UNIVERSITÀ DEGLI STUDI FIRENZE

DISEI

DIPARTIMENTO DI SCIENZE PER L'ECONOMIA E L'IMPRESA

Working Papers - Economics

Global Value Chain Trade along the Belt and Road and Projects Allocation

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Working Paper N. 07/2019

DISEI, Università degli Studi di Firenze
Via delle Pandette 9, 50127 Firenze (Italia) www.disei.unifi.it

Global Value Chain Trade along the Belt and Road and Projects Allocation

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Abstract

We analyze the trade patterns among the countries involved in the Belt and Road Initiative (BRI) and investigate whether and to what extent they explain the allocation of investment projects regarding their number and value. Our findings indicate that investments tend to concentrate in countries already involved in global value chains (GVC) and especially favor suppliers of intermediate goods to China with similar sectoral specialization. At the same time, more developed countries closer to destination markets tend to attract fewer but larger investments. The BRI represents an opportunity for China to upgrade its exports and for the involved countries to join GVC productions.

Keywords: Belt and Road, China, global value chains, trade patterns.

JEL classification: F14, F15, F21.

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Acknowledgements: *The authors wish to thank the participants of the 2018 Villa Mondragone Conference, the c.MET05 XV Workshop 2018, as well as participants of seminars in SACE (Rome) and Luiss (Rome) for their comments on previous versions of the paper. All errors remain ours.*

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1 Introduction

Officially announced by Xi Jinping in 2013, the Belt and Road Initiative (BRI), also called One Belt One Road (OBOR), is China's most ambitious geo-economic and foreign policy initiative in decades and the first example of "transnational" industrial policy. The BRI shows a commitment to easing bottlenecks to Eurasian trade by building networks of connectivity across Central, Western and Southern Asia, reaching out to the Middle East, Eastern and Northern Africa. The project combines a land-based Silk Road Economic Belt and a sea-based 21-st Century Maritime Silk Road connecting China to Europe.

Infrastructure development is the most explicit and visible aspect of the project, given that the BRI has mostly involved building roads, rails, and ports. However, through infrastructure development, the BRI has the potential to enhance policy coordination, trade facilitation, financial integration as well as capital and labour mobility. The project is particularly relevant for China since it can also help to tackle industrial overcapacity at home and acquire political influence abroad through investment. The BRI does not attempt to unbundle production and consumption - the vision of the original Silk Road - but rather to unbundle different segments of the production chain (or to reconfigure them internationally in a way that may be beneficial to China and its partners). This is going to affect the division of labor between countries therefore having potentially an important impact on development. Furthermore, through infrastructure development, the BRI can help participating countries to improve their trade logistics thereby increasing their potential to join international production networks. Global (or regional) value chains, in turn, can trigger development and growth prospects, especially for low and middle-income countries.

Through the BRI, China is determined to strengthen its trade relationships with neighboring countries by developing new export markets in Central, South and Southeast Asian countries as well as secure suppliers for its manufacturing. By virtue of BRI-related investments, existing value chains are likely to be reconfigured in the region. Likewise, improving access to intermediate inputs would enable China to upgrade its production.

In this paper, we concentrate on the trade-related aspects of the initiative. To the best of our knowledge, we are the first to quantitatively assess a relation between OBOR projects, trade and specialization.[1] We construct a novel database of all completed projects in countries along the corridors. We then assess the international trade motives

[1] As the Belt and Road initiative is still in its initial phase, the research on the topic is scarce, especially quantitative studies. For a review see Section 3.

behind the investments and explore which characteristics make countries more attractive and suited as project recipients. Our research questions are: What trade patterns characterize OBOR countries and project recipients? And what trade-related characteristics make countries more likely to be actively involved in the initiative and to reap the possible benefits? Specifically, we study whether OBOR investments, mostly infrastructural, favor countries that are more involved in intermediate trade and/or trade more intensely with China. We also examine whether sectoral specialization and the trade patterns, including countries' position in trade networks, play a role in the projects allocations. Based on this evidence, we then investigate econometrically what trade-related aspects are more likely to drive the investment project decisions.

In summary, we find that: i) investments seem to go towards large and relatively poor countries, however, richer countries get fewer but larger investments; ii) project recipients display relatively more diversified export structures than similar countries not included in the BRI and their specialization tends to overlap with that of China; iii) investments tend to favor countries that are more involved in GVC as suppliers of intermediates to China; iv) China is clearly the center of the intermediate trade network of OBOR countries, with some countries better positioned to represent crucial links to other regions; v) countries more involved in intra-industry trade and with relatively sophisticated export bundles are more likely to attract (larger) investments.

Our findings highlight that OBOR investments are closely related to trade patterns and GVC considerations; therefore, not only they will contribute to strengthen the regional GVC and related production networks, but also provide a reliable base of suppliers to China, which in turn may able to upgrade its productions.

The rest of the paper is organized as follows. Section 2 describes the OBOR corridors and projects. Section 3 introduces the related recent and growing literature on the BRI initiative. Sections 4 describes the sources and construction of the dataset. Section 5 provides descriptive analysis, while Section 0 presents an econometric analysis of project decisions. Finally, Section 7 concludes.

2 Corridors and investment projects

Table 1 lists the main countries dividing them into regional areas (there is no official list). More than sixty countries are somehow connected to the BRI. Their combined Gross Domestic Product is $23 trillion (30% of world GDP), their population approximately 4.4 billion people (around 60% of the world population).

Table 1 – Countries directly involved in the BRI.

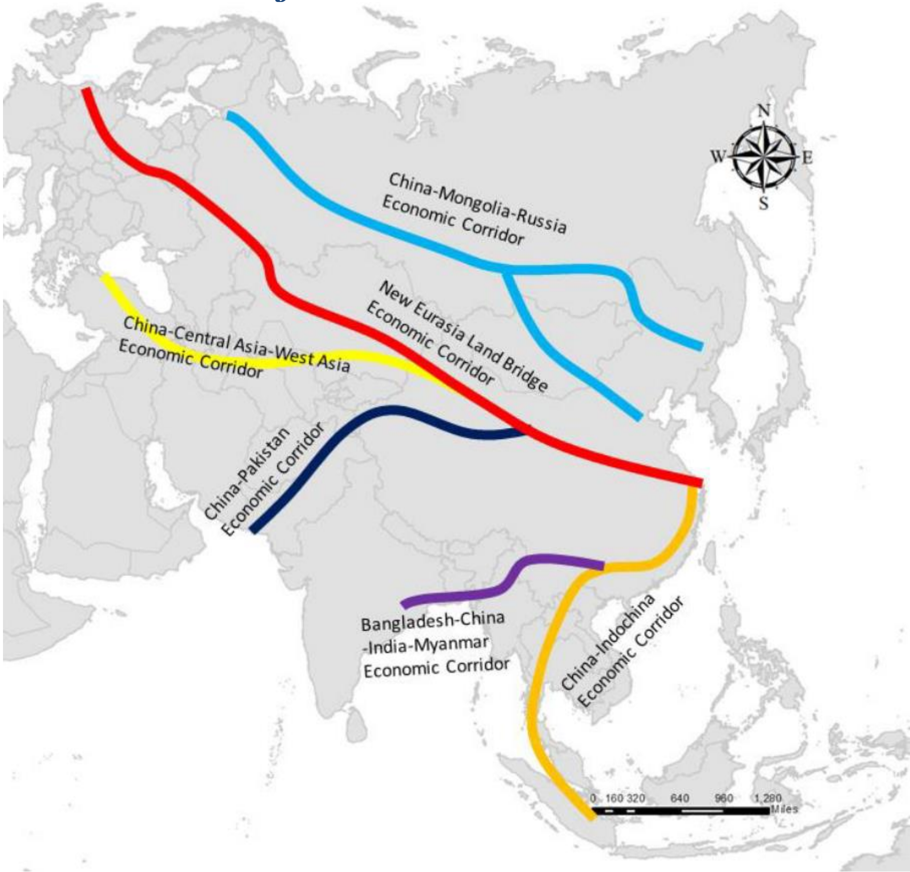
Region	Country
East Asia	China, Mongolia
Southeast Asia	Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, Timor-Leste, Vietnam
Central Asia	Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan
Middle East and North Africa	Bahrain, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Palestine, Syria, United Arab Emirates, Yemen
South Asia	Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka
Europe	Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Hungary, Latvia, Lithuania, Macedonia, Moldova, Montenegro, Poland, Romania, Russia, Serbia, Slovakia, Slovenia, Turkey, Ukraine

Source: Industrial Cooperation between Countries along the Belt and Road, China International Trade Institute. Note: The countries are grouped based on World Bank's classification by region.

While there are different representations of the BRI, in line with Derudder et al. (2016), we identify six different land corridors (Figure 1), encompassing the central cities along the international routes and the economic industrial parks (as cooperation platforms):

1. the China–Mongolia–Russia Corridor
2. the New Eurasian Land Bridge
3. the China–Central Asia–West Asia Corridor
4. the China–Indochina Peninsula Corridor
5. the China–Pakistan Corridor, and
6. the Bangladesh–China–India–Myanmar Corridor.

Figure 1 – The six land corridors.



Source: Derudder at al. (2018).

China has put strong emphasis on the connectedness with the Central Asian and South Asian countries, yet still little improvement in investment has been made, mainly because of political and economic risk. However, in 2016, Chinese enterprises signed 7961 new contracts for OBOR-related projects, with initiatives spread unevenly across countries. According to China's Ministry of Commerce (Mofcomm), this amount represents a 30.7% increase year on year, accounting for 51% of China's total foreign contract projects in the period (Mofcomm, 2017). The importance of the infrastructural investments is also related to the fact that eight Central Asian countries are landlocked (about one-fifth of the 44 landlocked countries in the world) and Uzbekistan is doubly-landlocked countries (i.e. all its neighbors are also landlocked).

With regards to completed projects, a total of 329 major infrastructure projects, including roads, railways, dry ports, and seaports, have been completed since the inception of BRI.[2] Roads account for 62% of projects, railways, dry ports, and seaports for 13%, 10%, and 14% respectively. Also completed projects are not uniformly

[2] The reported figure excludes infrastructure projects in other phases other than completed such as those planned, initiated, and/or under-construction.

distributed across the recipient countries. The position of a country along a corridor is likely to affect the number of completed projects. In 2018, Kazakhstan is the country with most projects completed. Its 26 projects are mostly concentrated in roads (20), rail (4), and dry port (2). Other countries with most projects completed are Cambodia (22), Vietnam (21), Kyrgyzstan (21), and Pakistan (20). A list of all projects completed in each country as at September 2018 is available in the Appendix A1.

2.1 Evidence for selected projects

In the last decades, production has been increasingly fragmented across firms and countries at all income and development levels. Against this background, the degree of competition along the Value Chains is also increasingly high for firms that have "to work together" in a vertically integrated system of production. Producers in GVCs need to ship parts, components, supplies, and finished goods quickly and cheaply both within the region and to other regions. Most of the GVC production hubs in China (eastern coastal cities) and Southeast Asia (e.g., Bangkok, Ho Chi Min City, Manila, and Singapore) have access to ocean shipping and low transport costs. Central Asia does not have such access and risks to be marginalized. Therefore, it is particularly relevant, especially for Central Asia, where several countries are landlocked, to count on infrastructural investments.

The key GVC sectors are in multicomponent goods such as automobiles and electronics. Automobile production is established in several Central Asian countries as joint ventures with foreign producers. For instance, Toyota entered into a partnership with Saryaka AvtoProm in 2014 to assemble a SUV in Kazakhstan. Less complex goods are also produced through value chains. Textiles and garments are made in several Central Asian countries. In some cases, they are produced largely from domestic inputs, such as in Pakistan where cotton is grown and turned into fabric. In the Kyrgyz Republic, for example, synthetic fabric is imported mainly from the PRC and made into clothing that is exported and sold in Kazakhstan and the Russian Federation.

China needs to cultivate opportunities outside its borders. As an example, Wang and Miao (2016) cite the Ruyi Group (Shandong), which has established weaving and spinning plants in Pakistan to benefit from low labor costs and has also acquired stakes in Australian and Japan textile manufacturers with the aim of setting up a truly international value and marketing chain. Today, the group is involved in Japan, Australia, New Zealand, India, and even the United Kingdom, Germany, and Italy.

Like Pakistan, Sri Lanka's manufacturing sector is weak and has not been integrated into the GVCs. Most Sri Lanka's exports to China are resources, raw materials and low-end manufactured products. The deep GVC integration of China's manufacturing sector places it able to help with Sri Lanka's GVCs participation through manufacturing integration of the two countries (Kelegama, 2014).

3 Related literature

The BRI is a relatively recent project, but its width and the magnitude of its possible effects are increasingly stimulating the research interests of researchers and policy makers. Yet the literature investigating the economic aspects of the initiative is still in its initial phase and quantitative studies are scarce. Most of the papers related to our work have been circulating in the last couple of years, some of the earliest papers dating back to just 2015, i.e. two years after the BRI was launched.

Some studies take a country perspective. For instance, Nataraj and Sekhani (2015) and Banerjee (2016) argue that India, despite some distrust towards the initiative, should welcome the projects as it is likely to gain from trade and from infrastructure building, while an ineffective involvement may lead to some isolation risks. Adopting a broader point of view, Cheng (2016), recognizing the complexity of the initiative and its strategic importance, questions its real objectives. According to Huang (2016), the BRI was promoted as an attempt to sustain China's economic growth and transition towards a more balanced development pattern, while also enhancing the country's role in the international setting.

Amighini (2017) includes several contributions with different perspectives on the BRI, including an assessment on the new geography of trade and some policy recommendations for the EU. The authors acknowledge that the initiative is likely to transform the network of international trade routes reducing the dominance of maritime connections in favor of the land corridors. This will in turn imply a deeper involvement of some countries that will bring about implications also for the geopolitical relations within the region. However, a key challenge for low and middle-income countries regards their readiness to enter the international production networks. Some of these difficulties can be overcome with a deeper integration of GVCs and domestic economic policies.

A two-part study by the Austrian Central Bank takes a project-oriented view of the BRI, focusing on its implications for Europe. The first part of the study (Barisitz & Radzyner, 2017a) reviews the initiative, its main institution and the details of some of the main investment projects. Based on the evidence gathered, the authors stress how maritime connectivity, while representing the dominant and cheaper mode is likely to lose some ground to improved overland connectivity. The second part of the study (Barisitz & Radzyner, 2017b) discusses the implications of the BRI for Europe, Southern Eastern Europe in particular.

Cai (2017) puts the BRI into perspective highlighting that China's "comparative advantages in manufacturing, such as low labor costs, have begun to disappear. For this reason, the Chinese leadership wants to capture the higher end of the global value chain. To do this, China will need to upgrade its industry." (p. 8) Also, in the words of Hu Huaibang, Chairman of the China Development Bank: "On the one hand, we should gradually migrate our low-end manufacturing to other countries and take pressure off industries that suffer from an excess capacity problem. At the same time, we should support competitive industries such as construction engineering, high-speed rail, electricity generation, machinery building and telecommunications moving abroad."[3] Yet, this China-centric approach might create some frictions with other countries along the road, as some of their sectors are directly competing with China. This aspect is clearly of primary economic importance for China's trade and development and, therefore, for the entire investment strategy behind the projects. Hence, in our work we explicitly take it into consideration.

Bustos (2018) investigates the exposure of OBOR countries to trade shocks originating from China. The author considers demand and competition shocks, the former referring to China as an importer and the latter to China as an exporter. In the last two decades, OBOR countries have been, on aggregate, a main destination of China's exports, but not a main source of China's imports. The pattern seems to be gradually changing, with some countries having increased their exports towards China. Econometric results show that exports of OBOR countries were significantly impacted by China's demand shocks, while competition shocks became somewhat more important in the last decade. The exposure to competition shocks is clearly related to trade similarity and specialization overlap with China, however, we also argue that there is a positive effect to consider as some degree of similarity can boost intra-industry trade and within-sector specialization related to global value chains productions.

Derudder et al. (2018) explicitly take a network analysis approach and investigate the hypothesis that a country's position in the network of connections (road, rail, air, and information technology) between OBOR countries matters for the possible gains from the initiative. They conclude that prioritizing the weak links of the network is likely to provide the largest benefits not only for the countries directly involved, but for the entire network as well.

[3] Hu Huaibang, "以开发性金融服务'一带一路'战略 (Using Development Finance to Service the One Belt and One Road Strategy)", China Banking Industry Magazine, 13 January 2016, http://www.cdb.com.cn/rdzt/gjyw_1/201601/t20160118_2187.html. Also cited in Cai (2017).

Villafuerte et al. (2016) investigate the economic impacts of the BRI using the GTAP model finding that there are possible benefits to trade and growth of both OBOR and non-OBOR countries, with some heterogeneity between countries. More recently, Enderwick (2018) offers an early stage assessment and discussion of the economic impact of the BRI, also considering it in a historical perspective. Overall, the possible benefits are heterogeneous, with some poorer countries benefiting greatly and China being the major beneficiary.

Johns, Clarke, Kerswell, & McLinden, 2018 review the main trade facilitation performance indicators (e.g. the logistics performance index, LPI) and discuss the challenges of each of the six corridors. They show that OBOR countries tend to perform poorly and proceed to identify the main priorities and recommendations, generally calling for increased cross-country coordination and transparency measures to be implemented on a corridor-by-corridor basis.

Two recent Eurasian Development Bank Reports study the BRI transport corridors. Vinokurov Lobyrev, Tikhomirov and Tsukarev (2018) give a quantitative assessment of the freight traffic along the corridors, concluding that there is little uncertainty about the fast growth of container traffic in the next few years. In the second report the same authors (Lobyrev, Tikhomirov, Tsukarev and Vinokurov, 2018) describe the physical and regulatory barriers to freight traffic growth in the long run and the investments that could foster it. Among the physical barriers, the relatively inadequate transport and processing capacity of Polish railways is worth mentioning as Poland is the main terrestrial gateway to the EU. The necessary improvements require sensible investments in the area. Ghossein, Hoekman, & Shingal (2018), using the same data source that we exploit in this paper (CSIS), describe procurement of BRI projects and discuss possible improvements in procurement practices.

One of the main direct effects of the BRI is the reduction in trade and transport costs, especially for the land routes. As stressed by (Amighini, 2017), "As there is no comprehensive information available on the improvements to infrastructure or the construction of new infrastructure, it is difficult to estimate how much transportation costs will be reduced." (Amighini, 2017 p. 135)

Quantification of the likely reduction in transportation costs is, in fact, one of the first subjects on which the most recent studies have tried to shed light. Garcia-Herrero & Xu (2017) provide one of the first estimates of the trade creation effects due to cheaper transportation. Specifically, their econometric estimates indicate that the elasticity of trade to transportation costs is 0.2 for railway, 0.55 for air and 0.11 for maritime. The scenario-based simulations show that EU countries, especially landlocked, are likely to benefit. Results provided by Lu et al. (2018), based on a gravity model of trade, point to a similar conclusion. Ramasamy, Yeung, Utoktham, & Duval (2017) investigate econometrically the trade effects of improvements in both hard (i.e. physical) and soft (i.e. administrative and ICT) connectivity, showing how expected gains vary from corridor to corridor.

Focusing on production networks, Boffa (2018) studies the production and trade linkages. Exploiting both custom trade data and input-output tables (TiVA, which includes 28 OBOR countries), the paper gives an in-depth description of the trade patterns and shows how regional trade integration between OBOR countries has increased, mostly thanks to trade in intermediate goods and global value chains. The paper also provides econometric estimates of the impact of trade costs on value-added trade: a decrease in trade costs increases gross and value-added trade between OBOR countries by 1.3-1.7%. Chen & Lin (2018) focus on foreign direct investments along the BRI, shoving how improvements in transportation costs can have a positive impact also on investments. The authors highlight that also in the case of FDI, the effects vary by transportation mode.

Furthermore, there is a complementarity effects since OBOR infrastructural projects seem to foster further subsequent Chinese FDI; a finding that is in line with Du & Zhang (2018). Rather than focusing on trade effects or FDI, de Soryres et al. (2018) explicitly study the impact of infrastructural project on shipment times and trade costs. They build an original dataset which includes information on projects and their geographical location and estimate that shipment times will decrease by 1.2-2.5%, which in turn implies a reduction in trade costs by 1.1-2.2% at the world level; results indicate even larger effects for OBOR countries, especially along the land corridors. Exploiting the same data, Baniya, Rocha, & Ruta (2019) estimate a gravity model and comparative advantage model to investigate the potential trade increases for participating countries.

4 Data sources

The data on infrastructural investments are taken from the Reconnecting Asia project of the Center for Strategic and International Studies (CSIS). The CSIS Reconnecting Asia project maps five infrastructural projects types – road, rail, seaports, intermodal facilities, and powerplants – geographically spread in Eurasia countries from 2006 till date. The compilation of the data by CSIS goes through three phases. First, primary information on infrastructure is collected from open sources with key information such as project type, cost, funders, commencement and projected completion dates. Primary sources of information include national agencies of host countries, regional development banks, projects contracts as well as CSIS partners.

In the second phase, projects information is verified and de-conflicted by CSIS research team to identify the most reliable and trustworthy information.[4] Projects data that passed the second stage screening process are then geotagged unto CSIS Reconnecting Asia project website and uploaded with supportive information in the final stage.[5] The filter tool on the project website mentioned above enables one to search for infrastructure projects by type, status (preparatory works, started, under construction, completed, and cancelled), commencement and completion dates, as well as funders.

We confine our compilation to roads, rails, seaports, and dryports infrastructure projects completed between 2013 and September 2018. The compilation criteria applied were motivated by our research questions. Additionally, at the time of data compilation, data on power plants had just been added to the database so therefore few projects had been screened. Using our search criterion, for each BRI country listed in Table 1, we compile information on completed infrastructure projects by type and cost. This enabled us to build a database containing both the number of completed projects and its estimated value. As of September 2018, we compiled a total of 329 completed infrastructure projects in BRI countries. Roads account for 65% of all completed projects. Rails, dryports, and seaports accounts for 0.18%, 0.03%, 0.14% respectively of all completed projects. Table 14 in the appendix lists all completed projects by type for all BRI countries.

The source of the trade data is the Eora multi-regional input-output tables (Eora-MRIO). The choice to use input-output tables is driven by the need to perform a GVC and network analysis, focusing on intermediate trade. The Eora database, contrary to other sources, has a wide country coverage, including low and middle-income countries. Each Eora input-output table includes 187 countries and 26 sectors; hence, the intermediate block has 26 times 187 cells, for a total of more than 23.6 million country-sector-to-country-sector observations. In most of the empirical analysis, however, we elaborate and organize the data and the variables so to operate at the country-sector level, thus having 4862 country-sector observations.

Other country level variables, such as GDP per capita and the logistics performance indicators are taken from the World Bank World Development Indicators (WDI) and from the Doing Business indicators.

[4] We do not know the duration required by CSIS to verify information in the second stage.
[5] Geotagged data can be publicly assessed on https://reconnectingasia.csis.org/map/

5 Country characteristics and trade

Trade between China and its Central Asian partners increased substantially in the last fifteen years. Back to 2000, the BRI countries only constitutes 13% of China's exports and 19% of China's imports, but both shares have reached up to 27% and 23% by 2015. The largest trading partners for China in the Belt and Road area are ASEAN countries (12% of China's total exports and 11.58% of total imports) with a relatively balanced trade payment, partly because of their complementarity on value added chain. China's second largest trading partners within the BRI area are countries in the Middle East (from where China mainly imports oils). South Asia is the third largest trading partner in the region and has a very unbalanced bilateral trade as well as a complex product structure. Central Asia, Central and Eastern European countries and Mongolia added up together account for less than 3 percent of China's external trade. Production and exports from Central Asia currently are concentrated in oil, minerals, and agricultural products, although there is considerable diversity among the countries and some countries are specialized in manufacturing, typically textiles and machinery.

In what follows we focus our attention on OBOR projects and trade, especially of intermediate goods, investigating several characteristics of the recipient countries. Starting a project in one country rather than in another represents a clear signal of preference or of higher expected return. The main recipients are likely to be the most strategic countries for the overall BRI. To this end, it is convenient to separate countries potentially involved in the BRI from those that received and completed projects. We thus study the economic and trade characteristics of those countries vis-à-vis non-OBOR countries and OBOR countries that did not get any project yet.

5.1 Income and projects

Let us consider GDP per capita. Averages of GDP per capita by groups are reported in Table 2. Relative to the world average income per capita (about 14.7 thousand dollars), OBOR countries are relatively poor (income per capita lower by about 4 thousand dollars). This fact is of course mostly due to the geography of the BRI, which involves many western and central Asian countries that are relatively poor and landlocked. OBOR countries are in fact very heterogeneous. The income gap between countries with completed projects and the other OBOR countries is even larger. The income of the former is less than half that of the latter. In particular, income per capita of the project recipients is about half the world average, while that of the other OBOR countries is 5 thousand dollars higher that the world average. Considering that many projects involve roads, rails and ports, these numbers suggest that investments seem to go where the infrastructure is more lacking and perhaps the return on each dollar spent is likely to be higher.

The opposite trend emerges when we consider population. OBOR countries are larger than the world average, which is 40.6 million; however, this result is driven by India: excluding India, OBOR countries are close to the world average population. Among OBOR countries, the effect of India, which is among the project recipients, while large, does not modify the evidence that projects tend to go towards large countries. Again, the effect of country size may be related to gravity forces and to the fact that projects may yield greater returns in larger markets.

Moreover, as projects tend to go towards relatively poor and populous countries, one may wonder whether labor cost considerations may play a role in the decision of where to invest.

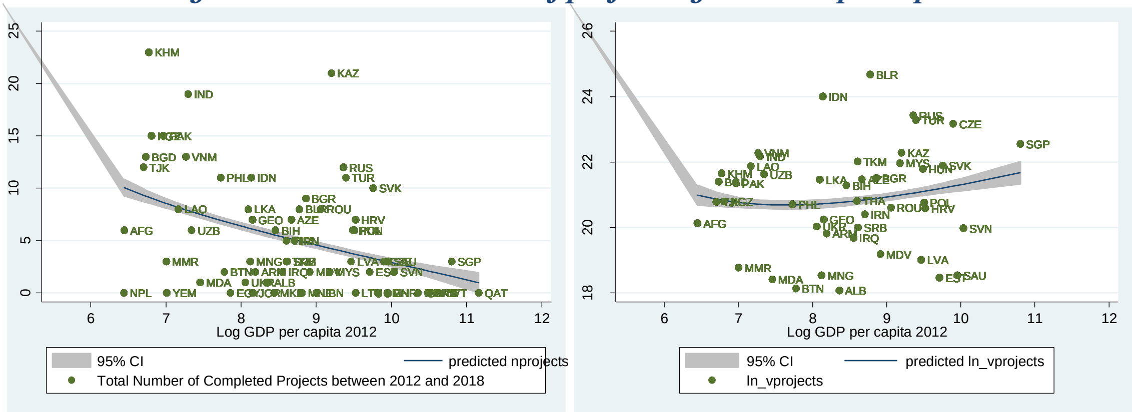
Table 2 – Income and population of OBOR countries.

	Per Capita GDP (2012) (US dollar)	Population (2012) (mln)	Population excl. India (2012) (mln)
OBOR	10627	50.2	29.9
of which			
projects	*7700*	*62.5*	*35.8*
non-projects	*19603*	*12.4*	*12.4*
non-OBOR	16927	35.3	35.3
Total	14693	40.6	33.5

Note: Projects refers to OBOR countries with at least one completed infrastructure projects, while non-projects refer to OBOR countries without any completed projects.
Source: authors' elaborations based on CSIS and WDI.

The above descriptive statistics show that there is a big difference between countries that received investments and the others. However, investments may vary also in number and in value; and one may wonder whether there is heterogeneity also within the group of recipients. In Figure 2, we plot the number (left panel) and the value (right panel) of projects against GDP per capita together with (fractional polynomial) predictions. On average poorer countries get more projects, but for a smaller total value.

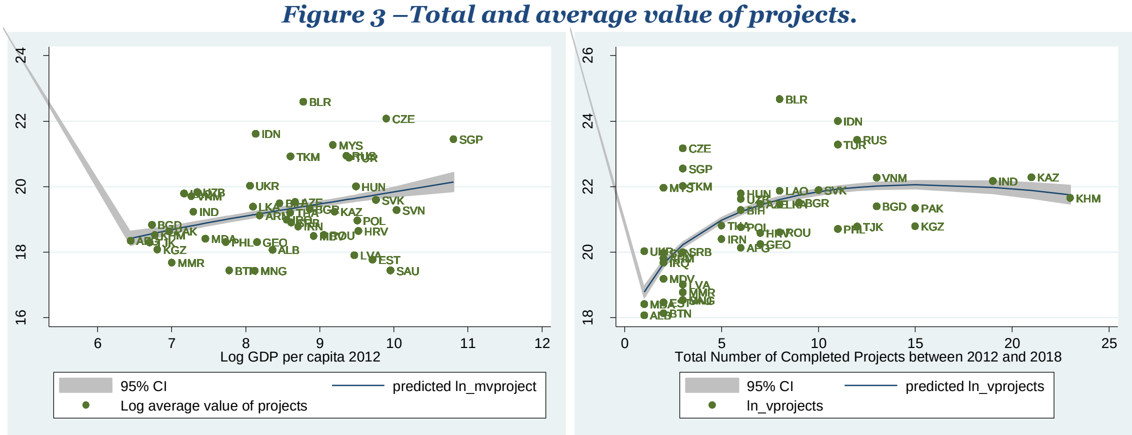
Figure 2 – Number and value of projects against GDP per capita.



Source: authors' elaborations based on CSIS and WDI.

This suggests that richer countries get larger projects. This is precisely what we see in Figure 3. Considering the relationship between total value and number of projects, however, we observe an inverted-U-shape. The first investment projects obtained in a country tend to be big, adding up to the total value invested; however, additional projects tend to be smaller and smaller, eventually adding close to nothing to the total invested value.

Figure 3 –Total and average value of projects.



Source: authors' elaborations based on CSIS and WDI.

5.2 Trade specialization and revealed comparative advantage

Let us now consider trade specialization to investigate whether countries with completed projects share common patterns. We compute of the revealed comparative advantage (RCA, Balassa, 1965), considering relative sectoral export shares (we use the normalized version) and the Lafay (1992) index, which measures the sectoral contribution to the overall normalized trade balance (see the appendix for details). While the Balassa index only takes into account exports, the Lafay index also considers imports, thus being more suitable for situations when GVC and IIT are pervasive. The two indicators tend to identify the same sectors of specialization, yielding similar distributions of comparative advantages: the indexes are in line for 82% of the country-sector observations (Table 3).

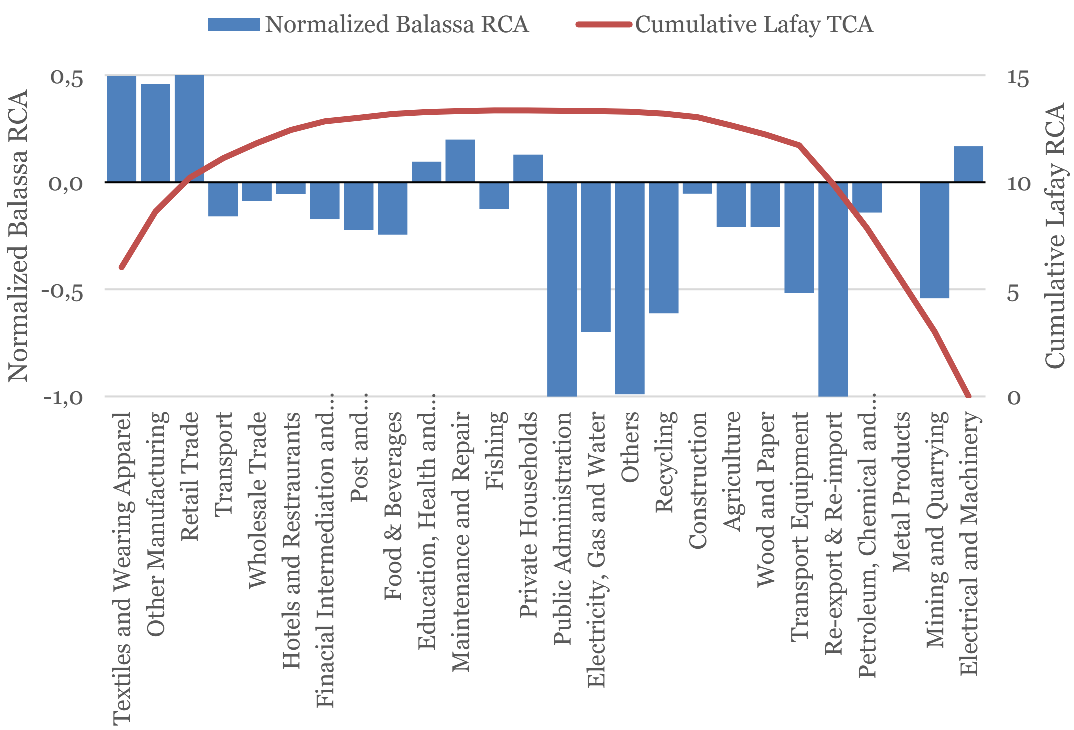
Table 3 – Specialization (+) and despecialization (-) sectors.

		Lafay +	Lafay -	Total
Balassa	+	41.4	8.1	49.6
Balassa	-	10.0	40.5	50.4
Total		51.4	48.6	100

Source: authors' elaborations based on Eora and CSIS.

The Lafay index has also a useful property: it sums to zero. Hence, the cumulative Lafay index, sorting sectors by RCA, forms a bell such that the slope corresponds to the strength of the RCA. Figure 4, reports the cumulative Lafay RCA index for China together with the Balassa index. Both indexes signal a strong specialization in textile, other manufacturing and retail trade. The different results for electrical and machinery is likely to be due to trade in intermediate goods, which we investigate later.

Figure 4 – RCA sectors for China.



Source: authors' elaborations based on Eora and CSIS.

The fact that the Lafay index sums to zero is also useful to investigate the so-called polarization, that is the strength of specialization (and despecialization). RCA polarization can be measured by the sum of positive Lafay indexes as in Table 4: a lower value signals a more diversified economy. To this regard, OBOR and non-OBOR countries are very similar; however, OBOR countries with projects tend to have a more diversified trade structure. This could suggest that investments do not seek a specific sectoral specialization, but rather a more diversified economic structure.

Table 4 – RCA polarization.

	Cum. positive Lafay RCA
OBOR	19.713
of which	
projects	*18.525*
non-projects	*23.128*
non-OBOR	19.588
Total	19.630

Note: Projects refers to OBOR countries with at least one completed infrastructure projects, while non-projects refer to OBOR countries without any completed projects.
Source: authors' elaborations based on Eora and CSIS.

Although countries that received investments do not have a particularly strong specialization in few sectors, projects may follow a specialization rationale. For instance, one may wonder whether projects tend to favor countries whose specialization is in line with that of China. To see this, we use two measures: i) we compute the shares of country-sector observations for which the sign of the RCA indexes coincides with that of China; ii) we compute a continuous (0 to 1) RCA overlap index measuring the degree of similarity in sectoral specialization with China (see the appendix for details). Results are reported in Table 5. The first two columns show the shares of country-sector observations with a specialization similar to China; the third and fourth columns show the overlap indexes. On average, OBOR countries have relatively high degree of overlap with China, with countries that received projects showing a slightly larger overlap. While this may suggest that investments tend to favor countries with a specialization close to that of China, at this level of analysis the evidence does not seem particularly strong.

Table 5 – RCA overlap with China.

	RCA same sign (Balassa)	RCA same sign (Lafay)	RCA overlap (Balassa)	RCA overlap (Lafay)
OBOR	0.527	0,551	0.748	0.870
of which				
projects	*0.528*	0,559	*0.752*	0.872
non-projects	*0.522*	0,531	*0.737*	0.865
non-OBOR	0.476	0,556	0.706	0.848
Total	0.493	0,554	0.720	0.855

Note: Projects refers to OBOR countries with at least one completed infrastructure projects, while non-projects refer to OBOR countries without any completed projects.
Source: authors' elaborations based on Eora and CSIS.

The above evidence is based on averages of country-sector overlap indexes. As a check, let us compute country aggregate overlap indicators (see the appendix for details). Results are qualitatively similar and even stronger, although the degree of overlap is lower (by construction). OBOR countries overlap relatively more with China, with countries that received projects showing a particularly high degree of overlap, especially as measured by the Lafay index.

Table 6 – Aggregate RCA overlap with China.

	Aggregate RCA overlap (Balassa)	Aggregate RCA overlap (Lafay)
OBOR	0.400	0.467
of which		
projects	*0.409*	*0.496*
non-projects	*0.374*	*0.383*
non-OBOR	0.299	0.448
Total	0.333	0.454

Note: Projects refers to OBOR countries with at least one completed infrastructure projects, while non-projects refer to OBOR countries without any completed projects.
Source: authors' elaborations based on Eora and CSIS.

5.3 Trade in intermediate goods

Let us now focus on trade in intermediate goods. We consider the shares of intermediates in total exports and total imports as well as the composition of intermediate trade, specifically the shares of total intermediates exported to and imported from China. Larger shares of intermediates in total trade indicate a stronger participation in GVC, while the shares of China measure the composition of intermediate trade, which may be biased towards the country. Descriptive statistics are reported in Table 7. At the world level, trade in intermediates represents about 71% of total export and 64% of total import (country-sector average). OBOR countries trade slightly less intermediates, but, non-surprisingly, they trade more with China. Countries with projects trade more intermediates, export more to China, but import less from China. This evidence is in line with the idea that OBOR projects may allow China to develop its suppliers' network, freeing internal resources for upgrading, while at the same time helping industrial development in the recipient countries.

Table 7 – Intermediate exports and imports shares.

	Export	Import	Export^{CHN}	Import^{CHN}
OBOR	70.1%	63.5%	4.2%	5.0%
of which				
projects	*71.2%*	*64.4%*	*4.6%*	*4.9%*
non-projects	*66.9%*	*61.0%*	*3.1%*	*5.5%*
non-OBOR	71.4%	64.2%	3.6%	4.8%
Total	70.9%	63.9%	3.8%	4.9%

Note: Projects refers to OBOR countries with at least one completed infrastructure projects, while non-projects refer to OBOR countries without any completed projects.
Source: authors' elaborations based on Eora and CSIS.

5.4 Trade of OBOR and projects recipient countries

We now further investigate the evidence emerged above by means of simple averages of the intermediate trade shares and RCA indexes. To this aim, we run a set of simple descriptive OLS regressions in which we control for GDP per capita. We are interested in the OBOR and projects dummies, which provide an indication of the conditional means. Let us estimate:

$$y_{ij} = \alpha + \beta_1 I_i + \beta_2 X_i + \gamma_j + \varepsilon_{ij}$$

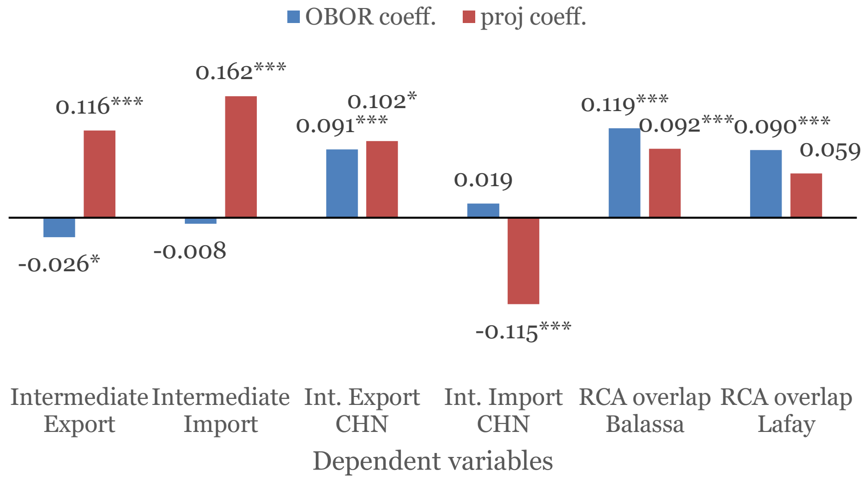
where the dependent variable y_{ij} is alternatively: intermediate export (i) and import share of total trade (ii), China's share of intermediate export (iii) and import (iv), the two RCA overlap indexes based on Balassa (v) and Lafay indicators (vi); I_i is a dummy indicating whether country i is part of OBOR or, in a second specification on OBOR countries only, whether the country received projects; X_i are country-level controls, i.e. GDP per capita (replacing GDP per capita with a logistics index does not affect the results; the two variables are positively correlated); γ_j denote sector fixed effects and ε_{ij} is the error term.

We run the regressions on two samples: first on all countries, including the OBOR dummy; second, on OBOR countries only, including the project dummy. All the results are in line with the previous evidence based on simple averages (see Tables 5-7), suggesting that the above stylized facts hold also controlling for GDP per capita and sector characteristics.[6] On average rich countries export less intermediates, while importing more of them. This confirms the idea that countries at a higher stage of development tend to occupy downward segments of GVCs. Let us focus on our variables of interest and refer to Figure 5, depicting the coefficients of the OBOR and project dummies from the respective regressions (see Appendix A2 for the complete regression

[6] Detailed results are in Appendix A2 for reasons of space.

tables). In the Figure, we see that the OBOR dummy coefficient on intermediate export is negative while that on import is non-significant, meaning that OBOR countries tend to export fewer intermediate products than their income level would predict. The project dummy coefficients on intermediate export and import are both positive, showing that, contrary to other OBOR countries, those that received projects tend to export and import more intermediates; indication suggesting that OBOR investments and production networks are closely related. With respect to the share of China as a destination or as a source of intermediate products, results indicate that on average rich countries trade more intermediates with China. This effect is higher for import from China: OBOR countries export more intermediates to China, but do not import more from China (see the OBOR dummy coefficients on intermediate export and import with China in Figure 5). This evidence is even stronger for OBOR countries with completed projects. They export more intermediates to China but import less (the project dummy coefficient is positive on intermediate export to China while it is negative on intermediate import from China). This suggests that investments may favor countries that are in a better position to supply intermediates to China, rather than countries that demand inputs. Finally, OBOR countries and China have relatively similar specialization; this holds for countries with projects as well (see the OBOR and project dummy coefficients for RCA overlap in Figure 5). OBOR investments, thus, tend to reflect China's comparative advantages, perhaps in different segments within the same sectors.

Figure 5 – Estimated coefficients of OBOR and projects dummies on different variables.

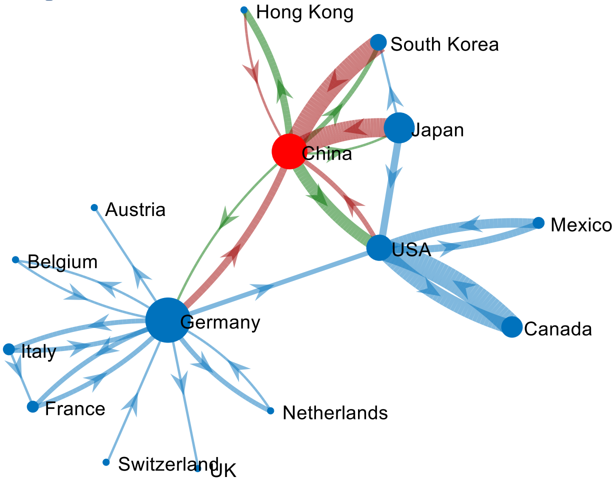


* p<0.1, ** p<0.05, *** p<0.01; see the appendix for detailed regression tables.
Source: authors' elaborations based on Eora, CSIS and WDI.

5.5 The intermediate trade networks

The above evidence points towards a role for GVC and production networks in the distribution of OBOR investment projects. In what follows, we investigate the configuration of the intermediate trade network of the OBOR countries. To get a clearer, easier to interpret, figure of the production linkages we present the results for manufacturing. For the same reason, we exclude minor trade flows.

Figure 6 – World intermediate trade network.

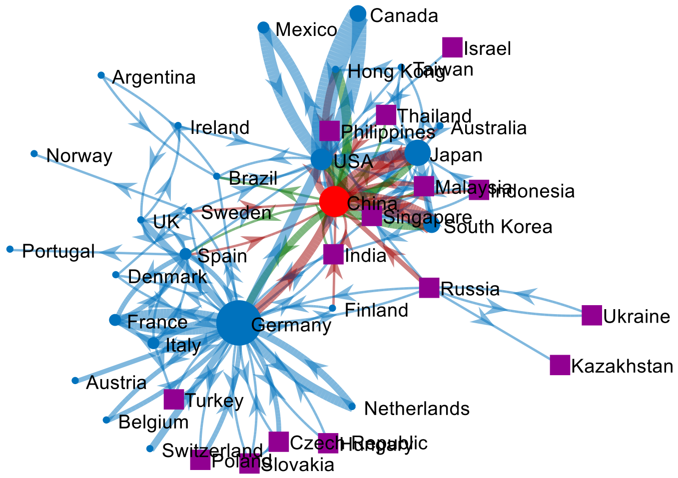


Note: manufacturing sectors, year 2012, flows>0.5% of world trade.
Source: authors' elaborations based on Eora.

The world intermediate trade network, non-surprisingly, clearly displays three main manufacturing regions: Europe, Asia and North America. These areas have three main hubs respectively: Germany, China and USA. The centrality of China in the world production network and, even more so, in the BRI is apparent. In this configuration, the BRI is likely to reinforce the link between Europe and China, which is dominated by the China-Germany relation, possibly creating more and new linkages and making the network more stable, i.e. less sensitive to shocks to specific spokes. The development of this new linkages, in which China is likely to play a major role, will probably reinforce the importance of China in the world intermediate trade network.

In the above figure most OBOR countries are absent. This is because their trade linkages are minor relative to the main world traders. To understand how OBOR countries connect with the main players, we slightly increase the detail and add them in Figure 7. OBOR countries tend to distribute into three regions: most (Asian) OBOR countries, as expected, gravitate around China; (East) European OBOR countries relate to China through Germany and do not present strong direct linkages with Asia; some OBOR countries, instead, belong to the Russian subnetwork. Creating significant trade connections between those countries, and probably with China, might deeply change the network configuration making all the OBOR countries more central and reducing the importance of the other regional hubs (Germany, USA, Japan and Russia).

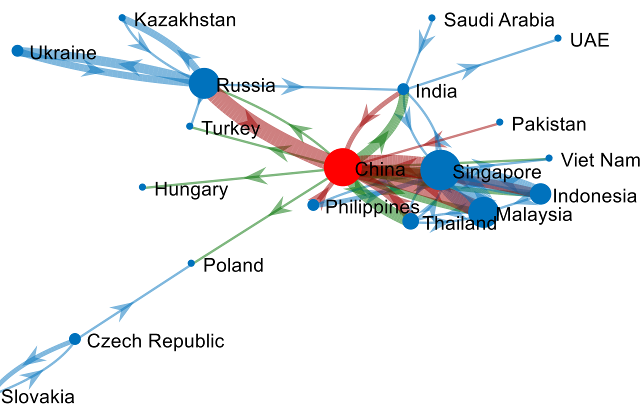
Figure 7 – World intermediate trade network plus main OBOR countries.



Note: manufacturing sectors, year 2012, flows>0.1% of world trade for OBOR countries, >0.5% for others.
Source: authors' elaborations based on Eora and CSIS.

The level of details of the previous figures, focused on the world network, shows that many OBOR countries do not share strong direct trade linkages. It is then useful to change the scale and focus on the OBOR intermediate trade sub-network in order to see the main linkages between OBOR countries, which although small on the world scale, may represent the basis for further development of trade thanks to the BRI. Figure 8 shows, again, the centrality of China.

Figure 8 – Intermediate trade network of OBOR countries.



Note: manufacturing sectors, year 2012, flows >0.5% of total regional trade.
Source: authors' elaborations based on Eora and CSIS.

Eastern Asian countries are relatively well connected among themselves, with most of them supplying manufacturing inputs to China. Russia also is a major supplier of manufacturing inputs. On the contrary, the links with European countries are clearly weak and the only relevant connection goes through Poland, which is thus in the position to greatly benefit from the BRI.

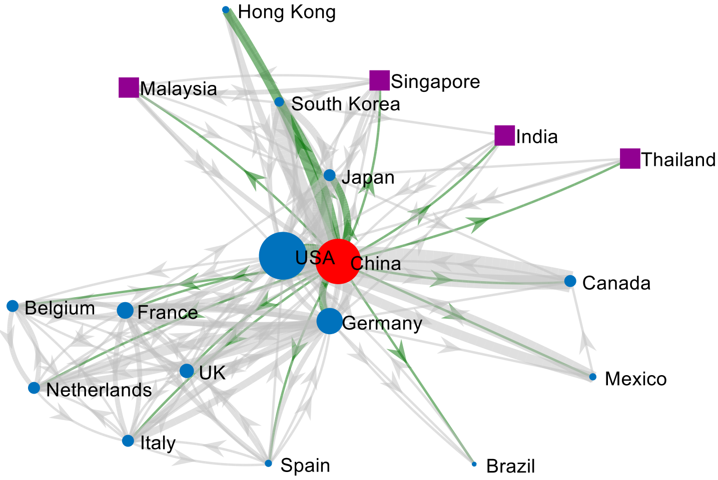
The importance of China both in the world trade network and as the main promoter of the BRI implies that understanding how countries connect to China, either as buyers or suppliers, directly or indirectly, is informative.

In Figure 9, we display the direct outward production links of China, that is the destinations of China's intermediate exports. We also include in the figure the main trade linkages between the direct buyers of intermediates. China's main partners are US, Germany and two Asian countries: Japan and South Korea. Countries along the Belt and Road are in purple and the graph shows that they are directly connected to China by trade in intermediates although, not surprisingly, the value of the outward flows is not particularly large.

Looking at China's inward production link, that is the sources of intermediate imports, gives a different picture. In Figure 10, we see that Germany, Japan and South Korea largely increase their role as suppliers of intermediates; similarly, the flows of a larger number of OBOR countries are non-negligible.

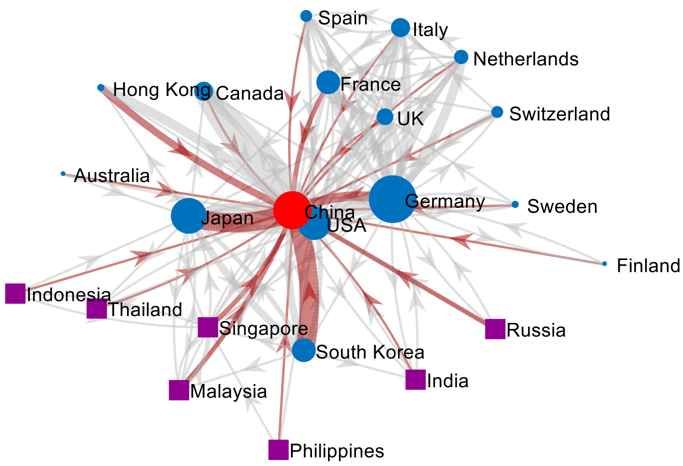
The BRI will probably reinforce these patterns since it facilitates regional trade. Beneficiary countries are likely to find the most attractive elements of the BRI to be its provision of hard infrastructure. Likewise, the BRI provides China with an opportunity to use its considerable economic means to finance (some of) these infrastructure projects around the world. The Asian Development Bank (ADB) estimates that the developing countries of Asia collectively will require $26 trillion in infrastructure investment to sustain growth.

Figure 9 Destinations of China's intermediate exports.



Source: authors' elaborations based on Eora and CSIS.

Figure 10 – Sources of China's intermediate imports.



Source: authors' elaborations based on Eora and CSIS.

Finally, we report in Table 8 the top fifteen countries ranked by the main centrality indicators calculated for the OBOR intermediate trade network (the values of the indicators as well as correlation matrices are reported in the Appendix A4). Although the indicators capture partially different aspects of the network and do not yield identical rankings, their correlations and rank correlations are very high. The indicators - briefly described in the Table note -, confirm the visual analysis, with China being the most central node of the network.

Table 8 – Indicators of centrality in the OBOR intermediate trade network: ranks.

	PageRank	Hubs	Authorities	Outdegree	Indegree	Betweenness
China	1	5	1	1	1	1
Singapore	2	2	2	2	2	4
Russia	3	4	14	3	6	2
India	4	7	5	6	4	3
Malaysia	5	1	3	4	3	30
Thailand	6	6	4	7	5	11
Turkey	7	16	11	13	9	8
Ukraine	8	17	8	9	7	14
Czech Republic	9	13	17	8	11	13
Poland	10	19	12	11	10	18
Saudi Arabia	11	10	16	17	16	10
UAE	12	14	13	14	15	7
Indonesia	13	3	6	5	8	47
Iran	14	12	18	18	19	12
Hungary	15	20	15	15	13	6

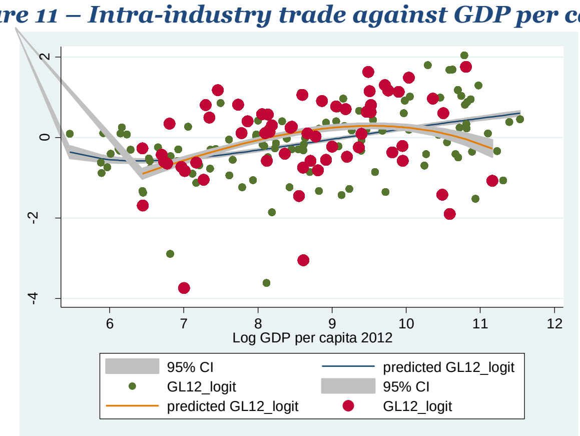
Note: manufacturing sectors, year 2012, ranks by country (see the Appendix for the indicator values). PageRank is derived from a random walk in the network and measures the probability to encounter a given node. Hubs and Authorities centrality scores are related recursive measures: hubs score measures outward (here export) connections to relevant authorities, while authorities score measures inward (import here) connections from relevant hubs. Out and indegree measure the number of forward (export) and inward (import) links. Betweenness centrality measures the likelihood that a node is in the shortest path between any two nodes.
Source: authors' elaborations based on Eora and CSIS.

5.6 Intra-industry trade

Let us now focus on intra-industry trade (IIT), particularly relevant since China is a major importer of manufactured inputs used in the production of its own exports. In this context, intra-industry linkages typically constitute the larger share of trade, especially with broader sector definition (as in Eora). By investigating IIT, we thus keep track of two broad and interrelated phenomena, i.e. product differentiation and GVC, for what regards trade flows within broadly-defined sectors. The most commonly used IIT indicator is the Grubel & Lloyd (1971, 1975) index (GL; see the Appendix A3 for details). Plotting GL against GDP per capita, as in Figure 11, reveals a positive correlation: richer countries tend to trade more within sectors. In the figure, however, we see that OBOR countries tend to form an inverted-U-shape: middle-income OBOR countries are more involved into intra-industry trade than their income level would imply-

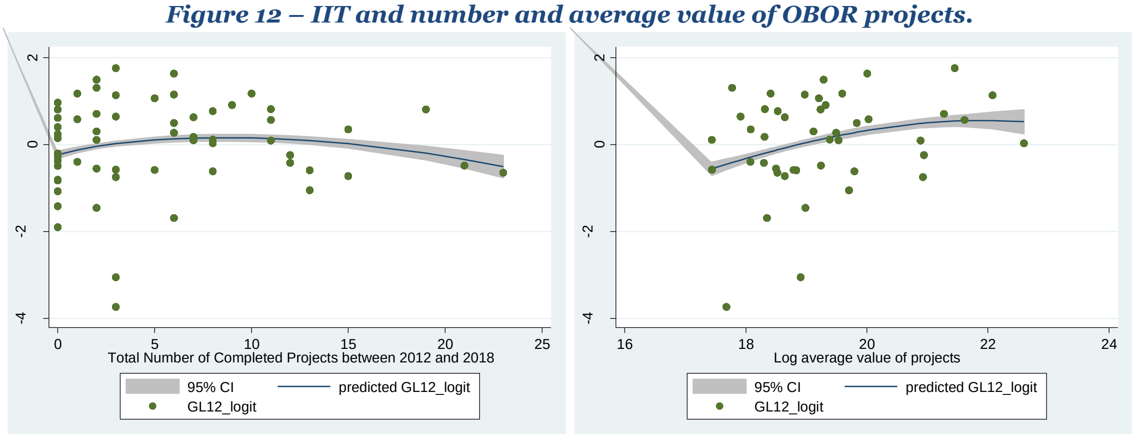
In Figure 12, we consider countries that received projects. IIT does not seem related to the number of projects, while we clearly see that countries more involved in IIT get larger investments.

Figure 11 – Intra-industry trade against GDP per capita.



Note: the graph uses a logit transformation of the GL index.
Source: authors' elaborations based on Eora, CSIS and WDI.

Figure 12 – IIT and number and average value of OBOR projects.



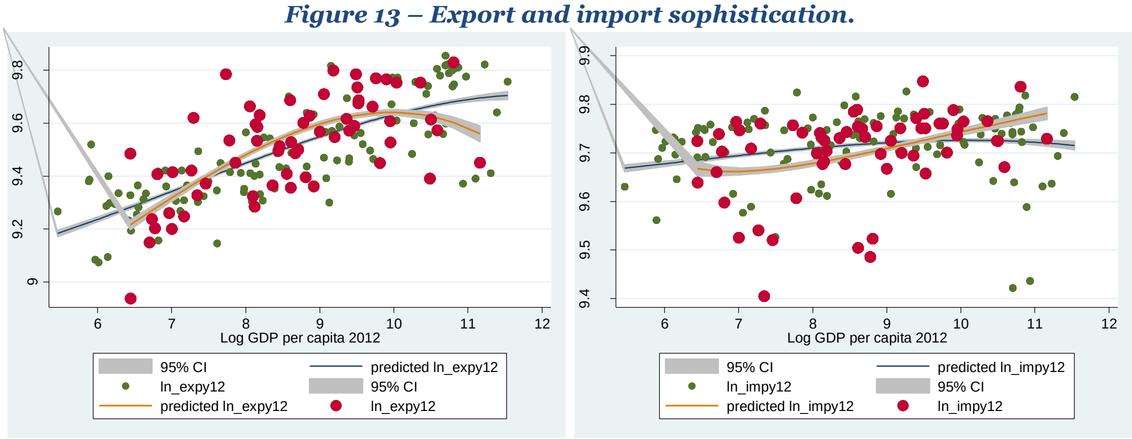
Source: authors' elaborations based on Eora and CSIS.

5.7 Export and import sophistication

One of the main issues of countries' participation in GVC regards their ability to reap the benefits and upgrade. The composition of the trade bundle provides a first indication of the capability of a country to secure and supply better, more sophisticated products, and ultimately occupy a more valuable position within the value chain. One indication of this is provided by a sophistication index developed by Hausmann et al. (2007) and Rodrik (2006), which captures the average level of income implied by a country's trade bundle. Non-surprisingly, rich countries tend to have more sophisticated export and import bundles, i.e. they import and, especially, export more advanced products. As a consequence, a similar indication is obtained by considering similarity indexes between a country's export bundle and the export bundle of richer countries (Schott, 2008; Wang & Wei, 2008). In what follows, we investigate export and import sophistication of OBOR countries. Our approach is similar to Marvasi (2013).

Figure 13 shows export and import sophistication. As expected, we see that exports sophistication is more variable than import sophistication, reflecting more closely the income level. Import sophistication tends to be higher than export sophistication, indicating that less developed countries tend to import relatively sophisticated products exporting less sophisticated ones, while more advanced countries trade highly sophisticated products. Consequently, the gap between import and export sophistication decreases with income. Rodrik (2006) and subsequent studies highlight the fact that China's export is particularly sophisticated conditional on its level of development. The figure suggests that we can generalize this finding to middle-income OBOR countries. To this regard, the BRI may contribute to create a group of interconnected sophisticated exporters. Marvasi (2013) shows that China's surprisingly high level of sophistication is due to intermediates, for which export sophistication surpassed import sophistication in the early 2000s. Over time, the increasing export sophistication signals China's upgrading. However, such improvement also implies that, relative to its income, China is becoming "less special". This adds to the possibility that the BRI can help China upgrade its suppliers' network.

Figure 13 – Export and import sophistication.

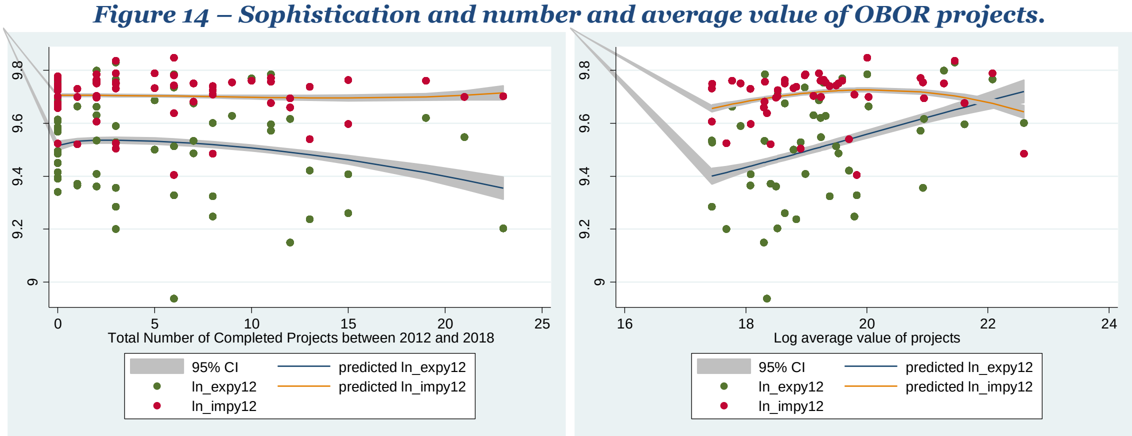


Source: authors' elaborations based on Eora, CSIS and WDI.

Focusing on OBOR countries with completed projects (Figure 14), we see that countries that obtained more projects tend to have less sophisticated exports and more sophisticated imports. On the contrary, more sophisticated exporters received projects of higher value, mostly in line with their higher income level.

We investigate further the export sophistication of OBOR countries by means of simple OLS regressions. The inverted-U shape of the relations between export sophistication (expy) and income for OBOR countries highlighted above is confirmed. Other things equal, OBOR countries gain sophistication faster, but also reach a maximum earlier at middle income levels. Focusing on OBOR countries only, those with projects shows a similar, if not stronger, pattern: middle-income countries with projects are more sophisticated, other things equal.

Figure 14 – Sophistication and number and average value of OBOR projects.



Source: authors' elaborations based on Eora and CSIS.

Table 9 – Export sophistication of OBOR countries.

	(1) OBOR=0 Exp. sophistication expy(ln) b/se	(2) OBOR=1 Exp. sophistication expy(ln) b/se	(3) Exp. sophistication expy(ln) b/se
OBOR			-1.587***
			(0.000)
Log GDP per capita	0.045***	0.401***	0.057***
	(0.000)	(0.000)	(0.000)
Log GDP per capita squared	0.001***	-0.019***	0.001***
	(0.000)	(0.000)	(0.000)
OBOR x Log GDP per capita			0.377***
			(0.000)
OBOR x Log GDP per capita squared			-0.022***
			(0.000)
Log Import sophistication	0.377***	0.072***	0.256***
	(0.000)	(0.000)	(0.000)
G&L Intra-Industry Trade	0.385***	0.481***	0.422***
	(0.000)	(0.000)	(0.000)
Constant	5.140***	6.557***	6.256***
	(0.000)	(0.000)	(0.000)
R-squared	0.767	0.730	0.752
N	2886	1586	4472

* p<0.1, ** p<0.05, *** p<0.01

Source: authors' elaborations based on Eora, CSIS and WDI.

Table 10 – Export sophistication of OBOR countries with projects.

	(1) proj=0 Exp. sophistication expy(ln) b/se	(2) proj=1 Exp. sophistication expy(ln) b/se	(3) Exp. sophistication expy(ln) b/se
Projects			-3.078***
			(0.000)
Log GDP per capita	-0.047***	0.557***	-0.102***
	(0.000)	(0.000)	(0.000)
Log GDP per capita squared	0.004***	-0.027***	0.008***
	(0.000)	(0.000)	(0.000)
projxgdppc12			0.659***
			(0.000)
Projects x Log GDP per capita			-0.035***
			(0.000)
Log Import sophistication	0.052***	-0.065***	-0.057***
	(0.000)	(0.000)	(0.000)
G&L Intra-Industry Trade	0.437***	0.490***	0.481***
	(0.000)	(0.000)	(0.000)
Constant	8.884***	7.147***	10.148***
	(0.000)	(0.000)	(0.000)
R-squared	0.590	0.787	0.771
N	390	1196	1586

* p<0.1, ** p<0.05, *** p<0.01

Source: authors' elaborations based on Eora, CSIS and WDI.

6 Econometric analysis of project decisions

Let us now investigate the drivers of projects investments decision. Our aim is to understand to what extent intermediate trade represents an important factor for the involvement into the BRI, and for the selection and distribution of projects. We first start with what determines whether a country is selected to be part of the Belt and Road Initiative, then move to investment project selection and finally investigate investment value. The underlying equation is:

$$y_i = \alpha + \beta_1 Exp_{ji} + \beta_2 Imp_{ji} + \beta_3 Exp_{ji}^{CHN} + \beta_4 Imp_{ji}^{CHN} + \beta_5 RCA_{ji} + \boldsymbol{\beta}_6{}' \boldsymbol{Z}_i + \varepsilon_i$$

where the dependent variable y_i is either: i) a dummy variable indicating whether country i is an OBOR country or not; ii) the number of completed projects; iii) total value of investments in the country (in logarithm). Five key trade variables are central to our analysis. Exp_{ji} is the intermediate export share of sector j over total export of country i. Likewise, Imp_{ji} is the intermediate import share of sector j over total import of country i. Exp_{ji}^{CHN} is the share of China on total intermediate export of country i in sector j. Similarly, Imp_{ji}^{CHN} is the share of China on total intermediate import of country i in sector j. The variable RCA_{ji} denotes the sector-level revealed comparative advantage overlap between country i and China. Finally, the vector $\boldsymbol{Z}_i$ includes a series of country-level control variables such as GDP per capita (in log), trade logistics index, export and import sophistication (in log) as well as measures of intra-industry trade. Finally, ε_i is an idiosyncratic error term clustered at the sector-level.

The cross-sectional nature of the data requires us to exclude contemporaneous correlation between variables. To overcome this, all independent variables including controls are lagged at year 2012. In this way, our econometric design analyses pre-BRI trade relations mechanism that explains selection and distribution of infrastructure projects.

6.1 What characterizes OBOR countries

Table 11 reports estimates of the above regression model in which the dependent variable is the OBOR dummy. The share of intermediate exports and imports are not statistically significant as determinants of being selected into the Belt and Road Initiative. However, the share of intermediate export to China increases the probability of a country being selected into the BRI. Surprisingly, intermediate import from China is not statistically significant to determine selection into BRI. In addition, sector-level overlapping RCA positively determines the probability of selection into BRI. To exclude results being driven by potential multi-correlation, we also estimate the equation separating the trade variables and results are consistent. Similarly, estimated coefficients of our main variables of interest are consistent including further controls as well.

Let us consider the other control variables. Results in column (1) show that countries with higher living standards have lower probability to be selected into the BRI. In column (2) instead of GDP, we include the trade logistics index and in columns three the export sophistication index (both highly correlated with income). Consistently, the estimate show that countries with better logistics have lower probability of participating into the BRI. On the contrary, countries with more sophisticated export bundles are more likely to be involved in the initiative. This is in line with the descriptive evidence in delivering the key message that richer countries, who are more likely to have better logistics, are less likely to be selected into BRI, while export sophistication increases the involvement probability. This is in line with the general objectives of the Belt and Road, which targets poor countries lacking key infrastructure that can facilitates trade.

In the last three columns of Table 11 we add import sophistication and intra-industry trade to the control variables. Results are robust, and we now observe that import sophistication is negatively associated with BRI participation, while a greater degree of intra-industry trade increases it.

Table 11 – Selection in OBOR.

	(1)	(2)	(3)	(4)	(5)	(6)
	OBOR	OBOR	OBOR	OBOR	OBOR	OBOR
Interm. Exp.	-0.176	-0.151	-0.108	-0.201	-0.198	-0.144
	(0.175)	(0.178)	(0.197)	(0.171)	(0.172)	(0.199)
Interm. Imp.	0.0339	0.0449	-0.0862	-0.0364	-0.0381	-0.113
	(0.115)	(0.124)	(0.125)	(0.107)	(0.113)	(0.119)
Interm. $Exp.^{CHN}$	0.697***	0.718***	0.510**	0.720**	0.765***	0.498**
	(0.267)	(0.267)	(0.233)	(0.282)	(0.268)	(0.241)
Interm. $Imp.^{CHN}$	-0.207	-0.0867	-0.121	-0.222	0.0125	-0.0959
	(0.269)	(0.314)	(0.257)	(0.271)	(0.308)	(0.260)
RCA Overlap	0.542***	0.533***	0.502***	0.496***	0.491***	0.509***
	(0.134)	(0.135)	(0.148)	(0.141)	(0.136)	(0.155)
GDP per cap. (ln)	-0.0215***			-0.0379***		
	(0.00666)			(0.00481)		
Logistics Index		-0.244***			-0.331***	
		(0.0269)			(0.0201)	
Exp. soph. (ln)			0.350***			0.275***
			(0.0686)			(0.0514)
Imp. soph. (ln)				-2.065***	-2.980***	-1.253***
				(0.0750)	(0.0672)	(0.0779)
GL-IIT				0.819***	1.147***	0.372***
				(0.0438)	(0.0352)	(0.0370)
Constant	-0.496***	0.0615	-4.004***	19.40***	28.80***	8.724***
	(0.164)	(0.161)	(0.657)	(0.778)	(0.696)	(1.169)
Observations	4,471	3,951	4,861	4,471	3,951	4,861
Pseudo-R2	0.00761	0.0113	0.0101	0.0236	0.0415	0.0155

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: authors' elaborations based on Eora, CSIS and WDI.

6.2 The number of completed projects

We now concentrate on the subset of OBOR countries to answer how do pre-existing trade relations explain the number of completed projects, subject to the fact that a country is participating in initiative. Our dependent variable is the number of completed projects, a count variable. We thus estimate a Poisson model. Results are reported in Table 12. While intermediate trade shares do not affect OBOR participation, they matter for the number of projects received. The share of intermediate export over total export reduces the number of infrastructure projects completed in an OBOR country, while the opposite holds for intermediate import. Countries that import high quantities of intermediate inputs are likely to be more integrated in the network of global value chain production; these countries are likely to receive more infrastructure projects than their peers. But trade relations with China are also relevant both for participation into the initiative and for the number of projects received. Intermediate trade with China is statistically significant and positively correlated with the number of completed projects. This seems to suggest that OBOR countries supplying intermediary inputs to China receive more infrastructure projects than countries supplying intermediate inputs to the rest of the world. Similarly, a higher degree of overlap with China in terms of revealed comparative advantage positively affects the number of completed projects.

Adding per capita GDP and trade logistics index as control variables, the coefficients of both variables indicate that countries with high living standards and good trade logistics infrastructure will have a smaller number of completed infrastructure projects. This enhances our previous assertion that the Belt and Road Initiative targets developing countries with high trade potentials. Export sophistication negatively correlates with the number of completed projects. Note that export sophistication is positively associated with participation into the BRI, but negatively with the number of projects. To reconcile these findings, recall that richer countries are generally more likely to export sophisticated products and could be able to provide for their own infrastructure. Finally, intra-industry trade positively correlates with the number completed projects.

Table 12 – Selection of project recipients.

	(1) Projects number	(2) Projects number	(3) Projects number	(4) Projects number	(5) Projects number	(6) Projects number
Interm. Exp.	-0.479***	-0.284**	-0.291**	-0.402***	-0.282**	-0.336***
	(0.113)	(0.120)	(0.135)	(0.0979)	(0.119)	(0.126)
Interm. Imp.	0.513***	0.306***	0.365***	0.463***	0.285***	0.381***
	(0.0754)	(0.0888)	(0.0938)	(0.0702)	(0.0882)	(0.0974)
Interm. $Exp.^{CHN}$	0.595**	0.963***	0.781***	0.728***	1.005***	0.887***
	(0.244)	(0.254)	(0.268)	(0.230)	(0.249)	(0.251)
Interm. $Imp.^{CHN}$	0.187	0.370*	0.720***	-0.0713	0.431**	0.662***
	(0.187)	(0.207)	(0.219)	(0.156)	(0.216)	(0.205)
RCA Overlap	0.403***	0.261**	0.396***	0.259***	0.229**	0.323***
	(0.0909)	(0.119)	(0.122)	(0.0884)	(0.116)	(0.106)
GDP per cap. (ln)	-0.371***			-0.454***		
	(0.00645)			(0.00590)		
Logistics Index		-0.105***			-0.162***	
		(0.0167)			(0.0148)	
Exp. soph. (ln)			-0.924***			-1.993***
			(0.0441)			(0.0591)
Imp. soph. (ln)				1.418***	-0.177***	0.237***
				(0.0691)	(0.0499)	(0.0549)
GL-IIT				0.737***	0.323***	1.420***
				(0.0331)	(0.0285)	(0.0295)
Constant	4.457***	1.721***	10.04***	-8.888***	3.466***	17.25***
	(0.110)	(0.0890)	(0.411)	(0.664)	(0.511)	(0.659)
Observations	1,586	1,508	1,612	1,586	1,508	1,612

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: authors' elaborations based on Eora, CSIS and WDI.

6.3 The value of completed projects

Lastly, we examine whether trade relations variables explain the value of the completed projects. We estimate our regression equation by means of OLS using the log of the value of infrastructure projects as dependent variable. Table 13 reports the.

The export and import shares of intermediate trade, in line with the previous regressions for the number of projects, display a negative and positive coefficient, both statistically significant at the 1% level. A stronger involvement in GVC as importer of intermediates rather than as exporter is associated with larger investment values.

Intermediate trade with China (either export or import), relevant for the number of projects, also has some impact on the value invested, at least on the import side. The coefficient of intermediate export to China remains consistently positive but non-significant in all the specifications, while the coefficient of intermediate import from China is significant in columns (3) to (6). One potential explanation is that, while two-way intermediate trade with China positively affects the number of projects a country receives, the total value invested follows a different rationale. The change in the sign of income, logistics and export sophistication seems to support this interpretation. OBOR investments seem to follow two different motivations: on average, less developed countries that are more involved in intermediate trade with China, especially as suppliers, receive a relatively larger number of smaller investments, while more developed countries that tend to import intermediates receive fewer but larger investments.

Table 13 – Value of the investment projects.

	(1) Projects val. (ln)	(2) Projects val. (ln)	(3) Projects val. (ln)	(4) Projects val. (ln)	(5) Projects val. (ln)	(6) Projects val. (ln)
Interm. Exp.	-1.260***	-0.705***	-1.039***	-1.242***	-0.826***	-1.114***
	(0.175)	(0.163)	(0.167)	(0.174)	(0.169)	(0.175)
Interm. Imp.	1.166***	0.877***	0.945***	1.122***	0.901***	0.961***
	(0.156)	(0.146)	(0.146)	(0.154)	(0.147)	(0.149)
Interm. $Exp.^{CHN}$	0.363	0.642	0.439	0.453	0.531	0.384
	(0.482)	(0.459)	(0.456)	(0.469)	(0.447)	(0.455)
Interm. $Imp.^{CHN}$	0.687	0.592	0.970**	0.966*	1.128**	1.209**
	(0.540)	(0.413)	(0.460)	(0.487)	(0.412)	(0.473)
RCA Overlap	1.008***	0.600***	0.737***	0.866***	0.592***	0.746***
	(0.174)	(0.174)	(0.168)	(0.183)	(0.186)	(0.173)
GDP per cap. (ln)	0.0772***			0.0226*		
	(0.0130)			(0.0125)		
Logistics Index		1.181***			1.491***	
		(0.0298)			(0.0306)	
Exp. soph. (ln)			1.410***			1.564***
			(0.0721)			(0.0913)
Imp. soph. (ln)				-0.849***	-3.248***	-1.231***
				(0.139)	(0.124)	(0.139)
GL-IIT				1.052***	0.255***	0.103*
				(0.0677)	(0.0418)	(0.0575)
Constant	19.59***	16.96***	7.003***	27.84***	47.51***	17.46***
	(0.205)	(0.142)	(0.668)	(1.332)	(1.172)	(1.310)
Observations	1,196	1,144	1,196	1,196	1,144	1,196
R-squared	0.059	0.139	0.085	0.073	0.165	0.089

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: authors' elaborations based on Eora, CSIS and WDI.

7 Conclusion

China is an important GVC player and the main central node in the Asian intermediate trade network. Within this context, the Belt and Road Initiative provides an opportunity for China to engage other developing countries in GVC trade and benefit from importing intermediate inputs and moving up in the value chain. At the same time the BRI is likely to reinforce the inter-regional connections by increasing the importance of strategic countries that are most likely to have a role as gates towards distant relevant markets such as Western Europe.

Infrastructure investments (new roads, railways, ports and communications, see table A1 in the Appendix) reduce transport costs and facilitate the movement of goods and people. Along the OBOR corridors, firms will be able to better coordinate production and the division of labor across regions. Landlocked economies will benefit from easier access to important routes. For several of them, participating in GVCs can help a transition from being a supplier of natural resources and raw materials to becoming a manufacturer of goods and services. More generally, developing countries involved in the BRI are likely to be strongly affected by Chinese investments as the returns even to relatively small projects are likely to be large. In a network perspective strengthening the weak links is likely to make the entire network more stable. A similar view is in Derudder et al. (2018). This is beneficial to the regional GVC and helps China building a reliable base of suppliers. Based on descriptive, graphical and statistical evidence, we claim that BRI related investments seem to favor large and relatively poor countries, but richer countries get larger investments. Countries receiving projects have a relatively more diversified export structure than their peers and, more importantly for our study, their specialization tends to overlap more with the specialization of China. This is an interesting and novel finding, so far to our knowledge not investigated. It triggered further inquiry on the level of GVCs involvement of the BRI countries. We find that more projects are completed in countries that are more involved in GVC as suppliers of intermediates to China. If one studies the trade networks, it emerges that China is the center of the intermediate trade network of OBOR countries, with some countries better positioned to represent crucial links to other regions.

In summary, our findings highlight that OBOR investments are closely related to trade patterns and GVC considerations. A simple econometric exercise allows us to characterize the BRI countries and to suggest how the pre-existing trade relations and specialization can explain the number and value of infrastructural investments. BRI countries are getting more involved into production networks, since they provide a reliable base of suppliers to China, which in turn may able to upgrade its productions and possibly alleviate its problems of overcapacity.

It is interesting to note that most of the countries where many and larger projects have been completed display a specialization that is relatively similar to that of China. We speculate that projects allocation is likely to reinforce China's comparative advantages and upgrade its productions by building on the specialization of other countries in the same sectors on different phases. Opportunities are there, along the "silk road". Policies in the different countries should be targeted at exploiting them.

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Appendix

A1: Detailed projects information

Table 14 – Completed projects (as at September 2018).

Corridors	Countries	Road	Rail	Dryport	Seaport	Total
New Eurasia Land Bridge Economic Corridor	Armenia	1	0	0	0	1
	Azerbaijan	6	2	0	0	8
	Belarus	4	3	0	0	7
	Georgia	3	1	1	1	6
	Kazakhstan	20	4	2	0	26
	Montenegro	0	1	0	0	1
	Poland	0	0	1	0	1
	Romania	1	1		0	2
	Russia	8	4	2	2	16
	Ukraine	2	0	1	1	4
China-Central Asia-West Asia Economic Corridor	Afghanistan	3	1	0	0	4
	Albania	2	0	0	0	2
	Bulgaria	2	2	0	0	4
	Croatia	3	0	0	5	8
	Iran	1	1	0	2	4
	Kyrgyzstan	21	0	0	0	21
	Mongolia	2	0	0	0	2
	Serbia	1	1	0	0	2
	Tajikistan	16	0	0	0	16
	Turkey	2	7	2	1	12
	Turkmenistan	1	0	0	0	1
	Uzbekistan	2	2	0	0	4
South-East Asia	Brunei	0	0	0	0	0
	Cambodia	21	1	0	0	22
	Indonesia	1	1	1	0	3
	Laos	9	1	1	0	11
	Malaysia	0	1	1	0	2
	Myanmar	1	0	0	1	2
	Philippines	0	0	0	5	5
	Singapore	1	0	0	2	3
	Thailand	2	4	0	0	6
	Timor-Leste	0	0	0	0	0
	Vietnam	13	2	3	3	21
South Asia	Bangladesh	2	1	10	1	14
	Bhutan	1	0	0	0	1
	India	8	0	6	4	18
	Maldives	1	0	0	0	1
	Nepal	0	0	3	0	3
	Pakistan	18	0	0	2	20
	Sri-Lanka	5	0	0	3	8
Middle East and Africa	Bahrain	0	0	0	1	1
	Egypt	0	0	0	0	0
	Iraq	1	0	0	1	2
	Israel	0	0	0	0	0
	Jordan	0	0	0	0	0
	Kuwait	0	0	0	0	0
	Lebanon	0	0	0	0	0
	Oman	0	0	0	0	0

	Palestine	0	0	0	0	0
	Qatar	0	0	0	0	0
	Saudi-Arabia	0	0	0	2	2
	Syria	0	0	0	0	0
	United Arab Emirates	0	0	0	0	0
	Yemen	0	0	0	0	0
Central Europe	Bosnia and Herzegovina	6	0	0	0	6
	Czech-Republic	0	0	0	0	0
	Estonia	0	0	0	3	3
	Hungary	2	0	0	0	2
	Latvia	0	0	0	2	2
	Lithuania	0	0	0	0	0
	Macedonia	0	0	0	0	0
	Moldova	1	0	0	0	1
	Slovakia	1	0	0	0	1
	Slovenia	0	0	0	1	1

Source: Center for Strategic and International Studies.

A2: Detailed regressions

Table 15 – Intermediate export and import shares and OBOR countries.

	(1) Intermediate Export b/se	(2) Intermediate Export b/se	(3) Intermediate Import b/se	(4) Intermediate Import b/se
OBOR	-0.026*	-0.018	-0.008	-0.004
	(0.013)	(0.014)	(0.017)	(0.018)
Log GDP per capita	-0.052***		0.060***	
	(0.004)		(0.005)	
Logistics Index		-0.192***		0.179***
		(0.011)		(0.016)
Constant	1.045***	1.132***	0.038	0.023
	(0.043)	(0.044)	(0.048)	(0.052)
Sector F.E.	Yes	Yes	Yes	Yes
R-squared	0.093	0.098	0.115	0.112
N	4471	3951	4472	3952

* p<0.1, ** p<0.05, *** p<0.01

Table 16 – Intermediate export and import shares and projects recipients.

	(1) Intermediate Export b/se	(2) Intermediate Export b/se	(3) Intermediate Import b/se	(4) Intermediate Import b/se
Projects	0.116***	0.140***	0.162***	0.138***
	(0.026)	(0.025)	(0.031)	(0.030)
Log GDP per capita	-0.024***		0.085***	
	(0.009)		(0.011)	
Logistics Index		-0.227***		0.127***
		(0.027)		(0.035)
Constant	0.625***	1.034***	-0.339***	0.040
	(0.100)	(0.099)	(0.112)	(0.113)
Sector F.E..	Yes	Yes	Yes	Yes
R-squared	0.102	0.105	0.101	0.095
N	1586	1508	1586	1508

* p<0.1, ** p<0.05, *** p<0.01

Table 17 – Intermediate trade with China and OBOR countries.

	(1) Intermediate Export^{CHN} b/se	(2) Intermediate Export^{CHN} b/se	(3) Intermediate Import^{CHN} b/se	(4) Intermediate Import^{CHN} b/se
OBOR	0.091***	0.101***	0.019	0.030
	(0.029)	(0.031)	(0.021)	(0.020)
Log GDP per capita	0.027***		0.040***	
	(0.009)		(0.008)	
Logistics Index		0.118***		0.199***
		(0.030)		(0.023)
Constant	-1.837***	-1.925***	-2.175***	-2.417***
	(0.111)	(0.130)	(0.090)	(0.086)
Sector F.E.	Yes	Yes	Yes	Yes
R-squared	0.033	0.039	0.085	0.094
N	4471	3951	4472	3952

* p<0.1, ** p<0.05, *** p<0.01

Table 18 – Intermediate trade with China and projects recipients.

	(1) Intermediate Export^{CHN} b/se	(2) Intermediate Export^{CHN} b/se	(3) Intermediate Import^{CHN} b/se	(4) Intermediate Import^{CHN} b/se
Projects	0.102*	0.168***	-0.115***	-0.113***
	(0.056)	(0.058)	(0.030)	(0.032)
Log GDP per capita	-0.075***		-0.105***	
	(0.021)		(0.012)	
Logistics Index		-0.096		0.005
		(0.069)		(0.043)
Constant	-0.797***	-1.230***	-0.691***	-1.580***
	(0.229)	(0.244)	(0.138)	(0.146)
Sector F.E.	Yes	Yes	Yes	Yes
R-squared	0.045	0.043	0.090	0.086
N	1586	1508	1586	1508

* p<0.1, ** p<0.05, *** p<0.01

Table 19 – Balassa RCA overlap and OBOR countries.

	(1) nRCA12over~D b/se	(2) nRCA12over~D b/se	(3) nRCA12over~p b/se	(4) nRCA12over~p b/se
OBOR	0.152***	0.141***	0.119***	0.108***
	(0.042)	(0.044)	(0.017)	(0.018)
Log GDP per capita	0.060***		0.076***	
	(0.013)		(0.005)	
Logistics Index		0.198***		0.310***
		(0.038)		(0.017)
Constant	-1.051***	-1.169***	-0.164***	-0.407***
	(0.156)	(0.157)	(0.055)	(0.059)
Sector F.E.	Yes	Yes	Yes	Yes
R-squared	0.175	0.154	0.061	0.066
N	4472	3952	4472	3952

* p<0.1, ** p<0.05, *** p<0.01

Table 20 – Balassa RCA overlap and project recipients.

	(1) nRCA12over~D b/se	(2) nRCA12over~D b/se	(3) nRCA12over~p b/se	(4) nRCA12over~p b/se
Projects	0.053	0.014	0.092***	0.062*
	(0.082)	(0.082)	(0.033)	(0.033)
Log GDP per capita	0.040		0.059***	
	(0.030)		(0.012)	
Logistics Index		0.183**		0.341***
		(0.086)		(0.038)
Constant	-0.975***	-1.129***	-0.023	-0.455***
	(0.331)	(0.308)	(0.122)	(0.121)
Sector F.E.	Yes	Yes	Yes	Yes
R-squared	0.156	0.156	0.060	0.067
N	1586	1508	1586	1508

* p<0.1, ** p<0.05, *** p<0.01

Table 21 – Lafay RCA overlap and OBOR countries.

	(1) RCA12lafay~D b/se	(2) RCA12lafay~D b/se	(3) RCA12lafay~p b/se	(4) RCA12lafay~p b/se
OBOR	-0.021	-0.007	0.090***	0.089***
	(0.042)	(0.044)	(0.022)	(0.023)
Log GDP per capita	-0.015		0.035***	
	(0.013)		(0.007)	
Logistics Index		-0.031		0.177***
		(0.038)		(0.022)
Constant	-0.251	-0.368**	0.726***	0.509***
	(0.153)	(0.155)	(0.093)	(0.096)
Sector F.E.	Yes	Yes	Yes	Yes
R-squared	0.149	0.136	0.058	0.063
N	4472	3952	4472	3952

* p<0.1, ** p<0.05, *** p<0.01

Table 22 – Lafay RCA overlap and project recipients.

	(1) RCA12lafay~D b/se	(2) RCA12lafay~D b/se	(3) RCA12lafay~p b/se	(4) RCA12lafay~p b/se
proj	0.155*	0.085	0.059	0.024
	(0.081)	(0.081)	(0.037)	(0.039)
Log GDP per capita	0.069**		0.046***	
	(0.029)		(0.015)	
Logistics Index		0.238***		0.276***
		(0.085)		(0.044)
Constant	-1.206***	-1.236***	0.707***	0.336**
	(0.327)	(0.304)	(0.176)	(0.166)
Sector F.E.	Yes	Yes	Yes	Yes
R-squared	0.125	0.124	0.065	0.067
N	1586	1508	1586	1508

* p<0.1, ** p<0.05, *** p<0.01

A3: Indexes and measures

Revealed comparative advantage indexes

Balassa RCA

The Balassa RCA index is computed as:

$$BRCA_{ij} = \frac{x_{ij}/X_i}{X_j/X}$$

where x_{ij} is exports of sector j of country i, $X_i = \sum_j x_{ij}$ is total exports of country i, $X_j = \sum_i x_{ij}$ is world exports of sector j and $X = \sum_i \sum_j x_{ij}$ is world exports. The index goes from 0 to infinity, with specialization sectors being those with $RCA_{ij} > 1$. Since the index is asymmetric, its normalized version is commonly used. The normalized Balassa index can be computed as:

$$\widetilde{BRCA}_{ij} = \frac{RCA_{ij} - 1}{RCA_{ij} + 1}$$

The normalized index goes from -1 to +1, being centered at zero. Positive (negative) values denote (de)specialization sectors.

Lafay RCA

The Lafay RCA index is computed as:

$$LRCA_{ij} = \left(\frac{x_{ij} - m_{ij}}{x_{ij} + m_{ij}} - \frac{X_i - M_i}{X_i + M_i}\right)\frac{x_{ij} + m_{ij}}{X_i + M_i}$$

where m and M denote imports. The index may take values in (-∞, +∞), with positive values indicating specialization sectors. By construction the index has the property that $\sum_j LRCA_{ij} = 0$.

RCA overlap

The overlap index (OI_{ij}) between the RCA_{ij} index of sector j of country i and the respective index for China, $RCA_{CHN,j}$, is computed as:

$$OI_{ij} = 1 - \frac{\Delta RCA_{ij}}{max\{\Delta RCA_{ij}|j\}}$$

where $\Delta RCA_{ij} = |RCA_{ij} - RCA_{CHN,j}|$ is the absolute difference between the indexes, $max\{\Delta RCA_{ij}|j\}$ is the cross-country largest sectoral absolute difference (note that the smallest sectoral absolute difference is zero by construction). For the normalized Balassa index, the $\Delta RCA_{ij_{max}} = 2$, since the index goes from -1 to +1. The overlap index goes from zero (no overlap) to one (perfect overlap).

The country-level overlap index can be easily computed, starting from the aggregate absolute difference in RCA with China, as:

$$OI_i = 1 - \frac{\sum_j \Delta RCA_{ij}}{max\{\sum_j \Delta RCA_{ij}\}}$$

Intra-industry trade: GL index

The most used IIT indicator is the Grubel-Lloyd index. For each sector, the index simply considers the degree of overlap between import and export. Its formulation for sector j of country i is the following:

$$GL_{ij} = 1 - \frac{|x_{ij} - m_{ij}|}{x_{ij} + m_{ij}} = \frac{2min\{x_{ij}, m_{ij}\}}{x_{ij} + m_{ij}}$$

The GL_{ij} index takes values from 0 to 1, where 0 means no IIT, i.e. one of the two trade flows is zero, and 1 indicates the maximum degree of IIT or a prefect sectoral import-export overlap.

Export and Import Sophistication indexes

The export sophistication index takes two steps. First, we calculate product sophistication as the average income level of exporting countries with weights equal to their RCA. A product is thus sophisticated if exported by specialized advanced economies. The index is computed as:

$$prody_j = \sum_i \frac{BRCA_{ij}}{\sum_i BRCA_{ij}} y_i = \sum_i \frac{x_{ij}/X_i}{\sum_i (x_{ij}/X_i)} y_i$$

where y_i denotes GDP per capita and $BRCA_{ij}$ is the Balassa RCA index for sector j of country i.

The country level export sophistication is obtained as a weighted average of the sophistication level of its export bundle.

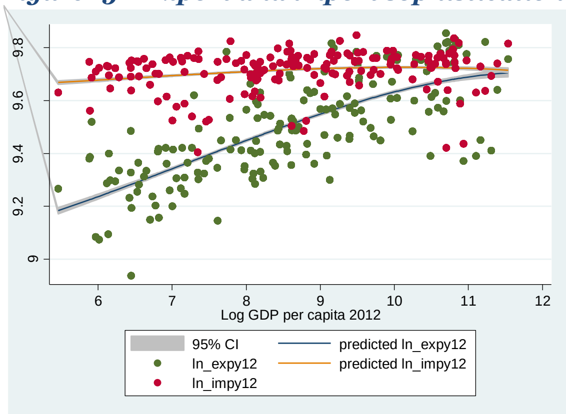
$$expy_i = \sum_j \frac{x_{ij}}{X_i} prody_j$$

Import sophistication is computed similarly as a weighted average of the sophistication level of a country's import bundle.

$$impy_i = \sum_j \frac{m_{ij}}{M_i} prody_j$$

This way of measuring import sophistication has been proposed in Marvasi (2013) and has the advantage of being based on univocal definition of product sophistication. The fact that product sophistication is based on exports is meaningful since exports reflect more closely the production capabilities of countries and, empirically, countries are more diverse in their export bundles than in their import bundles. The implication of measuring import sophistication in this way is that countries with sophisticated imports are those that buy sophisticated products, that is products that tend to be exported by richer countries. This is particularly useful when input-output linkages matter, since import sophistication is likely to capture the fact that a country obtains its inputs from advanced economies, a fact that may represent itself a source of competitive advantage in GVC.

Figure 15 – Export and import sophistication.



Source: authors' elaborations based on Eora and WDI.

A4: Network centrality indicators

Table 23 – Centrality in the OBOR intermediate trade network (manufacturing; trade weighted indicators)

	PageRank	Hubs	Authorities	Outdegree	Indegree	Betweenness
China	0,148	0,112	0,258	18,0	21,3	3025
Singapore	0,080	0,170	0,175	13,0	13,4	427
Russia	0,072	0,114	0,015	11,1	5,5	1900
India	0,066	0,052	0,062	6,0	6,4	1160
Malaysia	0,048	0,177	0,097	10,4	7,1	0
Thailand	0,043	0,074	0,074	4,7	5,6	122
Turkey	0,034	0,007	0,020	1,8	3,0	262
Ukraine	0,030	0,007	0,029	2,7	3,4	61
Czech Republic	0,027	0,010	0,011	3,6	2,6	120
Poland	0,027	0,005	0,016	2,2	2,9	44
Saudi Arabia	0,025	0,014	0,013	1,4	2,0	122
UAE	0,024	0,009	0,016	1,7	2,0	272
Indonesia	0,024	0,117	0,047	7,1	3,2	0
Iran	0,023	0,011	0,009	1,0	1,4	121
Hungary	0,022	0,005	0,013	1,6	2,1	288

Source: authors' elaborations based on Eora.

Table 24 – Correlation of centrality indicators of the OBOR intermediate trade network (manufacturing; trade weighted indicators)

	PageRank	Hubs	Authorities	Outdegree	Indegree	Betweenness
PageRank	1					
Hubs	0,755	1				
Authorities	0,907	0,782	1			
Outdegree	0,945	0,908	0,905	1		
Indegree	0,972	0,780	0,977	0,946	1	
Betweenness	0,872	0,502	0,703	0,779	0,797	1

Source: authors' elaborations based on Eora.

Table 25 – Rank correlation of centrality indicators of the OBOR intermediate trade network (manufacturing; trade weighted indicators)

	PageRank	Hubs	Authorities	Outdegree	Indegree	Betweenness
PageRank	1					
Hubs	0,769	1				
Authorities	0,869	0,852	1			
Outdegree	0,883	0,914	0,848	1		
Indegree	0,964	0,814	0,938	0,896	1	
Betweenness	0,591	0,501	0,471	0,572	0,531	1

Source: authors' elaborations based on Eora.