The abolition of People's Communes and fertility decline in rural China

Shuo Chen[a] Bin Xie[b*]

Report: Juncheng Jiang

School of Public Finance and Taxation

2024.12.02

中南财经政法大学

ZHONGNAN UNIVERSITY OF ECONOMICS AND LAW

Overview

Authors

Shuo Chen 陈硕

- Position
  - 2016- Full Professor, Fudan University
  - 2015-2016 Associate Professor, FDU
  - 2012-2015 Assistant Professor, FDU
  - 2011-2012 Post-doctor, Hong Kong University of Science & Technology
- Education
  - Ph.D. in Social Science, HKUST, 2011
  - Mphil in Social Science, HKUST, 2008
  - Msc in Economics, HKUST, 2006
  - B.A. in Management, Shandong University, 2002
- Research fields
  - Development economics
  - Economic history of China
  - Political economy of contemporary China

Bin Xie 谢斌

- Position
  - 2024- Associate Professor, Institute for Economic and Social Research, Jinan University
  - 2020- Assistant to Dean, IESR, Jinan University
  - 2017-2024 Assistant Professor, IESR, Jinan University
- Education
  - Ph.D. in Economics, Rutgers University, 2017
  - B.A. in Economics, Peking University 2010
- Research fields
  - Economics History
  - Labor Economics
  - Development Economics

Highlight

Highlight

ABSTRACT

This study investigates the impact of the abolition of People's Communes in the early 1980s on rural fertility in China. Exploiting the staggered implementation of agricultural decollectivization, we show that decollectivization led to a significant decline in rural fertility, independent of the impact of family planning policies. Counties with higher levels of egalitarianism during the commune period experienced a sharper fertility decline following decollectivization, indicating that the elimination of egalitarian income distribution is the key mechanism behind this fertility decline. We find no evidence supporting the alternative hypothesis that the fertility decline was due to increased opportunity costs of childbearing associated with higher agricultural productivity after decollectivization.

- They examine the impact of the abolition of People's Communes on rural fertility.
- Rural fertility rate declined significantly after agricultural decollectivization.
- The key mechanism is the elimination of egalitarian income distribution.

Motivation

The People's Commune system

As the largest social experiment of collectivization in human history, the People's Commune system in rural China operated from the late 1950s to the early 1980s, featuring institutional arrangements characterized by collectivism and equality.

- The incomes of commune members were distributed in a highly egalitarian fashion, which subsidized the fertility behaviors of peasants by transferring the childbearing costs from households to collectives.
- We witness a remarkable increase in the rural population over the two decades of the commune period.
- Empirical studies exploring the connection between the fertility trend and the rise and fall of the People's Commune system remain relatively limited

Contribution

Contribution

- By exploring the demographic effects of China's agricultural decollectivization, their study makes a contribution to the literature on the diverse impacts of this reform across various dimensions.
- Their findings illuminate the causal relationship between decollectivization and the subsequent fertility decline, providing new insights into the driving forces behind China's demographic transition.
- Mechanism analysis also contribute to the literature on the fertility impact of child subsidies

History background

2.1 People's commune system

In 1952, the Chinese Communist Party (CCP) launched agricultural collectivization to boost agricultural output and enhance resource extraction for industrial investment.
By the end of 1957, more than 97% of peasant households were organized into agricultural production collectives of different forms.

Despite regional and temporal variations, the income distribution of the People's Communes comprised two main components:

- an egalitarian ration system
- an incentive wage system based on labor

2.1 People's commune system

First, a fixed amount of grain ration (口粮) is distributed equally to meet the basic needs of commune members.
Second, to incentivize hard work, a portion of peasant incomes was determined according to workpoints (工分), which measures individual labor input in agricultural production.

In Mao's blueprint, the wage system was intended to gradually diminish as productivity increased, with people working spontaneously and consuming according to need in a utopian society.

2.1 People's commune system

Due to:

- the communist ideology
- the blind optimism about grain abundance during the Great Leap Forward.

the income distribution of the People's Communes learned excessively towards egalitarianism.
Incomes were highly equalized across teams and individuals within the communes, with the incentive wage largely existing in name.

The combination of low productivity and overconsumption due to such extreme egalitarianism made the system unsustainable, and the great famine ensued.

2.1 People's commune system

The catastrophic famine between 1959 and 1961 led to the nearcollapse of the commune system.

Then, households were allowed to retain a small amount of private plots (自留地) and engage in family sideline activities.

Communal dining halls were dismantled in most areas.

2.1 People's commune system

After introducing the famous slogan "never forget class struggle", Mao launched a series of political campaigns promoting class struggle and equality starting in 1963. These campaigns included the Socialist Education Movement, the "Learn from Dazhai in agriculture"(农业学大寨) movement, and ultimately the Cultural Revolution.

In the late 1970s, the government initiated the reform to gradually replace People's Communes with the household responsibility system (HRS) in rural China.

Nearly all counties abolished the communes and adopted the HRS by 1983.

With the dissolution of People's Communes, collectively owned land was contracted out to peasants households, who could retain surplus output after procurement as work incentives

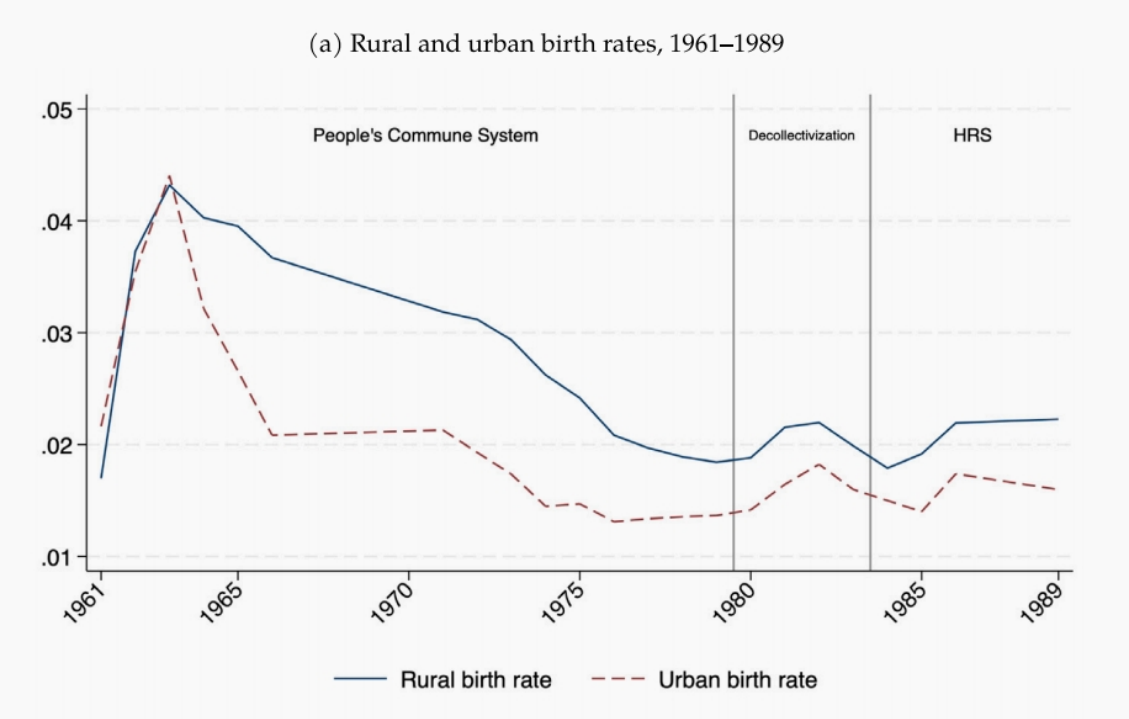
2.2. Rural fertility in the commune period

Between 1962 and 1978,

- rural population soaring from 556 million to 790 million
- average rural birth rate was at 3.0%
- contemporaneous urban birth rate was at 2.1%

Between 1979 and 1989 ,the average rural birth rate was at 2.0%

A significant gap between rural and urban birth rates narrowing only towards the late 1970s.



High birth rate in rural

Why?: the egalitarian income system incentivized

- First, the ration system directly subsidized commune members by allowing them to immediately claim grain rations for newborns, thereby reducing the financial burden of raising children.
- Second, the egalitarian income distribution indirectly subsidized peasants by lowering the opportunity costs of childbearing, as their incomes were minimally affected by actual labor inputs.

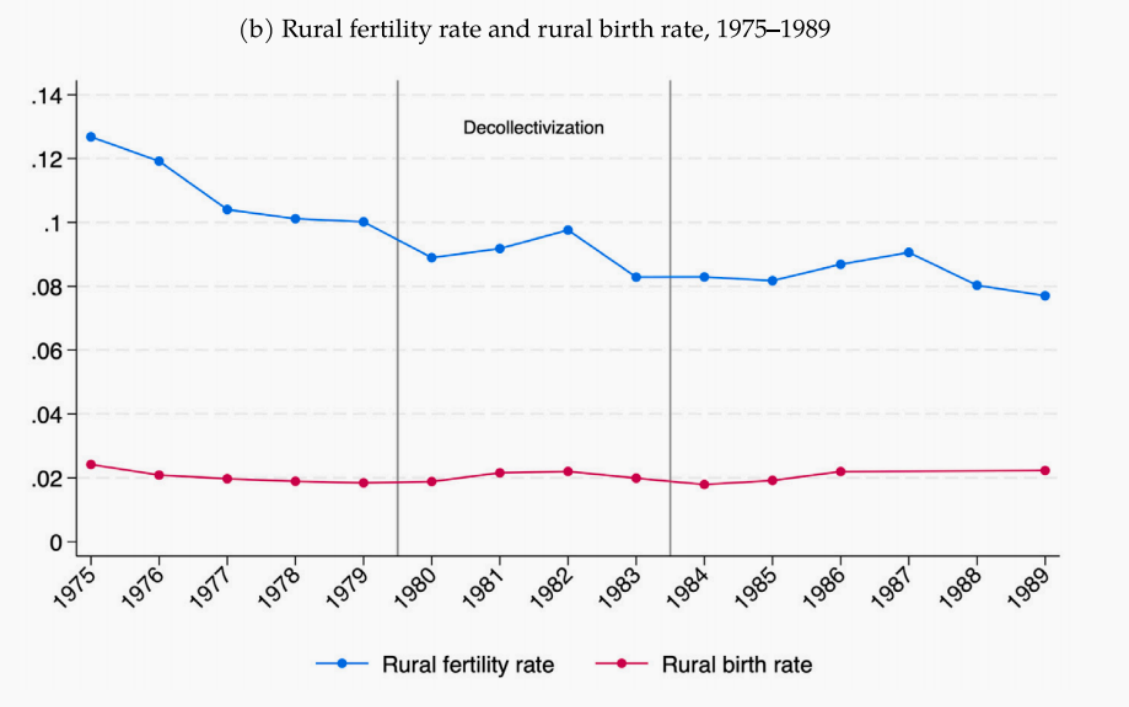
How? Vividly illustrate

Accounts from rural individuals vividly illustrate the perceived benefits of childbearing during the commune period with phrases such as
”Having a new child pays more than working hard all year”
”Immediately receive a ration of 75 kilos if your belly swells”.

The dissolution of the People's Commune system

Peasants once again assumed individual responsibility for production, consumption, and distribution.

This demographic shift led to a natural increase in the birth rate. In contrast, the rural fertility rate (measured as the number of births per woman aged 15–49) demonstrated a clear downward trend throughout this period.



The average fertility rate in the pre-reform years (1977–1979) is 0.102, while in the post-reform years (1984–1986) it is 0.084, reflecting a 16% decline

Data description

Various sources

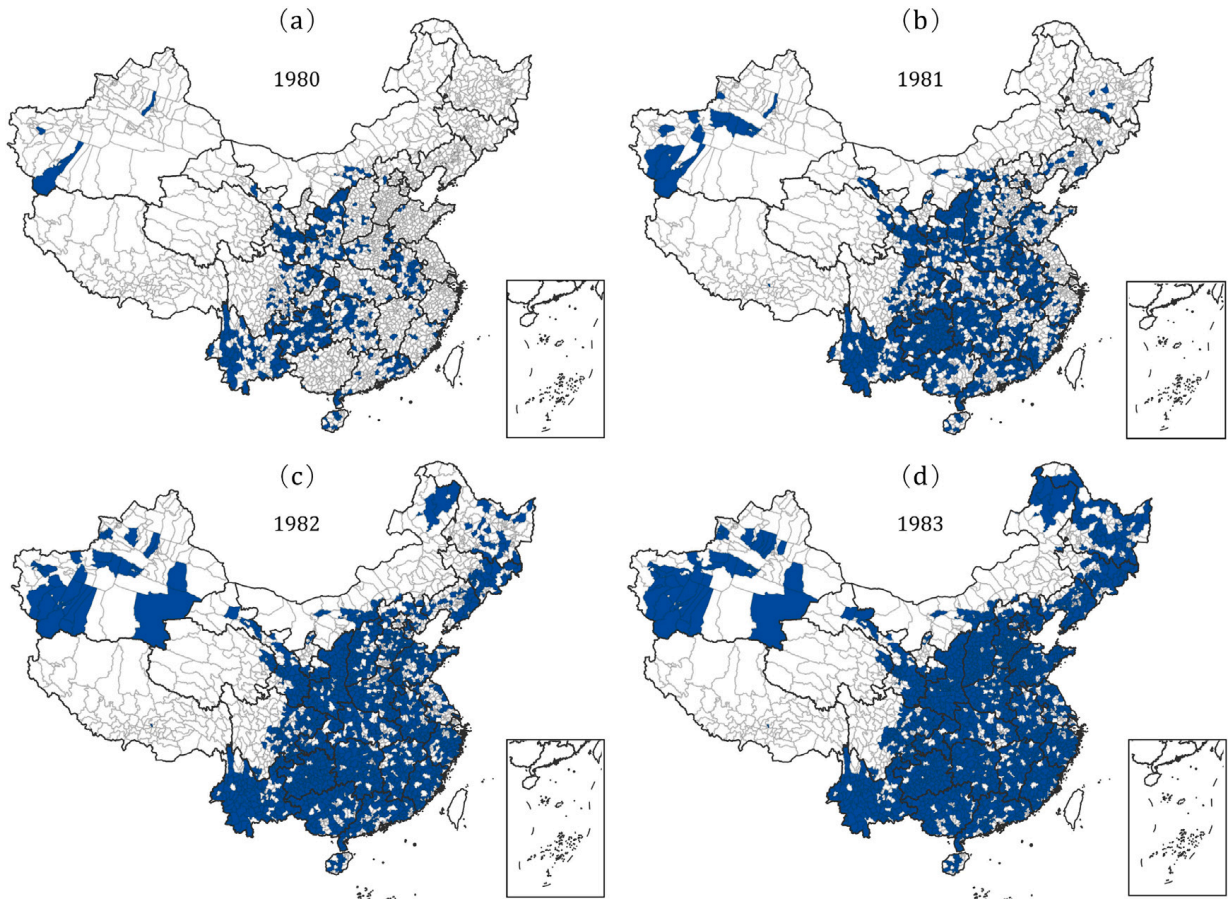
For empirical analysis, they compile a county-level panel dataset of 1774 counties covering the years of 1971–1989 from various sources.

Table 1
Summary statistics.

Variable	Mean	S.D.
Total rural population	348 486	255 377
Rural females aged 15–49	87 504	66 387
Annual rural births	8753	6760
Rural fertility rate (%)	10.87	5.03
Rural birth rate (%)	2.61	0.97
Decollectivization in 1980	0.24	0.42
Decollectivization in 1981	0.34	0.47
Decollectivization in 1982	0.28	0.45
Decollectivization in 1983	0.14	0.35
Provincial leader being alternate member	0.59	0.43
Distance to the provincial capital	11.99	0.73
Number of communes	28	107
Number of production teams	2558	1992
Population per commune	18 163	26 564
Population per production team	186	294
Maximum attainable crop yield per hectare	4.34	1.23
Potential crop output per capita	0.63	0.84

Note: Table 1 presents the mean and standard deviation of the main variables in our sample.

Timing of agricultural decollectivization by County.



24%, 34%, 28%, and 14% of the counties sequentially decollectivizatied in each year

Mechanism analysis

To construct the proxies for the level of egalitarianism for the mechanism analysis：

- they collect the rank (full member, alternate member, or nonmember) of provincial first party secretary in the Chinese Communist Party Central Committee (CCPCC) in each year during the commune period.
- they measure the career incentives of provincial leaders using the fraction of years the provincial leader being an alternate member of the CCPCC between 1963 and 1966.
- the distance of each county to the provincial capital as another proxy for local political radicalism

To measure the average size of collective, we gather data on the numbers of communes and production teams in each county from county gazetteers.

To examine the alternative explanation of the increase in potential income, we use crop yield potential data to construct an exogenous measure of county-level agricultural productivity in the post-reform period

Others

- information on the year of one-child policy implementation in each county from county gazetteers
- calculating each county's distance to the nearest main river, the closest treaty port, and four special economic zones established in 1980
- the annual net migration rate at the provincial level
- the occurrence of floods and droughts in each county in each year

Emprical ways

4.1 Baseline DiD estimation

Exploiting the different timings of decollectivization across counties, we apply the staggered difference-in-differences (DiD) strategy to estimate the standard two-way fixed effects (TWFE) model as follows: (1)

$$Y_{it} = \beta_1 D_{it} + \Phi_i + \Phi_t + X_{it}\gamma + \varepsilon_{it}$$

- $Y_i t$ is the natural logarithm of the rural fertility rate of county i in year t
- $.D_{it}$ is the binary indicator for the decollectivization of county i in year t.
- Φ_i and Φ_t represent county and year fixed effects.
- $X_i t$ is a set of covariates that include the implementation of family planning policies, county-specific linear time trend, and additional control variables

β_1 measures the treatment effect of decollectivization on fertility rate.

Baseline estimation

Table 2
Baseline estimation: Decollectivization and rural fertility.

	(1)	(2)	(3)	(4)
Decollectivization	−0.042***	−0.042***	−0.040***	−0.041***
	(0.010)	(0.010)	(0.010)	(0.010)
One-child policy		−0.059***	−0.048***	−0.048***
		(0.011)	(0.011)	(0.011)
Family planning commission		−0.077***	−0.045***	−0.043**
		(0.020)	(0.017)	(0.017)
County-specific linear trend			✓	✓
Additional covariates				✓
R^2	0.578	0.579	0.707	0.708
Observations	33 550	33 550	33 550	33 550

Note: Table 2 reports the OLS estimates from the regression model of Eq. (1). The dependent variable is the natural logarithm of rural fertility rate. The additional covariates in column 4 include interaction terms between the decollectivization dummy and the county's proximity to the nearest major river, historical treaty port, and the four special economic zones established in 1980, the indicators for flood and drought occurrences, and the annual provincial net migration rate. Standard errors clustered at the county level are reported in parentheses. *p < 0.1, **p < 0.05, ***p < 0.01.

4.2 Event-study estimation

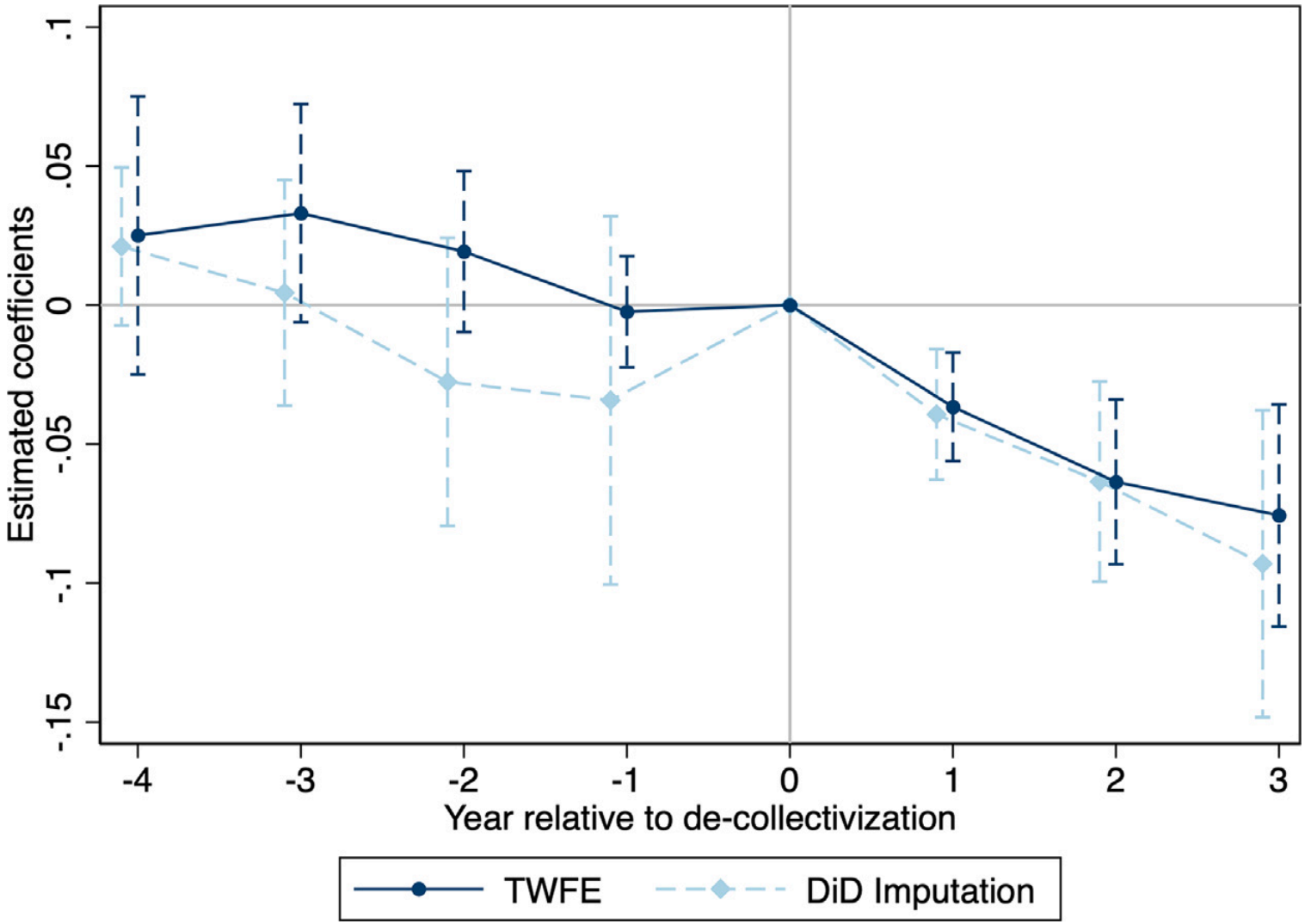
To obtain credible causal inference, the key assumption of the DiD estimation requires that counties should have exhibited parallel trends in rural fertility without the intervention. To empirically support the parallel trends assumption, they apply the event-study approach:

$$Y_{it} = \sum_{n=2}^{N} \gamma_n I_n^{Pre} + \sum_{m=0}^{M} \lambda_m I_m^{Post} + \Phi_i + \Phi_t + X_{it}\gamma + \varepsilon_{it}$$

- I_n^{Pre} and I_m^{Post} are the binary indicators for year t being nth year before decollectivization and mth year after decollectivization pre-trends in fertility of treated and control counties.

In this specification, γ_n detects whether there are different pre-trends in fertility of treated and control counties.
They expect the estimates of γ_n to be statistically indifferent from zero if the parallel trend assumption holds, and λ_m provides insights into the dynamic effect

Event study


Estimated coefficients
.1
.05
0
-.05
-.1
-.15
-4
-3
-2
-1
0
1
2
3
Year relative to de-collectivization
TWFE
DiD Imputation

4.3 Robustness checks

Definition of decollectivization: apply alternative thresholds of the share of HRS adoption to define the timing of decollectivization and re-estimate the model.

Table 3
Robustness check: Alternative forms of the treatment variable.

	Binary treatment		Continuous treatment			
	75% as threshold	87.5% as threshold	Sample with multiple data points		Full sample with imputation	
	(1)	(2)	(3)	(4)	(5)	(6)
Decollectivization (Binary)	−0.042***	−0.035***				
	(0.010)	(0.010)				
Decollectivization (Share)			−0.058***		−0.049***	
			(0.022)		(0.013)	
Decollectivization (Quartile)				−0.016***		−0.013***
				(0.005)		(0.003)
R^2	0.707	0.707	0.714	0.714	0.707	0.707
Observations	33 550	33 550	13 091	13 091	33 550	33 550

Note: Table 3 reports the estimates from the regression model of Eq. (1). The dependent variable is the natural logarithm of rural fertility rate. Columns 1 and 2 present the estimated coefficients on the binary treatment variable for decollectivization defined based on alternative thresholds (75% and 87.5%) of the share of HRS adoption. Columns 3 and 4 present the estimated coefficients on the continuous form and quartile form of the share of decollectivization using the sample of counties with the HRS share recorded in multiple years. Columns 5 and 6 present the estimated coefficients on the continuous form and quartile form of the share of decollectivization using the sample of counties with the HRS share recorded in multiple years. Standard errors clustered at the county level are reported in parentheses. $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

4.3 Robustness checks

Indicator of fertility:

Another issue is whether their finding is specific to using the natural logarithmic form of fertility rate as the dependent variable.

Table 4

Robustness check: Alternative indicators of fertility.

Dependent variable	Fertility rate (1)	Birth rate (2)	Ln(birth rate) (3)	Ln(# of births) (4)
Decollectivization	−0.349***	−0.118***	−0.052***	−0.050***
	(0.099)	(0.022)	(0.010)	(0.010)
R^2	0.712	0.662	0.633	0.937
Observations	33 550	33 550	33 550	33 550
Pre-reform mean	12.3	2.87		

Note: Table 4 reports the estimates from the regression model of Eq. (1) using different indicators of fertility as the dependent variable. The dependent variables in columns 1 to 4 are the level of rural fertility rate×100, the level of rural birth rate×100, the natural logarithm of rural birth rate, and the natural logarithm of the number of rural births, respectively. All columns control for county and year fixed effects, family planning policies, county-specific linear trends, and all additional covariates. Standard errors clustered at the county level are reported in parentheses. *p < 0.1, **p < 0.05, ***p < 0.01.

4.3 Robustness checks

Mortality selection of newborns and sex-selective abortion:

Table 5
Robustness check: Mortality selection and sex selection.

	(1)	(2)	(3)	(4)
Data source	County gazetteers		1990 census	
Ln(Y)	Birth rate	Death rate	Fertility rate: male births	Fertility rate: female births
Decollectivization	−0.034***	−0.013*	−0.035***	−0.051***
	(0.010)	(0.007)	(0.012)	(0.012)
R^2	0.806	0.960	0.639	0.634
Observations	11 975	11 990	33 411	33 394

Note: Table 5 reports the estimates from the regression model of Eq. (1). Columns 1 and 2 use the natural logarithm of annual birth rate and death rate from county gazetteers as the dependent variable, respectively. Columns 3 and 4 use the fertility rate for male and female births constructed based on the 1990 census as the dependent variable, respectively. All columns control for county and year fixed effects, family planning policies, county-specific linear trends, and all additional covariates. Standard errors clustered at the county level are reported in parentheses. *p < 0.1, **p < 0.05, ***p < 0.01.

4.4. Placebo test: Decollectivization and urban fertility

Table 6
Placebo test: Decollectivization and urban fertility.

Dependent variable	Urban fertility rate (1)	Urban birth rate (2)
Decollectivization	−0.029	0.064
	(0.591)	(0.057)
R^2	0.312	0.285
Observations	29 856	33 231
Pre-reform mean	8.28	1.87

Note: Table 6 reports the estimates from the regression model of Eq. (1). The dependent variables in columns 1 and 2 are urban fertility rate (×100) and urban birth rate (×100), respectively. All columns control for county and year fixed effects, family planning policies, county-specific linear trends, and all additional covariates. Standard errors clustered at the county level are reported in parentheses. *p < 0.1, **p < 0.05, ***p < 0.01.

Mechanism analysis

Key mechanism

They posit that the key mechanism behind the fertility decline following decollectivization is **the elimination of egalitarian income distribution**.

Under the commune system, peasants were provided with rations for their newborns and faced low opportunity costs of childbearing because their incomes were largely unrelated to their actual labor input.

This effectively means that the communes subsidized peasant fertility by sharing their childbearing costs.

With the abolition of egalitarianism: **Decollectivization**
the burden of childbearing costs: **collectives** $\rightarrow$ **individuals**
the possibility of free-riding ≈ 0
Fertility rates $\downarrow$.

Triple-difference

The rationale is that peasants in communes with a higher level of egalitarianism received greater "fertility subsidies" because the collective covered a larger portion of their childbearing costs. Consequently, they experienced a more significant increase in childbearing costs after decollectivization, which more strongly discouraged fertility.

$$Y_{it} = \beta_1 D_{it} + \beta_2 D_{it} \times H_i + \Phi_i + \Phi_t + X_{it}\gamma + \varepsilon_{it}$$

- this model further incorporates the interaction term of $D_i t$ and H_i,
- H_i is the indicator of the level of egalitarianism in county i during the commune period.
- Assuming that a greater value of H_i indicates a higher level of egalitarianism

They expect the estimate of β_2 to be negative and statistically significant, which suggests a stronger fertility effect of decollectivization among counties that were more egalitarian.

The level of egalitarianism

They construct proxies for the level of egalitarianism in income distribution based on two dimensions of the communes: **political radicalism and collective size.**

Heterogeneity by political radicalism:

Hypothesis 1. *Counties with provincial leaders who had greater career incentives (i.e., a higher likelihood of being an alternate member of the CCPCC) experienced a sharper decline in fertility following decollectivization*

Hypothesis 2. *Counties more distant to the provincial capital experienced a sharper decline in fertility following decollectivization*

Heterogeneity by collective size:

Hypothesis 3. *Counties with a higher population per commune or per production team experienced a sharper decline in fertility following decollectivization*

Table 7
Mechanism analysis: Heterogeneity by the level of egalitarianism.

Proxy for egalitarianism	(1) Political radicalism	(2)	(3) Collective size	(4)
Decollectivization	−0.014	−0.040***	−0.038***	−0.011
	(0.014)	(0.010)	(0.011)	(0.013)
Decollectivization	−0.046***			
× Provincial leader's career incentive	(0.016)			
Decollectivization		−0.021***		
× Distance to the provincial capital		(0.008)		
Decollectivization			−0.027***	
× Population per commune			(0.009)	
Decollectivization				−0.022**
× Population per production team				(0.011)
R^2	0.707	0.707	0.704	0.711
Observations	33 550	33 550	30 989	18 139

Note: Table 7 reports the estimates from the regression specification of Eq. (3) with full covariates. The dependent variable is the natural logarithm of rural fertility rate. The proxy for the level of egalitarianism in column 1 is the fraction of years the provincial leader being an alternate member of the CCPCC between 1963 and 1966. The proxy in column 2 is the standardized form of a county's distance to the provincial capital. The proxies in columns 3 and 4 are the standardized form of the average population per commune and per production team in the county, respectively. Standard errors clustered at the county level are reported in parentheses. *p < 0.1, **p < 0.05, ***p < 0.01.

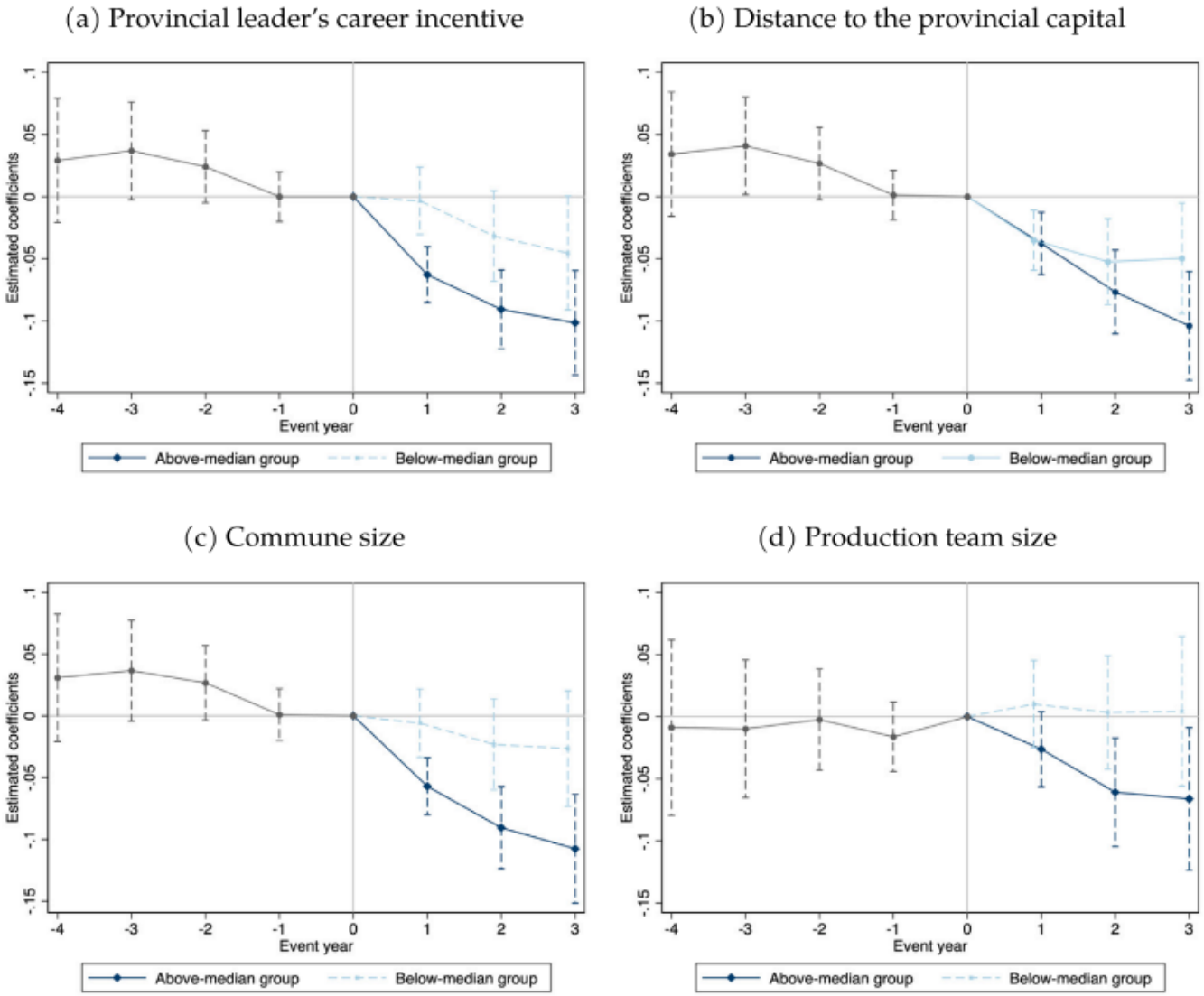


Fig. 4. Event-study estimation: Heterogeneity by the level of egalitarianism.
Note: Fig. 4 plots the point estimates and the 95% confidence intervals of the heterogeneous dynamic treatment effects by dividing counties into above-median and below-median groups based on the value of the proxy for the level of egalitarianism. The proxies in subfigures a–d are the fraction of years the provincial leader being an alternate member of the CCPCC, the county's distance to the provincial capital, the average population per commune, and the average population per team, respectively.

5.3 Excluding alternative explaination

A significant consequence of China's agricultural decollectivization is the increase in agricultural productivity and peasant incomes. Theoretically, the rise in peasant incomes following decollectivization introduce two opposing forces —income and substitution effects —that may impact fertility (Becker, 1965).

In the context of this study, the income effect predicts an increase in fertility following the rise in peasant income. This runs counter to our findings, making it an unlikely explanation for the observed outcome. On the other hand, the substitution effect implies that the fertility decline could be driven by the increase in the ''shadow price'' of children, as higher potential income after decollectivization made childbearing more costly. Thus, the increased opportunity costs of childbearing could present an alternative hypothesis to the mechanism we propose.

5.4. Reconciling with Almond et al. (2019)

In columns 1 and 2, covering about 8/9 of the 914 counties in their sample. These results indicate no significant fertility effect align closely with the their results.

Conversely, we use the sample of non-overlapping counties, exclusive to our dataset, suggests a strongly negative fertility impact.

Table 9
Reconciling with (Almond et al., 2019).

Sample	Overlapping counties		Non-overlapping counties	
	(1)	(2)	(3)	(4)
Decollectivization	−0.016	−0.017	−0.060***	−0.060***
	(0.015)	(0.015)	(0.014)	(0.014)
One-child policy	−0.058***	−0.059***	−0.041***	−0.041***
	(0.015)	(0.015)	(0.014)	(0.014)
Family planning commission		−0.086***		−0.002
		(0.020)		(0.027)
County and year FEs	✓	✓	✓	✓
County linear time trend	✓	✓	✓	✓
R^2	0.708	0.709	0.704	0.704
Observations	15 215	15 215	18 335	18 335

Note: Table 9 reports the estimates from the regression model of Eq. (1) using the samples of overlapping and non-overlapping counties. The dependent variable is the natural logarithm of rural fertility rate. Columns 1 and 2 use the sample of 803 overlapping counties that appear in both our and Almond et al. (2019)'s datasets. Columns 3 and 4 use the sample of 971 non-overlapping counties that exclusively appear in our dataset. Standard errors clustered at the county level are reported in parentheses. *p < 0.1, **p < 0.05, ***p < 0.01.

comparing the average characteristics of overlapping and non-overlapping counties in Table 10

Table 10
Comparison of non-overlapping and overlapping counties.

	(1) Non-overlapping counties	(2) Overlapping counties
Decollectivized in 1980	0.20	0.28
Decollectivized in 1981	0.33	0.35
Decollectivized in 1982	0.30	0.26
Decollectivized in 1983	0.17	0.11
Provincial leader being alternate member	0.61	0.58
Distance to the provincial capital	11.93	12.05
Population per commune	18745	17471
Population per production team	201	169
Pre-reform output per capita	0.43	0.41
Potential output per capita	0.66	0.60
Distance to Beijing	13.71	13.88
Observations	971	803

Note: Table 10 presents the average characteristics of non-overlapping counties and overlapping counties. "Pre-reform output per capita" is calculated as the county's 3-year average grain output per capita between 1977 and 1979.

Table 11
Determinants of the timing of decollectivization.

Dependent variable	(1) Year of decollectivization	(2)
Commune size	0.107***	
	(0.032)	
Production team size		0.191***
		(0.060)
Provincial leader's career incentive	0.179***	0.234***
	(0.054)	(0.067)
Distance to the provincial capital	0.063*	0.048
	(0.034)	(0.042)
Pre-reform output per capita	0.246***	0.241***
	(0.051)	(0.074)
Potential output per capita	−0.954***	−1.031***
	(0.074)	(0.095)
Distance to Beijing	−0.601***	−0.478***
	(0.036)	(0.049)
R^2	0.271	0.261
Observations	1364	798

Note: Table 11 reports the estimates from the cross-sectional regression with the year of decollectivization as the dependent variable. All explanatory variables except for provincial leader's career incentive are in natural logarithmic form. *p < 0.1, **p < 0.05, ***p < 0.01.

Regressing the year of decollectivization on various county characteristics (Table 11)

Concluding remarks

Conclusion

Our study identifies a significant reduction in rural fertility following the dissolution of the People's Commune system during the 1980s. We present empirical evidence suggesting that the elimination of its egalitarian income distribution primarily contributed to the fertility decline following decollectivization. This adds to our understanding of institutional factors beyond government family planning policies that influenced the fertility transition in China.

Moreover, our findings contribute to the broader discourse on the relationship between social policies and demographic trends. As many countries today grapple with population-related challenges, historical experiences from social experiments like the People's Commune system may offer valuable insights into the potential effects of different incentive structures on fertility.

Thanks for listening!