ICIC Express Letters
Part B: Applications
Volume **12**, Number **11**, November **2021**

 ISSN 2185-2766
pp. **1059–1065**

STRATEGIC ASSESSMENT OF "BELT AND ROAD" ON THE DEVELOPMENT OF CHINA'S COASTAL CITIES AND PORTS

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Received March 2021; accepted May 2021

Abstract. *This paper evaluates the "Belt and Road" strategy for China's coastal cities, ports, and port city development. It is intended to find out the shortcomings and constraints of the development of ports and port cities in China's strategic node areas. We construct a DID model including the "Belt and Road" strategy, local urbanization level, port contribution and port-hinterland synergy, which will estimate the impact of the "Belt and Road" on other variables in the model, and analyze the interaction mechanism between related variables. The results show that after the implementation of the "Belt and Road", the port contribution and port-hinterland synergy of China's coastal node areas have not significantly improved, and some areas have even declined; port development in strategic coastal areas lags behind economic development, which is not conducive to the node areas. Compared with non-strategic key planning areas, the promotion of economic development, industrial layout and urbanization in key coastal areas is not obvious. That is to say, there is a developmental dislocation between the urbanization development, industrial layout, development of the port city and port development in the coastal key areas. This dislocation weakens the policy and resource allocation advantages that the "Belt and Road" theoretically bring to the node cities. The coastal node areas should seize the opportunity, and the development layout should be forward-looking, systematic and sustainable. The coastal node areas should seize the opportunity. The development layout of cities in this region should be forward-looking, systematic and sustainable. Port upgrades, urban industrial layout and spatial planning should be combined to promote the simultaneous transformation and development of ports and cities.*
Keywords: Belt and Road, Policy assessment, Port development

1. **Introduction.** The "Belt and Road" strategy accelerates economic exchanges between regions along the route, improves the circulation of factors and the efficiency of resource allocation, so that resources are gradually concentrated in core cities and surrounding areas along the route, and promotes the construction of new urbanization in the coastal hinterland, and new urbanization drives infrastructure investment and improvement. The level of consumption, the realization of economies of scale and the accumulation of human resources through industrial agglomeration, provide conditions for the port to transform and upgrade to internationalization, informatization and knowledge. In turn, ports and port cities are also strategic nodes for the "Belt and Road" strategy to achieve interconnection and global resource allocation. The transformation and upgrading of ports can further exert their international shipping functions, support the two-way opening of the hinterland, coastal and inland areas, and accelerate industrial transformation and upgrading. In turn, we will optimize the urbanization pattern of the hinterland and promote the in-depth implementation of the "Belt and Road" strategy. In recent years, most of our country's coastal container terminals have not yet reached saturation and

DOI: 10.24507/icicelb.12.11.1059

have gradually shifted from a traditional business model to a modern information business model. The urbanization development of coastal node areas is transforming to a new type of urbanization, and the industrial layout of coastal node areas has been adjusted and upgraded.

The existing research on the "Belt and Road" strategy is mostly in China, and even in other languages, it is mostly Chinese. There are currently three main ideas: one is to study the geopolitics and strategic development issues of the "Belt and Road" strategy, such as Feng and Lin [1], and Li and Li [2]; the second is the research on the "Belt and Road" strategy and the trade pattern and strategic cooperation of countries along the route, such as Liu and Lu [3], and Huang et al. [4]; the third is the impact of the "Belt and Road" strategy on the infrastructure, urban construction, people's livelihood and economic growth of the countries and regions along the route, such as Li and Yan [5], and Lu et al. [6]. Foreign research on the "Belt and Road" strategy is mostly introduction and explanatory, mainly to introduce the significance and specific measures of China's "Belt and Road" strategy, such as Huang [7], and Chen [8]. It can be found that due to the strategic position and positioning of the "Belt and Road", the current research on the "Belt and Road" is mostly based on theory and macro-level research, focusing on international issues and macro-development strategic issues. However, there are few quantitative studies on the specific impact of the "Belt and Road" strategy on the areas along the route, especially on the specific mechanism of the domestic port cities along the route. At the same time, most studies only take the "Belt and Road" strategy as the economic and era background as a reference for the scope of variable selection, without introducing it into theoretical models or quantitative models. This background is even ignored in the research on the development of ports and cities along the route. Therefore, this article intends to evaluate the "Belt and Road" strategy for the development of coastal node cities, ports, and port cities, and on this basis, find out the shortcomings and limiting factors in the development of ports and port cities in the strategic node areas.

2. **Empirical Test.**

This paper applies the DID (Differences-in-Differences) method combined with panel data to test whether the "Belt and Road" strategy has a significant impact on the level of urbanization, port contribution, and port-city synergy in the strategically planned coastal node areas. At the same time, analyze the relationship between the variables. The DID method is currently widely used in policy evaluation, and its basic principle is to measure whether there are significant differences in policy targets before and after policy intervention. Compared with other methods, the Differences-in-Differences method combined with panel data can better control the difference before and after policy intervention and the influence of external factors.

2.1. **Data selection.**

The empirical part of this article is the annual panel data of 12 provinces (municipalities directly under the Central Government) from 2000 to 2016[1]. The data source is the China Economic Net statistical database and CNKI statistical database.

2.2. **Model setting.**

The Anyport theory, a universal model for ports, believes that there is a strong interaction between port development and urban expansion, industrial layout and regional development. This article focuses on the macro-level consideration of the development level of urbanization of coastal provinces, industrial structure, local economic development, and the contribution of ports to the hinterland in the coastal provinces under

[1]By consulting the relevant policies and documents of the "Belt and Road", at present, only Hebei, Shanxi, Jiangsu and Guizhou remain in the "three non-stick" areas that are not node regions, excluding node cities, or not along the planned corridor. At the same time, the port-related variables of inland provinces in the empirical model are referred to by their water transportation-related variables. Other provinces are node provinces along the "Belt and Road".

the background of the "Belt and Road". Therefore, the empirical part of this article uses the urbanization rate to indicate the level of urbanization development; the added value of the secondary and tertiary industries indicates the degree of industrial distribution; the local output level indicates the local economic development; the port location quotient and the radiation intensity coefficient indicate the port to the hinterland; the degree of synergy between port and city indicates the level of coordinated development of port and city. Based on the above analysis, combined with urban economics and Anyport-type model ideas, this paper constructs the following panel data model:

$$\ln CR_{it} = \beta_0 + \delta_1 D_i + \beta_1 \ln TY_{it} + \beta_2 \ln GDP_{it} + \beta_3 \ln S_{it} + \beta_4 \ln RI_{it} \times D_i + \beta_5 Q_{it} + \varepsilon_{it} \quad (1)$$

$$\ln RI_{it} = \beta_0 + \delta_1 D_i + \beta_1 \ln TY_{it} + \beta_2 \ln GDP_{it} + \beta_3 \ln CR_{it} \times D_i + \varepsilon_{it} \quad (2)$$

$$\ln S_{it} = \beta_0 + \beta_1 \ln RI_{it} + \beta_2 \ln CR_{it} \times D_i + \beta_3 \ln GDP_{it} + \beta_4 \ln TY_{it} + \varepsilon_{it} \quad (3)$$

In order to unify the dimensions and standardize the scale of variables, the panel data model data in this paper are all logarithmic series. In Formulas (1), (2), and (3), CR_{it} is the urbanization rate, TY_{it} is the sum of the added value of the second and third industries, and Q_{it} is the location quotient. GDP_{it} is the gross regional product, RI_{it} is the radiation intensity of the port, and S_{it} is the degree of synergy. When the sample area belongs to or includes node areas and cities after the "Belt and Road" strategy was proposed in 2014, or is directly planned as a maritime strategic fulcrum and a key area along the New Eurasian Continental Bridge Economic Corridor, the value will be assigned 1; otherwise it will be 0. In model (1), δ_1 and β_4 are the coefficients that this article focuses on, and δ_1 captures the impact of the "Belt and Road" strategy on the level of urbanization in the hinterland of coastal node areas. β_4 interactively explained the influence of port radiation intensity on urbanization construction under the "Belt and Road" strategy. The purpose of model (2) is to explore the influence of regional economic development, industrial layout, "Belt and Road" strategy, and the level of hinterland urbanization on the intensity of port radiation. Among them, δ_1 and β_3 need to be focused on, δ_1 reflects the impact of the "Belt and Road" strategy on the radiation intensity of ports in the coastal node areas of the strategic plan, and β_3 reflects the interactive influence of the "Belt and Road" strategy and urbanization on the radiation intensity of the port. In model (3), β_2 illustrates the interactive influence of the "Belt and Road" strategy and urbanization on the synergy between the port and the city. Model (3) measures the influence of regional economic development, industrial layout, urbanization construction, and the contribution of ports to the hinterland economy on the synergy of port and city. Because this model focuses on the influence of the economic conditions of the hinterland and the contribution of the port to the hinterland on the degree of coordination between the port and city, the macro-level influence of the "Belt and Road" strategy has been included in the explanatory variables, so this model does not set additive dummy variables characterization of "Belt and Road".

2.3. **Model setting and data verification.** According to the model from setting test, the three models should adopt the cross-section individual variable intercept model. According to the Hausman test models (1) and (3), the fixed-influence variable-intercept model is adopted, and the model (2) is the random-influence variable-intercept model[2]. In order to avoid spurious regression, it is necessary to perform unit root test on the variables included in the model before performing regression estimation. The data used in this article have different unit root processes in each cross-section sequence, so this article uses the Fisher-ADF test result to determine the unit root test. The test results are shown in Table 1.

[2]Due to limited space, the specific inspection process is not shown here.

TABLE 1. Test results of stationarity of model variables

Variables	Level value (constant and time trend) Fisher-ADF	Level value (constant term) Fisher-ADF	First difference Fisher-ADF
$\ln CR_{it}$	47.19*** (0.0014)		
$\ln GDP_{it}$	4.69 (1.0000)	36.19** (0.0291)	
$\ln TY_{it}$	16.42 (0.7933)	13.12 (0.9925)	74.41*** (0.0000)
$\ln S_{it}$	48.65*** (0.0009)		
$\ln Q_{it}$	23.08 (0.3975)	16.98 (0.7643)	64.72*** (0.0000)
$\ln RI_{it}$	12.34 (0.9499)	34.78** (0.0414)	
$\Delta \ln Q_{it}$	66.54*** (0.0000)		
$\Delta \ln TY_{it}$	10.78*** (0.0046)		

Note: The numbers in brackets are P values; "*", "**", and "***" represent the rejection of the null hypothesis at the significance level of 10%, 5%, and 1%, respectively.

Fisher-ADF test results show that the model needed to actually introduce is the logarithmic difference sequence of the added value of the secondary and tertiary industries TY_{it} and the location quotient Q_{it}, and all other variables are logarithmic.

2.4. **Analysis of empirical results.** In model (1), there is a synchrony correlation between $\ln RI_{it}$, $\ln S_{it}$, and $\Delta \ln Q_{it}$; In model (3), there is a synchrony correlation between $\ln RI_{it}$ and $\ln S_{it}$. And the data in the model has heteroscedasticity, so model (1) and model (3) are estimated by cross-section SUR method. The model estimation results are shown in Table 2.

The model (1) and model (3) in Table 2 are the impact of the "Belt and Road" strategy on the urbanization level and port radiation intensity in the hinterland of coastal node areas, as well as the interactive impact of the corresponding key influencing variables. Model (2) is the comprehensive impact of local economy, port variables, and the interaction between the "Belt and Road" and urbanization rate on the synergy of port and city.

The estimation result of model (1) is in line with the viewpoints of the "Belt and Road" strategy in promoting urbanization development. The significant positive coefficient δ_1 before D_i indicates that the urbanization level of the coastal node areas under the strategic key plan of the "Belt and Road" has been significantly improved compared with other non-strategic areas along the route. The significant negative coefficient β_4 of the interaction term in model (1) indicates that the port radiation intensity index in the coastal node area under the background of the "Belt and Road" has not played a positive role in promoting the urbanization of the hinterland compared with other non-strategic planned areas along the route, but has dragged it down the urbanization development in the hinterland.

Combining the above results and the significantly positive values of δ_1, β_1, β_2 and β_5. It can be found that the port construction and development of coastal node areas lag behind the comprehensive development of the region. Compared with other economic sectors, the level of port development has dragged down the urbanization of its hinterland.

Table 2. Panel analysis results of the empirical model

Variables	Model (1)	Model (2)	Model (3)
$\ln CR_{it}$			
$\ln GDP_{it}$	0.22***	0.12***	0.26***
	(83.85)	(6.09)	(4.84)
D_i	0.17**	−0.14***	
	(2.55)	(−3.39)	
$\ln RI_{it} \times D_i$	−0.06***		
	(−4.93)		
$\ln CR_{it} \times D_i$		−0.39*	−0.15*
		(−1.74)	(−1.78)
$\Delta \ln TY_{it}$	0.13***	0.08*	−0.49***
	(4.97)	(2.53)	(−4.67)
$\ln S_{it}$	−0.01**		
	(−7.78)		
$\Delta \ln Q_{it}$	0.10***		
	(9.79)		
$\ln RI_{it}$			0.06*
			(1.87)
Constant	−1.09***	3.86***	−2.79***
	(−110.79)	(37.72)	(−9.65)
R-square	0.99	0.21	0.56
F value	1222.27	8.84	14.73
Number of regions	12	12	12
Models	FE	RE	FE
Observations	187	170	187

Note: The numbers in brackets are T values; "*", "**", and "***" represent the rejection of the null hypothesis at the significance level of 10%, 5%, and 1%, respectively.

Significantly negative, from the perspective of port-city coordination, further proves that there is a misalignment between the port development in the coastal node areas of the "Belt and Road" and the economic development of the hinterland, indicating that ports should accelerate their development to adapt to the urban development speed of the hinterland under the "Belt and Road" strategy.

The coefficient δ_1 in front of D_i is significantly negative in model (2), indicating that the port construction and development in the node area lags behind other non-strategic planning areas along the route which verifies the conclusion of model (1). β_1 and β_2 are significantly positive, indicating that the industrial structure and economic development level of the hinterland have a significant role in promoting the intensity of port radiation. β_3 significantly negative indicates that the urbanization of the coastal node areas planned by the "Belt and Road" strategy does not promote the radiation intensity of the port as much as the non-strategic planned areas along the route. The conclusion of model (2) comprehensively shows that the economic development, industrial layout and urbanization construction of the hinterland of the coastal node areas of the strategic key planning of the "Belt and Road" or the non-strategic areas along the planned route play a role in promoting the development of the port. However, there are obvious shortcomings in the planning of port construction in coastal node areas.

The coefficient β_1 in model (3) is significantly positive, indicating that the increase in port radiation intensity is beneficial to increase the degree of coordination between ports and cities, which verifies the basic view in port economics that port development is

beneficial to enhancing the integration of ports and cities. Parameter β_2 is significantly negative, indicating that the urbanization in the coastal node areas under the "Belt and Road" strategic plan has a lower contribution to the coordinated development of Hong Kong and the city than in the non-strategic areas along the route, which further verifies the previous conclusions. Parameter β_3 is significantly positive, indicating that the improvement of hinterland economic development is conducive to enhancing the synergy of port and city. Combined with the conclusion that β_1 is significantly positive, it shows that hinterland economic development and the development of the port itself have a positive effect on the coordinated development of port and city. β_4 is significantly negative, indicating that the current industrial structure of the hinterland of the sample area is not conducive to improving the synergy between the port and city, indicating that the industrial structure of the sample area is relatively backward and the level of industrialization is low. It shows that the current industrial structure of the sample areas does not meet the requirements for enhancing the coordinated development of the port and city. The coastal node areas of the "Belt and Road" strategic plan need to seize strategic development opportunities to upgrade the industrial structure.

3. **Conclusions.** The conclusion of the empirical model of this paper finds that the urbanization level of coastal node areas in the strategic key planning of the "Belt and Road" has been significantly improved compared with other non-strategic areas along the route. However, the port radiation intensity and port-city synergy indicators in the coastal node areas did not play a positive role in promoting the urbanization of the hinterland. Instead, it lags behind other non-strategic planned areas along the route. This shows that there is a misalignment between the port development and the economic development of the hinterland in the coastal node areas of the "Belt and Road" strategy, which is not conducive to the urbanization of the port hinterland. This article believes that the "Belt and Road" strategy has a driving effect on the hinterland economic development, industrial layout, urbanization and port construction in the key planned coastal node areas. However, the effect of this promotion is not as good as that of non-strategic key planning coastal node areas which are not being promoted. This question is worth pondering. The explanation given by the empirical model in this article is that the strategic key planning of coastal node areas is that the urbanization development, industrial layout, port city development and port development are not sufficiently coordinated with each other, and there is a certain dislocation in it. This dislocation weakens the policy and resource allocation advantages that the "Belt and Road" strategy should theoretically bring to node cities.

This article believes that coastal node regions and cities should seize the opportunity, comply with the "Belt and Road" initiative to promote the export of advantageous resources and capital, accelerate the pace of our country's ports going global and participate in the construction and operation of key global ports, and overcome the lack of soft power, weak sustainability, and insufficient connections between coastal and internal land, weak port-city interaction, and single port operation mode are accelerating the speed of transformation and upgrading to knowledge-based and information-based ports. The specific measures are promoting the process of new urbanization, building a multi-node port coastal city cluster, optimizing the urban spatial structure, and the port will further exert its outward function to support the opening of the node area and drive the simultaneous transformation and development of the port and city.

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