we interpret the difference between the results from the two models (Figures 3 and 7) as suggesting that there are several host country-specific reasons for why the BRI attracts FDI from China.

Among the three channels, if the first two, infrastructure development or economic growth in the host country due to the BRI, has a positive effect on FDI inflows to the country, it should have increased FDI inflows not only from China but also from other countries. Then, without using host country-year fixed effects, we should have observed a positive and significant effect of the BRI on FDI from other countries. However, the effect of the BRI on FDI from Japan is positive and significant but weaker than that on FDI from China (Figure 5, and FDI from the US or India is not affected by the BRI (Figures 4 and 6).

The weak or insignificant effect of the BRI on FDI from other countries than China is that the third

channel, i.e., the change in the political institutions of the host country because of the BRI may have a negative effect on FDI from other countries, particularly the US and India which concerns political links with countries. In other words, although infrastructure development by the BRI may attract FDI from the US, political connections between the host country and China strengthened by the BRI may discourage it, resulting in smaller or no total effect.

5.3 Heterogeneity across the level of democracy

The previous subsection suggests the importance of political institutions of the host country affected by the BRI to its effect on FDI. Therefore, in this subsection, we examine the possible heterogeneity of the effect of the BRI across the initial levels of democracy. Specifically, we divide the sample into two subsamples, one consisting of countries with the average democracy level or higher in 2009 and the other consisting of other countries and conduct the same staggered DID even study analysis using equation 6.

The results for FDI from China, the US, and Japan are shown in Figures 9, 10, and 11, respectively, while the result for FDI from India that did not show any significant effect is omitted for simplicity. In each figure, panel (1) indicates the effect on FDI to democratic countries, whereas panel (2) is for autocratic countries.

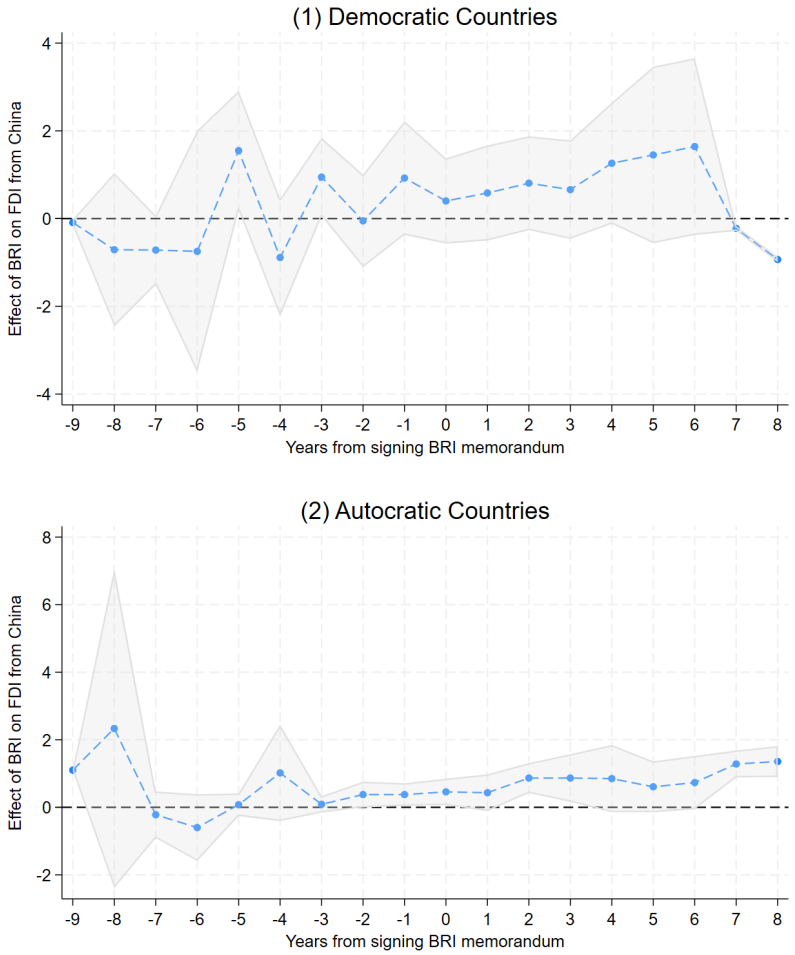
Figure 9 clearly shows that while the BRI increased FDI from China to autocratic countries (panel (2)), it did not have any significant effect on democratic country (panel (1)). This result implies that among the three channels of the effect of the BRI on FDI mentioned earlier, the first two, infrastructure development and economic growth, may attract FDI even from democratic countries, while the last channel, changes in political institutions, may discourage FDI from such countries. As a result, the total effect on FDI from democratic countries excluding host country-year fixed effects, i.e., these effects are included in the coefficient of the BRI dummy, becomes insignificant.

Focusing on FDI from the US and Japan, we find that the effect of the BRI on FDI from the two to democratic countries is insignificant, while that to autocratic countries is positive and significant in some cases. These results imply that FDI from the US and Japan is concerned about changes in political institution due to the BRI in initially democratic countries, while it is not so for initially autocratic countries. This is further possibly because the two countries are competing with China in political, economic, and technology fields and thus are concerned about connecting with autocratic developing countries more than promoting democracy in these countries.

6 Discussion and Conclusion

This paper investigates the impact of the Belt and Road Initiative (BRI) on foreign direct investment (FDI) from both China and other countries, such as the United States, Japan, and India. We apply

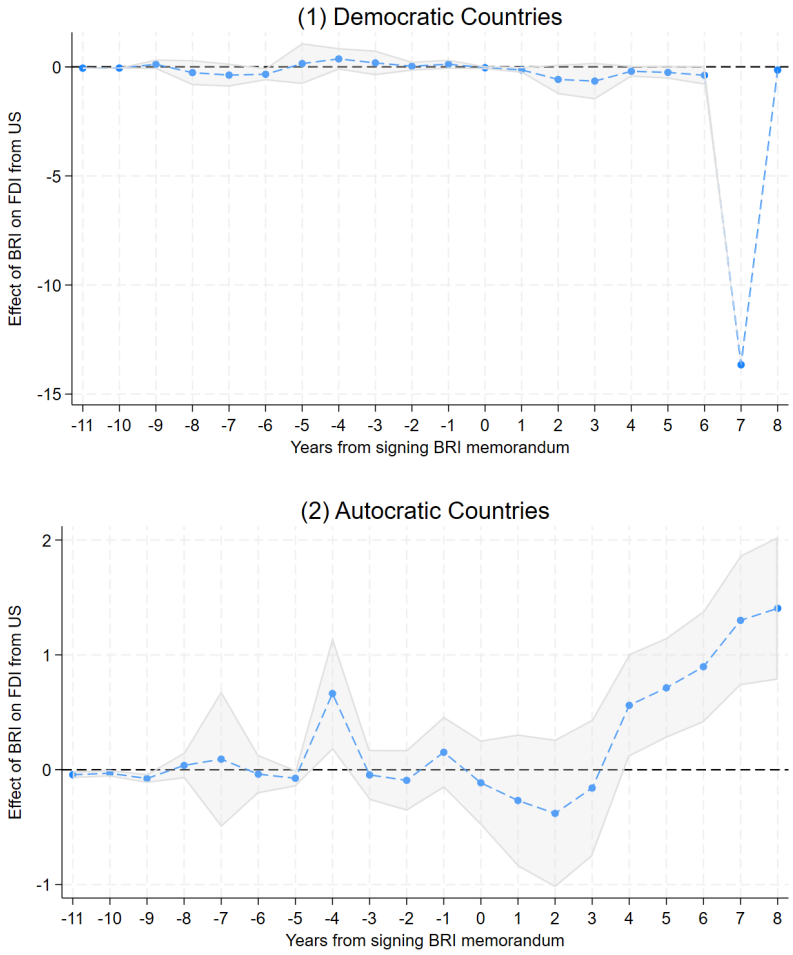
Figure 9: Effect of the BRI on FDI from China.



Note: Democratic countries are defined by countries with the average democracy score (0-1) of B-Dem of 0.5 or higher in 2009.

staggered difference-in-differences (DID) event-study estimations to a gravity model. The inclusion of the indirect effects of the BRI on FDI from countries other that China and the use of the staggered DID event-study model fill a gap in the existing literature. Our results using fixed effects at the country, year, and country-pair levels shows that BRI membership significantly affects FDI from China to the member country, being consistent with results from the existing literature. We also find a weaker positive effect of BRI membership on FDI from Japan using this specification, while finding no significant effect on FDI from the US or India. However, when host country-year and source country-year fixed effects are controlled for, we find no significant effect of the BRI membership on FDI from China, Japan, or any other country. Because the host country-year fixed effects include the effect through infrastructure development, economic growth, changes in political institutions in the host country caused by the BRI, our results indicate that the positive effect of the BRI on FDI from China attributes to these three channels. However, a weaker or insignificant effect on FDI from other countries implies that a positive

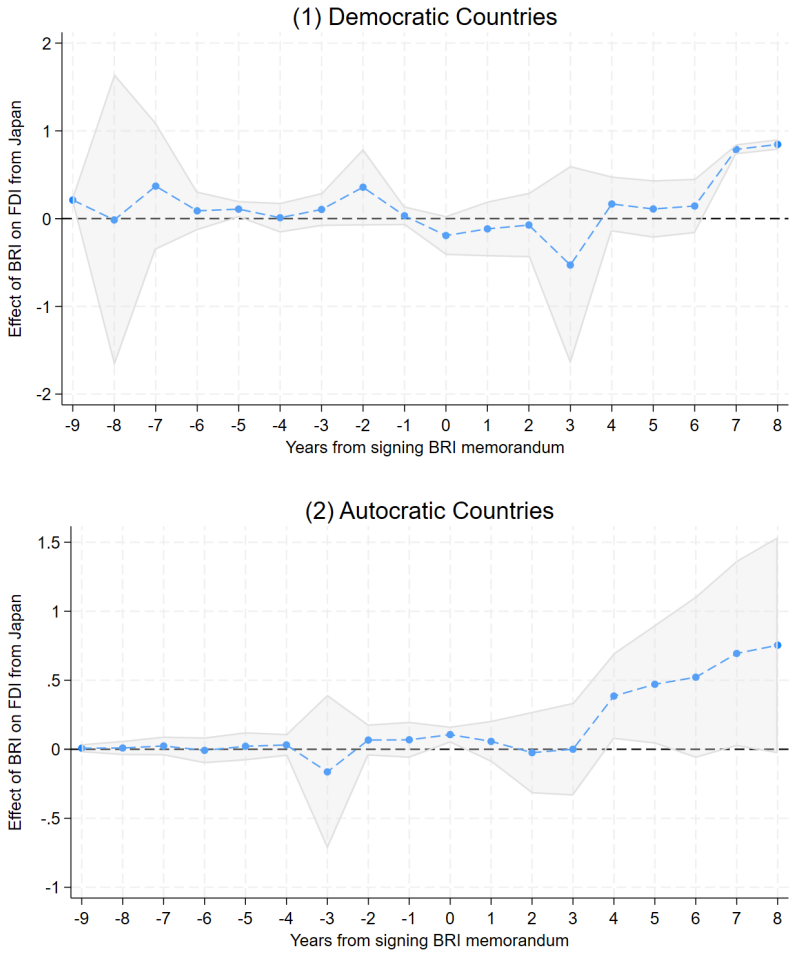
Figure 10: Effect of the BRI on FDI from the US.



Note: Democratic countries are defined by countries with the average democracy score (0-1) of B-Dem of 0.5 or higher in 2009.

effect of the BRI through infrastructure development or economic growth is cancelled out by its negative effect through changes in political institutions. In addition, we find that the effect of the BRI on FDI from China, the US, and Japan is positive and significant for autocratic countries but not for democratic countries.

Figure 11: Effect of the BRI on FDI from Japan.



Note: Democratic countries are defined by countries with the average democracy score (0-1) of B-Dem of 0.5 or higher in 2009.

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