

ERASMUS UNIVERSITY ROTTERDAM

Erasmus School of Economics

Bachelor Thesis Economie en Bedrijfseconomie

The employment effects of the Belt and Road Initiative: Regional case study in Piraeus port (GR) and Tilburg (NL).

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Date final version: 29-10-2023

The views stated in this thesis are those of the author and not necessarily those of the supervisor, second assessor, Erasmus School of Economics or Erasmus University Rotterdam.

Abstract

In 2013 Xi Jinping announced the Belt and road initiative, a huge infrastructure project that would connect the East to the West. This project was met with skepticism from the West and was characterized as an expansion of Chinese political influence. In this paper we review both perspectives and analyze the claimed effects of the Belt and Road Initiative on the world economy by means of a literature review. Secondly, this paper analyzes the local effects of the BRI on unemployment in Piraeus port in Greece and a rail terminal in Tilburg the Netherlands. It is found that the BRI might have a positive impact on local employment. The paper recommends further research to obtain more significant outcomes by means of a larger N, more detailed data on the area around terminal and a larger population of projects.

Table of Contents

| | |
|--|----|
| Abstract | 2 |
| 1. Introduction | 4 |
| Social relevance: | 6 |
| Scientific relevance: | 6 |
| 2. Literature review and theoretical framework | 8 |
| What is the belt and road initiative? | 8 |
| Relevant problems with large infrastructure projects | 10 |
| Economic impact of the BRI | 11 |
| Reduction in trade times and cost | 12 |
| Increasing trade and FDI due to the BRI | 12 |
| Increasing welfare due to the BRI | 13 |
| Environmental impact of the BRI | 13 |
| The BRI and the TEN-T program | 15 |
| 3. Case Study | 18 |
| Rail shipping history between the Netherlands and China and developments | 18 |
| Sea Shipping History between Greece and China and developments | 19 |
| Correlation between port throughput and employment | 19 |
| Visual Development of Piraeus Port from 2008 – 2023 | 20 |
| Development of Rail port in Tilburg from 2008 – 2023 | 20 |
| 4. Data | 21 |
| 5. Methodology | 23 |
| 6. Results | 26 |
| 7. Discussion | 28 |
| 8. Conclusion | 30 |
| 9. References | 31 |
| 10. Appendix A | 36 |
| 10. Appendix B | 37 |

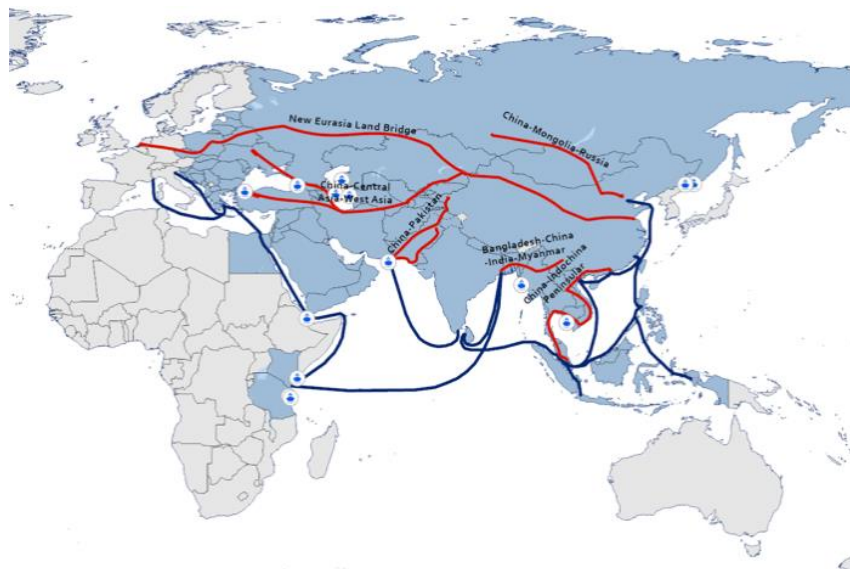
1. Introduction

In the modern era of global politics and economics, the Belt and Road Initiative (BRI) has emerged as a pivotal and transformative endeavor, that has been initiated by the People's Republic of China in 2013 (Sarker et al, 2018). The BRI presents an ambitious vision to foster connectivity and cooperation among countries across Asia, Europe, and Africa through infrastructure development, trade partnerships, and cultural exchange. This initiative holds profound implications for international relations, economic growth, and sustainable development. As scholars and policymakers seek to comprehend the multifaceted dimensions of the BRI, it becomes imperative to critically analyze its origins, objectives, and potential impacts (Johnsten, 2019).

The BRI's inception can be traced to a strategic articulation by Chinese President Xi Jinping during his visits to Central and Southeast Asia in 2013. The initiative encompasses two key components: the Silk Road Economic Belt, a land-based network of corridors connecting China to Europe via Central Asia, and the 21st Century Maritime Silk Road, focusing on maritime routes connecting China's southern coast to Europe through Southeast Asia and the Indian Ocean (State Council of the People's Republic of China, 2015). With an array of infrastructure projects ranging from roads, railways, and ports to digital networks, the BRI seeks to encourage economic integration, enhance regional cooperation, and facilitate cultural exchange among participating nations. In figure 1 the BRI routes have been visualized (Johnsten, 2019).

Figure 1

Belt and Road Initiative Routes



Note. This figure is from (Johnsten, 2019)

As the Belt and Road Initiative (BRI) continues to gather momentum as a monumental global development project, it has not only captured the attention of participating countries in Asia, Africa, and Europe but has also prompted extensive analysis and discourse within the western world. The BRI has created a wide range of perceptions, opinions, and concerns from Western nations (Chance & Mafinezam 2016). Below the varied Western viewpoints on the BRI are introduced, highlighting the multidimensional lenses the BRI is perceived, evaluated, and often critiqued through.

As seen from the figure below the BRI is a project that increases Eurasian connectivity through maritime routes and land-based routes. Seventeen out of twenty-seven European countries have formally joined the BRI bilateral memorandum of understanding. Chinese investments in Europe are diverse in nature and particularly prominent in Portugal, Greece, and Italy. Some examples are the port of Piraeus, Energias de Portugal; an electricity company in Portugal and commitments to invest in the ports of Genoa, Palermo, and Trieste in Italy. Furthermore, European legislators have been working on a more unified approach on the BRI (EC, 2018). They emphasize that they would like to work with their Asian partners, however working in the European way. The text emphasizes that that connectivity investments should be more in line with European standards especially that the investments should be more economically, fiscally, environmentally, and socially responsible (Sarsenbayev & Véron, 2020).

Whilst the European view is more nuanced the Americans view the BRI project in a more hostile manner (Chance & Mafinezam 2016). First, the United States expressed their concerns about the environmental standards, social standards, Chinese development practices and erosion of western development norms. Secondly, the BRI is viewed as an attempt to economically marginalize the United States, creating a Eurasian sphere of influence, and expanding China's overseas military presence. This perception is heightened by concerns about China's assertive statecraft. Thirdly, the US sees this as a challenge to US interest and international order and change the American favored monetary system and increasing the role of the Renminbi (Chinese Currency).

China's ambition with the belt and road initiative is economic in nature. China aims to stimulate economic growth in a vast region covering sub regions in Europe, Asia, and Africa. This area accounts for more than 60% of the world population and over 30% of the world's economic activity measured in gross domestic product (Huang, Y., 2016). China aims to do this by putting infrastructure development central to the plan. This remains a topic of debate in the international community, that is why this paper will research if the BRI does regionally benefit the inhabitants of the chosen case study areas. An example of a BRI project is:

Piraeus port in Greece, which this paper will also analyze. According to (the National Development and Reform Commission, 2021) and (Xinhua, 2022) Piraeus port in Greece had its number two and three piers taken over by Chinese shipping giant Cosco in 2009. Back then Greece was suffering from a huge economic crisis and the port of Piraeus was declining. Greek and Chinese officials like Adonis Georgiadis, Greek Minister of Development and Investments observed Piraeus port and agree that this is a successful China-Greece collaboration in the context of the BRI initiative (Xinhua, 2022). According to the sources there has almost been a fivefold increase from 2010 to 2020 in twenty-foot equivalent unit shipping containers (TEU)s. Increase from less than a million units to more than five million units. Furthermore, this created many jobs and there are more future plans for continued growth.

Social relevance:

The BRI initiative is viewed as Chinese imperialism by western countries (Chance & Mafinezam 2016); however, this could be a biased view. In this paper it will be analyzed if it is of mutual benefit to China and the participating countries. It is important for us to know if the investments made have a positive impact, so that in the future such projects can be initiated to increase international trade and prosperity for all countries involved. Furthermore, this paper would like to give a view that takes the view of all parties involved into account and objectively look at the benefits and negatives. This creates a better lens through which we can look at the BRI project as a whole and improve the future projects that are planned in the scope of the BRI and future multinational corporations.

Scientific relevance:

The BRI is quite a new and complex project and there is still limited knowledge on its local effects on the ground. Furthermore, as mentioned before, most of the papers and news outlets are negatively biased towards the BRI initiative as seen in (Bradsher, 2020). This could be due to Sinophobia increased due to the covid-19 pandemic (Zhang and Xu, 2020). This paper aims to give a side-by-side review of Western and Chinese views and focus on the economic benefits and benefits to the local population in which the belt and road initiative is active. Furthermore, since there is little empirical knowledge available on the benefits of the BRI in regional economies, this paper will take specific Chinese claimed economic benefits and attempt to validate them. By doing this, the paper contributes to a better understanding of the BRI.

Our main research question is as follows:

What is the effect of the Belt and Road Initiative (BRI) on employment?

The question is answered by addressing four focused sub questions.

- 1) *What are the claimed positive and negative effects of the BRI on employment, economy, and environment?*
- 2) *How does the BRI compare to other large programs such as the Ten-T program?*
- 3) *Does the BRI have a negative effect on unemployment in Piraeus Port (GR)?*
- 4) *Does the BRI have a negative effect on unemployment in Tilburg (NL)?*

The first two questions are answered by literature review. The third and fourth are answered through data analysis. This will be achieved by finding data on the amount of unemployment in the mentioned ports and using a linear regression to find a possible relationship between unemployment and throughput whilst keeping control variables in mind.

The remainder of the paper is organized as follows. In Section 2, the theoretical framework is laid out with supporting literature and definitions for the formulated hypothesis. In section 3 our case study is presented. The data is presented in Section 4. Section 5 defines the methodology and models used in calculating the results, which are presented in Section 6 of this paper. Furthermore, a discussion of the results will be presented in Section 7 along with a conclusion in section 8. Lastly, the references and additional sources and be found in section 9 and 10.

2. Literature review and theoretical framework

What is the belt and road initiative?

As mentioned in the introduction the belt and road initiative is a massive infrastructure project to increase economic activity in a specified region. But why did China initiate the belt and road initiative in the first place and what are the plans. To answer these questions three points will be discussed:

The belt and road initiative was initiated to connect the East and West with a land bridge and a maritime route. Furthermore, huge infrastructure projects would be realized to support increased trade. Whilst these were the objectives stated in the past the BRI initiative is like a living organism, the world around it changes and so does the project, we are researching a moving target given the drastic changes it has already undergone. Furthermore, the BRI has no comprehensive official list of projects nor is there a precise definition of what a BRI project is. In this part we will describe the BRI according to past research and future goals, however I want to make the reader aware of this fact. The BRI initiated as an initiative that aims to connect Asia to Europe and Africa using sea and land routes according to (State council of the PRC, 2015). It is one of the largest infrastructure projects in history with investment estimates of over **8000 billion dollars**. The project covers a large part of the world population and world GDP as stated earlier (Schulhof et al., 2022). The project focusses on infrastructure like power plants, ports, railroads, roads, and dams. More specifically according to (The world bank, 2019) the BRI consists of two parts. Each supported by significant infrastructure projects that have been mentioned before. One part is the Silk Road economic belt also just called the “belt” and the other is the new maritime silk road also known as the “road”. The overland “Belt” connects China to Central and South Asia and onwards to Europe. The maritime “road” links China to the countries of Southeast Asia, the Gulf countries, East and North Africa, and again to Europe. According to (The World Bank, 2019) several overland economic corridors have been recognized including:

“The China–Mongolia–Russia Economic Corridor, the New Eurasian Land Bridge, the China–Central Asia–West Asia Economic Corridor, the China–Indochina Peninsula Economic Corridor, the China–Pakistan Economic Corridor, and the Bangladesh–China–India–Myanmar Economic Corridor”. (p. 12)

We can see these corridors visually in the introduction. In the upcoming sections we will take a look how the BRI developed from 2015 onwards to 2023 and introduce some projects that have been initiated.

Secondly, is that the BRI is to help China sustain its economic growth. Between 1980 and 2015 China's GDP per capita grew from 200 US Dollars to over 8000 US Dollar. In this time period the average growth rate was 9.6%. This is an extremely high number compared to the rest of the world. However, from 2013 till 2015 there has been a steady decline in this growth rate. There are many theories surrounding this decline, one of the viewpoints are that the growth slowdown is cyclical due to a less active global economy (Lin & Zhang, 2015). The growth rate of Chinese export-oriented companies averaged 25% yearly., in 2015 this growth was less than zero, hence the theory that the slowdown of the Chinese economic growth is due to declining external demand. However, in this paper they do agree that China's growth potential is slowing down. This is because China will be a more service-oriented economy and double-digit growth rates in this part of the transition is rarely seen. Adding to this the demographic transition is slowing down the economy, enhanced by the one child policy that was implemented. This causes the able-bodied workforce to shrink (Cai & Lu, 2013). Lastly the Chinese economy was built on cheap labor and the costs of this labor has increased significantly therefore also causing the growth to slow down, this causes companies to look further for cheap labor elsewhere. The belt and road initiative is a way for China to relocate low wage jobs to different countries where there is a cost advantage that does not exist in China anymore in order to keep the competitive advantage. Furthermore, the BRI will be a vehicle for China to explore cooperation with new regions, the countries that are benefiting from the BRI are mostly low-income countries. These countries will have more potential to reach the double-digit growth that China's once had and will form economic partnerships with China more naturally if the proper conditions are in place (BRI). To sum it up China is looking to vitalize their economic growth with the BRI by forming new relations with low-income countries that have a higher growing potential. They will use these countries as vehicles to sustain China's economic growth by creating new markets for China's exports and creating opportunities for Chinese foreign direct investment.

Lastly through the belt and road initiative China can gain more international political influence and contribute to the international economic system (ICAS, 2016). This will give China a better position in the international community and greater economic influence. On these points there has been a consensus among most sources, however the Chinese government wants it to be seen as an effort of goodwill and cooperation. When China started its economic miracle in 1970 it was closed off to the rest of the world and the biggest sector was the agricultural sector. In 2007 it developed into a China where 37% of the GDP could be attributed to export and for many years China was the largest recipient of foreign direct investment.

However, the economic model that China thrived in was derived in 1944. The three key features

of this economic system are: That the United States is a key player and enforces their ideological ideas. Two: The US dollar is the main currency that is used in the international monetary system. Three: The International Monetary Fund, the World Bank and the World Trade Organization are responsible for keeping the system running. However, recently there has been more interest to revise this system due to the flaws that have been shown, one example is the subprime crisis in the United States, where mortgages were given out to people who could not afford them and selling them in securities that were rated as prime securities. This caused a housing bubble in 2008 and a huge global recession. Furthermore, the current economic system is modeled on the economic systems of developed countries and needs an update. Whilst the international community cannot agree on one course of action, there is a consensus that this system should be changed to one that suits the new global economy and China wants to be part of this change. As we can see from recent articles the BRICS countries want to create their own currency to replace the dollar (Sullivan, 2023).

Relevant problems with large infrastructure projects

According to (Flyvbjerg and COWI, 2004) there are several problems with Large Infrastructure projects, the paper states them as follows: “

- 1) Such projects are inherently risky because of long term planning horizons and complex interfaces.
- 2) Technology is often not standard.
- 3) Decision making and planning are often multifactor processes with conflicting interests.
- 4) Often the project scope or ambition level will change significantly over time.
- 5) Statistical evidence shows that such unplanned events are often unaccounted for, leaving budget contingencies sorely inadequate.
- 6) As a consequence, misinformation about costs, benefits, and risks is the norm.
- 7) The results are cost overruns and/or benefit shortfalls for the majority of projects. “

All these problems could influence the BRI. We will analyze each of these problems and see how they can impact the BRI.

The BRI has a long-term goal and can be seen as a risky project, adding to this it is a project that spans a huge area with many different cultures and economies. The BRI will be connecting the east with west using a maritime and land-based connection. Furthermore, it has been stated that other infrastructure projects like Dams, power plants, ports and telecommunications will be built. This is nothing that China has not done before, therefore it should mostly be standard infrastructure projects that China has

expertise and experience in. The decision making and planning will be quite a challenge for the BRI project since it spans over continents and governments that all have their own interests. Furthermore, it is true that project scope or ambition will change significantly over time, this is something that we can also see happening to the BRI. The world is an ever-changing environment, and this can also change the scope or ambition of a project. This leads to unplanned events that are not accounted for which could impact on the budget. The consequences are that lower costs understated, and the benefits overstated. This could also be the case for the BRI, which can also be affected by cost overruns and benefit shortfalls.

The latter is further supported by research where most infrastructure projects within China have a cost overrun of more than 30%. Furthermore, this paper has found that there are time overruns and benefit shortfalls. It suggests in contrary to the widespread belief that infrastructure projects benefit the economy, that infrastructure projects do not always lead to economic growth. On the contrary they found that infrastructure investments can lead to economic fragility that is leading China to a financial crisis due to infrastructure debt (Ansar et al, 2016).

We have learned that we should be wary of the benefits stated that the BRI can have. Infrastructure projects do not always lead to economic growth and good analysis of individual projects can tell us more about the benefits and costs.

[Economic impact of the BRI](#)

To answer what the claimed effects of the BRI are on the world this paper did a literature review. Whilst there have not been many studies yet on the exact effects of the belt and road initiative China claims that the BRI will increase trade and employment (Xinhua, 2017). This part is mostly based on the book that the world bank published on the BRI, due to the world bank having the most comprehensive study backed by an extensive model and intricate data. This book was one of the few who could provide concrete numbers on the gains that the BRI could make with a non-biased view. New investments in infrastructure under the BRI hold the potential to enhance the economies of participating nations and the global economy. The anticipated positive effects of these investments, such as reduced trade times and transportation costs, are expected to benefit many economies involved, leading to increased trade volumes and economic diversification. As the Belt and Road corridor economies expand exports and production diversity, trade can increase not only within these corridors but also with countries beyond the initiative. The decrease in trade times is likely to attract more foreign direct investment, particularly benefiting underdeveloped nations. Ultimately, this increased trade and investment are projected to

positively impact GDP, improve welfare, and reduce poverty within the region. However, while the overall transportation network improvements offer substantial advantages, there remains the possibility of individual project failures and potential losses for specific countries, caused by the substantial infrastructure costs relative to trade benefits (TWB, 2019, p. 51 – p. 55). The BRI builds on existing road networks and makes these networks denser. However, one problem with the study is that listing the exact projects that are part of the BRI is a difficult one. This is due to the fact that there is no official list and no one criterion defines if a project is a BRI project or not. However below we will list the economic benefits found in this study (TWB, 2019, p. 51):

Reduction in trade times and cost

This study found that the BRI substantially decreased shipment duration for economies lying on the Belt and Road corridor. These economies can experience a reduction in shipment duration of 3.2% with the rest of the world and interregional within the corridor shipment times were reduced up to 4%. Reduced shipping times decrease trade costs. Furthermore, the BRI has positive spillover effects on non-Belt and Road initiative countries. The study finds that the average decline in travel times across the world would be 2.5% due to the BRI. The reason is that non-BRI economies can utilize the network of the BRI. With the reduction in shipment times there comes a reduction in trade costs the study finds, with an overall worldwide decrease in trade cost of 2.2% (TWB, 2019, p. 56).

Increasing trade and FDI due to the BRI

The impact that the BRI makes on trade is positive for all economies within the BRI corridor. However, we must keep in mind the individual cases vary greatly. The reduction that the BRI brings to trade costs and times gives companies within the corridor an improved trading position, increasing their connectivity to regional and global value chains. This allows them to import cheaper and higher quality products, increasing productivity and their export value. The paper expects a gain for all BRI countries in this aspect (TWB, 2019, p. 58).

The Belt and Road Initiative's (BRI) transportation projects will impact sectoral trade flows based on reduced trading times. Perishable goods like fresh produce will benefit from faster transportation, enhancing timely delivery to consumers. The ability to import time-sensitive inputs swiftly will lead to specialization in sectors like chemicals, electronics, and processed foods. This shift in trade dynamics will alter countries' comparative advantages, favoring time-sensitive products and industries. Central Asia will see increased exports of agricultural and processed foods, while the Middle East, North Africa, and South Asia will experience growth in chemical exports. Manufacturing sectors, particularly electronics,

will expand exports in East Asia, Pacific, South Asia, and Sub-Saharan economies. This specialization may lead to reduced exports in sectors of relative disadvantage, including shifts in oil exports and electronics trade. However, this is a good thing for the world economy since countries will produce goods more efficiently due to the theory of comparative advantage (Costinot, 2009).

Longer shipping times increase barriers to trade and therefore decrease foreign direct investment, with the decrease in trading barriers the paper predicts that FDI will increase. The proposed BRI transport network is expected to give us a gain of 4.97 percent increase in total FDI flows to Belt and Road corridor economies, a 4.36 percent increase in FDI flows within BRI, a 4.63 percent increase in FDI flows from OECD countries, and a 5.75 percent increase in FDI flows from non-Belt and Road countries. All these aspects will increase global trade and create a more valuable global economy (TWB, 2019, p. 61).

Increasing welfare due to the BRI

The paper found that the BRI projects' reduction in trade costs is projected to raise global real income, benefiting both participating corridor economies and non-corridor countries. The BRI is estimated to lead to a 0.7 percent increase in global real income by 2030, with corridor economies capturing 70 percent of this gain (TWB, 2019, p. 63). China's real income is projected to rise by 20 percent of the total global gain. Corridor economies could experience a 1.2 percent rise in real income, while non-corridor economies could see a 0.3 percent increase. Notably, East Asia and Pacific regions might observe gains between 1 to 2 percent in real income, driven by improved productivity, exports, and income redistribution (TWB, 2019, p. 64). The BRI could potentially reduce extreme poverty, potentially lifting 7.6 million people worldwide from extreme poverty, mainly in corridor economies, and an additional 32 million people from moderate poverty. Specific countries like Kenya, Tanzania, Pakistan, and Bangladesh are expected to witness substantial poverty reduction. Overall, the BRI's impact on integration and growth could have positive poverty-alleviating effects. All in all, these effects give us a positive view on the BRI economic benefits. Further in this paper we will look at regional effects of the BRI (TWB, 2019, p.65).

Environmental impact of the BRI

Whilst the BRI tries to promote positive sociological and economic growth there are concerns about its potential negative environmental impacts. The expansion of transportation infrastructure through ecologically sensitive areas may lead to biodiversity loss, increased pollution, and habitat degradation. The construction of roads, ports, and power lines can contribute to illegal logging, poaching, and fires, potentially pushing ecosystems beyond their limits where irreversible damage occurs.

A recent analysis by the World Wildlife Fund (WWF) highlights that BRI corridors intersect with habitats of threatened species, important bird areas, biodiversity hotspots, and protected areas (Li & Shvarts, 2017). This raises concerns about potential severe environmental harm, as well as the possibility of downgrading or reducing legal protection for these areas to facilitate resource extraction. This is increased by that fact that most countries that are within the BRI initiative have increased environmental risk due to the fact that they are ranked low on environmental conservation (Environmental Performance Index, 2022). These concerns are supported by a spatial analysis (Hughes, 2019). In this paper it was concluded that the proposed routes were close to Key Biodiversity Areas and close to regions that have dense forestation having negative effects on biodiversity. Furthermore, it has been found that forests close to railways and roads in countries that lie within the proposed route of the BRI have a disproportionate amount of deforestation.

Moreover, the BRI's infrastructure development is expected to accelerate the extraction of raw materials, such as sand, limestone, and fossil fuels, exacerbating environmental issues like habitat destruction and greenhouse gas emissions (Ascencao et al, 2018). China's significant contribution emissions and its reliance on fossil fuels further raise environmental worries and this can clash with the ideals set by western powers, increasing resistance and contaminating their view on the BRI.

Another concern that is being raised is that developing countries will become polluting havens for developed countries in the context of the BRI due to the fact that these countries will become more accessible by the numerous infrastructure projects proposed. This is called the pollution haven hypothesis. This hypothesis suggests that developed countries will outsource their dirty industries and waste to countries with lower environmental standards (Kheder & Zugravu-Soilita, 2008). This only increases pollution and only relocates the problem to another country. As an example, we can see the UK which has exported its heavy polluting steel industry to China (Plumer, 2018). By making these countries economically more accessible this could become an unwanted effect of the BRI.

However, China has updated their legislation on environmental issues because of the environmental deterioration they experienced due to their rapid economic growth. They experienced the negative effects of rapid economic growth without adequate environmental safeguards. This had a lasting impact on air, water and soil pollution that has led to significant ecological degradation. Now China changed their views on environmental issues and aims to balance development with ecological considerations through strengthened regulations and policies (Xinhua, 2017). However, the Belt and Road Initiative (BRI), which extends development to other regions, risks neglecting environmental protection in favor of

economic prosperity. To ensure BRI success and avoid unwanted harm to vulnerable communities, it is suggested to apply China's own environmental standards to BRI projects outside China by (Xinhua, 2017). This approach involves Strategic Environmental and Social Assessments (SESAs) and robust Environmental Impact Assessments (EIAs) to proactively address ecological and social impacts. Despite the added complexities, the BRI can learn from successful road projects that combine development and environmental conservation (Ascencao et al, 2018). Overall, integrating environmental considerations into the BRI is crucial for sustainable development which is a more suited approach in our time and age.

The BRI and the TEN-T program

Since the BRI is not the first of its kind and not the only ongoing large infrastructure project, it is useful for this paper to discuss the similarities and differences between the BRI and other ongoing programs. The TEN-T program is similar to the BRI as it intends to develop infrastructure connection between member countries to lower the barrier to trade internationally within the members countries. Like the BRI the TEN-T program consists of many projects and its objective is to foster cohesion, enhance interconnection, ensure interoperability within the trans-European transport network, therefore decreasing the barrier to trade within the European union. However, unlike the BRI, the TEN-T program has a clear budgetary framework, a comprehensive program structure, a detailed project list, an evaluation framework and assigned coordinators for each corridor. Figure 2 shows the TEN-T core network corridors for surface transport (European Commission Trans-European Transport Network, 2018). However, here is where the similarities between these two programs stop. Whilst the BRI environmental standards can vary widely as we have seen, the TEN-T program applies strict European standards on social and environmental issues. Furthermore, the TEN-T program is designed to focus on Europe whilst the BRI has a broader scope. However, they are very similar, because they both want to remove barriers to trade and use infrastructure and policy to increase trade and accessibility. Whilst they differ in method and scope, the BRI can have a positive impact on the TEN-T program as they both wish to improve infrastructure to increase trade. We should understand how these two programs can interact.

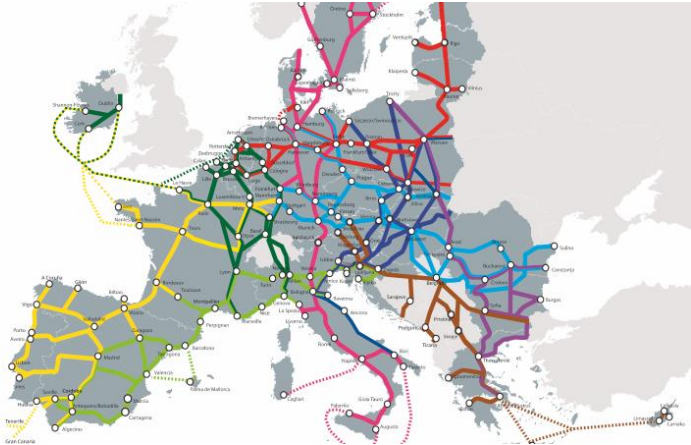
According to (Dunmore et al, 2019) from an EU perspective the potential interaction with the TEN-T program is the biggest concern. The impact of the BRI on the TEN-T program could lead to some airports, ports and other logistics related facilities to lose business, however, believe that overall there will be a net increase in trade. This is due to TEN-T infrastructure materially attracting more traffic due to BRI related developments. In terms of maritime and air traffic the decline for EU ports of cargo from

China is relatively small there will be no critical impact on their viability. However, it might lead to slower growth and delayed expansion of these ports. This is due to the rapid growth in China-related rail traffic because of the faster freight times compared to sea shipping and lower cost than air freight. This could affect our results and we should keep in mind that there could be a huge migration from sea shipping to rail shipping considering the benefits. If a huge increase in the use of rail transport arises, this would raise concerns about the potential exhaustion of existing capacity. This could lead to slower transit times and therefore eventually negating the benefits of rail transport, especially in the North Sea Baltic rail corridor. Rail capacity is a complex issue, influenced by multiple factors like train numbers, speeds, and route options. Furthermore, there are coordination problems along rail corridors, potentially resulting in a fragmented network. Short-distance passenger services may use capacity that would be better suited for long-distance and freight transport. Furthermore, the expansion of passenger services, both within and beyond cities, can strain rail capacity due to triggering the hidden demand (Rodrigue, 2020, p.246). Once introduced, it becomes challenging to remove them or secure approvals and funding for further expansion (Rodrigue, 2020, p. 247). In figure 3 the investments, objectives and projects are stated for the TEN-T and BRI.

In conclusion the TEN-T program and the BRI cannot be compared since their scope and goals are completely different, however it is important to note the impact they have on each other and prepare both infrastructure projects to have good synergy to maximize the benefits. This is also one of the goals of the BRI, which is to increase international cooperation.

Figure 2

Ten-T Program routes



Note. Taken from (European Commission Trans-European Transport Network, 2018)

Figure 3

BRI vs TEN-T Investment, Objectives and Projects

| Tent-Program (European Commission, 2018;2023) | Investment | Objectives | Projects |
|---|--|---|----------------------------------|
| | 30.4 billion Euro from 2014-2020; 12.8 billion Euro 2020-2030 | Coherent infrastructure across the EU | Railways |
| | | Efficient infrastructure across the EU | Inland waterways |
| | | Multimodal infrastructure across the EU | Short sea shipping routes |
| | | High-Quality transport infrastructure across the EU | Roads linking urban nodes |
| | | | Maritime and inland ports |
| | | | Airports |
| | | | Terminals |
| Belt and Road Initiative (The State Council Information Office of the People’s Republic of China, 2023); (Hughes et al, 2020) | Claimed 1000-billion-dollar budget from 2013 – xxxx (The budget ranges from 1000-8000 billion and the end date is unclear) | Policy Coordination | Eurasian rail network |
| | | Infrastructure Connectivity | Eurasian maritime network |
| | | Unimpeded trade | Telecommunication infrastructure |
| | | Financial integration | Energy networks |
| | | Closer people-to-people ties | Land and Seaports |

Note. Created by author. Based on the following sources: The state council information office of the people’s republic of China and European Commission and Hughes et al.

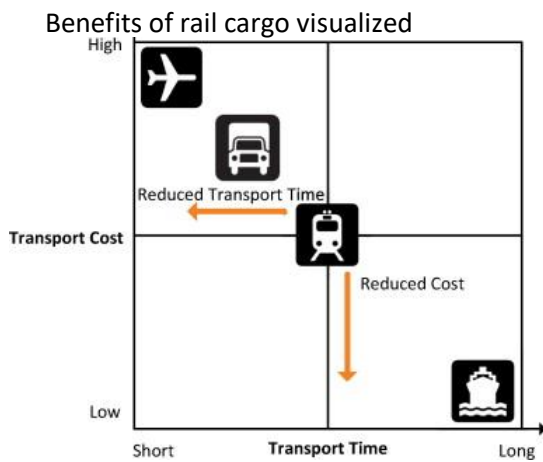
3. Case Study

To answer the sub questions if the BRI has a negative impact on unemployment in Piraeus and Tilburg ports, this paper will do a case study on both ports. One being a Sea port (Piraeus) and the other being a Rail Port (Tilburg).

Rail shipping history between the Netherlands and China and developments

Rail shipping is an age-old form of transport; however, it is a new development on the Eurasian continent. In the past one could choose between sea shipping or air shipping. Sea shipping has low cost; however, it takes 30-40 days to reach Europe, whilst air shipping costs significantly more, however you can receive your cargo within days. In the past you would have to choose between these two extremes, but with the rise of rail shipping you can get your cargo faster than sea shipping and cheaper than air shipping. It is a transport mode that is in the middle of air and sea shipping.

Figure 4



Note. Taken from (Rodemann & Templar, 2014)

The idea of using rail to move cargo between Asia and Europe is not new since the Trans-Siberian railway was built in 1916 and used for international freight since 1936. This railway was used mainly for internal transportation in the times of the Soviet Union and during the world wars it was used for military purposes. However, when in the 1960s when containerized cargo was invented the Russian government started to offer international transportation. Considering the economic developments rail cargo has huge potential in a world where 99% of goods are shipped by sea. This is since it offers a more flexible supply chain which can bring your goods faster compared to sea shipping and cheaper compared to air shipping (Rodemann & Templar, 2014). We will discuss a few facts why growth in rail cargo is anticipated and in figure 4 the benefits of rail transport compared to other methods of transport are

visualized. Due to the flexibility of rail transport, it is expected that more goods will be shipped by rail in the future (Rodemann & Templar, 2014). As an example, in this paper, we take Tilburg terminal which since 2016 welcomes cargo trains from China.

Sea Shipping History between Greece and China and developments

The ports in Greece were losing users and competitiveness due to low productivity levels and sub-par infrastructure. Therefore, Greece started a major port governance reform starting in 1999. These reforms eventually led to the first ever terminal concession by Chinese state-owned enterprise COSCO in 2008 and eventually a majority stake holder of Piraeus port in 2016 (Pallis & Vaggelas, 2017). Before the takeover Piraeus port was a port that had no significance, however due to the BRI and a vision by COSCO to turn Piraeus port in Greece into a major hub for the Maritime Silk Road in Europe, its throughput volume has grown tremendously in these years.

The Chinese government has plans to make Piraeus their entry point into the Southern, Eastern and Central European markets. China wishes to turn Piraeus into a gateway to Europe and make it one of the most competitive ports and strengthen hinterland accessibility by building railways. It can be noted that Sino-Greek relations are good. As mentioned before COSCO's involvement in Piraeus port began in 2008 when it obtained a license from the Greek government to operate container terminal II and III for 35 years. Whilst terminal I would still be operated by Greece. This investments COSCO made resulted in immense growth of Piraeus port and was named the world's fastest growing port in 2012 by Containerization International Magazine. In 2013 Piraeus was already in the top 10 biggest ports lists in Europe and its throughput grew sevenfold from 2009 until 2014. It should be noted that terminals II and III were far more efficient than their Greek counterparts in terminal I (Van der Putten & Meijnders, 2015).

Correlation between port throughput and employment

It is also important for us to know the effects of throughput to local employment; this is because the belt and road initiative promises to increase trade and throughput throughout the world. In a past paper 560 European regions have been analyzed from 2000 till 2006 included in 116 seaports and it has been found that there is a positive regional impact on local employment due to an increase in throughput. Cargo has more impact than passenger transport. This is important for us to know in this paper since we can expect a decrease in unemployment due to added throughput due to the belt and road initiative (Botasso et al, 2013). Furthermore, the regions are analyzed in Europe, the ports, and regions that we will analyze are also located in Europe, so we can expect similar behavior. However, we have seen that

there could be a huge increase in rail cargo due to the distinct advantages of this mode of transport, we will ignore this narrative and assume that rail ports and seaports behave similarly. It is not in the scope of this paper to analyze the differences between the rail and seaport, but it is important to note that they will behave differently.

Visual Development of Piraeus Port from 2008 – 2023

For a visual understanding of the development of Piraeus port we have satellite images from 2008 till 2023 to see the development. In Appendix B figure B5 you can see the satellite images side by side. As you can see in the image Piraeus port has gained new terminals and has gotten significantly more developed. This is in line with the literature that we have studied, which states that Piraeus has gained significant investments, increased in throughput, and becoming a bigger player in the region. The BRI investments have led to a new pier being developed and a huge increase in throughput, we can confirm this narrative with this visualization of the development.

Development of Rail port in Tilburg from 2008 – 2023

For a visual understanding of the development of Tilburg we have satellite images from 2008 till 2023 to see the development. In Appendix B figure B6 you can see the satellite images side by side. When analyzing these images, you can see the building density increased from 2008 – 2023. This is as we expected from our literature since there are new developments and more trains coming in from China. This could have led to a rise in demand for warehousing, transshipment, and customs clearance. This in turn led to more businesses being established in the vicinity. Furthermore, there seems to be more concrete next to the rails that can house containers, it looks like it has seen some development. However, this cannot be said with certainty, because it could also be due to a variety of other reasons like economic growth, unrelated business to the rail port and already planned building being built.

4. Data

The data for this paper has been collected from Dutch and International sources. This paper aims to find the positive economic impact the BRI might have on the regions stated. The data in this paper is quantitative data, as mentioned before this is collected from Dutch and International sources which are secondary data sources collected by governments or reputable organizations. This data was collected from 2006 – 2020 where possible, if this was not possible this will be mentioned. We choose to gather data from governments or reputable organizations due to the fact that we will have a similar data collection source for all data and due to reliability factors. Since it is very hard to specify what is a BRI investment and what is not, we chose not to use investments as one of our data variables. However, we chose to use a counterfactual that is easier to find, isolate and specify. We choose unemployment as the dependent variable in the regions that we are analyzing the effects of the BRI on. Furthermore, we choose a timespan from 2006 till 2020 to analyze, this is because Piraeus port got taken over in 2009 and rail service from China to Tilburg started in 2016 (Het Financieel Dagblad, 2017). We want to have a timespan after and before these events to analyze the effects of the BRI.

For data about regions in the Netherlands we used the Centraal Bureau voor de Statistiek. This is a Dutch government body that publishes statistical data about the Netherlands. We could find the number of unemployed persons on a regional level (U) from 2003 to 2020 in Noord-Brabant, this is comparable to a NUTS 2 region. This is the province that the rail terminal in Tilburg exists in. For this data we had employment data for each month, for the data we took the average of these months to gain an average employment number for a year. For Piraeus port we used Eurostat and found data on unemployment at a NUTS 2 level. This data is ranging from 2011 till 2020 and we choose NUTS 2 region called EL30. This region includes Athens and Piraeus, which are the focus of our study.

For the amount of rail cargo that enters the Netherlands we have found annual numbers for the value and weight of incomings goods by rail (C). These numbers are found from 2007-2020 and published by the Centraal Bureau voor de Statistiek in the Netherlands. We could not find the specific number for the rail terminal in Tilburg or a regional number, so therefore we chose this dataset. For the amount of sea cargo that enters Piraeus we used Eurostat again, however found that they only have data for Greece from 2020 onwards and could not find any dataset on Greek government websites or the website of the Port of Piraeus. In the paper we would like to use a creditable data provider, we could not find a specific dataset for Piraeus port, however we have found a dataset by the world bank that provides data on the container traffic in Greece measured in 20 Foot equivalent units (TEU). This has been chosen because

the amount of TEU was only available in the Netherlands for all modes of transport, specifically for rail transport only KG was available.

For the regional economic growth and country economic growth we used the CBS again for the Netherlands and for Greece we used the world bank (E). For the regional and economic growth in the Netherlands we used NUTS 2 region Noord-Brabant again and this data was available from 2000-2020. For Greece we used the world bank statistics again and could not find NUTS 2 data. However, we could find overall economic growth in Greece.

For data about the port being affected by the BRI we try to find news articles that tell us if the port has been affected by the BRI initiative or not. For both the rail port in Tilburg and Piraeus port we can find that they have been affected by the BRI. This will be a dummy variable and can take the values 0 or 1. When 1 is affected and 0 is not affected.

For data about the port being affected by other infrastructure projects we try to find news articles or government publications. For both the rail port in Tilburg and Piraeus seaport we can find that they have been affected by other infrastructure projects, mainly the TEN-T program. This will be a dummy variable and can take the values 0 or 1. When 1 is affected and 0 is not affected. We have seen that the ten-t investments in corridors that affect Piraeus and Tilburg have been commissioned from 2014 – 2020. Therefore, we have chosen 2014 as the year that the ten-t program affects our analysis (Railway Gazette International, 2013).

In the end for Piraeus we had data from 2011 till 2020 and for Tilburg we had data ranging from 2003 till 2020.

5. Methodology

In this research a simple linear regression is used using Stata as our statistical tool. We will be looking for a negative linear relationship between the regional unemployment figure and the effect of the BRI. This will be done in the Seaport of Piraeus in Greece and the Rail port in Tilburg in the Netherlands to one of the real impacts the BRI may have on individuals in the regions where the ports are located.

Whilst we recognize that a difference in difference analysis would be better suited for the demonstration of a spatial-economic change after a certain event. According to (Lechner, 2011) *“The difference in difference (DiD) approach is a research design for estimating causal effects. It is popular in empirical economics, for example, to estimate the effects of certain policy interventions and policy changes that do not affect everybody at the same time and in the same way.”* However, we have chosen for a linear regression due to limited availability of data and availability of resources other than data that we have for this paper. This will be further elaborated in the discussion.

Before analysis, the gathered data was prepared. The dataset was checked for missing data and homogenized. If data was missing, we would try to find another source that does have the year in which we want the data, if this was not possible it will be left empty. Furthermore, to homogenize the data we have transformed the variables to the same units as far as this is possible.

In the paper we will be using the following simple linear regression with control variables:

$$U = \beta_0 + \beta_1 BRI + \beta_2 C + \beta_3 P + \beta_4 E + \varepsilon_n \quad (1)$$

In which U is the average unemployment in a given year. BRI indicated if the port has been affected by the BRI or not in the given year. For the control variables we have chosen the following variables: C is the throughput in a year in the given ports. P a dummy variable indicates if the ports have been affected by another infrastructure project or not in the given year. Lastly, we have E which is the economic growth in the given country or region for a given year.

We have taken unemployment as a counterfactual. We intended to use the monetary investments the BRI made into specific ports and projects related to the port, however this data was not available, as mentioned before the BRI has no comprehensive list. However, we believe that unemployment is a good counterfactual to see if the BRI investments have made a positive impact on local economies, as the BRI

is intended to do so. Furthermore, the belt and road initiative has been seen as a political tool in the west, therefore we want to research if the BRI gives back economic prosperity to the population in the regions in which it operates.

BRI is taken as the independent variable so we can see the effect of the BRI on certain ports and the regions they reside in. This is a dummy variable and can take the value of 1 or 0 in a given year. How it is decided if the BRI had an effect on the port or not is by finding government publications, port publications of BRI involvement. When there has been BRI involvement, we will assume that BRI involvement is still there even though there are no articles in that given year. For Piraeus we have chosen that BRI involvement started in 2014 and not 2009 due to the fact that we only have unemployment data from Piraeus from 2011 onwards. Even though Cosco took lease of Piraeus in 2009, in 2014 Cosco got a majority share in Piraeus port. For Tilburg the point chosen is 2016, this is when the first trains from China started arriving here.

Throughput (C) has been chosen as a control variable, because in past papers throughput has been found to have a positive impact on regional growth, we want to isolate the impact the BRI implementation has on unemployment. Effects of other infrastructure projects (P) is also a dummy variable that can the value 1 or 0 in a given year, in which 1 is that there is effect of another infrastructure project and 0 that there is no effect. This involvement is decided by reading government publications, port publications or articles about involvement of other infrastructure projects. Lastly, worldwide economic growth in the given year (E) is taken as a control variable, because the worldwide economic growth also affects the unemployment in the region.

The Philips curve is a widely used model in economics and states that unemployment and inflation have a strong correlation. This is because the economist of that time were taught that wages were determined by supply and demand, and when demand exceeds supply the individuals in the labor market will drive up the wages and the demand will compete for labor that is not there. This means that unemployment is the gap between supply and demand (Humphrey, 1985). However, we have chosen not to include this variable since we believe in the alternative view that states that both inflation and unemployment can be modeled independently from each other and can be manipulated through different government policies (Karanassou et al, 2010).

For the validity of the model, the assumption of exogenous error terms has been made. We further assume that the measurement errors across different years is independently distributed. The regression

model used in this research satisfies all other OLS assumptions of linearity, endogeneity, normality and heteroscedasticity of the error term, autocorrelation, and multicollinearity. Thus, OLS estimates are reasonable estimators for the parameters. A standard significance level of 5% is used throughout this research paper.

Furthermore, we are going to look at throughput numbers before BRI involvement and after BRI involvement. This is to form an idea and intuition of what the BRI can have as impact on the ports that were involved. We also looked at satellite images of the sites where the ports are located to understand the development it has gone through in the years that the BRI started. We do understand that this growth, if it can be seen, cannot be attributed to the BRI only, however it gives the reader a more visual understanding of the impacts that increased economic activity can have on ports.

We have chosen this method to research the impact of the BRI on the mentioned ports due to the fact that a linear regression is a tried and tested method for finding correlation between two variables. The reader does have to note that more control variables should be used for a more precise value, this will be further elaborated in the discussion, however for the scope and timeline for this paper this was unfortunately not possible.

6. Results

First, we will give two tables below of descriptive statistics of relevant variables. This can be seen in table 1 for Piraeus and in table 2 for Tilburg. BRI and Other project are dummy variables. These can be a 0 or a 1. The fraction shows how many years the BRI or other projects were affecting the analyzed port.

| Variable | Mean | Standard Deviation |
|-----------------|----------|--------------------|
| Unemployment | 22.04 | 4.821526 |
| BRI | 0.7 | 0.4830459 |
| Throughput | 4273876 | 1336199 |
| Other Project | 0.5 | 0.5270463 |
| Economic Growth | -2.43187 | 4.588903 |

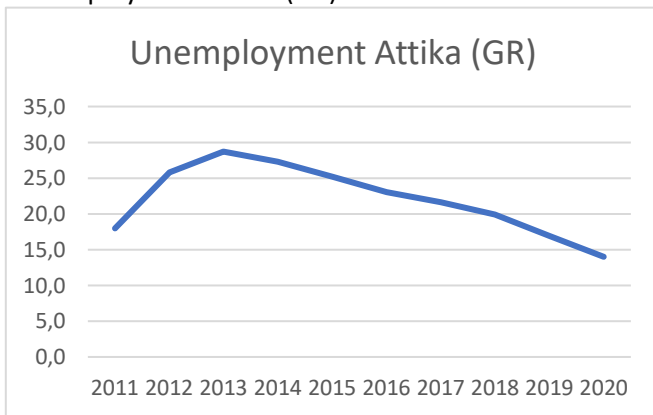
Table 1: Descriptive Statistics Piraeus. 2011 – 2020 with 10 observations.

| Variable | Mean | Standard Deviation |
|-----------------|-----------|--------------------|
| Unemployment | 6.13869 | 1.324779 |
| BRI | 0.3571429 | 0.4972452 |
| Throughput | 7670385 | 796132.7 |
| Other Project | 0.5 | 0.5188745 |
| Economic Growth | 1.385714 | 2.265411 |

Table 2: Descriptive Statistics Tilburg. 2007 – 2020 with 14 observations.

Figure 7

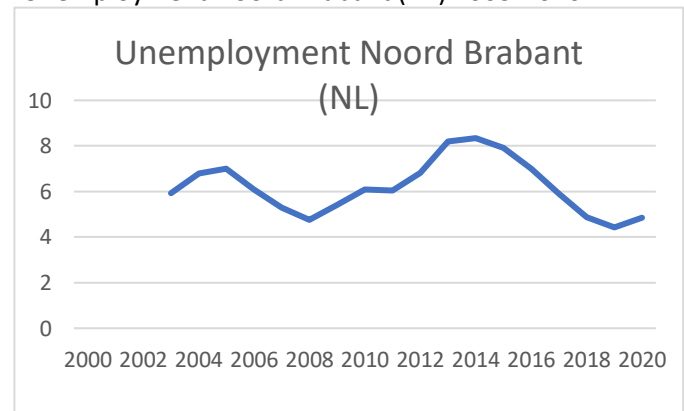
Unemployment Attika (GR) 2011-2020



Note. Figure created by author using data from Eurostat. Please not that the Attika data for unemployment was only available from 2011 onwards.

Figure 8

Unemployment Noord Brabant (NL) 2003-2020



Note. Figure created by author using data from Centraal Bureau van Statistieken.

As we can see from the Unemployment data in figures 7 and 8, we can assume that both got affected by the economic recession from 2008 onwards. We can see that they both follow an upward trend from 2008 and a downward trend after the economic recession. Piraeus got taken over from 2008 onwards and the first trains arrived in Tilburg in 2016. We can see a trend of declining unemployment in both graphs, but if this is due to BRI or due to other factors will be analyzed further.

To answer the research questions the two hypotheses are investigated. To start with, hypothesis one is examined.

H1: The belt and road initiative had a negative impact on the unemployment in Piraeus port in Greece.

To examine this question the model in the methodology section is used. The results of the simply linear regression can be found in table 3 below:

| Variable | Coefficient | Standard Error | P-value |
|---------------------------|---------------|----------------|---------------|
| Unemployment | Dependent Var | Dependent Var | Dependent Var |
| BRI Involvement | -2.152071 | 3.874358 | 0.603 |
| Economic Growth | 0.7342617 | .3016618 | 0.059 |
| Other Project involvement | -5.316043 | 3.44693 | 0.184 |
| Throughput | -7.22e-07 | 1.48e-06 | 0.647 |
| Constant | 31.07565** | 5.004395 | 0.002 |
| Observations | 10 | | |
| R ² | 0.7526 | | |

Table 3: Regression results Piraeus; *p<0.01, **p<0.05

From the results for Piraeus, we cannot draw a conclusion since the results are not significant meaning $P > 0.05$ except for the constant term. We expected that BRI involvement, economic growth, throughput, and other project involvement would have significant negative effect on the dependent variable unemployment. All of them except economic growth had a negative effect, however we cannot assume that these are correct since the P-value is larger than 0.05. This means our results are not significant and cannot tell us much about the correlation between these variables. In the discussion we will discuss why we got non-significant results and suggestions for future research to get significant results. None of the results are approaching significance or are significant results. Therefore, we cannot analyze these results and we cannot state there is any correlation with the data we have used in this paper.

H2: The belt and road initiative had a negative impact on the unemployment in the Tilburg Rail port in the Netherlands.

To examine this question the model in the methodology section is used. The results of the simply linear regression can be found in table 4 below:

| Variable | Coefficient | Standard Error | P-value |
|---------------------------|---------------|----------------|---------------|
| Unemployment | Dependent Var | Dependent Var | Dependent Var |
| BRI Involvement | -2.597047 | 1.237405 | 0.065 |
| Economic Growth | -0.0082885 | 0.1813571 | 0.965 |
| Other Project involvement | 2.212769 | 1.132556 | 0.082 |
| Throughput | -2.01e-07 | 9.62e-07 | 0.839 |
| Constant | 7.511047 | 6.705554 | 0.292 |
| Observations | 14 | | |
| R ² | 0.4673 | | |

Table 4: Regression results Tilburg; *p<0.01, **p<0.05

From the results for Tilburg, we also cannot draw a conclusion since the results are not significant meaning $p > 0.05$. We expected that BRI involvement, economic growth, throughput, and other project involvement would have significant negative effect on the dependent variable unemployment. All of them expect other project involvement had a negative effect, however we cannot assume that these are correct since the P-value is larger than 0.05. This means our results are not significant and cannot tell us anything about the correlation between these variables. In the discussion we will discuss why we got non-significant results and suggestions for future research to get significant results. However, the results for BRI involvement and Economic Growth are approaching significance $P > 0.1$ and are as we expected negative, we can cautiously interpret these results as in that the BRI could have had a positive local impact on employment in Tilburg and that Economic Growth could be a good control variable as we predicted in the literature review. By no means are these results definitive since they are non-significant. However, we can make light assumptions that there could be correlation.

7. Discussion

In this paper we have analyzed the Belt and Road Initiative and have found that it was an initiative to foster connectivity and cooperation among countries across Asia, Europe, and Africa through infrastructure development, trade partnerships, and cultural exchange. This initiative holds profound implications for international relations, economic growth, and sustainable development. We have seen that not everyone agrees that this was the goal of the BRI. Some argue that it is for China to gain more influence in our world and other think it is a monumental project that could change the lives of countless citizens and increase societal wealth and lift many out of poverty by creating infrastructure for more global trade. In this paper we have found that the BRI has the potential to have a positive impact on the world, but it does face many environmental and political challenges. In this paper we set off to

find the local impact of the BRI project on employment. We did a linear regression in Tilburg (NL) and Piraeus (GR) and we found that with the data we had acquired we could not conclude that the BRI has a positive impact on local employment and it does not support our hypothesis. However, we do believe that there is a positive impact from the BRI we could not pinpoint it with the data that we have. Below we will give suggestions and recommendations for future research.

In this paper we have tried using the difference in difference statistical method, however this was not possible due to the fact that we do not have all the data for before or after treatment for both ports. We have chosen to homogenize the testing methods for both ports, therefore settling on a simple linear regression with control variables. The difference-in-difference method would be more suitable for our dataset since DiD is used to: *“estimate effects of certain policy interventions and policy changes that do not affect everybody at the same time and in the same way”* (Lechner, 2011). This is the case for our paper. The low number of observations is inherently not suitable for a linear regression where a large N is better. A difference in difference analysis looks at the trend before the treatment and after the treatment, in this case before and after BRI involvement. Therefore, I would like to suggest that in future research more years and more cases are used, and/or the difference in difference method should be used for a more accurate statistical analysis on the effect of the BRI initiative on local employment. Furthermore, more specific data should be used, when selecting data, the data should be of the port itself and as specific to the region that we are analyzing as possible. This could be done by contacting the ports/municipalities/companies themselves for the required data in future research. Adding to this more control variables are needed. The world economy is a complex one and employment is affected by many factors that we did not include such as: Demography, People in between jobs, economic recessions etc. I believe that there should be a stronger economic model to isolate the impact of the BRI on employment in these studied areas.

Furthermore, in this paper we assumed that sea and rail ports are affected similarly by the BRI. However, we can say that this could not be the case, due to the difference in nature of these two types of transport forms. It should also be researched how differently rail ports behave compared to seaports since this is a form of transport that has recently gained more interest.

For the BRI itself this paper suggests that the Chinese government and the participating governments will create a universal list of investments and projects made possible by the BRI, stating the involved parties, goals, and investment. This would create more awareness and more data to analyze the benefits and negatives of the BRI. We have seen the TEN-T program in Europe does this perfectly with an

interactive map, mapping all the projects that have been made possible by the TEN-T program. This creates more overview and awareness. Adding to the overview and awareness this also creates more data for analysis that is crucial to oversee the effectiveness of these projects. Furthermore, literature review suggests that due to the lack of oversight of what is a BRI project and what is not, it would be helpful to interview the decision makers of these projects to find out more about the inner workings. This could provide information that is not publicly available and can give us more insight into investments made in these projects and involved parties. One of the key problems is the lack of data surrounding the BRI, which is maintaining the uncertainty about its effects.

8. Conclusion

To answer the main question of this paper: what are the effect is of the BRI on local employment? In this paper we have learned that the BRI is not a well-documented and monitored project, but an initiative that is vague and flexible that it is hard to say what is a BRI project and what is not. Furthermore, there is little transparency in the funding and investments made which make it difficult to research the effectiveness of the BRI. However, research from the world bank suggests that the BRI could have a positive economic impact worldwide, however we could not find support for our hypothesis that the BRI provides positive regional economic benefits in the Netherlands and Greece but have come closer to a theory on how to measure this and this is elaborated in the discussion. Furthermore, the TEN-T program and the BRI can have positive synergies together and show similarities. However, the scope and the timeframe of these two projects are different. The research suggests that similar to the Ten-T program, the BRI can have a positive impact on the world if the following challenges are addressed: The BRI can have a negative impact on the environment, it is important that these the Chinese government takes measures to mitigate the environmental impact according to European standards. Adding to this, it is important for the BRI to convey a cooperative image to the world, to reduce geopolitical tension coming from the west. Furthermore, large infrastructure projects have an inherent problem with overstating the benefits and understating the costs, it is therefore important to have a comprehensive overview of the investments made to make a clear audit of the profitability and viability of a given BRI project. Conclusively it is important to have independent data provision on local and regional effects in the economy for future research and international accountability.

9. References

- Ansar, A., Flyvbjerg, B., Budzier, A., & Lunn, D. (2016). Does infrastructure investment lead to economic growth or economic fragility? Evidence from China. *Oxford Review of Economic Policy*, 32(3), 360-390.
- Ascensao, F., Fahrig, L., Clevenger, A. P., Corlett, R. T., G Jaeger, J. A., Laurance, W. F., & Pereira, H. M. (2018). Environmental challenges for the Belt and Road Initiative. 10.1038/s41893-018-0059-3.
- Ben Kheder, S., & Zugravu-Soilita, N. (2008). The pollution haven hypothesis: a geographic economy model in a comparative study.
- Bottasso, A., Conti, M., Ferrari, C., Merk, O., & Tei, A. (2013). The impact of port throughput on local employment: Evidence from a panel of European regions. *Transport policy*, 27, 32-38.
- Cai, X., Che, X., Zhu, B., Zhao, J., & Xie, R. (2018). Will developing countries become pollution havens for developed countries? An empirical investigation in the Belt and Road. *Journal of Cleaner Production*, 198, 624-632.
- Chance, A., & Mafinezam, A. (2016). American perspectives on the belt and road initiative. *Institute for China-America Studies*, 68-75.
- Costinot, A. (2009). An elementary theory of comparative advantage. *Econometrica*, 77(4), 1165-1192.
- Environmental Performance Index. (2022). *Environmental Performance Index*. Retrieved August 16, 2023, from <https://epi.yale.edu/epi-results/2022/component/epi>
- European Commission. (2018). *Indicative TEN-T Investment Action Plan*. Retrieved October 25, 2023, from https://neighbourhood-enlargement.ec.europa.eu/system/files/2019-01/ten-t_iap_web-dec13.pdf
- European Commission, official website. (n.d.). European Commission. <https://commission.europa.eu/>

Explaining the European Union's approach to connecting Europe and Asia. (2018, September 19).

European Commission. Retrieved August 10, 2023, from

https://ec.europa.eu/commission/presscorner/detail/en/memo_18_5804

Google. (n.d.). [Satellite Images of Tilburg Rail Terminal and Piraeus Port]. Retrieved October 1st, 2023.

Het Financieel Dagblad. (2017, September 22). FD.nl. Tilburg verloor textiel maar wint plek aan

zijderoute. [https://fd.nl/ondernemen/1219734/tilburg-verloor-textiel-maar-wint-plek-aan-](https://fd.nl/ondernemen/1219734/tilburg-verloor-textiel-maar-wint-plek-aan-zijderoute)

[zijderoute](https://fd.nl/ondernemen/1219734/tilburg-verloor-textiel-maar-wint-plek-aan-zijderoute)

Huang, Y. (2016). Understanding China's Belt & Road initiative: motivation, framework and assessment. *China Economic Review*, 40, 314-321.

Hughes, A. C. (2019). Understanding and minimizing environmental impacts of the Belt and Road

Initiative. *Conservation Biology*, 33(4), 883-894.

Hughes, A. C., Lechner, A. M., Chitov, A., Horstmann, A., Hinsley, A., Tritto, A., ... & Douglas, W. Y. (2020).

Horizon scan of the belt and road initiative. *Trends in Ecology & Evolution*, 35(7), 583-593.

Humphrey, T. M. (1985). The evolution and policy implications of Phillips curve analysis. *Economic*

Review, 71(2), 3-22.

Hurley, J., Morris, S., & Portelance, G. (2019). Examining the debt implications of the Belt and Road

Initiative from a policy perspective. *Journal of Infrastructure, Policy and Development*, 3(1), 139-

175.

Jinping, X. Secure a Decisive Victory in Building a Moderately Prosperous Society in All Respects and

Strive for the Great Success of Socialism with Chinese Characteristics for a New Era Report at

19th CPC National Congress (Xinhua, 2017); <https://go.nature.com/2GJFr9t>.

Johnston, L. A. (2019). The Belt and Road Initiative: what is in it for China?. *Asia & the Pacific Policy*

Studies, 6(1), 40-58.

- Karanassou, M., Sala, H., & Snower, D. J. (2010). Phillips curves and unemployment dynamics: a critique and a holistic perspective. *Journal of Economic Surveys*, 24(1), 1-51.
- Lechner, M. (2011). The estimation of causal effects by difference-in-difference methods. *Foundations and Trends® in Econometrics*, 4(3), 165-224.
- Li, N. & Shvarts, E. The Belt and Road Initiative: WWF Recommendations and Spatial Analysis Briefing Paper (WWF, 2017); <https://go.nature.com/2v3SwoG>.
- Lin, J. Y., & Zhang, F. (2015). Sustaining growth of the People's Republic of China. *Asian Development Review*, 1(32), 31–48.
- (NDRC) People's Republic of China. (2021). Greece's Piraeus port vitalized under BRI cooperation. National Development and Reform Commission. https://en.ndrc.gov.cn/news/mediar/sources/202112/t20211231_1311182.html
- New York Times (2019, February 15). Can China turn the middle of nowhere into the center of the world economy? The New York Times. <https://www.nytimes.com/interactive/2019/01/29/magazine/china-globalization-kazakhstan.html>
- Pallis, A. A., & Vaggelas, G. K. (2017). A Greek prototype of port governance. *Research in transportation business & management*, 22, 49-57.
- Plumer, B. (2018, September 4). You've Heard of Outsourced Jobs, but Outsourced Pollution? It's Real, and Tough to Tally Up. *The New York Times*. <https://www.nytimes.com/2018/09/04/climate/outsourcing-carbon-emissions.html>
- Railway Gazette International. (2023). EU funding plan builds on TEN-T revisions. *Railway Gazette International*. <https://www.railwaygazette.com/infrastructure/eu-funding-plan-builds-on-ten-t-revisions/36354.article>
- Rodemann, H., & Templar, S. (2014). The enablers and inhibitors of intermodal rail freight between Asia and Europe. *Journal of Rail Transport Planning & Management*, 4(3), 70-86.
- Rodrigue, J. P. (2020). *The geography of transport systems*. Routledge.

Sarker, M. N. I., Hossin, M. A., Yin, X., & Sarkar, M. K. (2018). One belt one road initiative of China: Implication for future of global development. *Modern Economy*, 9(4), 623-638.

Sarsenbayev, M., & Véron, N. (2020). European versus American Perspectives on the Belt and Road Initiative. *China & World Economy*, 28(2), 84–112. <https://doi.org/10.1111/cwe.12322>

Schulhof, V., van Vuuren, D., & Kirchherr, J. (2022). The Belt and Road Initiative (BRI): What will it look like in the future?. *Technological Forecasting and Social Change*, 175, 121306.

State Council of the People's Republic of China (PRC), 2015. Full text: Action plan on the Belt and Road Initiative, issued by the National Development and Reform Commission, Ministry of Foreign Affairs, and Ministry of Commerce of the People's Republic of China, with State Council authorization. People's Republic of China (PRC).

http://english.www.gov.cn/archive/publications/2015/03/30/content_281475080249035.htm.

Retrieved from <http://english.www.gov.cn/archive/>

[publications/2015/03/30/content_281475080249035.htm](http://english.www.gov.cn/archive/publications/2015/03/30/content_281475080249035.htm).

Sullivan, J. W. (2023, August 4). BRICS currency could end dollar dominance. *Foreign Policy*.

<https://foreignpolicy.com/2023/04/24/brics-currency-end-dollar-dominance-united-states-russia-china/>

The State Council Information Office of the People's Republic of China. (2023). The Belt and Road

Initiative: A Key Pillar of the Global Community of Shared Future. Retrieved October 10, 2023, from

http://www.scio.gov.cn/zfbps/zfbps_2279/202310/t20231010_773734.html#:~:text=To%20promote%20greater%20connectivity%20through,%2C%20bolstering%20%E2%80%9Csoft%20connectivity%E2%80%9D%20through

Van der Putten, F. P., & Meijnders, M. (2015). *China, Europe and the maritime silk road*. Clingendael Institute..

World Bank. (2019). *Belt and road economics: Opportunities and risks of transport corridors*. The World Bank.

Wu, S., Liu, L., Liu, Y., Gao, J., Dai, E., Feng, A., & Wang, W. (2019). The Belt and Road: Geographical pattern and regional risks. *Journal of Geographical Sciences*, 29, 483-495.

Xinhua (2022) Feature: Greece's Piraeus port refilled with vitality under BRI cooperation.

http://en.ccceu.eu/2022-07/16/c_2296.htm

Zhai, F. (2018). China's belt and road initiative: A preliminary quantitative assessment. *Journal of Asian Economics*, 55, 84-92.

Zhang, Y., & Xu, F. (2020). Ignorance, orientalism and sinophobia in knowledge production on COVID-19. *Tijdschrift voor economische en sociale geografie*, 111(3), 211-223.

10. Appendix A

Data for Tilburg

| Year | Unemployment | BRI | Throughput | P (other project) | Economic Growth | |
|------|--------------|-----|------------|-------------------|-----------------|------|
| 2000 | | | 0 | | 0 | 5,4 |
| 2001 | | | 0 | | 0 | 2,3 |
| 2002 | | | 0 | | 0 | -1,4 |
| 2003 | 5,925 | | 0 | | 0 | 0,2 |
| 2004 | 6,7833333333 | | 0 | | 0 | 2,4 |
| 2005 | 6,9916666667 | | 0 | | 0 | 2,9 |
| 2006 | 6,0916666667 | | 0 | | 0 | 3,6 |
| 2007 | 5,3 | | 0 | 7133829 | 0 | 2,7 |
| 2008 | 4,7666666667 | | 0 | 7628070 | 0 | 2,4 |
| 2009 | 5,4166666667 | | 0 | 6512704 | 0 | -3,3 |
| 2010 | 6,0916666667 | | 0 | 6791188 | 0 | 2,3 |
| 2011 | 6,0333333333 | | 0 | 7433587 | 0 | 3,1 |
| 2012 | 6,825 | | 0 | 6890941 | 0 | -0,4 |
| 2013 | 8,2 | | 0 | 6903229 | 0 | -0,9 |
| 2014 | 8,3416666667 | | 0 | 7251492 | 1 | 2,3 |
| 2015 | 7,9083333333 | | 0 | 8442526 | 1 | 3,4 |
| 2016 | 7,0083333333 | | 1 | 8439892 | 1 | 2,2 |
| 2017 | 5,8916666667 | | 1 | 9101219 | 1 | 4,1 |
| 2018 | 4,875 | | 1 | 8269589 | 1 | 2,3 |
| 2019 | 4,425 | | 1 | 8155944 | 1 | 1,8 |
| 2020 | 4,8583333333 | | 1 | 8431181 | 1 | -2,6 |

Data for Piraeus

| Year | Unemployment | BRI | Throughput | P (other project) | Economic Growth | |
|------|--------------|-----|------------|-------------------|-----------------|--------------|
| 2011 | 18,0 | | 1 | 2012413 | 0 | -10,14931483 |
| 2012 | 25,8 | | 1 | 3085181 | 0 | -7,086696786 |
| 2013 | 28,7 | | 1 | 3523164 | 0 | -2,515997222 |
| 2014 | 27,3 | | 1 | 3954674 | 0 | 0,475695947 |
| 2015 | 25,2 | | 1 | 3736189 | 0 | -0,19608763 |
| 2016 | 23,0 | | 1 | 4088848 | 1 | -0,487173294 |
| 2017 | 21,6 | | 1 | 4602861 | 1 | 1,09214912 |
| 2018 | 19,9 | | 1 | 5398220 | 1 | 1,668428636 |
| 2019 | 16,9 | | 1 | 6153567 | 1 | 1,884341785 |
| 2020 | 14,0 | | 1 | 6183643 | 1 | -9,004043642 |

10. Appendix B

Figure B5

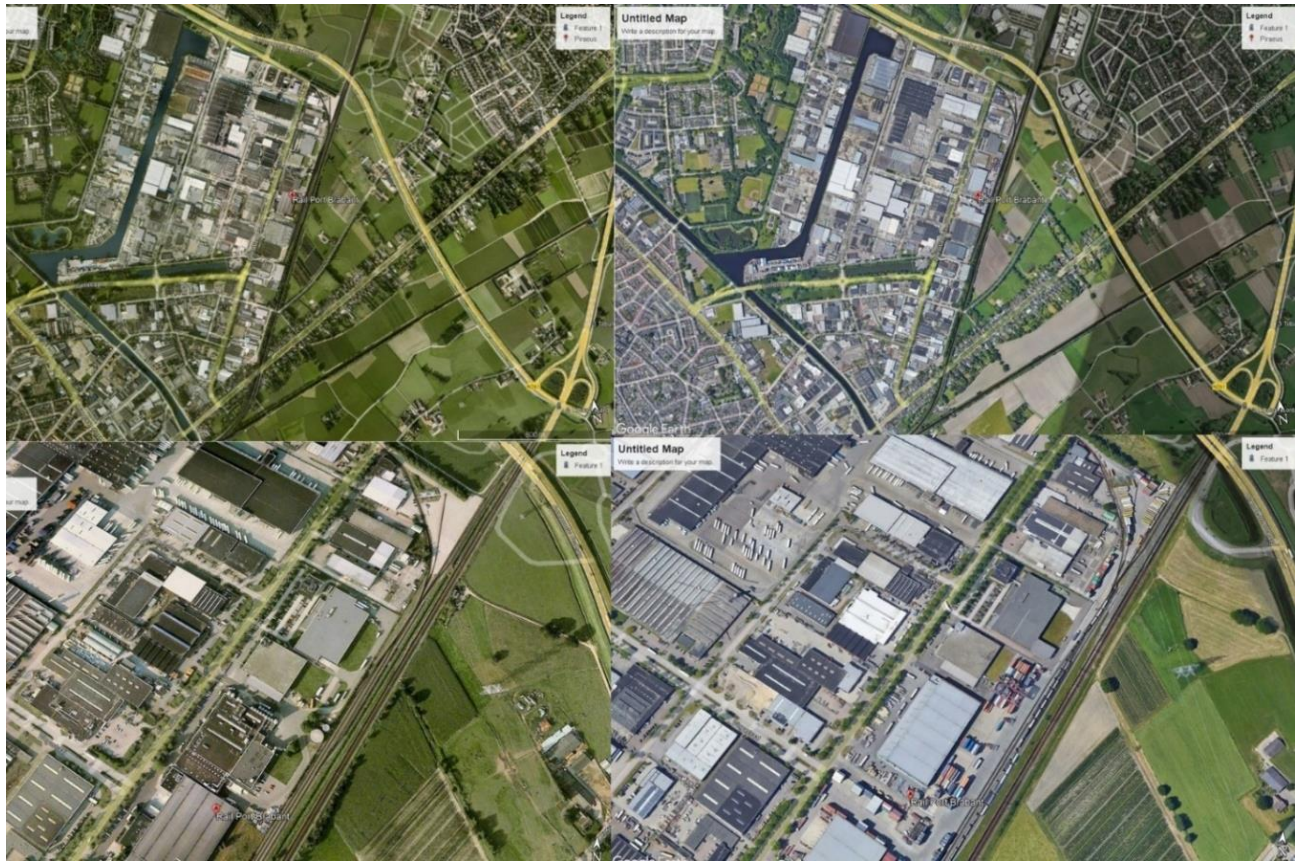
Development of Piraeus Port



Note. Image created by the Author taken from Google Earth Pro. The top left image is from 2008. The top right image is from 2023. These images give a broader overview of Piraeus port. The Bottom left image is from 2008. The bottom right image is from 2023. These images give a more clear view of the new terminal that has been built.

Figure B6

Development of Tilburg Rail Terminal



Note. Image created by the Author taken from Google Earth Pro. The top left image is from 2008. The top right image is from 2023. These images give a broader overview of Tilburg Rail Terminal. The bottom left image is from 2008. The bottom right image is from 2023. These images give a clear view of the development of the railport from 2008 till 2023.