Place-based Land Policy and Spatial Misallocation: Theory and Evidence from China

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Motivation

Place-based policies are extensively used:

- Why: to promote balanced development across regions (Neumark-Simpson-2015)
- How: land supply quotas, wage subsidies, tax subsidies, industrial zones, ...
- When: during or after rapid economic growth, especially in emerging countries

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How effective are place-based policies at achieving their targets?

- What frictions are the policies alleviating (or amplifying)?
- Do they cause efficiency loss through spatial misallocation?
- Are the targets necessarily "place-based"? (versus "people-based")

In this paper, we aim to provide answers by studying a national large-scale place-based land policy implemented by the Chinese government around 2003.

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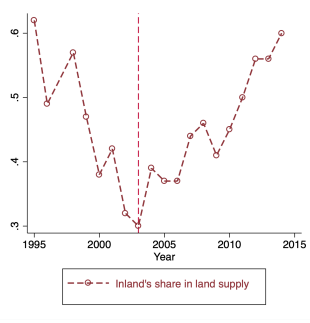
(a) The Regions and Plans

(b) Inland Share of Land Supply



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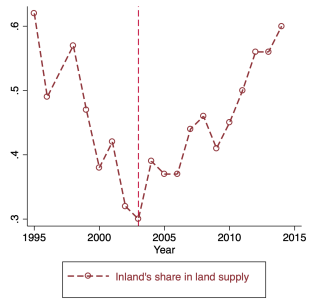
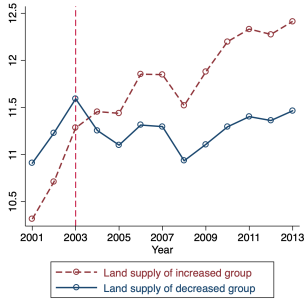


(c) Divergence between Cities



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- Using the change of policy in 2003 to find the (local) causal evidence
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- Quantitatively, it amplifies floor space constraints in developed (East) regions, creates spatial misallocation, and lowers national TFP, output, and welfare.

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  - But actually decreases incomes of workers from poorer areas. → "people-based" ✗
- Instead, regional transfer is both more equal and efficient.

Illustrating the mechanism

Consider two regions (East & West):

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- Regardless of the migration inflow and constrained land supply in East
- Distribute much more new land quotas to West than East

What happen then?

- More productive East is even more land-constrained:

$$\text{Land Prices} \uparrow \Rightarrow \begin{cases} \text{Residential floor space cost} \uparrow \Rightarrow \text{Labor supply} \downarrow \\ \text{Production floor space cost} \uparrow \Rightarrow \text{Labor demand} \downarrow \end{cases} \Rightarrow \text{Migrant to East} \downarrow$$

$$\Rightarrow \begin{cases} \text{Workers are locked in the West with lower income} \\ \text{Spatial misallocation in land and labor} \uparrow \text{ \& Agglomeration effects} \downarrow \\ \text{National TFP, output, and welfare} \downarrow \end{cases}$$

Roadmap

Part I: Causal evidence of the inland-favoring land policy's effects

1. Combining Boundary-RD and DID to show the direct (local) effects

Part II: Spatial equilibrium model to show the aggregate effects

1. A spatial equilibrium model with migration, production, housing/land, and agglomeration
2. Taking the model to the data and estimation of agglomeration
3. Equilibrium analysis of measured TFP and land constraints
4. Counterfactuals analysis to show the effects of eliminating the place-based policy

Empirical Analysis: Boundary-RD-DID Strategy

For firm i at border segment b in city c, year t, we have the following regression:

$$\begin{aligned} \ln(y_{ibct}) = {} & \alpha + \beta_1 \mathrm{East}_{ibc} + \beta_2 f(\mathrm{Dist}_{ibc}) + \beta_3 \mathrm{East}_{ibc} \times f(\mathrm{Dist}_{ibc}) \\ & + \mathrm{Post2003} \times [\delta_1 \mathrm{East}_{ibc} + \delta_2 f(\mathrm{Dist}_{ibc}) + \delta_3 \mathrm{East}_{ibc} \times f(\mathrm{Dist}_{ibc})] \\ & + \beta_4 X_{ct-1} + \phi_{bt} + \gamma_t + \psi_i + \epsilon_{ibt} \end{aligned} \tag{1}$$

- y_{ibt}: the firm-level TFP;
- East_{ib}: eastern region dummy;
- $f(\mathrm{Dist}_{ib})$: a smooth function of the distance between the firm and the border
- $\mathrm{Post2003}$: policy time dummy;
- X_{ct-1}: lagged city-level controls;
- ϕ_b: border segment FE; γ_t: year FE.
- Sample are firms from the National Industrial Enterprise Database 1998-2007
- Only keep firms within 200kms from the boundary

Empirical Analysis: Regression Results on Firm TFP

Table: **RD-DID Results on TFP (OP)**

	(1) Local Linear	(2) Poly RD (Poly=1)
Post2003×East	-0.0803**	-0.0782*
	(0.0356)	(0.0426)
City Lagged Controls	Y	Y
Border FE	Y	Y
Year FE	Y	Y
Firm FE	Y	Y
Observations	131,250	100,054
R-squared	0.1203	0.1162

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Model: Overview

Spatial allocation of workers:

- K cities with two sectors: Urban v.s. Rural
- Workers choose city-sector s.t. wages, migration & housing costs
- Urban production combining H/L-skill workers & production floor space
- Agglomeration in urban productivity due to population density

Endogenous floor space market s.t. land supply constraints

- Floor space construction using fixed land supply (policy determined);
- Residential vs. Production floor space
- Endogenous floor space price due to production & residential demand
- Local residents gain all the returns from residential floor space market

Model: Workers | Model: Migration | Model: Production | Model: Floor Space Market | Model: Equilibrium
Model: Data | Model: Calibration | Model: Unobserved | Model: Estimation | Model: Equilibrium Analysis

Take the Model to the Data

Data Used (233 cities with 2 sectors in both 2005 and 2010)

1. City-sector-level Hukou/Working Population and city-sector-pair migration flow from *Census*;
2. City-sector-level average residential housing cost from *Census*;
3. City-sector-level high/low-skill wages from various *City Statistic Yearbooks* of each city;
4. Land usage and other aggregate city-sector-level data from *Urban Statistic Yearbooks*.
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Unobservables and Parameters to be Solved or Estimated

1. Preference, Production, Friction Parameters: $\{ \beta, \alpha, \eta_j, \delta, \epsilon, \tau \}$
2. Unobserved Productivities and Agglomeration Parameter: $\{ A^h_{ju}, A^l_{ju}, \gamma \}$
3. Unobserved Floor Space and Construction Intensity Parameter: $\{ S^R_{ju}, S^M_{ju}, \phi_j \}$
4. Migration Costs: $\tau^s_{in,jk}$

The "Data Used" allows us to solve the "Unobservables" in an excel spreadsheet.

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Take the Model to the Data: Calibration of Fixed Parameters

Step 1: Calibrate Fixed Parameters: $\{ \beta, \alpha, \eta_j, \delta, \epsilon, \tau \}$ from "Data Used" and literature.

Table: **Fixed Parameters**

Parameter	Description	Value	Source
β	share of consumption in utility	0.77	*Urban Household Survey*
α	share of labor in production	0.88	*Enterprise Surveys*
η_j	relative cost of production to residential land	city-specific	China Land Market Website
σ	elasticity of substitution between H/L-skills	1.4	Katz and Murphy (1992)
ϵ	migration elasticity	1.9	Fang and Huang (2022)
τ	relative cost of rural housing	0.34	*Census*

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Take the Model to the Data: Solve Unobservables

Step 2: Solve Unobserved Productivities, Floor Space, and Migration Costs from "Data Used".

- **Unobserved Productivities:** (from the FOCs of the firm)

$$A^{l}_{ju} = \frac{q_{ju}^{\frac{1-\alpha}{\alpha}} w^{l}_{ju} (\Xi^{l}_{ju})^{\frac{1}{\sigma-1}}}{\alpha(1-\alpha)^{\frac{1-\alpha}{\alpha}}}, \quad A^{h}_{ju} = \frac{q_{ju}^{\frac{1-\alpha}{\alpha}} w^{h}_{ju} (\Xi^{h}_{ju})^{\frac{1}{\sigma-1}}}{\alpha(1-\alpha)^{\frac{1-\alpha}{\alpha}}} \tag{2}$$

  where $\Xi^{s}_{ju} = \frac{w^{s}_{ju} H^{s}_{ju}}{w^{h}_{ju} H^{h}_{ju} + w^{l}_{ju} H^{l}_{ju}}$ is the share of labor income distributed to low skill workers.

- Intuitively, observed higher production floor prices, higher wages, and a higher share of skill s in total payroll in "Data Used" all require higher skill s productivity at equilibrium.

▸ FOCs of the firm ▸ Back to Main

Take the Model to the Data: Estimate Agglomeration

Step 3: Estimate Agglomeration Elasticity using Indirect Inference

- Naive regression $\log(A_j^s) = \gamma \log(D_j) + a_j^s$ suffers from endogeneity for sure.
- Number of workers D is correlated with local productivity fundamentals a
- We use indirect inference to from our empirical study of the 2003 policy change.
- Data: $\ln(\overline{TFP}_{ju}) = \alpha + \delta_1 Post2003 \times East_{ju} + \phi_{ju} + \gamma_t + \epsilon_{jut}$, where $\overline{TFP}_{ju}$ is city-urban TFP.

Table: **City-level DID Results on TFP**

	(1) OP	(2) LP
Post2003×East	-0.0749***	-0.0516*
	(0.0241)	(0.0268)
Trend Variables	Y	Y
Year FE	Y	Y
City FE	Y	Y
Observations	1,788	1,788
R-squared	0.7537	0.6351

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Take the Model to the Data: Estimate Agglomeration

Step 3: Estimate Agglomeration Elasticity using Indirect Inference

- First calculate real world equilibrium city-urban TFP: $\ln(\widetilde{\mathrm{TFP}}_{ju}) = \ln\left(\frac{Y_{ju}}{(H^h_{ju}+H^l_{ju})^{\alpha}}\right)$
- Second, choose agglomeration elasticity γ_0 (and correspondingly, $a_j^{s,0}$), simulate a counterfactual equilibrium of 2005 without inland-favoring policy, then calculate: $\ln(\widetilde{\mathrm{TFP}}^0_{ju})$
- Third, run pooled reg. of "real world" ($\mathrm{Post2003} = 1$) and counterfactual ($\mathrm{Post2003} = 0$):

  Model: $\ln(\widetilde{\mathrm{TFP}}^0_{ju}) = \alpha + \delta_1^0 \mathrm{Post2003} \times \mathrm{East}_{ju} + \phi_{ju} + \gamma_t + \epsilon_{jut}$, iterate with different γ^i.

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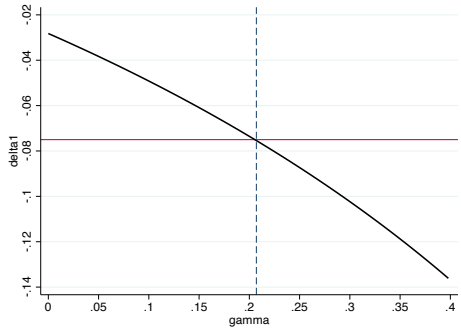
- Matching $\hat{\delta}_1^* = -0.075$ would give us an estimate of $\gamma = 0.207$.

Figure: **Relationship between γ and $\hat{\delta}_1$**



Model: The Spatial Distribution of Productivity

$$\ln(\widetilde{TFP}_{ju}) = \underbrace{\frac{\alpha\sigma}{\sigma-1}\ln(A^{l}_{ju})}_{\text{fundamental}} + \underbrace{\frac{\alpha\sigma}{\sigma-1}\ln\left(\left(\frac{A^{h}_{ju}}{A^{l}_{ju}}\Gamma^{h}_{ju}\right)^{\frac{\sigma-1}{\sigma}} + \left(\Gamma^{l}_{ju}\right)^{\frac{\sigma-1}{\sigma}}\right)}_{\text{skill premium}} + \underbrace{(1-\alpha)\ln(S^{M}_{ju})}_{\text{land scale premium}} \quad (3)$$

Regions (loc., dev.)	No. of Cities	2005 Total	2005 Fund	2005 SP	2005 LSP	2010 Total	2010 Fund	2010 SP	2010 LSP
National	225	38.17	35.31	0.66	2.19	40.44	37.52	0.70	2.22
(east, high)	21	39.73	36.73	0.75	2.25	41.50	38.44	0.77	2.29
(east, mid)	51	38.15	35.34	0.56	2.25	40.32	37.42	0.65	2.24
(east, low)	25	36.78	34.08	0.57	2.13	39.31	36.68	0.57	2.06
(inland, high)	2	38.00	35.27	0.67	2.06	39.74	36.72	0.88	2.13
(inland, mid)	50	37.18	34.30	0.78	2.11	39.87	36.91	0.78	2.17
(inland, low)	76	36.65	33.92	0.63	2.09	39.61	36.87	0.59	2.14

Notes: For the level of development, we divide all cities into three categories {high, mid, and low} to capture $\{10\%, 45\%, 45\%\}$ of the distribution of GDP per capita. Each region consists of the same cities in both 2005 and 2010.

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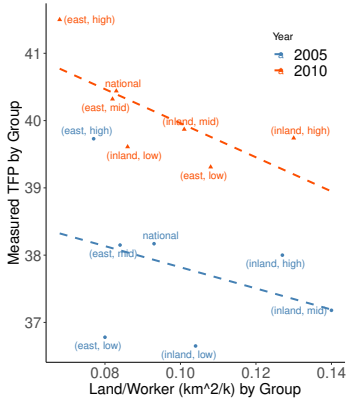
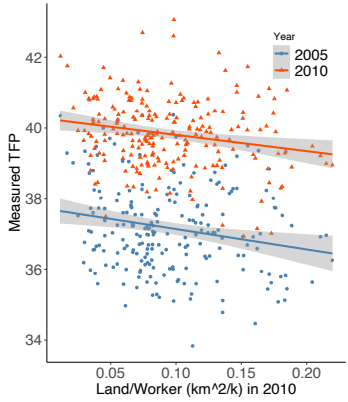
Model: Correlation Between Productivity and Land Abundance

(a) By City Group



(b) By Individual City



▸ Land Abundance ▸ Back to Main

Equilibrium Analysis: Takeaways

Regional Differences in Measured TFP:

- More developed eastern cities has much higher TFP
- The main differences are in the fundamental productivity in low-skill workers

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Regional Differences in Land Tightness:

- More developed (high TFP) eastern cities are much more constrained in land
- Their land tightness is even increasing overtime

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Counterfactual: Removing Inland-favoring Land Policy

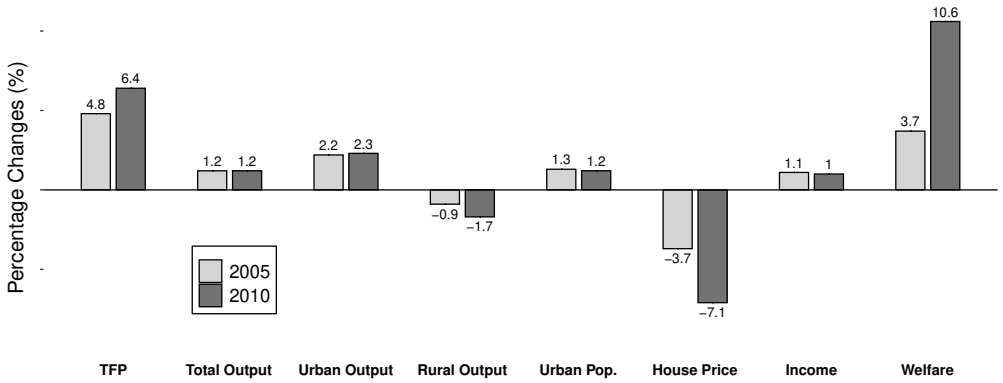
- What will happen to 2005/2010, if we remove the inland-favoring land supply policy?
- Keep pre-2003 land allocation rule: Detailed Allocation Rule Land Supply Per Capita
  - Keep national total new land supply unchanged
  - Distribute new land based on land supply growth **before 2003** in each city

Table: **Removing the Inland-favoring Policy: Total Land Supply** (km^2)

Regions (loc., dev.)	No. of Cities	Reality 2005	Reality 2010	Counterfactual $\widehat{2005}$	Counterfactual $\widehat{2010}$
National	225	22268	28336	22268	28336
(east, high)	21	5838	7272	6597	10958
(east, mid)	51	5875	7832	5734	6551
(east, low)	25	1418	1681	1472	1596
(inland, high)	2	169	206	169	169
(inland, mid)	50	5131	6578	4537	4819
(inland, low)	76	3837	4767	3760	4244

Counterfactual: Aggregate Effects

Figure: **Aggregate Effects of Removing the Inland-Favoring Policy**



Counterfactual: Spatial Effects on Economic Development

Table: **Removing the Inland-Favoring Policy: Spatial Effects on Economic Development**

Regions (loc., dev.)	No. of Cities	Δ TFP $\widehat{2005}$	Δ TFP $\widehat{2010}$	Δ Urban Output $\widehat{2005}$	Δ Urban Output $\widehat{2010}$	Δ Rural Output $\widehat{2005}$	Δ Rural Output $\widehat{2010}$	Δ Urban Pop. $\widehat{2005}$	Δ Urban Pop. $\widehat{2010}$	Δ House Price $\widehat{2005}$	Δ House Price $\widehat{2010}$
National	225	4.8%	6.4%	2.2%	2.3%	-0.9%	-1.7%	1.3%	1.2%	-3.7%	-7.1%
(east, high)	21	2.9%	6.7%	6.3%	14.4%	0.0%	4.0%	6.2%	13.1%	-18.7%	-34.5%
(east, mid)	51	0.0%	-1.2%	-0.7%	-3.8%	-0.5%	-0.9%	-0.4%	-2.6%	1.5%	12.4%
(east, low)	25	-0.3%	-1.7%	-0.4%	-3.9%	-1.4%	-3.5%	-0.6%	-2.6%	-3.1%	3.6%
(inland, high)	2	-0.2%	-2.2%	0.0%	-3.1%	0.0%	2.1%	0.1%	-0.9%	1.7%	18.8%
(inland, mid)	50	0.0%	-5.2%	-2.1%	-10.0%	-1.5%	-2.9%	-1.6%	-6.6%	1.9%	11.3%
(inland, low)	76	0.2%	-3.2%	-1.3%	-5.5%	-1.7%	-3.2%	-1.4%	-4.2%	-3.5%	-0.6%

▸ Spatial Effects on TFP Decomposition ▸ Spatial Effects on Migration

Counterfactual: Regional Transfer instead of Land Policy

- Remove the *Inland-favoring Land Policy* and instead use *Direct Regional Transfer*
- Not aiming to design an optimal *Direct Regional Transfer*
- We want to show that a nearly Pareto improvement is possible
- Redistribute gains in national land income based on the following principles
  - Allocate more for urban sector in prefectures with decreased housing prices (urban re-balancing)
  - Allocate more for rural sector in prefectures with increased housing prices (urban-rural re-balancing)

Counterfactual: Spatial Effects on Income and Welfare

Table: **Removing the Inland-Favoring Policy: Spatial Effects on Income and Welfare**

Regions (loc., dev.)	No. of Cities	Without Transfer: Δ Income $\widehat{2005}$	Without Transfer: Δ Income $\widehat{2010}$	Without Transfer: Δ Welfare $\widehat{2005}$	Without Transfer: Δ Welfare $\widehat{2010}$	Regional Transfer: Δ Income $\widehat{2005}$	Regional Transfer: Δ Income $\widehat{2010}$	Regional Transfer: Δ Welfare $\widehat{2005}$	Regional Transfer: Δ Welfare $\widehat{2010}$
National	225	1.1%	1.0%	3.7%	10.6%	2.3%	1.5%	4.4%	5.7%
(east, high)	21	2.1%	5.7%	9.8%	17.9%	-9.3%	-11.5%	7.1%	8.0%
(east, mid)	51	0.2%	-0.3%	-0.2%	-3.9%	0.4%	3.5%	1.0%	0.3%
(east, low)	25	0.9%	1.1%	-1.7%	0.8%	0.3%	4.4%	1.2%	4.4%
(inland, high)	2	0.0%	-1.6%	-0.5%	-5.1%	1.8%	3.4%	1.4%	0.5%
(inland, mid)	50	0.7%	-1.1%	-0.3%	-5.5%	15.9%	4.8%	4.6%	1.5%
(inland, low)	76	1.7%	1.1%	2.3%	-3.7%	5.1%	4.9%	4.4%	1.7%

▸ Spatial Effects on Income Decomposition ▸ Spatial Effects on Welfare Decomposition

Counterfactual: Remarks

Inland-favoring land supply policy ⇒ misallocation in land and labor

- 1. Efficiency
  - Production and residential housing prices ↑
  - Migration ↓
  - National-level output, productivity ↓
- 2. Equality
  - A seemingly regional convergence:
    Regional output/productivity gap ↓
  - Hurt people from underdeveloped regions:
    Chance to migrate to big cities ↓
    Wage and income of workers from underdeveloped regions ↓

Using *Direct Regional Transfer* instead improves both *Efficiency* and *Equality*.

Conclusion

- We study how can a place-based policy lead to spatial misallocation
- We focus on China's inland-favoring land supply policy in 2003
- Using RD-DID, we find causal evidence that this policy decreases firm productivity in the eastern region
- Using a spatial equilibrium model, we find that by removing this policy, we can not only increase national-level output and TFP, but also increase income and welfare of workers from underdeveloped regions

Appendix

Literature review

1. **Place-based policy and regional development:**
   Enterprise zones (Neumark and Kolko, 2010; Freedman, 2013; Ham et al., 2011; Busso, Gregory, and Kline, 2013; Reynolds and Rohlin, 2014);
   Discretionary grants (Crozet, Mayer, and Mucchielli, 2004; Devereux, Griffith, and Simpson, 2007; Bronzini and De Blasio, 2006);
   Infrastructure investment (Kline and Moretti, 2014; Glaeser and Gottlieb, 2008)

   We find a paradox: Help the region, but hurt the people from the region.

2. **Policy Distortions and (spatial) misallocation:**
   Romero (2009); Fajgelbaum et al. (2019); Hsieh and Klenow (2009); Hsieh and Moretti (2019); Yu (2019); Fang and Huang (2020);

   We show that place-based land policy may create spatial misallocation.

3. **Migration and regional development in China:**
   Hukou restriction and migration (Tombe and Zhu, 2019; Hao et al., 2019);
   Trade and labor mobility (Ma and Tang, 2020; Tian, 2018; Fan, 2019; Zi, 2020);
   Others: (Khanna et al., 2021; Sieg, Yoon, and Zhang, 2021; Huang, 2020)

   We connect spatial (land) misallocation and China's regional inequality

Empirical Analysis: RD-DID Strategy

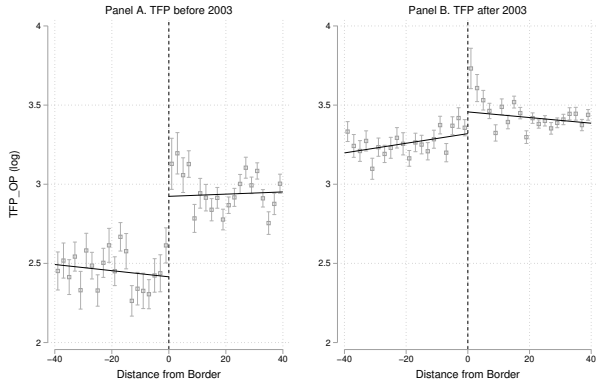
Boundary Regression Discontinuity + Difference-in-Differences:

$$\begin{aligned} \ln(y_{ibct}) = \alpha &+ \underbrace{\beta_1 \text{East}_{ibc} + \beta_2 f(\text{Dist}_{ibc}) + \beta_3 \text{East}_{ibc} \times f(\text{Dist}_{ibc})}_{\text{RD terms}} \\ &+ \underbrace{\text{Post2003} \times [\delta_1 \text{East}_{ibc} + \delta_2 f(\text{Dist}_{ibc}) + \delta_3 \text{East}_{ibc} \times f(\text{Dist}_{ibc})]}_{\text{Post2003} \times \text{RD terms}} \\ &+ \beta_4 X_{ct-1} + \phi_b + \gamma_t + \epsilon_{ibt} \end{aligned} \tag{4}$$

- Choose firms around the boundary
- First Diff: difference between east and non-east
- Second Diff: difference before and after 2003 policy (δ_1)

Empirical Analysis: RD Boundary

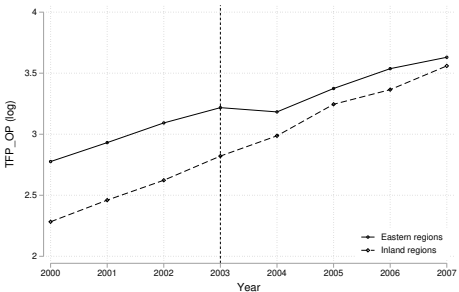
(a) RD Boundary (OP)



Empirical Analysis: Parallel Trend

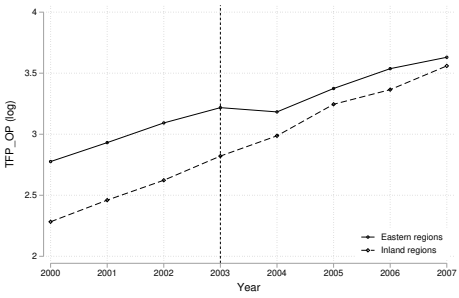
Empirical Analysis: Parallel Trend

(a) Time Trends of TFP (OP)

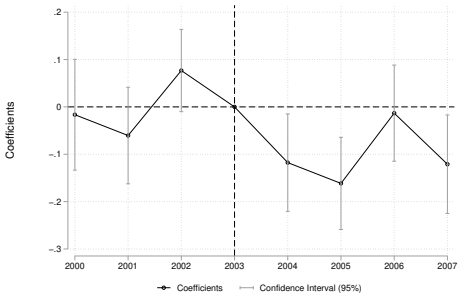


Empirical Analysis: Parallel Trend

(a) Time Trends of TFP (OP)



(b) Event Study - TFP (OP)



Empirical Analysis: Parallel Trend

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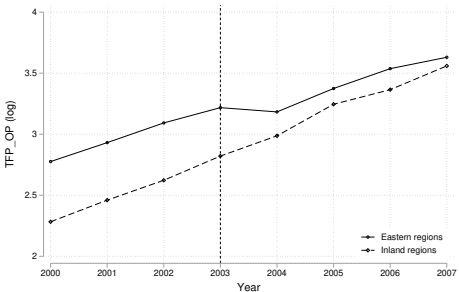
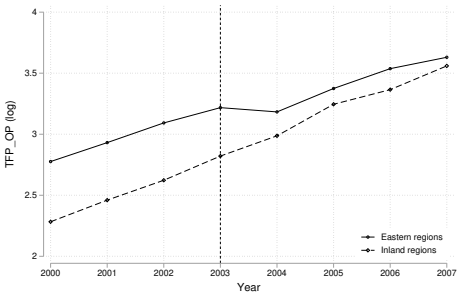
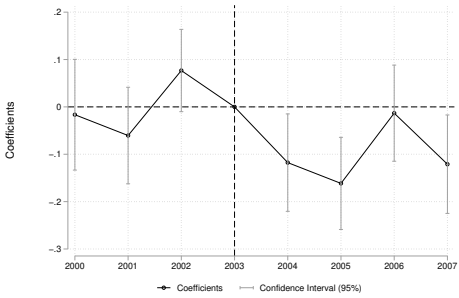


Empirical Analysis: Parallel Trend

(a) Time Trends of TFP (OP)



(b) Event Study - TFP (OP)



Empirical Analysis: Robustness and Takeaway

Nine Groups of Robustness Checks

- Alternative TFP estimation method ▸ Levinsohn and Petrin (2003)
- Alternative bandwidth choices ▸ Poly RD: 20, 30, 40, 50, 60, 70 km bandwidths
- Without city-level controls ▸ Without City-level Controls
- Keeping slopes unchanged at the boundary ▸ Keeping Slopes Unchanged
- Thick border: Drop firms right at the boundary ▸ Thick Border
- Are moving firms driving the results? ▸ Moving Firms
- Placebo test: moving the boundary ▸ Placebo Test
- The WTO effect ▸ Without Exporting Firms ▸ Controlling for Exporting
- Subsidy and tax policies ▸ Firm-level Subsidies ▸ Firm-level Subsidy and Tax Controls

Some Additional Empirical Results

- The policy enlarges land price gaps ▸ Land Prices
- The policy enlarges housing price gaps and reduces wage gaps ▸ Wages and Housing Prices

Robustness Check: Alternative TFP Estimation Method I

Table: RD-DID Results on TFP (LP)

	(1) Local Linear	(2) Poly RD (Poly=1)
Post2003×East	-0.0580	-0.0948**
	(0.0478)	(0.0439)
City Lagged Controls	Y	Y
Border FE	Y	Y
Year FE	Y	Y
Firm FE	Y	Y
Observations	85,748	100,054
R-squared	0.1418	0.1495

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Robustness Check: Alternative Bandwidth Choices

Table: Robustness: TFP Regressions with Different Bandwidth Choices (OP)

bandwidth	(1) 20km	(2) 30km	(3) 40km	(4) 50km	(5) 60km	(6) 70km
Post2003×east	-0.0235	-0.0120	-0.0782*	-0.0830**	-0.0576*	-0.0272
	(0.0682)	(0.0512)	(0.0426)	(0.0363)	(0.0330)	(0.0298)
City Lagged Controls	Y	Y	Y	Y	Y	Y
Border FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y	Y	Y
Observations	39,747	72,488	100,054	126,265	152,064	184,678
R-squared	0.1303	0.1114	0.1162	0.1196	0.1208	0.1161

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Robustness Check: Alternative Bandwidth Choices

Table: Robustness: TFP Regressions with Different Bandwidth Choices (LP)

bandwidth	(1) 20km	(2) 30km	(3) 40km	(4) 50km	(5) 60km	(6) 70km
Post2003×east	-0.0056	-0.0102	-0.0948**	-0.0953**	-0.0691**	-0.0377
	(0.0694)	(0.0526)	(0.0439)	(0.0374)	(0.0341)	(0.0310)
City Lagged Controls	Y	Y	Y	Y	Y	Y
Border FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y	Y	Y
Observations	39,747	72,488	100,054	126,265	152,064	184,678
R-squared	0.1644	0.1444	0.1495	0.1532	0.1547	0.1504

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Robustness Check: Without City-level Controls

Table: Robustness: TFP Regressions without City-level Controls (OP)

	(1) Local Linear	(2) Poly RD (Poly=1)
Post2003×East	-0.0844**	-0.0717*
	(0.0356)	(0.0426)
City Lagged Controls	N	N
Border FE	Y	Y
Year FE	Y	Y
Firm FE	Y	Y
Observations	131,250	100,054
R-squared	0.1157	0.1116

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Robustness Check: Without City-level Controls

Table: Robustness: TFP Regressions without City-level Controls (LP)

	(1) Local Linear	(2) Poly RD (Poly=1)
Post2003×East	-0.0530	-0.0884**
	(0.0479)	(0.0439)
City Lagged Controls	N	N
Border FE	Y	Y
Year FE	Y	Y
Firm FE	Y	Y
Observations	85,748	100,054
R-squared	0.1375	0.1446

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Robustness Check: Keeping Slopes Unchanged at the Boundary

Table: **RD-DID Results with No Slope Change (OP)**

	(1) Local Linear	(2) Poly RD (Poly=1)
Post2003×East	-0.0859**	-0.0777*
	(0.0346)	(0.0416)
City Lagged Controls	Y	Y
Border FE	Y	Y
Year FE	Y	Y
Firm FE	Y	Y
Observations	131,250	100,054
R-squared	0.1203	0.1162

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Robustness Check: Thick Border

Table: **RD-DID Results with Thick Border (OP)**

	(1) Local Linear	(2) Poly RD (Poly=1)
Post2003×East	-0.1029	-0.0977*
	(0.0710)	(0.0510)
City Lagged Controls	Y	Y
Border FE	Y	Y
Year FE	Y	Y
Firm FE	Y	Y
Observations	79,668	111,595
R-squared	0.1077	0.1165

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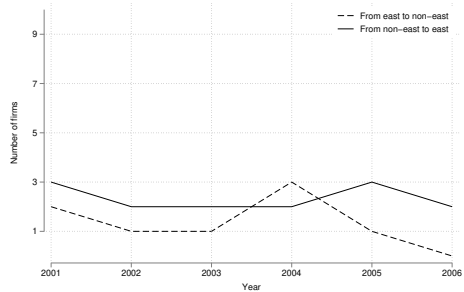
Robustness Check: Moving Firms

Figure: **Number of Movers from 2001 to 2007**



Notes: This figure shows the number of firms relocating from eastern to non-eastern regions and from non-eastern to eastern regions in each year between 2001 and 2007.

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Robustness Check: Drop Moving Firms

Table: **RD-DID Results without Movers (OP)**

	(1) Local Linear	(2) Poly RD (Poly=1)
Post2003×East	-0.0827**	-0.0754*
	(0.0356)	(0.0427)
City Lagged Controls	Y	Y
Border FE	Y	Y
Year FE	Y	Y
Firm FE	Y	Y
Observations	131,749	99,953
R-squared	0.1198	0.1161

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Robustness Check: Placebo Test

Table: Placebo Test on TFP (OP)

	(1) West 50km	(2) West 100km	(3) East 50km	(4) East 100km
Post2003×East	-0.0209	-0.0060	-0.0215	0.0139
	(0.0421)	(0.0316)	(0.0186)	(0.0142)
City Lagged Controls	Y	Y	Y	Y
Border FE	Y	Y	Y	Y
Year FE	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y
Observations	51,068	67,420	192,250	272,117
R-squared	0.7411	0.7363	0.7153	0.6968

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Robustness Check: Without Exporting Firms

Table: Robustness: TFP Regressions without Exporting Firms (OP)

	(1) Local Linear	(2) Poly RD (Poly=1)
Post2003×East	-0.0896**	-0.1082**
	(0.0406)	(0.0487)
City Lagged Controls	Y	Y
Border FE	Y	Y
Year FE	Y	Y
Firm FE	Y	Y
Observations	105,161	79,951
R-squared	0.1229	0.1204

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Robustness Check: Without Exporting Firms

Table: Robustness: TFP Regressions without Exporting Firms (LP)

	(1) Local Linear	(2) Poly RD (Poly=1)
Post2003×East	-0.1175**	-0.1399***
	(0.0550)	(0.0502)
City Lagged Controls	Y	Y
Border FE	Y	Y
Year FE	Y	Y
Firm FE	Y	Y
Observations	68,439	79,951
R-squared	0.1454	0.1533

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Robustness Check: Controlling for Exporting

Table: Robustness: TFP Regressions Controlling for Exporting (OP)

	(1) Local Linear	(2) Poly RD (Poly=1)
Post2003×East	-0.0725**	-0.0682
	(0.0356)	(0.0426)
log(Export)	0.0157***	0.0160***
	(0.0013)	(0.0015)
City Lagged Controls	Y	Y
Border FE	Y	Y
Year FE	Y	Y
Firm FE	Y	Y
Observations	131,250	100,054
R-squared	0.1222	0.1181

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Robustness Check: Controlling for Exporting

Table: Robustness: TFP Regressions Controlling for Exporting (LP)

	(1) Local Linear	(2) Poly RD (Poly=1)
Post2003×East	-0.0431	-0.0787*
	(0.0476)	(0.0437)
log(Export)	0.0253***	0.0256***
	(0.0016)	(0.0015)
City Lagged Controls	Y	Y
Border FE	Y	Y
Year FE	Y	Y
Firm FE	Y	Y
Observations	85,748	100,054
R-squared	0.1467	0.1543

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Robustness Check: Firm-level Subsidies

Table: RD-DID Results on Firm-level Subsidies

	(1) Local Linear	(2) Poly RD (Poly=1)
Post2003×East	-0.0084	-0.0089
	(0.0164)	(0.0168)
City Lagged Controls	Y	Y
Border FE	Y	Y
Year FE	Y	Y
Firm FE	Y	Y
Observations	101,083	96,756
R-squared	0.0009	0.0010

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Robustness Check: Firm-level Subsidy and Tax Controls

Table: RD-DID Results with Firm-level Subsidy and Tax Controls (OP)

	(1) Local Linear	(2) Poly RD (Poly=1)
Post2003×East	-0.0914**	-0.0950**
	(0.0363)	(0.0434)
Tax	0.0014***	0.0015***
	(0.0002)	(0.0003)
Subsidy	-0.0051	-0.0168
	(0.0099)	(0.0112)
City Lagged Controls	Y	Y
Border FE	Y	Y
Year FE	Y	Y
Firm FE	Y	Y
Observations	126,897	96,756
R-squared	0.1221	0.1183

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Robustness Check: Firm-level Subsidy and Tax Controls

Table: RD-DID Results with Firm-level Subsidy and Tax Controls (LP)

	(1) Local Linear	(2) Poly RD (Poly=1)
Post2003×East	-0.0761	-0.1081**
	(0.0487)	(0.0445)
Tax	0.0017***	0.0017***
	(0.0003)	(0.0003)
Subsidy	-0.0103	-0.0037
	(0.0125)	(0.0113)
City Lagged Controls	Y	Y
Border FE	Y	Y
Year FE	Y	Y
Firm FE	Y	Y
Observations	82,929	96,756
R-squared	0.1455	0.1535

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Additional Empirical Results: Land Prices

- Land transaction data from 2002 to 2018, collected from the China Land Market Website
- For land parcel i in city c and year t, we have the following regression:

$$\ln(y_{ict}) = \alpha + \text{Post2003} \times \text{East}_i + \beta_4 X_{ct-1} + \gamma_t + \psi_c + \epsilon_{ict} \tag{5}$$

- y_{ict} is the log price of land parcel i
- East_{it} equals one if the parcel is located in the east
- The RD-DID specification is not feasible due to insufficient data around the boundary, especially before 2003.

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Additional Empirical Results: Land Prices

Table: **DID Results on Land Prices**

	(1) Sample 02-07	(2) Sample 02-18
Post2003×East	0.155***	0.399***
	(0.0318)	(0.0307)
City Lagged Controls	Y	Y
Year FE	Y	Y
Firm FE	Y	Y
Observations	201,436	1,415,302
R-squared	0.480	0.453

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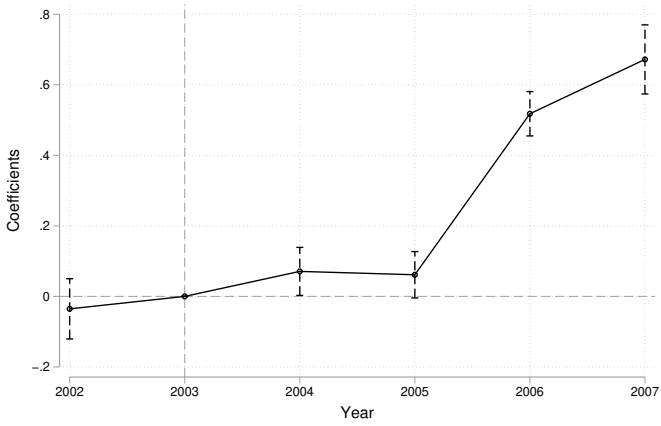
Additional Empirical Results: Land Prices

Figure: **Event Study - Land Price**



Additional Empirical Results: Wages and Housing Prices

- Simple city-level DID regression
- Wages and housing prices data from City Statistical Yearbooks

Table: **DID Results on Wages and Housing Prices**

	(1) Wages	(2) Housing Prices
Post2003×East	-0.0210*	0.0673**
	(0.0122)	(0.0269)
Province × Time Trend	Y	Y
GDP per capita × Time Trend	Y	Y
Industry Share × Time Trend	Y	Y
Year FE	Y	Y
Firm FE	Y	Y
Observations	1,792	1,789
R-squared	0.9385	0.7421

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Model I: Worker Preferences

- Worker's Utility:

$$U^{o}_{in,jk} = \frac{z^{o}_{in,jk}}{\tau^{s}_{in,jk}} \left(\frac{c^{o}_{in,jk}}{\beta}\right)^{\beta} \left(\frac{s^{o}_{in,jk}}{1-\beta}\right)^{1-\beta} \tag{6}$$

- Shock ($z^{o}_{in,jk}$) follows Fréchet Distribution: $F(z^{o}_{in,jk}) = e^{-z^{o}_{in,jk}{}^{-\epsilon}}$, $\epsilon > 1$
- FOCs: $c^{o}_{in,jk} = \beta v^{s}_{in,jk}$, $s^{o}_{in,jk} = (1-\beta)\frac{v^{s}_{in,jk}}{Q_{jk}}$
- Indirect Utility:

$$U^{o}_{in,jk} = \frac{z^{o}_{in,jk} v^{s}_{in,jk} Q^{\beta-1}_{jk}}{\tau^{s}_{in,jk}} \tag{7}$$

i,j: location (home, current); n,k: sector (rural, urban)
c: Goods consumption; s: Housing consumption; τ: Migration cost;
z: Location preference shock; Q: Housing rent; v: income

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Model I: Migration Flows

- Income: (wage + hometown housing rent)

$$v^s_{in,jk} = w^s_{jk} + \frac{Q_{in} S^R_{in}}{H^R_{in}} \tag{8}$$

- Gravity Equation of Migration Flow:

$$\pi^s_{in,jk} = \frac{(\tau^s_{in,jk} Q^{\beta-1}_{jk})^{-\epsilon} (v^s_{in,jk})^{\epsilon}}{\sum_{j'k'=11}^{JK} ((\tau^s_{in,j'k'} Q^{\beta-1}_{j'k'})^{-\epsilon} (v^s_{in,j'k'})^{\epsilon}} = \frac{\Phi^s_{in,jk}}{\Phi^s_{in}} \tag{9}$$

Proportion of skill s people migrating from in to jk
(conditional on people from in with skill s)

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Model II: Production

- Rural Production: $Y_{jr} = A_{jr}H_{jr}$.
- Urban Production:

$$Y_{ju} = (X_{ju})^{\alpha}(S^{M}_{ju})^{1-\alpha}, \text{ where } X_{ju} = [(A^{h}_{ju}H^{h}_{ju})^{\frac{\sigma-1}{\sigma}} + (A^{l}_{ju}H^{l}_{ju})^{\frac{\sigma-1}{\sigma}}]^{\frac{\sigma}{\sigma-1}} \tag{10}$$

- First Order Conditions:

$$w^{l}_{ju} = \alpha X^{\alpha-1}_{ju} S^{M}_{ju}{}^{1-\alpha} A^{l}_{ju}{}^{\frac{\sigma-1}{\sigma}} X^{\frac{1}{\sigma}}_{ju} H^{l}_{ju}{}^{-\frac{1}{\sigma}} \tag{11}$$

$$w^{h}_{ju} = \alpha X^{\alpha-1}_{ju} S^{M}_{ju}{}^{1-\alpha} A^{h}_{ju}{}^{\frac{\sigma-1}{\sigma}} X^{\frac{1}{\sigma}}_{ju} H^{h}_{ju}{}^{-\frac{1}{\sigma}} \tag{12}$$

$$S^{M}_{ju} = \left(\frac{1-\alpha}{q_{ju}}\right)^{\frac{1}{\alpha}} X_{ju} \tag{13}$$

FOC gives us a measure of skill premium ω of city j:

$$\omega_{ju} = \frac{w^{h}_{ju}}{w^{l}_{ju}} = \left(\frac{A^{h}_{ju}}{A^{l}_{ju}}\right)^{\frac{\sigma-1}{\sigma}} \left(\frac{H^{h}_{ju}}{H^{l}_{ju}}\right)^{-\frac{1}{\sigma}} \tag{14}$$

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Model II: Production

- Zero Profit Condition:

$$(X_{ju})^{\alpha}(S_{ju}^{M})^{1-\alpha} - W_{ju}X_{ju} - q_{ju}S_{ju}^{M} = 0 \tag{15}$$

  where $W_{ju}X_{ju} = w_{ju}^{l}H_{ju}^{l} + w_{ju}^{h}H_{ju}^{h}$

- FOC + Zero profit gives us production floor price at equilibrium:

$$q_{ju} = (1-\alpha)\Big(\frac{\alpha}{W_{ju}}\Big)^{\frac{\alpha}{1-\alpha}} \tag{16}$$

- Agglomeration:

$$A_{ju}^{s} = a_{ju}^{s} \times (D_{ju})^{\gamma}, \quad D_{ju} = \frac{H_{ju}^{h} + H_{ju}^{l}}{\bar{L}_{j}} \tag{17}$$

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Model III: Floor Space Market Clearing

- Production & Residential price difference (city-level tax equivalent of land use regulations η_j)

$$q_{ju} = \eta_j Q_{ju} \tag{18}$$

- Rural floor space price: $Q_{jr} = \tau Q_{ju}$ (simplified, calibrate from data)
- Urban floor space production: from land

$$S_{ju} = \phi_j L_j \tag{19}$$

- Urban floor space market clearing: supply = demand

$$S_{ju}^M = \left(\frac{(1-\alpha)}{q_{ju}}\right)^{\frac{1}{\alpha}} X_{ju} = \theta_j S_{ju} \tag{20}$$

$$S_{ju}^R = E[s_{ju}]H_{ju} = (1-\beta)\frac{E[\nu_{ju}]H_j}{Q_{ju}} = (1-\theta_j)S_{ju} \tag{21}$$

Equilibrium Definition | Back to Main

Model: Spatial Equilibrium

*A **Spatial General Equilibrium** for this economy is defined by a set of of exogenous economic conditions* $\{\tau^s_{in,jk}, A^s_j, \eta_j, \phi_j, L_j, H^s_{in}\}$*, a list of endogenous prices* $\{Q_{ju}, q_{ju}, w^s_{jk}\}$*, quantities* $\{\nu^s_{in,jk}, Y_{jk}, H^s_{jk}, S_{ju}\}$*, and proportions* $\{\pi^s_{in,jk}, \theta_j\}$ *that solve firms' problem, workers' problem, floor space producers' problem, and market clearing such that:*

*(i).**[Worker Optimization]** Taking the exogenous economic conditions* $\{\tau^s_{in,jk}, A^s_{jk}\}$ *and the aggregate prices* $\{Q_{ju}, w^s_{jk}\}$ *as given, workers' optimal choices of migration pins down the equilibrium labor supply in each city* H^s_{jk} *and the migration flow between each city pairs* $\pi^s_{in,jk}$*.*

*(ii).**[Firm Optimization]** Taking the exogenous economic conditions* $\{A^s_{jk}\}$ *and the aggregate prices* $\{q_{ju}, w^s_{jk}\}$ *as given, firms' optimal choices of production pins down the equilibrium labor demand* H^s_j*, equilibrium production floor space demand* $\theta_j S_{ju}$ *in each city.*

*(iv).**[Market Clearing]** For all cities, labor supply equals labor demand and floor space supply equals floor space demand. This pins down the equilibrium aggregate prices* $\{Q_{ju}, q_{ju}, w^s_{jk}\}$*, the equilibrium floor space* S_{ju}*, and the equilibrium output* Y_{ju}*.*

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Counterfactual: Regional Transfer instead of Land Policy

- Regional Transfer Rule:

$$\widehat{DT_{iu}} = \underbrace{-\left(\hat{Q}_{iu}\hat{S}^R_{iu} - Q_{iu}S^R_{iu}\right)}_{\text{restore urban land income}} + \underbrace{\frac{\frac{\hat{Q}_{iu}-Q_{iu}}{Q_{iu}}Q_{iu}S^R_{iu}}{\sum_i \frac{|\hat{Q}_{iu}-Q_{iu}|}{Q_{iu}}Q_{iu}S^R_{iu}} \times \gamma^1_u \times \Delta\Pi^R_L\Big|_{\hat{Q}_{iu}-Q_{iu}>0}}_{\text{adjust for housing price } \uparrow} +$$

$$\underbrace{\frac{\frac{\hat{Q}_{iu}-Q_{iu}}{Q_{iu}}Q_{iu}S^R_{iu}}{\sum_i \frac{|\hat{Q}_{iu}-Q_{iu}|}{Q_{iu}}Q_{iu}S^R_{iu}} \times \gamma^2_u \times \Delta\Pi^R_L\Big|_{\hat{Q}_{iu}-Q_{iu}<0}}_{\text{adjust for housing price } \downarrow}$$

$$\widehat{DT_{ir}} = \underbrace{\frac{\Delta\Pi^M_L H_{ir}}{\sum_i H_{ir}}}_{\text{urban-rural transfer}} + \underbrace{\frac{\frac{\hat{Q}_{ir}-Q_{ir}}{Q_{ir}}Q_{ir}S^R_{ir}}{\sum_i \frac{|\hat{Q}_{ir}-Q_{ir}|}{Q_{ir}}Q_{ir}S^R_{ir}} \times \gamma^1_r \times \Delta\Pi^R_L\Big|_{\hat{Q}_{ir}-Q_{ir}>0}}_{\text{adjust for housing price } \uparrow} +$$

$$\underbrace{\frac{\frac{\hat{Q}_{ir}-Q_{ir}}{Q_{ir}}Q_{ir}S^R_{ir}}{\sum_i \frac{|\hat{Q}_{ir}-Q_{ir}|}{Q_{ir}}Q_{ir}S^R_{ir}} \times \gamma^2_r \times \Delta\Pi^R_L\Big|_{\hat{Q}_{ir}-Q_{ir}<0}}_{\text{adjust for housing price } \downarrow}$$

Model: Spatial Distribution of Land Abundance

Table: **Spatial Distribution of Land Abundance**

Regions (loc., dev.)	No. of Cities	Worker/Land 2005	Worker/Land 2010
National	225	0.093	0.083
(east, high)	21	0.077	0.068
(east, mid)	51	0.084	0.082
(east, low)	25	0.080	0.108
(inland, high)	2	0.127	0.130
(inland, mid)	50	0.140	0.101
(inland, low)	76	0.104	0.086

Notes: This table displays a summary of the tightness of total urban land supply data by group (weighted by urban population) in 2005 and 2010 (unit: thousand workers/km^2). Regions are classified by the location of the city (east or inland) and the level of development (GDP per capita) in 2005.

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Details of the First Counterfacutal Land Allocation Rule

Detailed allocation rule is as follows:

$$\widehat{L_j(t)} = L_j(2003) + \underbrace{\sum_j [L_j(t) - L_j(2003)]}_{\text{actual total increment of land}} \times \underbrace{\frac{L_j(2003)(1+g_{L_j})^{t-2003}}{\sum_j L_j(2003)(1+g_{L_j})^{t-2003}}}_{\text{city j's share if no inland-favoring}} \tag{22}$$

- $L_j(2003)$: city j's urban land stock in 2003;
- $\sum_j [L_j(t) - L_j(2003)]$: National land supply increase from 2003 to t;
- g_{L_j}: j's land supply growth rate before 2003.

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Counterfactual: Results on Land Supply

Table: **Removing Inland-favoring Policy: Land Supply Per Thousand Workers** (km^2/k)

Regions (loc., dev.)	No. of Cities	Reality 2005	Reality 2010	Counterfactual $\widehat{2005}$	Counterfactual $\widehat{2010}$
National	225	0.093	0.083	0.092	0.082
(east, high)	21	0.077	0.068	0.082	0.090
(east, mid)	51	0.084	0.082	0.083	0.071
(east, low)	25	0.080	0.108	0.084	0.106
(inland, high)	2	0.127	0.130	0.127	0.107
(inland, mid)	50	0.140	0.101	0.126	0.079
(inland, low)	76	0.104	0.086	0.103	0.080

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Counterfactual: Spatial Effects on TFP Decomposition

Table:
Removing the Inland-Favoring Policy:
Spatial Effects on Measured TFP

Regions (location, development)	No. of Cities	2005 Total	2005 Fund	2005 SP	2005 LSP	2010 Total	2010 Fund	2010 SP	2010 LSP
National	225	4.8%	4.7%	-0.8%	0.8%	6.4%	6.6%	-0.6%	0.3%
(east, high)	21	2.9%	3.2%	-2.9%	2.8%	6.7%	4.9%	-2.7%	4.5%
(east, mid)	51	0.0%	0.2%	0.1%	-0.3%	-1.2%	0.5%	0.4%	-2.1%
(east, low)	25	-0.3%	-0.8%	0.1%	0.4%	-1.7%	-0.6%	-0.1%	-1.0%
(inland, high)	2	-0.2%	0.0%	0.0%	-0.2%	-2.2%	0.2%	0.0%	-2.4%
(inland, mid)	50	0.0%	0.9%	0.0%	-1.0%	-5.2%	-1.4%	-0.3%	-3.6%
(inland, low)	76	0.2%	0.4%	0.1%	-0.3%	-3.2%	-1.4%	0.2%	-2.1%

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Counterfactual: Spatial Effects on Migration

Table:
Removing the Inland-Favoring Policy:
Spatial Effects on Migration in 2005

Regions (loc., dev.)	No. of Cities	Urban Pop. High-skill	Urban Pop. Low-skill	Rural Pop. High-skill	Rural Pop. Low-skill
National	225	0.0%	1.5%	-1.3%	-1.4%
(east, high)	21	2.1%	7.1%	-0.3%	0.0%
(east, mid)	51	-0.9%	-0.5%	-1.5%	-0.6%
(east, low)	25	-0.5%	-0.7%	-2.3%	-1.3%
(inland, high)	2	-0.1%	0.1%	-0.2%	0.1%
(inland, mid)	50	-1.5%	-1.7%	-1.4%	-1.7%
(inland, low)	76	-1.0%	-1.7%	-0.8%	-1.9%

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Counterfactual: Spatial Effects on Migration

Table:
Removing the Inland-Favoring Policy:
Spatial Effects on Migration in 2010

Regions (loc., dev.)	No. of Cities	Urban Pop. High-skill	Urban Pop. Low-skill	Rural Pop. High-skill	Rural Pop. Low-skill
National	225	0.0%	1.4%	-1.4%	-2.2%
(east, high)	21	8.7%	13.9%	5.8%	3.2%
(east, mid)	51	-2.5%	-2.7%	-1.9%	-0.8%
(east, low)	25	-3.3%	-3.0%	-0.7%	-2.2%
(inland, high)	2	-1.0%	-0.9%	3.2%	1.8%
(inland, mid)	50	-6.3%	-6.9%	-2.5%	-3.1%
(inland, low)	76	-2.8%	-4.6%	-2.4%	-3.5%

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Counterfactual: Spatial Effects on Income Decomposition

Table:
Removing the Inland-Favoring Policy:
Decomposition of Spatial Effects on Income

Regions (loc., dev.)	No. of Cities	Without Transfer: Δ Wage Income $\widehat{2005}$	Without Transfer: Δ Wage Income $\widehat{2010}$	Without Transfer: Δ Non-wage Income $\widehat{2005}$	Without Transfer: Δ Non-wage Income $\widehat{2010}$	Regional Transfer: Δ Wage Income $\widehat{2005}$	Regional Transfer: Δ Wage Income $\widehat{2010}$	Regional Transfer: Δ Non-wage Income $\widehat{2005}$	Regional Transfer: Δ Non-wage Income $\widehat{2010}$
National	225	1.1%	1.0%	1.1%	1.1%	0.8%	0.7%	7.1%	4.4%
(east, high)	21	0.1%	0.0%	6.0%	13.7%	0.2%	0.4%	-27.9%	-28.5%
(east, mid)	51	0.4%	0.4%	-0.5%	-2.9%	0.3%	0.0%	0.8%	15.4%
(east, low)	25	1.3%	2.1%	-1.1%	-3.8%	1.4%	1.8%	-4.5%	16.5%
(inland, high)	2	0.0%	-1.6%	0.0%	-1.6%	0.0%	-1.7%	7.8%	19.4%
(inland, mid)	50	1.3%	0.7%	-1.9%	-8.1%	0.8%	0.2%	76.2%	22.3%
(inland, low)	76	2.4%	2.1%	-1.6%	-4.6%	1.7%	1.6%	21.3%	23.9%

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Counterfactual: Spatial Effects on Welfare Decomposition

Table:
Removing the Inland-Favoring Policy:
Decomposition of Spatial Effects on Welfare

Regions (loc., dev.)	No. of Cities	Without Transfer (Year 2005) Welfare	(Urban, High)	(Urban, Low)	(Rural, High)	(Rural, Low)
National	225	3.7%	1.9%	1.4%	4.7%	1.2%
(east, high)	21	9.8%	6.3%	5.8%	14.3%	3.0%
(east, mid)	51	-0.2%	-0.7%	-0.7%	-0.2%	-0.4%
(east, low)	25	-1.7%	0.8%	0.8%	-2.5%	1.6%
(inland, high)	2	-0.5%	-0.3%	-0.3%	0.3%	-1.0%
(inland, mid)	50	-0.3%	-2.2%	-1.3%	0.4%	-2.5%
(inland, low)	76	2.3%	0.0%	0.0%	3.1%	0.5%

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Counterfactual: Spatial Effects on Welfare Decomposition

Table:
Removing the Inland-Favoring Policy:
Decomposition of Spatial Effects on Welfare

Regions (loc., dev.)	No. of Cities	Without Transfer (Year 2010) Welfare	(Urban, High)	(Urban, Low)	(Rural, High)	(Rural, Low)
National	225	10.6%	2.8%	-0.6%	9.2%	12.4%
(east, high)	21	17.9%	16.1%	13.6%	19.3%	17.5%
(east, mid)	51	-3.9%	-4.5%	-5.4%	-3.3%	-3.5%
(east, low)	25	0.8%	-2.5%	-2.9%	6.3%	0.8%
(inland, high)	2	-5.1%	-5.7%	-6.7%	-4.9%	-4.9%
(inland, mid)	50	-5.5%	-9.4%	-8.7%	-4.5%	-3.3%
(inland, low)	76	-3.7%	-4.7%	-3.8%	-9.2%	-0.9%

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Counterfactual: Spatial Effects on Welfare Decomposition

Table:
Removing the Inland-Favoring Policy:
Decomposition of Spatial Effects on Welfare

Regions (loc., dev.)	No. of Cities	Regional Transfer (Year 2005) Welfare	(Urban, High)	(Urban, Low)	(Rural, High)	(Rural, Low)
National	225	4.4%	-9.2%	-7.7%	5.5%	4.3%
(east, high)	21	7.1%	-16.3%	-14.8%	13.5%	0.9%
(east, mid)	51	1.0%	-3.8%	-3.5%	1.1%	2.5%
(east, low)	25	1.2%	-6.8%	-8.5%	1.4%	5.5%
(inland, high)	2	1.4%	-0.5%	-0.4%	1.6%	1.8%
(inland, mid)	50	4.6%	-4.1%	-4.5%	2.8%	18.2%
(inland, low)	76	4.4%	-5.4%	-6.7%	4.4%	7.0%

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Counterfactual: Spatial Effects on Welfare Decomposition

Table:
Removing the Inland-Favoring Policy:
Decomposition of Spatial Effects on Welfare

Regions (loc., dev.)	No. of Cities	Regional Transfer (Year 2010) Welfare	(Urban, High)	(Urban, Low)	(Rural, High)	(Rural, Low)
National	225	5.7%	-13.5%	-10.8%	7.4%	8.0%
(east, high)	21	8.0%	-25.2%	-22.7%	12.7%	9.0%
(east, mid)	51	0.3%	-6.3%	-6.3%	-0.2%	3.2%
(east, low)	25	4.4%	-5.0%	-6.1%	6.6%	7.6%
(inland, high)	2	0.5%	-4.6%	-5.4%	0.7%	3.8%
(inland, mid)	50	1.5%	-7.6%	-7.3%	2.1%	6.1%
(inland, low)	76	1.7%	-6.2%	-5.9%	-2.0%	5.3%

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