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An Analysis of Chinese Belt and Road Initiative Investment Factors in Comparison with Historical Chinese ODI Trends

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ABSTRACT

This thesis analyzes various economic, political, and cultural factors which have potential to predict the volume of Belt and Road Initiative FDI received by all countries for which the necessary data is available. The Belt and Road Initiative (BRI) is China's flagship international development initiative which fulfills a wide range of important policy goals for the ruling Chinese Communist Party. This paper first considers the existing literature on FDI trends, with particular attention to Chinese-specific ODI patterns, alongside a multifaceted contextual analysis of the BRI in an effort to identify the factors of relevance in predicting BRI investment flows. Then, with all relevant data represented, linear regression models are run to first analyze the significance of selected variables in predicting BRI investment volume, and afterwards to compare these results with Chinese ODI trends before and after the launch of the BRI, as well as across construction and financial type investments separately. These results provide insight into whether the BRI can be seen as distinct from historical Chinese or global ODI patterns, and offer observational evidence for various motivations for the Belt and Road Initiative.

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Chapter 1

Introduction

In September 2013 at a summit in Kazakhstan, Chinese President Xi Jinping first announced the Belt and Road Initiative to the world. The geopolitical magnitude of this endeavor has been likened to the U.S. Marshall Plan of 1948 which saw $13.3 billion USD (equivalent to $173 billion in 2023) infused into rebuilding industry ravaged by war in Western Europe (Encyclopedia Britannica, 2018). As of the end of 2022, the BRI already has seen more than $800 billion of targeted FDI, comprising a mixture of grants, subsidized loans, and acquisitions, sent to scores of countries, most notably in the African and Asian continents (American Enterprise Institute, 2022). While the Belt and Road Initiative hearkens back to the glory days of Chinese global trading prominence through the Silk Road, it is not a singular route as its name might imply. The BRI consists of six broad economic corridors: the Bangladesh-China-India-Myanmar, China-Indochina Peninsula, China-Central-West Asia, New Eurasian Land Bridge, China-Mongolia-Russia, and China-Pakistan Economic Corridors, as pictured in Figure 1 (Damuri et al., 2019). These corridors are supported through both overland and maritime infrastructure, the latter known broadly as the Maritime Silk Road (刘梦, 2018). Within each of these corridors a plethora of construction projects are underway to integrate the developing world economy more closely to China. Apart from construction, there are also substantial non-construction investments which fall under the BRI as well, although these follow somewhat distinct patterns as are explored later in this paper.

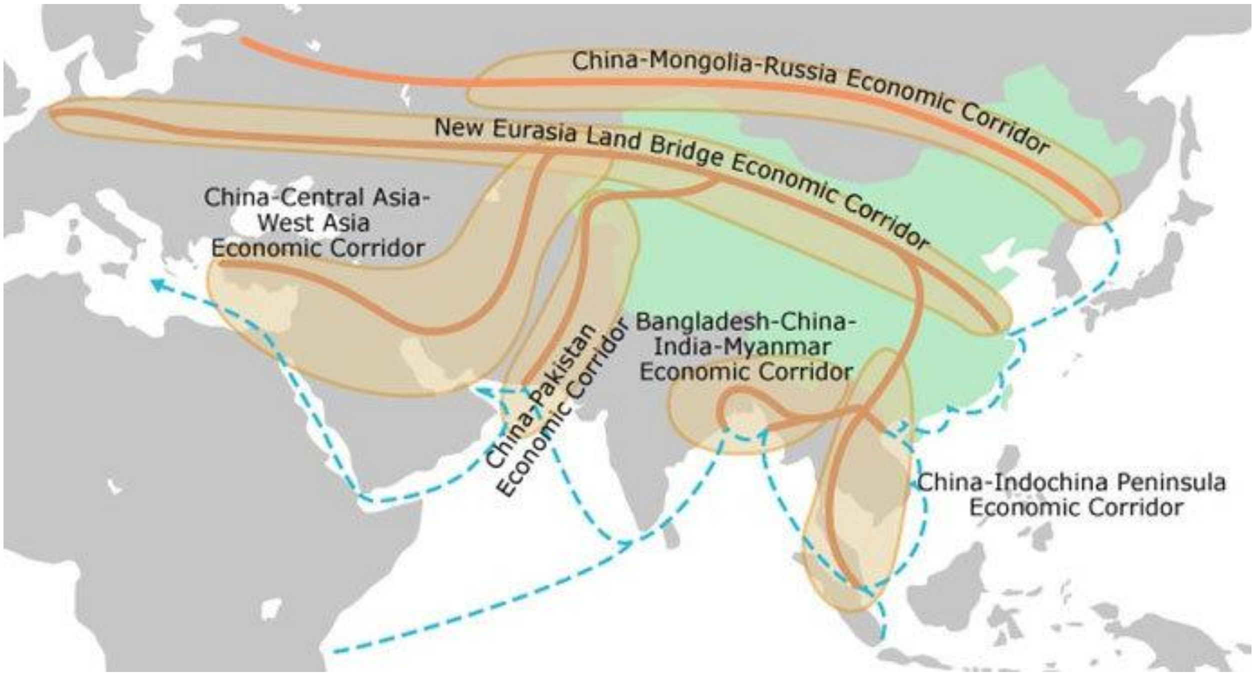

Figure 1 Map of BRI economic corridors

The economic and political significance of the Belt and Road Initiative is hard to overstate, for both China and the rest of the world. Not only does it dwarf historical integration and economic development initiatives in its funding and geographic scale; the BRI has many other characteristics which will shape the power and prosperity of all nations regardless of participatory status. From the presence of Chinese construction workers abroad to the increased use of the Chinese RMB (人民币), not to mention the establishment of new military ports and more direct access to Middle Eastern oil reserves, the BRI is a colossal fusion of infrastructure development, regional security concerns, international lending, and of course, trade. Beyond the economics, the BRI is also a politically motivated initiative, working to boost China's international prestige by casting China as a global leader and friend to developing countries. For instance, in Pakistan, the BRI even involves the development of schools, hospitals, and vaccine distribution networks (CPEC Authority, 2022).

The CCP under President Xi might market the BRI as a panacea for a host of Chinese domestic and international challenges, but that does not mean it is without risk. By making loans to countries rife with corruption and instability, China risks overexposure to periods of sharp global economic contraction, as has been painfully demonstrated during the COVID pandemic and ensuing lockdowns. China's own GDP per capita growth rate plunged from 5.6% in 2019 to 2.0% in 2020 (World Bank Data Bank, 2022) and ongoing "Zero COVID" lockdowns have not aided in the recovery. Internationally, the threat of the COVID pandemic to the BRI is by no means over, as the whole world faces a slowdown in GDP growth. While the reduction in fiscal and monetary stimulus has brought some pain, developed countries still have the resources to regain pre-pandemic production levels. By contrast, Ayhan Rose, Director of the Prospects Group at the World Bank, warns: "Emerging and developing economies, however, are flying low—and they do not have much gas left to use in terms of policy space if they encounter headwinds" (World Bank, 2022). A daring investment plan betting on continued rapid growth in these emerging economies could leave China at a loss if the anticipated return fails to materialize.

Considering the complexity of the motivations for the Belt and Road Initiative, it is reasonable to expect that some of these unique goals might lead the BRI to deviate from generic FDI patterns. That, combined with the significance of the project itself, warrants a thorough investigation to explore in what ways the BRI adheres to or deviates from universal and China specific ODI trends. To assess what the true priorities of the BRI are, it is necessary to observe the decade of data demonstrating which countries China has actually prioritized in its BRI investment patterns. After providing a review of the diverse scholarly opinions on the BRI and its multifaceted motives, I will summarize the essential research which already exists on the topic of Chinese ODI. This combined knowledge guides my selection of variables which are used to predict Chinese BRI investment volume by country. I will then compare the strengths and relationships of these variables across different outcomes of interest: Chinese ODI prior to the BRI, Chinese ODI since the BRI which is not a part of the initiative, and Chinese BRI investment by type (construction and non-construction).

In the words of Wood and Mayer (2009), “The least disputable of China’s impacts on the world has been the explosion of studies of China’s impact on the world.” This certainly holds true for the opinions of foreign policy experts, but there exists a glaring lack of genuine econometric analysis of the Belt and Road Initiative, at least with respect to the manifold stories about what it actually aims to achieve. By following the money trail, this paper can better deduce the underlying motives that influence BRI project planning by supplanting speculation with concrete data analysis. If BRI investment volumes can serve to indicate the priorities of Chinese political and business leaders, then this research will enable citizens and policymakers of all countries to better understand and anticipate the effects of the BRI and make more effective decisions as a result. This paper may also serve as a foundation for more developed models to expand upon in pursuit of an even sharper understanding of the BRI and its unique characteristics.

Chapter 2 Literature Review

Motivations for the Belt and Road Initiative

While the motivations for the BRI are too numerous and nuanced to fully discuss in this one paper, I will briefly outline some of the more notable aspects here, which will be drawn upon in the methodology section. This subsection will open with a summation of China's income inequality and regional instability problems which the BRI stands to alleviate in part. The export-based nature of the Chinese economy and its relevance here will be split into two subtopics covering the drive to sell Chinese manufactured goods in emerging markets across the developing world alongside the desire for cheap and reliable natural resource imports. Later, an overview of the bloated steel industry in China will demonstrate the motivation to reach developing countries with a higher demand for new infrastructure. The final portion of this literature review will be devoted to more political considerations, specifically the leveraging of debt by China to achieve military and economic policy goals in other countries.

The rapid pace of economic development in China has been accompanied by a surge in economic inequality, with cleavages between not just cities and rural areas, but also between eastern, coastal provinces and western, inland provinces. The average GDP per capita of the wealthiest provinces can be as great as five times higher than the GDP per capita of the poorest provinces in the more sparsely populated and less connected western provinces (Anwar, 2019). By contrast, the wealthiest state in the U.S., New York, was slightly more than double the GDP per capita of the poorest outlier, Mississippi, which still enjoyed a GDP per capita of more than $35,000 in 2012 chained USD (Statista). The western provinces of China are also those more heavily populated by China's ethnic minorities, amongst which resentment and even militant opposition to the national government has swelled in recent years. Beijing sees infrastructure development and economic integration as one key step towards dispelling this tension and helping the western provinces catch up to the more prosperous eastern ones. The geographic location of China is also important here. As China touches the sea to the east and there are few people living to the north in the Russian provinces of Siberia and the Far Eastern district, most of the global market which can be reached over land lies to the west or south of China, and so any highways or railroads Beijing constructs to transport goods more cheaply will have to pass through these provinces. For that reason, among others, an investment into the landlocked countries of Central Asia could also be seen as an indirect investment into the western provinces which can build their economies around the economic arteries of the BRI economic corridors.

China is renowned for its export-oriented economic model, sometimes referred to as "the world's factory" (Bajpai, 2022). Distance and GDP are the two fundamental components of the gravity model for trade (Le et al., 2020), and are likewise relevant to an investment initiative largely designed to increase trade flows. A greater distance from the investor country is generally expected to reduce FDI volume, while a higher GDP per capita indicates a higher income and development level, which is usually positively associated with FDI (Buckley & Casson, 1976). In the case of the BRI, however, I expect this relationship to actually be reversed, as the BRI is primarily oriented towards less developed nations. In either case, GDP will be an important variable to consider, and the same is true of distance between each country and China.

When considering exports, population is a major component of GDP. Total production can be found by multiplying worker productivity (determined by technology and capital) by the total number of workers. Therefore, countries with larger populations should have a higher level of production (and consumption) than countries with smaller populations at the same level of productivity. Economic research involving FDI typically draws upon GDP and perhaps GDP per capita, neglecting population as a variable, as demonstrated by Buckley et al. (2007). However, the BRI is especially motivated by a desire to tap into emerging markets and ensure the economic vitality of China's economy for decades, an economy still resting largely upon exports. The Made in China 2025 (中国制造 2025) initiative is evidence that the CCP does not see itself moving away from exporting manufactured goods. If anything, China is gearing itself to continue its role as the "world factory", with an eye towards more advanced manufacturing goods like electric cars in a new era with labor markets cheaper than China now competing for low-skill manufacturing products (Kennedy, 2015). In order to maximize its exports for decades to come, the CCP (and consequently the state-owned enterprises under its influence) are looking for the markets which may provide the future of their customer base in the face of a demographic decline experienced both domestically and abroad in the developed world. For this reason, population may also be seen as a measure of the future GDP growth potential of foreign markets, as the size of those markets will grow at a faster rate than the markets of smaller countries of the same productivity levels. It is clear from 21st century GDP per capita annual growth rates that regions like the Pacific, South Asia, and East Africa are catching up to high income countries in GDP per capita, as shown in Figure 2. Those countries which have larger populations may soon become China's primary markets for exported goods, and so China seeks to secure a foothold by integrating these countries through infrastructure and other investment projects.

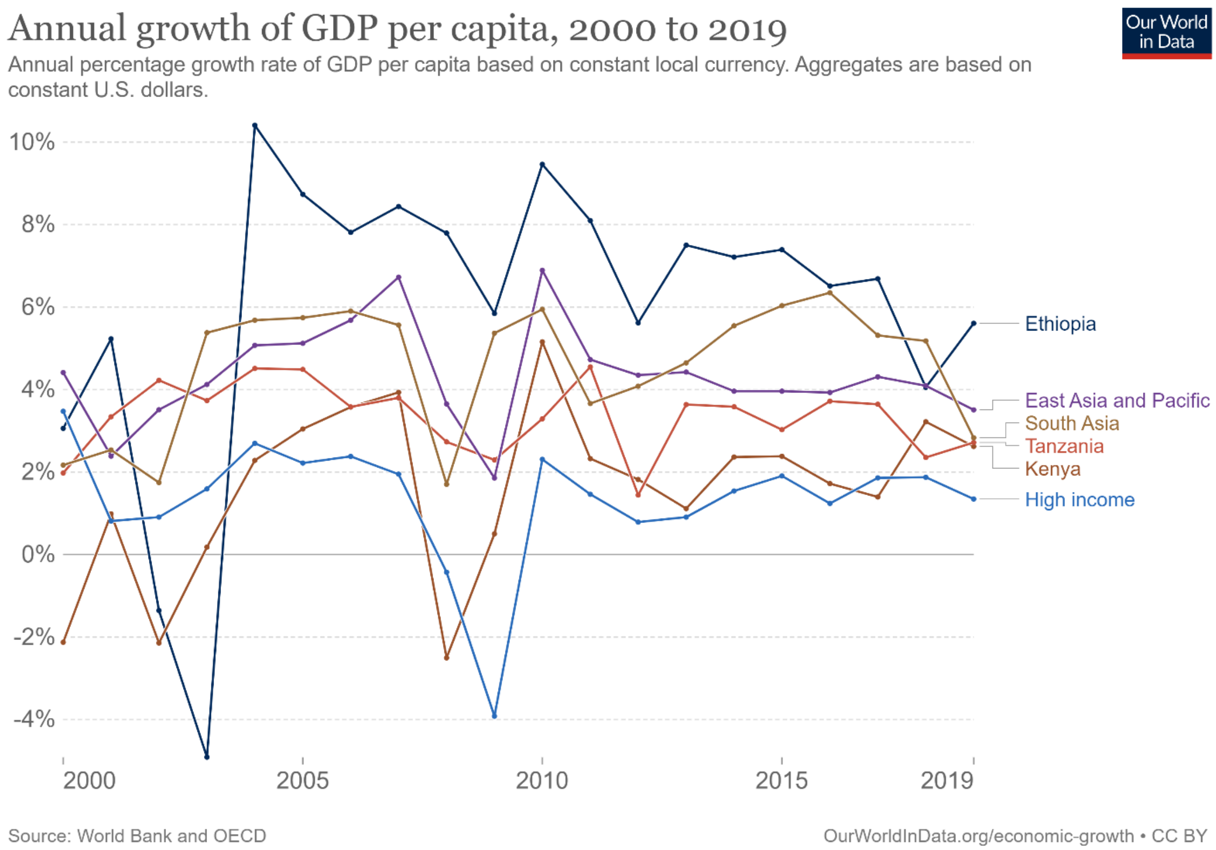

Figure 2 GDP per capita growth rate comparison from 2000-2019

The Made in China 2025 initiative highlights the need of China to increase its imports of rare earth metals used in high-end manufacturing. As China works to dominate the quickly growing electric car market, it also pursues those inputs which are necessary for its production methods. One well-known example of this is the 2016 acquisition of two major cobalt mines in the Democratic Republic of Congo by China Molybdenum. The reason this purchase has received special press attention is that a board member for the firm happened to be Hunter Biden, the son of current U.S. President Joe Biden. This fact brought accusations of corruption, especially considering that the firm which sold these cobalt mines to China was American. Setting aside these accusations, it is worth noting that 25% of China Molybdenum is owned by a local government in China. “15 of the 19 cobalt-producing mines in Congo were owned or financed by Chinese companies. The companies had received at least $12 billion in loans and other financing from state-backed institutions, and are likely to have drawn billions more” (Lipton et al., 2021). Considering that the Democratic Republic of Congo accounts for two-third of global cobalt production, this should signal just how strongly motivated China is to secure supplies of the natural resource inputs needed for its manufacturing juggernaut. According to the U.S. Office of Energy Efficiency and Renewable Energy (2021), “Cobalt is considered the highest material supply chain risk for electric vehicles (EVs) in the short and medium term.” The demand for metals is by no means restricted to rare earth metals. China leads global iron ore imports by a massive margin, accounting for more than 70% of imported iron ore in 2021 (Workman, 2021). Regarding energy imports, China requires a staggering amount of fuel to power its economy, and for that it relies heavily on energy imports: “an estimated 80 percent of China’s total energy supply comes from the Middle East and passes through the Malacca Strait” (Anwar, 2019). This exposes China to security threats should a U.S. naval blockade or even simple piracy disrupt the flow of oil along this passage. Better land infrastructure could help reduce this risk to China’s economy and military. In summary, the BRI is heavily influenced by China’s pursuit of emerging markets for its manufactured goods and by the desire to increase access to international natural resource reserves, which stem from the common factor of China’s economic model. The influence of Chinese policymakers over firm decision-making only heightens this natural resource acquisition frenzy.

As one might surmise from China’s share of global iron imports, the country is a massive steel producer. Liu and Song (2016) discuss the history and effects of this 21st century development. From 2000 to 2015, China’s steel production increased sixfold, surging to account for more than half of all global production in 2015. By this time, China was already turning to foreign markets to absorb its overcapacity, resulting in 37 anti-dumping and anti-subsidy lawsuits against China in 2015 alone. Meanwhile, the cost per ton of iron skyrocketed tenfold in the 8 year period from 2003 to 2011, driven primarily by Chinese demand. Domestic consumption peaked in 2013, and then began to fall off, even as production remained relatively constant over the next few years. While this article does not extend beyond 2015 in its data, other data sources show that China's crude steel production continues hover around 15% above domestic crude steel consumption levels (World Steel Association, 2020). The BRI initiative may serve as a form of stimulus to handle Chinese excess capacity for steel production by increasing the demand for steel through overseas construction projects. On the topic of overcapacity, China's construction industry may also be oversized, as the need for domestic production is falling, but the country still has more than 50 million construction workers (Zhang, 2022). One example of misdirected construction projects are China's so-called "Ghost Cities," or nearly desolate areas with empty high-rise offices and apartment buildings where nobody has ever lived; there are now an estimated 65 million unoccupied homes in China (Batarags, 2021). This problem was extensively photographed in 2015, and has existed since before the BRI, and hence the ever-increasing nature of the BRI may be driven to help put China's gigantic construction capabilities to more productive use through overseas construction projects. According to Hillman and Tippett (2021), the Chinese government pressures firms to use Chinese workers in overseas projects, and firms often have an existing incentive due to the cheapness of Chinese construction labor. With these factors combined, there is a case to be made for the BRI as a means of absorbing excess Chinese steel output while simultaneously leveraging a highly capable and affordable Chinese construction industry.

International Criticisms of the Belt and Road Initiative

As the BRI has expanded in its scope, distrust from American policymakers has expanded alongside it. In 2018, a bipartisan group of 14 U.S. Senators wrote to then Secretary of State Mike Pompeo, warning: "Beijing has repeatedly used economic pressure to affect foreign policy decisions…It is apparent that…the goal for the [Belt and Road Initiative] is the creation of an economic world order ultimately dominated by China" (Grassley, 2018). Mike Pompeo himself was vocally critical of the BRI during trips to Africa and India during the latter years of the Trump administration. More recently, in 2021 President Biden met with other G7 leaders to lay out a White House plan to counter the perceived threat of the expansive BRI: "A fact sheet distributed to reporters gave it a name, 'Build Back Better for the World,' with roots in Mr. Biden's campaign theme — shortened to B3W, a play on China's BRI" (Sanger and Landler). Considering these political headwinds and the dominance of the United States over the North Atlantic Treaty Organization, it is reasonable to expect that close U.S. partners in the West may not only share similar concerns about the BRI, but that the U.S. is likely to further pressure its close allies against any involvement with it. This will likely result in reduced BRI investment to countries closely tied to the United States politically and militarily.

These accusations point to another potential motivation of the BRI which Beijing naturally does not overtly espouse: the desire to acquire more political influence over other countries and expand the sandbox of the Chinese military in what is increasingly framed as a challenge to the American military hegemony. The reality is that Chinese state-owned enterprises (SOEs) are willing to offer loans to countries that most Western institutions avoid for concerns of failure to repay, which indeed is part of the appeal for many countries signing on to the BRI. Between economic woes and rampant corruption, some of these partner countries appear almost guaranteed to fail in their debt repayments; when this happens, Beijing applies pressure to receive a concession on other matters in exchange for forgiving or adjusting the debt payments. One noteworthy example of this is the new port leasing in relation to debt settlements reached between China and economically struggling Sri Lanka, in which China refused to reschedule debt payments when the foreign debt of the nation, presently valued at more than 100% of the country's GDP, became too burdensome. As a result, Sri Lanka had to grant a 99 year lease on the Hambantota port to the Chinese companies whose loans had enabled the project. Considering the level of connection between Chinese firms, particularly SOEs, and the policy agendas of the Chinese Communist Party, this kind of lease concerns much more than merely profit-seeking or employment. In the words of former Sri Lankan diplomat China's goal is to put the Hambantota port to dual use, commercial and military" (Dasgupta, 2022). It is worth noting that Sri Lanka sits in the backyard of India, a regional rival to China which has notably abstained from participation in the BRI. According to the former deputy high commissioner of India to Sri Lanka, K. P. Fabian, this essentially allows China to have easily military ship access to a major Sri Lankan port without needing to build an actual military base (Dasgupta, 2022). Taken into joint consideration with China's heavy investment into India's bitter rival Pakistan through the China-Pakistan Economic Corridor, it is easy to see why certain BRI non-participants express alarm at the leveraging of debt to secure military access all across the Indian Ocean.

China-Specific ODI Observations

The paper which most heavily inspires my own research model is a paper which predates the Belt and Road Initiative by a number of years. Buckley, et. al (2007) analyze the evolving nature of Chinese ODI in the years leading up to the Great Recession, at which time the Chinese economy was much smaller than it is today. The paper is especially valuable for my own research because in addition to thoroughly reviewing the contemporary literature on general ODI patterns, it considers the very distinct characteristics of China that may lead it to diverge from the conventional literature. From the heavy involvement of the state in economic affairs to the great importance of relationships (关系) in business dealings, to name only a few, factors which might not matter in a study of American, Colombian, or Swedish ODI can play a very key role in deciding where Chinese investments flow and in what volumes.

In the paper, universal factors such as physical distance between the host country and China, host country market size, host country population, trade volume between the host country and China, currency exchange rates, etc. are included to serve as the basic foundation of the model. The authors include a dummy variable for time based in 1992, which marked a shift towards liberalization for the Chinese economy. The ethnic Chinese proportion of the host country was another variable, justified on the basis of not only language and cultural familiarity, but also explicitly due to *guanxi* (relationships). In traditional Chinese culture, personal connections are essential for securing promotions and all manner of deals. In “The Determinants of Chinese Outward Direct Investment”, the results of several decades of research into this phenomenon are discussed: “A number of scholars argue that ethnic and family guanxi networks constitute a firm-specific advantage for Chinese MNEs because these help to reduce the business risk and transaction cost” (Buckley, et. al). Considering the nature of developing countries as generally riskier locations for business investment, this benefit could play an especially important role, compounded further by the knowledge of the host country economies in which Chinese multinational enterprises (MNEs) seek to operate. Not only does ethnicity capture the positive effects of common language background, but other factors like family ties are included as well. It is also more reliable data on Chinese ethnicity than Chinese language proficiency on an international basis (to say nothing of the fact that due to the wide range of regional Chinese languages and immigration patterns, not all Chinese immigrants may speak Mandarin, which would further distort existing language data). Buckley et. al represent the impact of *guanxi* using a dummy variable for whether a country has an ethnic Chinese population >1%, which reflects the use of this variable to test for whether there is an existing *guanxi* platform to facilitate the entry of foreign Chinese firms into the host market, as opposed to a broad test of the extent to which Chinese immigrants have culturally or politically influenced the country, in which case a continuous variable would have been the more likely choice. The importance of *guanxi* is openly stated by the CCP itself, as described by the Chinese equivalent of Wikipedia, Baidu Baike, which strictly adheres to the parameters of digital censorship in China (Wikipedia, 2021). One page which provides an overview of the BRI to native Chinese netizens summarizes a report jointly issued by the National Development and Reform Commission, the Ministry of Foreign Affairs, and the Ministry of Commerce which describes key actions for the success of the BRI, among which they include: "发挥海外侨胞以及香港、澳门特别行政区独特优势作用，积极参与和助力"一带一路"建设 [Bring into play the unique advantages of overseas Chinese as well as the Hong Kong and Macao Special Administrative Regions to actively participate and contribute to Belt and Road Initiative construction]" (Baidu Baike, n.d.). The term "overseas Chinese" refers to ethnic Chinese immigrants living in other countries, which also emphasizes the lingering connection between these immigrants their homeland. With this precedent and BRI-specific evidence in mind, it would be a grievous error to not incorporate this factor into my model.

It would be historically inaccurate to say that the Belt and Road Initiative suddenly sprang into existence at President Xi's 2013 summit in Kazakhstan. The truth is, in the years immediately prior to the official announcement of the BRI, the patterns which define the project had already begun to emerge. Furthermore, there is continuity between many of the countries which saw an uptick in Chinese originated FDI before the BRI officially launched and the countries which serve as cornerstones in the BRI today. While the trends of the BRI are standout regardless, it is worth considering the question of whether the BRI itself truly launched a shift in China's policy goals reflected through ODI, or if it simply serves as a moniker for the reality already unfolding. For this paper, it is important to consider which description best fits the BRI, because if it truly represents nothing more than a label for developing country investment projects, it offers little intrinsic value to an understanding of Chinese ODI evolution and its global implications for the 21st century. This challenge will be answered through comparing BRI investment volume not only with non-BRI investments since September 2013 (called not-BRI in this paper), but also with non-BRI investment volume from before the launch of the initiative (called pre-BRI in this paper).

- Constantinescu and Ruta (2018) explore the question of how far back the patterns of the BRI can be traced. For instance, since the entrance of China into the World Trade Organization (WTO) in 2001, the share of China's infrastructure-related goods exports sold to developing countries has increased. This increase has been the largest in the East Asia and Pacific regions, which comprised more than half of such exports to core BRI countries during the years 2013-

2017. The paper then provides country-specific charts displaying what share of China's total exports of merchandise and infrastructure-related goods are received from 2001-2017. Among these countries, Pakistan, Kenya, Bangladesh, and Myanmar all show a marked rise in their share of Chinese infrastructure-related goods exports beginning during or immediately after 2013, the first year of the BRI. Furthermore, other countries like Vietnam and Cambodia, whose shares had already been increasing, saw a continuation and acceleration in this increase in the years following 2013. The share of such goods exported to Europe and North America precipitously declined over this same period (Constantinescu and Ruta, 2018). In summary, while the announcement of the BRI itself was not the earliest point at which these trends emerged, it nonetheless appears to have greatly accelerated them and specifically gave a renewed wind to the bloated Chinese steel industry whose exports had fallen off significantly in the years preceding the BRI's announcement.

The graphs of Pakistan, Kenya, and Vietnam which Constantinescu and Ruta create through their own research are displayed below in Figures 3, 4, and 5, respectively. The darker line represents the merchandise export share, while the lighter line represents the infrastructure-related goods export share. One can observe that in all instances, the infrastructure-related goods export share to these countries is higher than the merchandise export share, which is logical when considering the outsized portion of merchandise exports that go to the United States and other developed countries. However, the significant increase in infrastructure-related goods export share to these and a host of other developing countries signals a shift in construction involvement towards the developing world at the expense of Europe, which held a much higher share during the early 2000s which had already begun to erode before the BRI, and fell off much more quickly once the BRI was launched in 2013.

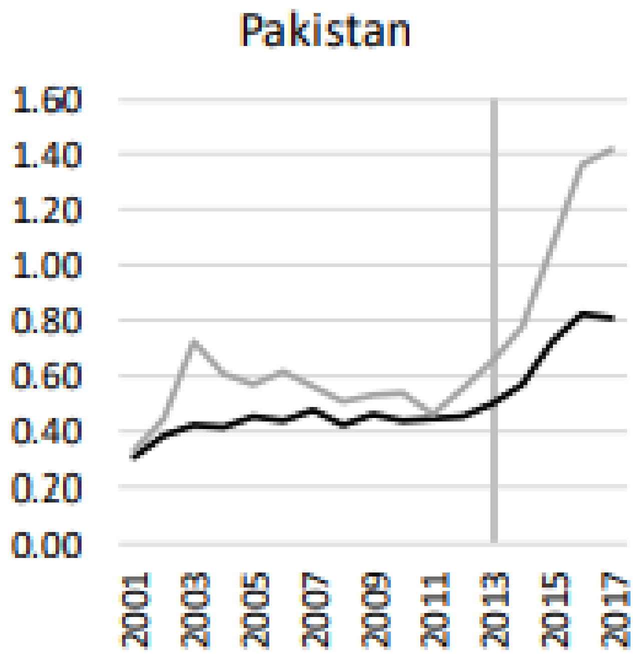

Figure 3 Chinese export share to Pakistan from 2001-2017

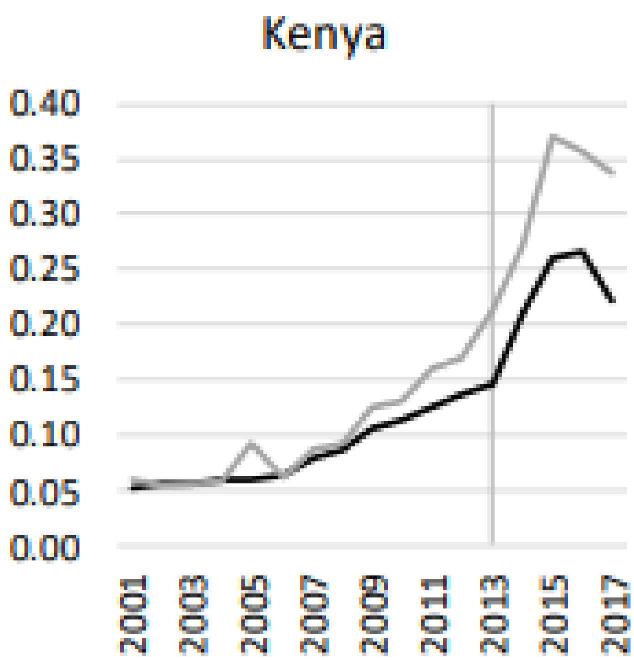

Figure 4 Chinese export share to Kenya from 2001-2017

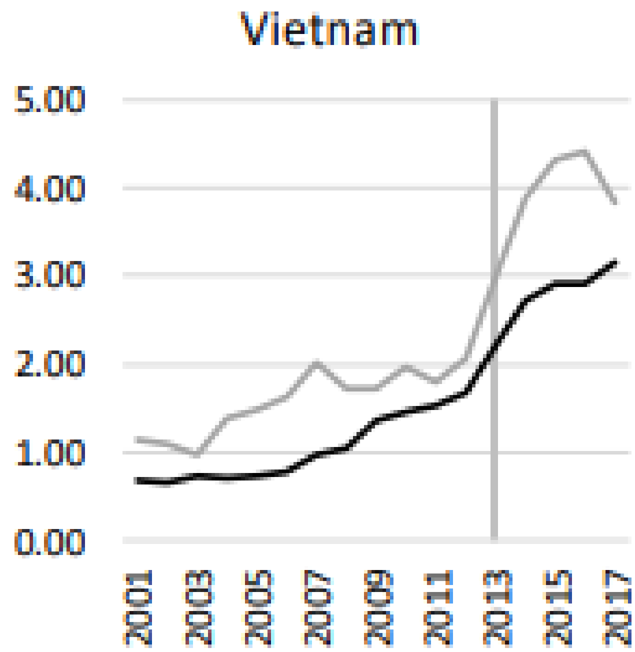

Figure 5 Chinese export share to Vietnam from 2001-2017

Chapter 3

Methodology

Overview of the Linear Regression Model

For this paper, a relatively simple ordinary least squares (OLS) linear regression model appropriately suits the research goals. The OLS linear regression model calculates a slope coefficient for every independent variable in order to minimize the sum of the squared differences between the investment volumes predicted by my model and the actual investment volume received by every country. There is also a β_0 intercept coefficient which has no particular relevance to the results of the model, as it only represents the predicted investment volume to a hypothetical country with a value of 0 for all other variables.

My model contains two types of variables, binary and interval. For binary variables, the value of variable x_i can only be either 0 or 1, and so β_i represents the predicted difference in investment volume for a country where $x_i = 1$ in comparison with a country where $x_i = 0$, all else equal. The interval variables are all natural logs, and so the β_i coefficient for any of these variables represents the predicted percent difference in investment volume for a country as $\ln(x_i)$ increases by 1% (Gelman & Hill, 2007, pp. 60–61), where x_i itself may not be measured in units of 1 (for example, the investment volume data is measured in millions of USD, while GDP data is measured in USD).

The variables used in each model are visible in the figures displayed in the Results section of this paper. The initial model used is described below:

$$LBRI_i = \beta_0 + \beta_1(LDIST_i) + \beta_2(LGDP_i) + \beta_3(LPOP_i) + \beta_4(LINFRAS_i) + \beta_5(LNATRES_i) + \beta_6(ETHNIC_i) + \beta_7(CONFLICT_i) + \beta_8(BORDER_i) + \beta_9(PORT_i) + \beta_{10}(NATO_i) + \varepsilon_i$$

In the above model, LBRI represents the natural log of the total BRI investment volume of a country *i* measured in millions USD, with data taken from American Enterprise Institute (2022). β_0 is the intercept of the slope where all other independent variables have a value of 0. $\beta_{1\text{-}10}$ represent the β coefficients for their respective independent variables. LDIST represents the natural log of the distance in kilometers between the centroids of country *i* and China, with data taken from Distance from China to Other Countries (2023). LGDP represents the natural log of GDP of country *i* in 2013 measured in USD, with data taken from The World Bank (2021). LPOP represents the natural log of population of country *i* based on the national census data closest to 2013, with data taken from United Nations Population Division (2022). LINFRAS represents the natural log of the World Economic Forum infrastructure rating of country *i* in its 2013 global report (ranging from 1-7), with data taken from Schwab (2014). LNATRES represents the natural log of the percent of total exports comprised by fuel products and metal ores for country *i* (theoretically ranging from 0-100), with data taken from The World Bank (2023). ETHNIC is a binary variable indicating whether country *i* has an ethnic Chinese population comprising at least 1% of the country's total population, with data taken from Poston and Wong (2016). CONFLICT is a binary variable indicating whether country *i* has experienced a category 5 severity militarized interstate dispute directly with China since 1949, with data taken from Palmer et al. (2021). BORDER is a binary variable indicating whether country *i* shares a contiguous land border with China. PORT is a binary variable indicating whether country *i* has direct port access to the ocean. NATO is a binary variable indicating whether country *i* is a member of NATO, with data taken from NATO (2020). ε_i is the error term which represents the difference between the actual investment volume in country *i* and the predicted investment volume in country *i* (which is assumed to have a normal distribution and a mean of 0).

For all other predictive models, the independent variables are consistent, and the only change is in the independent variable measured. The same general model as above is displayed below, where $INVEST_i$ can represent $LPREBRI_i$, $LNOTBRI_i$, $LCBRI_i$, or $LNBRI_i$:

$$INVEST_i = \beta_0 + \beta_1(LDIST_i) + \beta_2(LGDP_i) + \beta_3(LPOP_i) + \beta_4(LINFRAS_i) + \beta_5(LNATRES_i) + \beta_6(ETHNIC_i) + \beta_7(CONFLICT_i) + \beta_8(BORDER_i) + \beta_9(PORT_i) + \beta_{10}(NATO_i) + \varepsilon_i$$

In the above models, LPREBRI represents the natural log of total Chinese ODI volume (in millions USD) in country *i* between January 2005 and the launch of the BRI in September 2013. LNOTBRI represents the natural log of total Chinese ODI volume (in millions USD) excluding BRI investment (in millions USD) in country *i* from September 2013 to June 2022. LCBRI represents the natural log of total BRI construction investment volume (in millions USD) in country *i* from September 2013 to June 2022. Lastly, LNBRI represents the natural log of total BRI non-construction investment volume (in millions USD) in country *i* from September 2013 to June 2022. All of the data for these variables is taken from American Enterprise Institute (2022).

In order to test the difference in beta coefficients for each variable between different investment categories, I first list every country twice in the dataset, with the only difference being the value of the two chosen investment categories which are listed in the same column. I then create a variable called DUMMY which assigns a value of 1 for all observations of the first investment category, while the second investment category (the one being compared against) has a dummy value of 0 assigned for all of its observations. This dummy is multiplied by all ten original independent variables to create new interactive variables that hold either their original value or 0, depending upon which category of investment they fall under. Then, a new regression is run with the first investment category as the dependent variable, while the ten original variables, the new ten interactive variables, and the dummy variable serve as the independent variables. I run this same model three times, with the only difference being which categories of investment I list in the investment volume column. The three pairs of investment categories I compare are: LBRI against LPREBRI, LBRI against LNOTBRI, and LCBRI against LNBRI, where the first variable listed is the first investment category and the second variable listed is the second investment category for that particular comparison model. The general equation takes the form described below:

$$LNBRI_i = \beta_0 + \beta_1(LDIST_i) + \beta_2(LGDP_i) + \beta_3(LPOP_i) + \beta_4(LINFRAS_i) + \beta_5(LNATRES_i) + \beta_6(ETHNIC_i) + \beta_7(CONFLICT_i) + \beta_8(BORDER_i) + \beta_9(PORT_i) + \beta_{10}(NATO_i) + \beta_{11}(ILDIST_i) + \beta_{12}(ILGDP_i) + \beta_{13}(ILPOP_i) + \beta_{14}(ILINFRAS_i) + \beta_{15}(ILNATRES_i) + \beta_{16}(IETHNIC_i) + \beta_{17}(ICONFLICT_i) + \beta_{18}(IBORDER_i) + \beta_{19}(IPORT_i) + \beta_{20}(INATO_i) + \beta_{21}(DUMMY_i) + \varepsilon_i$$

The decision to take natural logs for numbers such as population or GDP is common practice in existing literature, as it can mitigate the distorting effect of outliers (a very common phenomenon in my data where some countries have more than one hundred times the GDP of many other countries). Moreover, using natural logs means that the resulting coefficients represent the percent change in the outcome variable caused by a 1% increase from any independent variable.

While reweighting certain variables might enable a greater predictive power of the model, it is not immediately clear which variables should be weighted more heavily and by how much, as the BRI is demonstrably unique in comparison with most other FDI. Moreover, the fundamental purpose of my models is to identify variables significant in predicting BRI trends in comparison with other Chinese ODI, in addition to separating the trends of BRI investments by category, rather than aiming to create the model which captures the greatest possible amount of variance in its R^2 value, so adjusting the weighting would be detrimental. Lastly, the existing papers I referenced did not involve weighting in their statistical models.

Explanation of Variable Selection

The reason for separating pre-BRI and not-BRI (which is non-BRI investment since the outset of the BRI) is that the effect of the ten independent variables on these two investment categories is likely to differ across these two time periods. Comparing BRI with not-BRI will provide a clear demonstration of whether BRI investment departs from other contemporary investment, while comparing BRI and pre-BRI will examine whether BRI investment marks a transition from the overall trend of Chinese investment prior to the launch of the initiative.

CBRI and NBRI are not expected to diverge by a large margin in most respects, but it is worth testing whether the centroid distance from China, existing infrastructure quality, presence of a contiguous border, and ocean port access are more impactful on construction type investments than non-construction type investments. I expect that those three variables would diverge the most, as they deal most directly with the physical factors tied to the value of highway, railway, and port developments. Countries closer to, and especially bordering, China would necessarily require any transcontinental integrated land routes to run through them at a higher rate of frequency. Countries with lower quality infrastructure will have a greater demand for infrastructure improvements and may offer a greater return on investment for construction projects. Lastly, countries with port access to the ocean are the only ones available for Maritime Silk Road construction investment. If there is substantial divergence in a comparison of beta coefficients test between CBRI and NBRI, it would indicate that the BRI itself needs to be subdivided in future analysis of Chinese investment patterns and their consequences.

The theoretical significance of each independent variable is already implied in the literature review of existing scholarly analysis of the Belt and Road Initiative and historical Chinese ODI trends. As I take the natural log of both GDP and population, the natural log of GDP per capita would collineate perfectly and be unusable, so GDP itself can be considered more as a measure of wealth than simply market size for this model, as population is already accounted for. Population is crucially relevant for understanding investment volume in the context of the BRI, as it both partially captures the market size of a host country as well as the potential future market size of a country. Countries with a larger population will experience a larger gain in overall market size from the same increase in GDP per capita than a smaller country, and most large population developing countries throughout Southeast Asia, South Asia, and East Africa have matched or exceeded the GDP per capita growth rate of Western Europe, as seen in Figure 2. Therefore, in the context of the BRI, I expect population to have a strongly positive relationship with BRI investment, while higher GDP should actually be negatively associated with BRI investment, in contrast with most FDI research on the effect of GDP on investment volume.

Natural logs are also used for all other continuous variables: distance, WEF infrastructure ratings, and natural resource export share. While I might have preferred to use population centroids instead of geographic centroids for countries (excluding minor outlying islands), this data was too difficult for me to find, and in any case, the discrepancy between the two should be rather inconsequential for most countries, as the use of any straight line to measure distance is itself a significantly more distortive effect which most literature is forced to accept due to the incredible ambiguity and complexity of measuring distance through means of aggregating existing infrastructure routes. Also, my own investigation into the distribution of Chinese population density and manufacturing locations indicates that the selection of the geographic centroid for China likely changes the location by roughly a few hundred kilometers to the west (Li et al., 2018), compared with the total 5,000+ kilometer distance between China and most countries. Furthermore, due to China's situation on the perimeter of the Pacific Ocean, the effect of this minor discrepancy between geographic and manufacturing centroids should be relatively constant for almost all countries and therefore not harmful to the model.

The selection of the World Economic Forum 2013 Global Competitiveness Report's overall infrastructure ratings is due to a combination of factors. Firstly, the WEF Global Competitiveness Report offers one of the only long-term, consistent, and wholistic measurements of infrastructure quality by country, which is expressed as a number between 1-7, with 7 being the highest possible score. The 2013 report, in addition to being the year when the BRI was announced, also had data for more countries than the 2012 report. The infrastructure ratings data is actually the first data I gathered, specifically because it was the data source with the most limiting list of countries; specifically, the report only contains 148 countries, out of the 193 formally recognized countries which currently exist (Worldometer, 2019). While the WEF's overall infrastructure rating may fail to properly reflect the infrastructure of interest to this model (their calculation includes inputs like telephone infrastructure), it was very challenging to find any suitable way to calculate a better suited rating independently using a combination of road infrastructure ratings, railroad infrastructure ratings, airport infrastructure ratings, and seaport ratings, especially considering that many countries are landlocked and thus have no ports, while archipelagos such as Indonesia and the Philippines may naturally have disproportionately few miles of roads and railroads relative to their population, which might gravely distort their infrastructure ratings. The overall infrastructure ratings of the WEF appear to compensate for these challenges more thoroughly than their categorical infrastructure ratings, hence why I opted to take the former as my variable for infrastructure. There is only one country in my dataset whose infrastructure rating does not come directly from the WEF 2013 Global Competitiveness Report, Iraq, for which I entered an original estimate based on available data. The motivations for this decision, along with the substitutional process employed are both described in the appendix of this paper.

Gathering the natural resource export share of countries (specifically fuel and metal products) proved to be the most challenging, as a number of countries were partially or completely missing data for either fuel products or metal products or both. Countries where the data was absent but not insignificant were excluded; countries which lacked 2013 data but had data for the year prior (2012) or following (2014) had that year's data used instead; I favored 2012 where possible here as it fell before the start of the BRI and would not bear the influence of the BRI. I only substituted this data for countries which demonstrated stable values in their natural resource export share in the surrounding years; anything with sharp aberrations I simply removed from my comprehensive dataset to avoid adding harmful inputs to my model. Additional details on this process and exact substitutions made are included in the appendix of this paper.

The precedent and inspiration to create a dummy variable for the presence of a substantial ethnic Chinese population is described in the literature review of Buckley et. al (2008), and I found that the designation of 1% as the threshold proved to be especially worthwhile as very few countries fell closely around that point (most were either below 0.7% or above 1.5%, which creates a cleaner cleavage). The data used by Poston and Wong (2016) comes from 2011, which is as close to 2013 as any data I could find on the topic. As noted above, there were very few observations likely to have crossed the 1% threshold in either direction during the time period from 2011-2013. For my dummy variable ETHNIC, all countries which have an ethnic Chinese population proportion greater than or equal to 1% receive a value of 1, and all others receive a value of 0.

A history of intense, direct military conflict is likely to weigh in on Chinese BRI investment volume, as countries with an especially negative history of interactions with China will likely restrict or completely prohibit BRI investments within their territories. To estimate this factor, I refer the Correlates of War Project Militarized Interstate Disputes (MIDs) dataset and list every country dyad where a country and China are listed as opposing parties in a level 5 MID (full scale war). I deliberately exclude Cold War coalition conflicts (specifically the Korean War and Vietnam War) because the involvement of every coalition country varied greatly, those wars were not primarily motivated by China-specific tensions, and the Sino-Soviet split saw China embraced by most of the liberal countries in later decades, as highlighted by the 2001 entry of China into the World Trade Organization. After personally investigating the level 4 MIDs between all countries and China, I determined that few, if any, of those engagements were significant enough to result in any noticeable change in long-term foreign relations and BRI openness. As a result, only countries which have fought a serious war directly against China receive a score of 1 for the CONFLICT dummy variable. In total, there are three such countries: India, Taiwan, and Vietnam (Palmer et al., 2021). An explanation of Taiwan's unique situation is included in the appendix.

The existence of a contiguous land border with China is listed in addition to a variable for distance, as countries which immediately border China are necessarily the countries which BRI land routes must pass through to reach the extremities of the network. These countries are also likely to experience heightened traffic of goods with China as either the origin or destination, as all routes must eventually converge somewhat at the border of China. Trade directly between China and the countries which border it also does not need to face any additional scrutiny or fines from intermediary countries as goods move across national borders. This will likely reduce the cost that might be experienced by countries whose imports and exports are forced to pass through additional countries while heading to or from China. Any country which shares a land border directly with China receives a value of 1 in the dummy variable BORDER, and all others receive a value of 0. For these reasons, I expect a contiguous border with China to positively impact a country's BRI investment volume, along with pre-BRI investment volume.

Access to international waterways through oceangoing seaports is another important factor which enables a country to trade more easily with distant nations. Furthermore, the BRI does seek to specifically develop maritime routes all throughout the Indian Ocean and beyond, and it is logical to assume that countries with port access to the ocean would receive more funding not only for port development, but also for roads and railroads from those ports towards the inland urban centers. Landlocked countries may also find that their trade connections to China are more prone to disruption by thirty party countries. Any country which has ports directly touching the ocean receive a value of 1 for the dummy variable PORT, while all landlocked countries receive a value of 0.

Given the vocal opposition of the United States to the BRI as a threat to its own national security and global leadership position, there is good reason to believe that countries which are closely tied to the United States politically and militarily would be less receptive to BRI investments, and potentially less attractive to China if political influence is indeed a motivation for the initiative. It is no simple task to assess the strength of American influence, especially in terms of foreign policy, on all countries. The United States currently has military bases in more than 80 countries, and the size and number of bases within each country also varies greatly. Some countries with U.S. military bases even have Chinese military bases as well, such as Djibouti. Countries which the U.S. State Department or various administrations recognize as friendly nations or strategic allies may very well be equally friendly with China and not necessarily subject to intense U.S. pressure on foreign policy matters. There are obvious weaknesses in using NATO membership as a proxy for falling within the American orbit of influence, such as the exclusion of all countries outside North America and Western Europe (which overlooks key U.S. partners in Asia and other continents). In the end, there are few measurements of direct U.S. ties which are not overly broad or arbitrary, and so I chose to use this as my proxy. The final dummy variable, NATO, assigns countries a value of 1 if they are a recognized NATO member and a value of 0 otherwise. The list of NATO members is posted on the organization's official website, of which there are 30 currently listed (NATO, 2020).

Chapter 4

Results and Analysis

Investment Prediction Tests

Below I include the t-score values for my multiple linear regression models which apply each of the ten aforementioned independent variables to five different categories of investment.

Variable	LPREBRI	LNOTBRI	LBRI	LCBRI	LNBRI
R^2	0.5813	0.4150	0.2249	0.3216	0.2758
LDIST	-0.25	2.18**	-2.25**	-2.52**	-2.19**
LGDP	1.93*	4.24***	-1.80*	-2.73***	-0.74
LPOP	4.03***	-0.86	2.65***	3.64***	2.55**
LINFRAS	0.46	1.27	0.28	0.15	0.91
LNATRES	2.45**	-1.54	1.91*	2.11**	1.23
ETHNIC	2.48**	-0.20	1.67*	1.51	2.89***
CONFLICT	-1.75*	1.87*	-2.43**	-2.70***	-2.44**
BORDER	0.97	0.86	-0.33	-0.32	0.45
PORT	0.87	-0.88	0.04	1.15	-0.60
NATO	-2.61**	0.63	-1.64	-2.39**	-1.49

Table 1 t-scores for the multiple linear regressions across investment categories

For the above table, the denotation * indicates a p-value < 0.1, ** indicates a p-value < 0.05, and *** indicates a p-value < 0.01. This denotation only serves to highlight the more statistically significant results, and does not carry any intrinsic meaning. R^2 is the proportion of total variance in investment volume types explained by my model (which is the same for each category of investment). All other table rows indicate the t-score of the independent variables for each of the five models run (one for each investment category).

The first thing to notice is the considerably low R^2 value of BRI investment volume, a mere 0.2249. That is less than half of the predictive power of the model for all pre-BRI investments, 0.5813, even though the model was originally designed to predict BRI investments specifically, which are also assumed to be of a less heterogenous nature than the entire collection of pre-BRI investments. That R^2 value implies that the model captures less than a quarter of total variance in BRI investments by country, which is rather weak for an effective predictive model, and also lower than most values in FDI literature. It is worth noting that the model does work noticeably better for predicting the two types of BRI, construction investment and non-construction investment, which have R^2 scores of 0.3216 and 0.2758, respectively. The key observation here, which will be further discussed in the conclusion section, is that there is substantial room for improvement in the predictive power of this model for BRI investments, even while the majority of the independent variables demonstrate a strong statistical significance in most models.

The variable LDIST is statistically significant for all models except pre-BRI, although the direction of the relationship is positive for NOTBRI and negative for both BRI and its two subdivisions. This means that increased geographic distance from China corresponds to a reduction in BRI investment, which is to be expected based on all existing FDI and gravity model literature. The positive sign on the LDIST coefficient in the NOTBRI investment model might partially reflect a crowding-out effect of BRI investment on NOTBRI investment, if such a phenomenon is occurring. When reviewing the BRI and NOTBRI investment data for each country, I noticed that a striking number of countries which have a non-zero value for one of those two investment categories have a zero value for the other type, a pattern which is not found when comparing BRI and pre-BRI investment data. This begs the question of whether China is forcing developing countries to choose between accepting BRI investment or receiving no Chinese FDI, or if there is a political motive to classify any investment in close BRI partner countries as BRI investment to impress the Chinese populace or intimidate international rivals like the United States. In any event, the positive relationship between geographic distance and NOTBRI investment is a curious one which breaks away from past research and could indicate some flaw in the design of my model.

The most interesting variable of this table is LGDP, which, once population is accounted for separately, is negatively associated with BRI investment. This directly contrasts with almost all existing FDI literature, although it is worth noting that other FDI research often neglects population as a variable. For example, Buckley et al. (2007) do not include population separately. Consequently, find that there is no statistical significance for GDP per capita and GDP per capita growth rate, but do identify a strong significance for GDP. That result at least partially aligns with my own results, as GDP essentially functions as GDP per capita once population is accounted for. However, while Buckley et al. find no significant relationship for GDP per capita and Chinese ODI, my model does find a statistically significant and specifically negative relationship between a country's wealth and Chinese BRI investment. The reason it is important to test both pre-BRI and not-BRI investments in my model is to demonstrate that this is not a fluke; using an identical model, GDP is shown to have a statistically significant positive relationship with both historical and contemporary non-BRI Chinese ODI. When examining

CBRI and NBRI, the relationship is strongly negative, although the statistical significance is slightly stronger for CBRI than for NBRI.

The variable LPOP exhibits a strong and positive relationship with all investment categories with the exception of NOTBRI, where it is statistically insignificant. This indicates that market size and potential market expansion do positively influence BRI investment volume, as population was assessed with GDP evaluated independently. While FDI literature tends to neglect population as its own variable, the effect of population is generally captured through GDP in those models. My results for population are therefore consistent with prior research of market size as measured using GDP, with GDP per capita separately assessing development level.

LINFRAS was not statistically significant in any of the five models, although it was somewhat more positive for NOTBRI and NBRI investments, which matches the expectation that BRI and specifically CBRI projects, largely focused on trade infrastructure improvements, would go towards countries with lower quality infrastructure in comparison with other kinds of investment. Nothing conclusive can be drawn from this, although I would reiterate the concerns raised in the methodology section that likely caused this variable to fail to capture the true effect of infrastructure quality on BRI investment.

The results for LNATRES vary across models; there is a strong and positive relationship between LNATRES and PREBRI, BRI, and CBRI. The relationship is much weaker for NBRI, and weakly negative for NOTBRI, which indicates that BRI construction investments, much like the historical Chinese ODI trends observed in past research, aim to support natural resource imports to China by lowering transportation cost and supply chain disruption risks. NOTBRI investment may instead be primarily directed towards developed countries, as is the case with most FDI in general, whose natural resource export share is lower, but offer lower risk investment opportunities. Countries with high natural resource export may suffer what is known as the "resource curse" in the field of political science, whereby countries with higher economic dependency on natural resource exports are often plagued with violence, corruption, and instability resulting from the differences in institutions prerequisite for such an economic model to function. My model does not directly account for violence, corruption, or instability, and so that may be reflected in the weak but negative coefficient on LNATRES for the NOTBRI model.

Out of all ten independent variables, ETHNIC is the only one to have a higher statistical significance (among significant variables) in the NBRI model than the CBRI model. The signs of the coefficients of all variables match across the BRI and CBRI models, which means that generally, CBRI tends to demonstrate more sharply any trend identifiable in the BRI model, which is logical considering that the BRI is largely a construction-focused initiative and the unique characteristics it bears are heavily tied to that fact. However, countries with at least a 1% ethnic Chinese population are both strongly and positively associated with higher non-construction BRI investment volume, while the coefficient of ETHNIC in the CBRI model actually falls short of statistical significance. ETHNIC is moderately strong and positive for BRI as a whole, although not as strong as for the PREBRI model. This shows that overseas Chinese are indeed a key part of Chinese ODI, just as previous literature has found, but that significance may vary widely across BRI investment type, and should perhaps should not be assumed to apply broadly to any investment encompassed by the BRI.

CONFLICT is statistically significant and negatively associated with all investment categories except NOTBRI, where it is both positive and statistically significant. It is important to consider that only three countries have a value of 1 for this dummy variable, and that because two of them (India and Taiwan) have not joined the BRI, all of the Chinese ODI since 2013 which has gone to them would be classified as NOTBRI. It happens to be the case that China is a major exporter to Taiwan, and also imports high-tech products from Taiwan. India has the largest population in the world as of this year and directly borders China to the south; most other countries which fit that description have received little to no Chinese investment outside of the BRI since 2013, and so that makes India another outlier whose effect is captured by the CONFLICT dummy variable. Vietnam by itself is not significant enough to outweigh the effects of the other two countries in this small subset. As is the case with the LDIST variable, the lesson from this might not be that a history of war with China promotes non-BRI Chinese investment, but rather a possible crowding-out effect of the BRI on non-BRI investments throughout Asian countries, especially developing countries, causes this dummy to appear to have a directly positive affect NOTBRI.

The variable BORDER might be the most redundant of the model, and indeed it failed to yield statistical significance in any test. China borders many countries, and the broad assumption of various routes converging through these countries with greater density may either be false or insignificant in comparison to other factors. For example, if the railroad mileage is expected to be higher in a country where two routes join together, this effect may occur in numerous other countries which do not border China, and not all countries which do border China will have more than one large route running through them. Furthermore, if that difference is expected to be so large, then it would be almost more rational to include the geographical size of a country to account for the differences in costs for developing roads which pass through from one end of a country to another. The effect of having a contiguous land border is probably captured well enough by LDIST to begin with, and so this variable could likely be discarded, as it is not used in many other papers assessing ODI volume.

The effect of ocean access on a country's investment volume, represented by the dummy variable PORT, was not statistically significant in any model. The coefficient of PORT was the most positive in the CBRI model, which matches the expectation that CBRI investment would be attracted to countries which could ship goods directly to and from China, as well as providing access points to inland markets access by the Maritime Silk Road. Even if the variable is not statistically significant, it nonetheless benefited the ability of the models to predict investment volume and also sharpened the statistical significance of some of the other independent variables as a result.

The final variable, NATO, proved to be strongly and negatively associated with both PREBRI and CBRI, and had a weak but still negative association with BRI in general and NBRI in particular. There was no statistical significance for the NOTBRI model. The results from the PREBRI model were surprising, as that covered the period before American and Chinese relations became cooler. The prior research on Chinese ODI did not attempt to address the consideration of international power games, and the hypothetical crowding-out of NOTBRI by BRI could not conceivably impact PREBRI. Furthermore, the PREBRI model had the highest R^2 of any model by a sizeable margin. This result is interesting and demands a further exploration of the history of Chinese ODI to Western Europe, but the core finding for this variable is that NATO membership does tend to reduce CBRI investment volume, at the very least. This is in line with expectations, and demonstrates the importance of considering how competition between global powers might shape the landscape of international economic cooperation.

Beta Coefficient Comparison Tests

The results of the beta coefficient comparison tests are listed below in a table to summarize the statistical significance of the difference in how each independent variable influences the predicted investment volume for various types of investments. Table 1 displays the t-scores of the interactive variables for each comparison; the full results of the regressions tested in Stata are attached in the Appendix of this paper.

Variable name	LBRI vs LPREBRI	LBRI vs LNOTBRI	LCBRI vs LNBRI
LDIST	-1.71*	-3.11***	-0.16
LGDP	-2.58**	-4.00***	-1.35
LPOP	-0.11	2.62***	0.67
LINFRAS	-0.03	-0.55	-0.55
LNATRES	0.18	2.45**	0.57
ETHNIC	-0.03	1.45	-1.05
CONFLICT	-1.01	-3.07***	-0.10
BORDER	-0.83	-0.79	-0.55
PORT	-0.46	0.56	1.23
NATO	0.13	-1.69*	-0.57

Table 2 t-scores for the difference in beta coefficient tests across investment categories

For the above table, the denotation * indicates a p-value < 0.1, ** indicates a p-value < 0.05, and *** indicates a p-value < 0.01. This denotation only serves to highlight the more statistically significant results, and does not carry any intrinsic meaning. The variables above are the same as in the previous models, i.e., all interval variables are expressed in natural log form.

Looking first at the differences in beta coefficients for pre-BRI investment and BRI investment, two variables stand out as having a statistically significant and negative association with BRI investment: distance and GDP. In the case of distance, this negative association implies that under the BRI, China has turned more towards countries in its own hemisphere as opposed to the faraway countries of Europe and North America where Chinese ODI had previously flowed in greater proportion. The difference in the beta coefficients for population is near zero, while GDP, as a proxy of wealth and development in this context, is strongly negative. This is the most important result of this paper regarding the question of whether the BRI can be said to truly mark a sweeping change in Chinese ODI patterns. Added atop the research of Buckley et. al (2007), it can be shown that since the liberalization of China in the early 90s, there had been a positive association between host country GDP and Chinese ODI during the decades before the BRI launch. While this trend continued through the 2005-2013 pre-BRI era of my own analysis, the BRI led a hard pivot towards poorer countries and emerging markets.

The two investment categories where the independent variables have the most disparate values are BRI and not-BRI type initiatives, which is to be expected. There is a strong statistical significance for the difference in values for the beta coefficients of distance, GDP, population, natural resource export share, and history of conflict. In comparison with non-BRI investments occurring since September 2013, the beta coefficients for distance, GDP, and history of conflict are more negatively associated with BRI investment volume, while the beta coefficients for population and natural resource export share are more positively associated with BRI investment volume. With GDP and population both listed separately, this means that countries further from

China, with higher economic development, and having a history of direct military conflict with China since 1949 are expected to receive relatively more not-BRI investment than BRI investment. The opposite is true for countries with a larger population and natural resource export share, which are expected to receive relatively more BRI investment than not-BRI investment.

When comparing the beta coefficients for each variable across construction and non-construction BRI investment, there are no t-scores which correspond to a statistical significance strong enough to warrant confident conclusions based on this model. It is interesting to note that among these variables, the strongest associations are for GDP (negative) and port access (positive), which would indicate that countries which are less economically developed and have direct port access to the ocean are expected to receive relatively higher construction BRI investment volume than non-construction BRI investment volume, which aligns with the more hawkish scholarly assumptions about the BRI's objectives, specifically the leveraging of debt-trap diplomacy in underdeveloped countries to grant increased port access for Chinese military ships. In situations where construction project loans fail to be repaid, there is often still some potential trade or military benefit for China that may not exist in non-construction type projects. On a less controversial note, construction type projects more directly support the Chinese steel and construction industries, which is a demonstrable motivator for BRI investment. Countries which are less developed may very well need more of this investment type, and those with port access could prove easier to ship goods to and more valuable as hubs in a broader transportation network. It is worth noting that in sharp contrast with the BRI vs not-BRI test, there is a complete lack of any clear statistical relationship between either distance from China or history of conflict and BRI investment type, indicating that these variables which are relevant for BRI investment volume do not necessarily correspond to particular types of BRI investment. In the case of conflict history, this is not surprising, as the countries which have a history of war with China are likely to distrust any kind of BRI involvement, as indeed has been demonstrated by both India and Taiwan. Also, with just three countries falling under this category (Vietnam being the third), there are also not many observations available to consider. The near-zero value of the beta coefficient for distance indicates that, at least when considering the existence of a contiguous border with China separately, there is no particular relationship between geographical distance and a tendency towards any particular type of Chinese BRI investment. The total lack of significance for distance in particular, in comparison with the modestly positive effect of port access, indicates that the BRI construction projects are not just centered in China's immediate vicinity and that maritime routes are indeed a key part of the Belt and Road Initiative's six economic corridors.

Chapter 5

Conclusion

Key findings

This paper demonstrates that the Belt and Road Initiative is clearly distinct from both historical Chinese ODI trends and contemporary non-BRI investment patterns through the use of multiple linear regression models and difference of beta coefficient tests. Specifically, there exists a statistically significant negative relationship between GDP and BRI investment volume once population is accounted for separately, which sharply contrasts with the majority of existing literature on general FDI trends. Furthermore, there is a statistically significant and negative effect of NATO membership and a history of direct military conflict with China on BRI investment volume, something which past research has generally not considered. Prior research regarding the positive significance of ethnic Chinese immigrant presence on historical Chinese ODI is reaffirmed to apply to BRI construction investments. Additionally, it is confirmed that there is a strong statistical significance for the differences in coefficients for LDIST, LGDP, LPOP, LNATRES, and CONFLICT when predicting BRI investment in comparison with non-BRI investment. In comparison with non-BRI investment occurring since September 2013, LDIST, LGDP, and CONFLICT have a distinctly negative effect on the volume of BRI investment, while LPOP and LNATRES have a distinctly positive effect on BRI investment volume. In terms of the efficacy of the models for predicting Chinese ODI volume by category, the weak R^2 value of 0.2249 for the BRI investment model indicates a tremendous amount of variance uncaptured by my model, which implies much room for additional relevant variables to better predict Chinese ODI volume and type.

Limitations

The first limitation of this research was in missing complete observations for various countries. Due to the difficulty of gathering reliable data on some regions, several of my datasets had no information about numerous countries which would have been beneficial to include in my model. In some instances, I made a close substitution with the data which did exist, and in other cases I was forced to omit countries from my dataset entirely. Furthermore, the countries which lacked data had a disproportionate tendency to be developing countries in Africa or Asia, which meant my model was missing crucial observations of likely candidates for BRI investment. To navigate this problem in the future, more variables would have to be created using more basic and universally available metrics, which may come at the expense of variable quality.

Another limitation to this research was the difficulty in measuring some factors of interest. For example, identifying a dummy variable to capture the foreign policy pressure of the United States against the BRI is not something that can be simply found on some database. The decision to use military base presence, official State Department announcements, mutual defense treaties, membership in international organizations, or other decisions all involve assumptions and ultimately a level of arbitrary categorization. Other variables which could be downloaded from a report were not necessarily the theoretical best representations of the factor they aim to measure. For instance, telephone infrastructure is part of the WEF 2013 Global Competitiveness Report's overall infrastructure rating for countries, which is not connected to the actual transportation infrastructure prerequisite for trade. However, creating a new variable out of the WEF's report would involve difficult decisions regarding how to aggregate the quality of infrastructure for countries whose topography may force atypical and asymmetric reliance upon particular kinds of infrastructure which an original rating may fail to reflect properly.

The last major limitation to these models is the limited number of variables in the dataset. Many other factors like economic stability of the host country, corruption ratings, and credit trustworthiness were left out of the model in order to better focus on the core objective of the paper, which was to demonstrate that fundamental differences do exist between the BRI and other kinds of Chinese ODI in order to explain the true motivations of the BRI. The inclusion of more variables might have improved the ability of the model to predict BRI and other categories of Chinese ODI, or even given more clarity to the relationship between statistically weak variables in the model such as LINFRAS.

Future Research

This paper is intended as a starting point for a more thorough investigation of the Belt and Road Initiative, and there is much room for revision and expansion of the models employed. Future research may seek to capture more of the variance in BRI investment funding than my own model succeeds in doing. This would allow for policymakers to better predict the future of Chinese ODI orientation over the coming years. It may also serve as a useful template for an analysis of other countries which have heavy government influence over private sector investment.

Overall, this paper was designed to prepare an answer for the oft-repeated question, "What are China's intentions with the Belt and Road Initiative?" The answer is truly multifaceted in nature, and so it is time for economists to employ concrete analysis to either validate or reject these anecdotal claims swirling endlessly across legislative chambers and newsrooms. The next major step of this research would be to analyze the connection between debt, credit trustworthiness, corruption, and monetary policy with the BRI to ascertain whether China seeks out countries vulnerable to debt. Time will be an important variable in more advanced models as well, in order to gauge the tendency of BRI investments to instigate debt crises, and what the consequences of BRI loans are for the developing world. Further expansion of this research would explore the short-term and long-term effects of the BRI on partner countries; criticisms aside, has it actually accelerated the development of low-income countries, and has it affected the way recipients of BRI investments interact with China on the global stage? These are the lingering questions which will define the legacy of the largest international development project in modern history.

Appendix

Expanded Methodology Section for Missing Data Values

For Iraq, I was forced to create an original value to retain it in my dataset, as the WEF had no calculation for that country during the 2013 report. The 2012 and 2014 reports also lacked a value for Iraq, and hence a substitution was not feasible. My primary reference point was Yemen, which has also experienced years of warfare and terrorism that have destroyed the infrastructure of the country. The WEF 2013 Global Competitiveness Report assigned a score of 2.6 to Yemen. After briefly researching the road and port quality of the two countries, with consideration to the comparatively more stable situation in Iraq, I deemed a slightly higher score of 2.8 to be an acceptable estimate. This score places Iraq on par with Bangladesh, Benin, and Mongolia. As of 2021, Iraq has 44,000 miles of paved highways, although most of these are one to two decades past their proper life expectancy (International Trade Administration, 2021). Comparing these statistics with available road data for Yemen, a slightly higher score for Iraq was warranted, especially in conjunction with recent deals for port improvements with other countries. The reason why I endeavored to retain Iraq in my dataset is due to information gleaned from Nedopil (2022b), which shows that Iraq received more BRI energy engagement than the next ten countries combined in the year 2021. For that reason, dropping Iraq from the dataset seemed inappropriate unless the data for that entire year was also omitted. The necessity of estimating a rating for Iraq may have partially harmed the statistical significance of the LINFRAS variable.

Regarding my data for LNATRES, there were multiple countries I was forced to omit from my dataset entirely, and others where I was able to appropriately substitute another number.

For Bhutan, there was no 2013 data for fuel or metal products, so I used 2012 data for both (as 2012 would not reflect the effect of the BRI, and the enticement of the resource exports would be present for the entire duration of the project). For Cape Verde, there was no 2013 data for fuel products, so I used 2012 numbers for that. For Gabon, I took the average data for the years 2006-2009 which were the closest to 2013; the averaging was intended to help account for minor annual fluctuations, given that the data was more than one year away from my standard selection. For Haiti, there was no data for 2013 or prior years, so I researched this country individually and found that the export share could be rounded to 0 for both fuel and metal products, as neither had a value of even 1%. For Honduras, there was no 2013 data for fuel or metal products, so I took the 2014 numbers as one 2012 number was starkly aberrant in comparison with all preceding and following years. For Libya, there was no 2013 data for fuel or metal products, so I took the 2016-2019 average, which was the earliest available; the data was relatively consistent over that time period and after from the other sources I encountered, barring a temporary collapse due to political turmoil (Statista Research Department, 2022). I did not want to exclude a major North African oil exporter from the dataset if reasonable substitute data was available, hence my approach for this country. For Mali, no 2013 data was available for fuel or metal products, so I used the 2012 numbers. The decisions to include all of these countries may have mildly impacted my data, but the exclusion of so many critical observations would have been especially harmful to my model as it would disproportionately remove developing countries, which are the focus of the Belt and Road Initiative. Taiwan is not recognized as a country by China, which considers it a rogue province, but Taiwan does nonetheless have an elected democratic government which exercises complete autonomy over the island territory, and its complete lack of involvement with the BRI contrasts with the recognized Special

Administrative Regions of Hong Kong and Macao, which are involved in the BRI as part of the People's Republic of China. For these reasons, Taiwan is considered an independent country for this dataset, as opposed to a province of mainland China.

Complete Regression Charts from Stata

```
. reg invest dist gdp pop infras natres ethnic conflict border port nato if dummy==2

      Source |       SS           df       MS      Number of obs   =       140
-------------+----------------------------------   F(10, 129)      =     17.91
       Model |    1116.798        10   111.6798    Prob > F        =    0.0000
    Residual |  804.374573       129  6.23546181   R-squared       =    0.5813
-------------+----------------------------------   Adj R-squared   =    0.5489
       Total |  1921.17258       139  13.8213854   Root MSE        =    2.4971

------------------------------------------------------------------------------
      invest | Coefficient  Std. err.      t    P>|t|     [95% conf. interval]
-------------+----------------------------------------------------------------
        dist |  -.1184656   .4782769    -0.25   0.805    -1.064748    .8278169
         gdp |   .4769062   .2475141     1.93   0.056    -.0128066     .966619
         pop |   1.055287   .2620702     4.03   0.000      .536775      1.5738
      infras |   .5350299    1.17313     0.46   0.649    -1.786036    2.856095
      natres |   .3508653   .1431888     2.45   0.016     .0675627    .6341679
      ethnic |   1.565434   .6306594     2.48   0.014     .3176588    2.813209
    conflict |  -2.790073    1.59805    -1.75   0.083    -5.951855    .3717094
      border |   1.043213   1.074832     0.97   0.334    -1.083367    3.169794
        port |   .5041755   .5827468     0.87   0.389    -.6488034    1.657154
        nato |  -1.534061   .5875151    -2.61   0.010    -2.696474   -.3716482
       _cons |  -24.33135   5.626567    -4.32   0.000    -35.46365   -13.19905
------------------------------------------------------------------------------
```

Figure 6 PREBRI predictive model

```
. reg invest dist gdp pop infras natres ethnic conflict border port nato if dummy==3

      Source |       SS           df       MS      Number of obs   =       140
-------------+----------------------------------   F(10, 129)      =      9.15
       Model |  696.08412        10  69.608412   Prob > F        =    0.0000
    Residual |  981.241249       129  7.60652131   R-squared       =    0.4150
-------------+----------------------------------   Adj R-squared   =    0.3696
       Total |  1677.32537       139  12.067089   Root MSE        =     2.758

------------------------------------------------------------------------------
      invest | Coefficient  Std. err.      t    P>|t|     [95% conf. interval]
-------------+----------------------------------------------------------------
        dist |   1.150241   .5282484     2.18   0.031     .1050892    2.195394
         gdp |   1.157983    .273375     4.24   0.000     .6171036    1.698862
         pop |  -.2477906   .2894519    -0.86   0.394    -.8204783    .3248971
      infras |   1.647842   1.295701     1.27   0.206    -.9157339    4.211417
      natres |  -.2434581   .1581495    -1.54   0.126    -.5563609    .0694446
      ethnic |  -.1380068   .6965521    -0.20   0.843    -1.516152    1.240139
    conflict |   3.304026   1.765018     1.87   0.063    -.1881056    6.796158
      border |   1.020641   1.187132     0.86   0.392    -1.328129    3.369412
        port |  -.5694022   .6436335    -0.88   0.378    -1.842847    .7040424
        nato |   .4118643      .6489     0.63   0.527    -.8720002    1.695729
       _cons |  -35.19619   6.214443    -5.66   0.000    -47.49161   -22.90076
------------------------------------------------------------------------------
```

Figure 7 NOTBRI predictive model

```
. reg invest dist gdp pop infras natres ethnic conflict border port nato if dummy==4

      Source |       SS           df       MS      Number of obs   =       140
-------------+----------------------------------   F(10, 129)      =      3.74
       Model |  491.982565        10  49.1982565   Prob > F        =    0.0002
    Residual |  1695.55426       129  13.1438315   R-squared       =    0.2249
-------------+----------------------------------   Adj R-squared   =    0.1648
       Total |  2187.53683       139  15.737675   Root MSE        =    3.6254

------------------------------------------------------------------------------
      invest | Coefficient  Std. err.      t    P>|t|     [95% conf. interval]
-------------+----------------------------------------------------------------
        dist |   -1.56101   .6943942    -2.25   0.026    -2.934886   -.1871339
         gdp |  -.6482979   .3593575    -1.80   0.074    -1.359295    .0626997
         pop |   1.006696    .380491     2.65   0.009     .2538848    1.759506
      infras |   .4743253   1.703228     0.28   0.781    -2.895552    3.844203
      natres |    .397256   .2078911     1.91   0.058    -.0140616    .8085736
      ethnic |   1.531345   .9156332     1.67   0.097    -.2802581    3.342947
    conflict |  -5.640641   2.320156    -2.43   0.016    -10.23113   -1.050156
      border |  -.5225795   1.560512    -0.33   0.738     -3.61009    2.564931
        port |   .0296302   .8460706     0.04   0.972    -1.644341    1.703602
        nato |  -1.402074   .8529935    -1.64   0.103    -3.089743    .2855941
       _cons |   17.79504   8.169024     2.18   0.031      1.63243    33.95766
------------------------------------------------------------------------------
```

Figure 8 BRI predictive model

```
. reg invest dist gdp pop infras natres ethnic conflict border port nato if dummy==5

      Source |       SS           df       MS      Number of obs   =       140
-------------+----------------------------------   F(10, 129)      =      6.12
       Model |  664.897529        10  66.4897529   Prob > F        =    0.0000
    Residual |  1402.57145       129  10.8726469   R-squared       =    0.3216
-------------+----------------------------------   Adj R-squared   =    0.2690
       Total |  2067.46898       139  14.8738775   Root MSE        =    3.2974

------------------------------------------------------------------------------
      invest | Coefficient  Std. err.      t    P>|t|     [95% conf. interval]
-------------+----------------------------------------------------------------
        dist |  -1.592322   .6315573    -2.52   0.013    -2.841873    -.34277
         gdp |   -.892541   .3268386    -2.73   0.007    -1.539199   -.2458829
         pop |   1.260405   .3460597     3.64   0.000     .5757179    1.945093
      infras |   .2339209   1.549099     0.15   0.880     -2.83101    3.298852
      natres |   .3990488   .1890787     2.11   0.037      .024952    .7731455
      ethnic |   1.253881    .832776     1.51   0.135    -.3937863    2.901549
    conflict |  -5.700327   2.110201    -2.70   0.008    -9.875412   -1.525243
      border |  -.4560771   1.419298    -0.32   0.748    -3.264194     2.35204
        port |    .887458   .7695082     1.15   0.251    -.6350328    2.409949
        nato |  -1.853056   .7758046    -2.39   0.018    -3.388005   -.3181077
       _cons |   19.25151   7.429795     2.59   0.011     4.551478    33.95154
------------------------------------------------------------------------------
```

Figure 9 CBRI predictive model

```
. reg invest dist gdp pop infras natres ethnic conflict border port nato if dummy==6

      Source |       SS           df       MS      Number of obs   =       140
-------------+----------------------------------   F(10, 129)      =      4.91
       Model |  585.022558        10  58.5022558   Prob > F        =    0.0000
    Residual |  1536.41019       129  11.9101565   R-squared       =    0.2758
-------------+----------------------------------   Adj R-squared   =    0.2196
       Total |  2121.43275       139  15.2621061   Root MSE        =    3.4511

------------------------------------------------------------------------------
      invest | Coefficient  Std. err.      t    P>|t|     [95% conf. interval]
-------------+----------------------------------------------------------------
        dist |  -1.445276   .6610036    -2.19   0.031    -2.753088   -.1374641
         gdp |  -.2538401   .3420774    -0.74   0.459    -.9306487    .4229684
         pop |   .9239101   .3621947     2.55   0.012      .207299    1.640521
      infras |   1.472256   1.621326     0.91   0.366    -1.735577     4.68009
      natres |   .2429445   .1978944     1.23   0.222    -.1485945    .6344835
      ethnic |   2.521478   .8716041     2.89   0.004     .7969881    4.245968
    conflict |  -5.386833   2.208589    -2.44   0.016    -9.756581   -1.017086
      border |   .6734154   1.485473     0.45   0.651     -2.26563     3.61246
        port |  -.4821598   .8053865    -0.60   0.550    -2.075637    1.111317
        nato |  -1.211255   .8119765    -1.49   0.138     -2.81777    .3952607
       _cons |   5.640223   7.776209     0.73   0.470    -9.745196    21.02564
------------------------------------------------------------------------------
```

Figure 10 NBRI predictive model

```
. reg invest dist gdp pop infras natres ethnic conflict border port nato idist igdp ipop iin
> fras inatres iethnic iconflict iborder iport inato dummy
```

Source	SS	df	MS			
				Number of obs	=	280
				F(21, 258)	=	7.92
Model	1611.58568	21	76.7421752	Prob > F	=	0.0000
Residual	2499.92885	258	9.68964672	R-squared	=	0.3920
				Adj R-squared	=	0.3425
Total	4111.51453	279	14.7366112	Root MSE	=	3.1128

invest	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
dist	-.1184652	.5962098	-0.20	0.843	-1.292522	1.055592
gdp	.4769061	.3085458	1.55	0.123	-.1306827	1.084495
pop	1.055287	.3266911	3.23	0.001	.4119667	1.698608
infras	.5350302	1.462398	0.37	0.715	-2.344726	3.414787
natres	.3508653	.1784961	1.97	0.050	-.0006295	.7023602
ethnic	1.565434	.7861665	1.99	0.048	.0173138	3.113554
conflict	-2.790072	1.992095	-1.40	0.163	-6.71291	1.132765
border	1.043214	1.339862	0.78	0.437	-1.595244	3.681672
port	.5041755	.7264397	0.69	0.488	-.9263306	1.934682
nato	-1.534061	.7323838	-2.09	0.037	-2.976272	-.0918501
idist	-1.442545	.8431679	-1.71	0.088	-3.102912	.2178225
igdp	-1.125204	.4363496	-2.58	0.010	-1.984464	-.2659437
ipop	-.0485918	.462011	-0.11	0.916	-.9583845	.8612008
iinfras	-.0607049	2.068143	-0.03	0.977	-4.133295	4.011886
inatres	.0463907	.2524317	0.18	0.854	-.4506981	.5434795
iethnic	-.0340896	1.111807	-0.03	0.976	-2.223462	2.155283
iconflict	-2.850569	2.817248	-1.01	0.313	-8.398299	2.697161
iborder	-1.565793	1.894851	-0.83	0.409	-5.297136	2.16555
iport	-.4745451	1.027341	-0.46	0.645	-2.497586	1.548496
inato	.1319864	1.035747	0.13	0.899	-1.907608	2.171581
dummy	42.1264	9.919234	4.25	0.000	22.59343	61.65937
_cons	-24.33135	7.013958	-3.47	0.001	-38.14325	-10.51946

Figure 11 Beta coefficients difference test for BRI and PREBRI

```
. reg invest dist gdp pop infras natres ethnic conflict border port nato idist igdp ipop iin
> fras inatres iethnic iconflict iborder iport inato dummy
```

Source	SS	df	MS
Model	2354.45025	21	112.116678
Residual	2676.79547	258	10.3751762
Total	5031.24571	279	18.0331388

Number of obs	=	280
F(21, 258)	=	10.81
Prob > F	=	0.0000
R-squared	=	0.4680
Adj R-squared	=	0.4247
Root MSE	=	3.2211

invest	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
dist	1.150242	.6169399	1.86	0.063	-.064637	2.365121
gdp	1.157983	.3192739	3.63	0.000	.529268	1.786697
pop	-.2477906	.3380501	-0.73	0.464	-.9134794	.4178982
infras	1.647842	1.513246	1.09	0.277	-1.332043	4.627727
natres	-.2434581	.1847024	-1.32	0.189	-.6071744	.1202582
ethnic	-.1380067	.8135014	-0.17	0.865	-1.739955	1.463941
conflict	3.304027	2.06136	1.60	0.110	-.7552071	7.36326
border	1.020642	1.386449	0.74	0.462	-1.709555	3.750839
port	-.5694022	.7516979	-0.76	0.449	-2.049647	.9108424
nato	.4118644	.7578486	0.54	0.587	-1.080492	1.904221
idist	-2.711252	.8724848	-3.11	0.002	-4.42935	-.9931537
igdp	-1.80628	.4515214	-4.00	0.000	-2.695417	-.9171438
ipop	1.254486	.478075	2.62	0.009	.31306	2.195912
iinfras	-1.173517	2.140052	-0.55	0.584	-5.387711	3.040677
inatres	.6407142	.2612087	2.45	0.015	.1263417	1.155087
iethnic	1.669351	1.150465	1.45	0.148	-.5961459	3.934847
iconflict	-8.944668	2.915204	-3.07	0.002	-14.68529	-3.204045
iborder	-1.54322	1.960735	-0.79	0.432	-5.404301	2.317861
iport	.599033	1.063061	0.56	0.574	-1.494349	2.692415
inato	-1.813939	1.07176	-1.69	0.092	-3.92445	.2965715
dummy	52.99124	10.26412	5.16	0.000	32.77911	73.20336
_cons	-35.19619	7.257832	-4.85	0.000	-49.48832	-20.90406

Figure 12 Beta coefficients difference test for BRI and NOTBRI

```
. reg invest dist gdp pop infras natres ethnic conflict border port nato idist igdp ipop iin
> fras inatres iethnic iconflict iborder iport inato dummy
```

Source	SS	df	MS			
Model	1330.35418	21	63.350199	Number of obs	=	280
Residual	2938.98163	258	11.3914017	F(21, 258)	=	5.56
				Prob > F	=	0.0000
Total	4269.33581	279	15.3022789	R-squared	=	0.3116
				Adj R-squared	=	0.2556
				Root MSE	=	3.3751

invest	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
dist	-1.445275	.6464481	-2.24	0.026	-2.718262	-.1722889
gdp	-.2538401	.3345448	-0.76	0.449	-.9126261	.404946
pop	.92391	.3542191	2.61	0.010	.2263813	1.621439
infras	1.472256	1.585624	0.93	0.354	-1.650157	4.59467
natres	.2429445	.1935368	1.26	0.211	-.1381683	.6240574
ethnic	2.521478	.8524112	2.96	0.003	.842909	4.200048
conflict	-5.386833	2.159955	-2.49	0.013	-9.64022	-1.133446
border	.6734161	1.452763	0.46	0.643	-2.187366	3.534198
port	-.4821598	.7876516	-0.61	0.541	-2.033205	1.068885
nato	-1.211255	.7940966	-1.53	0.128	-2.774991	.3524813
idist	-.1470464	.9142157	-0.16	0.872	-1.947321	1.653228
igdp	-.638701	.4731177	-1.35	0.178	-1.570365	.2929631
ipop	.3364955	.5009414	0.67	0.502	-.649959	1.32295
iinfras	-1.238336	2.242411	-0.55	0.581	-5.654095	3.177423
inatres	.1561042	.2737023	0.57	0.569	-.3828707	.6950792
iethnic	-1.267597	1.205491	-1.05	0.294	-3.641452	1.106258
iconflict	-.3134942	3.054638	-0.10	0.918	-6.328692	5.701703
iborder	-1.129493	2.054517	-0.55	0.583	-5.17525	2.916263
iport	1.369618	1.113908	1.23	0.220	-.8238905	3.563126
inato	-.6418016	1.123022	-0.57	0.568	-2.853258	1.569655
dummy	13.61129	10.75506	1.27	0.207	-7.567581	34.79017
_cons	5.640218	7.604974	0.74	0.459	-9.335508	20.61594

Figure 13 Beta coefficients difference test for CBRI and NBRI

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ACADEMIC VITA

Joshua Reynolds

EDUCATION

The Pennsylvania State University, University Park, PA Expected May 2023

- Bachelor of Science in Economics, Bachelor of Arts in Political Science
  Bachelor of Arts in Chinese, Bachelor of Arts in Spanish, Bachelor of Arts in Asian Studies
- Member of Schreyer's Honors College

Cumberland Valley High School, Mechanicsburg, PA Graduated May 2019

- 9 AP classes, 2 International Baccalaureate classes, Honors Society

LEADERSHIP EXPERIENCE

At-large representative of the university-wide student government (April 2020 – Present)

- Serve as the sole student liaison to all Transportation Services related offices at Penn State
- Co-lead committee meetings as the Vice-Chair of Facilities and assist the Chair in all capacities
- Learn how to draft and amend legislation through the democratic process

Member of the Presidential Leadership Academy (April 2020 – Present)

- Study leadership directly under the President of the Pennsylvania State University
- Discuss and deliberate on topics of great concern to the university administration
- One of thirty students selected from a graduating class of 8,000+

PROFESSIONAL EXPERIENCE

Resident Assistant, University Park, PA (June 2021 – Present)

- Foster relationships with and between residents through conversation and self-organized events
- Connect students to helpful resources, promote involvement, distribute university information
- Uphold university dorm policies, report violations, demonstrate model behavior
- Resolve conflicts among residents, offer advice, support residents' mental wellbeing

EXTRACURRICULAR INVOLVEMENT

- Programming Chair of International and Multicultural Assoc. of Schreyer Scholars (October 2022 – Present)
- Treasurer of Dance Dance Maniacs (February 2022 – Present)
- Active member of the Columbian American Students Association (August 2021 – Present)
- Programming Chair of the Liberal Arts Undergraduate Council (January 2020 – January 2021)
- Served on review boards for the University Park Allocation Committee (September 2019 – May 2020)

COMMUNITY SERVICE

- Four hours weekly spent preparing and running visual tech at church (August 2013 – August 2019)
- Misc. volunteer engagements averaging two hours weekly (January 2020 – Present)

AWARDS

The President's Freshman Award for maintaining a 4.0 GPA during my first semester at Penn State
National Honors Society for maintaining a weighted average of above a 93 throughout HS (2016-2019)
National Chemistry Olympiad Regional Finalist for the highest score in my region on the Chemistry Olympiad test

ADDITIONAL SKILLS

Spanish superior fluency (9+ years of study)
Chinese intermediate fluency (3+ years of study)
Proficient Excel literacy
Basic Access literacy