Impact of Transport Infrastructure on Common Prosperity: Based on the Two-Way Fixed Effects Model

Guoli Ou[1,2], Zhiqiang Zhu[1,*][a], Xiaoling Xie[1] and Junwei Wang[2]
[1]*The Platform of Transport Technology Thinktank (Research Institute of Highway, Ministry of Transport), Beijing 100089, China*
[2]*School of Economics and Management, Beijing Jiaotong University, Beijing 100044, China*
*

Keywords: Transport Infrastructure, Urban-Rural Income Disparity, Common Prosperity, Labor Mobility.

Abstract: Transportation has become the pioneer of Chinese modernization and plays an important role in achieving common prosperity. From the perspective of urban-rural income disparity, we empirically investigate the effect of transport infrastructure on common prosperity, the mechanism and nonlinear characteristics based on panel data of 30 provinces in China from 2001 to 2020. The results show that transport infrastructure can significantly reduce the urban-rural income disparity and promote common prosperity by the mechanism of labor mobility. With the continuous improvement of the transportation network, the effect of transport infrastructure in narrowing urban-rural income disparity and promoting common prosperity shows a marginal incremental trend. Our findings provide rewarding policy implications for the practice that transportation continues to empower the common prosperity in the new era.

1 INTRODUCTION

Common prosperity is the essential requirement of Chinese socialism. Realizing common prosperity in high-quality development is essentially a process of correctly handling the relationship between efficiency and equity and pursuing a balance between social equity and efficiency. As China enters the stage of high-quality development, the issue of urban-rural income disparity has become the most intuitive manifestation of potential economic and social inequities. Although the urban-rural income disparity has begun to converge in recent years, the serious imbalance in the distribution of income between urban and rural areas remains a constraint on China's ability to make substantial progress in promoting common prosperity.

In the previous literature, the positive effects of transport infrastructure on economic growth have emerged a basic consensus. Transport infrastructure improves the efficiency of capital flows, mainly by improving accessibility and reducing transport transaction costs (Baldwin and Martin, 2003), which in turn facilitates regional exchanges and international trade, affecting interregional trade costs and price differentials and thus increasing regional income levels (Donaldson, 2018). However, the positive effect of transport infrastructure on economic growth is significantly heterogeneous across regions (Zhang et al., 2024) and modes of transportation (Shi and Shen, 2023). In response to the existence of heterogeneity, Banerjee et al. (2020) point out that while transport infrastructure continues to strengthen linkages between urban and rural areas (Banerjee et al., 2020), urban area with more prominent locational advantages will continue to gather rural out-migration capital, thereby limiting or even worsening rural economic development and increasing the disparity between urban and rural development. Investment in transport infrastructure such as high-speed rail may also deteriorate regional economic conditions due to its high investment price and long payback cycle (Yoo et al., 2024).

The impact of transport infrastructure on the urban-rural income disparity has not yet been unanimously concluded in existing studies. Some scholars argue that differences in the level of transport infrastructure may exacerbate urban-rural

[a] https://orcid.org/0009-0001-3132-9728

Ou, G., Zhu, Z., Xie, X., Wang and J.
Impact of Transport Infrastructure on Common Prosperity: Based on the Two-Way Fixed Effects Model.
DOI: 10.5220/0013573100004671
In *Proceedings of the 7th International Conference on Environmental Science and Civil Engineering (ICESCE 2024)*, pages 37-44
ISBN: 978-989-758-764-1; ISSN: 3051-701X

income disparities, as public capital investment tends to be negatively correlated with income disparities in the short run, but may be positively correlated in the long run (Lu et al., 2022). Interregional public transportation infrastructure may also widen the urban-rural income disparity (Valenzuela-Levi, 2023). Others hold that the impact of transport infrastructure on the rural-urban income disparity may be characterized by significant threshold nonlinearities, and that while improved transport infrastructure promotes connectivity between rural and urban areas and equalization of access to resources, such improvements may not be sufficient in the short term to fully reverse the lag in rural areas (Ma et al., 2023). With regard to the mechanism of transport infrastructure affecting the urban-rural income disparity, previous literatures have focused on the important role of labor mobility factors, such as the proportion of the rural population, in the impact of transport infrastructure on the rural-urban income disparity (Ren and Zhang, 2013), suggesting that its impact on rural labor mobility shows a dynamically changing correlation (Sun, 2020).

Existing literature provides substantial references for revealing the impact of transport infrastructure on the urban-rural income disparity, but the conclusions are mostly based on linear assumptions, with certain deviations from the reality, lacking explanations of the internal mechanisms, and the theoretical guidance for promoting urban-rural coordination and common prosperity needs to be deepened. Therefore, from the perspective of urban-rural income disparity and based on the nonlinear correlation hypothesis, we empirically investigate the impact, mechanism and nonlinear characteristics of transport infrastructure on common prosperity by using Chinese provincial panel data from 2001-2020. The conclusions provide theoretical guidance and significant policy implications for the construction of transportation facilities to further promote common prosperity in the new era.

2 THEORETICAL ANALYSIS AND RESEARCH HYPOTHESIS

Compared with urban residents, rural residents have less access to factors of production and resources in terms of quantity and quality, as well as less efficient use of resources, a situation that can be improved by investing in transport infrastructure. Firstly, transport infrastructure can directly provide employment opportunities, and its construction and maintenance periods generate a large demand for less technically demanding labor, which enriches the income sources of rural labor and increases their incomes (Ma et al., 2023). Secondly, transport infrastructure can effectively reduce production transaction costs, smooth urban-rural trade routes, expand the spatial scope of markets, and increase farmers' revenue. It can also improve the structure of industrial development in rural areas, promote the development of the non-agricultural economy, solve the problem of employment for the impoverished (Ren and Zhang, 2013). Thirdly, transport infrastructure can promote the economy of road diffusion industry, so that the resources along that are exploited to a greater extent, radiate and drive the development of the surrounding areas (Sun, 2020), promote the integration of urban and rural economy, and thus facilitate the common prosperity.

According to the dual structure theory, the existence of a sectoral wage disparity will make rural laborers tend to move across sectors in order to earn higher incomes, but high mobility costs will restrict rural laborers from moving across urban and rural areas in practice, so that they will continue to engage in low-income jobs in rural areas, and the urban-rural income disparity will still exist due to the obstruction of labor mobility (Banerjee et al., 2020). Transport infrastructure will enhance urban and rural connectivity, reduce the cost of rural labor migrating, and promote labor mobility. As the transportation network is continuously improved and the cost of urban-rural travel is increasingly reduced, rural surplus labor will be transferred to the non-agricultural sector on a larger scale, and as the degree of urban-rural connectivity deepens, a large number of farmers will return to their hometowns to find employment and start their own businesses, thus realizing the optimal allocation of a wider range of labor resources, narrowing the gap between urban and rural areas, and promoting common prosperity (Liu and Zheng, 2013).

Transport infrastructure is inseparable from its construction and use and therefore may have threshold character. It means that transport infrastructure often

needs to reach a certain scale and size to play its role (Chen et al., 2021). According to the theory of matching transport supply and demand, when the stock of transport infrastructure is lower than the demand, high transportation costs will affect production efficiency, impede the cross-regional circulation of factors and limit economic development. Non-equilibrium theory shows that high-investment, long-cycle transport infrastructure construction needs to be moderately ahead of social

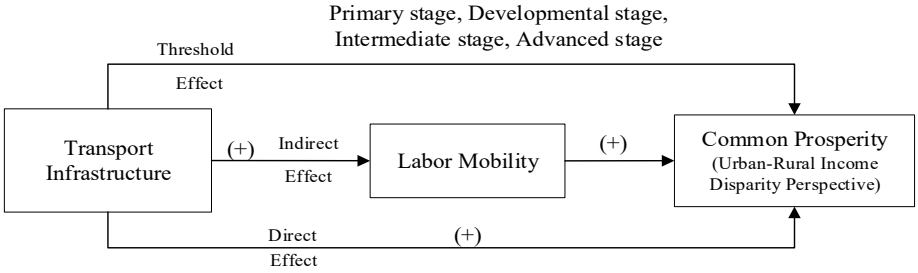

Figure 1: Logical mechanisms by which transport infrastructure affects common prosperity.

demand to give full play to its pioneering role, but too large a scale may lead to overinvestment, squeezing the space for other investments and inhibiting the development of other sectors. Therefore, the level of transport infrastructure determines the direction and extent of its effect on the urban-rural income disparity (Yang and Shi, 2019). Thus, we put forward to the following hypothesis:

Hypothesis 1: Transport infrastructure can narrow urban-rural income disparity and thus promote common prosperity.

Hypothesis 2: Transport infrastructure facilitates labor mobility, which in turn will affect the urban-rural income disparity and promote common prosperity.

Hypothesis 3: The impact of transport infrastructure on common prosperity from the perspective of urban-rural income disparity exhibits significant nonlinear characteristics.

Based on the above theoretical analysis, the internal mechanism of transport infrastructure affecting common prosperity is summarized as shown in Figure 1.

3 METHOD AND RESEARCH DESIGN

3.1 Empirical Model

Aiming to control for individual and time fixed effects and accurately estimate the causal relationship, we employ a Two-Way Fixed Effects (TWFE) model to examine the effect of transport infrastructure on common prosperity.

$$Theil_{it} = \alpha_0 + \alpha_1 trans_{it} + \alpha_2 control_{it} + \varepsilon_{it} + \gamma_t + \mu_i \quad (1)$$

Where $Theil_{it}$ is the dependent variable common prosperity, i denotes province i, t denotes the year t, $trans$ denotes the core explanatory variable transportation network density, $control$ is the control variable, α denotes the coefficients in front of each variable, γ_t is the time fixed effect, μ_i is the individual fixed effect, and ε_{it} is the error term. α_1 is the regression coefficient of the core explanatory variable, and since the level of common prosperity is measured inversely by the rural-urban income disparity indicator, when the coefficient is less than 0, it indicates that transport infrastructure has a significant promotion effect on common prosperity.

In order to verify the mechanism of labor mobility, we construct a mechanism testing model based on the causal step-by-step regression improvement method as follows:

$$Theil_{it} = \beta_0 + \beta_1 trans_{it} + \beta_2 control_{it} + \varepsilon_{it} + \gamma_t + \mu_i \quad (2)$$

$$labor_{it} = \gamma_0 + \gamma_1 trans_{it} + \gamma_2 control_{it} + \varepsilon_{it} + \gamma_t + \mu_i \quad (3)$$

$$CP_{it} = \eta_0 + \eta_1 trans_{it} + \eta_2 labor_{it} + \eta_3 control_{it} + \varepsilon_{it} + \gamma_t + \mu_i \quad (4)$$

Where β, γ, η is the variable pre-regression coefficient, $labor$ is the mechanism variable labor mobility, and the rest of the variables and parameters have the same meanings as above.

We conduct a panel threshold model to examine the nonlinear characteristics of transport infrastructure affecting common prosperity. First, a single threshold model is constructed as follows:

$$Theil_{it} = \omega_0 + \omega_1 trans_{it} I(trans_{it} \le \lambda) + \omega_2 trans_{it} I(trans_{it} > \lambda) + \theta control_{it} + \varepsilon_{it} + \gamma_t + \mu_i \quad (5)$$

If multiple thresholds exist, the model is converted as follows:

$$Theil_{it} = \omega_0 + \omega_1 trans_{it} I(trans_{it} \le \lambda_1) + \omega_2 trans_{it} I(\lambda_1 < trans_{it} \le \lambda_2) + \cdots + \omega_{n+1} trans_{it} I(trans_{it} > \lambda_n) + \theta control_{it} + \varepsilon_{it} + \gamma_t + \mu_i \quad (6)$$

ω is the pre-regression coefficient of each variable, λ is the threshold to be estimated, I is the

indicator function, θ is the coefficient of the control variable, and the rest of the variables and parameters have the same meaning as above.

3.2 Variable Selection

a) The dependent variable is the level of common prosperity ($Theil$). This paper chooses Theil index to measure the urban-rural income disparity, and the urban-rural income disparity to measure the level of regional common prosperity. The Theil Index is calculated as follows:

$$Theil_{it} = P_i/P \sum_{i=1}^{n} log(\bar{y}/y_i) \quad (7)$$

$$Theil_{it} = \sum_{g=1}^{G} P_g Theil_g + \sum_{g=1}^{G} P_g log(P_g/V_g) \quad (8)$$

Where *Theil* is the Theil index, P_i denotes the number of population in region *i*, *P* denotes the total population of the regional, y_i denotes the per capita income of region *i*, $\bar{y}$ is the average of y_i, and equation (8) is the decomposition formula further grouped according to the region, and the first term of the formula denotes the difference in per capita income among the regions within each group divided into groups, and the second term denotes the difference between the groups, and V_g denotes the proportion of income of group g to the total income, and P_g denotes the proportion of population of group g to the total population of the region, and larger values of the Theil Index imply a wider urban-rural income disparity and a lower level of common prosperity in the region.

b) The core explanatory variable is transport infrastructure (*trans*). In this paper, we use the transportation network density (the ratio of the mileage of transport infrastructure in operation to the administrative area), which is an indicator of the stock of two modes of transportation: road and rail, to measure the level of transport infrastructure development.

c) The mechanism variable is labor mobility(*labor*). Considering that urban-rural connectivity brought about by transport infrastructure is largely manifested in the expansion of non-farm employment income by the rural labor force going out to work, we select the proportion of the labor force going out to work to the total labor force to measure the labor mobility.

d) Control variables. In order to avoid the bias of estimation results caused by omitted variables, this paper introduces a series of control variables that may affect the common prosperity based on the existing literature, specifically included: financial development(*fina*), industrial structure(*indus*), the level of openness to the world(*open*), government intervention(*gov*), economic growth(*gdp*), and education level(*edu*). The description of the specific variables is shown in Table 1.

Table 1: Description of variables.

Type	*Definition*	*Notation*	*Conjecture*
dependent variable	Common prosperity	*Theil*	Urban and rural Theil Index
Core explanatory variable	transportation network density	*trans*	Sum of public-railway mileage/administrative area
Mechanism variable	labor mobility	*labor*	Outworker labor force/overall labor force
Control variables	financial development	*fina*	Year-end loan balances of financial institutions/GDP
	industrial structure	*indus*	Secondary and tertiary industry output/total output
	the level of openness to the world	*open*	Total exports and imports/GDP
	government intervention	*gov*	Government budget expenditure/GDP
	economic growth	*gdp*	GDP per capita
	education level	*edu*	Average years of schooling

3.3 Data Sources

In this paper, we select the panel data of 30 provinces (municipalities directly under the central government and autonomous regions) in China, excluding Tibet, Hong Kong, Macao and Taiwan, from 2001 to 2020 to examine the impact of transport infrastructure on common prosperity from the perspective of the urban-rural income disparity, and the data are mainly from the National Bureau of Statistics (NBS), China Statistical Yearbook, China Science and Technology Statistical Yearbook, China Industrial Statistical Yearbook, China Transportation Statistical Yearbook, China Internet Development Statistical Bulletin, GuotaiAn database, CEI statistics, as well as provincial and municipal statistical yearbooks.

Figure 2 and Figure 3 show the overall level of transport infrastructure development and urban-rural income disparity in China from 2001 to 2020, and it can be seen that the trend and direction of transport infrastructure and urban-rural income disparity are negatively correlated in general, and this paper further estimates and verifies the effect of transport infrastructure affecting the common prosperity and the mechanism of which from the perspective of urban-rural income disparity through the following empirical model.

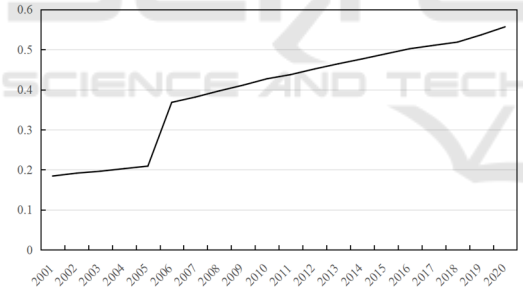

Figure 2: Transport infrastructure development.

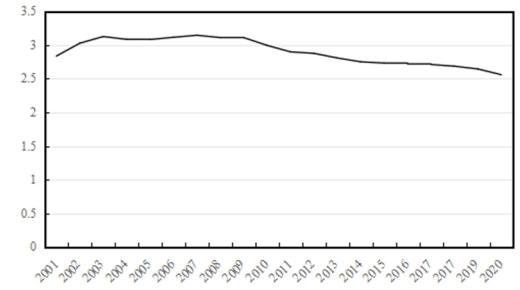

Figure 3: Urban-rural income disparity.

4 EMPIRICAL RESULT AND ANALYSIS

4.1 Benchmark Regression Results

In this paper, we use Stata17.0 to analyze and estimate the model for each variable and related data. According to the results of Hausman's test, a TWFE model is chosen to verify the core hypothesis 1. Table 2 reports the estimation results of the effect of transport infrastructure on common prosperity after adding control variables, time fixed effects, and province fixed effects. The results show that the estimated coefficient of the core explanatory variable, transport network density *trans*, is significantly negative at 1% statistical level, indicating that the improvement of transport infrastructure conditions contributes to the reduction of the urban-rural income disparity and thus promote the realization of common prosperity. The regression coefficients and significance of the remaining control variables are basically consistent with expectations, proving the rationality of the model setup in this paper, and hypothesis 1 is supported by empirical evidence.

Table 2: Benchmark regression results.

Explanatory Variable	Theil
trans	-0.3233*** (0.0718)
fina	-0.1319** (0.0617)
indus	-0.3188 (0.5588)
open	-0.0688** (0.0312)
gov	0.0707 (0.0587)
gdp	-0.1684** (0.0783)
edu	-0.8284** (0.4003)
cons	-9.8685*** (0.8510)
Province/Year fixed effects	YES
N	600
R^2	0.5291

Note: ***, **, * indicate significant at the 1 percent, 5 percent and 10 percent significance levels, respectively, and () is the standard error, as below.

4.2 Mechanical Test

The estimation results of the labor mobility mechanism test are shown in Table 3. As shown in

column (1) of Table 3, the regression coefficient of the total effect of transport infrastructure on common prosperity is -0.3233. In column (2), the coefficient of the effect of transport infrastructure on labor mobility is 0.0665. In column (3), the coefficient of the effect of labor mobility on common prosperity is -0.2904, and all of them are signed at the 1% significance level in line with the expected hypothesis. It indicates that labor mobility is an important mechanism path in the process of transport infrastructure to narrow the urban-rural income disparity and promote common prosperity, and hypothesis 2 of this paper is verified.

Table 3: Mechanism path test results.

Variable	(1)	(2)	(3)
	Theil	***labor***	***Theil***
trans	-0.3233*** (0.0818)	0.0665*** (0.0125)	-0.2904*** (0.0753)
cons	-9.8685*** (0.8510)	-0.7429*** (0.1308)	8.8462*** (0.6217)
control variable	YES	YES	YES
Province/Year fixed effects	YES	YES	YES
N	600	600	600
R^2	0.5291	0.7592	0.5565

4.3 Threshold Effect Test

The non-linear characteristics of transport infrastructure affecting common prosperity are regressed using Stata 17.0 software. The results of threshold value estimation are shown in Table 4. Comparison of the F-statistics reveals that the triple threshold estimates pass the 1% significant level test, indicating the existence of three thresholds for transportation on common prosperity. The regression results in Table 5. Results show that the three threshold estimates are 0.1421, 0.7458 and 1.2875, respectively, and based on the actual values of the threshold estimates, the development of transport infrastructure can be divided into four phases, which are the primary stage(0<*trans*≤0.1421), the developmental stage(0.1421<*trans*≤0.7458), the intermediate stage(0.7458<*trans*≤1.2875), and the advanced stage(*trans*>1.2875).

Table 4: Threshold effect test results.

model	F-value	P-value
single threshold	23.7734	0.0000
double threshold	12.6531	0.0000
triple threshold	5.7457	0.0010

As can be seen from Table 5, when the density of the transport network is less than the 1st threshold 0.1421, the impact coefficient is 0.0399, which is significantly positive at 5% statistical level, indicating that in the primary stage of the development of transport infrastructure, the inadequate transport infrastructure will exacerbate the urban-rural income disparity, which is detrimental to the promotion of the common prosperity. When the density of the transport network is between the 1st threshold 0.1421 and the 2nd threshold 0.7458, between the 2nd threshold 0.7458 and the 3rd threshold 1.2875, and higher than the 3rd threshold 1.2875, the regression coefficients are -0.0754, -0.2978, and -0.4428, respectively, which are significantly negative at 1% statistical level, indicating that as the transport infrastructure crosses over to the stage of development and further develops to the intermediate and advanced stages, it can significantly narrow urban-rural income disparity and promote common prosperity. It is obvious that as the level of transport infrastructure stock increases, the contribution of transport infrastructure to common prosperity has a marginal increasing trend in the second, third and fourth stages. Therefore, Hypothesis 3 of this paper is validated.

Table 5: Threshold effect parameter estimation results.

Explanatory variable: *Theil*	
Threshold variables: *trans*	**Coefficient Estimate**
0<*trans*≤0.1421	0.0399** (0.0184)
0.1421<*trans*≤0.7458	-0.0754*** (-0.0201)
0.7458<*trans*≤1.2875	-0.2978*** (-0.0611)
trans>1.2875	-0.4428*** (-0.0948)

Possible explanations for the non-linear growth characteristics of China's transport infrastructure in narrowing the urban-rural income disparity and promoting common prosperity are: when the transport infrastructure is in the primary stage, the density of the transport network is inadequate, and the

investment will be biased towards the urban areas, which promotes the economic development and income enhancement of the urban areas much more than the rural areas, resulting in the widening of the income disparity between urban and rural areas, which is not conducive to the common prosperity. With the continuous improvement of the transport infrastructure, the transportation network gradually covers rural areas and tends to be more comprehensive, due to the slow development of rural areas at the initial stage, the development potential is huge, so the latecomer advantage is strong, and this promotion effect gradually exceeds that of urban areas, showing a non-linear growth trend with an increasing marginal effect.

4.4 Robustness Test

In order to ensure the robustness of the research results, this paper replaces the core explanatory variable urban-rural Theil index with urban-rural residents' income ratio for the robustness test, and with the rest of the variables unchanged, regresses the baseline regression model, the mechanism model and the threshold effect respectively. The results of the three tests show that neither significance nor the direction of the coefficients have changed significantly, so the findings of this paper are very robust and all hypotheses are strongly validated. Due to space constraints, the robustness test estimates are not reported in the paper and can be obtained by contacting the authors.

5 CONCLUSIONS AND POLICY IMPLICATIONS

This paper studies the impact of transport infrastructure on common prosperity from the perspective of urban-rural income disparity using China's provincial panel data from 2001 to 2020. Regression results show that transport infrastructure significantly reduces the urban-rural income disparity and promotes the process of common prosperity in China. Further mechanistic analysis finds that transport infrastructure can facilitate urban-rural labor mobility and enhance urban-rural connectivity, thereby narrowing the urban-rural income disparity and promoting common prosperity. The impact of transport infrastructure on common prosperity shows significant non-linear characteristics. At the primary stage, when the level of transport infrastructure development is low, it exacerbates the urban-rural income disparity, and when it transitions to the developmental stage, the intermediate stage and the advanced stage, transport infrastructure markedly reduces the urban-rural disparity and promotes common prosperity, with the effect showing a tendency to increase at the margin.

The findings of this study provide valuable policy implications for empowering transportation for common prosperity in the new era. First of all, the government should pay attention to the construction of transport infrastructure, focus on urban-rural transport connection, enhance the accessibility of transport infrastructure, maximize the effect of transport infrastructure in narrowing urban-rural income disparity, and continue to promote common prosperity. Secondly, the government should optimize the process of mobility of rural labor, strengthen the construction and supervision of the labor market, enhance urban-rural economic ties, raise the income of rural labor, and ensure that the transport infrastructure boosts labor mobility to maximize its effect. Thirdly, other factors affecting the urban-rural income disparity need to be emphasized by the government. Strengthening interregional open exchanges, unleashing the vitality of rural economic development, improving the competitiveness of rural employment, supporting rural industries with special characteristics, and synergizing with transport infrastructure will continue to empower the common prosperity to move to a new level.

6 DISCUSSION

In this study, we constructed a TWFE model to reveal the impact of transport infrastructure on common prosperity from the perspective of the urban-rural income disparity, and also clarified the mechanism and non-linear effects of transport infrastructure on common prosperity, which provides policy implications for the practice, but the study still has several limitations. First, the connotation of common prosperity is abundant, and this paper only focuses on urban-rural income disparity, which can be studied in the future by constructing a quantitative index system taking other social factors into consideration. Second, the mechanism that transport infrastructure affects common prosperity is complicated, although we have revealed it from the perspective of labor mobility based on provincial data, it is still an important research direction to further explore its mechanism with a more detailed urban dimension data in the future.

ACKNOWLEDGEMENT

This paper is financially supported by Opening Funding Supported by the Platform of Transport Technology Thinktank (Research Institute of Highway, Ministry of Transport), Beijing, PRC, "How does Transportation Promote Common Prosperity".

REFERENCES

Baldwin, R. E., Martin, P. 2003. Agglomeration and Regional Growth. *Handbook of Regional and Urban Economics*, 4(3960): 2671-2711.

Donaldson, D. 2018. Railroads of the Raj: Estimating the impact of transportation infrastructure. *American Economic Review*, 108(4-5): 899-934.

Zhang, L. L., Tong, Q., Liu, J., et al. 2024. Research on the characteristics and spatial effects of transportation infrastructure on Common Prosperity—Based on Inter-provincial panel data and Spatial Durbin Model. *Inquiry into Economic Issues*, (2): 82-96.

Shi, M. Y., Shen, K. R. 2023. Transport infrastructure development and regional resource allocation —Based on the urban roads index. *Modern Economic Research*, (4): 26-40.

Banerjee, A., Duflo, E., Qian, N. 2020. On the road: Access to transportation infrastructure and economic growth in China. *Journal of Development Economics*, 145: 102442.

Yoo, S., Kumagai, J., Managi, S. 2024. Urban-rural gap induced by high-speed rail: 35 years of evidence from Japan. *Research in Transportation Business & Management*, 55: 101131.

Lu, H., Zhao, P., Hu, H., et al. 2022. Transport infrastructure and urban-rural income disparity: A municipal-level analysis in China. *Journal of Transport Geography*, 99: 103292.

Valenzuela-Levi, N. 2023. Income inequality and rule-systems within public transport: a study of Medellin (Colombia) and Santiago (Chile). *Journal of Transport Geography*, 112: 103700.

Ma, Y. T., Jiang, Y., Bao, H. J. 2023. Transportation infrastructure, digital economy and trade growth: A research on the regions along the New Western Land-Sea Route. *Reform*, (6): 142-155.

Ren, X. H., Zhang, Z. Y. 2013. Transportation infrastructure, factor mobility and urban-rural income disparity. *Management Review*, 25(2): 51-59.

Sun, Y. P. 2020. Transportation infrastructure construction, labor mobility and urban-rural income gap. *Nanjing Audit University*, 17(3): 103-111.

Liu, S. L., Zheng, S. L. 2013. Research on the cross-regional economic growth spillover effects of infrastructures——The empirical results come from China's provincial panel data. *Industrial Economics Research*, 65(4): 59-69.

Chen, Y., Wang, X. W., Zhang, G. X. 2021. Threshold effect of transportation infrastructure on rural poverty reduction. *Journal of China University of Geosciences(Social Sciences Edition)*, 21(5): 110-123.

Yang, Q., Shi, D. Q. 2019. Transportation infrastructure, factors mobility and urban-rural income disparity. *South China Journal of Economics*, (9): 35-50.