

# The Impact of the Belt and Road Initiative on Regional Economic Disparities: Dual Effects of Infrastructure and Trade Openness

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**Abstract.** The objective of the Belt and Road Initiative (BRI) is to foster equitable global development, however, during the implementation process, the policy's economic growth effect is not uniform throughout all regions, which leads to the potential of increasing regional economic disparities. This paper adopts a literature review approach to elucidate the effects of the Belt and Road Initiative on regional economic disparities, focusing on infrastructure and trade considerations for policymakers. It will sort out the theoretical background of regional economic disparities and will examine the impact of infrastructure investment as well as trade openness on specific regional economic disparities. The study finds that infrastructure investment and trade openness mainly affect inter- and intra-regional economic disparities, respectively. Infrastructure investment benefits Southeast Asia and South Asia significantly more than Central Asia and Eastern Europe, and the eastern coast of China significantly more than the inland regions. Trade openness is more effective in converging income disparities within countries with lower levels of economic development, but it may exacerbate economic disparities within middle- and high-income countries. The paper concludes that although the Belt and Road Initiative has attained certain successes, there is still a risk that it will exacerbate regional economic disparities. The findings help policymakers to further optimize regional policies to achieve the initiative's goal of rebalancing the global economy.

**Keywords:** Belt and road initiative; regional economic disparities; infrastructure investment; trade openness; economic growth.

## 1. Introduction

Realizing coordinated regional economic development is conducive to promoting higher quality, more equitable, and sustainable development within each region, and helps to build a strategic space for a modern economic system. Over the past 30 years, initiatives such as the ASEAN Free Trade Area (AFTA), the Eurasian Economic Union (EAEU), and the Central Asia Regional Economic Cooperation (CAREC), have been introduced to reduce economic disparities within regions and promote joint regional economic development. In China, the government has been gradually implementing strategies as well. This includes the Western Development Program, the Northeast Revitalization, the Coordinated Development of the Beijing-Tianjin-Hebei Region, and the Development of the Yangtze River Economic Belt to promote coordinated development across regions. Nevertheless, for an extended period, these endeavors have encountered challenges about factor distortion, disorderly competition, and widening regional disparities, and have not yielded the anticipated outcomes [1].

To reinforce its standing as a responsible great power and expand its influence worldwide, China proposed the Belt and Road Initiative in 2013. This effort aims to position China as a major force behind balanced global economic growth and to promote the creation of a more equitable, sustainable, and balanced global economic system. By 2022, over \$380 billion in bilateral investment has been made between China and co-building nations, of which direct investment in the co-establishment countries had exceeded \$240 billion. This has resulted in a notable increase in trade, ranging from 2.8 to 9.7 percent, thereby making a substantial contribution to the global economy.

However, the concrete implementation of the initiative has revealed discrepancies in the amount of Chinese infrastructure investment and trade across different countries and provinces. Such inter-

regional differences in economic growth rates may widen regional economic disparity, which may in turn erode social cohesion, lead to political polarization, and relapse into a vicious cycle of intra-regional economic decline. This runs counter to the Belt and Road Initiative's goal of fostering a balance of global prosperity [2].

This article presents a literature review aimed at helping policymakers understand the status of this initiative in promoting balanced regional development by providing perspectives on infrastructure and trade openness. With this knowledge, governments may target policy changes and encourage regionally balanced economic development. This paper is organized as follows: the second section examines the theoretical framework of policy impact on regional economic disparities; the third and fourth sections discuss the impact of the Belt and Road infrastructure and trade openness on regional economic differences; and finally, policy recommendations are made.

## **2. Evolution of Theories of Regional Economic Development**

### **2.1. Early Theoretical Explorations of Regional Economic Differences**

The study of regional economic disparities can be traced back to Adam Smith in 1776, who argued that the market's spontaneous adjustment mechanism would guide the flow of resources to more efficient regions [3]. Subsequently, in 1874, Walras advanced the general equilibrium theory, which argued that the supply and demand mechanism of the market could automatically realize the optimal allocation of resources and that higher returns on capital would draw more investment to lagging regions, narrowing the regional economic gap. However, these theories are too idealized, failing to consider the realities of geographic divides, policy constraints, and other factors on the persistence of regional economic disparities [4]. After entering the 20th century, economics progressively became more focused on how policy affects economic inequality. During the 1930s, amidst the Great Depression, Keynes proposed macroeconomic theories that advocated the use of monetary and fiscal policy by the government to lessen the adverse effects of the recession on employment, income, and output [5].

### **2.2. Evolution of Regional Economic Disparities and Spatial Perspectives**

The growth of regional economic disparities has garnered more attention from the economics community in the post-World War II era, due to the notable variations in worldwide economic development. This period saw the development of traditional regional economics, with the main field and object of study being the causes and development of uneven economic development among regions. The theory holds that imbalances in regional economic development are temporary and that, with the movement of production factors, interregional economic disparities will be gradually eliminated.

In 1944, Myrdal put forward the "Circular Accumulation Causality Theory", pointing out that the region with the advantage of first-mover location will be ahead of other regions to develop the economy, and the "diffusion effect" is significantly smaller than the "return effect", which will widen the regional economic gap [6]. In 1958, Hirschman further put forward the "unbalanced growth theory", that the unequal development of the region is the inevitable economic growth, and "polarization-trickle-down effect" to support Myrdal's view [7]. Kuznets proposed the "inverted U-shaped curve" idea in 1955 after researching the pattern of interregional economic disparities in greater detail. He found that regional economic disparities tended to widen and then narrow with economic development, but the theory was then found to be inconsistent with empirical research [8]. In 2005, Rao et al. proposed the "double S-curve" based on the above, which improved the theoretical foundation of regional economic disparity analysis [9].

In this context, scholars have further explored the causes of regional economic differences from the spatial perspective, economic gradient and industrial transfer, etc. Friedman proposed the center-periphery theory in 1966, which argues that any regional system consists of a developed region in the center and a backward region in the periphery and that policy regulation and inter-regional population

migration will promote the flow of factors of production, thus promoting spatial economic integration [10]. In 1968, Vernon and Raymond put forward the theory of regional economic gradient transfer, which suggests that each region is at a discrete stage of economic development, with the dominant industries situated in high-gradient areas, gradually shifting to low-gradient areas to narrow regional disparities [11]. Wei et al. further added that if the gradient difference between regions is too large, or the production cooperation network is not mature, the industry transfer will be difficult due to "stickiness", so it will exacerbate the inter-regional economic differences [12].

In 1975, French economist Perroux proposed the "growth poles theory", suggesting that economic development initially concentrates on sectors characterized by high levels of innovation, large scale, and dominance within the economy which drive other sectors through inter-industry linkages, therefore fostering the synergistic growth of the entire economy [13]. Boudeville believes that the region with the first-mover advantage can use the correlation promotion effect to drive the synergistic development of the economy of its neighboring regions [14]. Lu Da Dao and other scholars further put forward the theory of the "point-axis system" that the economic growth point will be diffused through transportation, logistics, and information flow, and drive the integration and coordinated development of a larger region in the form of "axis" [15].

### **2.3. Reassessing Regional Economic Differences in the New Economic Growth Theory and the New Economic Geography**

Since the 1980s, more and more empirical studies have found that traditional regional economic theories cannot adequately explain real regional economic differences. In response, scholars have proposed a new economic growth theory to adapt to the characteristics of economic development, which focuses on the impact of policies and firm behavior on regional economic disparities.

Romero (1986) suggests that government measures can support balanced economic development by countering the externalities of capital and implies the importance of endogenous technological advancement in the regional expansion of the economy [16]. Dourick and Nguge (1989) argue that economic convergence will occur only among rich countries or economic cooperation organizations and that economic disparities among developing countries will continue to widen, the "club convergence effect" [17]. Barro and Sala (1992) add that regional economic disparities will further diverge due to the lack of long-term economic growth potential in developing countries [18]. King and Rebelo et al. (1999) argued that the primary causes of economic disparity are regional expansion of the economy and government regulation of income difference and that inefficient institutional arrangements in some developing countries have led to a persistent increase in economic disparities between them and developed countries [19].

Since the 1990s, enterprise behavior has emerged as the central theme of the new economic geography, which holds that lower transportation costs will lead to changes in aggregation economies, externalities, and economies of scale, thus affecting the choice of enterprise location [20]. Enterprises in the region will form regional industrial clusters due to agglomeration economic advantage to achieve productivity improvement, so that the core region can achieve self-reinforcement, thus expanding the regional economic development gap [21]. In the 21st century, scholars have conducted further research into the evolution of the enterprise network and the formation of regional industrial clusters, which provides a more accurate theoretical basis for evolutionary economic geography in the context of regional policy [22].

## **3. Effects of Belt and Road Infrastructure Investment on Regional Economic Disparity**

### **3.1. Dual Effects of Infrastructure Investment on Regional Economic Growth**

Infrastructure is a public or quasi-public good that has the objective of improving the distribution of income in terms of equity and stimulating economic expansion [23]. Research has demonstrated

that infrastructure benefits local economies. For example, Fan and Zhang pointed out that funding for public infrastructure, such as highways, ports, railways, and airports can effectively promote regional growth and reduce economic disparities [24]. Wu used the DEA method to find that the efficacy of infrastructure development in neighboring regions is markedly positively correlated with the urbanization process in the region [25]. Chen and Li found that infrastructure improvement reduces transportation costs from the perspective of new economic geography, which causes changes in industrial agglomeration and aggregate market demand [26]. In addition, Patra et al. argued that infrastructure development will help to increase domestic output while alleviating poverty and optimizing intra-regional income distribution [27, 28].

However, several academics have found that infrastructure does not necessarily have a positive effect on economic growth and that it can exacerbate economic disparities between regions. According to Bougheas et al, there is an inverse U-shaped relationship between infrastructure and economic growth [29]. Li et al. added that most Belt and Road countries are currently underinvested in infrastructure, therefore, moderate investment can promote growth, but over-investment may inhibit economic development [30]. Furthermore, the development of transport infrastructure would intensify the siphoning effect of large cities, resulting in the diversion of resources and the marginalization of medium-sized and smaller cities [30]. Regarding investment in communications infrastructure, Fleisher et al. found that investment in telecommunications infrastructure in developed regions can exacerbate regional economic disparities [31].

### 3.2. Regional Impact of Belt and Road Infrastructure Investment

In the 1990s, China achieved high economic growth through large-scale infrastructure construction [32]. Drawing on this successful experience, the Belt and Road Initiative aims to reduce economic disparities through investment in infrastructure construction. Since the initiative was proposed, China has collaborated with many nations along the route to build significant infrastructure, and it has further invested RMB 380 billion in May 2017 to support it [33, 34]. Gong et al. applied a fixed-effects panel model and mediation effect testing procedures to confirm that while building infrastructure for the Belt and Road can greatly boost the economic growth of the nations along its path, it also carries the danger of unequal economic development [35]. Jessop and Apostolopoulou argued that urban centers are over-concentrated in this initiative, which will reconfigure the city as a node of wealth and may consolidate urban marginalization and exacerbate economic imbalance [36, 37].

More specifically, the effects of infrastructure improvements along the Belt and Road differ across regions. Chen and Li studied the investments made in 17 countries along the Belt and Road for transportation infrastructure between 2014 and 2020, and found that the overall impact is positive, but there are obvious regional differences [26]. The negative consequences of improved transport networks in other nearby regions bleed over into Central Asia, West Asia, and non-EU Eastern Europe. In the short term, the effects of China's infrastructure expenditures in South and Southeast Asian nations have been disparate, with Laos achieving the highest GDP growth and Vietnam and Thailand incurring the most significant losses. Over time, GDP growth in South and Southeast Asia has markedly surpassed that of Central Asia and Eastern Europe, potentially intensifying regional economic disparities. Yang et al. found the economic growth rate in Southeast Asia was 8.28%, while that in South Asia was only 1%, which may have widened the economic gap with the Southeast Asian region. The economic growth of Central and West Asia was only 0.65% and 0.46% respectively, which may further widen the economic gap with East Asia [38]. Wang and Chen confirmed the existence of large economic gaps between subregions along the Belt and Road through dynamic share transfer analyses [39]. Specifically, Belt and Road infrastructure investments have fueled tertiary sector growth in East and South Asia, thereby narrowing the economic gap with East Asia. However, this impact has been limited in Central Asia and Eastern Europe [39].

For China, Hao et al.'s comparative study reveals that the Belt and Road initiative's infrastructure investment efficiency follows the following pattern: East > Northwest > Northeast > Southwest, with

large regional differences and an insignificant tendency of narrowing [40]. Li et al. found that the initiative increases GDP per capita through transportation infrastructure developments, but the contribution is higher in coastal areas than in inland areas, which could widen the economic divide between China's east and west regions [41].

In conclusion, whereas infrastructure stimulates economic development along the Belt and Road, specific shortcomings further intensify regional disparities, with the effects of investment differing between regions.

## **4. Effects of Belt and Road Trade Openness on Regional Economic Disparity**

### **4.1. Theoretical Controversies on Trade Openness and Regional Economic Differences**

Although a large body of research suggests that trade reduces the wealth gap between rich and developing countries, there is ongoing debate on the connection between trade openness and regional income disparities. According to academics such as Hu, trade openness may exacerbate regional income disparities by limiting the income redistributive effect of fiscal spending [42]. Similarly, Dorn et al. used an instrumental variable approach to ascertain that although trade openness helps the impoverished in emerging and developing nations, its impact on the impoverished population as a whole is limited. For developed economies, however, trade openness leads to an increase in income disparity; this was particularly evident in China and the trade-transition economies of Eastern Europe [43].

Other scholars argue that trade openness plays a role in reducing regional disparities. Stolper and Samuelson's seminal theory asserts that developing nations have comparative advantages in labor-intensive sectors, and that trade openness enhances the export of these goods, thereby fostering industrialization and indirectly alleviating poverty through employment expansion [44, 45]. Furthermore, Industrialization will also broaden employment opportunities and income channels for low-skilled labor. This ultimately serves to reduce income inequality within countries [46, 47]. Concurrently, concurrently, trade openness can reduce the excessive concentration of regional elements in central cities and augment the income of immobile factors through spillovers, thus narrowing regional income disparities [48, 49].

Trade openness has a complicated effect on regional economic disparities that depends on several variables, such as the economic structure of the nation, the type of trade policy, resource endowment, and labor mobility between regions [50]. Thus, when evaluating the economic impact of trade openness, it is essential to consider the combined effects of various factors comprehensively.

### **4.2. Regional Impact of Belt and Road Infrastructure Investment**

The trade index between China and the participating nations in the Belt and Road Initiative has climbed from 100 in the base period to 165.4 in 2022 after the initiative's proposal. The initiative significantly reduces transaction costs, removes institutional and technical impediments to international trade, significantly reduces the risk of enterprise investment, and opens up fresh possibilities for growth for both China and the participating nations [51]. Countries along the route can take this opportunity to conduct multilateral and bilateral trade, thereby reducing regional economic disparities [52].

In terms of research methodology, the difference-in-difference (DID) method is widely used to examine the policy effects of the Belt and Road Initiative. According to Ma et al., trade openness is a key factor in this initiative's success in reducing poverty in low-income and lower-middle-income nations; however, it can also exacerbate the issue in high-income nations, and it works better in landlocked nations than in coastal ones [53]. Xie et al. add that the long-term impact of poverty reduction surpasses the short-term impact, and the distance between the participating nations and China has a major impact on the impact of poverty reduction in practice [52]. Qin et al. found that the initiative significantly contributed to the convergence of income inequality among Chinese cities due to trade liberalization and industrial restructuring, and the effect was more significant in central

and western parts of China [54]. Meng and Wang broadened Qin's approach to an international context, discovering that commerce associated with the Belt and Road Initiative can facilitate industrial advancement and enhance the comparative advantages of participating nations, hence diminishing domestic income disparity. In nations with lesser levels of economic growth, this effect is more pronounced [55]. Luo et al. found that complementary labor imports from China help boost labor force participation, promoting industrialization and urbanization, increasing labor's share of income, expanding the middle class, and reducing income inequality, which is reflected in the declining Gini coefficient in recent years [56].

In conclusion, the Belt and Road markedly improves the balanced economic development of low- and middle-income nations through trade openness. However, there is a possibility of intensifying the unbalanced development of the regional economy within high- and middle-income countries concurrently.

## 5. Conclusion

This paper examines the Belt and Road Initiative's impact on regional economic disparities, particularly focusing on the historical theoretical background, infrastructure investment, and trade openness. Findings show that infrastructure primarily influences interregional economic disparities, while trade predominantly affects intraregional economic disparities. The initiative has significantly accelerated infrastructure development in participating countries, with greater benefits being realized by Southeast and South Asia than by Central and Eastern Europe, and the eastern coast of China gaining more than inland areas. This may lead to greater economic disparities among regions. Regarding trade, enhancing trade openness under the initiative is conducive to the convergence of income disparities within lower-income countries but may exacerbate economic disparities within wealthy and middle-class nations.

Considering these findings, the paper suggests that relevant policymakers should adopt a balanced approach to infrastructure development across regions, rationally plan infrastructure development in less developed regions, and facilitate cross-border factor flows. At the same time, regional cooperation platforms should be established to promote a balanced distribution of resources among countries and prevent the development dividend from being concentrated in one region. Based on the finding that trade can significantly narrow the economic gap among these developing countries, the Chinese government should focus more on the resource endowments and national trade flows along the Belt and Road. It should also investigate each nation's comparative advantages to forge stronger ties between China's demand and the supply sides of participating nations. For countries with medium to high levels of economic development, it was suggested to improve the well-being of citizens, focus more on high-quality economic growth, and promote the optimization of income redistribution policies to reduce the economic disparities that exist in the region.

This study makes a significant contribution to the existing literature on the Belt and Road initiative by providing policymakers with information on how the policy affects trade and infrastructure-related regional economic disparities. The findings will inform the optimization of relevant regional policies, the promotion of balanced regional development along the route, and the achievement of the goal of rebalancing global economic development. The extant literature is deficient in its treatment of macro-regions, failing to provide a sufficiently nuanced analysis of economic imbalances at the regional level. Subsequent investigations ought to give precedence to the analysis of particular areas and the consequences of the Belt and Road initiative on economic disparities, thereby providing policymakers with more comprehensive direction.

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