Supplementary Materials for:

Double-Edged Trains:

Economic Outcomes and Regional Disparity of High-Speed Railways

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S1 Robustness Check

From this subsection, we present robustness check results, by:

1. Changing regression specifications to be weighted by land price to income and income per capita, changing non-HSR travel speed and replacing θ values (Section S1.1 and S1.2),
2. running IV regression, taking income and income per capita as dependent variables in Section S1.3, and
3. validating the counterfactual simulation results following Donaldson and Hornbeck (2016) in Section S1.4.

Consequently, most of our robustness check results provide qualitatively similar results as in our main specifications, reaffirming the robustness of our findings.

S1.1 Sensitivity Check (1)

Tables S1, S2, and S3 presents our robustness results of our main specification, taking land price, income, and income per capita as dependent variables. We proceed by explaining our results focusing on the land price, which is presented in Table S1. Eventually, we choose to use population-weighted estimation results (Column (1) of Table S1) for consistency in the regression. For example, weighting land price as in Column (2) reduces the influence of outliers (e.g., cities with very low land prices in 1983 that experienced large increases in land price from 1983 to 2020), but we need to replace the weighted variables with income when regressing income and with income per capita when regressing with income per capita. While replacing weights according to the dependent variable is also a valid choice, we choose to weigh based on the population to ensure consistency in the regression results. In the same line, we use population-weighted estimation results in Tables S2 and S3.

We conduct additional analyses with variations in speed (40 km/h and 80 km/h) until a person reaches the HSR station, and present the results in Column (4) and (5) of Tables S1, S2, and S3. We also report an unweighted estimate of a magnitude similar to that of the main specification, in Column (6) of Tables S1, S2, and S3.

S1.2 Sensitivity Check (2)

Next, we proceed to the sensitivity analysis by replacing value θ. While θ depends on the purpose of the assessment, in our market access calculation, we set $\theta = 3$ according to previous studies that have targeted passenger travel (Chang and Zheng (2022), Lin (2017)). We verify whether the implication from our results changes if we choose other values for θ. Following Donaldson and Hornbeck (2016), we use 1, 3.60, 3.73, 3.80, 6.74, 12.86, and 26.83 for the value of θ. When θ is higher, it means that the change in travel time has a larger impact on the value of market access.

Table S4 shows the results of the sensitivity analysis for θ, using land price as dependent variable. For nationwide (Panel A), Tokyo (Panel B), Megacities (Panel C) and Regional cores (Panel D), the impact of market access on land prices is positive and statistically significant. This means that these positive effects are robust against a change in θ. On the other hand, for Local cities (Panel E), while the coefficients are insignificant when

Table S1: Robustness Check Result (Dependent Variable: Land Price)

Panel A: Nationwide	(1) Main Specification	(2) Land Price Weighted	(3) Income Weighted	(4) Speed (40 km/h)	(5) Speed (80 km/h)	(6) No weight
ln(Market Access)	0.176***	0.289***	0.239***	0.0243	0.435***	0.258***
	(0.0357)	(0.0333)	(0.0220)	(0.0220)	(0.0490)	(0.0198)
N	42,440	37,246	37,168	42,440	42,440	42,440
R-sq	0.979	0.972	0.974	0.979	0.979	0.973
Panel B: Tokyo	(1) Main Specification	(2) Land Price Weighted	(3) Income Weighted	(4) Speed (40 km/h)	(5) Speed (80 km/h)	(6) No weight
ln(Market Access)	0.408***	0.604***	0.518***	0.0100	0.869***	0.607***
	(0.193)	(0.172)	(0.177)	(0.134)	(0.238)	(0.122)
N	2,079	1,984	1,976	2,079	2,079	2,079
R-sq	0.981	0.990	0992	0.981	0.982	0.993
Panel C: Megacities	(1) Main Specification	(2) Land Price Weighted	(3) Income Weighted	(4) Speed (40 km/h)	(5) Speed (80 km/h)	(6) No weight
ln(Market Access)	0.332***	0.778***	0.840***	0.0750	0.590***	0.800***
	(0.0795)	(0.0654)	(0.0699)	(0.057)	(0.095)	(0.0490)
N	12,065	11,337	10,746	12,065	12,065	12,065
R-sq	0.979	0.981	0.982	0.979	0.979	0.92
Panel D: Regional cores	(1) Main Specification	(2) Land Price Weighted	(3) Income Weighted	(4) Speed (40 km/h)	(5) Speed (80 km/h)	(6) No weight
ln(Market Access)	0.469***	0.736***	0.710***	0.167***	0.636***	0.738***
	(0.0784)	(0.0568)	(0.0588)	(0.0544)	(0.0936)	(0.0489)
N	6,146	5,296	5,377	6,146	6,146	42,440
R-sq	0.970	0.959	0.960	0.970	0.970	0.973
Panel E: Local cities	(1) Main Specification	(2) Land Price Weighted	(3) Income Weighted	(4) Speed (40 km/h)	(5) Speed (80 km/h)	(6) No weight
ln(Market Access)	-0.03	-0.02	-0.0874	-0.0405	0.0892	-0.0121
	(0.0404)	(0.0399)	(0.0805)	(0.0261)	(0.0575)	(0.0251)
N	24299	20613	21045	24299	24299	24,229
R-sq	0.955	0.941	0.951	0.955	0.955	0.949

Note: Standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01.
Column (1) reports estimates from equation 2 in the text–the main model. We regress the log value of land price on ln(Market Access), city fixed effects, prefecture-by-year fixed effects, and year-specific cubic polynomials in city latitude and longitude are included in cities' 1980 population value to weight the regression. Columns (2) through (6) report robustness checks, as discussed in the text: Column (2) weights our regression in equation 2 through 1983 land price following Donaldson and Hornbeck (2016), Column (3) weights the regression in equation 2 on 1983 income level; Columns (4) and (5) use a measure of market access only for cities 100 miles and 200 miles beyond a city, respectively; and Column (6) reports estimates from the baseline specification when not weighting by cities' 1983 population value.

θ is under 3.80, they turn positive and statistically significant when θ is over 3.80. Because the results for Local cities can be changed depending on θ, we do not find a robust effect of market access on land prices for Local cities. Results in Tables S5 and S6, which respectively shows the results of taking income and income per capita as dependent variables, are qualitatively similar to the results in main specifications.

S1.3 Robustness Check: IV regressions

Tables S7 and S8 present the additional robustness test results. We take income and income per capita as dependent variables and run the IV regression.

Table S2: Robustness Check Result (Dependent Variable: Income)

Panel A: Nationwide	(1) Main Specification	(2) Land Price Weighted	(3) Income Weighted	(4) Speed (40 km/h)	(5) Speed (80 km/h)	(6) No weight
lnMarket Access	0.425***	0.507***	0.563***	0.181***	0.738***	0.582***
	(0.017)	(0.021)	(0.019)	(0.010)	(0.023)	(0.00962)
N	60,861	39406	55156	60,861	60,861	60,861
R-sq	0.998	0.996	0.996	0.998	0.998	0.996
Panel B: Tokyo	(1) Main Specification	(2) Land Price Weighted	(3) Income Weighted	(4) Speed (40 km/h)	(5) Speed (80 km/h)	(6) No weight
ln(Market Access)	1.230***	1.595***	1.449***	0.650***	1.779***	1.446***
	(0.094)	(0.126)	(0.136)	(0.067)	(0.119)	(0.090)
N	2,170	1925	1925	2,170	2,170	2,170
R-sq	0.993	0.997	0.998	0.993	0.994	0.998
Panel C: Megacities	(1) Main Specification	(2) Land Price Weighted	(3) Income Weighted	(4) Speed (40 km/h)	(5) Speed (80 km/h)	(6) No weight
ln(Market Access)	1.116***	1.356***	1.594***	0.746***	1.353***	1.634***
	(0.046)	(0.046)	(0.050)	(0.037)	(0.051)	(0.030)
N	13,159	11,409	12,039	13,159	13,159	13,159
R-sq	0.998	0.996	0.997	0.998	0.998	0.997
Panel D: Regional cores	(1) Main Specification	(2) Land Price Weighted	(3) Income Weighted	(4) Speed (40 km/h)	(5) Speed (80 km/h)	(6) No weight
ln(Market Access)	0.832***	0.992***	0.970***	0.413***	1.056***	0.913***
	(0.038)	(0.046)	(0.038)	(0.033)	(0.037)	(0.023)
N	10,325	5,740	9,100	10,325	10,325	10,325
R-sq	0.998	0.993	0.995	0.998	0.998	0.994
Panel E: Local cities	(1) Main Specification	(2) Land Price Weighted	(3) Income Weighted	(4) Speed (40 km/h)	(5) Speed (80 km/h)	(6) No weight
ln(Market Access)	0.179***	0.232***	0.339***	0.069***	0.376***	0.359***
	(0.012)	(0.018)	(0.017)	(0.006)	(0.022)	(0.012)
N	37,377	22,257	34,017	37,377	37,377	37,377
R-sq	0.998	0.995	0.996	0.998	0.998	0.996

Note: Standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01.
Column (1) reports estimates from equation 2 in the text–the main model. We regress the log value of income on ln(market access), city fixed effects, prefecture-by-year fixed effects, and year-specific cubic polynomials in city latitude and longitude are included in cities' 1980 population value to weight the regression. Columns (2) through (6) report robustness checks, as discussed in the text: Column (2) weights our regression in equation 2 through 1983 land price following Donaldson and Hornbeck (2016), Column (3) weights the regression in equation 2 on the income level of 1983; Columns (4) and (5) use a measure of market access only for cities 100 miles and 200 miles beyond a city, respectively; and Column (6) reports estimates from the baseline specification when not weighting by cities' 1983 population value.

S1.4 Validating Counterfactual Simulations

Table S9 presents the results of the sensitivity analysis of the counterfactual simulation assuming the absence of all HSR networks by changing the speed of non-HSR traveling modes. If the speed of non-HSR travel is faster than 60 km/h, we find that the impact of the absence of HSR tends to become smaller than the baseline counterfactual simulation results.

Table S10 presents counterfactual simulation results calculated based only on the nationwide coefficients.

Table S3: Robustness Check Result (Dependent Variable: Income per Capita)

Panel A: Nationwide	(1) Main Specification	(2) Land Price Weighted	(3) Income Weighted	(4) Speed (40 km/h)	(5) Speed (80 km/h)	(6) No weight
lnMarket Access	0.023***	0.027***	-0.008*	0.022***	0.0128***	-0.005
	(0.004)	(0.005)	(0.005)	(0.003)	(0.007)	(0.004)
N	60,861	39406	55156	60,861	60,861	60,861
R-sq	0.977	0.967	0.954	0.977	0.977	0.951
Panel B: Tokyo	(1) Main Specification	(2) Land Price Weighted	(3) Income Weighted	(4) Speed (40 km/h)	(5) Speed (80 km/h)	(6) No weight
ln(Market Access)	0.327***	0.437***	0.327***	0.226***	0.389***	0.508***
	(0.066)	(0.074)	(0.075)	(0.042)	(0.090)	(0.051)
N	2,170	1925	1925	2,170	2,170	2,170
R-sq	0.959	0.960	0.952	0.959	0.959	0.957
Panel C: Megacities	(1) Main Specification	(2) Land Price Weighted	(3) Income Weighted	(4) Speed (40 km/h)	(5) Speed (80 km/h)	(6) No weight
ln(Market Access)	0.269***	0.233***	0.117***	0.248***	0.239***	0.371***
	(0.025)	(0.024)	(0.021)	(0.0186)	(0.0302)	(0.014)
N	13,159	11,409	12,039	13,159	13,159	13,159
R-sq	0.963	0.953	0.950	0.963	0.963	0.943
Panel D: Regional cores	(1) Main Specification	(2) Land Price Weighted	(3) Income Weighted	(4) Speed (40 km/h)	(5) Speed (80 km/h)	(6) No weight
ln(Market Access)	-0.011	0.044***	-0.010	0.0321***	-0.058***	-0.00819
	(0.010)	(0.012)	(0.012)	(0.006)	(0.012)	(0.010)
N	10,325	5,740	9,100	10,325	10,325	10,325
R-sq	0.962	0.928	0.900	0.962	0.962	0.890
Panel E: Local cities	(1) Main Specification	(2) Land Price Weighted	(3) Income Weighted	(4) Speed (40 km/h)	(5) Speed (80 km/h)	(6) No weight
ln(Market Access)	-0.020***	-0.024***	-0.034***	-0.0114***	-0.035***	-0.0154***
	(0.003)	(0.004)	(0.005)	(0.002)	(0.005)	(0.004)
N	37,377	22,257	34,017	37,377	37,377	37,377
R-sq	0.975	0.964	0.942	0.975	0.975	0.928

Note: Standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01.
Column (1) reports estimates from equation 2 in the text–the main model. We regress the log value of income per capita on ln(market access), city fixed effects, prefecture-by-year fixed effects, and year-specific cubic polynomials in city latitude and longitude are included in cities' 1980 population value to weight the regression. Columns (2) through (6) report robustness checks, as discussed in the text: Column (2) weights our regression in equation 2 through 1983 land price following Donaldson and Hornbeck (2016), Column (3) weights the regression in equation 2 on the income level of 1983; Columns (4) and (5) use a measure of market access only for cities 100 miles and 200 miles beyond a city, respectively; and Column (6) reports estimates from the baseline specification when not weighting by cities' 1983 population value.

S2 Additional Estimation Result: Variations in Linear Shinkansen Ridership

The benefits from the Linear Shinkansen may vary according to the changes in the potential ridership because the fare for the Linear Shinkansen has not been decided by the time of writing, unlike in the Regional Expansion Scenario, which will feature the same fare as those already existing for the Shinkansen. Furthermore, the trend of increasing construction may also reduce the potential benefits of the Linear Shinkansen. Thus, we test whether reductions in ridership (due to the higher fares than the existing Shinkansen fares) and such increases in construction costs reduce the benefits of constructing the

Linear Shinkansen.

To this end, we set four scenarios:

1. **Scenario A-1**: *Baseline* (Baseline result as in Table **??**)
2. **Scenario A-2**: *Half Ridership Scenario*, which assumes halved land prices increase due to the halved ridership,
3. **Scenario A-3**: *Double Construction Cost Scenario*, which assumes twice-increased estimated construction costs,
4. **Scenario A-4**: *Half Ridership & Double Construction Cost scenario*, which has halved land price and twice-increased estimated construction costs.

Table S11 presents the results. In Table S11, (A) presents the estimated land price benefits (for Scenarios A-1 and A-3) and hypothetical land price increase (for Scenarios A-2 and A-4) (which is denoted as (A)) in each scenario. (B) displays the estimated construction costs as of 2022 (for scenarios A-1 and A-2) and hypothetical construction costs (for scenarios A-3 and A-4). Finally, (A)-(B) represent the differences between the land price increase and the estimated construction costs, which then shows the economic gains in each scenario. We confirm that the estimated economic benefits decrease in all scenarios except the baseline scenario.

The results in Table S11 suggest that the increase in construction costs–which is plausible–can substantially lower the benefits of installing the Linear Shinkansen.

S3 Regional Variations in Market Access Increase by Counterfactual Scenarios

Figure S1 presents differences in the increase of land price, per market access increase according to the counterfactual scenarios by regions.

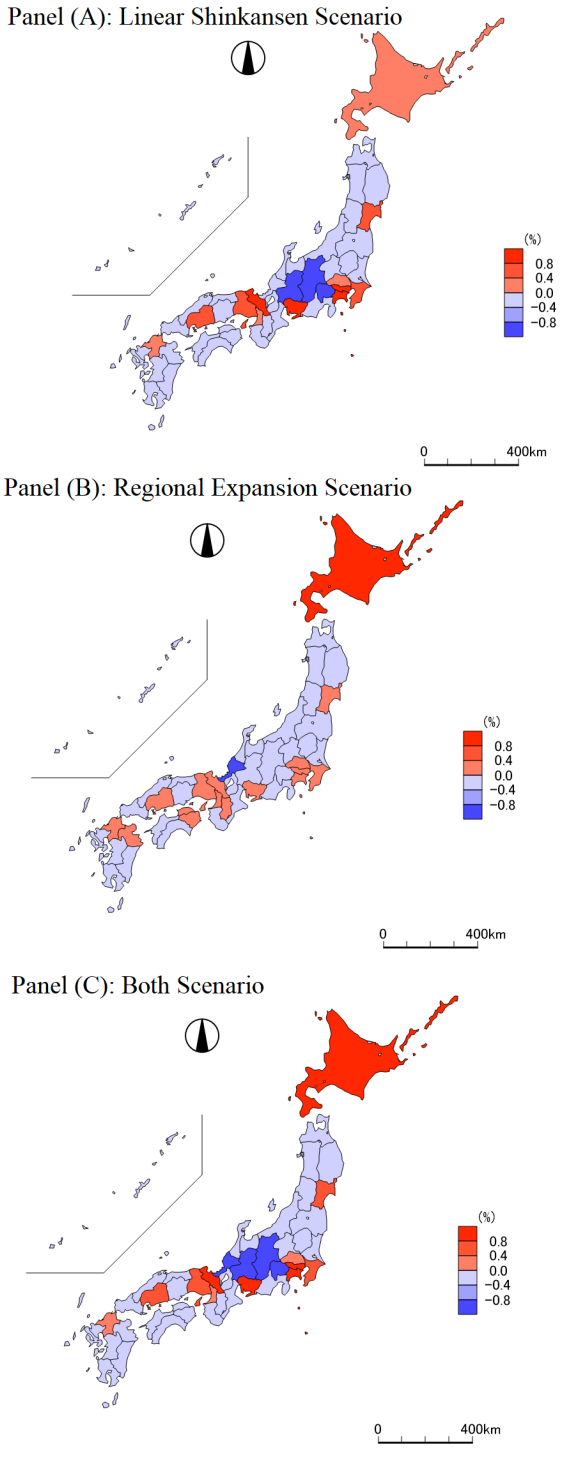

Figure S1: Changes in Land Price by Market Access Increase by Counterfactual Scenarios, according to the Regions

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Lin, Yatang, "Travel costs and urban specialization patterns: Evidence from China's high speed railway system," *Journal of Urban Economics*, mar 2017, *98*, 98–123.

Table S4: Sensitivity Check Result (Dependent Variable: Land Price)

Panel A: Nationwide	(1) $\theta = 3$	(2) $\theta = 1$	(3) $\theta = 3.60$	(4) $\theta = 3.73$	(5) $\theta = 3.80$	(6) $\theta = 6.74$	(7) $\theta = 12.86$	(8) $\theta = 26.83$
ln(Market Access)	0.176***	0.420***	0.236***	0.246***	0.252***	0.299***	0.229***	0.0405***
	(0.036)	(0.107)	(0.033)	(0.033)	(0.032)	(0.0264)	(0.0233)	(0.0078)
N	42,440	42,440	42,440	42,440	42,440	42,440	42,440	42433
R-sq	0.979	0.979	0.979	0.979	0.979	0.979	0.979	0.979
Panel B: Tokyo	(1) $\theta = 3$	(2) $\theta = 1$	(3) $\theta = 3.60$	(4) $\theta = 3.73$	(5) $\theta = 3.80$	(6) $\theta = 6.74$	(7) $\theta = 12.86$	(8) $\theta = 26.83$
ln(Market Access)	0.408**	0.715*	0.412**	0.407**	0.404**	0.216**	0.178**	0.0255***
	(0.193)	(0.423)	(0.170)	(0.165)	(0.162)	(0.095)	(0.070)	(0.006)
N	2,079	2,079	2,079	2,079	2,079	2,079	2,079	2078
R-sq	0.981	0.981	0.981	0.981	0.981	0.981	0.981	0.981
Panel C: Megacities	(1) $\theta = 3$	(2) $\theta = 1$	(3) $\theta = 3.60$	(4) $\theta = 3.73$	(5) $\theta = 3.80$	(6) $\theta = 6.74$	(7) $\theta = 12.86$	(8) $\theta = 26.83$
ln(Market Access)	0.332***	0.410**	0.375***	0.380***	0.381***	0.278***	0.178***	0.0270***
	(0.080)	(0.204)	(0.069)	(0.067)	(0.066)	(0.046)	(0.037)	(0.006)
N	12,065	12,065	12,065	12,065	12,065	12,065	12,065	12064
R-sq	0.979	0.979	0.979	0.979	0.979	0.979	0.979	0.979
Panel D: Regional cores	(1) $\theta = 3$	(2) $\theta = 1$	(3) $\theta = 3.60$	(4) $\theta = 3.73$	(5) $\theta = 3.80$	(6) $\theta = 6.74$	(7) $\theta = 12.86$	(8) $\theta = 26.83$
ln(Market Access)	0.469***	1.160***	0.455***	0.444***	0.438***	0.279***	0.213***	0.204***
	(0.078)	(0.244)	(0.072)	(0.071)	(0.071)	(0.057)	(0.052)	(0.049)
N	6,146	6,146	6,146	6,146	6,146	6,146	6,146	6,146
R-sq	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Panel E: Local cities	(1) $\theta = 3$	(2) $\theta = 1$	(3) $\theta = 3.60$	(4) $\theta = 3.73$	(5) $\theta = 3.80$	(6) $\theta = 6.74$	(7) $\theta = 12.86$	(8) $\theta = 26.83$
ln(Market Access)	-0.03	-0.068	0.0411	0.0558	0.0634*	0.223***	0.185***	0.0709***
	(0.040)	(0.136)	(0.036)	(0.036)	(0.036)	(0.030)	(0.025)	(0.017)
N	24,229	24,229	24,229	24,229	24,229	24,229	24,229	24223
R-sq	0.955	0.955	0.955	0.955	0.955	0.955	0.955	0.955

Note: Standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01.
Estimated coefficients in Table S4 are weighted by the population in 1983. For example, the results in Panel A are estimated after weighting the 1983 population, following Donaldson and Hornbeck (2016). Prefectures by year fixed effects, city fixed effects, and cubic-polynomial fixed effects are included in all models.

Table S5: Sensitivity Check Result (Dependent Variable: Income)

Panel A: Nationwide	(1) $\theta = 3$	(2) $\theta = 1$	(3) $\theta = 3.60$	(4) $\theta = 3.73$	(5) $\theta = 3.80$	(6) $\theta = 6.74$	(7) $\theta = 12.86$	(8) $\theta = 26.83$
ln(Market Access)	0.425***	0.610***	0.469***	0.475***	0.477***	0.494***	0.408***	0.055***
	(0.017)	(0.040)	(0.018)	(0.018)	(0.018)	(0.012)	(0.015)	(0.011)
N	60,861	60,861	60,861	60,861	60,861	60,861	60,861	60,861
R-sq	0.998	0.998	0.998	0.998	0.998	0.998	0.998	0.998
Panel B: Tokyo	(1) $\theta = 3$	(2) $\theta = 1$	(3) $\theta = 3.60$	(4) $\theta = 3.73$	(5) $\theta = 3.80$	(6) $\theta = 6.74$	(7) $\theta = 12.86$	(8) $\theta = 26.83$
ln(Market Access)	1.230***	0.994***	1.296***	1.293***	1.289***	0.839***	0.599***	0.007**
	(0.094)	(0.203)	(0.082)	(0.080)	(0.078)	(0.053)	(0.041)	(0.003)
N	2,170	2,170	2,170	2,170	2,170	2,170	2,170	2,169
R-sq	0.993	0.993	0.994	0.994	0.994	0.994	0.994	0.992
Panel C: Megacities	(1) $\theta = 3$	(2) $\theta = 1$	(3) $\theta = 3.60$	(4) $\theta = 3.73$	(5) $\theta = 3.80$	(6) $\theta = 6.74$	(7) $\theta = 12.86$	(8) $\theta = 26.83$
ln(Market Access)	1.115***	2.058**	1.022***	1.000***	0.987***	0.649***	0.490***	0.015***
	(0.046)	(0.122)	(0.039)	(0.038)	(0.037)	(0.023)	(0.018)	(0.005)
N	13,159	13,159	13,159	13,159	13,159	13,159	13,159	13158
R-sq	0.998	0.998	0.998	0.998	0.998	0.998	0.998	0.998
Panel D: Regional cores	(1) $\theta = 3$	(2) $\theta = 1$	(3) $\theta = 3.60$	(4) $\theta = 3.73$	(5) $\theta = 3.80$	(6) $\theta = 6.74$	(7) $\theta = 12.86$	(8) $\theta = 26.83$
ln(Market Access)	0.833***	0.250	0.810***	0.787***	0.787***	0.559***	0.459***	0.416***
	(0.038)	(0.176)	(0.031)	(0.031)	(0.031)	(0.034)	(0.027)	(0.024)
N	10,325	10,325	10,325	10,325	10,325	10,325	10,325	10,325
R-sq	0.998	0.998	0.998	0.998	0.998	0.998	0.998	0.998
Panel E: Local cities	(1) $\theta = 3$	(2) $\theta = 1$	(3) $\theta = 3.60$	(4) $\theta = 3.73$	(5) $\theta = 3.80$	(6) $\theta = 6.74$	(7) $\theta = 12.86$	(8) $\theta = 26.83$
ln(Market Access)	0.179***	0.231***	0.228***	0.238***	0.242***	0.365***	0.314***	0.157***
	(0.012)	(0.034)	(0.014)	(0.015)	(0.015)	(0.012)	(0.021)	(0.024)
N	37,377	37,377	37,377	37,377	37,377	37,377	37,377	37371
R-sq	0.998	0.998	0.998	0.998	0.998	0.998	0.998	0.998

Note: Standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01.
Estimated coefficients in Table S4 are weighted by the population in 1983. For example, the results in Panel A are estimated after weighting the 1983 population, following Donaldson and Hornbeck (2016). Prefectures by year fixed effects, city fixed effects, and cubic-polynomial fixed effects are included in all models.

Table S6: Sensitivity Check Result (Dependent Variable: Income per Capita)

Panel A: Nationwide	(1) $\theta = 3$	(2) $\theta = 1$	(3) $\theta = 3.60$	(4) $\theta = 3.73$	(5) $\theta = 3.80$	(6) $\theta = 6.74$	(7) $\theta = 12.86$	(8) $\theta = 26.83$
ln(Market Access)	0.023***	0.225***	0.013***	0.012***	0.011***	0.001	-0.007**	-0.004***
	(0.004)	(0.016)	(0.004)	(0.004)	(0.004)	(0.004)	(0.003)	(0.001)
N	60,861	60,861	60,861	60,861	60,861	60,861	60,861	60,854
R-sq	0.977	0.977	0.977	0.977	0.977	0.977	0.977	0.977
Panel B: Tokyo	(1) $\theta = 3$	(2) $\theta = 1$	(3) $\theta = 3.60$	(4) $\theta = 3.73$	(5) $\theta = 3.80$	(6) $\theta = 6.74$	(7) $\theta = 12.86$	(8) $\theta = 26.83$
ln(Market Access)	0.327***	1.045***	0.314***	0.310***	0.308***	0.205***	0.147***	0.004***
	(0.066)	(0.123)	(0.061)	(0.059)	(0.059)	(0.032)	(0.023)	(0.001)
N	2,170	2,170	2,170	2,170	2,170	2,170	2,170	2,169
R-sq	0.959	0.960	0.959	0.959	0.959	0.960	0.960	0.958
Panel C: Megacities	(1) $\theta = 3$	(2) $\theta = 1$	(3) $\theta = 3.60$	(4) $\theta = 3.73$	(5) $\theta = 3.80$	(6) $\theta = 6.74$	(7) $\theta = 12.86$	(8) $\theta = 26.83$
ln(Market Access)	0.268***	1.131***	0.198***	0.186***	0.180***	0.089***	0.058***	0.001
	(0.025)	(0.078)	(0.022)	(0.021)	(0.021)	(0.014)	(0.012)	(0.001)
N	13159	13159	13159	13159	13159	13159	13159	13158
R-sq	0.963	0.965	0.963	0.963	0.963	0.962	0.962	0.962
Panel D: Regional cores	(1) $\theta = 3$	(2) $\theta = 1$	(3) $\theta = 3.60$	(4) $\theta = 3.73$	(5) $\theta = 3.80$	(6) $\theta = 6.74$	(7) $\theta = 12.86$	(8) $\theta = 26.83$
ln(Market Access)	-0.011	0.285***	-0.034***	-0.036***	-0.038***	-0.043***	-0.042***	-0.042***
	(0.010)	(0.027)	(0.009)	(0.009)	(0.008)	(0.005)	(0.005)	(0.004)
N	10,325	10,325	10,325	10,325	10,325	10,325	10,325	10,325
R-sq	0.962	0.962	0.962	0.962	0.962	0.962	0.963	0.963
Panel E: Local cities	(1) $\theta = 3$	(2) $\theta = 1$	(3) $\theta = 3.60$	(4) $\theta = 3.73$	(5) $\theta = 3.80$	(6) $\theta = 6.74$	(7) $\theta = 12.86$	(8) $\theta = 26.83$
ln(Market Access)	-0.020***	-0.036***	-0.019***	-0.019***	-0.019***	-0.019***	-0.020***	-0.012***
	(0.003)	(0.011)	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)
N	37,377	37,377	37,377	37,377	37,377	37,377	37,377	37,371
R-sq	0.975	0.975	0.975	0.975	0.975	0.975	0.975	0.975

Note: Standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01.
Estimated coefficients in Table S4 are weighted by the population in 1983. For example, the results in Panel A are estimated after weighting the 1983 population, following Donaldson and Hornbeck (2016). Prefectures by year fixed effects, city fixed effects, and cubic-polynomial fixed effects are included in all models.

Table S7: Impact of Market Access on Income: Instrumented

Panel A: National				
Income (1985 to 2019)	ln(Market Access) (1985-2019)	Income (1985 to 2019)		
	Model (1)	Model (2)	Model (3)	Model (4)
	OLS	OLS	2SLS	OLS
ln(Market Access)			0.459***	0.425***
			(0.018)	(0.017)
ln (LCP	1.028***	0.478***		
Market Access)	(0.006)	(0.0188)		
N	60,861	60,861	60,861	60,861
R-sq	0.999	0.998	0.998	0.998
Panel B: Tokyo				
	Model (1)	Model (2)	Model (3)	Model (4)
	OLS	OLS	2SLS	OLS
ln(Market Access)			1.336***	1.230**
			(0.096)	(0.094)
Log LCP	0.991***	1.338***		
Market Access)	(0.004)	(0.094)		
N	2,170	2,170	2,170	2,170
R-sq	0.999	0.994	0.994	0.994
Panel C: Megacities				
	Model (1)	Model (2)	Model (3)	Model (4)
	OLS	OLS	2SLS	OLS
ln(Market Access)			1.133***	1.115***
			(0.05)	(0.05)
ln (LCP	0.931***	1.134***		
Market Access)	(0.030)	(0.048)		
N	13,159	13,159	13,159	13,159
R-sq	0.999	0.998	0.998	0.998
Panel D: Regional cores				
	Model (1)	Model (2)	Model (3)	Model (4)
	OLS	OLS	2SLS	OLS
ln(Market Access)			0.921***	0.827***
			(0.037)	(0.039)
Log LCP	1.047***	0.973***		
market access	(0.005)	(0.037)		
N	10,325	10,325	10,325	10,325
R-sq	0.999	0.998	0.998	0.998
Panel E: Other Cities				
	Model (1)	Model (2)	Model (3)	Model (4)
	OLS	OLS	2SLS	OLS
ln(Market Access)			0.190***	0.179***
			(0.0131)	(0.0124)
Log LCP	1.042***	0.198***		
market access	(0.003)	(0.014)		
N	37,377	37,377	37,377	37,377
R-sq	0.999	0.998	0.998	0.998

Note: Standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

Estimated coefficients in Table S7 are weighted by the population in 1983. For example, the results in Panel A are estimated after weighting the population from 1983, following Donaldson and Hornbeck (2016). Prefectures by year fixed effects, city fixed effects, and cubic-polynomial fixed effects are included in all models.

Table S8: Impact of Market Access on Income per Capita: Instrumented

Panel A: National				
Income per Capita (1985 to 2019)	ln(Market Access) (1983-2020)	Income per Capita (1985 to 2019)		
	Model (1)	Model (2)	Model (3)	Model (4)
	OLS	OLS	2SLS	OLS
ln(Market Access)			0.0227***	0.0234***
			(0.005)	(0.004)
Log LCP	1.041***	0.0237***		
market access	(0.049)	(0.003)		
N	60,861	60,861	60,861	60,861
R-sq	0.999	0.977	0.001	0.997
Panel B: Tokyo				
	Model (1)	Model (2)	Model (3)	Model (4)
	OLS	OLS	2SLS	OLS
ln(Market Access)			0.268***	0.268***
			(0.030))	(0.030)
Log LCP	1.028***	0.0237***		
market access	(0.006)	(0.005)		
N	2,170	2,170	2,170	2,170
R-sq	0.999	0.977	0.977	0.977
Panel C: Megacities				
	Model (1)	Model (2)	Model (3)	Model (4)
	OLS	OLS	2SLS	OLS
ln(Market Access)			0.385***	0.327***
			(0.067)	(0.066)
Log LCP	0.931***	0.269***		
market access	(0.030)	(0.026)		
N	13,159	13,159	13,159	13,159
R-sq	0.999	0.963	0.963	0.963
Panel D: Regional cores				
	Model (1)	Model (2)	Model (3)	Model (4)
	OLS	OLS	2SLS	OLS
ln(Market Access)			-0.0253***	-0.0111
			(0.0031)	(0.001)
Log LCP	1.047***	-0.027***		
market access	(0.005)	(0.011)		
N	10,325	10,325	10,325	10,325
R-sq	1.000	0.962	0.962	0.962
Panel E: Other Cities				
	Model (1)	Model (2)	Model (3)	Model (4)
	OLS	OLS	2SLS	OLS
ln(Market Access)			-0.0205***	-0.0200**
			(0.0034)	(0.0033)
Log LCP	1.042***	-0.021***		
market access	(0.003)	(0.004)		
N	37,377	37,377	37,377	37,377
R-sq	0.999	0.975	0.002	0.975

Note: Standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01.
Estimated coefficients in Table S8 are weighted by the population in 1983. For example, the results in Panel A are estimated after weighting the population of 1983, following Donaldson and Hornbeck (2016). Prefectures by year fixed effects, city fixed effects, and cubic-polynomial fixed effects are included in all models.

Table S9: Additional Result: Impact of the Absence of the Shinkansen Networks

		Difference (%)					
		(1)	(2)	(3)	(4)	(5)	(6)
		non-HSR Speed: 40km/h Population Distribution			non-HSR Speed: 80km/h Population Distribution		
		1983	2000	2020	1983	2000	2020
Panel A: Nationwide	Land price	-4.427	-4.297	-3.983	-1.607	-1.484	-1.212
	Income	-10.690	-10.376	-9.619	-3.880	-3.583	-2.926
	Income per capita	-0.579	-0.562	-0.521	-0.210	-0.194	-0.158
Panel B: Tokyo	Land price	-9.950	-8.763	-4.791	-7.108	-5.797	-1.464
	Income	-29.997	-26.419	-14.443	-21.428	-17.475	-4.414
	Income per capita	-7.975	-7.023	-3.840	-5.697	-4.646	-1.174
Panel C: Megacities	Land price	-7.642	-7.041	-4.825	-4.579	-3.880	-1.436
	Income	-25.689	-23.666	-16.218	-15.392	-13.041	-4.827
	Income per capita	-6.192	-5.705	-3.909	-3.710	-3.143	-1.163
Panel D: Regional cores	Land price	-12.123	-11.766	-12.887	-2.652	-2.349	-3.767
	Income	-21.377	-20.747	-22.723	-4.676	-4.143	-6.642
	Income per capita	0.310	0.301	0.330	0.068	0.060	0.096
Panel E: Local cities	Land price	0.827	0.845	0.933	0.134	0.165	0.290
	Income	-4.934	-5.039	-5.564	-0.802	-0.984	-1.732
	Income per capita	0.551	0.563	0.622	0.090	0.110	0.194

Note: Taking year 2020, with HSR as a benchmark, 'Difference' refers to the change in each economic outcome when we assume there was no HSR.

Table S10: Additional Counterfactual Simulation Results (Increase from the Baseline (%))

	Linear Shinkansen	**Regional Expansion**	**Both**
		(A) Nationwide	
Land price	0.743	0.121	0.857
Income	1.794	0.293	2.070
Income per capita	0.097	0.016	0.112
		(B) Tokyo	
Land price	0.579	0.0002	0.579
Income	1.398	0.0005	1.398
Income per capita	0.076	0.00003	0.076
		(C) Megacities	
Land price	0.565	0.0004	0.565
Income	1.364	0.0009	1.364
Income per capita	0.074	0.00005	0.074
		(D) Regional cores	
Land price	0.121	0.338	0.463
Income	0.293	0.816	1.118
Income per capita	0.016	0.044	0.060
		(E) Local cities	
Land price	1.158	0.204	1.341
Income	2.797	0.493	3.239
Income per capita	0.151	0.027	0.175

Note: The counterfactual simulation estimates are calculated using only nationwide coefficients, following Donaldson and Hornbeck (2016).

Table S11: Variation in Benefits from the Linear Shinkansen

Scenario A-1: Baseline	
	Benefits of the Linear Shinkansen
(A): Land Price Increase (Trillion JPY)	11.47
(B): Estimated Construction Costs (Trillion JPY)	7
(A)-(B): Estimated Economic Benefits (Trillion JPY)	4.47
Scenario A-2: Half Ridership Scenario	
	Benefits of the Linear Shinkansen
(A): Hypothetical Land Price Increase (Trillion JPY)	5.73
(B): Estimated Construction Costs (Trillion JPY)	7
(A)-(B): Estimated Economic Benefits (Trillion JPY)	-1.27
Scenario A-3: Double Construction Cost Scenario	
	Benefits of Linear Shinkansen
(A): Land Price Increase (Trillion JPY)	11.47
(B): Hypothetical Construction Costs (Trillion JPY)	14
(A)-(B): Estimated Economic Benefits (Trillion JPY)	-2.53
Scenario A-4: Half Ridership & Double Cost Scenario	
(A): Hypothetical Land Price Increase (Trillion JPY)	5.73
(B): Hypothetical Construction Costs (Trillion JPY)	14
(A)-(B): Estimated Economic Benefits (Trillion JPY)	-8.27