

Does the Belt and Road Initiative stimulate Chinese Exports?

Evidence from Micro Data

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Abstract

This paper evaluates firms' exporting responses to BRI and considers their heterogeneity in ownership types, product types, regional origin and trade mode. This is done by analyzing firm-product-destination level customs data from 2008 to 2016. Our empirical results show that aggregate export behavior increased significantly after BRI. However, ownership matters when evaluating firms' reactions, with SOEs and foreign firms benefitting, but privately owned domestic firms not. Further, our results on regional heterogeneity suggests that "open through the west", i.e., boosting the development of western regions in China, did not appear to work in the short term. Our findings show clearly the implications of BRI's impact from a firm level perspective.

Keywords: Belt and Road Initiative; firm's export; extensive margin; intensive margin; State-owned firms

JEL Classification: F10, O24

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1 Introduction

The “Belt and Road Initiative” (BRI), also known as “One Belt One Road” is an unprecedented endeavor by the Chinese government to invest massively in roads, railroads and other infrastructure. This new initiative represents the government’s ambition to connect China to overseas markets via establishing trade routes through Asia, Africa and Europe. Ultimately, the official aim is to facilitate trade and investment between China and the countries involved in BRI, fostering economic development in China but also in its partner countries (NDRC, 2015).¹

The official beginnings of the BRI can be traced back to specific dates. In September and October of 2013 respectively, China’s president Xi proposed the “*Silk Road Economic Belt*” in Kazakhstan and the “*21 Century Maritime Silk Road*” in Indonesia. In November 2013, the “Belt and Road Initiative” as umbrella term for these two distinct yet related initiatives, was officially taken up as a national policy, although details were only announced in 2015.² The purpose of this paper is to investigate whether the announcements of the new policy in 2013 has had any effect on China’s exports to countries involved in BRI.

Given this time line, we argue that, from 2013 on, Chinese firms as well as government at different levels were aware of the proposed policy. Thus, firms and governments may be expected to anticipate the initiative and act accordingly.³ By the same token, it is

¹ Chaisse and Matsushita (2018) also discuss the wider strategic implications for China and the world of the BRI initiative.

² In the official document named <Decision of the Central Committee of the Communist Party of China on Some Major Issues Concerning Comprehensively Deepening the Reform>, which shows the reform direction in the next five years.

³ There is evidence that local governments, in particular in Western and Central provinces started to take action from late 2013, to encourage firms to participate in BRI. Take Shanxi Province as an example, the government of

unlikely that the initiative was widely or officially expected before 2013 and hence may represent an unexpected exogenous “shock”. While Xi became president of China's military commission in November 2012, he only assumed the presidential office in March 2013. BRI is a new programme advocated by the government he leads, i.e. this initiative was not mentioned by the government before. Hence, it appears reasonable to assume that BRI could not be expected before 2013.⁴

In order to examine whether BRI has indeed impacted on Chinese exports, we use the announcement date 2013 as an exogenous shock and examine the heterogeneous responses of Chinese exports to destinations involved in BRI (so-called node countries) and those that are not, in a difference-in-difference setting. In contrast to the existing literature, ours is, to the best of our knowledge, the first study on BRI that uses firm level customs data to investigate this issue. This allows us to differentiate effects on the extensive and intensive margin of exports, as well as the role of firm level heterogeneity. After all, it is firms that engage in trade rather than countries, hence, evaluating firms' exporting responses towards BRI, and considering their heterogeneous responses, is crucial for understanding the overall effect of BRI.

More specifically, we use Chinese export information from customs data for the period 2008 – 2016, covering years prior and after the set-up of BRI. The customs data is at

Shanxi province organize the Fifth Eurasian Economic Forum and made joint statement with mayors from Italy, Turkmenistan, Armenia et al. about cooperation under the framework of BRI in September of 2013. They have linked freight line “Chang-An” connecting Xi’an and Zhem in Kazakhstan with China-Euro Express Railway in December of 2013. An experimental aviation area, targeting to become an aviation hub for Silk Road, is permitted by central government of China to set in Xi’an in June of 2014. Several schools on Central Asia are established and encourage exchanging students from Central Asia countries at the beginning of 2014. This information is from the article that the provincial secretary of Shanxi published in China Daily in September of 2014. The link is <http://politics.people.com.cn/n/2014/0909/c1001-25621879.html>.

⁴ We searched the Chinese newspaper database of CNKI, which covers almost all the mainstream and local newspapers, for reports on BRI or “Silk Road Economic Belt” or “Maritime Silk Road” or any similar programme under the name of “Silk Road”. None were found before September 2013.

the firm-product-destination level and this allows us to calculate export flows at different margins to partner countries for different ownership types (state-owned enterprises vs others) and different product types (capital vs other goods; homogenous vs differentiated goods). Since one of the aims of BRI is to boost development of the somewhat backward Western and Central regions in particular, we also distinguish exports by region within China.

Our empirical approach is couched in a difference-in-differences setting where we compare exports to BRI “node countries” before and after the announcement to a control group of other trade partners.⁵ We include time-varying controls as well as firm-product-partner and year fixed effects which control for selection (by China) of countries into the BRI. Note that this selection, certainly at the beginning of the programme, was mainly based on geographic characteristics, important aspects of which are captured by our observables and fixed effects.

Our empirical results show that on average Chinese firms’ export activity is increased by BRI. However, behind this aggregate result we discover important heterogeneities. Firstly, we do observe that firms with different ownership types behave differently. An export-enhancing effect of BRI is seen for SOEs and foreign owned firms, but not for privately owned domestic firms. We find that this works through increasing the volume of exports, while prices are lowered. Furthermore, while BRI was proposed to alleviate

⁵ There are all together 64 node countries, the list of which is shown in Table A1 in the Appendix. The countries that are included as BRI node country are determined by the official document <Vision and proposed actions outlined on jointly building Silk Road Economic Belt and 21st-Century Maritime Silk Road> released by China’s National Development and Reform Commission, Ministry of Foreign Affairs, Ministry of Commerce jointly, which is the same as Institute of Industrial Economics in Chinese Academy of Social Science defined in their publication <“The Belt and Road” National Industrialization Process Report> in 2016. The official link of this document is <http://www.mofcom.gov.cn/article/resume/n/201504/20150400929655.shtml>

regional inequality, we actually find that the already well developed Coastal provinces benefit more than Western or North-Eastern provinces. Overall, our study adds new insights on BRI's economic outcomes from the perspective of firms.

While some work analyzes the implications of BRI for various aspects of trade (viz., China's trade surplus (Chen et al., 2018), overall trade volumes (Li et al., 2019) and node country's export to China (Mao et al., 2019), these studies use aggregate country level data. This makes investigating firm's intensive and extensive export margins, or considerations about firms' heterogeneous responses impossible. We use firm-product-destination level customs data. We are only aware of one other study using firm level data, namely, Du and Zhang (2018) who investigate the implication of BRI for outward direct investment by Chinese firms. They establish that the initiative has substantially boosted Chinese investment into these countries.⁶

Our paper also contributes to a large literature that empirically investigates the causes and consequences of China's overall export performance using disaggregated data (e.g., Manova et al., 2015; Ma et al., 2014; Jarreau and Poncet, 2012; Girma et al., 2009). We particularly look at the effect of BRI on trading activities. By doing so, we also add further insights on Chinese firm's responses to external policy shocks. While accession to the WTO and its implications for firm's trading activities has attracted plenty of attention (Feng et al., 2017; Fan et al., 2019), we consider a more recent policy change. This also connects our paper to the more general literature that studies how policy

⁶ Two other studies look at Chinese outward investment (Kang et al., 2018) and China's inward FDI (Luo et al., 2019) using aggregate data.

shocks such as antidumping (Lu et al., 2013; Chandra and Long, 2013), export promotion programmes (Cadot et al., 2015) or trade agreements (Beverelli et al., 2015; Baier et al., 2018) can affect trading firms. Even though the BRI programme indicates a substantial policy change for China (Luo and Zhi, 2019), few studies have investigated its impact on firm's exports.

The remained of the paper is structured as follows. In Section 2 we discuss briefly why, and in what way, BRI may be expected to affect Chinese exports. Section 3 describes the econometric approach and data employed in our study. Section 4 presents our estimation results and Section 5 concludes.

2 Trade effects of BRI

The reasoning why BRI may be expected to boost exports comes from the details of the implementation of the initiative. These details on the design of the BRI initiative were released by China's National Development and Reform Commission, the Ministry of Foreign Affairs, and the Ministry of Commerce in March 2015.⁷ As the plan shows, unlike traditional regional economic integration agreements, BRI has no written terms on market access, tariff reduction or so forth.

The cooperation mechanism is rather flexible yet entails many aspects that may reduce trade costs or stimulate export activity. It emphasises the facilitation of "connectivity" in five areas through (i) policy coordination, (ii) infrastructure development, (iii) reduction of trade impediments, (iv) financial integration, and (v) exchange of people

⁷ The name of this official document is <Vision and proposed actions outlined on jointly building Silk Road Economic Belt and 21st-Century Maritime Silk Road>

(see also Du and Zhang, 2018; Huang, 2016). While an extensive literature looks at the trade effects of traditional EIAs, such as Yang and Martinez-Zarzoso (2014), Beverelli et al. (2015), Baier et al. (2018) or Baier et al., (2019), the trade effect of this new form of trade-stimulating policy on firms' exporting behavior – which is the focus of our paper - has not been investigated thus far.

As regards the five aspects of connectivity, bilateral coordination of economic and other policies between China and BRI node countries helps to reduce political and policy uncertainty. This, as Handley (2014) and Handley and Limão (2017) show can be expected to impact positively on bilateral trade. The construction of transportation, energy and communication facilities are the main areas of infrastructure development related to BRI. Such infrastructure can reduce trade cost, e.g, costs of transportation or communication and boost trade (e.g., Donaubauer et al., 2018). This effect may only be apparent in the medium to long run, however, due to construction time. Still, in the short run, since the infrastructure construction projects in many cases involve Chinese firms, they may import intermediate goods (equipment, machinery, etc.) from China, thus boosting China's exports also in the short run. Reductions of trade impediments include customs cooperation elimination of trade barriers between China and BRI countries, which have the potential to reduce variable trade costs. In terms of financial integration, the main priorities of the Initiative are the provision of finance, including the Silk Road Fund, Asia Infrastructure Investment Bank as well as Chinese foreign aid (Du and Zhang, 2018). These sources provide not only funding for the BRI node countries but also to Chinese firms, potentially alleviating financial constraints and enabling export

activity of the firms (e.g., Manova, 2013). Finally, the exchange of people leads to the creation or the enlargement of Chinese ethnic networks in BRI countries, which can also foster trade (Rauch and Trindade, 2002). In sum, the flexible cooperation mechanism set in place with BRI has not only the potential to reduce bilateral trade cost but to also stimulate bilateral trade between China and BRI node countries in other ways.

3 Methodology and Data

We model the effect of BRI on China's export performance in a gravity model setting,

$$exp_{ijkt} = \gamma BRI_j \times T_t + \alpha_1 X_{jt} + \mu_{ijk} + \vartheta_t + \varepsilon_{ijkt} \quad (1)$$

where the dependent variable exp is Chinese exports by firm i , product k , in year t to partner country j . The vector X_{jt} includes gravity style control variables, such as total GDP, difference in GDP per capita between China and the partner country, exchange rate, political relations and the existence of trade agreements (see Table A2 in the appendix for a definition of the variables). The equation also controls for firm-product-partner ijk and year t fixed effects. In traditional gravity models, a number of factors, such as distance, geography, political connections and so on, will also be included. However, the firm-product-partner fixed effect in model (1) captures all unobservable time invariant (over the analysis period) characteristics, which includes the above factors that determine trade between China and the partner (e.g., Baier et al., 2014, Rose, 2004), and also selection into the BRI programme.

BRI_j is a time invariant dummy variable equal to one if partner country i is part of the

BRI programme. T is a dummy equal to one once the BRI programme is established (2013) and zero before that. The interaction of these two variables yields the difference-in-differences estimate of the start of BRI on Chinese exports, γ . Identification of the coefficient rests on the assumption that, conditional on the included time varying characteristics and the firm-product-partner and year fixed effects, this is random.

In the estimation of BRI we will look for heterogeneity of γ along ownership type, type of export product, and exporter region. Firstly, we will investigate whether exports by state-owned enterprises (SOEs) are differently affected by the BRI programme than those by private-owned domestic and foreign firms. SOEs play a pivotal role in achieving government goals, in an economic system that can be characterized as a state capitalist model with an authoritarian political regime (Du and Zhang 2018). They may therefore be expected to show their “loyalty” to government as political promotion is a main incentive for SOE managers (Kato and Long, 2011). At the same time, some aspects of the BRI policies may be considered especially preferential for SOEs. Financial support for firms is a crucial component of the policy, and there is general agreement that SOEs in general receive more financial support from banks than non-SOEs (Wei and Wang, 1997; Lu et al., 2005; Firth et al., 2009; Li et al., 2009). Hence, they may also be expected to benefit disproportionately from the financing provided within the BRI programme. In addition, SOEs’ production share is especially high in infrastructure related industries, such as Metallurgical industry and railway transportation equipment⁸, which are industries that may particularly benefit from BRI.

⁸ SOEs account for 25 and 38 percent of production in these sectors (calculations based on data from <Chinese

Hence, notwithstanding the fact that private firms have also become an important part of China's economy, we may expect that exports by SOEs respond more strongly to the government-led BRI programme than exports by private owned firms, be they domestic or foreign owned.

Secondly, BRI may induce exports of capital goods more strongly than other products. Infrastructure-led economic integration has been one of BRI's priority from the very beginning. Such infrastructure includes transportation, energy and communication network⁹, and construction, all of which necessitate machinery and equipment, i. e. capital goods. This suggests that trade costs should be reduced more on these products, or BRI policy could be more favourable for these products to encourage exports. Hence, we classify exporting products into capital and non-capital goods, based on the BEC products category¹⁰. Before classifying, we link HS code to BEC product category¹¹. Furthermore, we also check whether the BRI effect is different for homogenous compared to differentiated goods, using the classification of Rauch (1999).

Thirdly, BRI is also used as an instrument to tackle the imbalances in economic development between the Eastern coastal regions and the more backward Western and Central regions (Du and Zhang, 2018). Hence, we will investigate whether there is indeed a different trade enhancing effect observable across regions.

Our analysis is based on firm level trade data by HS product category and destination

Industry Economy Statistical Yearbook 2013>).

⁹ The covering fields of infrastructure are from <Vision and Proposed Actions Outlined on Jointly Building Silk Road Economic Belt and 21st-Century Maritime Silk Road> released by China's National Development and Reform Commission, Ministry of Foreign Affairs, Ministry of Commerce jointly.

¹⁰ <https://unstats.un.org/unsd/tradekb/Knowledgebase/50089/Classification-by-Broad-Economic-Categories-Rev4>

¹¹ The concordances of HS code to BEC category and HS code to SITC category are from UN TRADE STATISTICS. The link is <https://unstats.un.org/unsd/trade/classifications/correspondence-tables.asp>.

country from China customs. This data is available to us from 2008 to 2016, which covers years before and after the unveiling of Belt and Road Initiative. For each record, trading information including total value, price and amount, as well as firm information including ID number, name, ownership type and location are reported.¹² These data allow us to calculate total exports by firm i of product k to partner country j . Table A2 in the Appendix includes the definition of all variables used in the estimations, along with some summary statistics.

[Insert Table 1 about here]

Table 1 shows aggregate values for total exports, as well as the number of exporters and the average value of exports per firm to countries that do participate in BRI and to those that do not. This shows that there exist obvious differences between exports to BRI countries and non-BRI countries. Total exports from China to non-BRI countries are much larger than to BRI countries, as is the number of exporters and the average exports per firm. In addition, we observe a growth in total exports after 2013 for both BRI countries and non-BRI countries. Compared with 2012, the growth rate of total exports for BRI countries in 2014 is about 45% and is 17% for non-BRI countries. Hence, this is some preliminary evidence of a positive growth rate difference, in line with the idea that BRI stimulated exports more to BRI participants compared to non-participants. However, we now turn to a more formal econometric difference-in-differences analysis

¹² We delete firms with missing values either in their names, ID number or trade type. We only consider direct exporters, i.e. manufacturing firms, in this paper. We treat firms with keywords such as “trading”, “importing and exporting”, “business and trading”, “foreign trade”, “industrial trade”, “business”, “logistic”, “economic cooperation”, “technology cooperation”, in their names as intermediaries and exclude them from regression.

which also allows us to control for other confounders which may play a role.

4. Empirical results

4.1 Baseline results

The baseline estimation of the difference-in-differences model in equation (1) is presented in Table 2. This shows that the start of the BRI programme has had a positive effect on firm-product exports to BRI partner countries compared to non-BRI partners (the control group).¹³ The estimations in Table 3 look at different margins of exports: total quantity and average price for firm-product-partner, as well as the total number of products exported by firm-partner. The results show that the boost in exports stems from increases in the quantity of a given product (column 1) as well as an increase in the total number of products exported by a firm. The average product price appears to have fallen in exports to BRI compared to non-BRI countries.

[Insert Tables 2 and 3 about here]

As pointed out above, this aggregate result may hide differential responses by firms of different ownership types. We investigate this in Table 4, distinguishing exports by SOEs, private domestic and foreign owned firms. The results suggest that there is indeed heterogeneity in response, in that the start of the BRI programme has an overall export-enhancing effect (relative to the control group) for SOEs and foreign owned

¹³ An important assumption for the validity of the difference-in-differences estimation is that of common trends of control and treated group. This implies that pre-BRI establishment, there should not be any significant difference in export performance between the two groups of countries. We tested whether firms already exported more to the node countries before BRI, by considering the interaction terms of BRI dummy with year dummy of 2011, 2012, etc. up to 2015. The results in Table A4 in the appendix show that there is no evidence that firms exported more to the node countries before 2013. There is some evidence that exports to node countries were less than to those of the control group countries. This suggests that, if anything, our estimation results may be downwards biased and hence present a lower limit of the true effect.

firms. Private domestic firms, by contrast, do not experience an overall increase. This is because, while they export more (column 2 and 4) this is done at a lower price (column 3) which leads to an overall constant export value.

[Insert Table 4 about here]

4.2 Regional dimension

Chinese policy makers also claim that one of the aims of the BRI programme is to alleviate regional inequality in industrial development. Given that the Coastal regions are the most developed and export intensive, such a policy bias should imply that other regions should be able to boost their exports relatively more as a result of the start of the BRI programme. We investigate this issue in Table 5, where we split the sample according to the location of the exporter, and then run regressions separately.

The results show that, in terms of overall exports, the Coastal and Central provinces clearly benefit more from BRI. By contrast, we estimate significant negative effects of the start of the BRI programme on export activity for firms located in Western and North-Eastern provinces. Hence, the aim to boost particularly Non-Coastal regions does not seem to be fully met, certainly for the period of analysis in this paper.

[Insert Table 5 about here]

4.3 Product categories

Another extension that may be illuminating to explore is the product category. Since infrastructure development is one of the crucial issues of BRI according to the Chinese

government, we firstly examine whether exports of products that are closely related with infrastructure development, i.e. capital goods, benefit more strongly from the BRI programme.¹⁴ The results, shown in columns (1) and (2) of Table 6, do not provide evidence for such a conjecture, however. Rather, it seems that non-capital goods experienced the strongest export boost through the BRI programme.

Another possible distinction of products is into homogeneous and differentiated products. We do this using the classification of Rauch (1999). Our results show that both types of products experience increases in exports after the introduction of the BRI, but that the effect is more pronounced for homogenous products.

[Insert Table 6 about here]

Another stab at product differences is related to export processing. As early as the mid-1980s China introduced special “processing trade” schemes in an attempt to boost exports. The hallmark of this scheme is that there are tariff-exemptions on imported inputs as long as these are only processed in the country and then re-exported. Domestic sales of these processed goods are, in general, not permitted. Firms that export under such processing schemes behave very differently than “ordinary exporters” (e.g., Dai et al., 2017; Girma and Görg, 2022). Based on our customs data, we can distinguish export processors and ordinary exporters similar to Dai et al. (2017). This yields the results in columns (5) and (6). We can see that both types of export products benefit similarly from the BRI programme.

¹⁴ BEC products category classifies products into three groups, capital goods, intermediates and consumption goods. Capital goods are more related with infrastructure construction compared with other products.

4.4 Country characteristics

In a further extension of the baseline model we allow the BRI effect to differ depending on characteristics of the partner country. In particular, we investigate whether it matters whether a country is resource-rich or not, whether it is well governed, or whether violence is an issue in the country. To do so we interact $BRI_j \times T_t$ with an indicator for a certain country characteristic and add the interaction term to the empirical model (1).¹⁵

Estimations in columns (1) and (2) look at resources and we find that the positive BRI effect found in Table 2 is less for firms exporting to resource rich countries (be it total resources or oil). We also find that exports to countries with good governance are not boosted as much as exports to other countries (columns 3 – 4). And finally, exports to countries with higher violence or terrorism benefit less from BRI (columns 5 to 6).

[Insert Table 7 about here]

5. Conclusions

To understand the effect of BRI fully, it is necessary to investigate firms' behavioral responses towards BRI. After all, it is firms who engage in trade rather than countries.

We use firm-product-destination level customs data from 2008 to 2016, evaluating firms' exporting responses towards BRI and considering their heterogeneous export

¹⁵ We use six measures. First, total resource rent as percentage of GDP, second, oil rent as percentage of GDP, third, an indicator of regulatory quality from World Governance Indicators, fourth an indicator of government effectiveness from WGI (higher rank implies better quality), fifth, the rank of business cost of terrorism and sixth the rank of organized crime in Global Competitiveness Report from World Economic Forum. For the last two indicators, countries with higher rank are under higher threat of terrorism or organized crime.

responses in terms of ownership types, product types, regional origin and trade mode.

Our empirical results show that there is an overall positive export response by Chinese firms to BRI. However, ownership matters when evaluating firms' reactions. We find that SOE firms and foreign firms increase their exporting to BRI countries significantly after the BRI program is announced, while private firms do not appear to benefit.

Further, we look at heterogeneity by product types. The results show that exports of non-capital goods benefit more from BRI than capital goods, while there is no strong difference between homogeneous and differentiated goods. We also investigate the heterogeneous response by region of the exporter to test whether "open through the west" worked out. It turns out that firms located in western or north-eastern provinces actually export less to BRI countries after 2013. While firms located in coastal and central provinces export more to BRI countries.

Our findings show who is positively affected by BRI and who is not, in the short term. First and foremost, it is SOEs and foreign firms. Even though private domestic firms account for a large share of Chinese exports, they did not react positively to BRI. However, for the success of BRI and the wider economic cooperation with BRI countries, it can be seen as crucial that private firms also join in and benefit from the scheme. Hence, a non-discriminating collaborative framework that reduces trade costs for all participants should be offered by BRI, to have prolonged and widely impacts.

Additionally, the aim of boosting development in Western regions, "open through the west", has thus far not appeared to work well. Infrastructure connectivity of China and

its BRI partners through western provinces in China still has a long way to go, as well as the economic development in the west provinces.

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Table 1 Descriptive statistics on exports

	Total exports (in billion dollars)		Number of exporters (in ten thousand)		Average exports per firm (in million dollars)	
	To BRI	To Non-BRI	To BRI	To Non-BRI	To BRI	To Non-BRI
2008	266.34	957.38	2.48	5.73	10.73	16.70
2009	226.09	805.02	2.01	4.68	11.26	17.20
2010	292.10	1051.22	2.33	5.69	12.53	18.47
2011	324.59	1178.58	2.62	6.51	12.39	18.10
2012	391.05	1581.44	3.31	9.16	11.80	17.27
2013	418.55	1563.42	3.46	9.00	12.11	17.37
2014	566.52	1851.63	3.59	8.38	15.79	22.11
2015	421.81	1364.19	2.90	6.70	14.54	20.36
2016	466.00	1284.95	2.63	5.24	17.69	24.50

Table 2**Firms export response on BRI**

	(1)
$BRI_j \times T_t$	0.0103*** (5.99)
$\ln GDP_{jt}$	0.4270*** (89.82)
$d \ln PGDP_{ijt}$	0.0252*** (6.70)
$Exchange_{ijt}$	-0.0760*** (-20.71)
$Poli_rela_{ijt}$	-0.0606*** (-18.88)
FTA_{ijt}	-0.0067* (-1.76)
Firm-product-destination fixed effect	YES
Year fixed effect	YES
Observations	25838037

Note: Here we use firm-product-destination-year level data to check Chinese firm's export response to BRI.

***, **, * indicate statistical significance at 1, 5, 10 percent level, respectively.

Table 3

Different export margins

	(1)	(2)	(3)
	Quantity	Price	Number of products
$BRI_j \times T_t$	0.0399*** (23.00)	-0.0294*** (-36.81)	0.0056*** (6.76)
Other variables	Controlled	Controlled	Controlled
Firm-product-destination fixed effect	YES	YES	--
Firm fixed effect	--	--	YES
Year fixed effect	YES	YES	YES
Observations	25571310	25571301	11169168

Table 4

Exporting response by ownership

Panel A Export response of SOEs				
	(1)	(2)	(3)	(4)
	Export	Quantity	Price	Number of products
$BRI_j \times T_t$	0.0425*** (7.32)	0.0566*** (9.56)	-0.0129*** (-4.25)	-0.0043 (-1.20)
Observations	2197846	2185088	2185088	604985
Panel B Export response of private domestic firms				
	Export	Quantity	Price	Number of products
$BRI_j \times T_t$	-0.0069 (-1.96)	0.0191*** (5.25)	-0.0269*** (-16.27)	0.0072*** (4.20)
Observations	4700131	4680885	4680885	2226640
Panel C Export response of foreign firms				
	Export	Quantity	Price	Number of products
$BRI_j \times T_t$	0.0237*** (6.18)	0.0519*** (13.65)	-0.0270*** (-16.12)	0.0263*** (15.99)
Observations	5566204	5460727	5460727	2262397
Other variables	Controlled	Controlled	Controlled	Controlled
Firm-product-destination fixed effect	YES	YES	YES	--
Firm fixed effect	--	--	--	YES
Year fixed effect	YES	YES	YES	YES

Note: There are missing values of ownership in the custom database, which is the reason that the total observation here are far less than Tables 2 and 3.

Table 5

Exporting response by region

Panel A Export response of coastal provinces				
	(1)	(2)	(3)	(4)
	Export	Quantity	Price	Number of products
$BRI_j \times T_t$	0.0100*** (4.17)	0.0434*** (17.85)	-0.0327*** (-29.71)	0.0087*** (7.63)
Observations	12740808	12740808	12740808	5563681
Panel B Export response of central provinces				
	(5)	(6)	(7)	(8)
	Export	Quantity	Price	Number of products
$BRI_j \times T_t$	0.0256*** (3.92)	0.0276*** (4.18)	-0.0018 (-0.60)	-0.0118*** (-4.01)
Observations	1275401	1275401	1275401	669867
Panel C Export response of west provinces				
	(9)	(10)	(11)	(12)
	Export	Quantity	Price	Number of products
$BRI_j \times T_t$	-0.0336** (-2.32)	-0.0031 (-0.22)	-0.0291*** (-4.25)	0.0173** (2.44)
Observations	353853	353853	353853	160595
Panel C Export response of northeast provinces				
	(13)	(14)	(15)	(16)
	Export	Quantity	Price	Number of products
$BRI_j \times T_t$	-0.0351*** (-2.62)	-0.0341** (-2.53)	-0.0017 (-0.26)	0.0211*** (3.62)
Observations	468797	468797	468797	224977
Other variables	Controlled	Controlled	Controlled	Controlled
Firm-product-destination fixed effect	YES	YES	YES	--
Firm fixed effect	--	--		YES
Year fixed effect	YES	YES	YES	YES

Table 6

Exporting response by goods type

	(1)	(2)	(3)	(4)	(5)	(6)
	Capital goods	Non-capital goods	Homogenous product	Differentiated product	Processing trade	Ordinary trade
$BRI_j \times T_t$	-0.0059 (-1.53)	0.0135*** (7.03)	0.0230*** (5.36)	0.0090*** (4.79)	0.0123*** (2.64)	0.0114*** (5.25)
Other variables	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Firm-product-destination fixed effect	YES	YES	YES	YES	YES	YES
Year fixed effect	YES	YES	YES	YES	YES	YES
Observations	4179783	21658188	3892630	21927598	4328690	17562564

Table 7

The impact of partner country's characteristics on firms' exporting response

The impact of partner country's characteristics on firms' exporting response						
	(1)	(2)	(3)	(4)	(5)	(6)
$BRI_i \times T_t \times Res_{jt}$	-0.0006*** (-3.48)					
$BRI_i \times T_t \times oil_{jt}$		- 0.0007*** (-4.19)				
$BRI_i \times T_t \times regul_{jt}$			- 0.0161*** (-10.22)			
$BRI_i \times T_t \times gov_eff_{jt}$				-0.0131*** (-8.10)		
$BRI_i \times T_t \times terro_{jt}$					- 0.0060*** (-3.18)	
$BRI_i \times T_t \times vio_{jt}$						-0.0107*** (-5.10)
Other variables	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Firm-product-destination fixed effect	YES	YES	YES	YES	YES	YES
Year fixed effect	YES	YES	YES	YES	YES	YES
Observations	25838037	25838037	25838037	25838037	25838037	25838037

Appendix

Table A1

List of BRI node country

Region	Country	total amount
Commonwealth of Independent States	Russia, Ukraine, Belarus, Georgia, Azerbaijan, Armenia, Moldova	7
Central Asia	Mongolia, Kazakhstan, Uzbekistan, Turkmenistan, Kyrgyzstan, Tajikistan	6
South Asia	India, Pakistan, Bangladesh, Sri Lanka, Afghanistan, Nepal, Maldives, Bhutan	8
South-east Asia	Indonesia, Thailand, Malaysia, Vietnam, Singapore, Philippines, Myanmar, Cambodia, Laos, Brunei, Timor-Leste	11
West Asia and North Africa	Saudi Arabia, The United Arab Emirates, Oman, Iran, Turkey, Israel, Egypt, Kuwait, Iraq, Qatar, Jordan, Lebanon, Bahrain, Yemen, Syria, Palestine	16
Central East Europe	Poland, Romania, Czech Republic, Slovakia, Bulgaria, Hungary, Latvia, Lithuania, Slovenia, Estonia, Croatia, Albania, Serbia, Macedonia, Bosnia, Montenegro	16

Notes: The country-group division is according to the publication <"The Belt and Road" National Industrialization Process Report> of Institute of Industrial Economics in Chinese Academy of Social Science. However, we exclude some countries from our regression for data missing problem, including Syria, Palestine, Serbia, Macedonia, Montenegro.

Table A2**Variable definitions and summary statistics**

Variables	Meaning	Obs	Mean	Min	Max
$lnexp_{ijkt}$	The log of China's export by product.	51057410	9.11	0	24.02
$lnGDP_{jt}$	The log of partner countries GDP.	51058689	13.20	3.30	16.75
$dlnPGDP_{ijt}$	The difference of the log of China's and its partner country's GDP per capita	51058689	1.29	0.00	3.37
$Exchange_{ijt}$	Exchange rate of partner country / exchange rate of China. Use price level ratio of PPP conversion factor (GDP) to market exchange rate	51058689	1.32	0.33	3.43
$Poli_rela_{ijt}$	The political relation between China and partner country. See Appendix A3 for calculation.	50562520	0.31	-0.86	0.89
FTA_{ijt}	Dummy variable of signing FTA with China.	50362487	0.22	0	1
Res_{it}	Total resource rent to GDP (%)	50544422	3.53	0.00	63.28
oil_{it}	Oil rent to GDP (%)	50544422	0.50	0.00	41.13
$regul_{it}$	Regulatory Quality, index from WGI database of World Bank	51058689	0.57	-2.65	2.26
gov_eff_{it}	Government Effectiveness, index from WGI database of World Bank	51058689	0.64	-2.45	2.44
$violence_{it}$	Business costs of crime and violence, 1-7 (best), index from Global Competitive Index	40846077	4.75	1.63	6.80
$terro_{it}$	Business costs of terrorism, 1-7 (best), index from Global Competitive Index	40846077	5.17	2.32	6.80

Note: Panel data in country-product-firm-year level.

A3 Calculation of bilateral political relation

Following Knill and Mauck (2012), our proxy for political relations is based on United Nations voting records. The motivation for this proxy is that nations with more (less) closely related votes in the UN General Assembly are likely to have stronger (weaker) political relations. We quantify the degree to which countries' votes are similar using Gartzke's "S" measure (Gartzke, 1998), where "S" is the proxy for bilateral political relations (PR). Specifically, we calculate the proxy using the equation:

$$pol_rela_{ij} = 1 - [2 * d/dmax] \quad (A1)$$

where pol_rela_{ij} is the bilateral political relations, d is the sum of the distance between votes for a given bilateral pair and year, and $dmax$ is the maximum possible distance between votes for a given bilateral pair and year. The distance between votes is calculated by first classifying "Yes" votes equal to one and "No" votes equal to zero. For each vote, the distance is calculated as the absolute value of the difference in votes. Thus, if both nations vote the same (opposite) way, the distance is zero (one) for that vote. This distance measure is then cumulated over the year for each bilateral pair. Thus, pol_rela_{ij} ranges from -1 (all votes are different) to $+1$ (all votes are the same), which represents weak and strong political relations, respectively. Data source is <https://dataverse.harvard.edu/dataverse/Voeten>.

Table A4**Pre-trend test**

	(1)	(2)
$BRI_i \times Y2011$	0.0015 (0.71)	0.0021 (1.01)
$BRI_i \times Y2012$	-0.0233*** (-11.29)	-- --
$BRI_i \times Y2013$	-- --	-0.0336*** (-16.33)
$BRI_i \times Y2014$	0.0060*** (3.05)	-0.0013 (-0.65)
$BRI_i \times Y2015$	0.0139*** (6.66)	0.0082*** (3.82)
Other variables	Controlled	Controlled
Country-product-firm fixed effect	YES	YES
Year fixed effect	YES	YES
Observations	25838037	25838037

Note: we interact BRI dummy with year dummies, whose coefficient shows the gap of China's export to BRI countries and non-BRI countries at specific year. Result (1), (2) are what we got when treating year 2013 and 2012 as base year.