The Impact of the Belt and Road Initiative on Foreign Direct Investment from China, the United States, and Other Major Investor Countries*

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Abstract

This paper investigates the impact of the Belt and Road Initiative (BRI) on foreign direct investment (FDI) from China and other major source countries, such as the United States, France, and Japan, applying staggered difference-in-differences (DID) event-study estimations to a gravity model. In addition to estimations using country-pair fixed effects, we estimate models with source and host country-year fixed effects to control for the effect through changes in any host-country attribute due to the BRI, such as infrastructure, and highlight the effect through changes in bilateral relationships. We find that FDI from China, Hong Kong, the US, Switzerland, Japan, and France to BRI countries increased in the post-BRI period, while FDI from the UK, the Netherlands, and Luxembourg decreased. After controlling for country-year fixed effects, there remain the post-BRI upward trend in FDI from the US, Switzerland, and France and the downward trend in FDI from the UK, the Netherlands, and Luxembourg. These findings suggest that FDI from non-China countries to BRI countries can be affected by their bilateral relationships. For example, the US may invest more in BRI countries to strategically compete with China there.

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 2013, China initiated a new framework to promote regional economic development called the Belt and Road Initiative (BRI). The BRI initially aimed to develop transport infrastructure from China through West Asia to Europe, while it soon expanded to South and Southeast Asia, Africa, and the rest of the world and became engaged in development of other types of infrastructure, for example, that for information and communication technology (ICT), energy, and mining (Huang, 2016). For example, in 2013, or the initial year of the BRI, the share of energy projects in the total BRI engagement was 52%, whereas the share of transport projects was 17%. In 2023, the share of energy projects declined to 31%, and the share of transport projects was 16%. By 2023, 150 countries had signed memorandums of understanding (MOUs) for the BRI, and the cumulative engagement for BRI-related investments exceeded 1 trillion US dollars (Nedopil, 2024). The BRI countries include most of low- and middle-income countries, except for several such as India, Bhutan, Brazil, and Mexico, and some developed countries of which most are East European countries, except for Portugal. Other developed countries, such as The United States, most West European countries, Japan, and Australia, have not signed an MOU for the BRI.

Although development of energy and transport infrastructure is its crucial element, the BRI is also supposed to strengthen economic ties between China and participating countries, including trade and foreign direct investment (FDI) (Nugent and Lu, 2021; Nedopil, 2024). Several studies have indeed shown that participating in the BRI has a positive effect on the level of Chinese FDI to the partner country, applying difference-in-differences (DID) estimations to gravity models (Du and Zhang, 2018; Kang et al., 2018; Yu et al., 2019; Shao, 2020; Nugent and Lu, 2021). These studies find that Chinese FDI to BRI countries increased more significantly than to other developing countries. However, the effect of the BRI is found to be heterogeneous. For example, participating in the BRI is negatively correlated with Chinese investment for advanced economies (Yu et al., 2019).

In addition to FDI from China, the BRI may influence FDI from other countries due to changes in characteristics of the host country and bilateral relationships between the host and source countries. For example, infrastructure development due to the BRI could encourage FDI inflows regardless of the source country (Donaubauer et al., 2016). Productivity growth in the host country due to BRI projects may also attract FDI from any country (Carr et al., 2001). In addition, participation in the BRI signals closer political alignment with China, because China intends to assert greater international influence through the BRI (Huang, 2016). Therefore, bilateral relationships between BRI countries and non-China source countries may change and affect FDI, particularly when the source countries compete or, conversely, cooperate with China. However, whether or not participation in the BRI influences FDI from countries other than China has not been studied in the literature. Moreover, the existing literature does not fully examine the mechanisms behind the effect of the BRI, particularly failing to distinguish between

effects through changes in host-country characteristics, such as infrastructure, and changes in bilateral relationships due to strategic competition and investment cooperation with China.

Further, the current literature relies on DID estimations assuming single timing of the treatment. For example, Du and Zhang (2018), Kang et al. (2018), Yu et al. (2019), and (Nugent and Lu, 2021) assume that all countries that have signed an MOU for the BRI participated in the BRI in 2013 when President Xi Jinping first announced the BRI. 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 gaps. First, in addition to looking at the effect of the BRI on FDI from China to BRI countries, we also estimate its effect on FDI from major source countries of FDI, such as the United State (US), the United Kingdom (UK), France, Germany, and Japan, some of which compete with China in economic and political relationships with BRI countries while others are more cooperative to China. Second, we distinguish between the BRI effect through changes in host-country characteristics and bilateral relationships by comparing results from estimations with and without country-year fixed effects. The effect estimated in the specifications using country-year fixed effects that control for any host-country attribute, such as the level of infrastructure and productivity, can be interpreted as the effect through changes in bilateral relationships. Finally, 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.

To preview the results, we find that FDI from China, Hong Kong, the US, Switzerland, Japan, and France to BRI countries increased in the post-BRI period, while FDI from the UK, the Netherlands, and Luxembourg decreased. After controlling for host country-year fixed effects, there remain the post-BRI upward trend in FDI from the US, Switzerland, and France and the downward trend in FDI from the UK, the Netherlands, and Luxembourg while the positive effect on FDI from Japan disappears. These findings suggest that changes in bilateral relationships are an important determinant of FDI to BRI countries. We presume that the US invests more in BRI countries to strategically compete with China, whereas French and Swiss firms cooperate with Chinese firms in investment projects in BRI countries supported by policies. In contrast, the UK possibly reduced FDI to BRI countries to mitigate risks of supply chains with BRI countries strongly linked with China. FDI from Japan to BRI countries is most likely to be affected by host-country characteristics, rather than bilateral relationships.

2 Related Literature

The existing literature on the relationship between BRI and FDI involves ex-ante and ex-post evaluations. For an ex-ante evaluation, World Bank (2019) and Chen and Lin (2020) quantified the potential impact of BRI on participating countries' ability to attract FDI. For example, World Bank (2019) estimated that the proposed BRI transport network is expected to lead to a 5 percent increase in total FDI inflows to BRI countries. By regions, the potential FDI-promotion effect of the proposed BRI transport network is the largest for BRI countries in Sub-Saharan Africa (7.5%), followed by Central Asia (%), East Asia and Pacific (6.3%), South Asia (5.2%), Europe (3.7%), and Middle East and North Africa (3.4%). By income group, the potential FDI-promotion effects are 7.6 percent for low income, 6 percent for lower middle income, 5 percent for upper middle income, and 3.8 percent for high income BRI countries, respectively.

The ex-post analyses, more relevant to this paper, primarily focuses on the direct effect on outward FDI from China using DID estimations. Overall, prior evidence suggests that the BRI membership promotes Chinese outward FDI inflows to its member country. However, BRI's FDI-promotion effects are substantially heterogeneous in terms of firm, sector, and host-country characteristics, and also the results are inconclusive among studies.

Du and Zhang (2018) adopted a gravity model with a three-dimensional panel data covering 7 source countries (Australia, Canada, China, Japan, Singapore, UK, and US) and 127 host countries from 2011-2015. In their study, host countries listed on the BRI plan are defined as treatment group, whereas the period after the announcement of the BRI in 2013 is set to the post-treatment period. They find that BRI countries received a larger Chinese merger and acquisition investment as a result of the BRI announcement than non-BRI countries, relative to the other source countries. They also find that the BRI's FDI-promotion effects are more strongly associated with the continental silk-road countries and non-state owned enterprises.

Analyzing a panel data covering 216 host countries and regions from 2010-2015, Kang et al. (2018) find that the BRI increased Chinese FDI outflows to BRI countries, mainly driven by the maritime silk-road countries unlike Du and Zhang (2018). However, the matching-DID estimation provides no evidence on the BRI's FDI-promotion effects, casting doubts on the infrastructure-led and institution-based strategy of the BRI.

Analyzing a panel data covering 132 host countries from 2000-2015, Yu et al. (2019) find evidence on the BRI's FDI-promotion effects for 57 countries participated in Belt and Road Forum in 2017 but not for 65 countries listed in the BRI blueprint. They argue that the results might reflect the significance of host-country's willingness to participate in the BRI. Shao (2020) analyzed 1139 outward FDI transactions by Chinese firms across 84 host countries from 2005-2017, finding evidence on the BRI's FDI-promotion effects, which are stronger for low-risk countries than for high-risk countries.

Nugent and Lu (2021) applied a triple DID to a three-dimensional panel data covering 35 sectors across

152 host countries form 2009-2018. After controlling for country-sector, country-year, and sector-year fixed effects, they find that the BRI decreased Chinese FDI outflows to its member countries. However, Chinese FDI outflows to both overcapacity- and pollution-related sectors significantly increased as a result of the BRI, suggesting that Chinese firms have been motivated to place FDI investments in BRI countries for the sake of alleviating China's own overcapacity and pollution problems. However, unlike this study, Nugent and Lu (2021) used only country-pair and year fixed effects and did not incorporate source and host country-year fixed effects which enable us to examine mechanism of the BRI effect.

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 (International Monetary 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. 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.

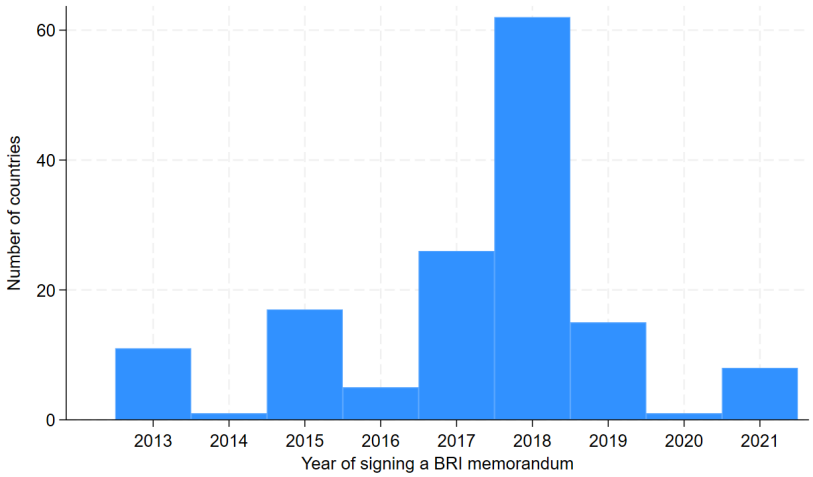
This paper defines BRI members as nations that have signed a memorandum of understanding (MOU) with China to cooperate with the BRI. For a list of BRI member countries, and which year those countries joined the initiative, we use the Green Finance & Development Center's dataset, which contains join dates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

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.

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. Summary statistics for variables at the country level to control for source and

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



Source: Nedopil Wang (2022).

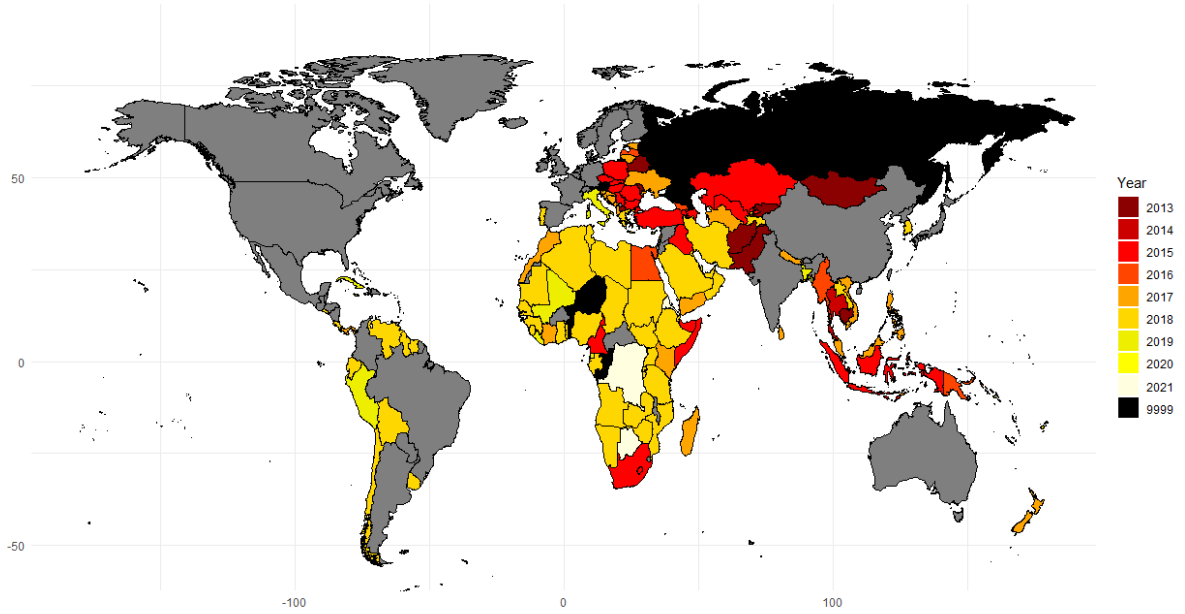
host country-year attributes, as explained in detail later, are provided in Figure 1. In the heterogeneity analysis after the benchmark regressions, we divide host countries into two groups, depending on the level of democracy measured by the average of the core democracy indices of V-Dem Institute (2023). These indices take a value from 0 to 1, a higher value indicating a higher level of democracy. The last row of Table 1 shows summary statistics of the democracy level of the host country.

Table 1: Summary Statistics

	N	Mean	S.D.	Min	Max
Bilateral FDI (million $)	114,192	3,423	30,270	-31,892	1.550e+06
Inverse hyperbolic sine of FDI	114,192	2.461	3.609	-11.06	14.95
Dummy for host country's participation in BRI	114,192	0.264	0.441	0	1
Nominal GDP (billion $)	2,357	426.2	1,717	0.0281	23,315
– in logs	2,357	24.32	2.349	17.15	30.78
Real GDP per capita (PPP, thousand $)	2,357	24.86	25.67	0.861	173.9
– in logs	2,357	9.551	1.162	6.758	12.07
Number of Broadband subscribers	2,357	12.87	13.57	0.000399	77.12
– in logs	2,357	1.204	2.376	-7.825	4.345
Rail lines (km)	884	11.61	25.22	0.230	194.4
– in logs	884	8.220	1.422	5.439	12.18
Index of corruption	2,357	0.0184	0.982	-1.798	2.435
Index of rule of law	2,357	0.0264	0.957	-2.406	2.125
Index of democracy	2,077	0.438	0.237	0.0494	0.863

Source: International Monetary Fund (2023), Nedopil Wang (2022), World Bank (2024), V-Dem Institute (2023).

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



Source: Nedopil Wang (2022). Notes: 9999 indicates that the year of signing a BRI memorandum is not available for the country. Countries in gray have not signed a BRI memorandum.

4 Empirical Methodology

4.1 Conceptual framework

There are several possible 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 (Cheng and Kwan, 2000; Khadaroo and Seetanah, 2010). 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.

Second, such infrastructure development may further promote economic growth, as evidenced for railroads (Donaldson, 2018), ICT infrastructure (Czernich et al., 2011), and transport infrastructure particularly in BRI partner countries (Wang et al., 2020). In addition to infrastructure development, the BRI is often associated with technology transfer to partner countries (Qi et al., 2019; Chen, 2024). Because thick literature on determinants of FDI has found that the market size and productivity of the host country is an important factor of FDI inflows (Carr et al., 2001; Faeth, 2009; Markusen and Venables, 1998), the BRI is likely to increase FDI inflows from China as well as others to BRI partner countries through an increase in market size and productivity.

In addition to these channels through changes in the host country-specific characteristics, the BRI may affect FDI through changes in bilateral relationships between the source and host countries. There are several sources of these changes. First, as China has become a economic and technology superpower and strengthened economic and political ties with other countries through the BRI and other measures, the US-China rivalry has been fueled (Li, 2021; Banerjee and Dutta, 2023). Accordingly, the US have implemented several policy measures to compete with China and promote infrastructure development in low and middle-income countries, particularly in BRI countries, including the Blue Dot Network (BDN) and the Better Utilization of Investment Leading to Development (BUILD) initiatives. Further, together with other G7 countries (Canada, France, Germany, Italy, Japan and the UK), the US started the Build Back Better World (B3W) initiative in 2021, which tries to mobilize the private sector to invest in infrastructure (Savoy and McKeown, 2022). This strategic competition with China may promote FDI from the US and other G7 countries to BRI countries.

Second, source countries of FDI are not necessarily compete with China but often cooperate with China. Notably, by 2019, 19 countries, including Italy, France, Japan, the Netherlands, Switzerland, and the UK (but not the US), had signed MOUs with China for third-party market cooperation, i.e., cooperation in investment in third countries (Zhang, 2019; Xu, 2022; Yun et al., 2024). In addition, private firms outside China have signed MOUs with Chinese firms for joint investment in third countries. For example, CGN (China General Nuclear Power Group) Europe Energy signed an MOU with EDF Energies Nouvelles and InnoSun of France for clean-energy investment in Africa. In line with the MOU between Japan and China, Itochu Corporation of Japan, CITIC of China, and Chia Tai Group of Thailand jointly engage in a high-speed railway project in Thailand (Zhang, 2019). These agreements between China and these countries may promote FDI from the non-China countries to BRI countries.

Finally, although these channels above promote FDI to BRI countries, there can be an adverse effect of the BRI. It is now well-known that global supply chains are vulnerable to foreign economic shocks that may arise due to natural disasters and geopolitical issues (Alfaro and Chor, 2023; Inoue and Todo, 2023). Therefore, many countries are now implementing policies for onshoring (relocation of production facilities to the domestic economy) and friendshoring (to like-minded countries), including the CHIPS and Science Act of the US, the European CHIPS Act of the European Union, and the Economic Security Promotion Act of Japan, reducing trade and investment with non-like-minded countries to minimize risks of disruptions of supply chains with these countries (Todo and Inoue, 2021). The private efforts to mitigate the risks should have a negative impact on FDI from countries that strategically compete with China to BRI countries. Therefore, the effect of the BRI on FDI from the US and other Western countries through changes in their relationships with BRI countries can be positive or negative, depending on the importance of each of these three channels.

4.2 Empirical model

This paper starts from applying a simple DID model to a gravity model of FDI in order to examine the effect of BRI membership on bilateral FDI from China, the US, Japan, and other major investor countries. Specifically, we estimate effect of participating in the BRI on FDI from various countries, using the following specification:

$$\text{arcsinh}(FDI_{ijt}) = \lambda_{ij} + \lambda_t + \sum_c \beta_c D_i^c D_{jt} + \epsilon_{ijt}, \tag{1}$$

where $\text{arcsinh}(FDI_{ijt})$ is the inverse hyperbolic sine 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, cultural, and linguistic distance and historical relationships between the two countries, 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, US, Japan, ...}, whereas D_{jt} is equal to one if host country j is a partner country of the BRI in year t.

The key coefficient, β_c, indicates the effect of a country's participating in the BRI on FDI from country c. To provide a clear understanding of the interpretation of the coefficient, let us differentiate equation (1) with respect to $D_{ijt} \equiv D_i^c D_{jt}$, using equation (2) and omitting subscript ijt for simplicity:

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

Rewriting equation 3, we obtain

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

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 **??**), $\sqrt{1 + FDI^2}$ is approximately equal to FDI in most cases. Assuming this, we obtain from equation (4):

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

Equation (5) indicates that β_c can be interpreted as the effect of participation in the BRI on the rate of change in FDI inflows from country c.

We now expands the simple DID model to a DID event study estimation to estimate the dynamics of the effect on FDI from various countries, using the following specification:

$$\text{arcsinh}(FDI_{ijt}) = \lambda_{ij} + \lambda_t + \sum_c \sum_l \beta_{cl} D_i^c D_{jt}^l + \epsilon_{ijt}, \tag{6}$$

where D_{jt}^l is equal to one if recipient country j participates in the BRI in year t and the current year is $t + l$ where $l \in$ {..., -3, -2, 0, 1, 2, 3, ...} and zero otherwise. The set for l excludes -1, meaning that we use one year before the participation as the reference period. Coefficient β_{cl} indicates the effect of a host country's participating in the BRI on FDI from country c l years after the participation.

The recently growing literature on staggered DID finds that standard DID estimations using equations such as (6) that ignore the heterogeneity of the treatment effect across cohorts that are treated in different periods are most likely to be biased (Callaway and Sant'Anna, 2021; Goodman-Bacon, 2021; Roth et al., 2023; Sun and Abraham, 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 share of each cohort, 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):

$$\text{arcsinh}(FDI_{ijt}) = \lambda_{ij} + \lambda_t + \sum_c \sum_{e=2013}^{2021} \sum_l \beta_{cel} D_j^e D_i^c D_{jt}^l + \epsilon_{ijt}, \tag{7}$$

where c is a set of source countries of FDI, such as China, the US, and Japan, 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 participates in the BRI in year e (i.e., j concludes an MOU for the BRI in year $e + 1$). 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 participation in the BRI in year e on FDI from country c l years after the participation. After the above model is estimated, the β_{cel} coefficients are aggregated by cohort e and source country c, using the interaction

weights developed by Sun and Abraham (2021):

$$\beta_{cl}^{SA} = \sum_{e=2013}^{2021} \omega_e^{SA} \beta_{cel} \tag{8}$$

where w_e^{SA} is the weights for cohort e. The interaction weighted 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 Mechanism Analysis

As discussed in Section 4.1, participating in the BRI can affect FDI not only from China but also from other countries through several channels: changes in host country-specific factors, such as transport and ICT infrastructure, market size, productivity, and governance, and country pair-specific factors, i.e., bilateral relationships between the source and host countries. To distinguish between the effects of the BRI through these different channels and examine the mechanism behind the BRI effect, we further estimate other specifications than equation (7).

First, to highlight the first four channels, infrastructure, market size, productivity, and governance, we incorporate measures of the four for the source and host country as independent variables in equation (7):

$$\text{arcsinh}(FDI_{ijt}) = \theta_s X_{it} + \theta_h X_{jt} + \lambda_{ij} + \lambda_t + \sum_c \sum_{e=2013}^{2021} \sum_l \tilde{\beta}_{cel} D_j^e D_i^c D_{jt}^l + \epsilon_{ijt}, \tag{9}$$

where X_{it} is the vector of the four measures for country i in year t. In this equation, $\tilde{\beta}_{cel}$ does not reflect the effect of the BRI on FDI from country c through changes in the four factors while including the effect through other source and host country-specific factors not represented by the four and bilateral factors such as strategic competition, third-party cooperation, and risk migitation.

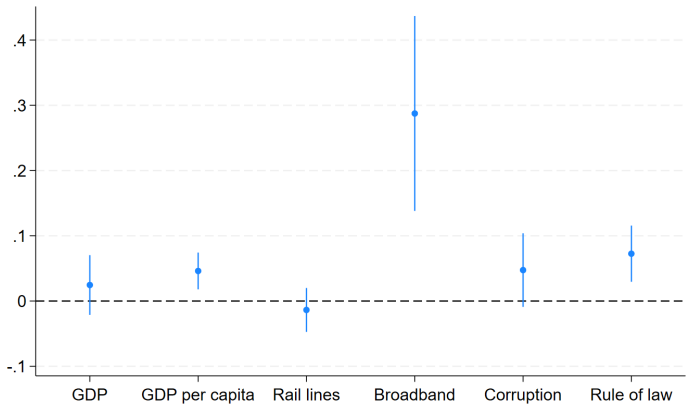
To choose country-level covariates X, we estimate the effect of the BRI on possible measures, such as nominal GDP, purchasing-power-parity (PPP) adjusted real GDP per capita, the number of broadband subscribers, total rail lines (in logs), and the indices of corruption and rule of law. All of these variables are taken from the World Development Indicators of the World Bank. Note that the indices of corruption and rule of law are normalized to fit the standard normal distribution and take a value approximately from -2.5 to 2.5. A higher value of the index of corruption indicates a lower level of corruption. Specifically, we apply the simple DID estimations described in equation (1) to country-level data, using the following equation:

$$Y_{it} = \lambda_i + \lambda_t + \beta_l D_{it} + \epsilon_{it}, \tag{10}$$

where Y_{it} is one of the four attributes of country i in year t, and D_{it} is equal to one if country i participates in the BRI in year t and zero otherwise. Figure 3 shows that participation in the BRI has a positive

and significant effect on real GDP per capita (a measure of productivity), the number of broadband subscribers (ICT infrastructure), and the index of rule of law. Further results from staggered DID estimation shown in Figure A1 in the Appendix are similar to those from the simple DID. Accordingly, we will employ these three variables that seem to be improved by the BRI and nominal GDP that is a standard factor of FDI as the covariates in equation (9).

Figure 3: Effect of the BRI on various attributes of the host country



Notes: This figure shows the average treatment effect and its 95% confidence interval estimated from a simple DID, assuming that the treatment is given one year before signing an MOU. The outcome variables on the horizontal axis from left to right indicate nominal GDP (log), real GDP per capita (PPP, log), total rail lines (km, log), the number of broadband subscribers (log), the index of less corruption, and the index of rule of law. All outcome variables are taken from the World Development Indicators of the World Bank.

In alternative specifications, we incorporate source country-year and host country-year fixed effects that capture any unobservable time-varying attribute of each of the two countries and thus are often included in recent gravity models (Baltagi et al., 2014; Greaney and Kiyota, 2020):

$$\text{arcsinh}(FDI_{ijt}) = \lambda_{ij} + \lambda_{it} + \lambda_{jt} + \sum_{c} \sum_{e=2013}^{2021} \sum_{l} \tilde{\tilde{\beta}}_{cel} D_j^e D_i^c D_{jt}^l + \epsilon_{ijt}. \tag{11}$$

In this equation, the effect of the BRI on FDI through any host country-specific factor that is caused by the BRI is absorbed in λ_{jt}. Therefore, $\tilde{\tilde{\beta}}_{cel}$ reflects a change in FDI from country c through country pair-specific factors, including bilateral relationships, due to the host country's participation in the BRI. By comparing β_{cel}, $\tilde{\beta}_{cel}$, and $\tilde{\tilde{\beta}}_{cel}$, we can infer channels of the effect of the BRI on FDI from each source country.

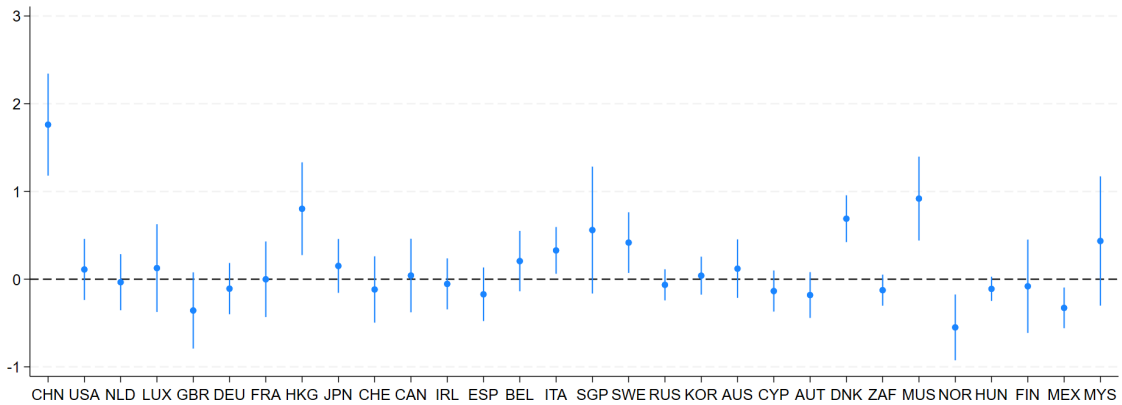
5 Results

5.1 Results from simple DID

We start with the estimation of the effect of the BRI on FDI from China and other major source countries, using the simple DID represented by equation (1). In particular, we focus on FDI from top 30 countries in terms of the absolute amount of FDI outflows in our sample, such as the US, the United Kingdom, Germany, Japan, and China, for simplicity of presentations. The full list of the top 30 countries and their country codes are presented in the notes of Figure 4. The total amount of FDI outflows from the top 30 countries consists of 97% of its world sum in our sample.

Figure 4 illustrates that the average effect of participating in the BRI on FDI from China (CHN), Hong Kong (HKG), Italy (ITA), Sweden (SWE), Denmark (DNK), and Mauritius (MUS) is positive and statistically significant while its effect on FDI from other countries is insignificant. The heterogeneous effects across source countries may be due to heterogeneous impacts of the BRI on characteristics of partner countries, such as their market size, productivity, and infrastructure. Another possibility of the reason for the heterogeneous effects is that FDI to BRI partners may not necessarily be promoted by changes in these host-country characteristics, but by changes in bilateral relationships, as proposed in Section 4.1.

Figure 4: Effect of the BRI on FDI inflows from top 30 sourece countries: Simple DID



Notes: These figures show the average treatment effect on FDI from top 10 source countries, using the simple DID estimation and assuming that the treatment is given one year before signing an MOU. The reference year is one year before the treatment. The country name for each code on the horizontal axis is as follows: China (CHN), the US (USA), the Netherlands (NLD), Luxembourg (LUX), the UK (GBR), Germany (DEU), France (FRA), Hong Kong (HKG), Japan (JPN), Switzerland (CHE), Canada (CAN), Ireland (IRL), Spain (ESP), Belgium (BEL), Italy (ITA), Singapore (SGP), Sweden, (SWE), Russia (RUS), South Korea (KOR), Australia (AUS), Cyprus (CYP), Austria (AUT), Denmark (DNK), South Africa (ZAF), Mauritius (MUS), Norway (NOR), Hungary (HUN), Finland (FIN), Mexico (MEX), and Malaysia (MYS). Countries are ordered by the total amount of FDI outflows, except that China, the tenth largest investor country, is placed the first because of its importance in the study.

5.2 Benchmark results from staggered DID

To examine the dynamic effect of the BRI on FDI, we apply the staggered DID event study estimation of Sun and Abraham (2021) to equation (7), i.e., assuming heterogeneity of the effect across cohorts. However, we made the following three amendments in order to make the estimations feasible and to satisfy the parallel-trend assumption.

First, when we incorporate the effect on FDI from all source countries into the estimation (i.e., $c \in$ {all source countries} in equation [7]), we find that the computation is in feasible. Even if we choose top 30 source countries, the computation takes tremendous time. To avoid the computational complexity, we focus on the effect on FDI from the top 10 source countries, i.e., China, the US, the Netherlands, Luxembourg, the UK, Germany, France, Hong Kong, Japan, and Switzerland. We experiment with some other sets of 10 countries, for example, six countries that show a positive effect in the simple DID (Figure 4) and some more additional major source countries, such as the US, the UK, Germany, and Japan, and obtained similar results.

Second, when we estimate equation (7), we find that the pre-treatment parallel trend is not satisfied for FDI from most of the 10 countries, as shown in Figure A2 in the Appendix. In particular, the coefficients β_{cl}^{SA} in equation (8) tend to be negative before the treatment and positive after the treatment, increasing over time. To control for the increasing time trend, we incorporate nominal GDP of the source and host countries in logs as control variables into equation (7).

Finally, we further assume that each treatment is given one year before signing an MOU for the BRI because, when we define the year of signing an MOU as the treatment year, we find that the parallel trend is not necessarily satisfied. This assumption can be justified because the effect of the BRI on FDI inflows to partner countries may emerge several years before signing an MOU for the BRI.

The dynamic effects of the BRI on FDI from each of the top 10 source countries estimated from the staggered DID event study estimations with the amendments above are shown in each panel of Figure 5. We show the effect of the BRI from seven years before the treatment to seven years after the treatment, because the number of treated observations out of this time range is small so that the estimated standard errors tend to be quite large. In all panels, the effect of the BRI on FDI in the pre-treatment period is statistically insignificant and shows no clear trend. Panels (A), (B), (C), and (J) indicate that the average effect of participating in the BRI on FDI from China, Hong Kong, the US, and Switzerland, respectively, to BRI partners is positive and significant at the 5% level 4-6 years after the participation. In Panels (D) and (G), we find a positive effect of the BRI on FDI from Japan and France, respectively, although the effect is not significant at the 5% level. In contrast, Panels (E), (H), and (I) find a negative and significant effect on FDI from the UK and a negative but insignificant effect on FDI from the Netherlands and Luxembourg. The effect of FDI from Germany (Panel [F]) is insignificant and show no clear trend. The size of the BRI effect on FDI from some countries is quite large. For example, FDI from China to

BRI partner countries almost doubled 5-6 years after signing an MOU. FDI from Hong Kong and the US increased by approximately 40-60% on average because of the BRI.

5.3 Mechanisms

As we discussed in Sections 4.1 and 4.3, FDI to BRI countries may have increased because of the improvements in productivity, infrastructure, and governance shown in Figures 3 and A1. To test if these are the channels of the BRI effect on FDI, we incorporate measures of these channels, i.e., real GDP per capita in logs, the number of broadband subscribers in logs, and the index of rule of law of the host country, into the estimation, as shown in equation (9).

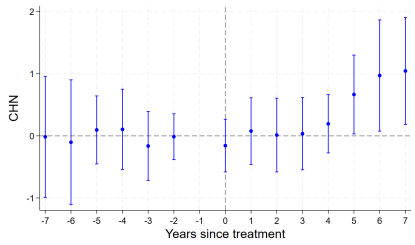
The blue dots and lines in Panels (A)-(D) and (J) of Figure 6 indicate that signing an MOU for the BRI has a positive and significant effect on FDI from China, Hong Kong, the US, Japan, and Switzerland, even after controlling for those potential factors of FDI, while Panel (E) shows a negative effect on FDI from the UK. FDI from other countries is not significantly affected by the BRI. In short, the positive and negative effect of the BRI on FDI from some of the top 10 countries remain when we additionally control for the measures of productivity, infrastructure, and governance. Therefore, we conclude that the BRI promoted FDI from China, Hong Kong, the US, Japan, and Switzerland not because the BRI improved these measures in the host countries but because of other factors not controlled explicitly in this estimation.

We further employ source and host country-year fixed effects into the estimation (equation [11]) to control for any country-year specific factor that is not controlled for in the previous estimations (equation 9). The results shown by red dots and lines in Figure 6 demonstrate that the effect of the BRI on FDI from any country is insignificant at the 5% level, after controlling for source and host country-year fixed effects. However, when we focus on the overall trends of point estimates after the treatment leaving the statistical significance aside, several notable findings emerge. First, the average coefficient of FDI from China is positive and weakly significant from 0 to 3 years after the treatment (the p value is 5.1% for the year of the treatment and 7.1% 3 years later), implying that FDI from China may have increased at least for a few years because of changes in bilateral relationships due to the BRI. Second, we find an upward trend in FDI from the US, Switzerland, and France and a downward trend in FDI from the UK, Luxembourg, and the Netherlands several years after participating in the BRI. Moreover, the absolute values of the point estimates in the post-treatment periods are larger for the US, France, Switzerland, the UK, the Netherlands, and Luxembourg, when country-year fixed effects are controlled for (red dots) than when only country-year attributes are (blue), while this tendency is the opposite for Japan.

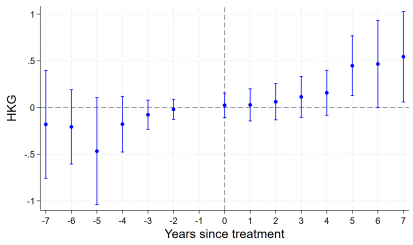
These findings show suggestive evidence that a country's signing an MOU for the BRI affected FDI to the BRI country because of changes in bilateral relationships with the source country, in addition

Figure 5: Effect of the BRI on FDI inflows from the top 10 source countries: Controlling for GDP of source and host countries and country-pair and year fixed effects

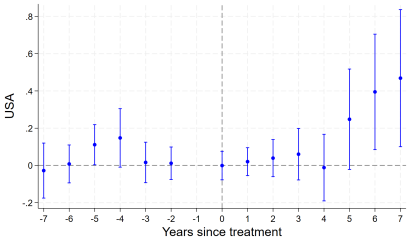
(A) China



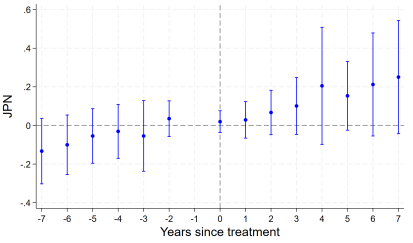
(B) Hong Kong



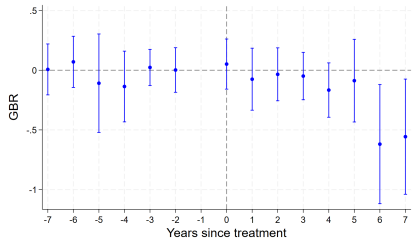
(C) United States



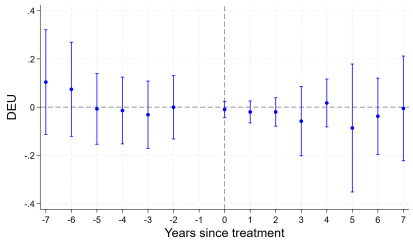
(D) Japan



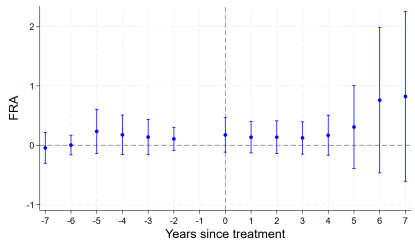
(E) United Kingdom



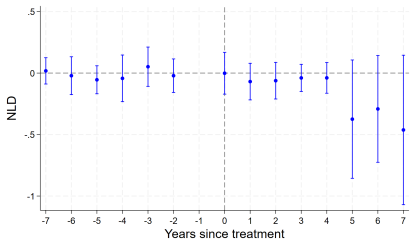
(F) Germany



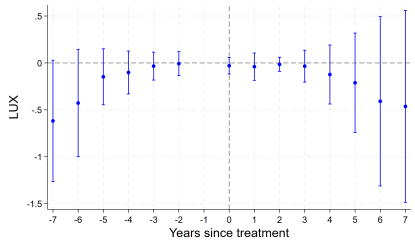
(G) France



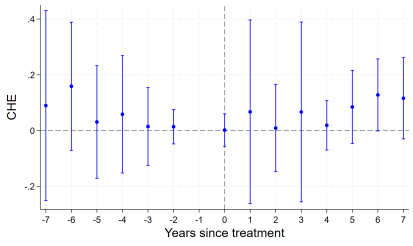
(H) Netherlands



(I) Luxembourg

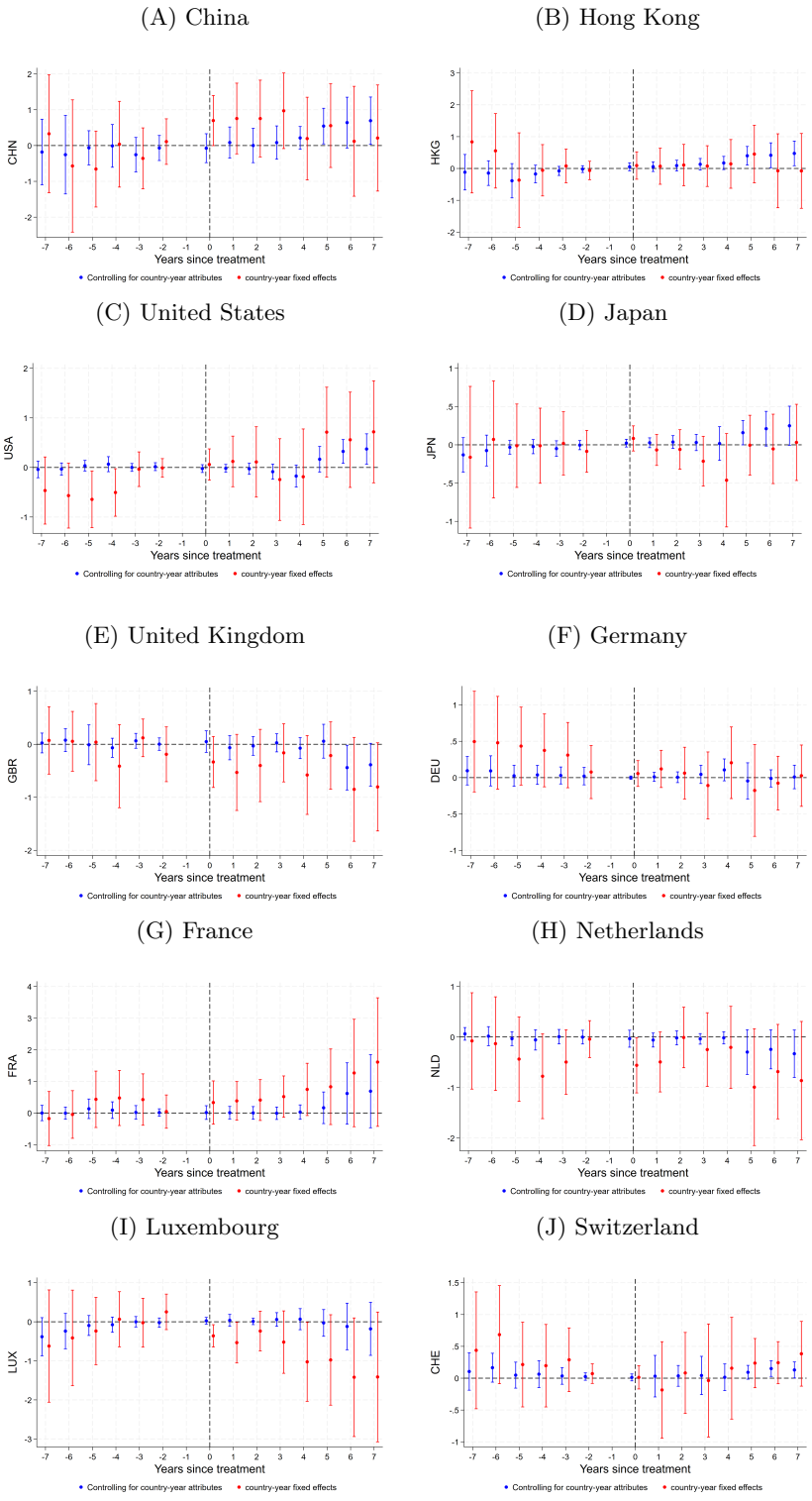


(J) Switzerland



Notes: These figures show the average treatment effect on FDI from the top 10 source countries, assuming that the treatment is given one year before signing an MOU. The reference year where the effect is set zero is one year before the treatment.

Figure 6: Effect of the BRI on FDI inflows from selected top 10 source countries: Controlling for source and host country-year attributes or fixed effects



Notes: These figures show the average treatment effect on FDI from the top 10 source countries, assuming that the treatment is given one year before signing an MOU. The blue (red) dots and lines indicate results by controlling for source and host country-year attributes (fixed effects). The reference year where the effect is set zero is one year before the treatment.

to improvements in infrastructure, productivity, market size, and governance in the BRI country. The direction of the effect varies depending on how the bilateral relationship is affected by the BRI through the three channels argued in Section 4.1: strategic competition with China, investment cooperation with China, and mitigation of risks of supply chains with countries friendly to China. The total effect and its possible reasons can be categorized into the following four.

First, the positive effect on FDI from the US, which has signed no MOU with China for third-party market cooperation (Zhang, 2019), implies that US firms increased investment in BRI countries by following policy supports of the US government to strategically compete with China in BRI countries, such as the, BDN, BUILD, and B3W (Savoy and McKeown, 2022), as explained in Section 4.1. Although the US government also encourages friendshoring to like-minded countries (Todo and Inoue, 2021) and thus may discourage investment in countries closely linked with China, the positive effect through strategic competition is more likely to surpass the negative effect through risk mitigation.

Second, FDI from France and Switzerland to BRI countries increased because governments and private firms of both countries signed several MOUs with China for third-party market cooperation and conducted investment jointly with China in BRI countries, particularly in Africa (Zhang, 2019). Notably, France was engaged in cooperation with China most extensively among European countries (Yun et al., 2024; Xu, 2022). For example, Alstom France and China Water Conservancy and Hydro Power Group cooperate for hydropower projects in Uganda, Ghana, and Cote d'Ivoire. Also, CMA CGM of France and MSC Cruises of Switzerland collaborate with Hunan Road & Bridge for an infrastructure project in Benin (Yun et al., 2024). These examples support the positive effect of the BRI on FDI from the two countries.

Third, FDI from other three European countries, the UK, the Netherlands, and Luxembourg, showed a downward trend in FDI to BRI countries. Although the UK and the Netherlands signed an MOU with China for third-party market cooperation (Zhang, 2019), they took a cautious approach to deal with China. For example, the UK government's view of China and its BRI shifted from a positive to a substantially negative one in 2019, by formally stating "systemic challenge" from China Ashbee (2024). The Dutch government published "The Netherlands-China: A New Balance" in 2019 to emphasize cautious engagement with China, particularly in critical economic sectors (Brancaccio, 2024). Therefore, these countries may have taken into account geopolitical risks of supply chains with unfriendly BRI countries more seriously than others.

Finally, FDI from Japan or Germany did not show an upward or downward trend after controlling for country-year fixed effects, implying that the positive effect through third-party market cooperation and negative effect through minimizing supply chains with unfriendly BRI countries cancel out each other. Although Japan has signed an MOU with China for third-party cooperation, practical cooperation between the two is reported to have faced challenges because of political interference and potential

economic risks in BRI countries (Su et al., 2020; Zhang, 2021). Although many German companies, including Siemens and GAUFF, have collaborated with Chinese companies, the German government has not signed an MOU with China for third-party market cooperation (Yun et al., 2024). These observations are in line with the lack of a positive BRI effect on FDI from the two. We observe a positive and significant effect of the BRI on FRI from Japan when we control for attributes of the host country (blue dots and lines in Panel [D] of Figure 6). The different results between estimations using country attributes and country-year fixed effects suggest that FDI from Japan to BRI countries increased because of changes in attributes of the host country not explicitly controlled for by our measures of productivity, ICT infrastructure, and governance, such as improvements in transport infrastructure and systems for investment.

5.4 Heterogeneity across democracy levels

Next, we will look into possible heterogeneity in the effect of BRI on FDI inflows. In particular, we are interested in heterogeneity across different levels of democracy of host countries because the BRI has targeted autocratic countries more than democratic countries. As Table 2 shows, approximately two-thirds of BRI partner countries are autocratic countries defined by the average of the seven core indices of democracy (ranging from 0 to 1) in the V-Dem dataset. One reason for the bias towards autocratic countries is that because China itself is autocratic (its democracy index is 0.094 in 2009 and 0.068 in 2021), China prefers to be linked with autocratic countries. In contrast, democratic countries, such as the US and Japan, are hesitant to sign an MOU for the BRI with China. Another reason is that the democracy level is positively correlated with the income level, except for some oil-producer countries, such as Qatar and Saudi Arabia (Figure A3 in the Appendix). Then, poor and autocratic countries are more willing to sign an MOU for the BRI that may promote infrastructure development and FDI from China than rich and democratic countries. Because of the systematic differences between democratic and autocratic countries, the impact of the BRI on FDI inflows may differ between the two types. Therefore, we divide the sample into two sub-samples, one consisting of countries with the average democracy level of 0.5 or higher in 2009 and the other consisting of other countries and conduct the same staggered DID even study analysis using equation (7).

We focus on the results for FDI from the US and Japan shown in Figure 7, because the effect on FDI from the two to democratic and autocratic countries are quite different from each other, while the difference is unclear for the other top 10 source countries as presented in Figure A4 in the Appendix. In each panel of the figure, the blue points and lines indicates the effect on FDI to democratic countries, whereas the red points and lines are for autocratic countries. We find that the effect of the BRI on FDI from the US and Japan to autocratic countries is positive and significant 5-6 years after their

Table 2: Number of BRI and non-BRI countries by democracy levels

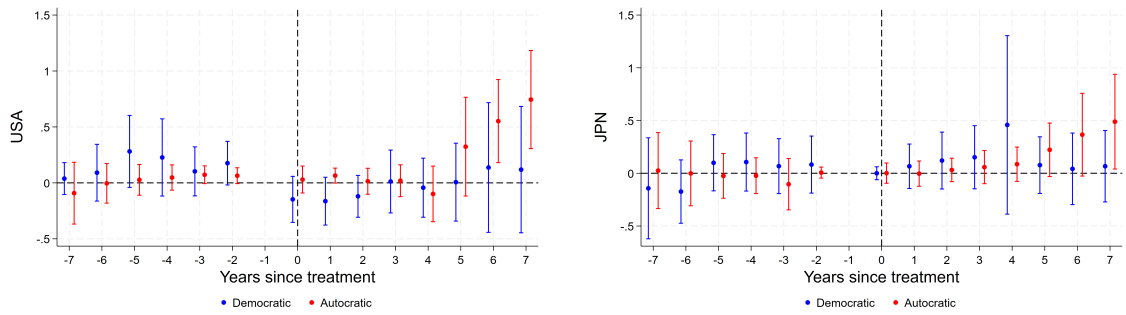
	Autocratic countries	Democratic countries	Total
BRI countries	93	52	145
Non-BRI countries	15	52	69
Total	108	106	214

Notes: Democratic countries are defined as those whose democracy index in 2009 taken from V-Dem is small than 0.5 (the index ranges from 0 [most autocratic] to 1 [most democratic]). BRI countries are defined as those which signed an MOU for the BRI with China during the period 2009-2021.

participation, while the effect on FDI from the two countries to democratic countries is not significant at any significance level or does not show any upward trend in the post-BRI period. In addition, the point estimates are substantially larger for the effect on FDI to autocratic countries than to democratic.

Figure 7: Effect of the BRI on FDI from selected countries to democratic and autocratic countries: Controlling for GDP of source and host countries and country-pair and year fixed effects

(A) From the US (B) From Japan

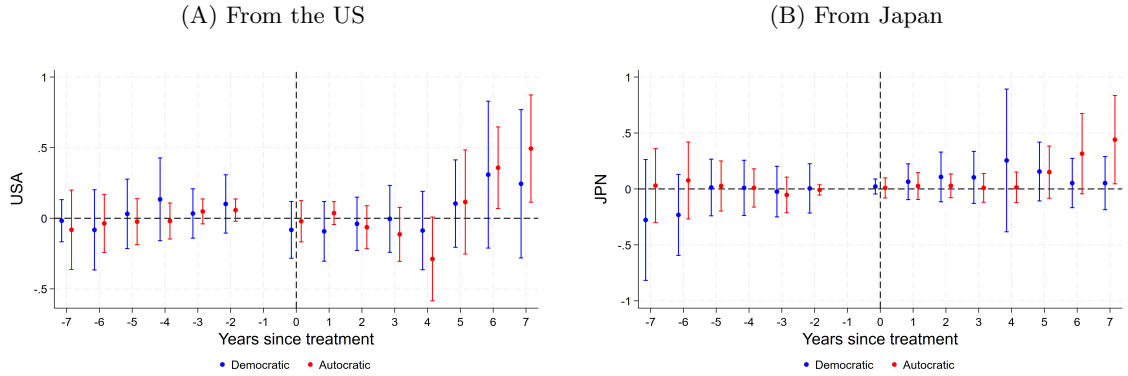


Notes: These figures show the average treatment effect on FDI from the US and Japan to democratic (blue dots and lines) and autocratic countries (red), assuming that each treatment is given one year before signing an MOU. The reference year is one year before the treatment. Democratic countries are defined by countries with the average democracy score (0-1) of V-Dem of 0.5 or higher in 2009. Results for other top 10 source countries are provided in Figure A4 in the Appendix.

As in Section 5.2, we incorporate into the set of control variables, i.e., measures of productivity (real GDP per capita), infrastructure (the number of broadband subscribers), and governance (the index of rule of law) to highlight the effect of the BRI on FDI inflows not through improvements in these factors (equation [9]). Figure 8 illustrates that the effect of FDI from the US and Japan is essentially the same as that in Figure 7, suggesting that the effect of the BRI on FDI from the two to autocratic countries is not necessarily driven through improvements in productivity, infrastructure, or governance, as we found in Section 5.2.

Further, when we incorporate source and host country-year fixed effects into the estimation (equation [11]), we find no significant effect of the BRI on FDI from any country to either democratic or autocratic countries (Figure 9). However, the point estimate of the effect on FDI from the US to autocratic countries 5-7 years after the treatment is positive and larger than that to democratic countries. These

Figure 8: Effect of the BRI on FDI to democratic and autocratic countries: Controlling for attributes of source and host countries



Notes: These figures show the average treatment effect on FDI from the US and Japan to democratic (blue dots and lines) and autocratic countries (red), assuming that each treatment is given one year before signing an MOU. The reference year is one year before the treatment. Democratic countries are defined by countries with the average democracy score (0-1) of V-Dem of 0.5 or higher in 2009. Results for other top 10 source countries are provided in Figure A5 in the Appendix.

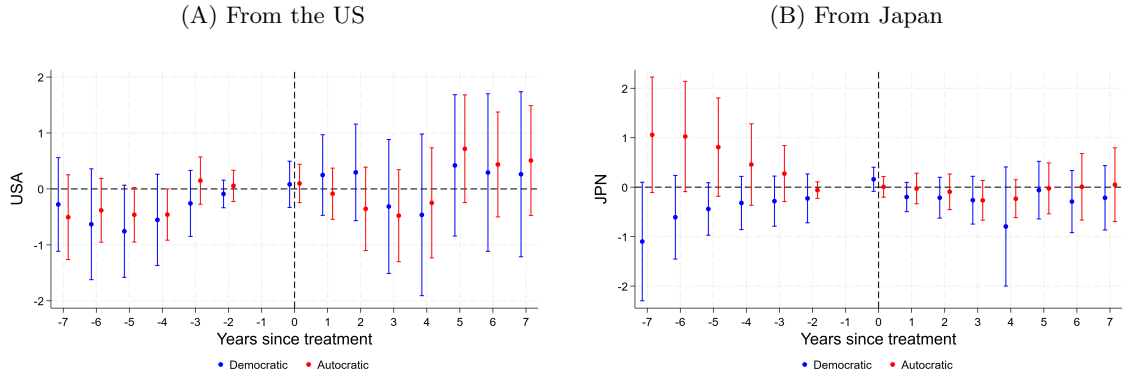
results suggest that the BRI changed the bilateral relationship between the US and the BRI country more and thus attracted more FDI from the US when the host country is autocratic than when democratic. This conclusion is in line with our interpretation in Section 5.3 that the US invests in BRI countries to strategically compete with China. Because autocratic BRI countries are more likely to strengthen their economic and political ties with China than democratic BRI countries, the US is mobilized to invest in these countries more.

By contrast, the effect on FDI from Japan is close to zero and not different between democratic and autocratic countries. Therefore, the positive effect on FDI from Japan to autocratic countries found in Figure 8 may be the result from changes in characteristics of host countries due to the BRI that are controlled for by country-year fixed effects in Figure 9. This conclusion is also consistent with our previous conclusion from the comparison between the blue and red dots and lines in Figure 6.

6 Conclusion

This paper investigates the impact of the Belt and Road Initiative (BRI) on foreign direct investment (FDI) from China and other top 10 source countries, including the United States, the United Kingdom, Germany, and Japan. We apply staggered difference-in-differences (DID) event-study estimations to a gravity model. We contribute to the literature by estimating the effect of the BRI on FDI from countries other than China. Moreover, to highlight mechanisms of the BRI effect on FDI from non-China countries, we distinguish between the effects of the BRI through changes in characteristics of the host country and changes in bilateral relationships between the source and host countries, by utilizing country attributes and fixed effects at various levels. Changes in host-country characteristics include improvements in

Figure 9: Effect of the BRI on FDI to democratic and autocratic countries: Controlling for country-pair and country-year fixed effects



Notes: These figures show the average treatment effect on FDI from the US and Japan to democratic (blue lines) and autocratic countries (red), assuming that each treatment is given one year before signing an MOU. The reference year is one year before the treatment. Democratic countries are defined by countries with the average democracy score (0-1) of V-Dem of 0.5 or higher in 2009. Results for other top 10 source countries are provided in Figure A5 in the Appendix.

productivity and infrastructure, while bilateral relationships are affected by strategic competition and investment cooperation with China and mitigation of risks of supply chains with BRI countries closely linked with China. Finally, we examine heterogeneous effects of the BRI on FDI to democratic and autocratic countries.

Our results using country-pair and year fixed effects shows that signing an MOU for the BRI with China significantly affects FDI from China and Hong Kong to BRI countries, being consistent with results from the existing literature. We also find a positive and significant effect of the BRI on FDI from the US and Switzerland and a negative and significant effect on FDI from the UK several years after participating in the BRI. We observe an upward trend of FDI from Japan and France and a downward trend of FDI from the Netherlands and Luxembourg in the post-BRI period, although these effects are not statistically significant. We further control for source and host-country fixed effects and still observe an upward post-BRI trend in FDI from the US, Switzerland, and France and a downward trend in FDI from the UK, the Netherlands, and Luxembourg. Country-year fixed effects represent effects through changes in any characteristic of the host country due to the BRI, including market size, productivity, infrastructure, and governance. Therefore, these results from estimations with country-year fixed effects imply that changes in bilateral relationships due to the BRI affected FDI from some non-China countries. From anecdotal evidence of policies and business practices, we conclude that the US increased FDI to BRI countries to strategically compete with China over the economic and political presence there, whereas France and Switzerland did so because of their active cooperation with China in private investment in BRI countries, particularly in Africa. The UK and the Netherlands which have taken a cautious approach to relationships with China decreased FDI to BRI countries possibly to reduce risks of supply chains with countries close to China. FDI from Japan to BRI increased, but this is possibly because of changes in

host-country characteristics, rather than changes in bilateral relationships. Further, when we distinguish between sub-samples depending on whether the host country was initially democratic or autocratic, we find that FDI from the US to autocratic BRI countries increased while FDI to democratic countries did not, even after county-year fixed effects are controlled for. This finding confirms our conclusion that the US increased FDI to BRI countries because of strategic competition with China.

Finally, we note several caveats of this paper. First, although our estimations using source and host country-year fixed effects showed an upward or downward trend in FDI from several source countries after participating in the BRI, the effect is often insignificant at the 5% level because of large standard errors, suggesting substantial heterogeneity in the BRI effect. Although we examined heterogeneity depending on the level of democracy, there could be other sources of heterogeneity. Examining heterogeneity more deeply may show more significant effects of the BRI. Second, our analysis revealed that changes in bilateral relationships had affected FDI from non-China countries to BRI countries and suggested different reasons for such changes, i.e., strategic competition, investment cooperation, and mitigation of supply chain risks, based on anecdotal evidence. However, quantitative analysis could provide clearer evidence for the mechanism for each country. Finally, this study does not consider spillover effects, i.e., a possible negative effect of a host country's participation in the BRI on FDI to non-BRI countries due to diversion from non-BRI to BRI countries. Therefore, the estimated effect of the BRI in this study should be interpreted as the net effect of the BRI, i.e., the pure effect of the BRI on FDI from a source country to the BRI country less its average spillover effect on FDI from the source to non-BRI countries. We leave these issues for future research.

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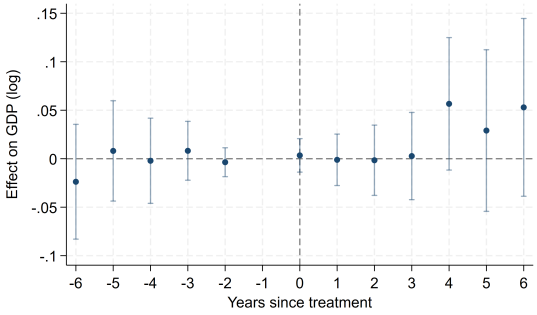
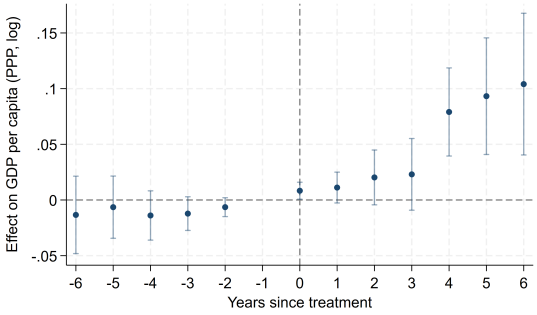
Appendix

Figure A1: Effect of the BRI on attributes of partner countries

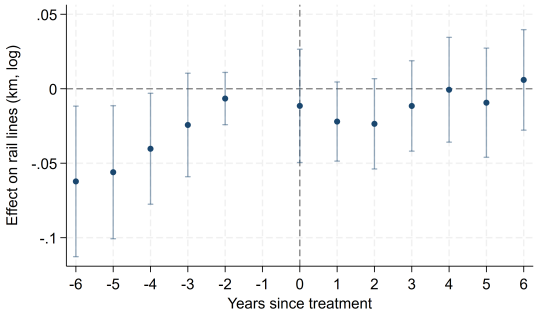
(A) Nominal GDP



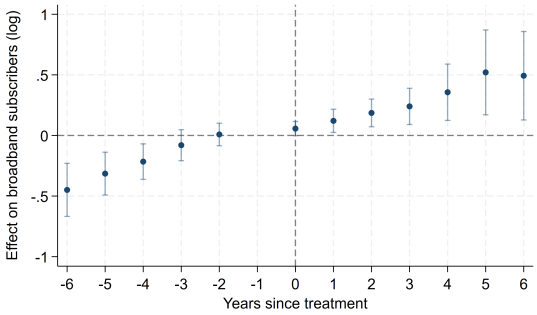
(B) Real GDP per capita (PPP)



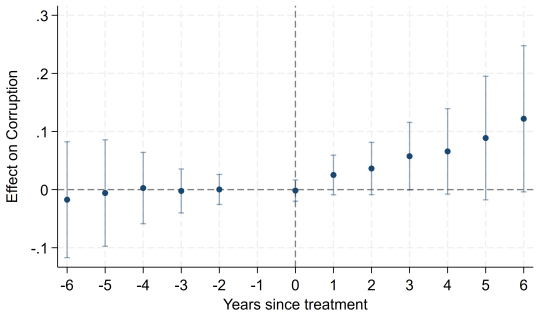
(C) Rail lines



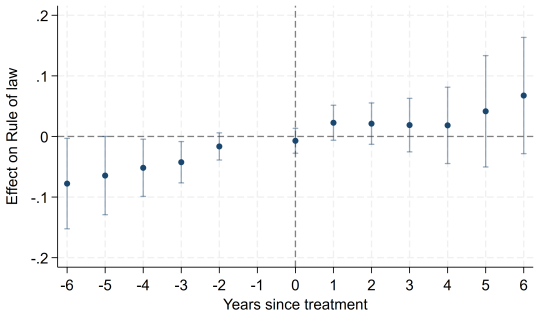
(D) Broadband subscribers



(E) Corruption (inverse)

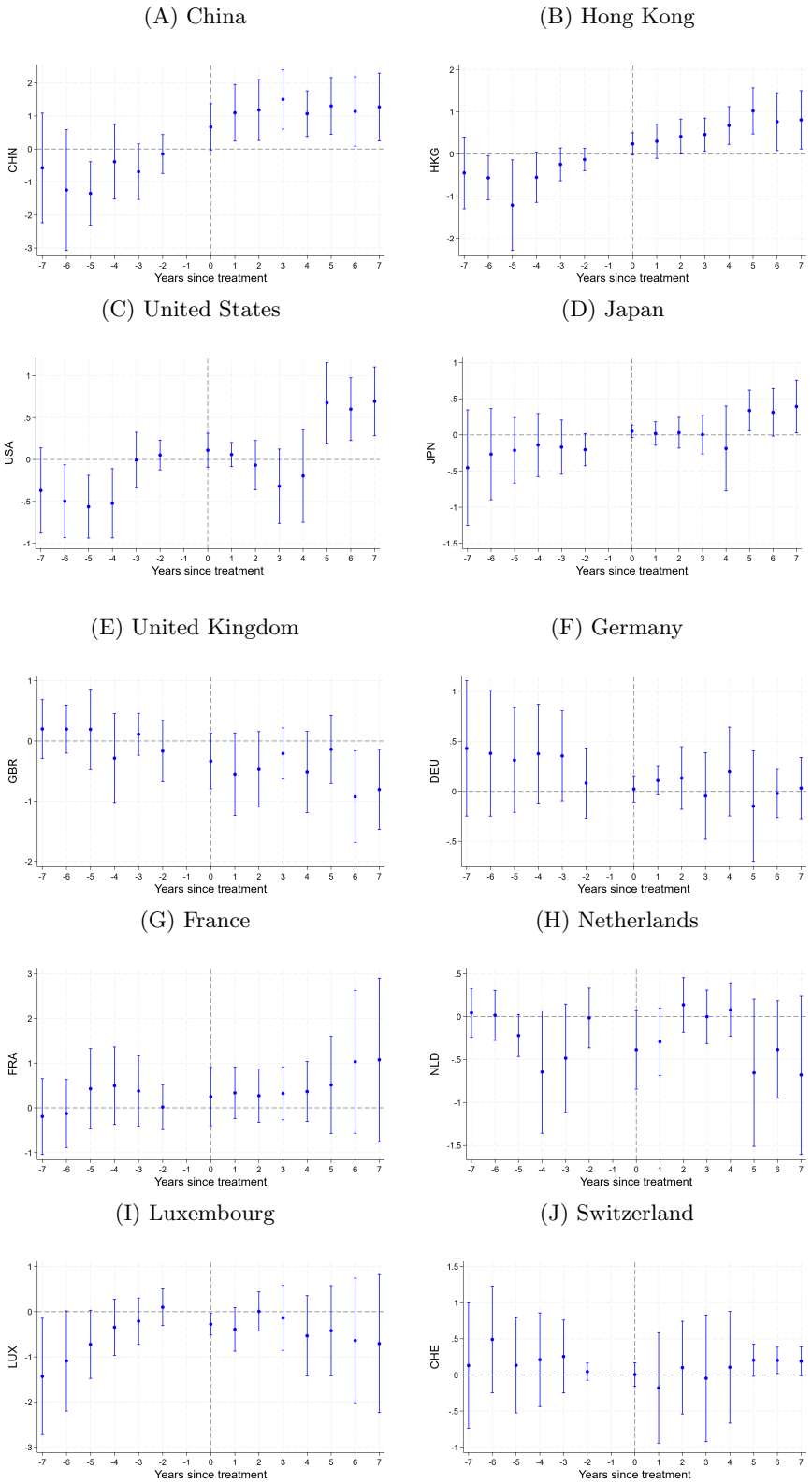


(F) Rule of law



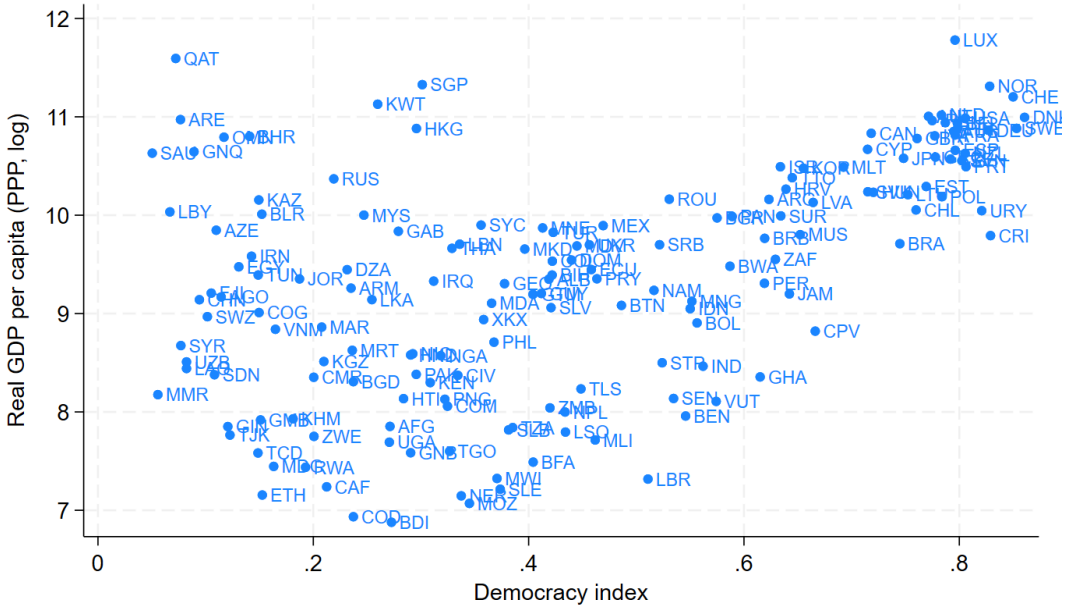
Notes: These figures show the average effect of the BRI on various attributes of partner countries, assuming that the treatment is given one year before signing an MOU for the BRI. The reference year where the effect is set zero is one year before the treatment. In Panels (A)-(D), the outcome variables are in logs. In Panels (E) and (F), the variables are measures of better institutions and normalized ranging from -2.5 to 2.5. All the outcome variables are taken from the WOrld Development Indicators of the World Bank.

Figure A2: Effect of the BRI on FDI inflows from top 10 source countries: Controlling for only country-pair and year fixed effects



Notes: These figures show the average treatment effect on FDI from top 10 source countries, assuming that the treatment is given one year before signing an MOU. The reference year where the effect is set zero is one year before the treatment.

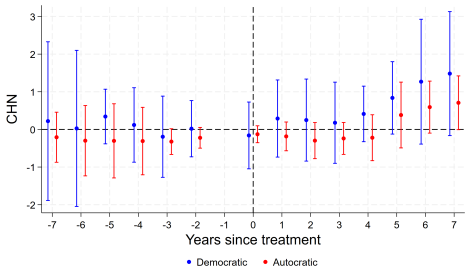
Figure A3: Correlation between real GDP per capita and the democracy level (2009)



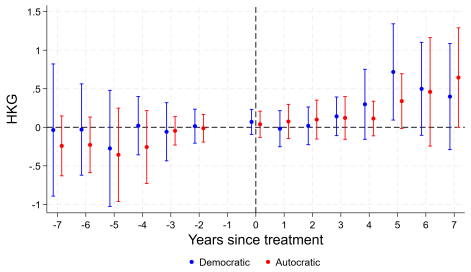
Notes: The democracy index is defined by the average democracy score (0-1) of V-Dem's seven core indices.

Figure A4: Effect of the BRI on FDI from selected major source countries to democratic and autocratic countries: Controlling for GDP of source and host countries and country-pair and year fixed effects

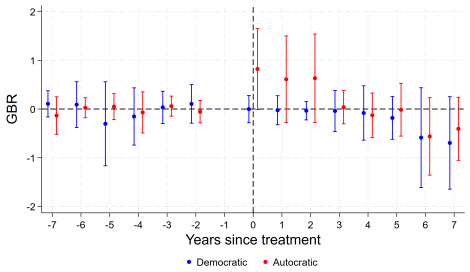
(A) From China



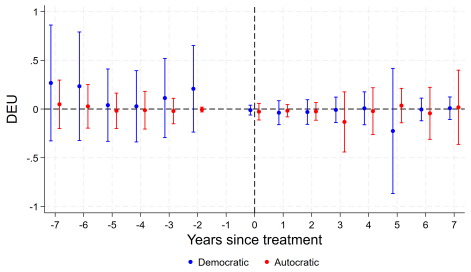
(B) From Hong Kong



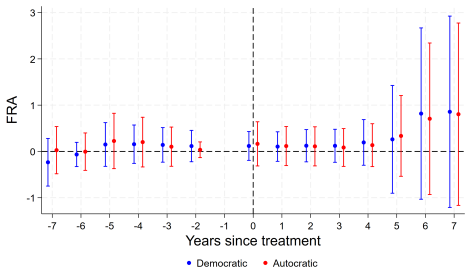
(C) From the UK



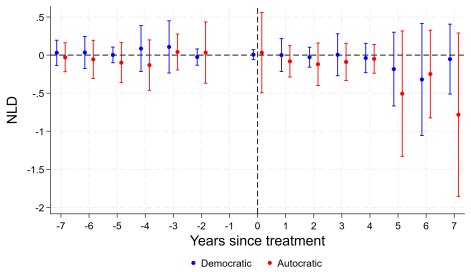
(D) From Germany



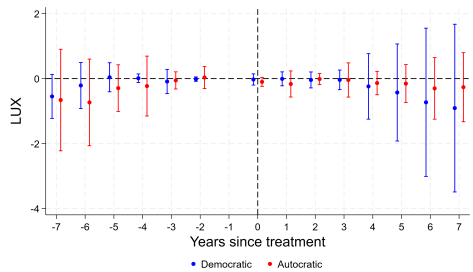
(E) From France



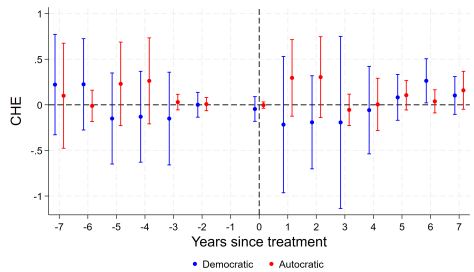
(F) From the Netherlands



(G) From Luxembourg

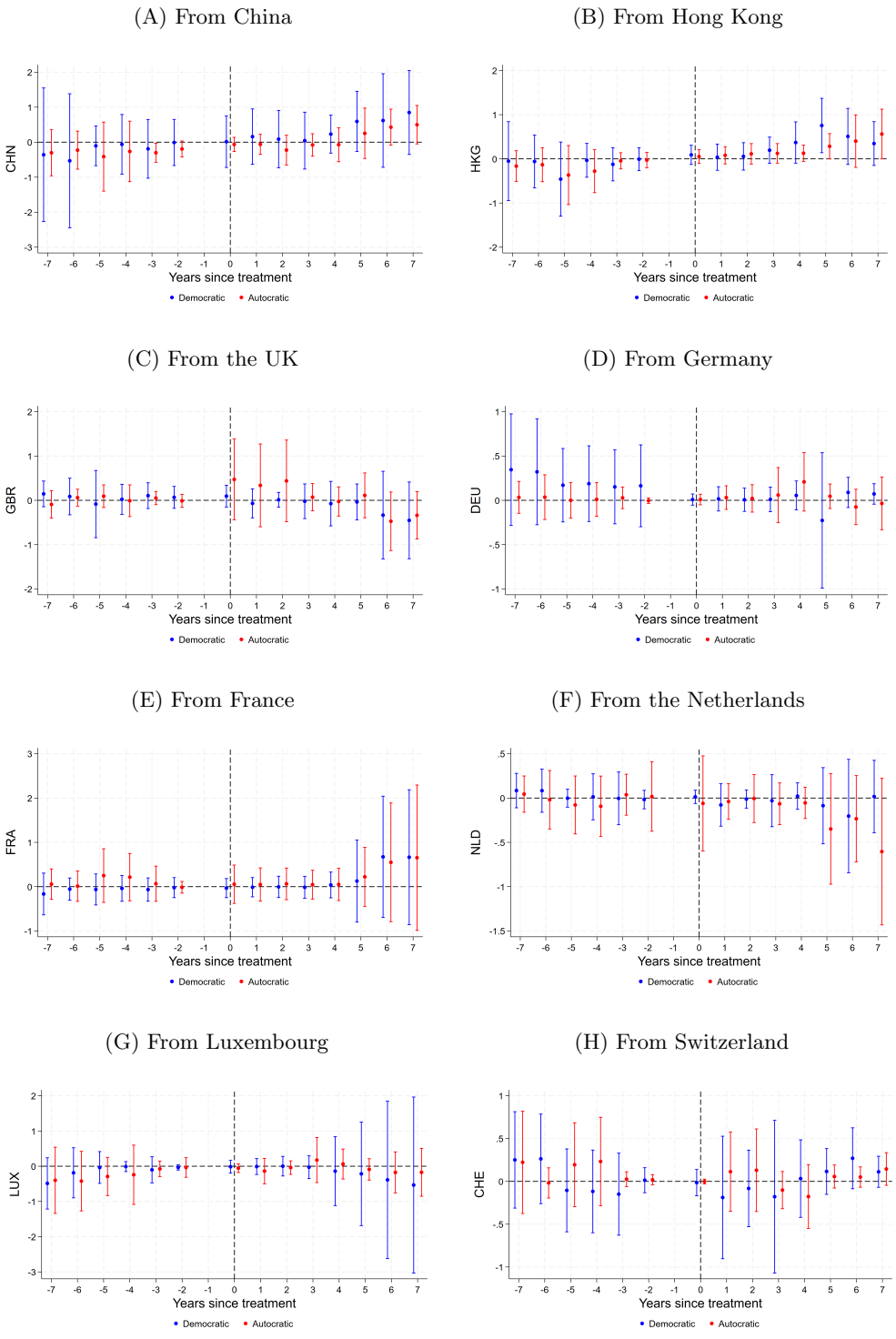


(H) From Switzerland



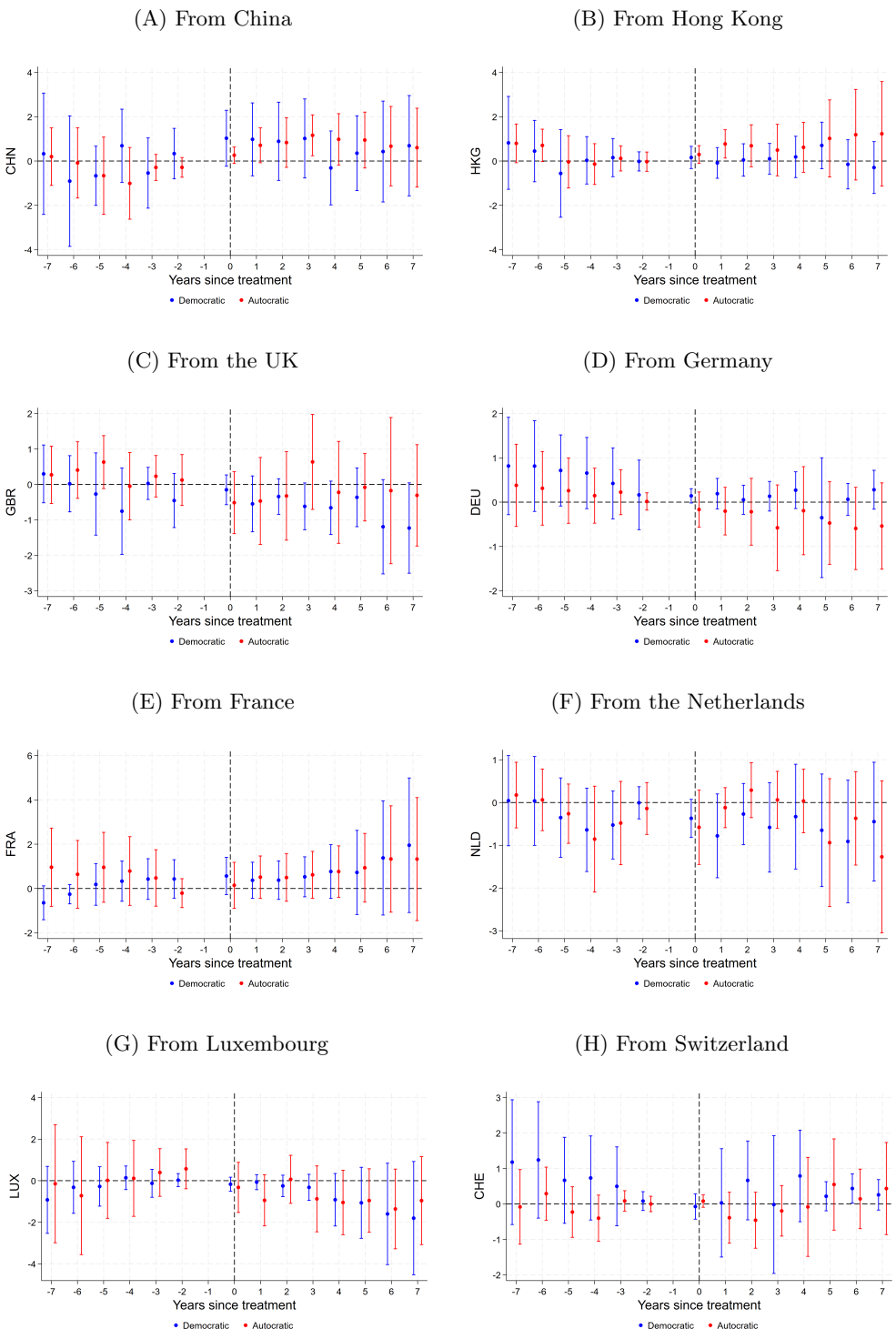
Notes: These figures show the average treatment effect on FDI from the top 10 countries, except for the US and Japan, to democratic (blue lines) and autocratic countries (red), assuming that each treatment is given one year before signing an MOU. The reference year is one year before the treatment. Democratic countries are defined by countries with the average democracy score (0-1) of V-Dem of 0.5 or higher in 2009.

Figure A5: Effect of the BRI on FDI from selected major source countries to democratic and autocratic countries: Controlling for various attributes of source and host countries and country-pair and year fixed effects



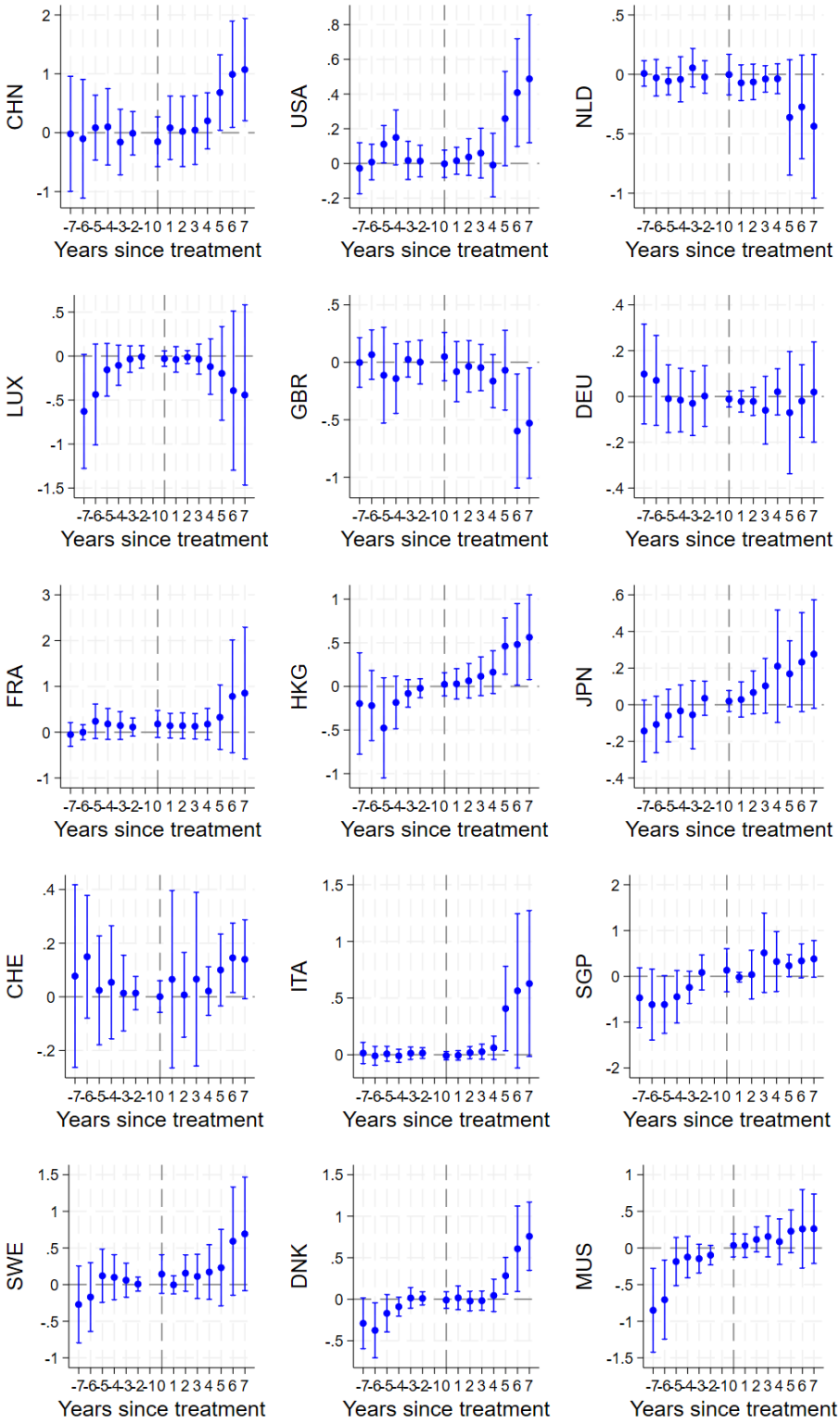
Notes: These figures show the average treatment effect on FDI from the top 10 countries, except for the US and Japan, to democratic (blue lines) and autocratic countries (red), assuming that each treatment is given one year before signing an MOU. The reference year is one year before the treatment. Democratic countries are defined by countries with the average democracy score (0-1) of V-Dem of 0.5 or higher in 2009.

Figure A6: Effect of the BRI on FDI to democratic and autocratic countries: Controlling for country-pair and country-year fixed effects



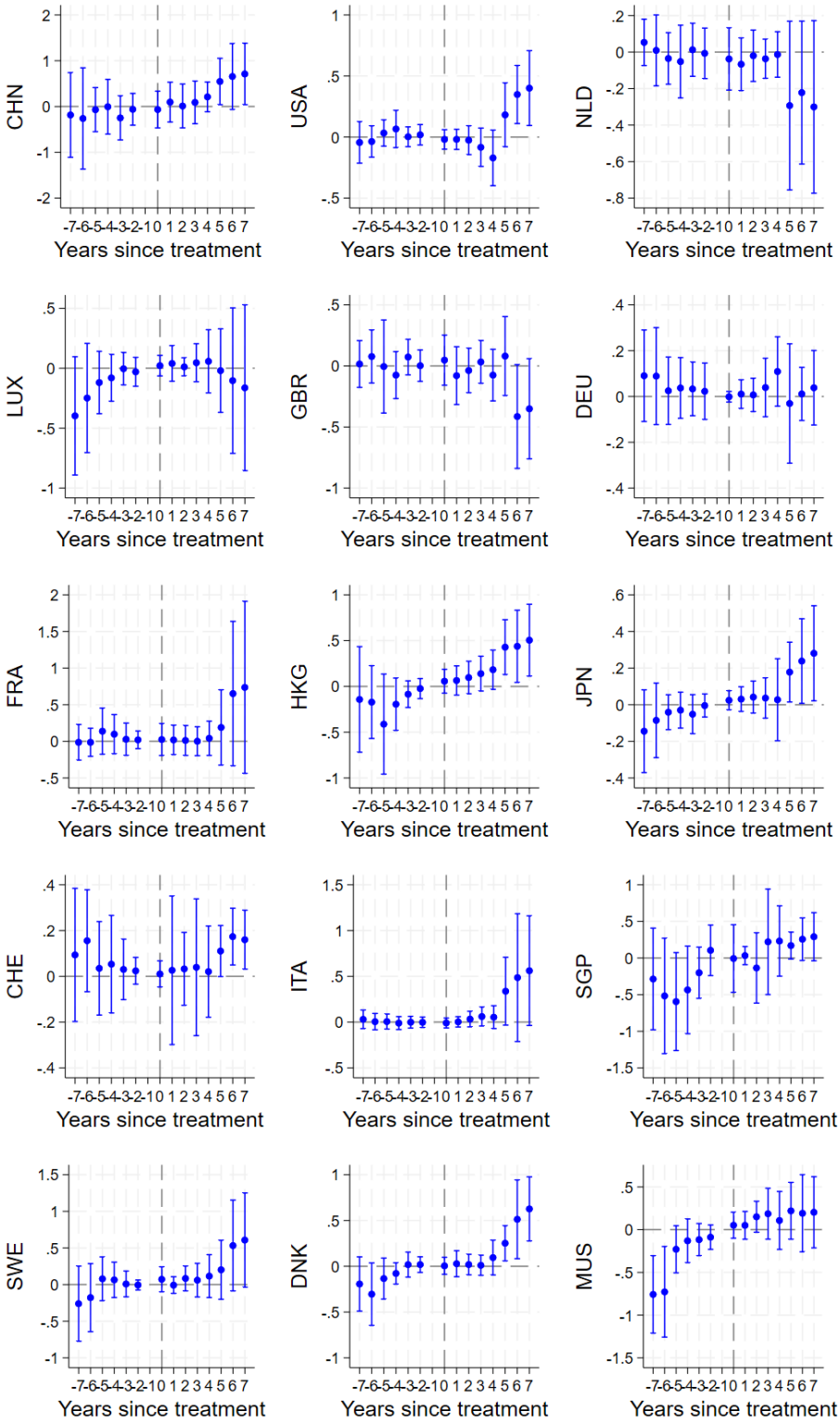
Notes: These figures show the average treatment effect on FDI from the top 10 countries, except for the US and Japan, to democratic (blue lines) and autocratic countries (red), assuming that each treatment is given one year before signing an MOU. The reference year is one year before the treatment. Democratic countries are defined by countries with the average democracy score (0-1) of V-Dem of 0.5 or higher in 2009.

Figure A7: Effect of the BRI on FDI inflows from top 10 and 5 major source countries: Controlling for GDP of source and host countries and country-pair and year fixed effects



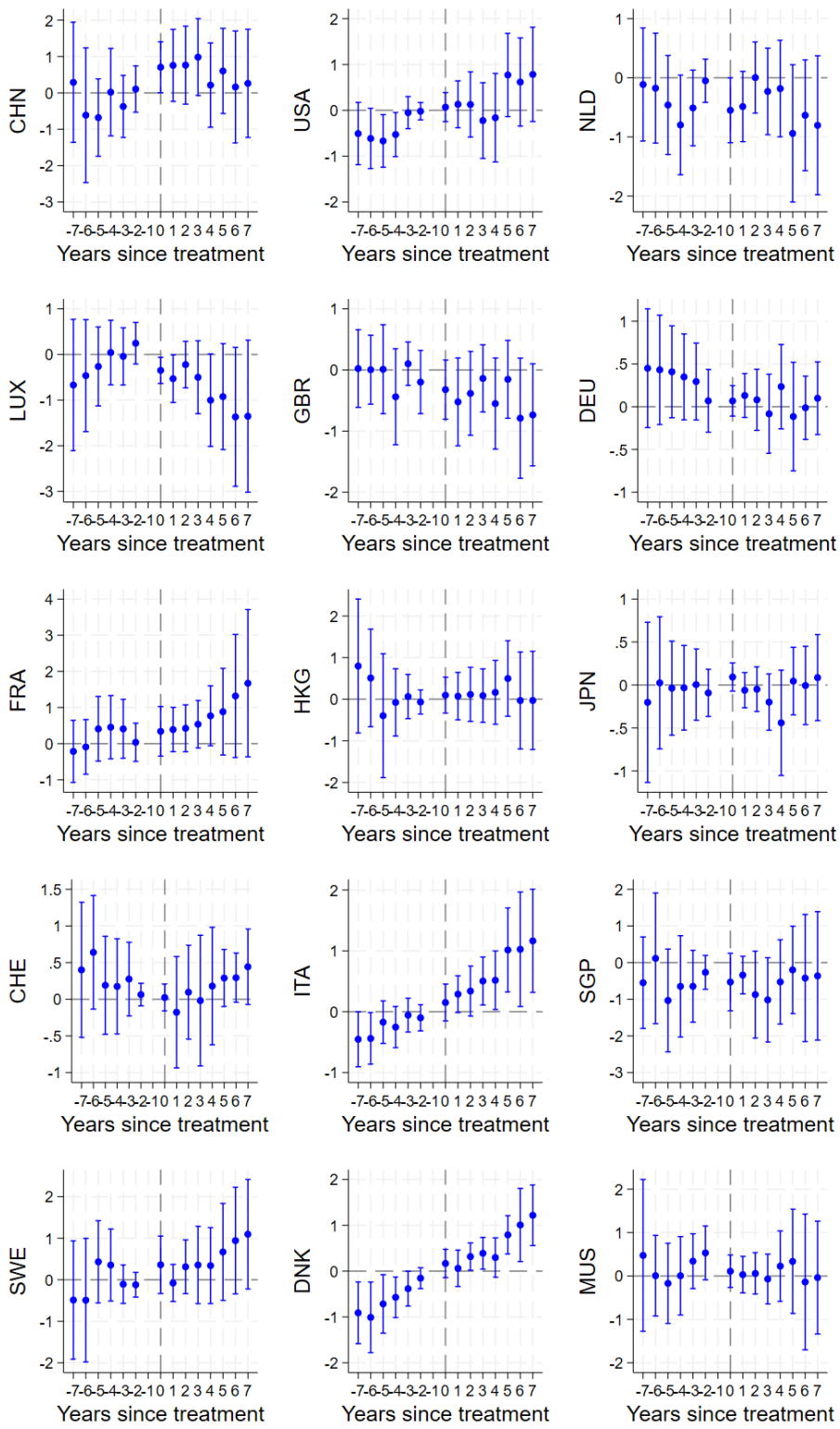
Notes: These figures show the average treatment effect on FDI from major 15 source countries, using the staggered DID estimation. We assume that the treatment is given one year before signing an MOU. The reference year is one year before the treatment. The country name for each code on the horizontal axis is as follows: China (CHN), the US (USA), the Netherlands (NLD), Luxembourg (LUX), the UK (GBR), Germany (DEU), France (FRA), Hong Kong (HKG), Japan (JPN), Switzerland (CHE), Italy (ITA), Singapore (SGP), Sweden, (SWE), Denmark (DNK), and Mauritius (MUS).

Figure A8: Effect of the BRI on FDI inflows from top 10 and 5 major source countries: Controlling for attributes of source and host countries and country-pair and year fixed effects



Notes: These figures show the average treatment effect on FDI from major 15 source countries, using the staggered DID estimation. We assume that the treatment is given one year before signing an MOU. The reference year is one year before the treatment. The country name for each code on the horizontal axis is as follows: China (CHN), the US (USA), the Netherlands (NLD), Luxembourg (LUX), the UK (GBR), Germany (DEU), France (FRA), Hong Kong (HKG), Japan (JPN), Switzerland (CHE), Italy (ITA), Singapore (SGP), Sweden, (SWE), Denmark (DNK), and Mauritius (MUS).

Figure A9: Effect of the BRI on FDI inflows from top 10 and 5 major source countries: Controlling for source and host country-year and country-pair fixed effects



Notes: These figures show the average treatment effect on FDI from major 15 source countries, using the staggered DID estimation. We assume that the treatment is given one year before signing an MOU. The reference year is one year before the treatment. The country name for each code on the horizontal axis is as follows: China (CHN), the US (USA), the Netherlands (NLD), Luxembourg (LUX), the UK (GBR), Germany (DEU), France (FRA), Hong Kong (HKG), Japan (JPN), Switzerland (CHE), Italy (ITA), Singapore (SGP), Sweden, (SWE), Denmark (DNK), and Mauritius (MUS).