

# Farmland Regulation, Structural Change and Agricultural Development: Evidence from Chongqing Land Coupon Reform

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# Motivation

- ▶ For food security concerns, China implements strict policy to reserve farmland and sustain grain output for many years
- ▶ However, top-down regulations may harm farmers' incentive and fail to foster agricultural development
- ▶ At the same time, strict land use policy could deter urbanization and structural change
- ▶ Will **market-based approach** be a silver lining?
  - ▶ preserve farmland and promote structural change
  - ▶ benefit farmers in remote rural area

# Land-Use Conflicts in China

- ▶ **Farmland Red Line policy (FRP)**
  - ▶ preserve at least 1.8 billion mu farmland nationwide
  - ▶ one unit of unused land converted to farmland if one unit of farmland converted to urban land within prefecture (Yu, 2022)
  - ▶ each region maintains certain amount.
- ▶ The amount of urban land can be developed is subject to **urban construction quota**, a top-down allocation approach.
  - ▶ high tier government allocate quotas to lower tier
  - ▶ quota is skewed to west and central regions (Fang et al., 2023)
  - ▶ no market to trade quota
- ▶ Massive migration from rural to urban leaves abundant idle **rural residential land**, yet farmers are not allowed to sell it

# What This Paper Does

- ▶ I study a market-based land reform in China, **Chongqing Land Coupon System**
  - ▶ allows farmers and firms to trade land coupon.
  - ▶ coupon is created when farmers reclaim rural housing (rural residential land) to farmland
  - ▶ land coupon system generates extra urban construction quota
- ▶ Evaluate how Land Coupon reform affects agricultural development and structural change
  - ▶ collect comprehensive transaction record of Land Coupon
  - ▶ compare counties close to province boundary

# Literature

## 1. Food Security and Farmland Preservation

- ▶ Farmland Red Line Policy (Yu, 2022)
- ▶ Grain Production Project (Xi, 2023)

**This paper studies a market-based land reform**

## 2. Land Use Policy and Urban Land Quota in China

- ▶ Quotas allocation across regions (Fu, Xu and Zhang, 2021; Fang et al., 2022);
- ▶ Allocation between industrial and residential/commercial land (Henderson et al., 2022; Lu et al., 2023; He et al., 2023)

**This paper studies a reform that creates land quota**

## 3. Rural Land Property

- ▶ Land titling and agricultural productivity (de Janvry et al, 2015; Chen, 2017; Chari et al., 2021); land titling and rural entrepreneurship (Bu and Liao, 2022); land titling and human capital (Liu et al., 2023)

**This paper focuses on rural residential land**

## Basic Information about Chongqing



- ▶ Chongqing is one of the municipality (others are Beijing, Shanghai and Tianjin)
- ▶ Area: 82,400 square kilometers; 38 counties
- ▶ Population: more than 32 million
- ▶ GDP: 3 trillion yuan in 2023

## How Chongqing Land Coupon System Works

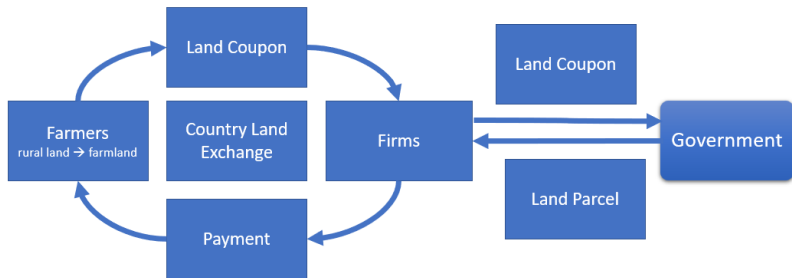
- ▶ It was implemented since 2008, when 7.5 million rural people work in the city, leave abundant idle rural housing
- ▶ Urban land supply is in shortage, constrained by farmland preservation requirement, especially in main city area
- ▶ Chongqing Land Coupon System
  - ▶ Land Coupon is created when rural housing (rural residential land) reclaimed to farmland
  - ▶ Land Coupon permits equal amount of urban land to be developed **in other places within Chongqing**
  - ▶ To develop urban residential or commercial land, firms need to purchase at least the same amount of Land Coupon from farmers through Chongqing Country Land Exchange (CCLE)
  - ▶ After the reform, urban construction quota comes from two sources: allocated quota by central government, newly created quota by farmers







# Land Coupon Transaction Process



## ► Three phases of Land Coupon

1. Land Coupon Generation
2. Land Coupon Trade and Compensation
3. Land Coupon Utilization

FAQs

Suppliers

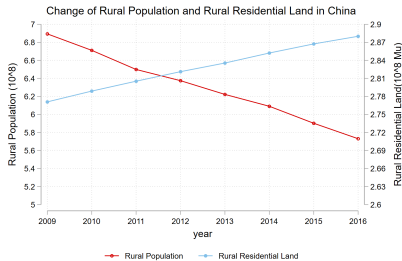


Figure 1: Rural Population and Rural Residential Land in China

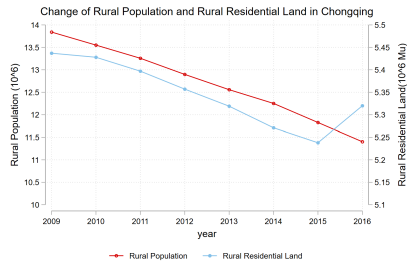
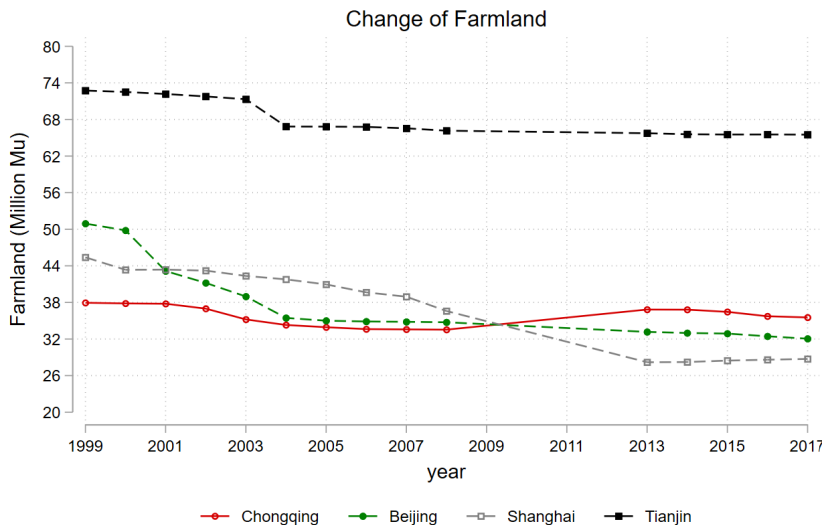


Figure 2: Rural Population and Rural Residential Land in Chongqing

# Change of Farmland

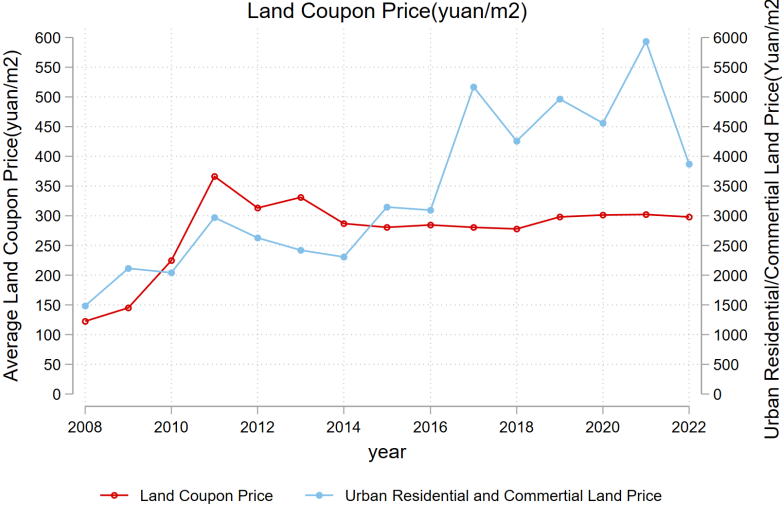


- ▶ Compare to Beijing, Shanghai and Tianjin, Chongqing maintains farmland

# Data

1. Land Coupon Transaction Database (2008-2023)
  - ▶ Purchaser's name, traded area and payment
  - ▶ Supplier's name, ID, area, compensation value, location (village) of reclaimed rural land.
  - ▶ I aggregate land coupon supply to county level
2. County and City Statistics Yearbook (2000-2021)
  - ▶ GDP by sector, GDP per capita, input and output in ag

# Transaction Price



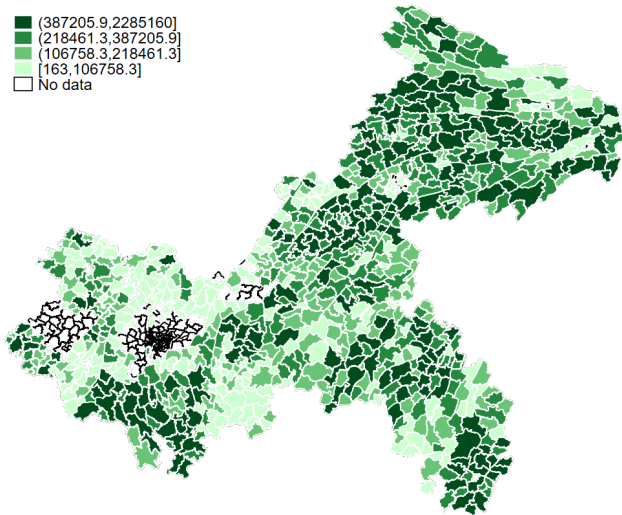
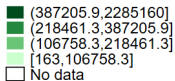
Area

Value

Supplier

# Land Coupon Supply (Town-level)

Accumulated land coupon supply 2008-2023(m<sup>2</sup>)



## Empirical Strategy

- ▶ Five provinces adjacent to Chongqing: Sichuan, Hunan, Hubei, Guizhou, and Shaanxi
- ▶ Sample: counties within 50 km to the province boundary; drop counties in Chongqing that never supplied land coupons



- ▶ Empirical Specification:

$$y_{it} = \beta \text{Coupon} * \text{Post08} + \alpha_i + \gamma_t + \mu_{it} \quad (1)$$



# Effects on Local Economic Development

Table 1: Impact of Land Coupon Supply on Local Economic Development

	(1)	(2)	(3)	(4)
	$\ln(\text{GDP}_{ag})$	$\ln(\text{GDP}_{industry})$	$\ln(\text{GDP}_{service})$	$\ln(\text{GDP per capita})$
Coupon *Post08	0.620*** [0.019]	0.131*** [0.031]	-0.338*** [0.030]	0.264*** [0.022]
CountyFE	Y	Y	Y	Y
YearFE	Y	Y	Y	Y
Cluster	County	County	County	County
N	2417	2420	2410	2083

Note: Sample period is from 2000 to 2020. Coupon is a dummy variable, which equals to one if county  $i$  has ever supplied land coupon by reclaiming rural residential land to farmland. Post08 is a dummy variable, which equals to zero for years before 2008. Robust standard errors in parentheses. \*\*\*, \*\*, and \* indicate statistical significance at 1%, 5% and 10%, respectively.

# Effects on Structural Change

Table 2: Impact of Land Coupon Supply on Structural Change

	(1)	(2)	(3)
	GDP share <sub>ag</sub>	GDP share <sub>industry</sub>	GDP share <sub>service</sub>
Coupon *Post08	-0.098*** [0.006]	0.150*** [0.007]	-0.052*** [0.008]
CountyFE	Y	Y	Y
YearFE	Y	Y	Y
Cluster	County	County	County
N	2407	2410	2410

Note: Dependent variables are sector share in value added. Sample period is from 2000 to 2020. Coupon is a dummy variable, which equals to one if county  $i$  has ever supplied land coupon by reclaiming rural residential land to farmland. Post08 is a dummy variable, which equals to zero for years before 2008.

# Effects on Agricultural Development

Table 3: Impact of Land Coupon Supply on Agricultural Development

	(1)	(2)	(3)
	ln(Grain Output)	ln(Sown Area)	ln(Ag. Machine Power)
Coupon *Post08	1.524*** [0.018]	1.547*** [0.034]	1.566*** [0.021]
CountyFE	Y	Y	Y
YearFE	Y	Y	Y
Cluster	County	County	County
N	2166	1133	1963

Note: Sample period is from 2000 to 2020. Coupon is a dummy variable, which equals to one if county  $i$  has ever supplied land coupon by reclaiming rural residential land to farmland. Post08 is a dummy variable, which equals to zero for years before 2008. Robust standard errors in parentheses. \*\*\*, \*\*, and \* indicate statistical significance at 1%, 5% and 10%, respectively.

# Conclusion

- ▶ Chongqing Land Coupon system is a market based land reform, which is effective at preserving farmland and sustain grain output
- ▶ GDP per capita experienced larger increase in counties that supply land coupon
- ▶ It also promotes structural change

# Thank You!

Please send comments or questions to:  
[fanym96@connect.hku.hk](mailto:fanym96@connect.hku.hk)

# Basic Information about suppliers

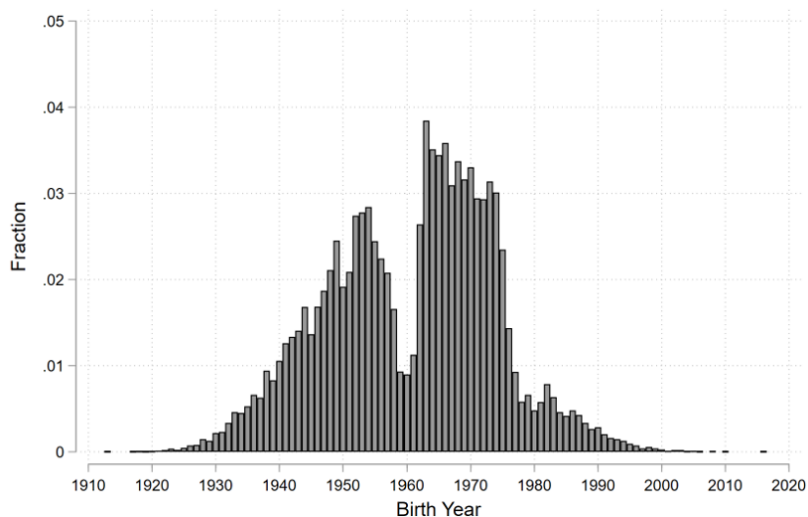
Descriptive Statistics

VARIABLES	(1) N	(2) mean	(3) sd	(4) min	(5) max
Area of reclaimed land (m2)	29,735	302.8	149.5	2	2,586
Compensation (Yuan)	29,735	63,428	31,347	418.8	543,984
Birth year	29,735	1961	13.23	1913	2016
Gender (female=1)	11,353	0.154	0.361	0	1

Note: This Table reports basic characteristics of suppliers of land coupons. Data is from 2021 compensation for land coupon sales.

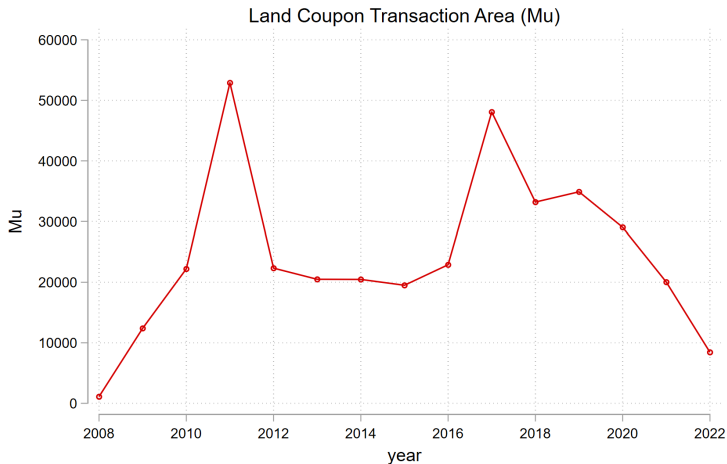
## Birth Year Distribution

## Birth Year Distribution of Suppliers



► Using 2021 Land Coupon Payment Data

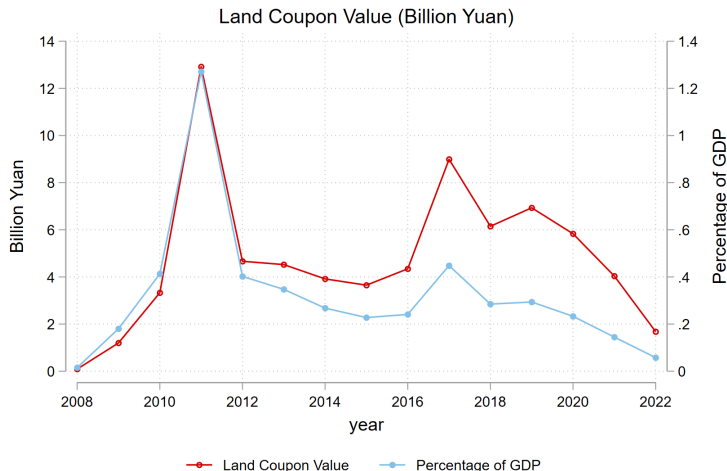
# Transaction Area



- ▶ By the end of 2022, the total amount of land coupon traded is around 245 sq.km, which is about 0.3% of administrative area of Chongqing



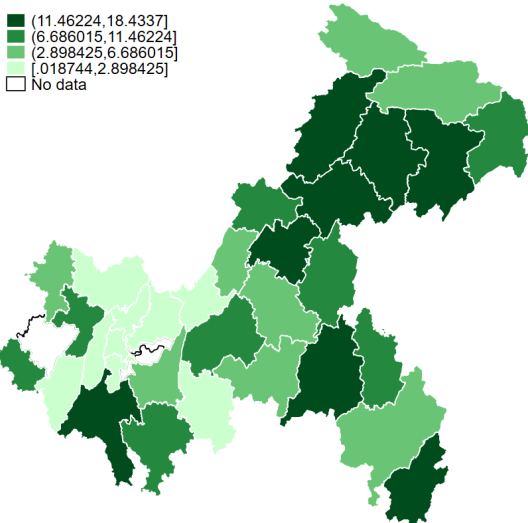
# Transaction Value



- ▶ By the end of 2022, the total transaction value of land coupon reached 72.26 Billion Yuan
- ▶ On average, it contributes 0.32% of GDP in Chongqing

# Accumulated Land Coupon Supply (County-level)

Land coupon supply 2008-2023(km2)



## FAQs (i)

### **1. What type of rural land can be reclaimed to farmland?**

Ans: Abandoned or idle rural construction land, such as dilapidated house, rural residential base and surrounding rural land of farmers who got urban hukou; elderly people who move to live with family; rural land for town and village enterprises (TVEs), public facilities, schools, whole village relocation project

### **2. How farmers and rural collectives share the compensation?**

Ans: After deducting necessary reclamation cost and management cost (usually 55.5 yuan/m<sup>2</sup>, about 18% of land coupon unit price), then farmers get 85% of the net compensation, and rural collectives get 15%.

### **3. Do farmers reclaim rural housing by themselves?**

Ans: Not necessarily, local government will tender professional construction firms to reclaim and inspecting team to verify quality.

### **4. After reclamation, who has the use right of farmland?**

Ans: Rural collectives enjoy ownership. Farmers who request to reclaim their rural residential land have the priority to contract the farmland if they stay in the village. If they leave, then rural collectives will take it back and contract to other farmers or firms.

### **5. Do farmers need approval from other people?**

Ans: Yes, for residential land, farmers need approval from rural collectives. Rural collectives will check whether farmers have other place to live to ensure farmers will not become homeless, whether there is conflict about reclamation such as sharing yards or offence with neighbors, whether the whole family agree to reclaim. For public rural land, two thirds of members need to approve for it.

## FAQs (iii)

### **6. How farmers get paid and how long does it take?**

Ans: Suppliers of land coupon are price-takers. They can't bargain for transaction price. To protect farmers, Chongqing Country Land Exchange (CCLE) set minimum transaction price in each auction. In theory, CCLE will clear the suppliers selling decision by first come first serve. Purchasers will bid for land coupon. After receiving payment from purchasers, CCLE will request banks to send money to farmers directly. Depend on market demand, the whole process may take more than two years. Han and Lin (2019) provide a more detailed description of the transaction procedure and length.

### **7. How frequently is land coupon auction?**

Ans: Normally once a month

### **8. Who need to purchase land coupons?**

Ans: Firms or individuals who want to use urban commercial/residential land such as real estate firms. Use industrial land doesn't require land coupons.

## FAQs (iv)

### **9. Does buying land coupon guarantee acquiring urban land parcel?**

Ans: No, firms who plan to acquire a parcel of urban commercial/residential land to develop are required to purchase land coupon at least the same amount of the urban land parcel before auction. It is an entry requirement not guarantee for obtaining urban land.

### **10. Are buyers and sellers from the same county?**

Ans: Not necessarily, for purchasers, land coupon is like a prerequisite for bidding urban land, thus the source of land coupon is not important. I am currently working on matching firms that purchasing land coupon with business registration data, which provides information of firm's industry, address, registry capital. I also plan to match with LandChina data, which documents where firms actually acquire urban land parcels and at what price. Roughly speaking, purchasers come from main city area and suppliers are from remote and less developed regions.