The Political Economy of China's Housing Boom

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The Chinese Housing Boom

Table: Real Housing Price Indices: China vs. US

City Tier	US (1996Q1-2006Q1)	China (2003Q1-2013Q1)
1	1.881908	5.089953
2	1.701291	3.894921
3	1.38853	3.115647

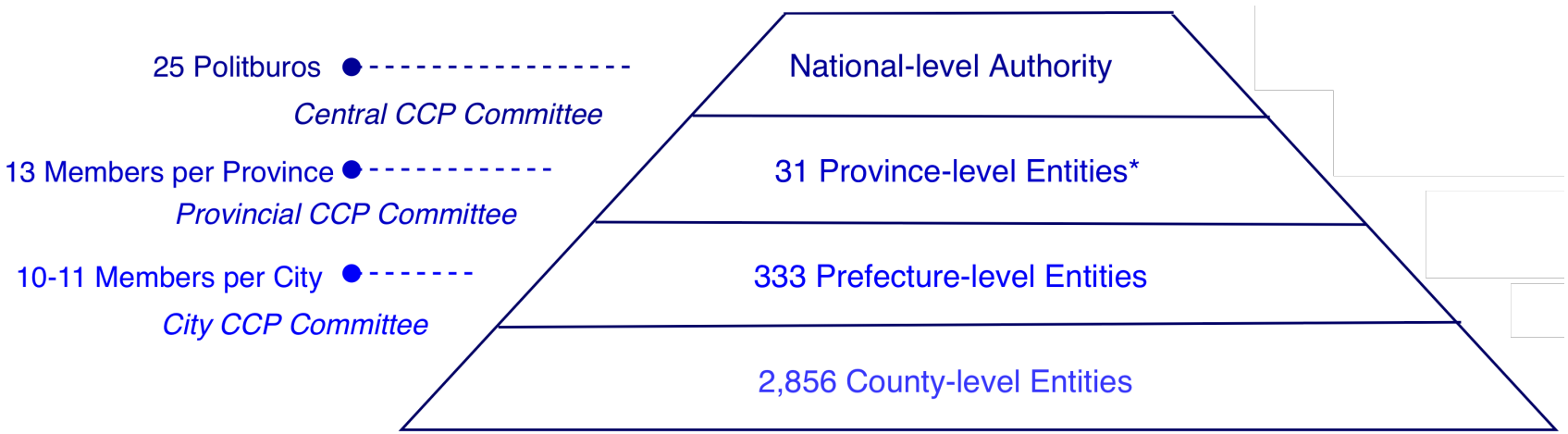
Data Source: Glaeser et.al. (2017); Fang et.al. (2015).

What's driving the Chinese housing boom?

- Demand: Status/demographics (Liu-Wei-Zhang 2017; Chen-Zhang 2019); urbanization (Garriga-Hedlund-Tang-Wang 2017); monetary policy (Xu-Chen 2010); household income growth (Fang-Gu-Xiong-Zhou 2015)
- Supply: **Land supply decisions driven by political forces**

Background: The Chinese Communist Party

Figure: The Power Pyramid



- Personnel is managed by administration one level above
- Promotion based on GDP growth, demographics, etc. (Li-Zhou 2005)
- "Yardstick" tournament (Shleifer 1985; Maskin-Qian 2000; Xiong 2019)

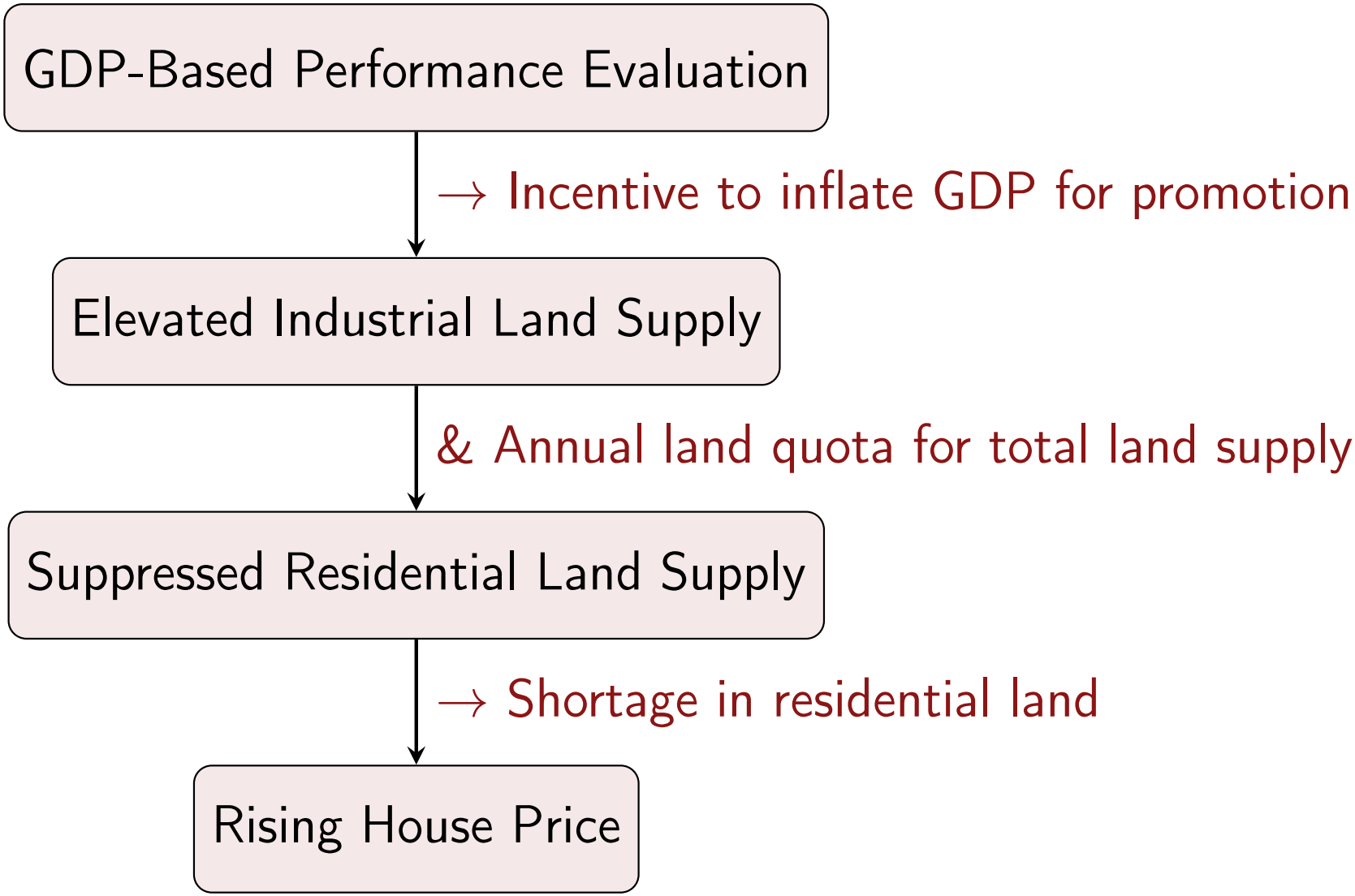
Background: China's Land Management

- Land is a state-owned asset
  - Two general types of land: urban and rural land.
- Local administration sells the usufruct of land
  - Subject to annual quotas on rural-to-urban land conversion

    ▸ Agencies
  - After rural-to-urban conversion, city government leases out land to firms, real estate developers, etc.

    ▸ Land Share
  - 2007 Property Rights Law:
    When the term for the right to use land for residential purposes expires, the term will be automatically renewed.

Channel: Political Tournament and Housing Prices



Data

- **Political Data**
  China Political Elite Dataset; Provincial and City Leader Dataset
  ▸ Summary Statistics
- **Land Data**
  China Real Estate Index System
  ▸ Summary Statistics
- **Macroeconomic Data**
  National Bureau of Statistics (NBS)
  ▸ Summary Statistics
- **Sample**
  195 cities, 2004-2015;
  Covers 91%-97% of China's housing market
  ▸ Sample Coverage

Empirical Specification

$$Y_{i,t} = \beta_0 + \beta_1 \, GDP\ Concern_{i,t} + \beta_3 X_{i,t} + \epsilon_{i,t}$$

Variables

$Y_{i,t}$	Outcome Variable
$GDP\ Concern_{i,t}$	Exogenous GDP Concern Proxy
$X_{i,t}$	Controls

Indices

i — *city*

t — *year*

- Outcome variables: **house price growth**, industry & residential land supply, and industrial & residential land price.
- Controls: Land quota, GDP growth, GDP, government fiscal revenue, population; city-term FE, and year FE.
- Challenge: $GDP\ Concern_{i,t}$ is not observable!

GDP Concern Measurement

- Potential proxies: age to retire (Peng 2014), educational qualifications (Adolph-Liu-Shih 2012), GDP performance (Li-Zhou 2005), etc.
- To get around the endogeneity, we construct annual GDP concern fluctuations from an exogenous shock: social tie establishments.
  Identifying assumptions:
  - Hometown tie is strongly and monotonically correlated with GDP concerns
  - Hometown tie affects economic outcomes through the proposed political economy channel only

Hometown Ties

- A hometown connection is established when newly appointed provincial leader sharing the same city of birth as an incumbent city leader,
- We define hometown tie as having a contemporaneous or one-year-lagged hometown connection.
- In our data, 13% of city-term pairs (2000-2015) experienced a hometown connection; $< 0.5\%$ of hometown connection was local.
- Hometown ties are amongst the strongest and most established social connections throughout the Chinese history (Douw; Chen et.al. 2004; Fisman et.al. 2018/2019).

Measurement: GDP Concern

$$Y_{i,t} = \beta_0 + \underbrace{(\beta_1 + \beta_2 \textit{Hometown Tie}_{i,t})}_{\textit{GDP Concern}} \times \text{GDP Growth}_{i,t} + \beta_3 X_{i,t} + \epsilon_{i,t}$$

Variables

$Y_{i,t}$:	promotion outcome
$\textit{Hometown Tie}_{i,t}$:	hometown tie indicator
$\text{GDP Growth}_{i,t}$:	GDP growth
$X_{i,t}$:	controls

Indices

i — *city*

t — *year*

- Controls: past economic performance, hometown tie, city FE, province-startyear FE, person FE, CCP rank FE, and city-term FE.

Hometown Tie Attenuates GDP Concern

$$Y_{i,t} = \beta_0 + \underbrace{(\beta_1 + \beta_2 \textit{Hometown Tie}_{i,t})}_{\textit{GDP Concern } \chi_{i,t}} \times \text{GDP Growth}_{i,t} + \beta_3 X_{i,t} + \epsilon_{i,t}$$

	Promotion Outcome		
	(1)	(2)	(3)
Annual GDP Growth	3.798**	3.701**	3.708**
	(1.688)	(1.835)	(1.443)
GDP Growth * $1_{\textit{hometown tie},t \text{ or } t-1}$	-5.293***	-5.306***	-5.309***
	(1.256)	(1.351)	(1.063)
$1_{\textit{hometown tie},tort-1}$	0.0881***	0.0883***	0.0883***
	(0.0277)	(0.0296)	(0.0233)
Past GDP Growth	9.183***	9.241***	9.243***
	(1.703)	(1.833)	(1.441)
GDP Growth*Minority	-17.10***	-13.37**	-13.38***
	(6.242)	(6.214)	(4.884)
$_c ons$	0.00533	0.00415	0.000809
	(0.0201)	(0.0217)	(0.0171)
N	2840	2840	2799
R-Squared	0.347	0.353	0.323
Prov-StartYear FE	Y	Y	N
Person FE	Y	Y	N
City FE	N	Y	N
Rank FE	N	Y	N
City-Term FE	N	N	Y

House Price Growth Rate

$$hpr_{i,t} = \beta_0 + \beta_1 Hometown\ Tie_{i,t} + \beta_3 X_{i,t} + \epsilon_{i,t}$$

	(1)	(2)	(3)
	House Price Growth Rate		
$1_{hometown\ tie,t\ \ or\ \ t-1}$	-0.0722**	-0.0725**	-0.0688**
	(0.0287)	(0.0285)	(0.0285)
N	509	509	498
R-squared	0.984	0.984	0.984
(Lagged&Contemp.) Log Land Quota	Y	Y	Y
GDP	N	Y	Y
Lagged Log Housing Price	N	N	Y
Resident Population	N	N	Y
City-Term FE	Y	Y	Y
Prov-Year FE	Y	Y	Y

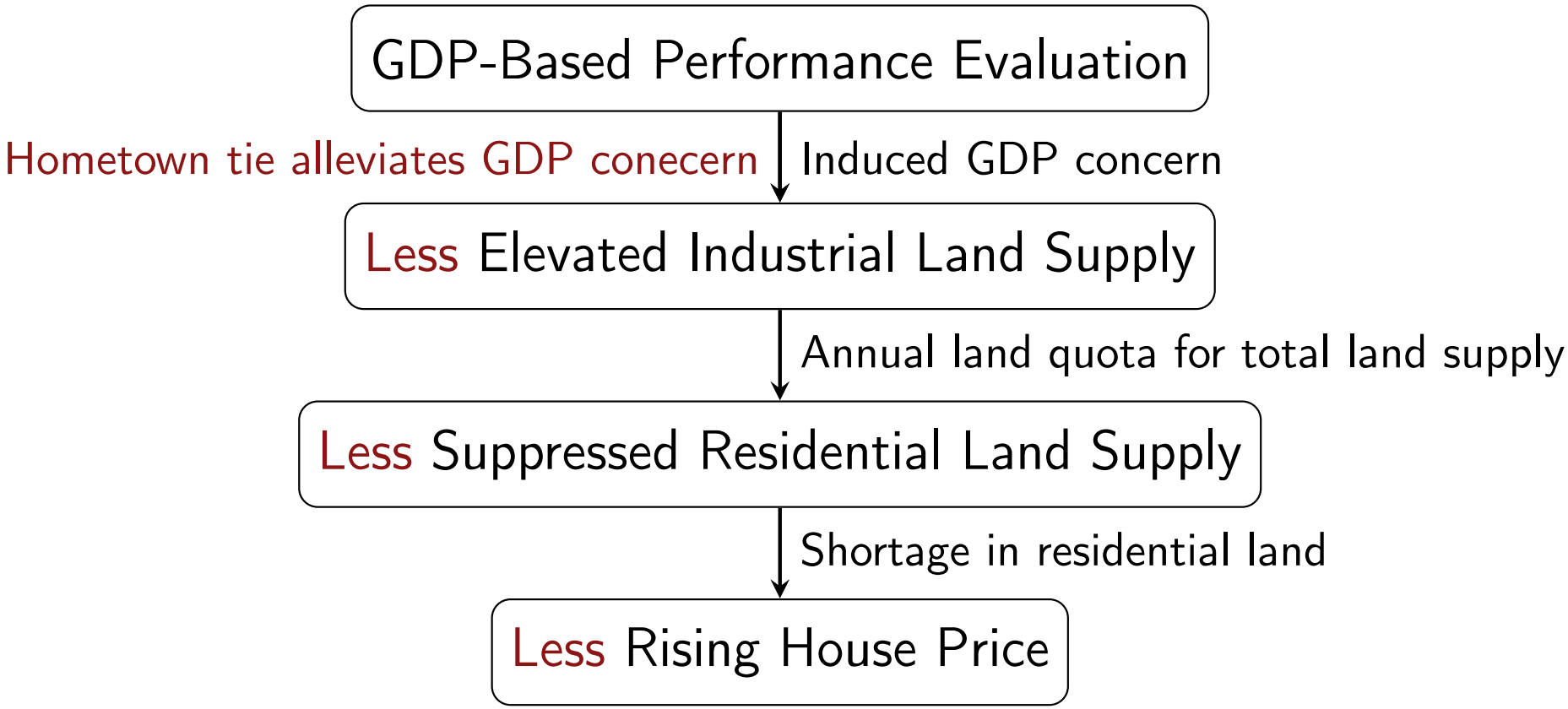
Land Supply

$$Supply_{i,t} = \beta_0 + \beta_1 Hometown\ Tie_{i,t} + \beta_3 X_{i,t} + \epsilon_{i,t}$$

	Land Supply (Ratio)			
	(1) Residential	(2) Industrial	(3) Commercial	(4) Other
$1_{hometown\ tie,t\ or\ t-1}$	0.138***	-0.106**	-0.0321*	0.00169
	(0.0316)	(0.0410)	(0.0170)	(0.0454)
N	729	702	717	529
R-squared	0.699	0.673	0.621	0.539
Baseline Controls	Y	Y	Y	Y
Lagged Log Land Supply	Y	Y	Y	Y
	Land Supply (Log Quantity)			
$1_{hometown\ t\ or\ t-1}$	0.374***	-0.328*	-0.551***	-0.864
	(0.131)	(0.186)	(0.131)	(0.737)
N	719	674	700	273
R-squared	0.909	0.924	0.817	0.645
Baseline Controls	Y	Y	Y	Y
Lagged Log Land Supply	Y	Y	Y	Y
Logged Land Quota	Y	Y	Y	Y
City-Term FE	Y	Y	Y	Y
Prov-Year FE	Y	Y	Y	Y

▸ Trend

Political Economy Channel: Review



Conclusion

Findings

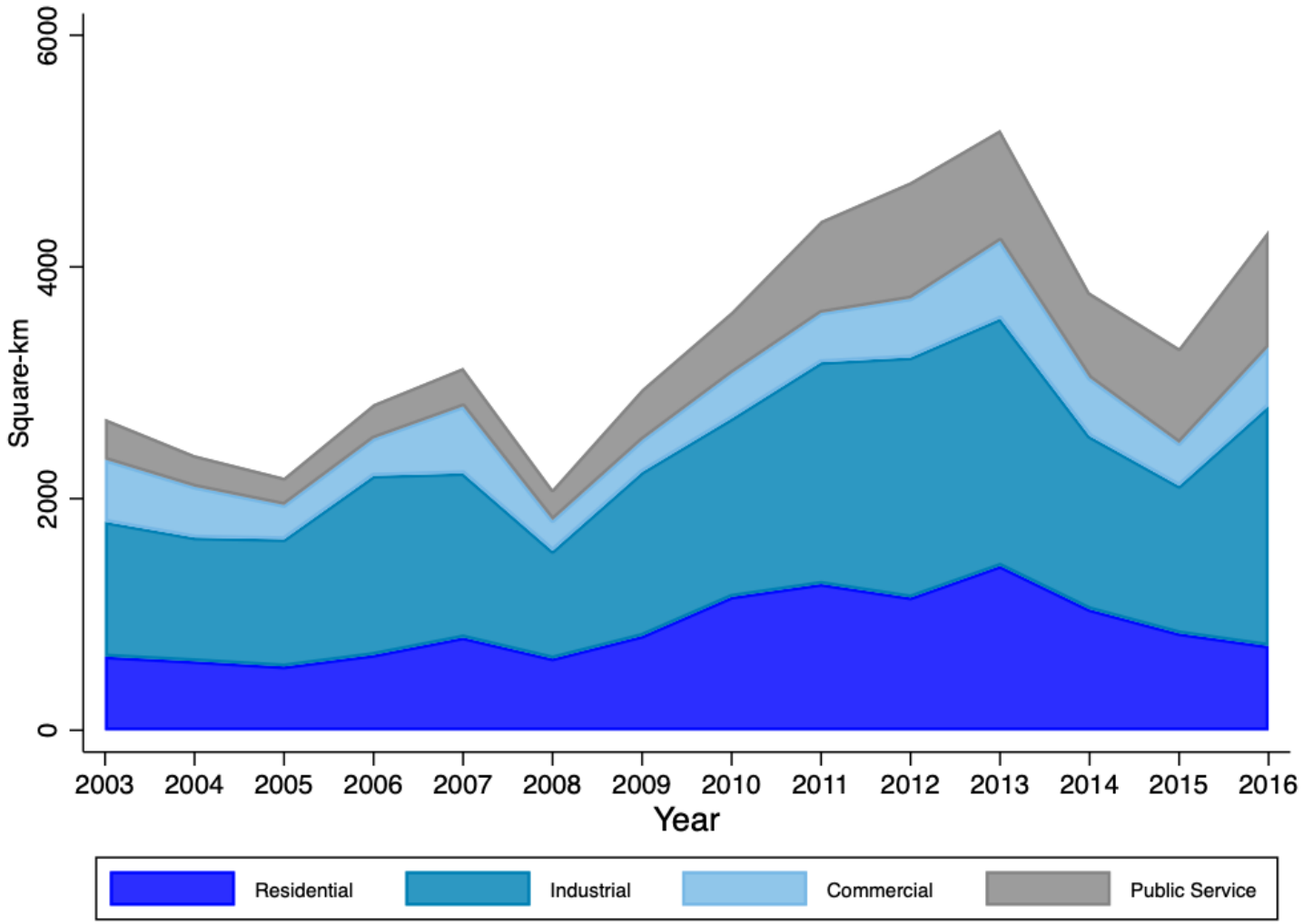
- Hometown connections affect city leaders' promotion outcomes.
- CCP's GDP-based promotion system affected city-level land allocation decisions, which in turn influenced land price and house price.
- China's institutional friction is a significant contributor to China's housing price growth.

Policy Implication

- Examine the interaction between political frictions and land/housing markets to address concerns on housing

Appendix

Land Allocation by Type



▸ Land

Table: Summary Statistics of City Party Secretaries, by Term

Total	1,636
By next job assignment	
Promotion	339
Lateral transfer	1,255
Retirement	390
Termination during term in office	42
Term length	
Median	4
Std. Dev.	1.9
Mean	4.06

Summary statistics for Chinese city party secretaries between 2000 and 2015.

Source: China Political Elite Dataset.

▸ Data

Table: Summary Statistics of Planned and Sold Land Area, by City

	Land Area		Building Area		Ratio
	Residential	Industrial	Residential	Industrial	$\frac{Industrial}{Residential}$
unit	10,000 sq. m.	10,000 sq. m.	10,000 sq. m.	10,000 sq. m.	
count	195	195	195	195	195
mean	329.39	472.43	768.22	523.10	1.83
Std.	299.56	388.00	674.70	427.92	1.57
min	42.50	20.05	63.13	22.62	0.35
median	238.97	378.09	589.34	404.95	1.48
max	2,605.24	2,587.58	6,417.12	2,634.38	17.65

▸ Data

Table: Summary Statistics of Macro Variables, by City

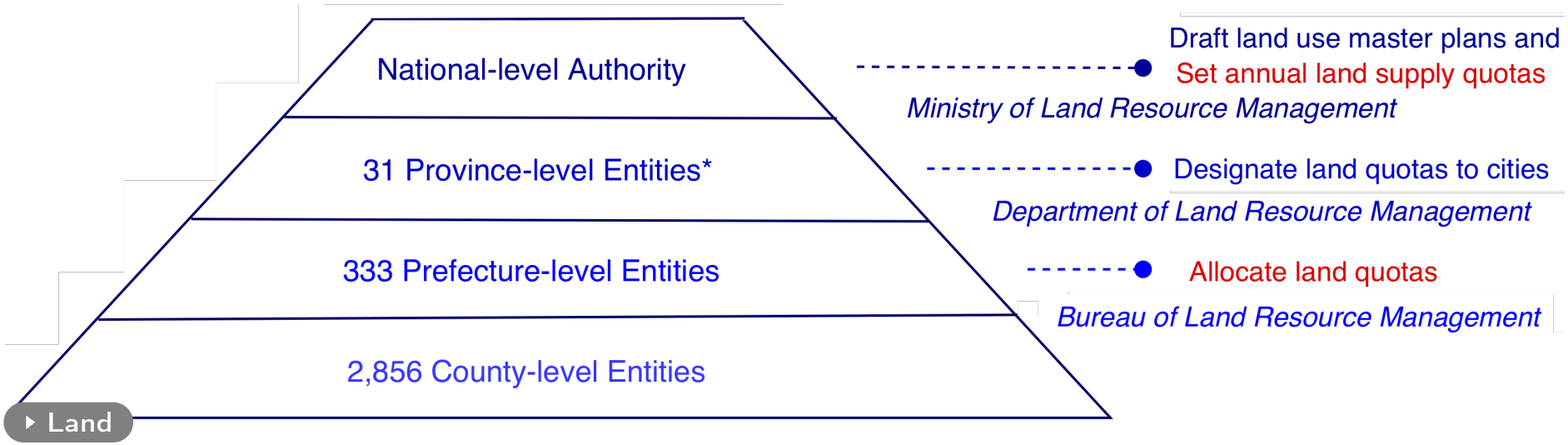
	House Price	Fixed Inv.	Real Estate Inv.	GDP	ΔGDP	Avg. Wage
unit	RMB/sq.m.	RMB (mn)	RMB (mn)	RMB (bn)	RMB (bn)	RMB
mean	3750.41	105752.95	21748.16	0.1826	0.0168	31,342.38
std	2166.56	103832.76	33869.33	0.2245	0.0196	7,339.60
median	3017.30	66654.79	9738.30	0.1047	0.0097	29,810.69

Table: Summary Statistics of Macro Variables, by City (*Continued.*)

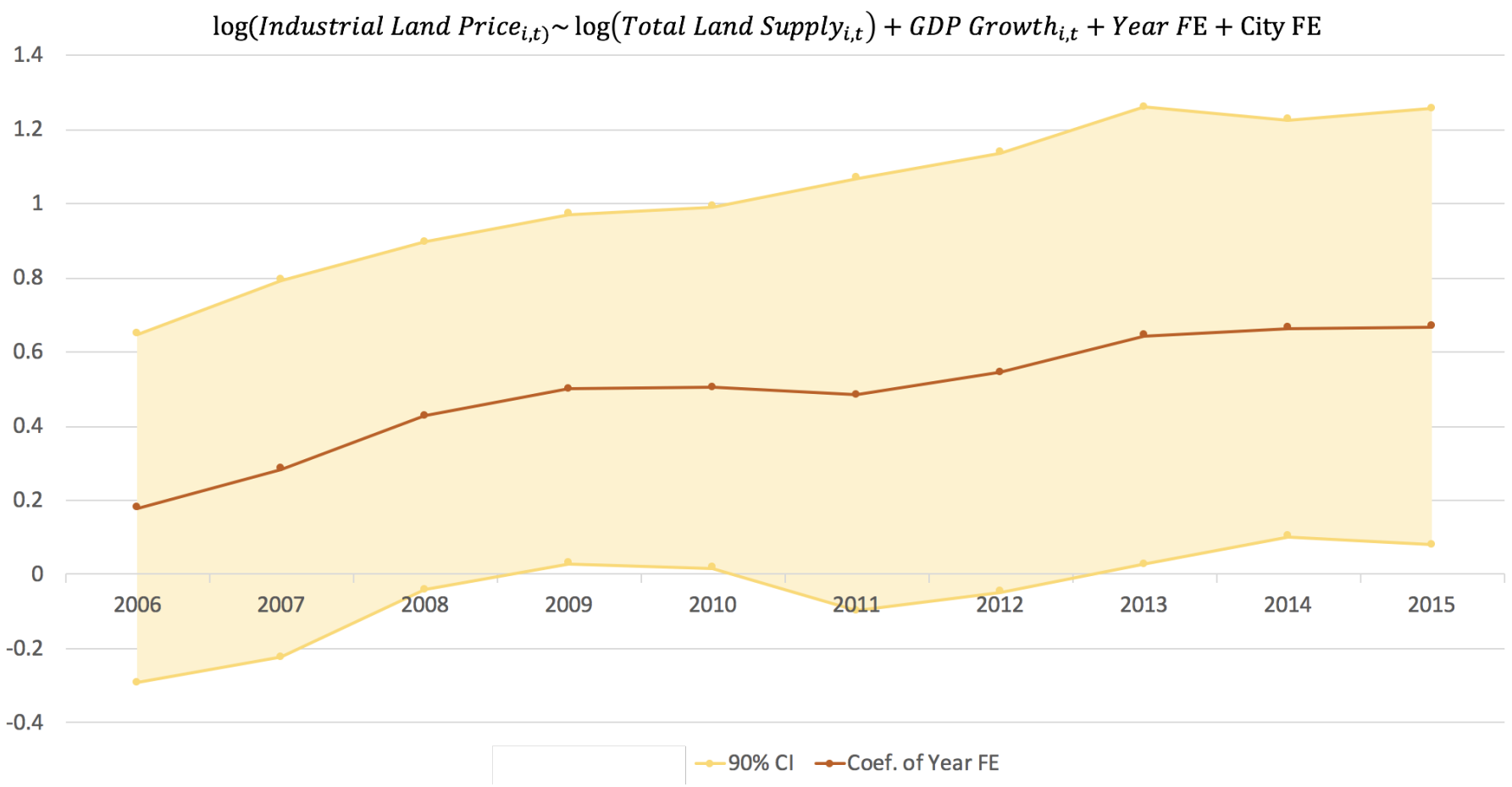
	Paved Road	Registration	Usual Residence	Govt. Revenue	Deposits
unit	sq.m. (mn)	Person (k)	Person (k)	RMB (mn)	RMB (mn)
mean	0.02	4,769.80	5,023.02	15.82	298,465.74
std	0.03	3,278.12	3,519.75	31.97	655,356.56
median	0.01	3,915.89	4,332.87	7.03	108,967.86

▸ Data

Land Management Pyramid

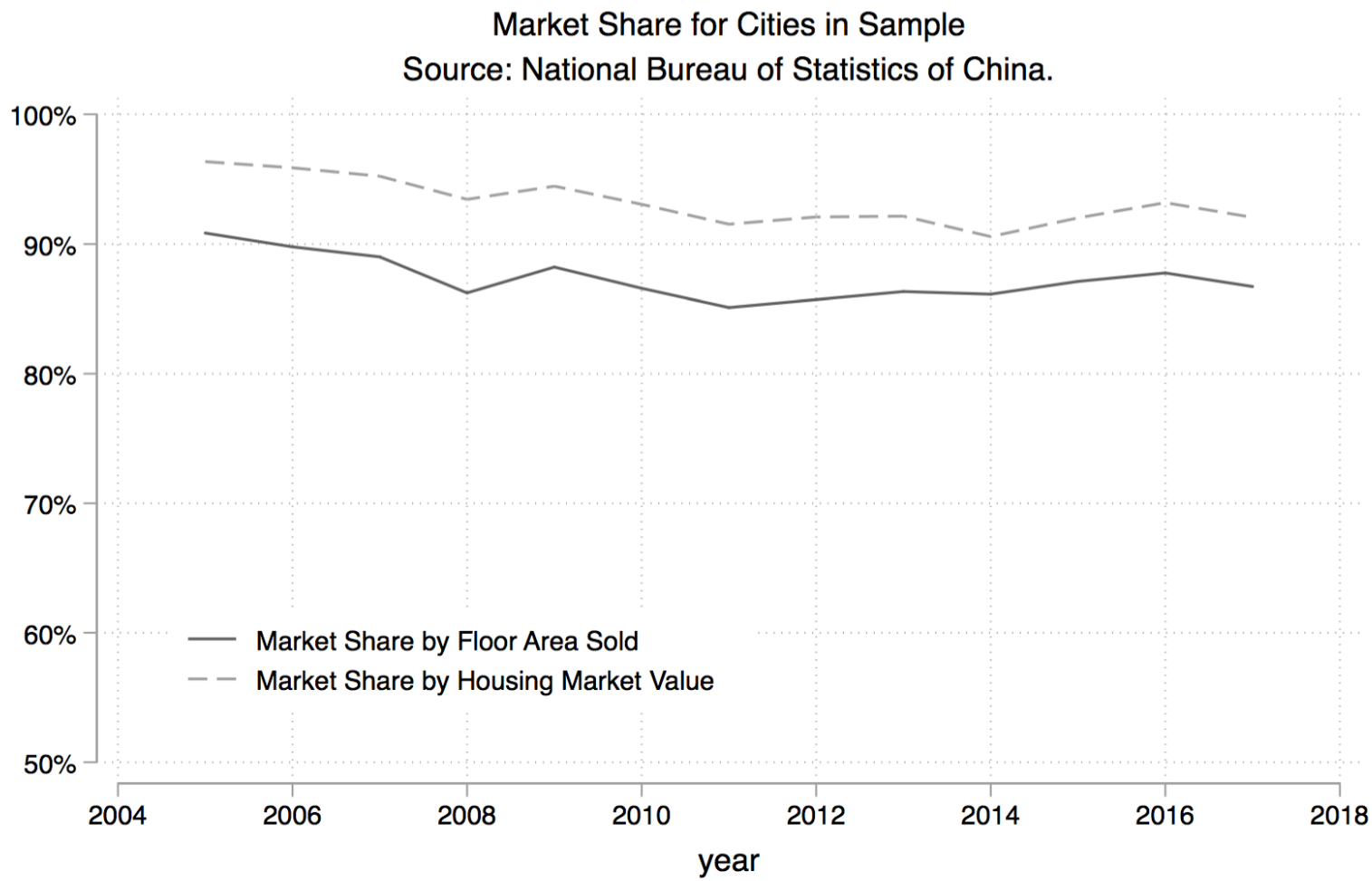


Aggregate Time Trend



▸ Land Supply

Sample Coverage



▸ Data

Specification

Representative firm:

$$\max_{K,L,D} AK^{\alpha}L^{\beta}(D_{-1}+\lambda D)^{1-\alpha-\beta} - RK - wL - r_{ind}D,$$

Representative household:

$$u^h(C,H) = \Big[\underbrace{\Big(\int_0^1 h_j^{\frac{\epsilon-1}{\epsilon}}dj\Big)^{\frac{\epsilon}{\epsilon-1}}}_{H}\Big]^{\eta} C^{1-\eta}$$

$$C + \int_0^1 p_j h_j dj = wL + \phi wL,$$

For each developer in the continuum of real estate developers:

$$h_j = \xi N_j$$

Back

Set-up

Environment Static GE, consider a city as SOE.
Agents Rep. household & firm; real estate developers, and a city leader.
Specification ▸ Notation

- Representative firm: competitive, CRS; industry land stock grows with new industry land integrated at a proportional cost.
- Representative household: inelastic labor supply with Cobb-Douglas utility over numeraire and housing; housing is CES aggregate.
- Monopolistically competitive real estate developers convert residential land into housing projects; they share identical linear conversion technology.

The City Leader

D: industrial land; N: residential land.
The city leader has rational expectations

$$u^g(D,N) = \underbrace{v^h(D,N)}_{\textit{household welfare}} + \underbrace{E[V^P(D,N)]}_{\textit{expected promotion payoff}}$$

$$V^P(D,N) = \begin{cases} 1 & \text{w/ prob. } \mathcal{P}(Y(D,N)) \\ 0 & \text{otherwise} \end{cases}$$

GDP-Based Promotion System

$$\mathcal{P}(Y(D,N)) = \chi Y(D,N)$$

Hence

$$u^g(D,N) = v^h(D,N) + \chi Y(D,N),$$
$$\text{s.t. } D + N = \zeta.$$

Equilibrium

An equilibrium consists of prices and allocation such that: all agents maximize utility/profit; labor, land, and housing markets clear.

A unique equilibrium exists.

Proposition

GDP concern χ increases industrial land supply, reduces residential land supply, and rises house price.