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Does the Belt and Road Initiative Promote Sustainable Development? Evidence from Countries along the Belt and Road

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Abstract: The "Belt and Road (B&R) Initiative" is an innovative idea proposed by China aimed at promoting common prosperity in the world. Although it has gained more and more recognition and response, there is also some one-sided understanding or distortion. Taking the 60 countries along the Belt and Road from 2010 to 2015 as samples, this paper mainly answers three questions from the perspective of sustainable development: (1) What is the current status of sustainable development in all countries along the "B&R"? (2) Is the "B&R Initiative" conducive to promoting the sustainable development of all countries along the "B&R"? (3) How could the "B&R" be better promoted? The study found that, first, various countries along the "B&R" have manifested an imbalanced characteristic in terms of the sustainable development, and there is much room for improvement in general. Second, the "B&R Initiative" has a positive impact on the sustainable development of all countries. However, due to the relatively short period of time, this impact is not significant at present. Third, to promote "B&R" construction, we must take sustainable development as the fundamental goal to jointly promote the connectivity of facilities, integrate the UN 2030 sustainable development goals, and strengthen the cross-border cooperation between non-governmental and non-profit organizations.

Keywords: sustainable development; "Belt and Road Initiative"; innovation; difference-in-differences

1. Introduction

Since the United Nations World Commission on Environment and Development (WCED) formally proposed the concept of sustainable development in its 1987 Report, "Our Common Future", the concept has drawn great attention and universal consensus of all countries in the world, and its promotion has become an important agenda of their common concern. At present, from a global perspective, the status quo of sustainable development in various countries and the effectiveness of policy implementation show significant differences. The "Belt and Road (B&R) Initiative" proposed by China in 2013 may become a new option and a new program to promote the sustainable development of all countries. Since the "B&R Initiative" aims at providing more public goods to the international community through policy communication, facilities connectivity, trade flow, financing, and non-governmental exchange; and through sharing the development opportunities in China with other countries along the "B&R" and achieving common prosperity, it is essentially promoting the sustainable development of all countries. Although this Initiative has been endorsed and participated in by more and more countries and international organizations in the world, such as the 2016 UN General Assembly, who has for the first time adopted the "B&R Initiative" in its resolution,

which has been unanimously endorsed by its 193 member states, there are still different voices in the world. This requires a more profound study to correctly understand the meaning and impact of the "B&R Initiative".

According to the existing literature, at present, the discussions on the "B&R Initiative" mainly focus on three aspects: (1) What is the "B&R Initiative"? There are mainly two kinds of views on the purpose of China's "B&R Initiative". One is that from a purely economic cooperation perspective, the Initiative is mainly aimed at promoting the internationalization of the RMB(Renminbi) and Chinese enterprises' "Go-global" to acquire global resources to cope with the U.S. economic policies of the Asia Pacific Rebalancing strategy, and even solely for the purpose of resolving the increasingly excess capacity in China; the other is that behind this Initiative actually hides China's attempt to break the hegemony position of the United States, enhance its international influence and then seek global leadership as a political purpose [1,2]. In fact, we should not over-interpret the above views, which are too one-sided. The proposal of "B&R" is only intended to help China out of the "middle-income trap" and at the same time promote economic growth via reciprocity and win-win cooperation in Asia, Europe, Africa, and the related areas (mainly underdeveloped areas) [3,4]. Although infrastructure is the focus of cooperation, it also includes policy dialogue, free trade, financial support, personnel exchanges, etc.

(2) What is the impact of the "B&R Initiative"? The current discussions are mainly based on two aspects: First, an analysis of the combined effects on the countries involved [5,6]. Some scholars deem that the "B&R Initiative" is conducive to promoting the improvement and long-term growth of China's economic structure, reducing the uncertainty of regional economic development and international relations, and thus its advantages outweigh its disadvantages [7–9]; however, some scholars believe that the Initiative threatens the international influence and practical interests of China in the region and therefore does more harm than good [10]. Second, an analysis of the impact on socio-economic and other professional fields. Zhang, for instance, believes that the "B&R Initiative" by strengthening awareness of constructing human destiny common community, providing sustainable global public goods and raising global governance standards, combining bottom-up and top-down approaches to encourage spontaneous behaviors in global governance, and integrating China's experience into common development, are conducive to upgrading and restructuring global governance on the basis of the four mechanisms [11]. Herrero and Xu found that the "B&R Initiative" has improved cross-border infrastructure, reduced trade costs, and promoted free trade. Meanwhile, this trade creation effect has significant differences in different regions, wherein the European Union (EU) member states have benefited less than Asian countries [12].

(3) Analysis of the future prospects and expectations of the "B&R Initiative". Although some scholars are not optimistic about the future development prospects of the "B&R Initiative", more scholars hold that they should be cautiously optimistic [13,14]. This Initiative has the potential to promote the growth of underdeveloped regions as a new dynamic economic pillar and facilitate policy communication to achieve successful cooperation among emerging market economies [15]. However, the construction of the "B&R" also faces high risks and barriers [16–19], such as the lack of an intermediary coordination mechanism, potential conflicts that may arise between different political systems and concepts, and the financial viability of multinational projects. Therefore, it requires China to carefully plan its own national blueprint, rationally invest and manage projects based on market economy, and take a cautious military and strategic engagement to avoid the urgent challenge of a world order headed by the United States.

To sum up, the existing research has conducted a more comprehensive and profound discussion on the "B&R Initiative", but there is still much room for development. From an internal logic point of view, the analyses of motivation, risk control, and promotion strategies all need to be based on impact assessment. However, the current literature on the impact of the "B&R Initiative" is mostly focused on a specific area, especially in the economic field, while few studies have been made to evaluate the impact of the "B&R Initiative" from a sustainable development perspective. This paper attempts to demonstrate whether participation in the "B&R" project has promoted the improvement

of the national sustainable development level, and put forward corresponding policy suggestions to this end. The remaining parts of this paper are structured as follows: the second part considers theories involving the theoretical frame of sustainable development, the relationship between the "B&R Initiative" and sustainable development and the driving force mechanism. The third part is to evaluate the level of sustainable development of "B&R" countries by constructing the index system. The fourth part takes the DID-based (difference-in-differences) method for empirical verification of the impact of the "B&R Initiative" on the national sustainable development and innovation mechanism. The fifth part furnishes the policy suggestions of advancing the "B&R".

2. Theories

2.1. Sustainable Development Theory

Sustainable development refers to the development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Specifically speaking, at the level of requirements, to meet the needs of the present means that sustainable development must first of all demonstrate the quality of development; while not compromising the ability of future generations to meet their own needs denotes the maintaining or enhancing of the development momentum. At the level of objectives, the harmony between human beings and nature also proposed the essentials for equity in addition to emphasizing the quality and driving force of development. Although equity also belongs to one aspect of development quality in a broad sense, in order to reflect its uniqueness and importance, people usually summarize the connotation of sustainable development as three elements: quality, driving force, and equity. Among them, the quality element mainly reflects the matching and optimization degree of development status, efficiency, happiness, etc., with ecological environment capacity and carrying capacity. The driving force element reflects the potentiality of sustainable development of countries or regions, which are mostly composed of some endowments indexes, such as natural capital, human capital, etc.; while equity element mainly expresses the elimination of the disparities between rich and poor, various regions, and urban and rural areas, as well as gender differences, intergenerational differences, and so forth.

Based on the above understanding, at present, the theoretical framework of sustainable development is mainly manifested in the following models: pressure-state-response model (PSR), reaction-action cycle (RAC), Daly triangle, information pyramid, etc. [20–22]. Among them, the most widely used is the PSR model proposed by the UN Commission on Sustainable Development, based on which some variation models, such as Driving Force-State-Response Framework (DFSR), Pressure-State-Impact-Response Framework (PSIR), Driving Force-Pressure-Status-Impact-Response Framework (DPSIR), and so forth, are generated. The advantage of this model is that it theoretically contains a clearer logical relationship, viz., "what is the status quo, why, and how to deal with it?" Unfortunately, during the specific operation, the basis or logic of the causal relationship between many indexes is not very reliable, and even perplexed by the problem of two-way causality.

Considering that theoretical frameworks invariably require comprehensive consideration of the complicated system of economy, society, and environment, as well as the regional differences, we believe that it may be more reasonable and applicable to establish a theoretical model of sustainable development from a bedding of the system dimension. According to the existing literature and information, the modeling analyses of most studies are usually conducted from the perspectives of the economy, society, and environment. Some scholars or institutions (such as the UN Commission on Sustainable Development) consider the economy, society, environment, and system as evaluation dimensions for sustainable development. However, there are still some deficiencies in the construction and demonstration of the logical relations among different dimensions in these theoretical models. Therefore, we hereby construct a five-dimensional model of sustainable development based on "economy-society-environment-infrastructure-mechanism" (Figure 1). Among them, the economy, society, and environment are components of a sustainable development system,

while infrastructure and mechanism are the internal mechanisms that drive the operation of the system. The evaluation of economy, society, and environment mainly embodies the present situation and ability of system sustainable development. The assessment of infrastructure and mechanism emphasizes the hardware and software power or guarantee of the system, with sustainable development as its ultimate pursuit or goals. Within the system components (economy, society, and environment), the sustainable development of economy, society, and environment represents, respectively the foundation, the condition, and the goal for sustainable development. In other words, both economic growth and environmental protection are for social progress and improvement of human life quality and health level.
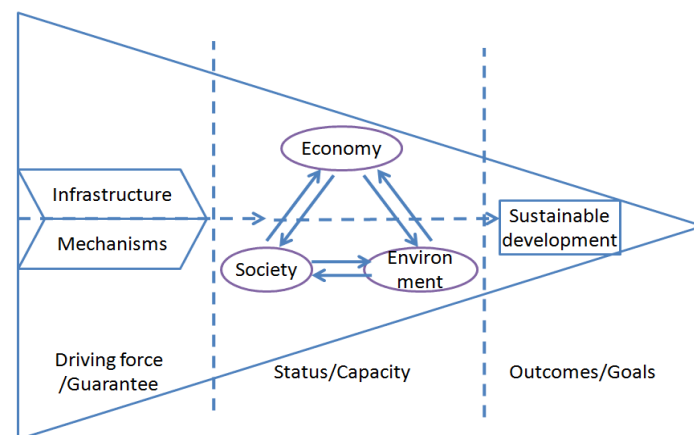

Figure 1. Evaluation of five-dimensional model of sustainable development.

2.2. The Relationship between "B&R Initiative" and Sustainable Development

In essence, the "B&R Initiative" as an open, multi-national mechanism of regional cooperation is inherently integrated with sustainable development.

First, consistent goals: The "B&R Initiative" is a product of conformity to the multipolarization, economic globalization, cultural diversification, and social information trend of the world, and the adaptation to the new normal in the domestic economy. It aims to promote economic cooperation, regional connectivity and market integration among the countries along the "B&R", so as to create a community of common interest, responsibility, and outcome featuring political mutual trust, economic integration, and cultural tolerance. Its emphasis on win-win cooperation and mutual benefit is inherently consistent with the goal of promoting sustainable development that is harmonious between people and between people and nature. Furthermore, the specific objectives of the "B&R Initiative", such as promoting economic growth and social progress, safeguarding fairness and justice, and strengthening environmental protection, are precisely the keystones of the United Nations' (UN') 2030 Sustainable Development Agenda.

Second, consistent principles: There are three major principles for sustainable development: fairness, sustainability, and commonality. Among them, the principle of fairness mainly refers to the equality of opportunity choices, including the two aspects of intragenerational equity and intergenerational equity. The "B&R Initiative" also embodies the principle of fairness. For example, it is an open Initiative that gives access to not only geographically-related countries but also to all countries on an equal footing. In addition to complying with market rules in melon-cutting, it also contains the contents of international aid and others to fulfill its international obligations. The principle of sustainability refers to the moderate development, and principally, the rational utilization of resources, ecology, and the environment. The "B&R Initiative" embodies the principle of sustainability in at least two aspects: (1) focusing on environmental protection, since most of the countries along the "B&R" are laden with ecological problems, the Initiative proposes to uphold the concept of green development; and (2) promoting infrastructure construction to provide hardware

support for sustainable development. The principle of commonality focuses primarily on integrity and interdependence. The "B&R" project needs the participants' joint cooperation to achieve its ultimate goal of creating "Three Communities". Therefore, this is not an Initiative led by or dominated by China. Rather, it is proposed by China with multinational participation and global benefit.

Third, consistent contents: In theory, the main contents of sustainable development include the three aspects of economic, social, and ecological sustainable development. Specifically, they are pursuing economic growth with better quality and efficiency, improving the quality of human life and protecting the earth's ecological environment. The "B&R Initiative" is put forward in the context of China's need to expand and deepen its opening up to the outside world, and the strong complementarity among the economies along the "B&R" and their strong willingness to cooperate. Its main content includes not only economic cooperation but also cultural exchanges. Based on this, the "B&R Initiative" has identified five key areas of cooperation: policy communication, facilities connectivity, trade liberalization, financing, and non-governmental exchange. Promoting the above "five keys areas" under the green development framework will not only promote the economic growth of all countries, but also improve the residents' quality of life.

Fourth, similar paths: The realization of the goal of sustainable development needs the corresponding ability for support. From a path perspective, promoting the "B&R Initiative" is highly similar to achieving sustainable development. This is because the "B&R Initiative" has also enhanced the participating countries' capacity in the sustainable development. Generally speaking, the capacity-building for sustainable development includes decision-making, management, a legal system, policy, scienc and technology, education, human resources, public participation, etc. It can be divided into two categories, one is for improvement of elements and the other is for improvement of mechanisms. The "B&R Initiative" can be achieved mainly through two major channels. The first is content construction. For example, the promotion of science, technology, education, and human resources in various countries can be optimized through facilities connectivity and trade liberalization, etc., while policy-making, management, legal systems, and policies of all countries can be strengthened through policy communication and non-governmental exchange so as to enhance public participation and achieve mechanism improvement. The second major channel is a cooperation mechanism by strengthening the capacity building of sustainable development through the spillover effect. The specific cooperation mechanisms include multi-level and multi-channel cooperation and consultation such as the Shanghai Cooperation Organisation (SCO), China-ASEAN "10 + 1", the Asia-Pacific Economic Cooperation (APEC), and other multilateral cooperation organizations, as well as the "Belt and Road" International Summit Forum, Boao Forum for Asia, and other cooperation platforms.

There are two main mechanisms for the impact of OFDI (Outward Foreign Direct Investment) on host country innovation (technology spillover). First, when the host country with a higher technology level: Regarding the positive externalities that result from geographical proximity to the technology leaders of the host countries, OFDIs of multinational corporations (MNCs) with less advanced technology are often motivated by the acquisition of advanced technology, which compels through market competition mechanisms the host-country enterprises to upkeep incessant innovation, thereby enhancing the overall innovation capability and level of the host countries. Second, when the host country has a lower technology level: MNCs with higher technical level usually have the advantage of monopoly, technology, advanced management experience, and economies of scale. After OFDI, the above advantages can spill over to the host country companies through learning mechanisms, personnel flow mechanisms, etc., thereby promoting the host country's innovation ability and level.

There are also two situations in which OFDI impacts on home-country innovation (reverse technology spillover). First, when the home country has a higher technology level: From the perspective of product cycle, when the product is mature and standardized, OFDI can be made. On the one hand, when the next generation of products must be developed, the necessity will urge home countries to engage more in innovation; on the other hand, the OFDI at this stage is generally only for the sake of

reducing the cost of factors or acquiring overseas markets. Due to the particularity of the host country's market environment and factors of production, home-country enterprises will inevitably need to make corresponding technological improvements or innovations to raise the overall innovation level back home. For OFDI at an innovation phase of the product, home country enterprises typically aim at the lower research and development (R&D) costs, advertising costs, and market potential in the host country, which also encourage enterprise innovation, especially for applicable technical innovation in host country markets. Second, when the home country has a lower technology level. In this case, home-country enterprises' direct investment in the host country can reduce their R&D costs by acquiring knowledge, especially tacit knowledge, through spillover effects. This saves money for home-based enterprises and enables them to invest more resources in domestic innovation, that is, R&D cost sharing; on the other hand, overseas R&D results will be fed back to home-country companies to further enhance the technological level and innovation capability back home, namely, feedback of R&D gain.

The above analysis is only directed at technological innovation. In fact, the impact of OFDI on innovation is also spread to institutional innovation, management innovation, business model innovation, format innovation, and cultural innovation, etc., through the same or similar channels or paths.

3. Methods

The "B&R Initiative" was formally put forward in 2013. From the perspective of the composite index for sustainable development, the changes of all countries along the "B&R" in 2015 with respect to 2014 may be attributable to a combination of various factors. However, the "B&R" policy promotion and implementation is certainly one of the important factors that cannot be ignored. We have examined separately the changes in the composite index of sustainable development of all countries along the "B&R" before and after the Initiative (2012–2013, 2014–2015). Compared with 2014, the levels of sustainable development in all countries except Yemen increased in 2015, while in 2013 only six countries showed an increase in the level of sustainable development. In order to demonstrate more accurately the impact of the "B&R Initiative" on the sustainable development of all countries along the "B&R", this paper will conduct an empirical analysis with the aid of econometrics.

3.1. Models

The "B&R Initiative" can be viewed as a policy experiment. There are usually four methods for assessing the effects of a policy, namely the instrumental variable method, the break-point regression method, the difference-in-differences (DID) method, and the Propensity Score Matching method. Considering the difficulty of singling out eligible instrument variables in the instrumental variable method as well as the potential heterogeneity of individual response to policies, the need for large sample size in propensity matching method to obtain a high-quality matching, and the inability of breakpoint regression method to identify the distance breakpoint treatment effect, and other factors, this paper will use the DID method to evaluate the effect of the "B&R Initiative" on sustainable development. This requires that the sample countries be firstly divided into treatment and control groups based on whether or not they respond to the "B&R Initiative". As various countries' response time of the "B&R Initiative" has been one after another, and although some countries did not respond to the Initiative, they did have substantive participation from the nongovernmental sector, it is therefore difficult to distinguish the treatment group from the control group completely. For this reason, based on the public official information, of the 60 countries along the "B&R" as discussed above, we classified 34 countries that signed a co-construction agreement, a memorandum of understanding with the Chinese government, or whose top-level leaders declare publicly to take an active part in the "B&R Initiative" (excluding those countries that respond to the Initiative after 2015) as treatment group, and the remaining 26 countries as the control group (Appendix A, Table A1). Furthermore, taking 2014 as a timeline, the overall sample was divided into four sub-groups, that is, the treatment group before the "B&R Initiative," the treatment group after the "B&R Initiative", the response group before

the "B&R Initiative," and the response group after the "B&R Initiative." Accordingly, the baseline regression model of the DID method can be set as follows:

$$sustain_{it}=\beta_0+\beta_1 treated_{it}+\beta_2 time_{it}+\beta_3 treated_{it}*time_{it}+\beta_4 Z_{it}+\varepsilon_{it} \tag{1}$$

wherein the explained variable sustain represents the level of sustainable development of the country, the subscripts *i* and t represent the *i*th country and the *t*th year, respectively, *Z* represents a series of control variables, and ε denotes the random disturbance terms. The coefficient β_3 reflects the net effect of the "B&R Initiative" on the sustainable development of countries along the "B&R". If the Initiative promotes the improvement of the sustainable development of all countries, the coefficient should be positive.

The most important prerequisite for adopting the DID method is that the treatment group and the control group must meet the common trend assumption. That is, if the "B&R Initiative" has not been proposed, the trend of changes in the sustainable development level of the two groups over time does not show systematic differences. According to the composite index of national average sustainable development composite index of the treatment group and the control group, the trend of change before 2014 is basically the same, meeting the assumption of a common trend.

3.2. Dependent Variables: Sustainable Development

The evaluation of sustainable development has always been the focus and difficulty of academic research. From the academic point of view, the current mainstream evaluation methods are the economic method, sociological method, ecological method, and systematic method. The criteria or basis for these methods to sustainable development differ from one another. From a formal point of view, the sustainable development evaluation methods can be divided into two categories: single index evaluation method and multi-index evaluation method. Since sustainable development is a relatively comprehensive concept in itself, it is often too one-sided to view it from the perspective of economy, society, and ecology. Therefore, this paper adopts an index system method to evaluate the sustainable development as comprehensively, objectively, and scientifically as possible.

3.2.1. Index System and Evaluation Methods

In our opinion, the design of the evaluation index system for sustainable development at least needs to meet the six principles of comprehensiveness, logic, science, objectivity, hierarchy, and operability. However, the selection of specific index must follow the five principles of availability, universality, comparability, spatiotemporality, and conciseness. Our final evaluation index system for sustainable development, consisting a total of 56 specific index in 15 dimensions, is based on the five-dimensional model of sustainable development proposed in the previous section, and drawing on the existing index system or research results, especially the incorporation and integration of the 17 Sustainable Development Goals set forth in the UN's "Transforming Our World: The 2030 Agenda for Sustainable Development" and the 169 specific targets, which are then adjusted based on the availability and quality of data (Appendix A, Table A2).

This paper mainly evaluates the sustainable development of countries along the "B&R". The initial sample of the study was 65 countries along the "B&R" including China from 2010 to 2015. Due to the particular lack of data in some of these countries, five countries: Syria, Bosnia and Herzegovina, the United Arab Emirates, Palestine, and Bahrain were deleted, culminating in a sample of 60 countries along the "B&R" (Table 1).

Table 1. Study samples.

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

Note: collated by the author.

At present, the assessment methods based on index system mainly include principal component analysis (PCA), fuzzy mathematics, and data envelopment analysis (DEA). In recent years, a number of new methods also emerged, such as the set pair analysis of linear models, the matter-element extension method, and the neural network method of nonlinear models. The difficulty lies in the distribution of the index weight, which has become the key to influence the resultant evaluation and its accuracy and rationality. There are mainly two kinds of methods (subjective and objective) to determine the weight of indexes. In this paper, we use the combination of subjective weight of expert scoring and objective weight of entropy to determine the weight. The final weights of the indexes are as follows: the average weight of the economic, social, and environment (respectively: 0.25) as the integral part of the entire sustainable development system, is relatively higher as compared with that of the two operating system mechanisms (weight respectively: 0.125) of infrastructure and mechanism; while an average weight is assigned to the dimensions, segmented dimensions, and the index levels.

3.2.2. Overall Evaluation

According to the calculated composite index of national sustainable development along the "B&R" in 2015, we can find out: (1) The levels of sustainable development in various countries are uneven and it is an arduous journey to achieve the goal of sustainable development. Among them, the average of the national sustainable development composite indexes along the "B&R" was 43.7, indicating that it is still a long way to go before most countries can achieve the sustainable development goals. The three countries with the highest levels of sustainable development were Singapore, Israel, and Slovenia. The three lowest countries were East Timor, Afghanistan, and Yemen, and their levels of sustainable development were uneven with wide gaps.

(2) The levels of sustainable development in various countries generally show an upward trend. Except for Yemen and Qatar, all countries' overall sustainable development indexes in 2015 saw improvements over 2010. In 2010–2015, the composite index of sustainable development of all countries showed a clear upward trend; generally speaking, the higher the stage, the lower the growth rate of the composite indices.

(3) Different countries in different regions have different levels of sustainable development. Generally speaking, the countries in Central and Eastern Europe have the highest level of sustainable development. South Asia is the region with the poorest sustainable development level.

3.2.3. Analysis of Key Areas of Sustainable Development

The levels of economic sustainable development of the countries along the "B&R" are quite different, and basically show an upward trend. In 2015, the mean value of the index of sustainable development of economies along the "B&R" was 44.3, which shows that there was a broad prospect for

carrying out economic cooperation through the "B&R Initiative" and enhancing the level of sustainable economic development of all countries. Except for Central and Eastern Europe, the sustainable development of the national economies in the remaining regions were seriously divided. In general, the sustainable development of all countries showed an upward trend.

There was little difference in the level of social sustainable development among the countries along the "B&R". In 2015, the average value of social sustainable development index of the countries along the "B&R" was 45.2. In 2010–2015, the index of social sustainability in the vast majority of countries fluctuated relatively frequently and did not show a clear trend. This shows that the social goals of sustainable development were relatively difficult to achieve and were prone to fluctuations.

The level of environmental sustainability along the "B&R" varied significantly, but the development remained basically stable. In 2015, the average value of environmental sustainability indexes of all countries was 36.9. This shows that paying attention to environmental protection, energy conservation, and emission reduction was an important part of achieving sustainable development in advancing the "B&R". The differences among the countries in the relatively low level of environmental sustainability were relatively significant. The trend of environmental sustainable development of all countries was basically stable and it was harder to achieve the goal of environmentally sustainable development.

Infrastructure is the shortest board in promoting the sustainable development of countries along the "B&R", and its evolution trends were diversified. In 2015, the average value of infrastructure development indexes of all countries along the "B&R" was 33.4, which was the lowest among the five major subsystems of sustainable development. It shows that infrastructure construction was the biggest shortcoming in the process of promoting sustainable development in countries along the "B&R". However, China had the highest index of infrastructure development, reaching 76.1, much higher than the rest of the countries. Moreover, the level of infrastructure development varied greatly from country to country, indicating that it was feasible and promising to implement bilateral and multilateral infrastructure cooperation.

The mechanism subsystem enjoyed the highest level of sustainable development of all subsystems in all countries along the "B&R", and its development trends were relatively dispersed. In 2015, the mean value of the index of development of the mechanism subsystem was 63.2, but its values were extremely uneven. From the perspective of the regional difference, the highest level was in Central and Eastern Europe.

3.3. Other Variables and Data

According to the empirical model, the explained variables represent the level of national sustainable development. To demonstrate the impact of the "B&R Initiative" on the overall national and key-area sustainable development, we use the composite indexes of the sustainable development of the countries in the evaluation results of the previous part, and the indexes of sustainable development in five dimensions of economy, society, environment, infrastructure, and mechanism as explained variables.

In the explaining variables, *treated* as the dummy variable was used to distinguish the treatment group from the control group, and the assignment values were 1 and 0, respectively; *time* represented time, the year before the launch of "B&R Initiative" is 0 and the year after that is 1; *treated* $\times$ *time* was a cross term (i.e., *did*) used to measure the net impact of the "B&R Initiative".

Furthermore, to exclude other factors affecting the level of sustainable development of the countries, this paper added some control variables as follows. First, location factors: A large number of studies show that location has a significant impact on regional economic growth. Location is closely related to many elements of a sustainable development system such as resource endowments, institutional environment, and infrastructure. Therefore, location is an important factor affecting the sustainable development of all countries. The sixty countries along the "B&R" in this paper are distributed in six major regions in Central and Eastern Europe; East Asia, Mongolia, and Russia; Southeast Asia; South Asia; West Asia and the Middle East; and Central Asia. Therefore, dummy variables including cee (1 for Central and Eastern Europe, 0 for the rest of the countries), nea (1 for East Asia, Mongolia, and Russia, and 0 for

the rest), sea (1 for Southeast Asian countries and 0 for the rest), sa (1 for South Asian countries, 0 for the rest), mewa (1 for West Asia and Middle East countries, and 0 for the remaining countries). Second, income factors: On the one hand, countries with higher income in the world generally enjoy higher levels of sustainable development. On the other hand, raising their income levels and optimizing the income structure also play a significant role in promoting sustainable development. According to the classification of the World Bank, this paper divides the sample countries into four categories: low-income countries, lower-middle-income countries, higher-middle-income countries, and high-income countries, and sets three dummy variables: lmid (1 for lower-middle-income countries and 0 for the remaining countries), umid (1 for higher-middle-income countries and 0 for the rest), high (1 for high-income countries and 0 for the rest). Third, political factors: In theory, the political system, the degree of democracy, and so on, especially the social stability, have a profound impact on a country's economic growth, social development, and the improvement of its mechanisms, and thus determine its level of sustainable development. In this paper, we use the Fragile States Index released by the U.S. Fund for Peace Foundation to measure the overall social stability of all countries, including the social, economic, political, and military indexes. The larger the index value, the more likely it is that the country will fail, and vice versa.

4. Empirical Results

4.1. Statistical Description of the Main Variables

According to the statistical description of the main variables (Table 2), we can see: (1) The gap between the countries along the "B&R" in terms of sustainable development was extremely large. The highest composite index of sustainable development was 62.7 and the lowest was 20.4. The gap between the two was as high as 42.3, the standard deviation was also as high as 7.4. (2) The Polarity Diversity of the overall level of sustainable development also existed in the five major areas of economy, society, environment, infrastructure, and mechanism, with the gap between the two poles surpassing that of the composite index of sustainable development. The largest one was in the mechanism, with a gap of 94.7. (3) The levels of sustainable development of the five major subsystems of countries along the "B&R" were uneven, with the distribution of mechanisms, infrastructure, and economic systems being relatively more discrete. (4) The standard deviation of the Fragile States Index of the countries along the "B&R" was 1.78, indicating that the distribution was relatively concentrated but the gap between the two poles was large.

Table 2. Statistical Descriptions.

Variable	Obs	Mean	Standard Deviation	Minimum	Maximum
sustain	360	41.50	7.40	20.4	62.7
economic	360	36.66	11.50	13.2	81.9
social	360	44.76	9.69	19.9	68.5
environment	360	37.17	8.79	12	76.2
infrastructure	360	33.31	12.30	4.9	76.8
mechanism	360	61.53	16.96	4.3	99
treated	360	0.57	0.50	0	1
time	360	0.33	0.47	0	1
nea	360	0.05	0.22	0	1
sea	360	0.18	0.39	0	1
sa	360	0.13	0.34	0	1
mewa	360	0.25	0.43	0	1
cee	360	0.30	0.46	0	1
lmid	360	0.38	0.49	0	1
umid	360	0.33	0.47	0	1
high	360	0.25	0.43	0	1
fsi	360	6.92	1.78	2.6	10

Note: calculated according to stata13.

4.2. Regression Results

In this paper, we used the DID method to evaluate the net effect of the "B&R Initiative" on sustainable development of all countries along the route. We take the composite index of national sustainable development and the indices of sustainable development of economy, society, environment, infrastructure, and mechanism as explained variables. According to the results in Table 3, we can make the following conclusions.

Table 3. FE (Fixed Effect) Regression Results of the "B&R Initiative" to Sustainable Development.

Independent Variable	Dependent Variable					
	Sustain	**Economic**	**Social**	**Environment**	**Infrastructure**	**Mechanism**
did	1.879 (0.204)	6.352 (0.626)	0.280 (0.107)	0.326 (0.315)	0.521 (0.252)	1.935 (0.703)
fsi	−0.585 *** (0.199)	−1.803 *** (0.608)	0.104 (0.104)	0.080 (0.306)	0.047 (0.244)	−1.464 ** (0.683)
cons	45.190 *** (1.375)	47.931 *** (4.210)	43.987 *** (0.719)	36.68 *** (2.120)	32.880 *** (1.692)	71.294 *** (4.729)
R-square	0.529	0.168	0.391	0.071	0.115	0.360
Obs	360	360	360	360	360	360

Note: The values in parentheses in the table are the standard error; **, and *** denote the significance at 5%, and 1% levels, respectively. Some test results are not listed in the table for the reason of space.

The "B&R Initiative" had a positive impact on the overall level of sustainable development of all countries along the "B&R" and the level of sustainable development in the five major areas of economy, society, environment, infrastructure, and mechanism, but the impact was not significant. There may be three reasons for this: (1) The "B&R Initiative" was launched in 2013 and is currently in the early stages of its construction. In particular, it requires a relatively long period of time for some major projects. In the future, with the further deepening of international cooperation and supporting policy and environment improvement, their positive impact on the sustainable development of all countries may be more obvious. (2) Although the countries in the control group did not expressly respond to the "B&R Initiative", some non-governmental participation may also exist in some countries in the process of construction, thus having some positive impact on the sustainable development of the country, this will result in a non-significant positive net effect. (3) From a statistical point of view, many control variables were added to the regression, which reduced the degree of freedom, and to a certain extent, may have also led to a larger standard error and an insignificant result.

According to the cross-term coefficient and the five major subsystems for sustainable development, the "B&R Initiative" had the most significant contribution to the improvement of infrastructure in all countries, which is in line with many current bilateral or multilateral cooperation projects. The cooperation of infrastructure had in fact improved the supply of public goods and services in various countries and the quality of life of the people, so it also had a considerable effect on the promotion of the sustainable development of the state society. The construction of the "B&R" project must first meet the premise of environmental protection and then be transmitted to the mechanism and economic level.

4.3. Robustness Test

To verify the robustness of the regression results in Table 4, and to overcome the potential contemporaneous correlation among groups of disturbing terms between different samples (namely, the potential mutual influence of activities promoting sustainable development, including the economic, social, and environmental activities conducted by geographically adjacent countries in the same period), this paper used the FGLS (feasible generalized least square) method to re-regress the

empirical model. The results show that the magnitude, sign, and significance of the coefficients of the major variables are approximately or substantially the same.

Table 4. FGLS (Feasible Generalized Least Square) Regression Results.

Independent Variable	Dependent Variable					
	Sustain	Economic	Social	Environment	Infrastructure	Mechanism
did	0.38 (0.5)	0.184 (0.13)	0.504 (0.46)	0.342 (0.21)	1.252 (0.74)	0.26 (0.1)
treated	1.037 ** (2.21)	−1.398 (−1.56)	2.328 *** (3.41)	0.817 (0.8)	0.455 (0.43)	4.293 *** (2.8)
time	1.527 *** (2.67)	6.143 *** (5.6)	−0.175 (−0.21)	−0.621 (−0.5)	−0.695 (−0.54)	2.24 (1.2)
nea	3.419 *** (3.27)	0.22 (0.11)	1.957 (1.28)	6.017 *** (2.64)	16.526 *** (7.06)	−5.459 (−1.6)
sea	0.083 (0.11)	1.396 (0.96)	−1.521 (−1.37)	0.91 (0.55)	−3.32 * (1.94)	2.435 (0.98)
sa	−2.226 *** (−2.58)	−1.905 (−1.15)	−7.626 *** (−6.06)	2.083 (1.1)	−2.81 (−1.45)	−0.047 (−0.02)
wa	−2.112 *** (−2.89)	−0.182 (−0.13)	−0.094 (−0.09)	−5.015 *** (−3.13)	−2.121 (−1.29)	−4.12 * (−1.72)
mee	−1.78 ** (−2.16)	−9.1 *** (−5.76)	3.830 *** (3.18)	2.325 (1.29)	−2.085 (−1.13)	−6.132 ** (−2.27)
lmid	3.651 *** (3.18)	−1.39 (−0.63)	3.498 ** (2.09)	−1.609 (−0.64)	11.198 *** (4.35)	16.995 *** (4.53)
umid	8.472 *** (6.93)	6.926 *** (2.96)	8.54 *** (4.79)	−6.551 ** (−2.45)	22.916 *** (8.36)	27.019 *** (6.76)
high	15.063 *** (11.4)	20.874 *** (8.25)	12.884 *** (6.68)	−7.386 ** (−2.56)	26.455 *** (8.93)	41.358 *** (9.56)
fsi	−1.549 *** (−9.82)	−0.903 *** (−2.99)	−1.599 *** (−6.95)	−1.545 *** (−4.48)	−1.231 *** (−3.48)	−3.033 *** (−5.88)
cons	44.226 *** (21.98)	37.384 *** (9.7)	47.127 *** (16.06)	51.993 *** (11.82)	24.326 *** (5.39)	56.224 *** (8.54)
obs	360	360	360	360	360	360
Wald chi2 (12)	1379.14	786.18	1042.64	153.81	597.38	493.68
Prob > chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Log likelihood	−947.286	−1181.194	−1083.135	−1228.867	−1237.811	−1374.01

Note: The values in parentheses in the table are the Z statistic; *, **, and *** denote the significance at 10%, 5%, and 1% levels, respectively. Some variable coefficients are not listed in the table for the reason of space.

In general, compared with the income factors, the location factor as a control variable had a relatively small impact on the sustainable development of all countries. Moreover, contrary to the impact on economy, infrastructure, and mechanism, CEE's (Central and Eastern Europe) location has significantly positive impact on social and environmental sustainability, reflecting its location advantage in the social and environmental fields.

The impact of income factors on sustainable development of countries was significantly positive; in terms of the coefficients, the higher the income, the better the overall national level of sustainable development and the sustainable development of the five major areas of economy, society, environment, infrastructure, and mechanism. The impact of the Fragile States Index on sustainable development was significantly negative; that is, the higher the social stability, the more it could promote the sustainable development of all countries and the development of their five major subsystems.

The paper also regressed the model without considering the control variables, and the variables were basically the same. Given the above, the regression results in Table 3 are robust and reliable.

5. Conclusions and Discussion

Based on the above analysis, we can conclude that: (1) The "B&R Initiative" and sustainable development were internally unified. Promoting the "B&R Initiative" had brought about an opportunity to achieve the goal of sustainable development. Similarly, sustainable development is also of great significance to the "B&R Initiative". For example, it will be conducive to obtaining broader support, facilitating the integration of development strategies of various countries and international organizations, and facilitating cooperation among countries in key areas. (2) The overall level of national sustainable development of the countries along the "B&R" was not high, and the individual developments are imbalanced. Central and Eastern European countries have the highest levels of sustainable development; whereas South Asia is a region with a relatively low level of sustainable development. (3) The levels of sustainable development in five major areas of economy, society, environment, infrastructure, and mechanism vary greatly in various countries along the "B&R"with infrastructure and environment being the weakness. (4) The launch of the "B&R Initiative" has promoted the sustainable development of economy, society, environment, infrastructure, and mechanism. As a result, all countries have shown an overall improvement in their sustainable development. Due to the short period from the launch of the "B&R Initiative", its positive effect on sustainable development was not significant at the time of publishing.

In theory, the "B&R" construction can affect the sustainable development of all countries through multiple effects such as cost, scale, externalities, and employment effects. The driving force behind these effects is innovation. The key to advancing the "B&R Initiative" lies in the key projects. In essence, this is Outward Foreign Direct Investment (OFDI). At present, theorists have conducted a great deal of in-depth discussion on the impact of OFDI on innovation, especially on technological innovation [23–25]. The vast majority of documents confirm that there is a technology spillover and a reverse technology spillover effect on host countries and home countries respectively by OFDI, which are reflected in the three aspects of enterprises, industries, regions, and countries [26,27]. There are even some literatures that analyze the main factors affecting technology spillover [28].

Therefore, from the perspective of promoting sustainable development, the "B&R Initiative" was necessary, feasible, and effective leastwise at the time of publishing, the effective furtherance of it calls for the joint efforts of the related countries and the international community. Therefore, the following are suggested:

(1) To promote sustainable development as the fundamental goal of the "Belt and Road" construction: In the past, due to asymmetric information, mismatch of expression and inconsistency in understanding, many countries often understood the "B&R" one-sidedly as an example of economic cooperation, especially an international capacity-cooperation. Some Western developed countries even look at it in a hostile manner as the Chinese version of the "Marshall Plan," and hold that behind China's "B&R Initiative" is the political purpose of raising China's international voice and influence. However, judging from the content and purpose of the "B&R Initiative", it is its proper meaning to promote the sustainable development of all countries. The Belt and Road (B&R) and sustainable development are highly compatible in terms of their internal logic. Moreover, according to the study, the current overall level of sustainable development in the countries along the "B&R" was still relatively low and there was still much room for improvement. This will make it feasible to promote sustainable development as the goal of the "B&R".

(2) To jointly promote facilities connectivity: At present, the sustainable development of all countries along the "B&R Initiative" has shown an imbalanced character. Not only the overall level of sustainable development was unbalanced, but also the development between different areas. The key to solving this problem lies in promoting the facilities connectivity. The development of economy, society, and environment all need the support of infrastructure. In theory, infrastructure is an important guarantee for promoting sustainable development, and should be developed moderately ahead of schedule. At the time of publishing, infrastructure was also the biggest shortfall in the national sustainable development system of countries along the "B&R". China, with its obvious advantages in infrastructure, should strengthen cooperation with other countries in promoting facilities connectivity.

(3) To coordinate the "B&R Initiative" under the UN 2030 Sustainable Development Goals: The B&R Initiative is more than just a regional cooperation Initiative. Its ultimate goal is to benefit the world. Therefore, promoting the sustainable development of countries along the "B&R" must be integrated with the framework for sustainable development set by the United Nations. We should leverage the UN 2030 Sustainable Development Goals to coordinate the "B&R Initiative" and global sustainable development. For example, all countries should respect the objective law of sustainable development in the world and fully understand that sustainable development, as a complicated systematic project, cannot be accomplished in a single step. It is necessary to make overall planning first in a step-by-step approach with increasing difficulty and an orderly manner. All countries should actively bring the areas covered in the United Nations 2030 SDGs as key areas for cooperation and efforts in advancing the "B&R" project.

(4) To strengthen cross-border cooperation between non-governmental and non-profit organizations: In advancing the sustainable development of the countries along the "B&R", there are many aspects, such as facilities connectivity, trade exchange, and cooperation mechanisms, that need to be coordinated and resolved by many countries. This requires the cross-border cooperation of some non-governmental and non-profit organizations. For instance, efforts can be made to jointly conduct the master plan study, and give full consideration to the balance of interests of all parties; run joint schools to expand the size of the international students; strengthen scientific and technological cooperation, co-build laboratories, extensively carry out exchanges, and cooperation among countries along the "B&R"; mutually hold the Tourism Promotion Week, Awareness Month, and other activities to jointly create cross-border excellent tourism itineraries with the characteristics of the "B&R"; and coordinate the research on route design and technical standards for facilities connectivity.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Table A1. Countries in Treatment and Control Groups.

	Treatment Group	Control Group
Countries	China, Tajikistan, Kyrgyzstan, Uzbekistan, Kazakhstan, Vietnam, Thailand, Cambodia, Laos, Malaysia, Myanmar, Nepal, Sri Lanka, Bangladesh, Pakistan, Afghanistan, Mongolia, Russia, Azerbaijan, Israel, Armenia, Qatar, Saudi Arabia, Jordan, Iran, Iraq, Egypt, Slovenia, Hungary, Poland, Czech Republic, Serbia, Belarus, Ukraine	Lithuania, Slovakia, Moldova, Singapore, Romania, Estonia, Maldives, Bulgaria, Latvia, Philippines, Indonesia, Macedonia, Turkey, Georgia, Kuwait, India, Albania, Turkmenistan, Brunei, Croatia, Bhutan, Oman, Montenegro, Lebanon, Timor-Leste, Yemen

Table A2. National Sustainable Development Evaluation Index System.

Goals	System	Dimension	Segmented Dimensions	Index
Sustainable Development	Economy	Economic scale	Output value Growth	Per capita GDP (Gross Domestic Product) Annual GDP growth rate
		Economic quality	Structure	Gross capital formation as a percentage of GDP Service added value as a percentage of GDP OFDI as a share of GDP Current account balance as a percentage of the total trade volume
			Benefit	Gross Labor Productivity (whole-society productivity)
		Economic vitality	Innovation Openness Risk	National Innovation Index Economic extroversion Debt to GDP ratio
	Society	Population base	Population endowment	Natural population growth rate Population density
			Population structure	Birth sex ratio Number of scientific and technological personnel per 10,000 people Population urbanization rate
		Living standard	Nutrition	Malnutrition incidence
			Poverty	Population ratio of those earning less than 1.9 US dollars/day
			Hunger	Per capita grain output (PCGO) Per hectare grain output (PHGO)
			Housing	Proportion of population in urban agglomerations with population over 1 million

Table A2. *Cont.*

Goals	System	Dimension	Segmented Dimensions	Index
Sustainable Development	Society	Equal employment	Social equity	Gini Coefficient Human Development Index
			Labor and employment	Unemployment rate Proportion of women in the workforce
		Public Service	Health	Per capita health expenditure Hospital beds per one thousand people Life expectancy Neonatal mortality rate Maternal mortality rate
			Education	School enrollment (primary) School enrollment (secondary) School enrollment (colleges and universities) Literacy rate Government expenditure on education
	Environment	Resources	Forests Land Water	Per capita forest coverage Per capita land resources possession Per capita fresh water resources possession
		Energy	Energy consumption	Unit GDP energy consumption Energy consumption elasticity coefficient
			Energy structure	Share of secondary energy
		Pollution	Carbon dioxide Nitric oxide Methane Soot	Per capita carbon dioxide emissions Per capita nitric oxide emissions Per capita methane emissions Per capita soot emissions
		Ecological Protection	Protected areas	Share of nature reserve areas in national territorial area
	Infrastructure	Transportation Facilities	Railway Port Airport	Per capita railway mileage Port handling capacity Air transport volume
		Information and public service facilities	Internet Fixed and mobile phone	Internet penetration Fixed and mobile phone penetration
			Public facility	Electricity penetration rate Access ratio of improved water sources Access ratio of improved sanitation facilities
	Mechanism	Domestic systems	Economic systems Social governance	Economic Freedom Index Global Governance Index
		International Cooperation	Commitment to international obligations	Official development assistance provided (accepted) as a share in GDP

Note: Designed and collated by the author.

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