Infrastructure, International Relations, and Foreign Direct Investment: The Case of the Belt and Road Initiative and US-China Tensions

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Abstract

This thesis examines the impact of participation in the Belt and Road Initiative (BRI) on inward foreign direct investment (FDI) and the mediating role of a country's relations with the United States. Using a sample of 159 countries from 2007 to 2022, this study conducts two difference-in-difference analyses and a regression analysis.

The findings reveal no significant effect of participation in the BRI on inward FDI, challenging the assumption that international infrastructure makes a country more attractive for foreign investors. Furthermore, this study finds no support for a mediation effect by a country's relations with the United States.

These findings contribute to the FDI literature by suggesting a more complex nature of the relations between infrastructure, international relations, and FDI flows than previously theorized. It provides valuable insights for policymakers and sets the stage for future research on FDI flows and their determinants.

13000 words including reference list

Keywords: FDI, BRI, international relations, infrastructure, China, world leadership

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1. Introduction

FDI is an important driver of economic growth and business development, gathering significant attention from academics to explaining it. Studies have conceptualized and tested the motives behind FDI (Dunning & Lundan, 2008; Vernon, 1979), the process by which firms perform FDI (Johanson & Vahlne, 1977), and the locations which firms choose for their FDI (Dunning, 1980; Narula & Santangelo, 2012).

These academics appear to agree that infrastructure is an important determinant of FDI flows (Dunning, 1980; Narula & Santangelo, 2012; Jain et al., 2016). Research on infrastructure shows that countries are more attractive as a host of FDI if they possess high-quality national infrastructure (Narula & Santangelo, 2012; Jain et al., 2016; Shah, 2014) and are connected well to the home country of the investing firm and other markets, showing potential for further expansion of the firm (Dorakh, 2021; Jain et al., 2016). Although infrastructure is theorized to be a significant determinant for a country's inward FDI and international infrastructure is suggested to have a larger impact on FDI than domestic infrastructure (Mollick et al., 2006), empirical research is often limited to infrastructure within a host country's borders (Shah, 2014; Donaubauer et al., 2016; Ross, 2019).

Furthermore, international relations are mentioned in various theories as a determinant of FDI (Narula & Santangelo, 2012; Jain et al., 2016; Zaheer, 1995). Although rare, studies do show that strong international relations appear to encourage FDI flows between countries (Desbordes & Vicard, 2005; Gangi & Ahmed, 2017; Har et al., 2010) and vice versa (Mansfield & Pevehouse, 2000; Gartzke et al., 2001), as well as for outsider countries (Rafat & Faharani, 2019; Kim, 2016). However, these studies often focus on individual cases, and studies of a larger scale measure international relations using indicators of armed conflict to measure international relations (Desbordes & Vicard, 2005; Kim, 2016). This focus on armed conflict ignores the many other facets of international relations such as economic interdependence, cultural exchanges, or diplomatic negotiations (Keohane & Nye, 1977).

These concepts together play a role in shaping FDI flows. International infrastructure projects underpinned by strong international relations in the form of bilateral investment treaties can amplify FDI by enhancing connectivity and allowing for increased market access (Desbordes & Vicard, 2005). This is demonstrated in studies of Sudan (Gangi & Ahmed, 2017) and Mexico (Mollick et al., 2006).

The general literature on FDI determinants only limitedly sheds light on these concepts as determinant of FDI flows. Although international infrastructure and relations are mentioned as factors that affect firms' decisions with regards to FDI in various popular works, academics lack clarity in the extent to which they matter and the way they interact to shape FDI.

This lack of academic understanding of infrastructure and international relations as determinant of FDI is illustrated well by the case of the Belt and Road Initiative (BRI). The BRI is a project inspired by the historic Silk Road to connect China with Asia, Russia, Europe, South America, and Africa through a network of railways and maritime routes (Belt and Road Portal, n.d.). Its goal is to provide better infrastructure for China and participating countries, to encourage Chinese firms to engage in FDI (Freymann, 2020; Wang et al., 2020; de Soyres et al., 2019).

On the one hand, studies show that participation in BRI effectively reduces trade costs and improves the efficiency of shipment among participants of the BRI (Huang, 2016; Du & Zhang, 2018; de Soyres et al., 2019). It is thereby predicted to contribute to the growth of FDI of 3 percent among countries that participate in the BRI (Chen & Lin, 2020; Lu et al., 2023; Ly, 2021), as would be expected by mainstream FDI literature. On the other hand, the BRI is also suggested to be a pawn in the ongoing tensions between China and the United States (US) (Beeson, 2018; Flint & Zhu, 2019; Zhao, 2019) and various studies report countries risking their relations with the US when joining the BRI (Chaziza, 2021; Di Lan & Vu, 2019; Wang, 2021). Following FDI literature, worsening relations are expected to negatively affect inward FDI. This dichotomy suggests conflicting expectations for the effect of the BRI on inward FDI in participating countries.

The literature on FDI is not yet developed enough to properly understand the effects of such international infrastructure and international relations on FDI flows. Because of the BRI's unprecedented scale and scope it becomes possible, as well as even more relevant than ever to understand the effect of such practices on FDI.

Inward FDI is crucial for economic growth by creating financial markets that are conducive for investment (Alfaro et al., 2004), attracting the transfer of technology, thereby enhancing domestic productivity (Borensztein et al., 1998), and creating competitive, hence efficient markets (UNCTAD, 2012). For society at large, this creates employment and improves standards of living (Blomström & Kokko, 1998). The multifaceted approach of the BRI shows much potential for boosting FDI (Zhao, 2016). In particular, developing nations with less

attractive markets and institutional characteristics are shown to have experienced more inward FDI due to the BRI (Chen & Lin, 2020). Thereby, the BRI is even suggested to help developing nations escape poverty (Chen et al., 2019). The Asian Development Bank underscores the urgency of the BRI for economic growth, estimating that developing Asia alone requires 26 trillion US dollars' worth of investment in infrastructure between 2017 and 2030 to sustain current growth rates (Asian Development Bank, 2017). At a broader level, the BRI is suggested to have the potential of increasing welfare almost worldwide by enhancing international business and trade (Jackson & Shepotylo, 2021).

Although joining the BRI could potentially enhance inward FDI, countries are afraid it will damage their relations with the US (Brattberg, 2021; Akita, 2020; Stromseth, 2019; Maduz, 2023). This has prompted many different responses. Most recently, Italy withdrew its Motion of Understanding in what is suggested to be an attempt to signify support for the US-led world order (Marino, 2023; Mazzocco & Palazzi, 2023), because of the deteriorating US-China relations and fear of secondary sanctions (Pugliese, 2020). The European Union as a whole is unable to act as a union because of conflicting opinions (Sánchez, 2022). In contrast, the US' decision to withdraw from nuclear agreements and introduction of secondary sanctions through partner countries was not enough to stop Iran from joining (Chaziza, 2021). Other countries choose to participate as part of a diplomatic strategy to diversify their dependencies on the US and China (Abuza, 2020; Di Lan & Vu, 2019; Punyaratabandhu & Swaspitchayaskun, 2018; Wang, 2021).

Although the risk of confrontation between China and the US appears to cool down, there seems to be little interest in coordination and their sanctions are not showing any significant reductions (Bown, 2023; Kim, 2024; Kennedy, 2024). At the end of 2023, the US even announced the India-Middle East-Europe Economic Corridor (IMEC), which is suggested to be an effort to provide a US-initiated alternative to the BRI (Marino, 2023). These tensions pressure countries to 'side' with either China or the US (Yilmaz, 2021; Stromseth, 2019; Huang & Wu, 2023). With their economic development on the line, it has become most relevant for countries to understand the implications of their choice to join the BRI on their relations with the US and their FDI.

To gain a better understanding of how international infrastructure and relations determine FDI, this study will investigate the effect that participation in the BRI and the strength of US relations have on inward FDI. This prompts two research questions:

RQ1: *How does a country's participation in the BRI affect that country's inward FDI?*

RQ2: *How do a country's relations with the US mediate the relation between participation in the BRI and that country's inward FDI?*

To test this, this study conducts difference-in-difference analyses and regression. Using these methods, this study aims to examine the effect of participation in the BRI on the development of inward FDI and US relations and the relation between US relations and inward FDI. The final sample consists of 159 countries including countries that joined between 2013 and 2019, who were observed from 2007 to 2022.

The analyses find no support for any change in inward FDI or US relations as a result of participating in the BRI and no role of relations with the US as mediator. This goes against the expectations of various scholars (Chen & Lin, 2020: Lu et al., 2023; Narula & Santangelo, 2012; Dorakh, 2021; Chaziza, 2021; Di Lan & Vu, 2019; Wang, 2021). By testing and finding no support for the role of determining FDI for two factors commonly understood as FDI determinants, this study highlights the need for further development of these theories. More specifically, it contributes to the growing literature on the BRI by empirically testing its effects.

2. Theoretical framework

In the introduction, the topics of FDI flows, infrastructure, and international relations and their places in academic and practical discourse were discussed. This chapter delves deeper into existing academic theory on these topics. By applying these theories to the BRI and its geopolitical context, four hypotheses about their interrelations are developed. Finally, these interrelations are presented in the form of a conceptual model.

A widely used framework for analyzing the reasons why firms engage in FDI is the eclectic paradigm. The eclectic paradigm, also known as the OLI paradigm, poses that a firm will engage in FDI under three conditions. First, a firm must have ownership advantages (Dunning, 1980). These arise from transferable firm-specific resources due to specific assets, transactional efficiency, or their institutional environment (Dunning & Lundan, 2008). Empirical evidence finds support for these types of advantages determining FDI such as the positive influence of GDP, nation-wide competitive advantages, or regulative freedom to invest (Kyrkilis & Pantelidis, 2003; Cieślik & Tran, 2019). Firms can make use of these resources while engaging in FDI, possibly even helping them compete abroad.

Second, there must be advantages of engaging in FDI due to the location a firm invests in (Dunning, 1980). At a national level, these can be derived from the domestic features or international ties. At an industry- or firm level, location advantages can arise from the collocation of other actors or the structure of the market and demand (Narula & Santangelo, 2012).

Finally, there must be advantages of internalizing the investment. Internalization advantages arise from keeping the cross-border activities in-house due to higher transaction costs when orchestrating via the market (Dunning, 1980), thereby borrowing from Transaction Cost Economics (TCE). Transaction costs refer to the resources used to organize an activity via the market (Allen, 1999). TCE assumes that transaction costs depend on the asset specificity, uncertainty and complexity, and frequency of the transaction (Tadelis & Williamson, 2012).

In line with the OLI paradigm, this means that, at the country-level, FDI can be attracted through a certain set of location features. Domestic location features can be (1) basic, legal, and financial infrastructure, (2) regulation and policy, and (3) natural assets, including macroeconomic and sociological assets (Narula & Santangelo, 2012). Internationally, FDI is determined by inter-regional ties or various forms of distance between home and host country

(Jain et al., 2016). This distance is conceptualized as being of psychic, cultural, geographic, economic, administrative, or institutional nature (Jain et al., 2016).

Infrastructure as FDI determinant

Infrastructure can be conceptualized in three distinct forms. Institutional infrastructure comprises 'all customary and established rules of the community as well as the facilities and procedures for guaranteeing and implementing these rules by the state' (Buhr, 2003, p.4), such as the legal system, a local currency, or antitrust laws. Personal infrastructure refers to the human capital that is available in a population. Finally, material infrastructure represents capital goods that are often public such as transportation, education, health facilities, or the provision of energy and water (Buhr, 2003).

Together, institutional, personal, and material infrastructure relate to many of the domestic location features that firms consider when choosing a location for FDI. Infrastructure itself is already a location feature (Narula & Santangelo, 2012), but it can also affect the access firms have to natural resources (Vakulchuk et al., 2019), firms' access to finance (Liang, 2019), or the openness of a country (Mollick et al., 2006). Through these mechanisms, infrastructure can affect FDI inflows.

At an international level, infrastructure can reduce distance. It can enhance transportation by making it efficient and affordable (de Soyres et al., 2019), making it more viable for firms to move goods across further distances and engage in FDI to support this (Dunning, 2008). Although material infrastructure and transport costs are two of the most important location determinants of FDI (Rehman et al., 2022), infrastructure might also be relevant for reducing institutional distance between countries by creating shared institutions (Xiao et al., 2023). Reduced institutional distance is suggested to increase FDI (Jain et al., 2016; Cezar & Escobar, 2015). Moreover, considering that institutions act as carriers of culture (Kostova & Zaheer, 1999), a shared institutional framework could potentially bridge cultural distance, or help compensate for it (Xu & Shenkar, 2002).

Application to participation in the BRI and inward FDI. In 2013, China's president Xi Jinping proposed the Belt and Road Initiative (BRI), an ambitious project inspired by the historic Silk Road to connect China with South(east) Asia, Central Asia, Russia, Europe, South America, and Africa through a network of railways and maritime routes (Belt and Road Portal, n.d.).

The BRI defines five major priorities: policy coordination, facilities connectivity, unimpeded trade, financial integration, and people-to-people bond (Xinhua Silk Road Information Service, 2020). Through these, it aims to enhance transportation and foster closer economic ties, political trust, and cultural exchange (Belt and Road Forum for International Cooperation, 2017). This entails a variety of projects. These projects are focused on rail and road connectivity, energy connectivity, people-to-people connectivity, or trade promotion and industrial development. This last category is designed to enhance industrial capacities, stimulate economic growth, and create jobs (Vakulchuk et al., 2019).

These priorities and projects cover all types of infrastructure mentioned before. The BRI enhances institutional infrastructure by building new, shared institutions such as Silk Road Fund, Asian Infrastructure Investment Bank, and the economic corridors (Shahriar et al., 2018). By including projects that improve living conditions and education (Vakulchuk et al., 2019, Wang, 2023), the BRI builds personal infrastructure. Finally, the physical belt and road represent the material infrastructure (Shahriar et al., 2018).

Considering the infrastructure projects that are part of the BRI, existing FDI literature would expect a country participating in the BRI to attract more FDI after joining the BRI. Therefore, this study formulates the following hypothesis:

H1: *Participation in the BRI positively affects a country's inward FDI.*

International relations as FDI determinant

The international ties that influence FDI can be defined as the entirety of interactions among states, encompassing diplomatic, economic, social, cultural, and political dynamics (Brown & Ainley, 2005). Through diplomatic dialogue, treaties, alliances, and sometimes conflict, a web of formal relations emerges (Brown & Ainley, 2005; Keohane & Nye, 1977).

These international relations can change the extent to which a country is able to attract FDI in complex manners spanning over political stability, economic policies, security concerns, and global influence. Political stability and diplomatic relations make investment predictable and lower risk, thereby enhancing confidence from the investing part (Dunning & Lundan, 2008; Shu, 2023; Li et al., 2017). Political certainty enables foreign firms to mitigate uncertainties associated with FDI (Globerman & Shapiro, 2002). Furthermore, diplomatic relations might take form in bilateral or multilateral agreements such as Free Trade Agreements. These reduce barriers to investment, making FDI more attractive (Büthe & Milner, 2008).

International ties in the form of economic integration can also enhance FDI, by providing firms with harmonized regulations (Medvedev, 2006). Similar to the advantage that comes from investing in countries with shared infrastructure with surrounding countries, similar economic policies show potential for further expansion.

Furthermore, security concerns and conflict can deter FDI (Mansfield & Pevehouse, 2000) whereas peaceful international relations and security operation can bolster FDI (Li & Resnick, 2003).

Finally, the dynamics that exist in international relations at a larger level shape FDI flows. The foreign policies of major powers have profound effects on global FDI patterns (Gartzke et al., 2001). Not only are they major sources and destinations of investment, but they also create the international economic order.

A useful lens to understand the role of these powers, is world leadership. A world leader is a country that sets the political agenda for the rest of the world by providing geopolitical order and security without military force (Modelski, 1978; Flint, 2011). This creates a system wherein countries navigate issues of conflict and cooperation through governance, overcoming the absence of a central global government (Brown & Ainley, 2005). Orchestrating this is the responsibility that comes with great power in the form of international relations and dynamics (Baldwin, 2016).

Stable recognition of a world leader is characterized by relative stability and the promotion of global trade. According to mainstream FDI literature, stability and international trade would be expected to enhance FDI. Geopolitical tensions and shifts in power dynamics, on the other hand, could conversely lead to instability and reduced global trade, thereby harming inward FDI.

Application to relations with the US and inward FDI. The current geopolitical landscape recognizes the United States as world leader (Flint, 2011). As world leader, the US does not only engage in large volumes of FDI and international trade on its own, but they also have much influence on the global economic landscape, including trade norms, financial regulations, and investment climates (Jensen, 2003; Büthe & Milner, 2008).

Because of this, it would appear that close relations and adhering to the norms installed by the US could enhance a country's attractiveness for FDI by creating political stability,

economic alignment, and the potential for easier access to the American market that comes with diplomatic ties.

Conversely, tensions with the US or deviating from the systems introduced by the US should reduce the attraction of FDI through the risks that come with bad relations such as political isolation, trade barriers, or even sanctions. Due to the US' position as world leader, these effects would be spread as coming from the US, as well as other countries that adhere to the American economic order. This leads to the second hypothesis:

H2a: *Good relations with the US positively influence a country's inward FDI.*

Infrastructure and international relations

International infrastructure can enhance connectivity between countries like previously mentioned. This connectivity facilitates economic interdependence, which inhibits more peaceful and cooperative international relations between the economic interdependent (Keohane & Nye, 1977). This way, infrastructure can even serve as a tool for diplomatic efforts to grow closer ties between countries (Calder, 2012), or project influence and build soft power (Jones & Zeng, 2020).

Application to participation in the BRI and relations with the US. The BRI is suggested to be part of an attempt to place China at the forefront of international politics, recovering China's former dominant position within Asia (Beeson, 2018; Flint & Zhu, 2019; Zhao, 2016) and serving as a brand of Chinese power (Freymann, 2020). The increased connectivity and cooperation that comes with the BRI is to allow China to exert more influence on partner and global economies, such as by being part of global production networks, creating shared jurisdictions, and coupling Chinese and foreign firms (Flint & Zhu, 2019). Although China makes effort to not provoke the dominant world leader (Flint, 2011), China is suggested to make efforts to succeed the US in this role (Abubakar Siddique, 2022).

Regardless of China's efforts, the relation between the US and China has grown to be troubled. This led to the start of a tariff war in 2018, causing a tit-for-tat response by both nations (Steinbock, 2018; Liu & Woo, 2018). By 2020, tariffs had increased by 30,4% from US on China, and 23,3% from China on the US (Li et al., 2020). The BRI helps China develop trade relations with other countries, thereby partially mitigating the effects of tariffs from the US, their largest trading partner (Saud & Arif, 2020; Fajgelbaum et al., 2021; Nidhiprabha, 2019). In combination with China's quest for more geopolitical power and challenging the

current US-led world order, the BRI has caused the relationship between the US and China to intensify even more (Blanchard, 2021).

This reconfiguration of the geopolitical landscape could have implications for the rest of the world. Based on the previously mentioned theory on infrastructure and international relations, the infrastructure created by the BRI could cause countries to create economic interdependence with China (Keohane & Nye, 1977), thereby possibly reducing economic dependence on the US.

Furthermore, these countries thereby align with some norms and policies introduced by another world power, possibly finding themselves diverging from the economic order introduced by the US. China offers these countries an alternative to the US-led world order that includes investment and infrastructure. Joining the BRI could thereby reduce dependency on the institutions originating from the US (Punyaratabandhu & Swaspitchayaskun, 2018). Considering how interdependence can create international relations (Keohane & Nye, 1977), reducing interdependence might also weaken relations.

In addition to the shift of dependency, alliances with the US might also become less sustainable when part of the BRI. Countries might be pressured by the US to not join the BRI, who wants countries to continue operating under a US-led order (Chaziza, 2021; Di Lan & Vu, 2019; Wang, 2021). This leads to the following hypothesis:

H2b: *Participation in the BRI negatively influences the relations a country has with the US.*

Considering that participation in the BRI is expected to harm relations with the US (H2b) and relations with the US are expected to determine inward FDI (H2a), these hypotheses suggest a mediation effect. This mediation effect expects that participation in the BRI has a negative indirect effect on inward FDI through relations with the US.

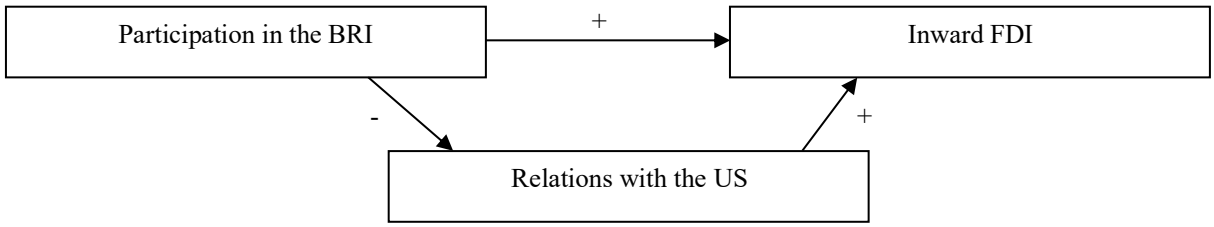
H3: *Combining the negative effect of participation in the BRI on relations with the US and the positive effect of relations with the US on inward FDI, participation in the BRI will indirectly negatively affect inward FDI.*

Conceptual model

This theoretical framework can be visualized in the form of the conceptual model as shown in figure 1, in which the relations reflect the hypotheses developed above. To summarize, the model conceptualizes participation in the BRI to positively affect a country's inward FDI

(H1). However, relations with the US also influence inward FDI positively (H2a), while participation in the BRI is expected to negatively affect relations with the US (H2b). This adds up to a model of partial mediation, with a hypothesized positive direct effect and a hypothesized negative indirect effect.

Figure 1: Conceptual model



3. Methodology

This study maintains a positivist attitude towards knowledge and therefore assumes that it can create objective knowledge based on empirical research (Bryman, 2012). This is combined with a deductive approach of using existing knowledge to create new hypotheses about that which is yet unknown (Vennix, 2019). By drawing from the literature of FDI determinants and international relations, three hypotheses were defined with regards to how these might interact. In the spirit of these approaches, this methodology section outlines how this study aims to test these hypotheses.

Data and sample

The sample this study uses consists of panel data including 159 countries and 2518 observations, ranging from 2007 to 2022. The criteria applied to selecting the participants are that (1) they are recognized by the United Nations, (2) those that participate in the BRI joined before 2020, and (3) those that participate in the BRI did not cease participation before 2023. For theoretical reasons, this study excludes the United States.

This data was retrieved from a combination of five data sets. The World Bank provides data on country-level economic indicators as well as institutional quality. Their World Development Indicators comprise data on global development including financial flows at the country-level[1]. Their World Governance Index uses aggregated data to represent the quality of governance, based on the measurement of six dimensions: voice and accountability, political stability and absence of violence/terrorism, government effectiveness, regulatory quality, rule of law, and control of corruption[2]. These are used to collect data about indicators of national economic development and institutional quality.

Third, the database of United States Census Bureau is used[3]. They provide monthly data on the United States' economy and international trade. This study collects data about bilateral trade between the United States and other countries. Fourth, this study will make use of the dataset by Voeten, Strezhnev and Bailey, which contains data about the voting behavior of countries in the United States General Assembly from 1946 to 2022[4]. Finally, this study collects

[1] Please refer to: World Bank (n.d.-a)

[2] Please refer to: World Bank (n.d.-b)

[3] Please refer to: United States Census Bureau (n.d.)

[4] Please refer to: Voeten et al., (2009)

data from a dataset by Nedopil, which reports the countries that participate in the BRI and their date of joining[5].

The collected data was inspected for missing values and outliers. Observations with data missing for over half of total values or for over half of the values of the dependent variable throughout the years are considered problematic. These observations or participants were therefore removed from the sample. Missing values for one control variable exceeded the acceptable threshold of 10% and were dependent on other variables. These were therefore remedied using Multiple Imputation, creating twenty new datasets. Analyses will be conducted on all twenty datasets and then aggregated applying Rubin's rules.

Based on z-scores and visual inspection, outliers were detected at the univariate, bivariate, and longitudinal level. The Netherlands and Switzerland were identified as problematically unique observations and are therefore removed. Their values varied from higher than all others to lower than all others due alternating between high levels of investment and disinvestment. Furthermore, Angola and Yemen repeatedly arise as an outlier in the way that they develop. This might be due to the financial crisis and outbreaks of yellow fever and many other diseases in Angola around the start of 2016, and the Yemeni civil war that started in 2014. These make extraordinary events that could potentially impact the development business and FDI. Therefore, they were removed from the sample.

Variables

The dependent variable of the conceptual model in this study is inward FDI at the country-level. This study understands *inward FDI* as the number of US dollars that are invested into a country by foreign entities, resulting in an ownership of at least 10%. This study takes the value of the investment rather than the quantity to account for the significance of the investment for the domestic economy, the level of commitment from foreign investors, and relevance for policymaking and economy. Larger investments typically inhibit larger commitment and larger impact on a domestic economy (Johanson & Vahlne, 1977; Blomström & Kokko, 1998). This data is retrieved from the World Bank's World Development Indicators.

This study considers *participation in the BRI* as the independent variable. A country is considered part of the BRI once it has signed a Memorandum of Understanding. This formal

[5] Please refer to: Nedopil, C. (2023)

action officially declares a country's cooperation in the BRI. This variable, therefore, is a dummy variable indicating whether a country is a participant or not. For methodological purposes, this study will consider the year in which a country signed the Memorandum of Understanding too. This information will be retrieved from the dataset of Nedopil.

The hypothesized mediator is the variable that represents a country's relations with the US. To capture the entirety of international relations, this variable is operationalized based on the framework of international relations by Keohane and Nye (1977). They theorize international relations to be made up out of economic interdependence, political engagement, cultural and social ties, technological and scientific cooperation, and legal and institutional similarity. The primary arguments for this study to hypothesize a mediation effect are based on economic interdependence, political engagement, and legal and institutional similarity. Therefore, this operationalization is simplified to include these dimensions only.

The first dimension, economic interdependence, will be measured by bilateral trade dependence, calculated as the average dependence on bilateral trade of the observed country and the United States. The dependence on bilateral trade is calculated by dividing bilateral trade by GDP. The data for this variable are retrieved from the US Census Bureau's dataset and the World Bank's World Development Indicators.

The second dimension, political engagement, is measured by the means of voting alignment between the observed country and the US in the United Nations General Assembly. For this, a value will be computed by assigning scores for voting similarity per voting session. If both countries vote the same, 1 point is assigned. One country voting 'yes' or 'no' and the other abstaining result in 0,5 point. Both countries voting different, none abstaining, receives 0 points. This was inspired by the computation of similar variables by the creators of the dataset themselves. The average of these scores per year represent the alignment between both countries' votes where a value of 1 represents identical voting and a value of 0 represents absolutely different voting. This score is computed using the dataset of Voeten et al.

The third dimension, legal and institutional similarity, is represented by the institutional similarity between the observed country and the United States. The absolute differences between the scores of the observed country and those of the United States on the six dimensions of the World Bank's World Governance Index are calculated. The average of these differences as subtracted of the largest possible average difference to compute a score where 1 represents identical values, and 0 represents absolute difference.

These three indicators are standardized using z-scores and then averaged to create the final value representing relations with the US. The operationalization of this variable is presented in table 1.

Table 1: Operationalization of relations with the US

Relations with US	Economic interdependence	Bilateral trade dependence
	Political engagement	Voting alignment in United Nations General Assembly
	Legal and institutional similarity	Institutional similarity

To account for the influence of other contextual factors, this study includes some commonly argued FDI determinants as control variables. Studies show that inward FDI is determined by multiple factors at the national level, an especially important one being macroeconomic context (Jain et al., 2016). Boateng et al. (2015) find that important macroeconomic factors to influence FDI are GDP and trade openness, which is defined as the share of total international trade in GDP. To increase the validity of this study, the model controls for the effect of both these factors on FDI. These values will be retrieved the World Bank's World Development Indicators.

Furthermore, numerous studies report the large effect of institutional quality on attracting FDI as country (Buchanan et al., 2012; Masron & Abdullah, 2010; Bénassy-Quéré et al., 2007). Therefore, this study will also control for institutional quality, retrieved from the World Bank's World Governance Index (WGI). This variable will be computed as the average of the values of the six dimensions.

Methods and assumptions

This model hypothesizes a direct effect of the independent variable on the dependent variable, as well an indirect effect through the mediator. Such analysis involves the estimation of the following relations: (1) the IV and DV, (2) the IV and M, (3) the M and DV, controlling for the IV, (4) the IV and DV, controlling for the M, and (5) the IV and DV through the M, or the mediation effect (Hair et al., 2019).

Estimating these different relations involves two methods. For the relations of the IV with the DV and M, I conduct two difference-in-difference analyses. Difference-in-difference (DiD) analysis makes use of panel data to examine the development of a value over a certain time period. To examine the effect of a certain 'treatment', in this case participation in the BRI,

the developments of a treatment group and a control group are compared. This way, it can establish whether the treatment group develops differently from the control group once the treatment was introduced. When applied to this study, this method translates to the following mathematical equation:

$$InwardFDI, US\ relations_{c,t} = \alpha + \beta_1 BRI_c + \beta_2 POST_t + \beta_3 (BRI_c \times POST_t) + \beta_4 ControlVars + \varepsilon_{i,t}$$

c = country

t = year of measurement

α = intercept

β = coefficient

ε = error

POST = number of years post-treatment

The advantage of this method lies in its ability to overcome heterogeneity of units (Hair et al., 2019). It does, however, typically require the treatment group to undergo treatment all at the same time. In this sample, countries join the BRI at different times. Conducting a standard DiD analysis elevates the risks of making Type-I and Type-II errors (Baker et al., 2022).

To account for this, this study will conduct a DiD as adapted by Callaway and Sant'Anna (2021). This adaptation controls for the heterogeneity between treatment groups, in this case based on the year in which they join. This adaptation further divides the treatment groups based on the time at which they undergo treatment. It estimates treatment effects for each group and aggregates these to get an overall treatment effect.

The relation between M and DV will be estimated by the means of a regression. This translates to the following mathematical equation:

$$InwardFDI_{c,t} = \alpha + \beta_1 US\ Relations_{c,t} + \beta_2 ControlVars_{c,t} + \varepsilon_{i,t}$$

c = country

t = year of measurement

α = intercept

β = coefficient

ε = error

Because this sample contains data for a number of years, countries are observed multiple times. To account for the unobserved unique characteristics that partially determine the dependent variable for all the years measured, this study uses regression specifically designed for panel data. This adaptation includes either random or fixed effects that constantly influence countries. A Hausmann test (see appendix 1) revealed these unobserved unique effects to be uncorrelated with the independent variables of this study. Therefore, the regression will be estimated using random effects.

To estimate the mediation effect, the interactions between the IV and M and between the M and DV are multiplied. Their validity will be determined using Sobel's test:

$Z = \frac{A \times B}{\sqrt{(A^2 \times s_b^2) + (B^2 \times s_a^2)}}$ (Hair et al., 2019)

A = interaction coefficient of IV and M

s_a = standard error of the interaction of IV and M

B = interaction coefficient of M and DV

s_b = standard error of the interaction of M and DV

In order to conduct these analyses, the data is assumed to meet the assumptions of linearity, homoscedasticity, normality of the error term distribution, and independence of the error terms. Furthermore, the data that is used in DiD analysis must meet the assumption of following parallel trends to the control group before treatment.

These assumptions were tested using visual inspection of histograms and scatterplots, a Breusch-Pagan test for heteroscedasticity, a Woolridge test for autocorrelation in panel data, and a test for pretreatment parallel trends. A couple of violations were found. First, visual inspection showed abnormal distributions of inward FDI, GDP, and trade openness (see appendix 2). Furthermore, the scatter plots Breusch-Pagan test indicated a violation of the assumed homoscedasticity (see appendix 3 to 5). The Woolridge test revealed that error terms were not entirely dependent (see appendix 6). This means that the errors of a country over the years depend on other errors for that same country through the years. Finally, the test for pretreatment parallel trends showed violations (see appendix 7). In the analysis of BRI participation and inward FDI, countries that joined in 2014 did not follow parallel trends to the control group. In the analysis of BRI participation and relations with the US, only countries that joined in 2015, 2017, and 2019 followed parallel trends to the control group.

These violations were remedied by transforming GDP and trade openness into logistic variables. Inward FDI is left out on purpose, so as not to tort with the interpretability due to its role as dependent variable. To remedy heteroscedasticity, further analysis will be conducted using robust standard errors. As for the violation of the Woolridge test, it must be noted that panel data is inherently at risk of error terms depending on one another because observations are part of the same time series or cluster of participants. Because this data primarily used to conduct DiD analysis where development is key, this violation is ignored. Finally, the violations of parallel trends will be remedied by excluding the groups for which the assumption is violated. This excludes one country, Thailand, from the analysis of BRI participation and inward FDI and 53 countries from the analysis of BRI participation and relations with the US.

This concludes the preparation of the sample. The next chapter will further describe the content of the sample and the results of the analyses.

4. Results

The previous chapter described the design of this research, including the sample that is used, the variables that are measured, and the methodology this study applies to gain insight into the relations between participation in the BRI, relations with the US, and inward FDI. The results of these analyses are presented here.

Descriptive statistics

The variables of this study are described in table 2. These tables include the variables as they will be used in analysis after imputation, outlier removal, and application of remedies for violated assumptions. Visual representation is found in appendix 2. Table 2 shows that the average value of InwardFDI is 8,35 billion US dollars. The values of InwardFDI measured in this sample range from -322 billion to 344 billion US dollars and the standard deviation is 28 billion US dollars, indicating a high kurtosis. The variable US_Relations is on average observed at a value of 0,0472794. The histogram shows that it is distributed quite normally. lnGDP and lnTradeOpenness are both transformed and therefore cannot be interpreted directly. Their transformations, however, indicate that most countries originally fall on the lower end of GDP and trade openness. On average, countries score -0,0106179 on InstitutionalQuality, with a range from -2.220968 to 1.8833. The descriptive data and distribution indicate that the quality of institutions is more often worse than the average than it is better than average.

Table 2: Descriptive data of metric variables

Variable	Obs	Mean	Std. dev.	Min	Max
InwardFDI	2513	8.35e+09	2.80e+10	-3.22e+11	3.44e+11
US_Relations	2514	0.0472794	0.5288788	-1.734.514	7.957.235
lnGDP	2515	2.431.084	2.321.284	1.715.046	3.051.934
lnTradeOpenness	2292	4.348.829	0.5327373	0.0507977	7.327.423
Institutional_Quality	2517	-0.0106179	0.839051	-2.220.968	18.833

Furthermore, about a quarter of countries in this sample never participated in the BRI and are part of the control group. The treatment group is spread over groups that join between 2013 and 2019. The group of countries that joined in 2014 and 2016 contain noticeably less observations than other groups. The largest group of observations belong to the group that joined in 2018, containing 851 observations.

Table 3: Descriptive data of categorical variables

	Freq.	**Percent**	**Cum.**
BRI_Country_dummy			
0	624	24.78	24.78
1	1894	75.22	100.00
Total	2518	100.00	
JoinYear			
0	624	24.78	24.78
2013	128	5.08	29.86
2014	16	0.64	30.50
2015	260	10.33	40.83
2016	64	2.54	43.37
2017	351	13.94	57.31
2018	851	33.80	91.10
2019	224	8.90	100.00
Total	2518	100.00	

Findings

Earlier we hypothesized that participation in the BRI (H1) and maintaining good relations with the US (H2a) positively affects a country's inward FDI. However, participation in the BRI is hypothesized to negatively affect a country's relations with the US (H2b), and through this negatively affects inward FDI (H3). In line with the former chapter, these hypotheses are tested by estimating a total of five relations.

All results are presented in table 4 and 5. Visual representation of the DiD analyses can be found in appendix 8. The first model in table 4 presents the results of the regression analysis in the form of B coefficients and standard deviations of the control variables. The first model shows only lnGDP to be a significant control variable at a p-level below 0,01, with a coefficient of 4.93e+09. This means that a 1% increase of GDP results in an increase of inward FDI by 49,3 million US dollars. Furthermore, the constant of -1,11e+11 is significant with a p-level below 0,05. Important to note is that lnTradeOpenness and InstitutionalQuality appear to be non-significant predictors of InwardFDI.

Table 4: Results of regression inward FDI and relations with US

	InwardFDI		
Variables	**Model 1**	**Model 2**	**Model 3**
US_Relations			-1.53e+09
			(1.09e+09)
		-1.32e+09*	-1.40e+09**
BRI_Country_annual		(4.60e+08)	(4.82e+08)
lnGDP	4.93e+09**	5.11e+09**	5.15e+09**
	(1.67e+09)	(1.67e+09)	(1.68e+09)
lnTradeOpenness	-3.20e+08	-4.70e+08	-1.93e+08
	(1.57e+09)	(1.59e+09)	(1.52e+09)
InstitutionalQuality	3.46e+09	3.39e+09	3.62e+09
	(2.19e+09)	(2.17e+09)	(2.24e+09)
Constant	-1.11e+11*	-1.14e+11*	-1.16e+11**
	(4.04e+10)	(4.02e+10)	(4.03e+10)
Observations	2291	2291	2291
Number of companies	145	145	145
R-squared within	0,0024	0,0026	0,0034
R-squared between	0,3145	0,3158	0,3109
R-squared overall	0,2074	0,2086	0,2056
Standard errors inbetween parentheses **p<0,01, *p<0,05			

Table 5 presents the results of the three DiD analyses with InwardFDI and US_Relations as dependent variables. These tests measure the change in development of the dependent variable as a result of undergoing treatment. Hypothesis 1 poses that participation in the BRI positively affects inward FDI. However, the absence of any asterisks in table 5 tells that there appear no significant effects on InwardFDI as a result of treatment. This means that there is not enough evidence to reject the null hypothesis that treatment groups developed in parallel to the control group after treatment. Therefore, hypothesis 1 is rejected.

Table 5: Results of DiD analyses

	InwardFDI	**InwardFDI, controlling for US_Relations**	**US_Relations**
ATT	2.25e+09	2.20e+09	-.0080988
	(1.89e+09)	(1.79e+09)	(.0248469)
ATT G2013	-1.61e+09	-2.05e+09	
	(3.09e+09)	(2.75e+09)	
ATT G2014			
ATT G2015	8.55e+08	1.29e+09	-.0418082
	(2.34e+09)	(2.37e+09)	(.0613747)
ATT G2016	3.08e+09	2.88e+09	
	(1.09e+10)	(1.00e+10)	
ATT G2017	6.88e+09	6.43e+09	.0231071
	(5.42e+09)	(5.91e+09)	(.0422757)
ATT G2018	1.36e+09	1.47e+09	
	(1.35e+09)	(1.20e+09)	
ATT G2019	4.21e+09	3.85e+09	-.004048
	(5.92e+09)	(5.74e+09)	(.0577234)
Observations	2488	2268	1452
Standard errors inbetween parentheses **p<0,01, *p<0,05			

The third model of table 4 includes the independent variable of interest, relations with the US, in the regression analysis while controlling for participation in the BRI. According to hypothesis 2a, a positive effect of relations with the US on inward FDI is expected. The results of the regression show that US_Relations has no significant effect. Therefore, the null hypothesis that US_Relations has no effect on InwardFDI must be accepted, thereby rejecting hypothesis 2a.

Hypothesis 2b poses that participation in the BRI negatively affects a country's relations with the US. Table 5 presents the outcome of the DiD analysis that tested this, showing no significant ATTs. This means that the DiD analysis found no evidence that treatment changes the development of US_Relations. Therefore, hypothesis 2b is, too, rejected.

Hypothesis 3 summarizes hypotheses 2a and 2b and expects there to be an overall negative mediation effect through the relations with the US. Using the methodology described earlier, the mediation effect would have a coefficient of 10,933,380 and a Z-value of approximately 0,316. This corresponds to a p-value of approximately 0,752. The high p-value of the mediation effect does not meet the threshold of 0,05 and so it cannot support that there is a mediation effect. This is reflected in table 5, showing that although controlling for US_Relations alters the ATTs, these are still not significant. Therefore, hypothesis 3 is rejected.

Robustness checks

To test for robustness of the DiD models, forwarded and lagged variables are included in four more DiD analyses. Variables were forwarded and lagged as much as two years to ensure at least one year of observations after treatment. The results of these analyses are in appendix 9. None of these analyses with InwardFDI as dependent variable prove a significant ATT at $\alpha = 0,05$. Therefore, the DiD model of BRI and InwardFDI appears robust against changing timing. The models with US_Relations as dependent variable show a couple of significant ATTs. These occur for the group that joined in 2014, and once overall. The group of 2014 is not parallel to the control group. Therefore, their results are not reliable. However, one more significant ATT is measured when applying a lag in time of two years. This could suggest some sensitivity of the DiD model of US_Relations.

The robustness of the regression is tested by transforming the independent variables into interaction variables with BRI_Country_annual. The results of this test, as shown in appendix 10, indicate that none of the interaction effects are significant. This indicates certain robustness against other types of relations.

Finally, the estimated models are tested for robustness by splitting the sample based on the countries' GDP. Countries were divided over four groups, based on the quartile they belonged to in the distribution of GDP. Appendix 11 shows the results of these tests. The results show a significant result for the effect of US_relations on InwardFDI for countries in the third quartile with a coefficient of 1,73 billion. This means that an increase of relations with the US by one point of the scale used in this study would result in an increase of 1,73 billion US dollars' worth of FDI, for countries within this GDP range. The significant coefficient indicates that the earlier results of the regression are not entirely robust.

The results of this robustness test on the DiD models are also shown in appendix 11. For the DiD model with InwardFDI as dependent variable, there are various significant ATTs. The overall ATTs are significant for countries in the first and fourth quartile with coefficients of -6.58e+07 and 1.29e+10, respectively. This indicates that for countries in the first quartile, participation in the BRI would lead to a decrease of inward FDI of 65,8 million US dollars. For countries in the fourth quartile, participation in the BRI is suggested to result in an increase in inward FDI of 12,9 billion US dollars. This indicates that the formerly estimated model might not be robust against different levels of GDP.

The DiD model with US_Relations as its dependent variable displays a number of significant ATTs for groups based on their year of joining the BRI, however not for overall quartiles. Therefore, the formerly estimated model does seem robust against different levels of GDP for the estimation of changing relations with the US as a result of participating in the BRI.

5. Discussion

The previous chapter presented the results of various DiD and regression analyses. The analyses identified the presence and absence of a number of relations in the sample. This chapter delves into these study's findings, exploring their implications for the academic understanding of infrastructure, international relations, and FDI as well as the practical implications for the BRI, geopolitics, and economic objectives. It also critically examines the limitations of these findings in drawing reliable and valid conclusions. Lastly, this chapter translates these implications and limitations to suggestions for further research.

The BRI and inward FDI

In the theoretical framework, theories were discussed that argue infrastructure makes a location more attractive for FDI. Placed in the eclectic paradigm of Dunning and Lundan (2008), greater infrastructure would provide a country with an additional location advantage. It hereby would help satisfy at least one of the three requirements for a firm to engage in FDI. This way, this study argued that infrastructure could make a country more attractive as location for FDI. For this reason, this study hypothesized that a country's participation in the BRI would enhance inward FDI.

However, this study could not support this hypothesis. In this sample, countries do not receive more or less inward FDI as a result of joining the BRI. This implies that BRI participation does not bring the location advantage that was hypothesized in this study. This could be due to the BRI not delivering the advantages it is planned to bring. Previous empirical studies suggest that although the BRI has successfully lowered certain trade barriers (Cui & Song, 2018), the BRI is not necessarily successful in creating financial integration (Yu et al., 2020) and fails to close certain political gaps among participants (Kuik, 2020). Furthermore, the BRI is already argued by some to be hindered by debt, feasibility, and political instability resulting in the delay of projects (Zhu, 2023).

Furthermore, these results could imply that the common assumption that infrastructure attracts investment is incorrect, and give indication of a more complicated relation between infrastructure and inward FDI. Through its infrastructure, the BRI was hypothesized to (1) lower the threshold to investing in foreign countries or (2) allow for the use of a host country as 'springboard' for easier access to other countries if the firm is located outside the BRI. Although the latter presents something attractive, the former might simply be the removal of

a hygiene factor. If this would be the case, removing the hygiene factor might not do much if the host country still lacks attractors. This might explain the sensitivity of the model to variations in host countries' GDP, suggesting that other factors determine how attractive a host location is.

The absence of a relation between participation in the BRI and inward FDI in this sample contradicts predictions of Chen and Lin (2020) and empirical testing by Rehman et al. (2022). More general, the absence of this relation goes against general literature on infrastructure and inward FDI. Other studies, too, found that the availability of infrastructure in the host country positively affects inward FDI (Shah, 2014; Kaur et al., 2016; Mollick et al., 2006). However, the sensitivity of this relation to the level of GDP does resemble what other studies found. Suh and Boggs (2011) found that the effect of communication infrastructure on inward FDI depend on the development of the host country.

Relations with the US as mediator

The mediation effect that was hypothesized in this study essentially consists of two relations: the effect of relations with the US on inward FDI, and the effect of participation in the BRI on relations with the US.

As for the first half, similar to infrastructure, relations with the US were also theorized to enhance inward FDI. By adhering to the system laid out by the world leader, countries are suggested to be part of a system of relative stability and the promotion of global trade. Theory suggests both of these to enhance FDI and location choice. With this reasoning, this study hypothesized a country's relations with the US to positively affect inward FDI.

Yet, this study was not able to support this hypothesis. There could be various explanations for this.

First of all, the results can be explained using literature. At an extreme, these results could indicate that the world leader has lost importance. Scholars argue that the last cycle of world leadership as introduced by Modelski (1978) has recently ended as the US gradually lost their position, and that there will be no successor. Instead, it is argued that the world will be lead in a multipolar manner, relying on multiple actors to carry the responsibilities of previous world leaders (Posipsil, 2013; Rennstich, 2004). This would suggest that international relations with the US might no longer determine FDI to the same extent as theorized before.

Another possibility is the misspecification of who the world leader is. China is suggested to make efforts to succeed the US in their role as world leader (Abubakar Siddique, 2022), or share this responsibility with the US (Brooks & Wohlforth, 2016). Although others argue this to be unlikely (Enescu, 2023; Chan, 2007), these contradicting speculations could be at the root of a possible misspecification of the US as world leader. In this case, worsening relations with the US might be made up for by improved relations with China. This, however, was outside of the scope of this research.

Finally, the results can be explained by the methodology applied. This study is new and adds to the literature precisely for its new operationalization of the relation between two countries. However, this is an early attempt at quantifying international relations. This quantification was inspired by theory and included aspects previously often ignored, however it has not yet been tested. Therefore, the operationalization likely still needs refinement.

Overall, this study gives reason to suspect a more complex relation between world leadership and international relations and inward FDI than previously theorized. Instead of simple enhancement, relations with a world leader might have to be placed into context of geopolitical developments.

In the theoretical framework, infrastructure was linked to increased interconnectedness, leading to more peaceful and cooperative international relations. With the use of these, infrastructure is suggested to be a tool to project influence and build soft power. This study researched the case of the BRI, which was initiated by China. China is suggested to be a possible competitor of the current world leader, the US. In an aim to maintain its status as world leader, the US is expected to push back against any advancements in the BRI. Based on this, it was hypothesized that BRI participation would negatively affect a country's relations with the US, thereby representing the other half of the mediation effect.

This study's findings did not confirm this and found no change in relations with the US as a result of joining the BRI. One explanation could be that, in reality, infrastructure is simply not that important to geopolitics. Although the BRI is considered the largest infrastructure project to ever exist (Kirchherr et al., 2018), these results could suggest that a multitude of projects is necessary to measure a significant change.

Another explanation lies closer to the behavior of the US. It is possible that participation triggers not as much disapproving behavior in the form of worsening relations as expected. The US's international relations are what attributed them their power and

ultimately awarded them the position of world leader. It is thinkable that the US does not worsen relations at the risk of losing connectedness and power.

Additionally, it might be fruitful to consider the cases of countries that join the BRI in the hopes of spreading their interdependencies. This hypothesis is based on the shift of the source of countries' dependencies from the US to China, which was observed by various scholars (Abuza, 2020; Di Lan & Vu, 2019; Punyaratabandhu & Swaspitchayaskun, 2018; Wang, 2021). However, the reasoning of these countries indicates that participating countries do not relocate all efforts previously aimed at the US to China. Instead, they relocate only part; in contrast to the extreme shift that was assumed in the theoretical framework. The absence of a relation between BRI participation and relations with the US could be due to a lesser decline in dependence on the US than considered in formulating the hypothesis.

Finally, it is possible that participants in the BRI relocated even less of their dependencies from the US to China. As this study found no effect of participation in the BRI on inward FDI, it could be that countries did not find another source of security and dependence in China from joining the BRI. After all, this sample does not suggest countries can rely on the BRI for inward FDI. This would mean that countries did not become less dependent on the US as a result of joining the BRI, thereby giving less reason to the US to loosen relations and push back against BRI participation.

Because the results show no relation between participation in the BRI and relations with the US, this could mean that the relation between infrastructure and international relations is not as straightforward as expected. This finding aligns with scholars who recently highlighted the varied impacts infrastructure projects like the BRI can have depending on the national and international context (Jones & Zeng, 2020; Pajunen, 2008). As this study lacks evidence for a relation between participation in the BRI and relations with the US as well as between relations with the US and inward FDI, it also lacks evidence to suggest a mediation effect.

Limitations

The results of this study are limited by a couple of factors. First of all, this study assumes that participation in the BRI guarantees improvements in infrastructure. As discussed earlier, studies show mixed evidence of the BRI's progress in realizing its five major priorities.

Second, the research design is somewhat flawed. The operationalization of the variable of US_Relations is, although based on an established framework of international relations, new and not tested for validity. This study was also limited to measuring at most nine years of participation in the BRI. Considering the size infrastructure projects might take, the improvements planned as part of the BRI, or its effects might not yet be fully realized.

Third, the sensitivity of the DiD methodology to violations of their assumptions required certain years to be removed from analyses. This limits the validity of these research. Furthermore, the robustness checks revealed some significant and contradicting results when grouping countries based on their GDP. This implies the presence of a more complex relation, or perhaps the importance of certain other factors that were outside of the scope of this study.

Finally, this study is limited in making conclusions about the effect of infrastructure. Although this study represents the majority of all countries, it represents only one infrastructure project. More specifically, an infrastructure project known for its unprecedented size and tense diplomatic context. Therefore, these results cannot be generalized to predict the effect of just any infrastructure project on international relations and FDI flows.

Implications for theory and practice

Despite its limitations, this study presents academics and practitioners with various valuable insights. For academics, this study challenges the widely held assumption that infrastructure attracts FDI. The absence of a significant relation between participation in the BRI and inward FDI suggests that the relation might be more complex than previously theorized. The FDI literature could benefit from reevaluating this relation.

Another commonly assumed predictor of inward FDI lies in international relations. These findings suggest that relations with the world leader, or one of the world's most powerful countries, do not replicate this assumption. The lack of support for this mediation effect implies that there are other factors at play in the relation between international relations and FDI flows.

For policymakers, these findings help gain insight in the effect of the BRI or other infrastructure projects on international relations and economic outcomes. These findings show that infrastructure or specifically the BRI does not necessarily help a country attract

firms' investment. These effects might be contingent on the specific circumstances a country is in.

However, these findings also do not give reason to fear the BRI for what it will do with a country's international relations. The findings cannot support the harm that policymakers fear participation in the BRI will do to relations with the US. Additionally, the findings cannot support that worsening relations with the US should be feared for the sake of inward FDI.

Suggestions for further research

So far, this chapter has discussed the findings of this study and how they relate to existing theory, their limitations, and their implications for both academics and practitioners. This discussion has identified various gaps that withhold us from properly understanding and explaining the interrelations of infrastructure, international relations, and FDI. Based on this, the following lines of further research are suggested.

First of all, the FDI literature would benefit from more research into the effect of infrastructure on FDI flows. These studies could include a variety of infrastructure projects and home- and host location contexts. Predictions of FDI based on infrastructure could attain more reliability with which these theories can be applied to new contexts and infrastructure projects.

Furthermore, the understanding of international relations as predictor of FDI flows could be improved by more studies aiming to construct generalizable theory. So far, various scholars have studied the subject by the means of case studies. This study failed to find a generalizable role of international relations in this context, implying that there are important factors beyond the scope of this study. I would encourage academics to continue these efforts, so that we may make progress in understanding such a complex subject.

6. Conclusion

The literature on FDI commonly assumes that infrastructure and international relations are key determinants of FDI flows. However, many empirical studies are limited to single case studies and consider infrastructure only within the boundaries of the host country. Given its unprecedented scale and scope, the BRI has created the demand and opportunity for studying how such an international project influences FDI flows across multiple countries and contexts. This understanding is crucial for both academics and policymakers as they navigate the right path towards economic development.

By answering the research questions ‘How does a country’s participation in the BRI affect that country’s inward FDI?’ and ‘How do a country’s relations with the US mediate the relation between participation in the BRI and that country’s inward FDI?’, this study contributes to the further development of FDI literature and provides policymakers with new insights. Based on data of 159 countries from 2007 to 2022, this study concludes that participating in the BRI does not clearly affect inward FDI. Furthermore, this study concludes that participating in the BRI does not clearly change relations with the US, nor that these relations matter for the sake of inward FDI. Therefore, countries’ relations with the US are not found to mediate the relation between participation in the BRI and that country’s inward FDI.

These findings add to the existing FDI literature by suggesting a more complex nature of the interrelations between infrastructure, international relations, and inward FDI than previously theorized. Hopefully, this inspires academics to conduct further research on various infrastructure projects and countries from all kinds of international contexts.

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Appendices

Appendix 1: Haussmann test for fixed or random effects regression

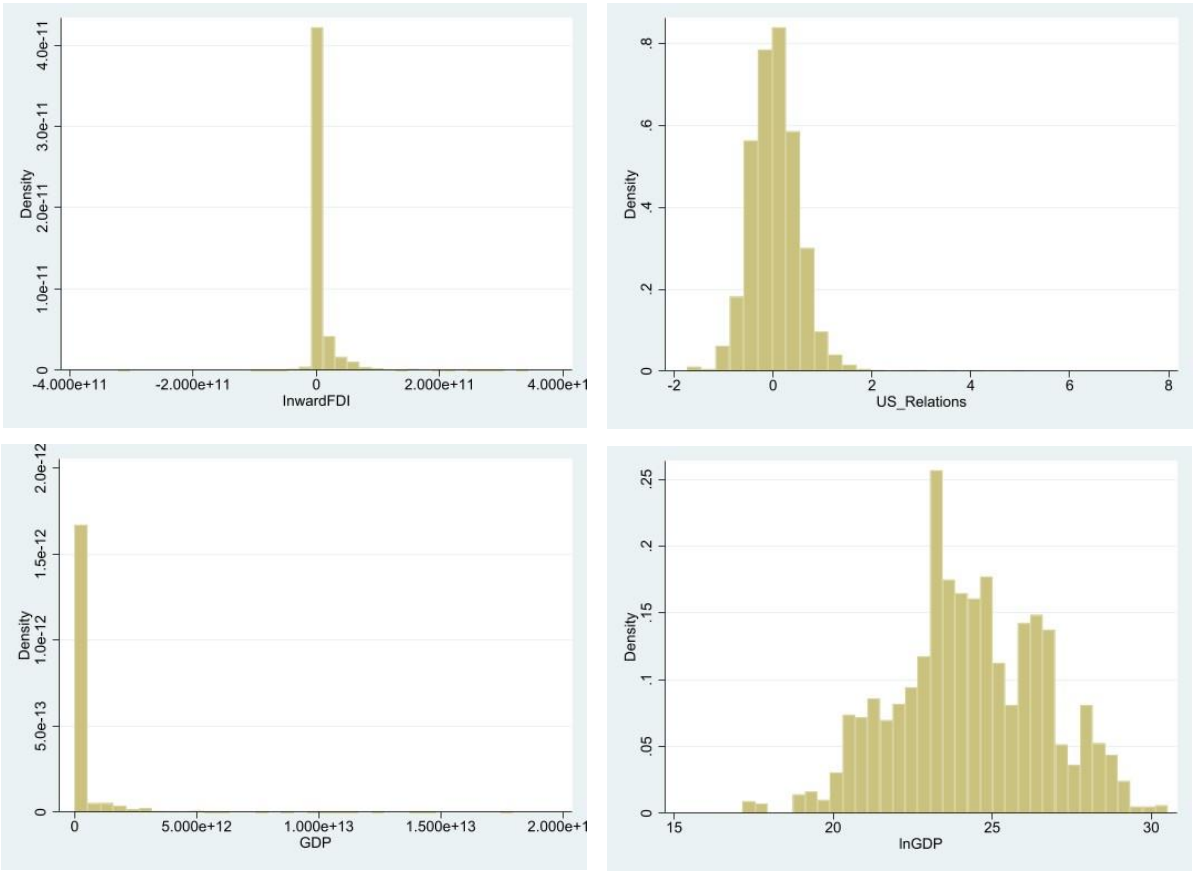
	fe_model	re_model	Difference	Std. Err.
US_Relations	-2.01e+09	-1.40e+09	-6.13e+08	5.55e+08
lnGDP	2.05e+09	4.72e+09	-2.67e+09	1.35e+09
lnTradeOpenness	4.43e+08	1.29e+08	3.14e+08	7.76e+08
InstitutionalQuality	7.12e+09	2.77e+09	4.35e+09	2.65e+09

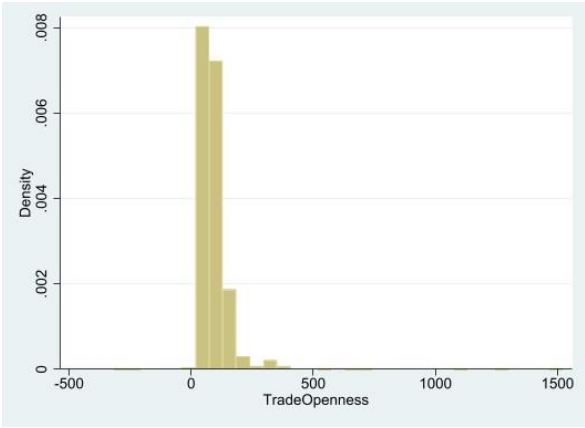
Test of H0: Difference in coefficients not systematic

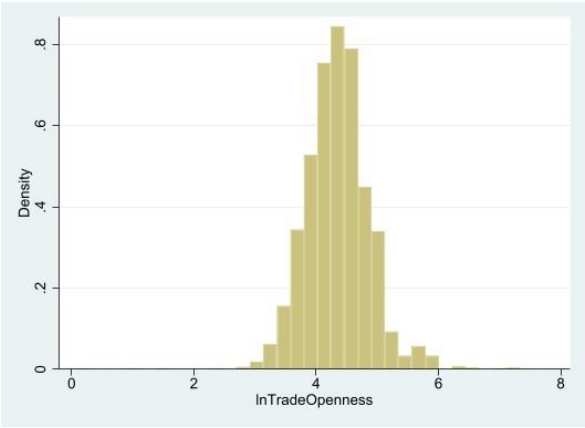
chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B) = 7.24

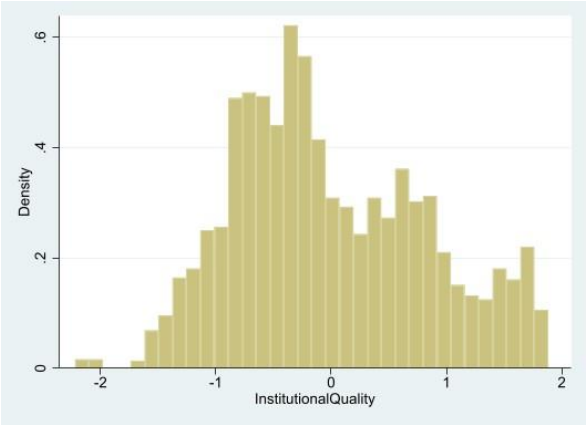
Prob > chi2 = 0.1236

Appendix 2: Distributions of all variables

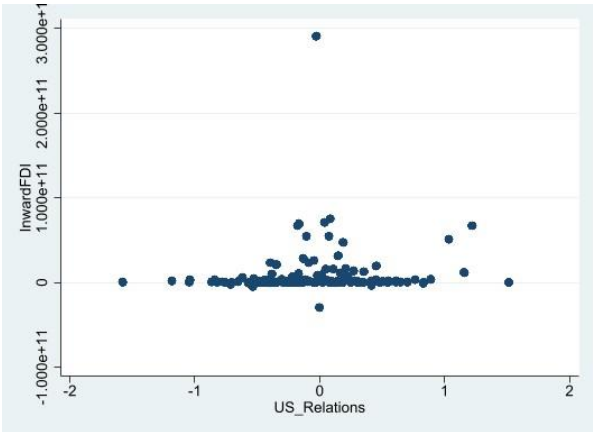


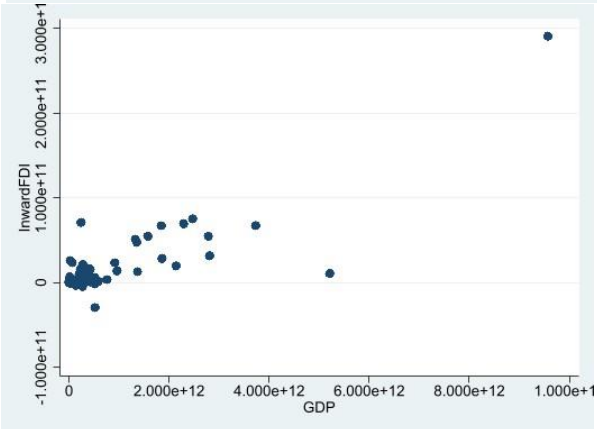


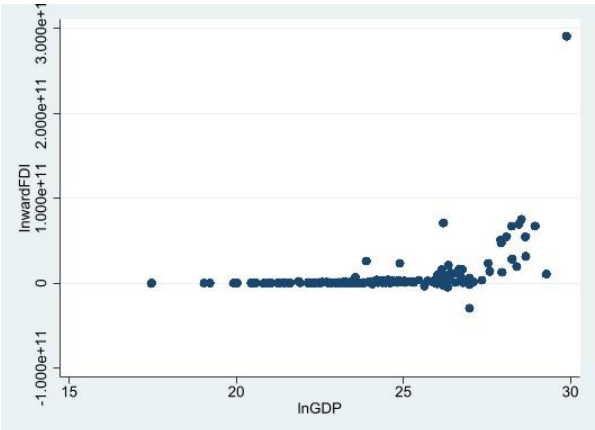


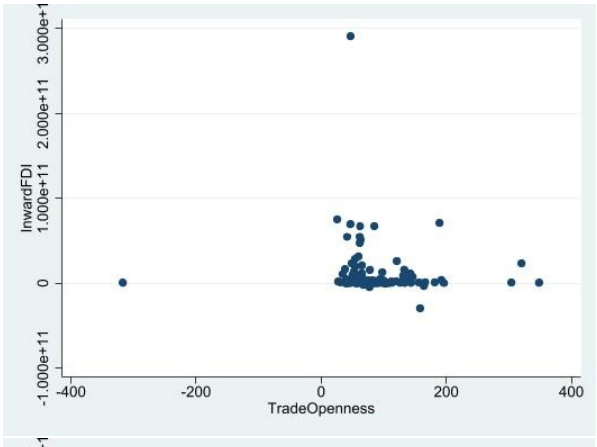


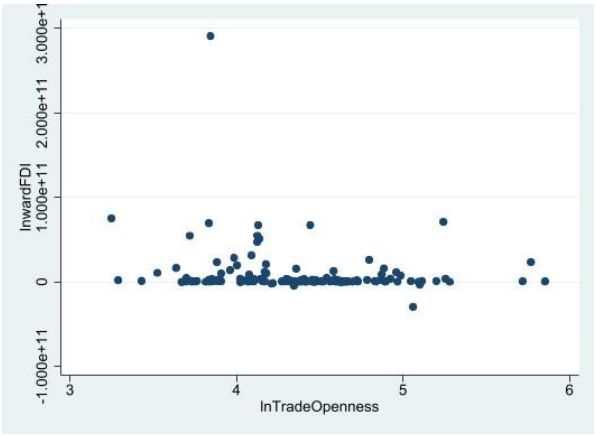
Appendix 3: Plots for all hypothesized and assumed relations for observations measured in 2013

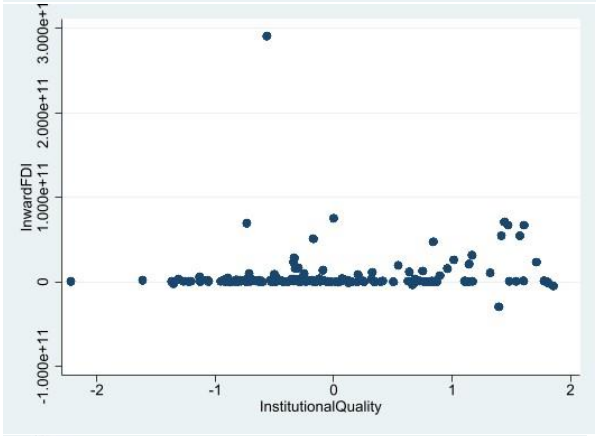


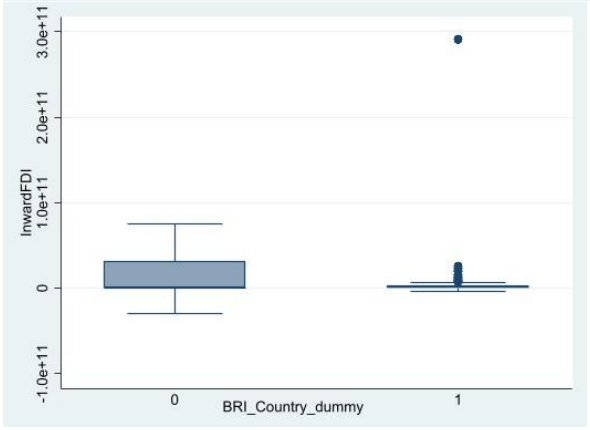


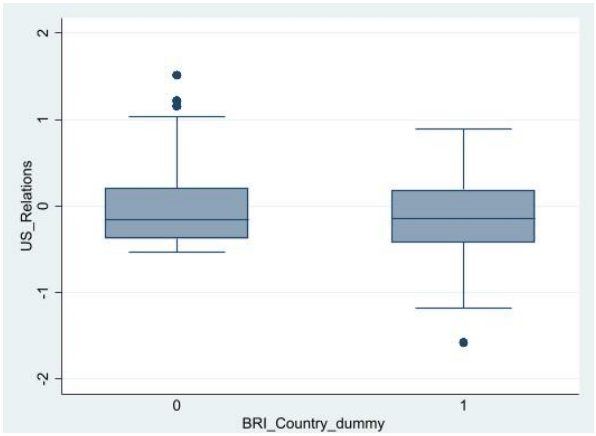




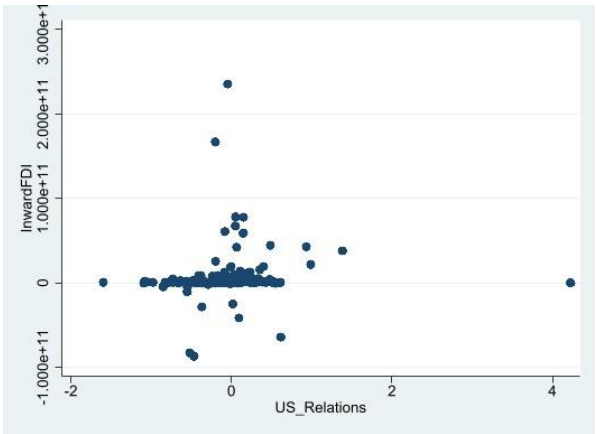


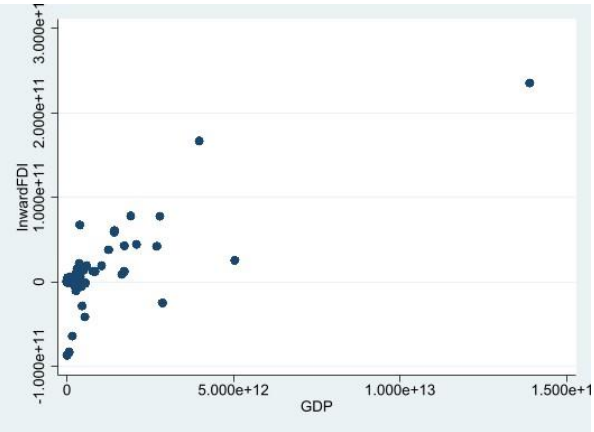


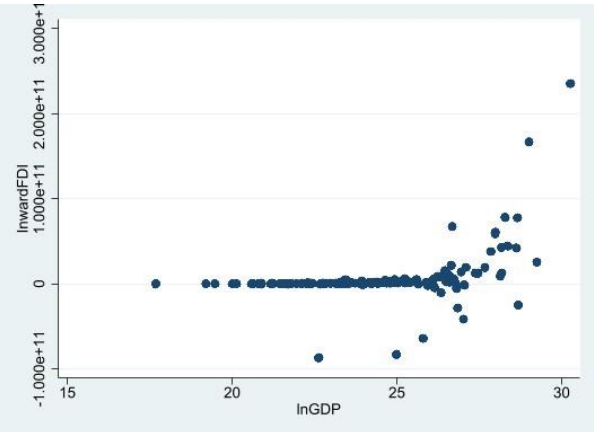


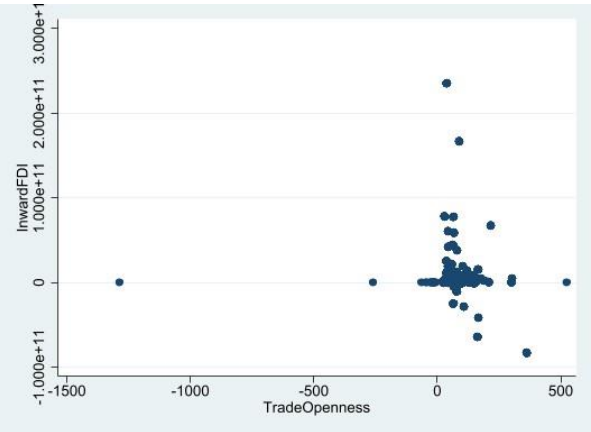


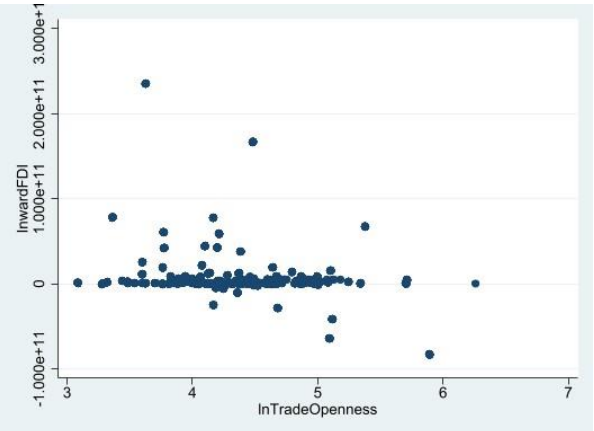
Appendix 4: Plots for all hypothesized and assumed relations for observations measured in 2018

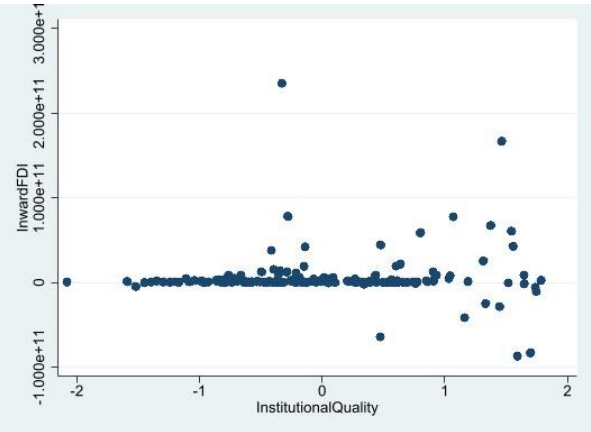


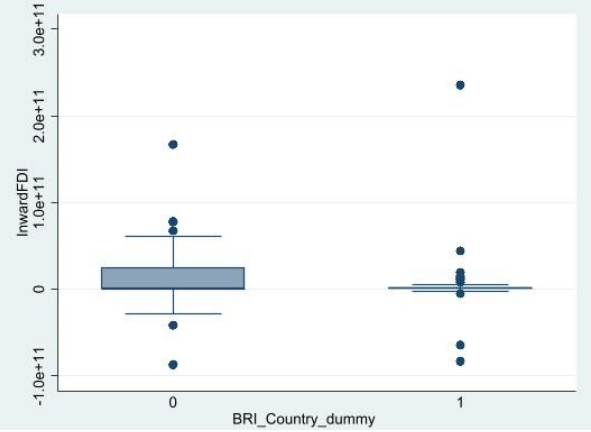

InwardFDI
-1.000e+11
0
1.000e+11
2.000e+11
3.000e+1
0
5.000e+12
1.000e+13
1.500e+1
GDP

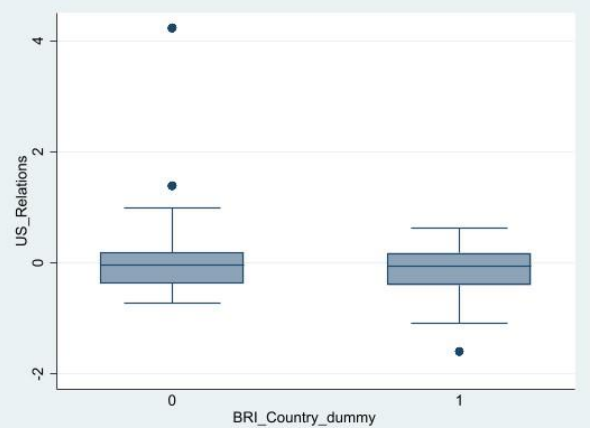

InwardFDI
-1.000e+11
0
1.000e+11
2.000e+11
3.000e+1
15
20
25
30
lnGDP


InwardFDI
-1.000e+11
0
1.000e+11
2.000e+11
3.000e+1
-1500
-1000
-500
0
500
TradeOpenness


InwardFDI
-1.000e+11
0
1.000e+11
2.000e+11
3.000e+1
3
4
5
6
7
lnTradeOpenness


InwardFDI
-1.000e+11
0
1.000e+11
2.000e+11
3.000e+1
-2
-1
0
1
2
InstitutionalQuality


InwardFDI
-1.0e+11
0
1.0e+11
2.0e+11
3.0e+11
0
1
BRI_Country_dummy


US_Relations
-2
0
2
4
0
1
BRI_Country_dummy

Appendix 5: Breusch-Pagan test for heteroscedasticity

H0: Constant variance

chi2(1) = 222.51

Prob > chi2 = 0.0000

Appendix 6: Woolridge test for autocorrelation

H0: no first-order autocorrelation

F(1, 144) = 10.658

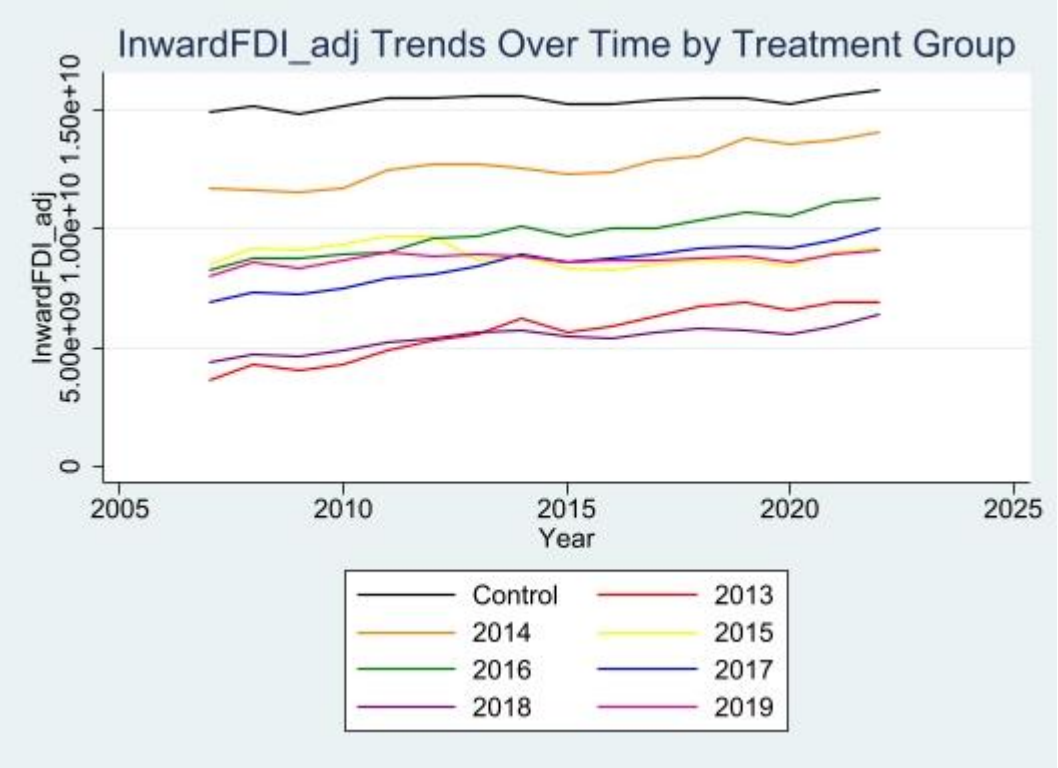
Prob > F = 0.0014

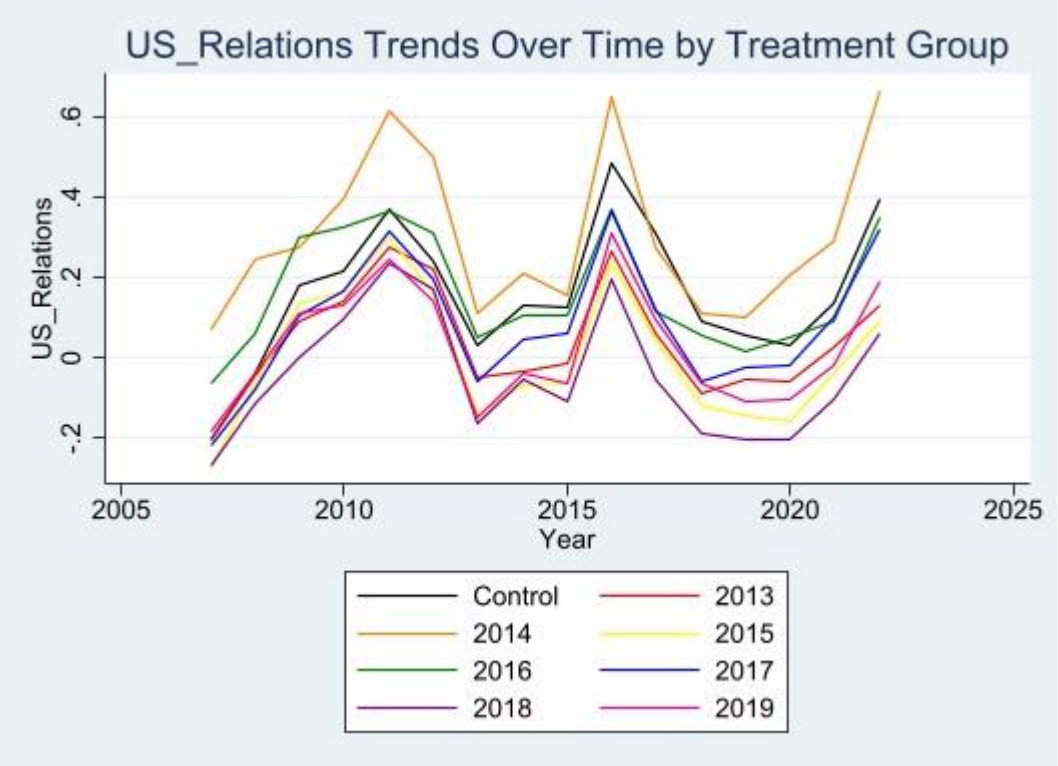
Appendix 7: Test for parallel trends before treatment

DiD uses a chi-square to determine parallel trends. H0: pre-treatment is equal to 0, therefore parallel to control group

InwardFDI	
2014	
chi2(6) = 674.2666 p-value = 0.0000	
US_Relations	
2013	2014
chi2(5) = 14.0849 p-value = 0.0151	chi2(6) = 172.8088 p-value = 0.0000
2016	2018
chi2(8) = 19.7418 p-value = 0.0114	chi2(10) = 34.9230 p-value = 0.0001

Appendix 8: Visual representation of DiD analyses





Appendix 9: Robustness check by including forwarded and lagged time variables in DiD

	InwardFDI, for 2	**InwardFDI, for 1**	**InwardFDI, lag 1**	**InwardFDI, lag 2**	**US_Relations, for 2**	**US_Relations, for 1**	**US_Relations, lag 1**	**US_Relations, lag 2**
ATT	3.84e+08	2.81e+09	-1.27e+09	-1.07e+09	-.0323763	-.0059761	.015598	.0415973*
	(2.32e+09)	(2.63e+09)	(2.82e+09)	(2.02e+09)	(.045647)	(.0218981)	(.0274423)	(.0193707)
ATT G2013	-1.35e+09	-6.02e+09	-3.95e+09	-5.30e+09	-.059482	-.044002	-.0886832	-.007012
	(1.96e+09)	(5.62e+09)	(7.28e+09)	(5.86e+09)	(.0458644)	(.0572043)	(.062656)	(.0725861)
ATT G2014	1.37e+10	-1.41e+10	-5.22e+09	3.14e+10	-.1555503**	-.1787412**	.0233506	.0843874
	(1.49e+10)	(5.74e+09)	(7.62e+09)	(2.21e+10)	(.0323417)	(.0326999)	(.0504951)	(.062653)
ATT G2015	-2.30e+08	7.56e+09	4.05e+09	3.33e+09	.0126618	-.0142014	-.0536426	.0805884
	(3.97e+09)	(5.65e+09)	(7.06e+09)	(4.93e+09)	(.0567341)	(.0600649)	(.0658008)	(.0591187)
ATT G2016	2.08e+09	-1.36e+09	5.94e+09	1.65e+09	-.076801	-.0393486	.0635363	.1756615
	(4.97e+09)	(2.04e+09)	(5.81e+09)	(2.65e+09)	(.0655234)	(.0655878)	(.0471337)	(.131856)
ATT G2017	-1.76e+09	4.54e+09	2.08e+09	1.30e+09	-.02396	-.0345296	.119381	.0912968
	(2.43e+09)	(7.33e+09)	(2.46e+09)	(3.44e+09)	(.059762)	(.0678147)	(.1310116)	(.0515468)
ATT G2018	3.46e+08	2.74e+09	7.49e+08	-2.60e+09	-.0491967	.0178216	.0298249	.004392
	(4.45e+09)	(3.30e+09)	(1.83e+09)	(2.93e+09)	(.0713732)	(.0446239)	(.0506147)	(.0360509)
ATT G2019	6.80e+09	5.52e+09	-3.30e+10	-8.88e+09	.011452	.0662046	.0093224	-.031917
	(5.69e+09)	(4.97e+09)	(2.38e+10)	(1.47e+10)	(.0559188)	(.1333527)	(.0411275)	(.0539673)
Observations	1989	2141	2140	1996	2186	2352	2350	2192

Standard errors inbetween parentheses

**p<0,01, *p<0,05

Appendix 10: Robustness check by including interaction variables in the regression

	InwardFDI
Variables	**Model 1**
BRI_Country_annual*US_Relations	1.65e+09
	(1.36e+09)
BRI_Country_annual*lnGDP	7.26e+08
	(6.12e+08)
BRI_Country_annual*lnTradeOpenness	-1.55e+09
	(1.34e+09)
BRI_Country_annual*InstitutionalQuality	-8.61e+08
	(7.80e+08)
Constant	-1.16e+11**
	(3.84e+10)
Observations	2291
Number of countries	145
R-squared within	0,0051
R-squared between	0,3141
R-squared overall	0,2084
Standard errors inbetween parentheses	
**p<0,01, *p<0,05	

Appendix 11: Robustness check by splitting the sample based on GDP

	Regression InwardFDI			
Variables	**Q1**	**Q2**	**Q3**	**Q4**
US_Relations	-1.42e+08	-1.17e+09	1.73e+09**	-8.68e+09
	(1.69e+08)	(1.01e+09)	(8.74e+08)	(5.36e+09)
BRI_Country_annual	-1.64e+08*	-7.94e+08	-5.58e+08	-6.23e+08
	(9.20e+07)	(6.55e+08)	(1.04e+09)	(1.26e+09)
lnGDP	2.45e+08*	1.46e+09**	2.68e+09*	2.78e+10***
	(1.38e+08)	(7.34e+08)	(1.43e+09)	(9.49e+09)
lnTradeOpenness	1.55e+08	2.54e+08	6.25e+08	1.29e+10**
	(1.28e+08)	(9.17e+08)	(1.60e+09)	(6.46e+09)
InstitutionalQuality	5.89e+08	1.88e+09	-8.73e+07	-2.87e+08
	(5.96e+08)	(1.85e+09)	(4.93e+08)	(5.88e+09)
Constant	-5.29e+09*	-3.33e+10**	-6.69e+10	-7.83e+11***
	(2.98e+09)	(1.33e+10)	(4.14e+10)	(2.68e+11)
Observations	469	580	632	610
Number of companies	46	58	58	46
R-squared within	0,0002	0,0213	0,0013	0,0189
R-squared between	0,2574	0,1125	0,2397	0,5431
R-squared overall	0,0788	0,0695	0,0096	0,3549
Standard errors inbetween parentheses				
**p<0,01, *p<0,05				

Please see the next page for the robustness check on the DiD analyses.

	DiD InwardFDI				**DiD US_Relations**			
	Q1	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**
ATT	-6.58e+07**	7.85e+08	2.62e+09	1.29e+10**	.0070109	.038904	.0643027	-.0407454
	(3.28e+07)	(7.02e+08)	(1.75e+09)	(6.53e+09)	(.0905094)	(.0610487)	(.0393166)	(.049505)
ATT G2013		-2.74e+09***		3.38e+10*				
		(8.17e+08)		(1.73e+10)				
ATT G2014								
ATT G2015		2.08e+08	5.78e+09*	4.84e+09*	-.2883254	.1516586***	.0271478	-.0215834
		(2.31e+08)	(3.00e+09)	(9.37e+09)	(.209808)	(.0290839)	(.0765688)	(.0660069)
ATT G2016								
ATT G2017		6.52e+08	-8.31e+08	2.82e+10*	.1481669	.0584151	.0848587**	-.0662586
		(5.04e+08)	(9.06e+08)	(1.48e+10)	(.11616)	(.0771839)	(.0345583)	(.1165046)
ATT G2018	-8.49e+07**	3.05e+08	9.73e+07	9.89e+09				
	(3.53e+07)	(7.35e+08)	(2.05e+08)	(6.14e+09)				
ATT G2019	5.69e+07	5.24e+09**		-8.75e+09*	.1411047	-.0455206	.1083436*	-.0617083***
	(4.61e+07)	(2.34e+09)		(5.24e+09)	(.1840674)	(.0796499)	(.0641569)	(.0240217)
Observations	402	531	416	564	280	272	388	451
Standard errors inbetween parentheses								
***p<0,01, **p<0,05 *p<0,1								