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The Effects of the China–Europe Railway Express on Regional Economic Synergy under the Belt and Road Initiative: Evidence from a Multi-period Difference-in-Differences Model

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Abstract

This study examines the effect of the China–Europe Railway Express on regional economic synergy under the Belt and Road Initiative. Using a balanced panel of 29 Chinese provincial-level regions from 2010 to 2022, the staggered opening of railway services is treated as a quasi-natural experiment, and a multi-period difference-in-differences model is employed. A regional economic synergy index is constructed from GDP per capita, fixed-asset investment per capita, and the share of the secondary industry using the entropy-weighting method. The baseline results show that the average treatment effect is negative but statistically insignificant. This finding remains stable after adjusting the treatment timing, replacing the dependent variable, excluding the earliest-opening regions, and conducting a placebo test. The parallel-trends test supports the validity of the identification strategy. Heterogeneity analysis indicates a significant negative short-term effect in regions with a low initial development level, although formal interaction tests do not confirm statistically significant differences across groups. The mechanism tests provide no evidence that railway opening significantly increases economic openness, trade volume, or investment intensity. Nevertheless, the augmented regressions show that trade volume and investment intensity are positively associated with regional economic synergy. These findings suggest that the regional economic effects of the China–Europe Railway Express depend on complementary industrial, trade, investment, and institutional conditions rather than on transport connectivity alone.

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Keywords

China–Europe Railway Express, Belt and Road Initiative, regional economic synergy, multi-period difference-in-differences, regional heterogeneity, transport connectivity.

Introduction

The Belt and Road Initiative has strengthened the role of cross-border transport connectivity in regional economic cooperation. As a major land-based logistics corridor between China and Europe, the China–Europe Railway Express improves market accessibility, shortens transport time, and creates new opportunities for trade and investment. However, the economic benefits of transport corridors are not automatic and depend on complementary conditions such as industrial capacity, logistics infrastructure, and institutional coordination [World Bank, 2019].

Existing studies mainly examine the effects of the China–Europe Railway Express on trade routes, logistics efficiency, export performance, and urban economic activity. Research shows that the railway can improve the competitiveness of overland China–Europe transport and influence local economic and trade vitality [Wenet et al., 2019; Liu et al., 2024]. Nevertheless, less attention has been paid to its broader impact on regional economic synergy, which involves economic development, investment capacity, and industrial structure.

This study treats the staggered opening of the China–Europe Railway Express as a quasi-natural experiment and applies a multi-period difference-in-differences model to panel data for 29 Chinese provincial-level regions from 2010 to 2022. A regional economic synergy index is constructed using GDP per capita, fixed-asset investment per capita, and the share of the secondary industry. The analysis estimates the average policy effect, tests the parallel-trends assumption, conducts robustness checks, and examines heterogeneity across regions with different development conditions.

The study contributes to the literature by extending the evaluation of the China–Europe Railway Express from individual trade and transport outcomes to a multidimensional measure of regional economic synergy. It also considers differences in treatment timing and regional economic foundations, thereby providing a more differentiated assessment of the development effects of transport connectivity.

Literature Review

Recent studies on the China–Europe Railway Express mainly focus on trade creation, urban development, operational efficiency, and sustainable transformation. Mau and Seuren find that the expansion of China–Europe railway connections increases European exports to China and expands product variety, particularly in industries with intermediate time sensitivity [Mau, Seuren, 2023]. From an operational perspective, Feng et al. examine the pricing mechanism of integrated railway logistics and show that coordination among carriers is essential for improving the efficiency of the entire transport chain [Feng et al., 2023].

A second strand of research evaluates the regional and urban economic effects of railway operations. Liu and Meng employ a spatial DID model and find that the China Railway Express contributes to urban economic and trade vitality, although the magnitude of the effect varies across city types [Liu et al., 2024]. Chen et al. further show that railway-route expansion improves transport accessibility and supports the long-term development of Chinese cities through international trade, industrial expansion, innovation, and financial development, with particularly pronounced effects in inland cities [Chen et al., 2024].

Recent research has also extended the analysis to environmental and institutional dimensions. Zou and Feng report that international railway infrastructure promotes corporate green innovation, suggesting that the economic effects of the railway may extend beyond trade growth to sustainable

industrial transformation [Zou, Feng, 2024]. Yu et al. emphasize that infrastructure reliability, trade facilitation, and transport costs jointly determine the sustainable operation of the China–Europe Railway Express and its contribution to regional economic integration [Yu et al., 2024].

Overall, the existing literature confirms that the China–Europe Railway Express can influence trade, accessibility, urban development, logistics efficiency, and green innovation. However, most studies concentrate on individual outcomes or city-level effects. Less attention has been paid to whether the staggered opening of the railway produces a broader and more coordinated economic effect at the provincial level. This study addresses this gap by constructing a regional economic synergy index and applying a multi-period DID model to examine the overall effect, regional heterogeneity, and potential transmission channels.

Theoretical Mechanisms and Research Hypotheses

The opening of the China–Europe Railway Express may affect regional economic synergy through changes in transport accessibility, market integration, trade activity, and investment allocation. However, the magnitude of these effects depends on local economic conditions and the ability of regions to transform transport connectivity into productive economic activity.

The China–Europe Railway Express reduces the time cost of cross-border transportation and provides an alternative to maritime and air freight. Improved accessibility can expand market reach, strengthen interregional production linkages, and facilitate the movement of goods, capital, and intermediate inputs. These changes may enhance regional specialization and improve the allocation of economic resources.

At the same time, the opening of a railway service may generate complementary investment in logistics facilities, industrial parks, warehousing, and connecting infrastructure. Such investment can strengthen regional production capacity and contribute to the coordination of economic growth, investment, and industrial development.

Accordingly, the following hypothesis is proposed:

H1. The opening of the China–Europe Railway Express promotes regional economic synergy.

The economic effects of the railway are unlikely to be uniform across regions. Eastern regions generally possess stronger industrial foundations, more developed logistics systems, and greater access to international markets. By contrast, central and western regions may benefit more from improved land-based connectivity because the railway reduces their geographical disadvantage relative to coastal areas.

Nevertheless, regions with weaker initial economic foundations may lack the industrial, financial, and logistics capacity required to use the new transport corridor effectively. In such regions, the short-term effects may be limited or even negative because of high complementary investment costs, weak cargo demand, and intensified interregional competition. The policy effect may therefore vary according to location, initial development level, and treatment timing.

This leads to the second hypothesis:

H2. The effect of the China–Europe Railway Express on regional economic synergy differs across regions with different locations, initial development levels, and opening times.

The China–Europe Railway Express may influence regional economic synergy through three main channels.

First, improved transport accessibility may increase regional openness by reducing barriers between inland regions and international markets. Greater openness can strengthen external economic

linkages and facilitate the inflow of capital, technology, and intermediate goods.

Second, lower transport time and improved reliability may stimulate import and export activity. Trade expansion can enlarge market demand, promote industrial specialization, and strengthen interregional production networks, thereby supporting regional economic coordination.

Third, the opening of the railway may attract fixed-asset investment related to logistics, manufacturing, warehousing, and infrastructure. Stronger investment intensity can improve regional production capacity and create the complementary conditions required for transport connectivity to generate broader economic benefits.

Therefore, the following hypothesis is proposed:

H3. The China–Europe Railway Express promotes regional economic synergy by increasing economic openness, expanding trade volume, and strengthening investment intensity.

Overall, the theoretical framework suggests that the China–Europe Railway Express may generate both direct and indirect regional economic effects. However, these effects depend on the capacity of local economies to absorb and utilize the opportunities created by improved transport connectivity.

Research Design

This study uses a balanced panel of 29 Chinese provincial-level regions from 2010 to 2022, comprising 377 province-year observations. The staggered opening of the China–Europe Railway Express is treated as a quasi-natural experiment.

The dependent variable, *Synergy*, is a composite regional economic synergy index constructed using the entropy-weighting method. It combines GDP per capita, fixed-asset investment per capita, and the share of the secondary industry, with respective weights of 0.4620, 0.3816, and 0.1563.

The treatment variable is defined as:

$$DID_{it} = \begin{cases} 1, t \geq T_i \\ 0, t < T_i \end{cases}$$

where eT_i=max($OpenYear_i$,2013). Regions that opened the service before 2013 are therefore treated from 2013 onward, while later-opening regions are treated from their actual opening year. Population size ($lnPop$) is included as the baseline control variable. Economic openness ($Open$), trade volume ($lnTrade$), and investment intensity ($lnPCInv$) are used in further analyses.

The baseline multi-period DID model is specified as:

$$Synergyit=\alpha+\beta DIDit+\gamma Xit+\mu i+\lambda t+\varepsilon itSynergy_{it}=\alpha+\beta DID_{it}+\gamma X_{it}+\mu_i+\lambda_t+\varepsilon_{it}$$

Where μi and λt denote region and year fixed effects, respectively. The coefficient β captures the average effect of the China–Europe Railway Express opening on regional economic synergy. Standard errors are clustered at the provincial level.

To test the parallel-trends assumption and dynamic policy effects, the following event-study model is estimated:

$$\alpha + \sum\nolimits_{k\neq -1} \beta_k \, Event_{it}^{k} + \gamma X_{it} + \mu_i + \lambda_t + \varepsilon_{it}]$$

The year immediately before treatment ((k=-1)) is used as the reference period. Robustness checks include lagging the treatment year, replacing the dependent variable, excluding the earliest-opening regions, and conducting a placebo test. Further analyses examine heterogeneity across regional

location, initial development level, and treatment timing, as well as the roles of openness, trade, and investment intensity.

Empirical Results and Discussion

Table 1 reports the descriptive statistics of the main variables. The sample consists of 377 province-year observations covering 29 provincial-level regions between 2010 and 2022. The regional economic synergy index has a mean of 0.360 and a standard deviation of 0.134, indicating substantial cross-regional and intertemporal variation in economic development capacity, investment intensity, and industrial structure.

The mean value of DID is 0.581, implying that approximately 58.1% of the observations are located in the post-treatment period. The wide ranges of Open, lnTrade, pcGDP, and lnPCInv further reflect the pronounced heterogeneity among Chinese regions in terms of openness, trade scale, economic development, and investment capacity. Such variation provides the empirical basis for identifying the economic effects of the staggered opening of the China–Europe Railway Express.

Table 1 - Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
Synergy	377	0.360	0.134	0.078	0.763
DID	377	0.581	0.494	0.000	1.000
lnPop	377	8.224	0.748	6.333	9.448
Open	377	0.244	0.260	0.008	1.473
lnTrade	377	8.010	1.581	3.125	11.336
pcGDP	377	5.622	2.721	1.323	18.042
pcInv	377	4.176	1.760	0.892	9.543

Notes: Synergy denotes the regional economic synergy index. DID is the treatment indicator for the effective opening of the China–Europe Railway Express. lnPop is the logarithm of population size. Open measures economic openness. lnTrade is the logarithm of total imports and exports. pcGDP and lnPCInv denote GDP per capita and fixed-asset investment per capita, respectively.

Table 2 presents the baseline multi-period DIDestimates. Column (1) includes province and year fixed effects but excludes the additional control variable. The coefficient of DID is -0.021. After controlling for population size in Column (2), the coefficient decreases in absolute value to -0.014. Neither estimate is statistically significant at conventional levels.

The results therefore provide no evidence that the opening of the China–Europe Railway Express generated an immediate and uniform improvement in regional economic synergy over the sample period. This does not necessarily imply that the railway service has no economic value. Rather, it suggests that the conversion of improved transport connectivity into broader regional coordination is not automatic. New railway services may reduce physical transport barriers, but their wider economic effects depend on whether local economies possess sufficient trade demand, industrial capacity, logistics infrastructure, and market integration to absorb and amplify the connectivity shock.

The insignificant average treatment effect may also reflect the multidimensional nature of the dependent variable. The regional economic synergy index captures not only trade-related activity but also changes in per capita output, investment capacity, and industrial structure. The opening of a railway route may affect these components at different speeds and in different directions. Short-term construction and adjustment costs may coexist with longer-term gains, thereby weakening the average effect estimated over the full sample.

The validity of the DID strategy depends on the absence of systematic differences in pre-treatment trends. The joint test of the pre-treatment coefficients yields a p-value of 0.822, indicating that the pre-treatment coefficients are jointly insignificant. This result supports the parallel-trends assumption and suggests that the post-treatment estimates are unlikely to be driven by differential pre-existing trends.

The remaining columns report several robustness checks. Delaying treatment by one year produces a coefficient of -0.013, which remains statistically insignificant. Replacing the dependent variable with an alternative composite index yields a coefficient close to zero. The estimates also remain insignificant after excluding the earliest-opening regions and assigning a placebo treatment date three years before the effective treatment year. The stability of the sign and significance pattern across alternative specifications indicates that the baseline result is not sensitive to a particular treatment definition, sample composition, or index construction method.

Table 2 - Baseline DID Estimates, Parallel-Trend Test, and Robustness Checks

Variables	Baseline	With Controls	Lagged Treatment	Alternative Index	Excluding Early Regions	Placebo Test
DID	-0.021	-0.014	-0.013	-0.000	-0.010	-0.008
	(0.013)	(0.013)	(0.014)	(0.007)	(0.013)	(0.017)
Controls	No	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	377	377	377	377	351	377
R^2	0.853	0.878	0.878	0.980	0.878	0.877
Pre-trend joint test p-value	—	0.822	—	—	—	—

Notes: Cluster-robust standard errors at the provincial level are reported in parentheses. The robustness checks include delaying treatment by one year, replacing the dependent variable with an alternative composite index, excluding the earliest-opening regions, and assigning a placebo treatment date three years earlier. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

The average treatment effect may conceal differences across regions with distinct economic structures and development conditions. Table 3 therefore reports subsample estimates based on regional location, initial development level, and treatment timing.

The estimated coefficient is -0.004 for eastern regions and -0.021 for central and western regions. Although the coefficient is larger in absolute value for the central and western subsample, neither estimate is statistically significant. This pattern indicates that the short-run economic adjustment associated with railway opening may be stronger in inland regions, but the available evidence is insufficient to establish a statistically robust regional difference.

A more pronounced result emerges when the sample is divided by initial development level. The estimated coefficient for high-development regions is close to zero and statistically insignificant, whereas the coefficient for low-development regions is -0.028 and significant at the 5% level. Economically, this result suggests that regions with weaker initial economic foundations may face greater short-term adjustment costs after the introduction of new international transport services.

Several mechanisms may account for this pattern. First, less-developed regions may lack the industrial and logistics capacity needed to transform transport accessibility into export expansion and production upgrading. Second, the opening of a new transport corridor may require substantial complementary investment before positive spillovers materialize. Third, improved connectivity may intensify interregional competition and facilitate the outward movement of capital, labor, or commercial activity from weaker regions toward more productive centers. In this case, the short-term

effect may be negative even if longer-term effects become positive.

Nevertheless, the subgroup result should be interpreted cautiously. The formal interaction tests do not establish statistically significant differences between high- and low-development regions. The significant coefficient in the low-development subsample therefore indicates a conditional pattern within that group rather than definitive evidence of structural heterogeneity across groups.

The estimates for early- and late-opening regions are both statistically insignificant. This suggests that an earlier opening does not necessarily guarantee a stronger regional synergy effect. The economic return to railway access may depend more on complementary local conditions than on the duration of operation alone.

The last three columns of Table 3 examine possible transmission channels. The estimated coefficient of DIDis positive for economic openness but statistically insignificant. The coefficients for trade volume and investment intensity are negative and also insignificant. Therefore, the results do not support the hypothesis that the opening of the China–Europe Railway Express systematically increases openness, trade activity, or investment intensity at the provincial level during the sample period.

One possible explanation is that the economic effects of the railway are concentrated in specific cities, logistics hubs, firms, or industries, while the province-level indicators used here aggregate over a much broader economic area. As a result, localized gains may be diluted in provincial averages. In addition, the effect of railway services may depend on route frequency, cargo composition, government subsidies, and the degree of integration with local supply chains, none of which is directly measured in the current dataset.

Table 3 - Heterogeneity and Mechanism Tests

Variables	DID		Controls	Province FE	Year FE	Observations	R^2
East	-0.004	(0.019)	Yes	Yes	Yes	130	0.873
Central-West	-0.021	(0.017)	Yes	Yes	Yes	247	0.866
High Development	-0.003	(0.024)	Yes	Yes	Yes	195	0.854
Low Development	-0.028**	(0.012)	Yes	Yes	Yes	182	0.870
Early Opening	-0.008	(0.033)	Yes	Yes	Yes	221	0.847
Late Opening	-0.020	(0.018)	Yes	Yes	Yes	156	0.935
Open	0.019	(0.024)	Yes	Yes	Yes	377	0.953
lnTrade	-0.059	(0.075)	Yes	Yes	Yes	377	0.975
lnPCInv	-0.085	(0.074)	Yes	Yes	Yes	377	0.795

Notes: Columns (1)–(6) report heterogeneous treatment effects by regional location, initial development level, and treatment timing. Columns (7)–(9) report mechanism regressions in which economic openness, trade volume, and investment intensity are used as dependent variables. Cluster-robust standard errors at the provincial level are reported in parentheses. ***, **, and* denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 4 introduces the proposed channel variables directly into the regional economic synergy equation. The purpose of this exercise is not to establish formal mediation but to examine whether these variables are independently associated with regional economic synergy after accounting for the treatment indicator, population size, and fixed effects.

The coefficient of economic openness is -0.068 and statistically insignificant. By contrast, the coefficient of lnTrade is 0.062 and significant at the 1% level. This result indicates that, holding other factors constant, provinces with stronger trade activity tend to exhibit higher levels of regional economic synergy. Trade expansion may contribute to regional coordination by enlarging markets, increasing specialization, facilitating the diffusion of intermediate inputs, and strengthening interregional production linkages.

Investment intensity also displays a strong positive association with the dependent variable. The coefficient of lnPCInv is 0.178 and significant at the 1% level. This suggests that investment capacity is an important condition for transforming transport accessibility into broader economic outcomes. Regions with stronger investment support may be better positioned to develop logistics facilities, industrial parks, warehousing systems, and connecting infrastructure, thereby increasing the economic return to international transport corridors.

After lnPCInv is introduced, the coefficient of DID becomes close to zero. Although this pattern is consistent with the possibility that investment conditions absorb part of the relationship between railway opening and regional economic synergy, it cannot be interpreted as evidence of a causal mediation effect. The mechanism regression in Table 3 does not show that railway opening significantly increases investment intensity. The same limitation applies to trade volume.

Taken together, the results indicate that trade scale and investment capacity are strongly associated with regional economic synergy, but the opening of the China–Europe Railway Express alone is insufficient to generate these effects. The economic contribution of the railway appears to depend on complementary conditions that determine whether transport connectivity can be converted into sustained production, trade, and investment activity. This finding shifts the interpretation from a simple infrastructure effect toward a conditional development effect: connectivity creates opportunities, but regional economic outcomes depend on the capacity to use them.

Table 4 - Augmented Outcome Regressions

Variables	(1)	(2)	(3)
DID	-0.013	-0.011	0.001
	(0.014)	(0.013)	(0.009)
Open	-0.068		
	(0.093)		
lnTrade		0.062***	
		(0.019)	
lnPCInv			0.178***
			(0.013)
Controls	Yes	Yes	Yes
Province FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	377	377	377
R^2	0.878	0.891	0.953

Notes: The dependent variable is the regional economic synergy index. Cluster-robust standard errors at the provincial level are reported in parentheses. All specifications control for population size and include province and year fixed effects. Column (1) includes economic openness, Column (2) includes trade volume, and Column (3) includes investment intensity.***, **, and* denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Conclusion and Policy Recommendations

This study examines the effect of the staggered opening of the China–Europe Railway Express on regional economic synergy using a multi-period DID model and panel data for 29 Chinese provincial-level regions from 2010 to 2022. The baseline results show that the estimated average treatment effect is negative but statistically insignificant. This finding remains stable after changing the treatment timing, replacing the dependent variable, excluding the earliest-opening regions, and conducting a placebo test. The results therefore do not provide sufficient evidence that the opening of the railway service generates an immediate and uniform improvement in regional economic synergy.

The heterogeneity analysis further shows that the estimates differ across regions with different economic conditions. In particular, the negative effect is statistically significant in regions with a low initial development level, although the formal interaction tests do not confirm a significant difference between groups. This result suggests that less-developed regions may face short-term adjustment costs because improved transport accessibility must be supported by sufficient industrial capacity, logistics services, and investment resources before broader economic benefits can emerge.

The mechanism tests do not show that railway opening significantly increases economic openness, trade volume, or investment intensity. However, the augmented regressions indicate that trade volume and investment intensity are positively associated with regional economic synergy. Accordingly, the economic value of the China–Europe Railway Express appears to depend less on the formal opening of a route itself than on whether regional economies can transform transport connectivity into sustained trade, investment, and industrial activity.

These findings lead to several policy implications. First, the development strategy of the China–Europe Railway Express should shift from quantitative expansion toward service quality and network efficiency. Local governments should place greater emphasis on train frequency, loading rates, return cargo, customs coordination, and multimodal connections. Recent network-based research shows that infrastructure gaps, border inefficiencies, inconsistent customs procedures, and limited multimodal integration continue to restrict the performance of some railway nodes [Wang, Chen, 2025].

Second, differentiated regional policies are required. Less-developed regions should not rely solely on operating subsidies or the establishment of new routes. Policy support should also strengthen industrial parks, logistics centers, warehousing facilities, and local export capacity. This is particularly important because the wider development benefits of railway infrastructure may emerge through technological innovation, industrial upgrading, and financial development rather than through transport accessibility alone [Wang et al., 2023].

Third, the resilience of cross-border transport corridors should be strengthened. The disruption of the Eurasian rail land bridge after 2022 demonstrated the risks associated with dependence on a limited number of transit routes and critical nodes [Pomfret, 2023]. The development of alternative corridors, improved coordination with transit countries, and stronger risk-management mechanisms can reduce the vulnerability of China–Europe supply chains.

Finally, the performance evaluation of the China–Europe Railway Express should move beyond the number of routes and trains. A more comprehensive assessment should include cargo value, operating efficiency, return-trip balance, private-sector participation, industrial spillovers, regional trade growth, and environmental performance. Overall, the China–Europe Railway Express should be regarded as enabling infrastructure whose regional economic effects depend on complementary trade, investment, industrial, and institutional conditions.

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Влияние железнодорожных перевозок Китай–Европа на согласованное региональное экономическое развитие в рамках инициативы «Один пояс, один путь»: результаты многоэтапной модели разностей-в-разностях

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Аннотация

В статье исследуется влияние железнодорожных перевозок Китай–Европа на согласованное региональное экономическое развитие в рамках инициативы «Один пояс, один путь». На основе сбалансированных панельных данных по 29 регионам провинциального уровня Китая за 2010–2022 гг. поэтапное открытие железнодорожных маршрутов рассматривается как квазиэксперимент, а для оценки его последствий применяется многоэтапная модель разностей-в-разностях. Индекс согласованного регионального экономического развития рассчитывается методом энтропийного взвешивания на основе ВВП на душу населения, инвестиций в основной капитал на душу населения и доли вторичного сектора экономики. Результаты базовой оценки показывают, что средний эффект воздействия является отрицательным, однако статистически незначимым. Данный вывод сохраняется после корректировки момента начала воздействия, замены зависимой переменной, исключения регионов, наиболее рано открывших маршруты, а также проведения плацебо-теста. Проверка параллельности трендов подтверждает обоснованность выбранной стратегии идентификации. Анализ неоднородности выявляет статистически значимый отрицательный краткосрочный эффект в регионах с низким исходным уровнем развития, хотя формальные тесты взаимодействия не подтверждают статистически значимых различий между группами. Проверка механизмов не выявляет доказательств того, что открытие железнодорожных маршрутов существенно повышает уровень экономической открытости, объём внешней торговли или интенсивность инвестиций. Вместе с тем расширенные регрессионные модели показывают, что объём торговли и интенсивность

инвестиций положительно связаны с согласованным региональным экономическим развитием. Полученные результаты свидетельствуют о том, что региональные экономические эффекты железнодорожных перевозок Китай–Европа зависят не только от транспортной связанности, но и от сопутствующих промышленных, торговых, инвестиционных и институциональных условий.

Для цитирования в научных исследованиях

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Ключевые слова

Железнодорожные перевозки Китай–Европа, инициатива «Один пояс, один путь», согласованное региональное экономическое развитие, многоэтапная модель разностей-в-разностях, региональная неоднородность, транспортная связанность.

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