Bottom-Up Institutional Change and Growth in China

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TFP and Institutional Change

The main driver of China's economic growth since 1978 is the total factor productivity (TFP) growth (Zhu, 2012, 2023; Zilibotti, 2017).

Studies have attempted to identify the sources of TFP growth:

- Improvement in factor allocation: capital (Hsieh and Klenow, 2009; Song et al., 2011); labor (Tombe and Zhu, 2019; Hao et al., 2020)
- Internal and external trade liberalization (Brandt et al., 2017; Tombe and Zhu, 2019)

Yet, a large residual remains that cannot be accounted for.

This paper examines contribution from institutional change driven by market-oriented reforms.

The Reform Narratives

Grand design: China's economic reforms were centrally planned and orchestrated from Beijing (Blanchard and Shleifer, 2001; Wu, 2009).

Bottom-up: China's economic reforms emerged primarily through decentralized initiatives and local experimentation (Coase and Wang, 2012).

- Examples: 1970s land reforms and 1990s privatization emerged from local initiatives (Xu, 2011, 2022).
- Many key reforms started locally - often without Beijing's approval or against its directives

The Reform Narratives

We provide evidence for this bottom-up narrative.

- Ideas for reforms: Beijing or elsewhere?
- Bottom-up innovations constitute a source of reform ideas
- China's TFP growth and economic development

Overview of Data Sources

Source: 4,800+ volumes of county gazetteers, i.e., Chronicles of Major Events

Novel dataset: Around 2 million major events (1976-2005) at the county level

Content: Important cultural, economic, and political developments at year-month level

Key feature: Comprehensive chronicles of local developments through granular records of actual decisions and practices

Main Advantages

Identifies *de facto* institutional changes through observed economic activities rather than *de jure* policy documents

Tracks emergence and diffusion of new reforms across localities over time

Uniquely suited for studying bottom-up reforms

- Often before central government approval
- Before formalization into local/national laws and regulations

Research Questions and Findings

Growth: How did reforms shape regional economic performance?

- **Province level:** Growth, TFP, and Investment
  - Bottom-up reforms improved growth through productivity gains
  - Top-down reforms stimulated growth through capital deepening
- **Prefecture level:** New firm entry to proxy productivity
- **County level:** Structural transformation to proxy productivity

Emergence: What conditions enable local reform experiments? Political risks

Diffusion: How do reforms spread across regions? Suitbility

Historical Background

The shifting political landscape after 1976:

- Regime legitimacy and economic performance.
- Political control v.s. market mechanism.
- Uncertainty about China's reform direction and political risks.

Reformists:

- Tolerated economic practices contradicting orthodox socialism

Historical Background

Hu Yaobang, then General Secretary of the Chinese Communist Party (CCP), in November 1980:

> *After the Third Plenary Session of the Fifth National People's Congress, the central government put forward four principles for local governments. They are as follows: If the central government hasn't considered it, the local government can propose ideas; if the central government hasn't given instructions, but the local government sees fit, they can take action; if what the central government proposes doesn't suit the local situation, the local government can make flexible arrangements; and if the central government makes a wrong decision, the local government can debate it.*

Historical Background

Despite political uncertainty and risks, local governments started initiating reforms, many of which eventually became national policies.

During his 1992 southern tour, Deng Xiaoping remarked:

> *[Reforms] were created at the grassroots level; we took these ideas, refined them, and used them as a guide for the entire country.*

Data

Major reform events at the central government level:

- Reform Data (reformdata.org), a database maintained by the China Institute of Reform and Development (CIRD)
- 7,692 reform events documented over the period 1978-2018

Local events from county-level gazetteers:

- Text from the chapter on "Chronicle of Events"
- First round of local gazetteers: >430,000 events in 2,307 counties of 29 provinces (excl.Tibet) over 1976-1989
- Second round of local gazetteers: >1,117,933 events over 1990-2005
- A team of RAs spent two years to collect and digitize the textual data

Sketch: Matching Local Events and National Reforms

Goal: map county-level events to major national reforms implemented in the three decades after 1976.

Step 1: Identified key national reforms: manual reading (25)

Step 2: Classified local events by their reform relevance and matched them to specific reforms

- Key words matching: transparency (123,777)
- Supervised machine learning: semantic relation and automation (104,996)

Step 3: Constructed a panel dataset tracking reform activities at the county-year-month level.

Major Economic Reforms

- Focus on national-level reforms, despite their origins
- Exclude non-economic reforms: population control, education, healthcare, environmental protection, and political institutions
- Exclude purely central-level reforms without local participation, like exchange rate system reform
- Include both successful reforms and those later reversed or rejected
- Each reform serves as an umbrella covering multiple related ones

Nation-wide Economic Reforms

	Year when Central Govt. Partially consented (1)	Year when Central Govt. Endorsed (2)	Bottom-up Index (3)
Household Responsibility System (家庭联产承包制)	1980	1982	3.044
Development of Individual Economy (发展个体经济)	1979	1982	-0.423
Substitution of Profit with Taxes (利改税)	1980	1983	-2.150
Importing Tech and Complete Sets of Equip (引进新技术和成套设备)	1978	1984	0.729
Developing Township and Village Enterprises (发展乡镇企业)	1979	1984	1.112
Rural Credit Coorporative Reform (农村信用社改革)	1980	1984	0.906
Wage System Reforms (工资体制改革)	1978	1985	-1.099
Horizontal Economic Cooperation (横向经济联合)	1980	1986	0.306
Urban Credit Coorporative Development (城市信用社发展)	1986	1986	1.806
SOE Managerial Responsibility Contract (经营责任承包制)	1979	1987	-0.116
Urban Pension System Reform (城镇养老制度改革)	1983	1991	0.303
FDI and Special Economic Zones (外资，经济特区)	1980	1992	-0.761
Transformation of SOEs into Shareholding Companies (企业股份制)	1984	1992	0.148
Price Reform (价格改革)	1984	1992	-0.826
Land Use System Reform (土地使用制度改革)	1988	1992	-0.007
Tax Sharing Reform (分税制改革)	1992	1994	-2.889
Labor Contract System (劳动合同制)	1983	1994	0.626
Development of Private Economy (发展私营经济)	1988	1997	0.299
Privatization of SOEs (国企私有化)	1995	1997	1.897
Housing Reform (住房制度改革)	1979	1998	-0.992
Setting Up A Modern Enterprise System (建立现代企业制度)	1993	1999	0.693
Advancing Western Development (西部大开发)	1999	1999	-0.662
Hukou Reform (户籍制度改革)	1984	2001	0.692
Rural Tax and Fee Reform (农村税费改革)	1993	2004	-1.576
Bankruptcy Reform (破产制度改革)	1986	2006	-1.060

Household Responsibility System

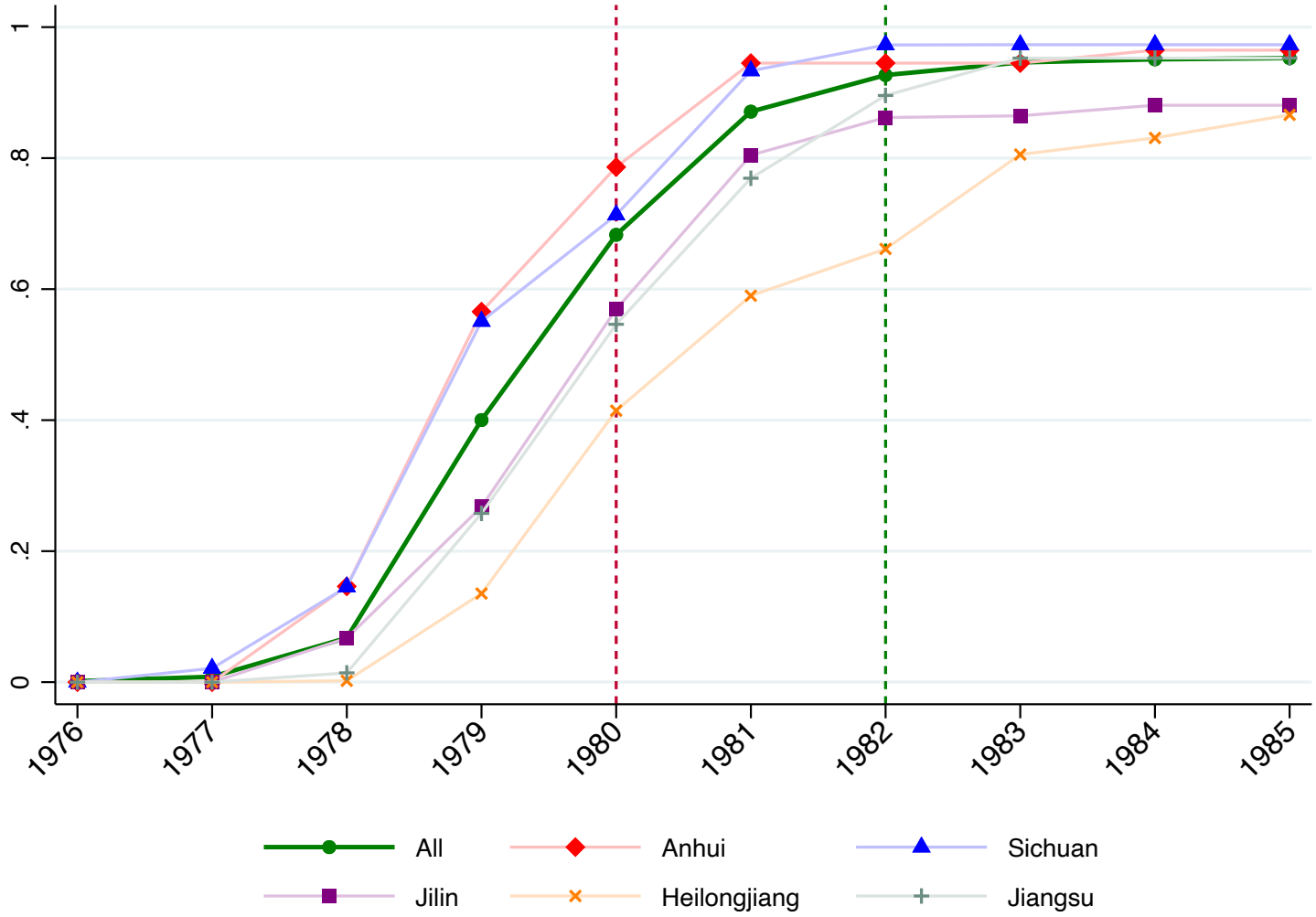
Identify local events related to the HRS reform based on keywords:

生产责任制 联产承包 包产到户 包干到户 分田到户 包群到户 大包干 联产到劳 定额计酬 承包土地 土地承包 山林承包 果树承包 水面承包 小段包工, etc.

Production responsibility system, Collective production contracting, Household responsibility system, Household contract responsibility system, Land distribution to households, Collective contract responsibility system to households, Overall contract responsibility system, Collective production to labor system, Quota-based remuneration, Land contracting, Land contract system, Forest land contracting, Fruit tree contracting, Water surface contracting, Piecework subcontracting, etc.

Policy in Place $= 1$ for a county in year t if any of the keywords are observed in the local events of year t or earlier

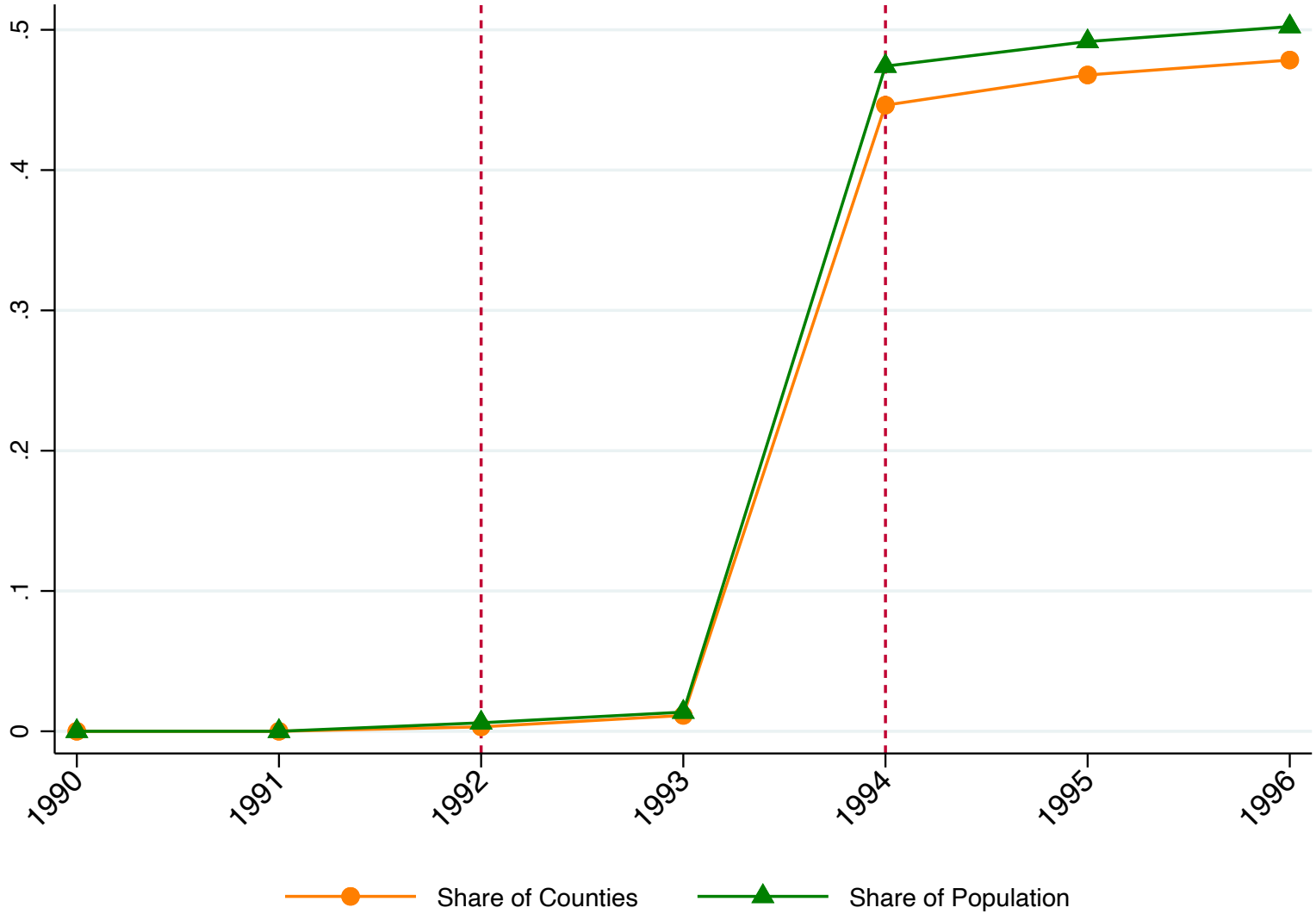
Bottom-Up Reforms: Household Responsibility System



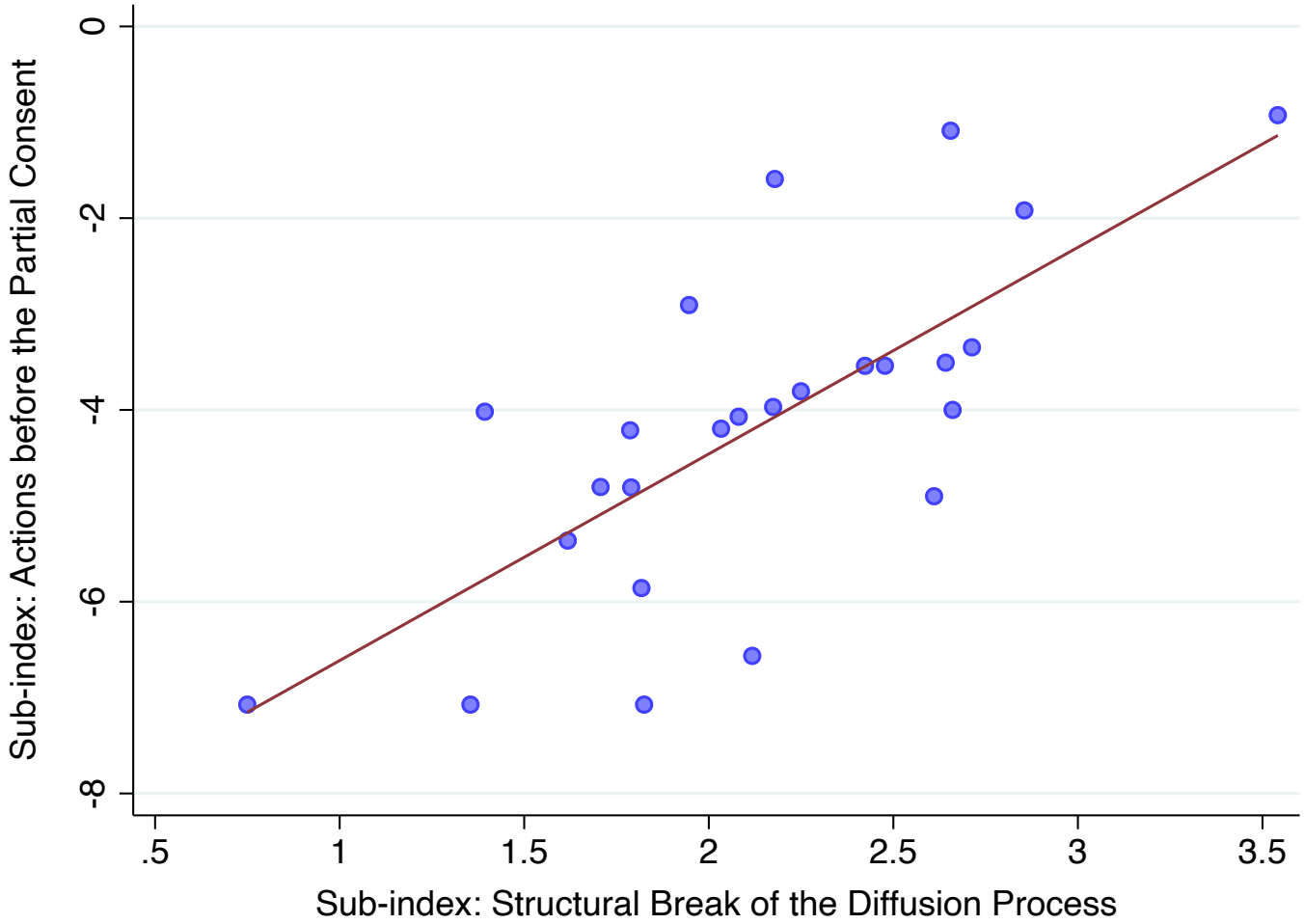
Top-Down Reforms: 1994 Tax-Sharing Reform

- Pre-1994: Local governments paid fixed annual sum to center, which received only 22% of fiscal revenues
- New system classified taxes as central, local, or shared, significantly increasing central government's revenue share
- 1992: Central government launched pilot reforms in selected regions
- 1994: Nationwide implementation of tax-sharing system

Top-Down Reforms: 1994 Tax-Sharing Reform



Actions before Partial Consent v.s. Structural Break



Constructing Innovation and Adoption of Reforms

Merge provincial economic data with local events into 3-year periods τ (1981-1983, ..., 2002-2004).

Innovators of policy q: the first 3 percent of the counties that implement q.

$Innovation_{i,\tau}$ = total number of new reforms initiated by county i during $(t-3, t-2, t-1)$, lagged one year from period τ.

Constructing Innovation and Adoption of Reforms

We aggregate this measure to the provincial level as follows:

$$Policy\ Innovator_{p\tau} = \sum_{i \in p} \frac{Pop_{i0}}{Pop_{p0}} Innovation_{i,\tau}$$

$$Policy\ Follower_{p\tau} = \sum_{i \in p} \frac{Pop_{i0}}{Pop_{p0}} Adoption_{i,\tau},$$

where Pop_{i0} and Pop_{p0} denote the baseline population of county i and province p, respectively.

Innovation and Adoption Intensities: They quantify the share of the population in province p exposing to new reform policies as innovators and followers during the period τ.

Reform Innovation, Adoption and Growth

Dependent Variable:	$\Delta \ln GDP$ *per worker*$_{p\tau}$ (1)	$\Delta \ln GDP$ *per worker*$_{p\tau}$ (2)	$\Delta \ln TFP_{p\tau}$ ($\alpha = 0.5$) (3)	Δ*Investment Rate*$_{p\tau}$ (4)
Policy Innovator$_{p\tau}$	0.0878***	0.0608**	0.0595**	0.0458*
	(0.0317)	(0.0287)	(0.0280)	(0.0229)
Policy Follower$_{p\tau}$	0.0077	0.0170**	0.0175**	-0.0384***
	(0.0105)	(0.0083)	(0.0080)	(0.0098)
$\Delta \ln$ *Capital per worker*$_{p\tau}$		0.4764***		
		(0.0592)		
Province Baseline Characteristics×Period	Y	Y	Y	Y
Province	Y	Y	Y	Y
Year	Y	Y	Y	Y
Observations	232	232	232	232
R-squared	0.7230	0.8007	0.7324	0.6354

Heterogeneous Effects: The Role of Bottom-Up Forces

We analyze whether the growth effects vary across economic reforms with differing bottom-up intensities.

We introduce the following measures:

$$\textit{Bottom-Up Policy Innovator}_{p\tau} = \sum_{i \in p} \sum_{q} \textit{Bottom-Up Index}_q \times \frac{Pop_{i0}}{Pop_{p0}} \times \textit{Innovation}_{i,q,\tau},$$

$$\textit{Bottom-Up Policy Follower}_{p\tau} = \sum_{i \in p} \sum_{q} \textit{Bottom-Up Index}_q \times \frac{Pop_{i0}}{Pop_{p0}} \times \textit{Adoption}_{i,q,\tau}.$$

Bottom-up Forces: Heterogeneous Effects

Dependent Variable:	$\Delta \ln GDP$ per worker$_{p\tau}$ (1)	$\Delta \ln GDP$ per worker$_{p\tau}$ (2)	$\Delta \ln TFP_{p\tau}$ ($\alpha = 0.5$) (3)	ΔInvestment Rate$_{p\tau}$ (4)
Policy Innovator$_{p\tau}$	0.0434	0.0267	0.0251	0.0749**
	(0.0348)	(0.0349)	(0.0349)	(0.0288)
Bottom-Up Policy Innovator$_{p\tau}$	0.0838***	0.0654**	0.0636**	-0.0497**
	(0.0297)	(0.0262)	(0.0260)	(0.0238)
Policy Follower$_{p\tau}$	0.0095	0.0175*	0.0182**	-0.0372***
	(0.0105)	(0.0085)	(0.0084)	(0.0083)
Bottom-Up Policy Follower$_{p\tau}$	0.0303**	0.0201**	0.0191*	-0.0021
	(0.0132)	(0.0095)	(0.0094)	(0.0102)
$\Delta \ln$ *Capital per worker*$_{p\tau}$		0.4561***		
		(0.0518)		
Province Baseline Characteristics$\times$Period	Y	Y	Y	Y
Province	Y	Y	Y	Y
Year	Y	Y	Y	Y
Observations	232	232	232	232
R-squared	0.7691	0.8305	0.7691	0.6350

Reform Innovation, Adoption, and Firm Entry

- Reforms led to surge in firm creation through reduced entry barriers and enhanced potential returns
- Net entry accounted for over two-thirds of manufacturing TFP growth (1998-2007) (Brandt et al., 2011)
  - New entrants showed above-average productivity levels and growth rates
  - Exit of inefficient incumbent firms enabled more productive resource reallocation
- Using prefecture-level firm registry data to examine the impact of bottom-up reform innovations on firm entries

Reform Innovation, Adoption, and Firm Entry

Dependent Variable:	*Entries of Private Firms per Capita*$_{j\tau}$			*Entries of SOEs&COEs per Capita*$_{j\tau}$		
	(1)	(2)	(3)	(4)	(5)	(6)
Policy Innovator$_{j\tau}$	0.3155***	0.3569***	0.0395*	0.0429	0.0389	-0.0418
	(0.1120)	(0.1002)	(0.0217)	(0.0413)	(0.0431)	(0.0517)
Bottom-Up Policy Innovator$_{j\tau}$		0.1452**	0.0337**		-0.0559**	-0.0484*
		(0.0680)	(0.0170)		(0.0223)	(0.0263)
Policy Follower$_{j\tau}$	0.0340**	0.0374**	0.0038	0.0095*	0.0115**	0.0025
	(0.0139)	(0.0147)	(0.0031)	(0.0051)	(0.0052)	(0.0025)
Bottom-Up Policy Follower$_{j\tau}$		0.0157*	0.0053*		0.0117**	0.0079**
		(0.0080)	(0.0029)		(0.0048)	(0.0038)
Prefecture Baseline Characteristics×Period	Y	Y	Y	Y	Y	Y
Province×Period	Y	Y	Y	Y	Y	Y
Prefecture	N	N	Y	N	N	Y
Observations	2,608	2,608	2,608	2,608	2,608	2,608

Reform Innovation, Adoption, and Structural Change

- Structural transformation: a key proxy of productivity and income growth
- Changes in agricultural employment shares correlate with TFP changes (Restuccia, Yang, and Zhu 2008)
- Productivity growth drives structural transformation through:
  - Push channel: Higher agricultural productivity releases farming labor
  - Pull channel: Rising non-agricultural productivity draws workers to non-agricultural sectors

Reform Innovation, Adoption, and Structural Change

Dependent Variable:	$\Delta \ln Share\ Agri_{i\tau}$			
Sample:	82-90,90-00,00-05		82-90,90-00	
	(1)	(2)	(3)	(4)
Policy Innovator$_{i\tau}$	-0.0551**	-0.0544**	-0.0550**	-0.0544**
	(0.0230)	(0.0219)	(0.0229)	(0.0217)
Bottom-Up Policy Innovator$_{i\tau}$		-0.0185*		-0.0193*
		(0.0095)		(0.0098)
Policy Follower$_{i\tau}$	0.0022**	0.0018*	0.0020	0.0016
	(0.0010)	(0.0011)	(0.0020)	(0.0021)
Bottom-Up Policy Follower$_{i\tau}$		-0.0031		-0.0051*
		(0.0021)		(0.0029)
County Baseline Characteristics×Period	Y	Y	Y	Y
Province×Period	Y	Y	Y	Y
Observations	6,806	6,806	4,539	4,539
R-squared	0.2872	0.2879	0.1798	0.1814

Reverse Causality

Concerns:

- Fast-growing regions may have higher reform demand and better implementation capacity

Robustness check:

- Granger causality tests show baseline results not driven by pre-trends
- Estimate inverse-propensity score weighted models to strengthen the causal interpretation
- Results hold for GDP, firm entry and structural change

Bottom-up Reforms: Emergence and Diffusion

Emergence and Political Risk:

- Bottom-up reforms face higher political risks
- Regions anticipating greater benefits become early adopters
- Early adopters have higher productivity gains than later followers

Diffusion and Suitability:

- Local governments and entrepreneurs have better information to initiate reforms that address regional needs and boost productivity
- When local governments make adoption decisions, reforms better match local conditions and generate stronger growth

Emergence, Diffusion, and Economic Impacts

We examine the conditions that enabled local reform initiatives:

- geographically distant counties
- politically unimportant counties

We explore the mechanisms of bottom-up reform diffusion:

- exposure effect
- local suitability

Literature

Methodology: Identify reform events from economic activities using textual analysis tools (Gentzkow et al., 2019a,b; Bertrand et al., 2021; Kelly et al., 2021)

Institutions and Growth: Focus on actual institutional changes and economic growth (e.g., Acemoglu et al., 2001; Rodrik et al., 2004; Hayek, 1945, 1960, 1973)

China's Productivity Growth: Market-oriented reforms and TFP (Brandt et al., 2013; Hsieh and Klenow, 2009; Brandt et al., 2017; Tombe and Zhu, 2019; Hao et al., 2020)

Policy Diffusion: Focus on economic impacts (e.g., Mukand and Rodrik, 2005; Buera et al., 2011; Besley and Case, 1995; Mulligan and Shleifer, 2005; Bernecker et al., 2021; DellaVigna and Kim, 2022; Wang and Yang, 2024)

Concluding Remarks

China's growth miracle was powered by bottom-up innovations from farmers, entrepreneurs, and local officials

Key questions for future research:

1. Counterfactual growth without bottom-up innovations?
2. Recent institutional changes and economic slowdown:
   - Power recentralization
   - Rise of top-down industrial policies
   - Declining local policy experimentation

Characteristics of Reform Policy Innovators

Dependent Variable: $Innovator_{i,q}$	(1)	(2)	(3)
$Share\ College\ or\ above_i$	0.0158**	0.0109	0.0109
	(0.0061)	(0.0066)	(0.0066)
$Bottom\text{-}Up\ Index_q \times Share\ College\ or\ above_i$			0.0025
			(0.0020)
$Share\ Middle\ \&\ High\ School_i$	-0.0021	-0.0004	-0.0004
	(0.0038)	(0.0044)	(0.0044)
$Bottom\text{-}Up\ Index_q \times Share\ Middle\ \&\ High\ School_i$			0.0024
			(0.0016)
$Share\ Agri_i$	-0.0295	-0.0396	-0.0396
	(0.0249)	(0.0280)	(0.0280)
$Bottom\text{-}Up\ Index_q \times Share\ Agri_i$			0.0053
			(0.0064)
$Share\ Ind_i$	-0.0257	-0.0328	-0.0328
	(0.0225)	(0.0244)	(0.0244)
$Bottom\text{-}Up\ Index_q \times Share\ Ind_i$			0.0040
			(0.0046)
$Log\ Pop_i$	0.0263***	0.0262***	0.0262***
	(0.0078)	(0.0068)	(0.0068)
$Bottom\text{-}Up\ Index_q \times Log\ Pop_i$			0.0024
			(0.0019)
$Log\ Dist.\ to\ Railway_i$	0.0029**	0.0029***	0.0029***
	(0.0012)	(0.0010)	(0.0010)
$Bottom\text{-}Up\ Index_q \times Log\ Dist.\ to\ Railway_i$			0.0014***
			(0.0005)
$Log\ Fiscal\ Revenue_i$	-0.0031	-0.0014	-0.0014
	(0.0070)	(0.0045)	(0.0045)
$Bottom\text{-}Up\ Index_q \times Log\ Fiscal\ Revenue_i$			-0.0025**
			(0.0012)
$Log\ Agri\ \&\ Ind\ Output\ per\ capita_i$	0.0113*	0.0106**	0.0106**
	(0.0057)	(0.0049)	(0.0049)
$Bottom\text{-}Up\ Index_q \times Log\ Agri\ \&\ Ind\ Output\ per\ capita_i$			0.0019
			(0.0018)
coast	0.0007		
	(0.0077)		
Province FEs	N	Y	Y
Reform FEs	N	Y	Y
Observations	56,750	56,750	56,750
R-squared	0.0648	0.0833	0.0842

Spatial Diffusion of Reforms

Dependent Variable: $Y_{iqt} = 1$	(1)	(2)	(3)	(4)
Λ_{iqt}	2.5846***	2.6206***	3.5886***	3.6125***
	(0.6981)	(0.6923)	(0.6009)	(0.5972)
Bottom-Up Index$_q \times \Lambda_{iqt}$		0.5799		0.4930
		(0.3901)		(0.4367)
$Sim^{Avg}_{i,\Omega_{q,t-1}}$	0.6198***	0.6049***	0.9883***	0.4467***
	(0.0833)	(0.0833)	(0.0923)	(0.0911)
Bottom-Up Index$_q \times Sim^{Avg}_{i,\Omega_{q,t-1}}$		0.0697***		0.0663***
		(0.0148)		(0.0147)
County Baseline Characteristics	Y	Y	Y	Y
Region×Reform FEs	Y	Y	N	N
Reform×Year FEs	Y	Y	N	N
Region×Year FEs	Y	Y	N	N
Region×Reform×Year FEs	N	N	Y	Y
Observations	587,004	587,004	557,255	557,255

Characteristics of Reform Policy Innovators: Alternative Measures and Specifications

Dependent Variable: $Innovator_{i,q}$	(1) OLS	(2) OLS	(3) OLS	(4) IV
$Share\ College\ or\ above_i$	0.0169**	0.0133*	0.0133*	0.0109
	(0.0065)	(0.0075)	(0.0075)	(0.0066)
$Bottom\text{-}Up\ Index_q \times Share\ College\ or\ above_i$			0.0044*	0.0037
			(0.0025)	(0.0023)
$Share\ Middle\ \&\ HighSchool_i$	0.0000	0.0013	0.0013	-0.0004
	(0.0055)	(0.0065)	(0.0065)	(0.0044)
$Bottom\text{-}Up\ Index_q \times Share\ Middle\ \&\ HighSchool_i$			0.0007	0.0026*
			(0.0010)	(0.0014)
$Share\ Agri_i$	-0.0314	-0.0334	-0.0334	-0.0396
	(0.0272)	(0.0302)	(0.0302)	(0.0280)
$Bottom\text{-}Up\ Index_q \times Share\ Agri_i$			0.0066	0.0070
			(0.0067)	(0.0068)
$Share\ Ind_i$	-0.0272	-0.0297	-0.0297	-0.0328
	(0.0242)	(0.0257)	(0.0257)	(0.0244)
$Bottom\text{-}Up\ Index_q \times Share\ Ind_i$			0.0056	0.0053
			(0.0051)	(0.0050)
$Log\ Pop_i$	0.0275***	0.0280***	0.0280***	0.0262***
	(0.0079)	(0.0075)	(0.0075)	(0.0068)
$Bottom\text{-}Up\ Index_q \times Log\ Pop_i$			0.0036	0.0027
			(0.0034)	(0.0026)
$Log\ Dist.\ to\ Railway_i$	0.0021**	0.0025***	0.0025***	0.0029***
	(0.0010)	(0.0009)	(0.0009)	(0.0010)
$Bottom\text{-}Up\ Index_q \times Log\ Dist.\ to\ Railway_i$			0.0008*	0.0014***
			(0.0005)	(0.0005)
$Log\ Fiscal\ Revenue_i$	-0.0040	-0.0020	-0.0020	-0.0014
	(0.0070)	(0.0049)	(0.0049)	(0.0045)
$Bottom\text{-}Up\ Index_q \times Log\ Fiscal\ Revenue_i$			-0.0022	-0.0021
			(0.0024)	(0.0016)
$Log\ Agri\ \&\ Ind\ Output\ per\ capita_i$	0.0093	0.0108**	0.0108**	0.0106**
	(0.0055)	(0.0048)	(0.0048)	(0.0049)
$Bottom\text{-}Up\ Index_q \times Log\ Agri\ \&\ Ind\ Output\ per\ capita_i$			0.0020	0.0021
			(0.0016)	(0.0019)
coast	0.0005			
	(0.0068)			
Province FEs	N	Y	Y	Y
Reform FEs	N	Y	Y	Y
Observations	56,750	56,750	56,750	56,750
R-squared	0.0648	0.0833	0.0842	–

Spatial Diffusion of Reforms: Additional Heterogeneity Analysis

Dependent Variable: $Y_{iqt} = 1$	(1)	(2)	(3)	(4)
Λ_{iqt} (within prov)	0.7700***			
	(0.1462)			
Λ_{iqt} (outside prov)	0.4967			
	(1.0475)			
$Sim^{Avg}_{i,\Omega_{q,t-1}}$ (within prov)	0.2460***			
	(0.0586)			
$Sim^{Avg}_{i,\Omega_{q,t-1}}$ (outside prov)	0.4007***			
	(0.0930)			
Λ_{iqt}		2.3188**	3.7386***	0.9780
		(0.9265)	(0.8356)	(1.1820)
$Sim^{Avg}_{i,\Omega_{q,t-1}}$		0.6935***	0.5179***	0.4286***
		(0.1184)	(0.0773)	(0.1517)
Sample:	All	1976-1985	1986-1995	1996-2005
County Baseline Characteristics	Y	Y	Y	Y
Region×Reform FEs	Y	Y	Y	Y
Reform×Year FEs	Y	Y	Y	Y
Region×Year FEs	Y	Y	Y	Y
Observations	480,819	219,442	264,935	100,745

Spatial Diffusion of Reforms: Alternative Measures and Specifications

Dependent Variable: $Y_{iqt} = 1$	(1)	(2)	(3)	(4)
Panel A: Alternative Measure of Suitability				
Λ_{iqt}	2.8276***	2.8604***	3.8513***	3.8744***
	(0.7024)	(0.6970)	(0.6015)	(0.5969)
Bottom-Up Index$_q \times \Lambda_{iqt}$		0.5631		0.4689
		(0.3856)		(0.4318)
$Sim^{p10}_{i,\Omega_{q,t-1}}$	1.1541***	1.1249***	1.1557***	1.1294***
	(0.0906)	(0.0909)	(0.0893)	(0.0898)
Bottom-Up Index$_q \times Sim^{p10}_{i,\Omega_{q,t-1}}$		0.0617***		0.0566**
		(0.0228)		(0.0228)
Observations	587,004	587,004	557,255	557,255
Panel B: Linear Probability Model				
Λ_{iqt}	0.1789***	0.1815***	0.2388***	0.2397***
	(0.0364)	(0.0356)	(0.0324)	(0.0317)
Bottom-Up Index$_q \times \Lambda_{iqt}$		0.0419		0.0226
		(0.0252)		(0.0274)
$Sim^{Avg}_{i,\Omega_{q,t-1}}$	0.0063**	0.0058**	0.0063**	0.0058**
	(0.0027)	(0.0027)	(0.0026)	(0.0026)
Bottom-Up Index$_q \times Sim^{Avg}_{i,\Omega_{q,t-1}}$		0.0058***		0.0055***
		(0.0012)		(0.0012)
Observations	587,004	587,004	587,004	587,004
Panel C: Alternative Measures Based on ML+Manual Annotation				
Λ_{iqt}	2.5772***	2.5888***	3.6012***	3.6015***
	(0.8016)	(0.8033)	(0.7152)	(0.7175)
Bottom-Up Index$_q \times \Lambda_{iqt}$		0.2584		0.1278
		(0.4150)		(0.4326)
$Sim^{Avg}_{i,\Omega_{q,t-1}}$	0.6368***	0.6215***	0.6295***	0.6155***
	(0.0798)	(0.0790)	(0.0804)	(0.0796)
Bottom-Up Index$_q \times Sim^{Avg}_{i,\Omega_{q,t-1}}$		0.0799***		0.0759***
		(0.0163)		(0.0159)
Observations	605,217	605,217	571,489	571,489
County Baseline Characteristics	Y	Y	Y	Y
Region × Reform FEs	Y	Y	N	N
Reform × Year FEs	Y	Y	N	N
Region × Year FEs	Y	Y	N	N
Region × Reform × Year FEs	N	N	Y	Y

Reform Policy Innovation, Adoption, and Economic Growth: Pre-trend Test

Dependent Variable:	3-*Year Lagged Period* $\Delta \ln GDP$ *per worker*$_{p\tau}$ (1)	3-*Year Lagged Period* $\Delta \ln GDP$ *per worker*$_{p\tau}$ (2)	3-*Year Lagged Period* $\Delta \ln TFP_{p\tau}$ ($\alpha = 0.5$) (3)	3-*Year Lagged Period* Δ*Investment Rate*$_{p\tau}$ (4)
Policy Innovator$_{p\tau}$	-0.0361	-0.0355	-0.0347	0.0437
	(0.0381)	(0.0407)	(0.0428)	(0.0397)
Bottom-Up Policy Innovator$_{p\tau}$	0.0378	0.0216	0.0123	0.0260
	(0.0322)	(0.0303)	(0.0303)	(0.0276)
Policy Follower$_{p\tau}$	0.0016	-0.0067	-0.0105	0.0185
	(0.0099)	(0.0119)	(0.0121)	(0.0109)
Bottom-Up Policy Follower$_{p\tau}$	-0.0035	-0.0083	-0.0104	-0.0075
	(0.0122)	(0.0120)	(0.0115)	(0.0132)
3-*Year Lagged Period* $\Delta \ln$ *Capital per worker*$_{p\tau}$		0.3273***		
		(0.0666)		
Province Baseline Characteristics$\times$Period	Y	Y	Y	Y
Province	Y	Y	Y	Y
Year	Y	Y	Y	Y
Observations	232	232	232	232
R-squared	0.7495	0.7766	0.7874	0.6309

Reform Policy Innovation, Adoption, and Economic Growth: Alternative Measures and Specifications

Dependent Variable:	$\Delta \ln GDP$ per worker$_{p\tau}$ (1)	$\Delta \ln GDP$ per worker$_{p\tau}$ (2)	$\Delta \ln TFP_{p\tau}$ ($\alpha = 0.5$) (3)	ΔInvestment Rate$_{p\tau}$ (4)
Panel A: Alternative Measures Based on ML+Manual Annotation				
Policy Innovator$_{p\tau}$	-0.0181	-0.0304	-0.0310	0.0532***
	(0.0222)	(0.0212)	(0.0217)	(0.0160)
Bottom-Up Policy Innovator$_{p\tau}$	0.0770***	0.0720***	0.0717***	-0.0361**
	(0.0234)	(0.0239)	(0.0238)	(0.0156)
Policy Follower$_{p\tau}$	0.0125	0.0209**	0.0214**	-0.0527***
	(0.0124)	(0.0099)	(0.0099)	(0.0100)
Bottom-Up Policy Follower$_{p\tau}$	0.0344***	0.0222**	0.0216**	-0.0187**
	(0.0111)	(0.0099)	(0.0101)	(0.0084)
$\Delta \ln$ *Capital per worker*$_{p\tau}$		0.4754***		
		(0.0540)		
Observations	232	232	232	232
R-squared	0.7372	0.8117	0.7441	0.6586
Panel B: IV Estimation				
Policy Innovator$_{p\tau}$	-0.0405	-0.0396	-0.0395	0.1200**
	(0.0486)	(0.0447)	(0.0449)	(0.0451)
Bottom-Up Policy Innovator$_{p\tau}$	0.1296***	0.1010***	0.0990***	-0.0712*
	(0.0357)	(0.0298)	(0.0294)	(0.0368)
Policy Follower$_{p\tau}$	0.0291*	0.0340***	0.0343***	-0.0483***
	(0.0150)	(0.0109)	(0.0106)	(0.0102)
Bottom-Up Policy Follower$_{p\tau}$	0.0580**	0.0425**	0.0414**	-0.0228
	(0.0246)	(0.0182)	(0.0182)	(0.0149)
$\Delta \ln$ *Capital per worker*$_{p\tau}$		0.4667***		
		(0.0512)		
Observations	232	232	232	232
F-stat	6.265	6.162	6.265	6.265
Province Baseline Characteristics$\times$Period	Y	Y	Y	Y
Province	Y	Y	Y	Y
Year	Y	Y	Y	Y

Policy Innovation, Adoption, and Structural Change: Pre-trend Test

Dependent Variable: *Lagged Period* $\Delta \ln$ *Share Agri*$_{i\tau}$	(1)	(2)
Policy Innovator$_{i\tau}$	0.0043	0.0061
	(0.0259)	(0.0293)
Bottom-Up Policy Innovator$_{i\tau}$		0.0031
		(0.0158)
Policy Follower$_{i\tau}$	0.0012	0.0009
	(0.0017)	(0.0018)
Bottom-Up Policy Follower$_{i\tau}$		-0.0033*
		(0.0017)
County Baseline Characteristics×Period	Y	Y
Province×Period	Y	Y
Observations	4,532	4,532
R-squared	0.1750	0.1757

Policy Innovation, Adoption, and Structural Change: Alternative Measures and Specifications

Dependent Variable: $\Delta \ln Share\ Agri_{i\tau}$	(1)	(2)	(3)	(4)
Panel A: Alternative Measures Based on ML+Manual Annotation				
Policy Innovator$_{i\tau}$	-0.0648**	-0.0626**	-0.0643**	-0.0623**
	(0.0261)	(0.0238)	(0.0261)	(0.0238)
Bottom-Up Policy Innovator$_{i\tau}$		-0.0400***		-0.0404***
		(0.0088)		(0.0087)
Policy Follower$_{i\tau}$	0.0025**	0.0020	0.0014	0.0008
	(0.0012)	(0.0012)	(0.0020)	(0.0020)
Bottom-Up Policy Follower$_{i\tau}$		-0.0048**		-0.0065**
		(0.0020)		(0.0028)
Observations	6,806	6,806	4,539	4,539
R-squared	0.2886	0.2909	0.1821	0.1867
Panel B: IV Estimation				
Policy Innovator$_{i\tau}$	-0.0992**	-0.1008***	-0.0983**	-0.0998***
	(0.0363)	(0.0325)	(0.0364)	(0.0326)
Bottom-Up Policy Innovator$_{i\tau}$		-0.0664***		-0.0674***
		(0.0148)		(0.0147)
Policy Follower$_{i\tau}$	0.0033**	0.0023	0.0022	0.0011
	(0.0014)	(0.0015)	(0.0023)	(0.0023)
Bottom-Up Policy Follower$_{i\tau}$		-0.0062**		-0.0084**
		(0.0025)		(0.0034)
Observations	6,806	6,806	4,539	4,539
Kleibergen-Paap F-stat	157.4	43.45	154.8	42.32
Sample:	82-90,90-00,00-05		82-90,90-00	
County Baseline Characteristics×Period	Y	Y	Y	Y
Province×Period	Y	Y	Y	Y

Policy Innovation, Adoption, and Firm Entry: Alternative Outcomes and Pre-trend Test

Dependent Variable:	*Entriess of SOEs per Capita*$_{j\tau}$ (1)	*Entries of COEs per Capita*$_{j\tau}$ (2)	3-*Year Lagged Period Entries of Private Firms per Capita*$_{j,\tau}$ (3)	3-*Year Lagged Period Entries of SOEs&COEs per Capita*$_{j,\tau}$ (4)
Policy Innovator$_{j\tau}$	-0.1074*	0.0021	0.0564	0.0308
	(0.0573)	(0.0346)	(0.0381)	(0.0255)
Bottom-Up Policy Innovator$_{j\tau}$	-0.1049***	-0.0281	-0.0351	-0.0117
	(0.0330)	(0.0220)	(0.0284)	(0.0167)
Policy Follower$_{j\tau}$	0.0058	0.0018	-0.0034	0.0010
	(0.0038)	(0.0029)	(0.0038)	(0.0028)
Bottom-Up Policy Follower$_{j\tau}$	0.0057	0.0079*	-0.0063**	0.0051
	(0.0057)	(0.0041)	(0.0029)	(0.0051)
Prefecture Baseline Characteristics×Period	Y	Y	Y	Y
Province×Period	Y	Y	Y	Y
Prefecture	Y	Y	Y	Y
Observations	2,608	2,608	2,608	2,608

Policy Innovation, Adoption, and Firm Entry: Alternative Measures

Dependent Variable:	*Entries of Private Firms per Capita*$_{j\tau}$			*Entries of SOEs&COEs per Capita*$_{j\tau}$		
	(1)	(2)	(3)	(4)	(5)	(6)
Policy Innovator$_{j\tau}$	0.2370***	0.3137***	0.0464*	0.0296	0.0240	-0.0346
	(0.0876)	(0.0730)	(0.0246)	(0.0387)	(0.0385)	(0.0487)
Bottom-Up Policy Innovator$_{j\tau}$		0.1521***	0.0173		-0.0531*	-0.0512
		(0.0494)	(0.0238)		(0.0292)	(0.0324)
Policy Follower$_{j\tau}$	0.0240**	0.0254**	0.0020	0.0085	0.0097*	0.0004
	(0.0115)	(0.0110)	(0.0024)	(0.0053)	(0.0052)	(0.0025)
Bottom-Up Policy Follower$_{j\tau}$		0.0042	0.0041		0.0093	0.0063
		(0.0098)	(0.0037)		(0.0057)	(0.0051)
Prefecture Baseline Characteristics×Period	Y	Y	Y	Y	Y	Y
Province×Period	Y	Y	Y	Y	Y	Y
Prefecture	N	N	Y	N	N	Y
Observations	2,608	2,608	2,608	2,608	2,608	2,608