Bottom-Up Institutional Change and Growth in China[*]

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Abstract

This paper investigates the role of bottom-up reforms in driving China's economic growth. Leveraging granular documentation from county-level gazetteers, we identify local reform events from 1976 to 2005, capturing *de facto* policy innovations and their diffusion. Our findings show that bottom-up reforms primarily drive growth through productivity improvements, while centrally sponsored reforms operate mainly through capital accumulation. While both learning and suitability drive reform diffusion, suitability to local conditions matters more for bottom-up than centrally sponsored reforms. Early adopters of bottom-up reforms were typically politically peripheral counties, suggesting that limited central oversight created political space for risky reform initiatives.

Keywords: Bottom-up institutional change, TFP growth, policy diffusion, machine learning.

JEL codes: C81, O31, O35, O38, O40, O43, R11

1 Introduction

Since 1978, China has transformed from one of the world's poorest countries into the world's second-largest economy, now accounting for over 19% of global GDP. Growth accounting exercises have identified the growth of total factor productivity (TFP) as the main driver of this economic success during the reform era (Zhu, 2012; Zilibotti, 2017). Studies that examine the sources of TFP growth have focused on resource reallocation (Brandt et al., 2013), international trade liberalization (Brandt et al., 2017), and integration of the domestic market through internal trade and migration (Tombe and Zhu, 2019; Hao et al., 2020). However, these identified sources explain only a small portion of the observed TFP growth, leaving a large residual unexplained. This paper investigates how institutional change during China's reform era contributed to TFP growth.

Although a large literature examines how institutions shape economic development (e.g., North, 1990; Acemoglu et al., 2001; Rodrik et al., 2004), few studies analyze the impact of actual changes in institutions on economic growth due to the lack of systematic data on institutional change. In this paper, we use a large textual database to systematically examine the major institutional changes in reform-era China and link them to China's economic growth. We show that institutional changes from the bottom up are associated with faster TFP growth, while institutional changes from the top down are associated with higher speed of capital accumulation.

The conventional narrative of China's economic reform has been depicted as a gradual systematic experimental process orchestrated by a powerful central government (Blanchard and Shleifer, 2001; Heilmann, 2008a,b). Yet, this top-down, grand design narrative contradicts extensive historical evidence showing that China's many economic reforms emerged primarily through local experimentation and decentralized initiatives. Many significant reforms originated at the local level, with farmers, entrepreneurs, and low-level government officials pursuing these experiments either without the endorsement from the central government or, in some cases, in direct defiance of Beijing's explicit prohibitions (Coase and Wang , 2012; Nee and Opper, 2012). The land reform of the late 1970s and the privatization of small and medium-sized state-owned enterprises of the 1990s are prominent examples of such bottom-up innovations (Xu, 2011).

Reform initiatives emerged from the ground largely in response to the shifting political landscape after 1978. While party leadership unanimously recognized the need to bolster regime legitimacy through improved economic performance, they remained divided over strategies. Die-hard socialists defended the command economy on ideological grounds and viewed market mechanisms as threats to political control, while reform-minded leaders believed market forces

could coexist with the authoritarian control of the Chinese Communist Party. These strategic divisions created substantial uncertainty about China's reform direction.

Nevertheless, as reformists gained the upper hand, they fostered a political climate that tolerated economic practices contradicting orthodox socialism. This shift substantially reduced the risks for local governments to introduce market-oriented mechanisms. This permissive stance was explicitly articulated by 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.

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.

Against this historical backdrop, our study provides systematic empirical evidence that bottom-up institutional innovations drove gradual yet transformative changes during the reform era and contributed significantly to China's TFP growth and economic development.

We begin by compiling a novel dataset of over 1.8 million major events from 1976 to 2005 at the county level, drawn from more than 4,800 volumes of local gazetteers documenting important cultural, economic, and political developments at the year-month level. These gazetteers provide comprehensive chronicles of local developments through granular records of actual decisions and practices by local officials and entrepreneurs. The advantage of this dataset is that it allows us to identify *de facto* institutional innovations through observed economic activities rather than *de jure* policy documents. Crucially, we can track how new reform practices emerged and diffused across localities over time—often before receiving central government approval or being formalized into local and national laws and regulations—making this dataset particularly valuable for studying bottom-up reforms.

Next, we map county-level economic events to major national reforms implemented in the three decades after 1976. We identified 25 key reform sets spanning diverse policy domains and covering all major reform categories of this period. Using textual analysis tools, we classified events by their reform relevance and matched them to specific reforms. We then constructed a panel dataset tracking reform activities at the county-year level.

Using this dataset, we can trace how each reform emerged and diffused across counties. Through analyzing these diffusion patterns, we identify two key features that allow us to distinguish bottom-up from centrally sponsored reforms, without relying on prior knowledge. First, bottom-up reforms originated from local counties and emerged before central government approval, while centrally sponsored reforms followed central directives. Second, bottom-up reforms spread gradually between counties, whereas centrally sponsored reforms displayed sharp, discontinuous jumps in adoption rates following central mandates. Using these spatial and temporal patterns, we develop a continuous measure of bottom-up influence for all 25 key reforms. This measure captures a nuanced aspect of the reform process: most reforms were not simply bottom-up or top-down, but rather exhibited both influences at different stages of implementation.

Armed with these data and measures, we investigate three sets of questions regarding the emergence, diffusion, and economic consequences of institutional reforms. First, we examine the conditions that enabled local reform initiatives. As the political climate grew more tolerant of non-orthodox reforms while maintaining substantial uncertainty, we analyze how counties' political risk exposure influenced their propensity to initiate bottom-up reforms. This leads us to investigate which county-level characteristics contributed to reduced political vulnerability. Second, we explore the mechanisms of reform diffusion. Since reforms with bottom-up features spread across counties without central government mandates, we analyze the key factors that drove their diffusion between localities, particularly learning effects and local suitability. Third, we assess the economic implications of different reform approaches by examining how bottom-up versus centrally sponsored reforms affected total factor productivity and economic growth.

First, county remoteness, measured by distance to railway networks, strongly predicts innovations in reforms with stronger bottom-up components (those with higher bottom-up indices), while demographic and economic characteristics—including population size, workforce education, and per capita output (both agricultural and industrial)—do not. This geographic pattern suggests that remote, less politically influential counties had an advantage in initiating policy experiments, likely due to their insulation from political risks.

The pattern of central government attention, as measured by Politburo Standing Committee (PSC) members' visits, further supports this interpretation. All reform innovators saw increased

PSC member visits after implementation, likely for impact assessment. However, counties with centrally sponsored experiments received more PSC visits before and during reforms, while bottom-up innovators saw fewer visits during these periods. This pattern suggests that limited oversight from Beijing actually advantaged bottom-up reformers by providing them political space needed for local experimentation.

Second, we find that both policy learning and suitability channels play crucial roles in shaping the spatial patterns of policy diffusion. Specifically, the learning channel suggests that counties learned from early adopters about the benefits and political risks of reform policies. Counties with greater exposure to reforms—determined by their proximity to and the economic size of early adopters—were better positioned to learn. The suitability channel suggests that the fit of a new reform policy for a county was a key determinant of its adoption decision. Suitability tended to be higher when counties shared more similarities with early adopters across various dimensions, such as demographics, industry composition, and human capital endowment. Our investigation reveals that suitability had a more pronounced effect on policy adoption for bottom-up reforms compared to centrally sponsored ones. This suggests that when reforms originated locally without central mandates, local governments were more likely to adopt policies well-suited to local conditions. In contrast, under top-down directives, local governments had less discretionary power and were less able to incorporate local circumstances into their adoption decisions.

Third, using province-level panel data, we document that both reform innovations and their diffusion are positively associated with economic growth, though the growth mechanisms differ systematically by reform type. Bottom-up reforms generate growth primarily through productivity improvements: a one standard deviation increase in bottom-up reform adoption (in areas where 10% of the population is exposed) raises three-year GDP per worker growth by 1.1 percentage points and TFP growth by 0.74 percentage points. In contrast, centrally sponsored reforms drive growth mainly through capital accumulation, as evidenced by higher fixed investment rates. While reform followers benefit from reform diffusion across regions, these growth effects diminish substantially beyond the initial adopters. Notably, the growth effects are more pronounced for bottom-up reforms compared to top-down directives, highlighting the crucial role of local initiative in China's reform-driven growth.

We corroborate this key finding using two additional datasets: prefecture-level data on urban firm entry and county-level data on rural structural transformation. While existing studies document that reform-driven firm entry contributes significantly to productivity and economic growth, our findings reveal a more nuanced pattern: although reform innovations generally encourage private firm entry, the effects are stronger for bottom-up reforms initiated

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by local governments. Similarly, taking structural transformation from the agricultural to the non-agricultural sector as a proxy for productivity and economic growth in both sectors, we find that bottom-up reforms are more effective at accelerating structural transformation.

China's reform-era policymaking is often portrayed as a centrally directed process, following a "proceeding from point to surface" experimental approach (Heilmann, 2008a,b; Xu, 2011; Wang and Yang, 2024). In this narrative, central leadership controlled reform blueprints while delegating implementation to local governments. Our findings reveal a contrasting view in which bottom-up initiatives emerged as the driving force. As political tolerance grew and ideological constraints weakened, decentralized policy innovations emerged organically. Local governments, particularly those insulated from political risks, became independent sources of policy experimentation. Bottom-up reforms that introduced market mechanisms and reduced distortions spread, as localities learned their suitability for local conditions. These bottom-up reforms drove GDP growth primarily through enhanced aggregate productivity. Our study thus provides an alternative narrative of China's reform success, highlighting how decentralized experimentation and spontaneous policy diffusion shaped the country's economic transformation.

Our paper engages with several strands of literature. First and foremost, it connects with the literature on policy innovations and dissemination. Most existing empirical studies focus on policy experimentation, learning, and emulation across countries (e.g., Mukand and Rodrik, 2005; Buera et al., 2011), as well as across government units within liberal democracies (e.g., Besley and Case, 1995; Mulligan and Shleifer, 2005; Bernecker et al., 2021; DellaVigna and Kim, 2022). However, relatively less is understood about how policies are formed and spread in China—an authoritarian regime characterized by a region-based multilevel hierarchical system—especially those key reforms that have driven institutional changes during its reform period, which has been marked by rapid economic growth.

Qian et al. (2006) develop a theory explaining how China's region-based governance structure fostered policy experimentation across subnational governments. Heilmann (2008a,b) analyze the institutional setup and political logic of centrally sponsored policy experiments. While these studies focus on centrally coordinated experiments, we examine the varying significance of bottom-up forces across different reforms (Xu, 2011) and their growth implications. We also compare the spatial diffusion patterns between bottom-up and centrally sponsored reforms and document their differential economic impacts.

One recent contribution by Wang and Yang (2024) examines policy experiments through designated experimentation points in China, empirically investigating potential biases in policy learning. Our study differs from theirs in several dimensions. First, instead of focusing on official experiments as in their study, we use local events to capture *de facto* policy innovations

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and their dissemination, as well as their impacts on TFP growth. Second, our analysis covers a different period and draws from different sources: while Wang and Yang (2024) rely on government documents describing policy experiments from the post-2000 period, we use county-level gazetteers to study the period up to 2005 when China's major economic reforms occurred (Zilibotti, 2017).

While a large literature examines how institutions shape economic development and their persistence (e.g., Acemoglu et al., 2001; Rodrik et al., 2004), few studies analyze the impact of actual institutional changes on economic growth. To the best of our knowledge, our paper provides the first systematic evidence linking bottom-up institutional changes to economic growth in reform-era China.

Our study connects to a growing literature that uses computational linguistics to extract rich textual features and uncover otherwise undetectable relationships in social sciences (Gentzkow et al., 2019a,b; Bertrand et al., 2021; Kelly et al., 2021). Through textual analysis, we identify region-specific events related to key reform policies, enabling us to map the spatial patterns of both bottom-up and centrally sponsored reforms across China and analyze their growth implications.

The rest of the paper is organized as follows. Section 2 details our data sources, introduces measurements to quantify the extent of bottom-up forces in driving different economic reforms, and describes the strategies used to identify local reform-related events. Section 3 investigates the characteristics of reform policy innovators. Section 4 explores how the new policy ideas are spread and internalized, and contrasts the diffusion patterns across different types of reforms. Section 5 examines the relationship between policy innovations, their diffusion, and regional economic performance. Section 6 concludes.

2   Data and Measurement

We compiled a unique dataset on county-level major events during China's reform era (1976-2005) to analyze the innovation and diffusion of key economic reforms. Section 2.1 describes our primary data sources, with additional details provided in Appendix A. Sections 2.2 and 2.3 explain how we identify key economic reform policies and reform-related events at the county level. We select counties as our unit of analysis for our baseline empirical work, as they represent the administrative level where many policies, including Hukou registration, are implemented. Section 2.4 presents two high-profile cases—the Household Responsibility System and the Tax Sharing Reform—representing bottom-up and centrally sponsored reforms respectively. Recognizing that both bottom-up and top-down forces often interact during the making of each

reform, we propose in Section 2.5 a measure that captures the extent of bottom-up forces in economic reforms.

2.1 Data Sources

2.1.1 Chronicle of Events at the County Level

We obtain information from local gazetteers (地方志) at both the county and prefecture levels to compile a comprehensive dataset documenting local events during China's reform period. Often regarded as the "encyclopedia" of their respective localities, these gazetteers provide historical and contemporary information on nature, society, economy, culture, and politics. There are two runs of compilation and publishing of local gazetteers after the upheaval of the Cultural Revolution. Most of the first-run gazetteers were published in the 1990s and document events up to the mid-1980s; the second-run gazetteers, mainly published in the 2010s, cover events from the mid-1980s to the mid-2000s.

Although the content of local gazetteers varies by region, their format is relatively uniform, which facilitates our textual analysis implementation. A key section common to local gazetteers is the "Chronicle of Major Events" (大事记), which provides concise records of significant occurrences within the locality during specific historical periods and on a monthly basis after 1949. Each event is documented in a separate entry, providing information on the event's time, precise location, key players involved, and a summary. This feature is useful for tracking local developments and events across various domains such as politics, economy, culture, and society.[1] Notably, this section maintains records of even sensitive political events that are not documented in other sections of the gazetteer (Xue, 2010).[2]

With the support of a dedicated team of research assistants, we have compiled an extensive collection of county gazetteers from various online and offline sources.[3] We extract text from

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[1]In the political realm, it documents events such as key personnel changes, visits from upper-level government leaders, major political conventions and meetings, as well as political movements. Economic events include major reforms in the economic system, fluctuations in local economic conditions along with their causes and consequences, and development of infrastructure projects, and other significant economic activities. In the domain of culture, it covers events related to achievements in areas such as education, science, art, sports, and heritage preservation. Social events encompass responses to natural disasters, charity work, public health issues, public security management, and more.

[2]In April 1985, the Steering Group for National Gazetteer Work issued a detailed guideline on compilation of local gazetteers. While the guideline emphasizes that local gazetteers should truthfully and accurately record and reflect history, it also suggests that the accounts of the major sensitive political events since 1949 (e.g., the Great Leap Forward and the Cultural Revolution) should follow the principal of "being rough, not detailed". Specifically, "rough" means at least the basic facts of an event should be described, while "not detailed" implies that the accounts should omit specific details such as individual names and comprehensive statistics. Due to the summarizing nature of the 'Chronicle of Major Events' section, information on sensitive topics is sometimes only available in this particular section. (Xue, 2010).

[3]We have accessed some scanned gazetters from the online database WangFangData (`https://fz.`

Figure 1: Data Coverage Over Time
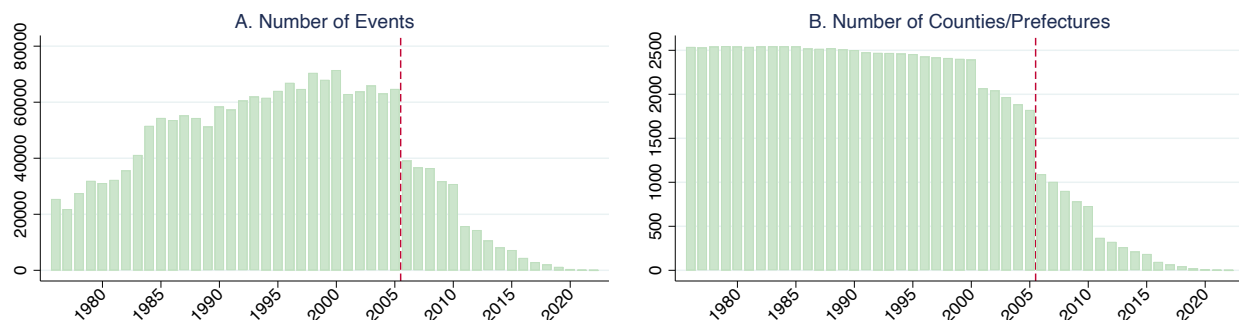
the "Chronicle of Major Events" section and employ Optical Character Recognition (OCR) to scanned images into machine-readable text. This text is then cleaned and organized into a structured dataset. To ensure accuracy, we engaged a team to manually verify and correct any errors introduced during the OCR process by cross-referencing the converted text with the original images. We assign each county a code according to the administration division codes used in the 1990 population census.

Our dataset of local events covers 2,568 county-level divisions in China, starting from 1976—two years before the reform—capturing a total of 1,836,590 events.[4] The average event description is approximately 48 Chinese characters long, and the average number of events per county-year observation is around 51. The first-run gazetteer compilation includes over 646,000 events from 2,515 counties across 30 provinces, covering more than 98% of the population and primarily spanning the period from 1976 to 1985. The second-run consists of more than 1,190,000 events from 2,288 counties in the same 30 provinces, accounting for more than 94% of the population and mainly spanning from 1986 to 2005. Figure 1 presents a summary of the data coverage over time. The left panel illustrates the number of local events over time, whereas the right panel depicts the number of counties covered in our sample over the same period. Due to a significant decline in geographic coverage after 2005, our analysis restricts the sample period to 1976-2005, when the major economic reforms in China occurred (Zilibotti, 2017).[5] To the best of our knowledge, this is the first effort to compile text data on local events across China

wanfangdata.com.cn). Additionally, several provinces offer online portals that provide e-books, such as Sichuan (https://www.scdfz.org.cn/szfz/sxz) and Zhejiang (https://dfz.zj.gov.cn/zlyz/fzbSite/home#header). However, many of the second-run local gazetteers are not available online. To collect data from these books, our team of research assistants visited over ten libraries and archives nationwide and scanned the "Chronicle of Major Events" sections.

[4]We assign the content from the prefecture-level gazetteers to city-governed districts when district-level gazetteers are unavailable.

[5]In Appendix A.1, we show that there is little correlation between the missing status of local events and county characteristics during our sample period.

at a granular geographic level, providing a panoramic yet detailed view of the nation's recent history.[6]

This unique dataset of local events offers an opportunity to explore how China's transformative institutional reforms were formulated and disseminated across space and time—an inquiry that is challenging to address using existing databases of local laws and regulations—for the following reasons. First, in terms of spatial variations, local events provide comprehensive coverage across administrative levels. Local events capture concrete actions of local governments, entrepreneurs, and enterprises, revealing rich variations in institutional changes even within provinces. In contrast, local legislative authority was highly restricted before 2000, limited primarily to provincial capitals and designated prefecture cities, with legislative power extending to just 49 prefecture cities by the late 1990s.[7] Given this restriction, the variations of institutional changes within provinces during the reform period were unlikely to be fully reflected in local laws. Second, in terms of timing, local events track reform experiments and initiatives before their formalization into regulations. This temporal advantage allows us to trace how reforms emerged and evolved on the ground, providing information about institutional transformation during the experimental phases that preceded codification into law.

2.1.2 Other Data Sources

We introduce additional measures and control variables at the county level, drawing data gathered from the following data sources:

(i) The 1982, 1990, 2000 and 2010 County Population Census Data from the China Data Center at the University of Michigan (CDC). The 1982 census data are used to construct measures of counties' baseline socioeconomic characteristics, while information from the subsequent census years is used to assess structural transformation over different periods.

(ii) A map of county-level administrative units from 1990, provided by the CDC, is used to geolocate the counties.

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[6]Recent studies have utilized information from county gazetteers to examine various political movements and policy shocks in contemporary China. These include the Cultural Revolution (Walder and Su, 2003), the diffusion of diagnostic ultrasound (Chen et al., 2013), land reforms across different periods (Almond et al., 2019; Alesina et al., 2021), the Send-Down Movement (Chen et al., 2020), as well as the Great Leap Forward and the Great Famine (Kasahara and Li, 2020). All of these papers rely solely on information from the first-run county gazetteers, whereas our study also utilizes information from the second-run county gazetteers to extend the analysis to the mid 2000s. In addition, rather than focusing on a specific policy during a given period, our study provides the first attempt to explore the formation and diffusion of a host of key reform policies throughout China's 30-year reform period.

[7]The 2000 Legislation Law extended this authority to 282 cities, though limited to specific domains like urban construction and environmental protection. As stipulated by the Law of Local Organizations and the 2000 Legislation Law. See `http://www.npc.gov.cn/zgrdw/npc/xinwen/rdlt/fzjs/2011-02/10/content_1619880.htm`.

(iii) A map of China's railway network in 1980, obtained from Baum-Snow et al. (2017), is employed to calculate the distance from each county to the nearest railroad.

(iv) *Statistical Material for Prefectures, Cities, and Counties Nationwide* (Ministry of Finance, 1993) provides data on counties' fiscal revenue in 1993.

(v) *The Dictionary of the CCP Central Committee Members of Various Plenums, 1921-2003* (Organization Department of the CCP and Party History Research Center of the CCP Central Committee, 2004) is used to identify members of the Politburo Standing Committee of the Chinese Communist Party (CCP) for each year. Combined with the dataset on local events, we can infer the visits by Politburo Standing Committee members to each county over time.

(vi) The provincial-level data on GDP, investment, employment, and TFP from Brandt et al. (2013) and Hao et al. (2020).

(vii) The Business Registry Database, maintained by the State Administration of Industry and Commerce, provides a comprehensive record of all firms that have operated in China since 1949. This database includes information on firm characteristics such as the year of establishment, exit date (if available), location, ownership type, business scope, registered capital, and employment. For the purpose of our analysis, we aggregate the number of registrations by ownership type (e.g., private enterprises versus state-owned enterprises) at the prefecture-year level to infer firm entries across different regions and time periods.[8]

2.2   Identifying Key Economic Reforms

To compile a list of critical economic reforms in China over the period from 1978 to 2005, we collected the chronicle of major reform events from Reform Data (reformdata.org), a database maintained by the China Institute of Reform and Development (CIRD). There are 7,692 reform events documented over the period 1978-2018 at the national level, which are comprehensive and exhaustive of all national-level reforms.

To identify key economic reforms, we conduct a systematic manual review of events documented in this comprehensive database. Our screening process follows a set of main criteria. First, given our focus on critical economic policies, we exclude reforms in non-economic domains such as population control, education, healthcare, environmental protection, and political institutions. Second, we omit policies that were implemented exclusively at the central government

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[8]In the Business Registry Database, county codes are often missing for the earlier years. Therefore, we conduct the analysis at the prefecture level.

level - such as exchange rate regime changes and stock market regulations - since these reforms involved minimal local government participation.

Third, we include not only those "successful" policies and reforms that received central government's implicit or explicit approval but also those that were ultimately reversed or disapproved.[9] This approach allows us to capture the full spectrum of local reform experimentation, including those initiatives that were ultimately terminated through top-down decisions.

Finally and importantly, each critical reform identified should be considered as an umbrella encompassing multiple related policies. For instance, as detailed in Section A of the Online Supplementary Appendix, the price reform encompasses various policy initiatives, from the introduction of dual-track pricing systems across different sectors to the establishment of markets that facilitated price discovery through trading. Thus, the reform diffusion examined in Section 4 captures both policy adoption and incremental innovations in implementation.

Table 1 presents a comprehensive list of 25 reforms identified through our filtering criteria. These reforms span multiple dimensions: urban and rural sectors, state and private ownership, and diverse industries including agriculture, industry, real estate, and finance. The reforms also cover broad policy domains ranging from fiscal and labor policies to pension systems, land use regulations, housing reforms, migration policies, property rights, trade/FDI regulations, business entry/exit rules, and technology initiatives. Section A of the Online Supplementary Appendix provides detailed summaries of each reform's evolution, based on our systematic review of official documents and research papers, which are available on the authors' website.

Columns (1)-(2) of Table 1 present two critical timing measures for our empirical analysis: (i) the year when the central government granted partial consent for reform experimentation, and (ii) the year when the central government endorsed nationwide adoption. The average duration between initial partial consent and final endorsement is 7.2 years, with a standard deviation of 5.7 years. This substantial time gap underscores China's gradualist, experimental approach to reform implementation.

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[9]For example, the rural financial reforms of the 1980s, which delegated control rights of rural financial institutions to depositor-members and promoted bottom-up development of informal finance, were reversed by the central government in the 1990s (Huang, 2012). Similarly, the development of Urban Credit Cooperatives was halted in 1988 when the People's Bank of China centralized supervision and subsequently stopped issuing new licenses. The "blue-stamped household registration"—a bottom-up Hukou policy reform that created an intermediate status between formal household registration and temporary residence registration—was gradually phased out and eventually discontinued in the 2000s. The term "blue-stamped" derives from the blue stamp applied by public security authorities.

Table 1: Key Economic Reforms

Reforms	Year when Central Govt. Gave Partial Consent (1)	Year when Central Govt. Endorsed Nationwide Reform (2)	Bottom-Up Reform Index (3)
Household Responsibility System (家庭联产承包制)	1980	1982	3.033
Development of Individual Economy (发展个体经济)	1979	1982	-0.444
Substitution of Profit with Taxes (利改税)	1980	1983	-2.138
Importing Tech and Complete Sets of Equip (引进新技术和成套设备)	1978	1984	0.707
Developing Township and Village Enterprises (发展乡镇企业)	1979	1984	1.102
Rural Financial Reform (农村金融改革)	1980	1984	0.885
Wage System Reform (工资体制改革)	1978	1985	-1.119
Horizontal Economic Cooperation (横向经济联合)	1980	1986	0.285
Urban Credit Coorporative Development (城市信用社发展)	1986	1986	1.792
SOE Managerial Responsibility Contract (经营责任承包制)	1979	1987	-0.137
Urban Pension System Reform (城镇养老制度改革)	1983	1991	0.278
FDI and Special Economic Zones (外资，经济特区)	1980	1992	-0.783
Transformation of SOEs into Shareholding Companies (企业股份制)	1984	1992	0.127
Price Reform (价格改革)	1984	1992	-0.844
Land Use System Reform (土地使用制度改革)	1988	1992	-0.028
Tax Sharing Reform (分税制改革)	1992	1994	-2.874
Labor Contract System (劳动合同制)	1983	1994	0.605
Development of Private Economy (发展私营经济)	1988	1997	0.283
Privatization of SOEs (国企私有化)	1995	1997	1.888
Housing Reform (住房制度改革)	1979	1998	-1.001
Setting Up A Modern Enterprise System (建立现代企业制度)	1993	1999	1.036
Advancing Western Development (西部大开发)	1999	1999	-0.684
Hukou Reform (户籍制度改革)	1984	2001	0.671
Rural Tax and Fee Reform (农村税费改革)	1993	2004	-1.565
Bankruptcy Reform (破产制度改革)	1984	2006	-1.078

2.3 Identifying Reform Events at the County Level

We employ two complementary approaches to link local events with each reform: keyword matching and machine learning techniques. The keyword approach offers transparency in the identification process, while the machine learning approach leverages advanced textual analysis tools to capture semantic relationships. This dual methodology allows us to harness both the interpretability of direct keyword matching and the sophistication of modern semantic analysis.

Our baseline approach employs keyword matching, capitalizing on the government's practice

of introducing distinctive terminology when implementing major reform policies. For instance, the Household Responsibility System was associated with specific phrases such as '联产到户、包产到户、包干到户、大包干' (Household-based joint production contract, household-based contract responsibility system, Household-based production contract system, large-scale household contracting system). To develop our keyword list, we carefully examined random samples of events from both the partial approval and final endorsement periods of each reform. The selection of keywords was optimized to balance false positive and false negative rates in identifying reform-related events. Appendix A.2 provides the complete list of keywords for each reform, while Section B of the Online Supplementary Appendix presents five illustrative examples of reform-related events identified through this keyword approach.

To validate our baseline approach, we develop a complementary methodology combining supervised machine learning with manual annotation, implemented in three steps. First, we construct a training dataset through manual annotation of events from a random sample of counties. This process involves classifying events as either reform-related or unrelated, and for reform-related events, identifying the specific reform they correspond to. The careful construction of this training dataset is crucial for model performance. Second, we employ a pre-trained RoBERTa model (from the BERT family) for classification. The model is trained on our annotated dataset to recognize patterns characterizing reform-related events. During training, we parameterize the model to minimize false negatives at the expense of increased false positives, ensuring comprehensive capture of reform activities. Finally, we apply the trained model to classify events in our full sample, followed by manual review of identified reform events to eliminate false positives. This ensures classification accuracy while maintaining comprehensive coverage. Appendix A.3 documents the technical specifications of our machine learning approach.

In our empirical analysis, we use the keyword matching measures as our baseline due to their transparency, while employing the machine learning-based measures with manual annotation for robustness checks.

2.4   Bottom-Up v.s. Centrally-Sponsored Reforms: Examples

Having established our event collection and reform identification methodology, we examine two prominent reforms from our sample: the Household Responsibility System, which exemplifies a bottom-up reform process, and the 1994 tax-sharing reform, which represents a top-down reform initiative.

We present the diffusion curves of these reforms, documenting their emergence and spread across counties over time. These diffusion patterns are helpful in two important ways. First,

they help validate our data collection and classification methodology by allowing us to compare our identified patterns with historical accounts and prior knowledge of these reforms. Second, the contrasting patterns between the two reforms reveal key differences between bottom-up and centrally sponsored reforms, which help characterize the extent of bottom-up forces in each reform.

Household Responsibility System (HRS). The Household Responsibility System (HRS) reform in early 1980s China represented a fundamental shift in agricultural policy. Despite being officially banned at the Third Plenum of the 11th Central Committee in 1978, subnational governments began experimenting with contracting land and output quotas from communes to households.[10] Anhui and Sichuan—two populous inland provinces severely affected by the Great Leap Forward famine—pioneered the most notable HRS policies (Bai and Kung, 2014). Their provincial leaders, Wan Li and Zhao Ziyang, recognizing HRS's effectiveness in boosting agricultural productivity, permitted villages to adopt the system rather than punishing violations of central policy.[11]

As regional HRS experiments proved successful, the central government began endorsing the system in 1980.[12] The CCP Central Committee's 1982 'No.1 Document' formally established the HRS as China's agricultural foundation, allowing farmers to lease land, make independent production decisions, and retain surplus after meeting state quotas. During the reform's nationwide implementation (1978-1984), agricultural TFP grew by 5.62% annually. Studies by McMillan et al. (1989) and Lin (1992) attribute this growth primarily to HRS-generated incentive effects on farmer effort and production decisions.

Panel A of Figure 2 illustrates the diffusion process of the HRS reform across the country over time. In our analysis, a county is considered to have adopted the reform in a given year if any reform-related event occurred in that year or in previous years. The diffusion process is captured by two measures: the cumulative share of counties that have adopted the reform and the share of total population residing in these adopting counties.

Two notable patterns emerge from the data. First, approximately 10% of counties initiated HRS adoption in 1978, despite the reform being officially and explicitly banned by the central government. The diffusion process accelerated rapidly after 1978, reaching nearly 70% coverage

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[10]In September 1979, the Fourth Plenum of the 11th Central Committee officially passed the 'Decision on Several Issues Concerning Accelerating Agricultural Development,' explicitly prohibiting land division for individual farming and discouraging the household responsibility system with output quotas.

[11]During his 1992 southern tour, Deng Xiaoping noted: "The household contract responsibility system in rural areas is an invention of the farmers. Many aspects of rural reform were created at the grassroots level; we took these ideas, refined them, and used them as a guide for the entire country."

[12]The Central Committee's "No. 75 Document" of September 1980 permitted HRS adoption in poor and remote regions, and in areas where it was already successfully implemented.

Figure 2: Diffusion of Reform Policies: HRS and Tax-Sharing Reform
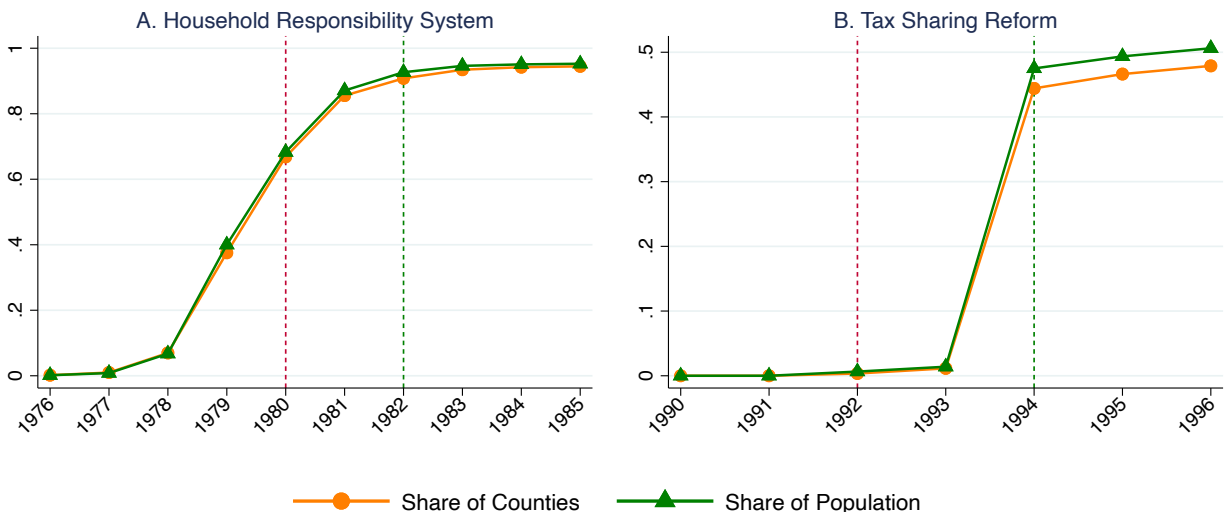
Notes: Panel A presents the spread of the HRS over time, while Panel B depicts the diffusion process of the Tax-Sharing Reform. Both panels use measures based on the keyword matching approach. For each reform, there are two key time points: (i) the year the central government granted partial consent to experiment with the reform policy (indicated by a red dashed line), and (ii) the year the central government endorsed the reform for nationwide adoption (indicated by a green dashed line). We report, for each year, the share of counties that have adopted the reform (indicated by a connected orange line with circles) and the share of the population living in those counties (indicated by a connected green line with triangles).

by 1980, when the central government granted partial consent. Second, the adoption rate showed little response to the central government's full endorsement in 1982, an unsurprising outcome given that most counties had already implemented the reform by that time.

For further validation purposes, we examine the provincial patterns of HRS diffusion shown in Figure A.2. The data confirm that Anhui and Sichuan provinces pioneered the HRS experiments, while northeastern provinces like Heilongjiang and Jilin lagged in adoption. We also observe that more developed coastal regions did not necessarily lead in policy innovation. For example, Jiangsu, a relatively wealthy coastal province, displayed adoption patterns similar to those of Jilin, a northeastern province, prior to 1982. These provincial variations in adoption timing and speed align with documented historical accounts of the HRS's bottom-up development (Wu, 2009; Xu, 2011).

Tax Sharing Reform. Prior to the 1994 Tax Sharing Reform, China's "fiscal responsibility system" allowed local governments to retain revenues after remitting fixed amounts to the center, leaving central government with just 22% of fiscal revenues by 1993 (Xu, 2011). In 1992, central authorities piloted a new system that categorized taxes as central, local, or shared. Implemented nationwide in January 1994, this reform expanded central revenue share and en-

hanced funding for national initiatives. The reform exemplifies top-down policy implementation, with central authorities directing changes across China.

Panel B of Figure 2 visualizes the diffusion of the tax-sharing reform across the country over time. The patterns differ markedly from those of the HRS reform in two key aspects. First, local event descriptions contained no mentions of the reform before the central government's policy experiment in 1992. The reform appeared in local event records only after the central government selected a small number of counties as experimental sites during 1992-1993. Second, reform coverage expanded dramatically after the central government's nationwide implementation decision, reaching nearly 50% by 1994. The population share residing in reform-adopting counties followed an identical sharp trajectory. This sudden surge in adoption following central directives reflects the reform's top-down nature, contrasting sharply with the bottom-up innovation and gradual diffusion of the HRS reform.

2.5   Constructing Bottom-Up Reform Index

The contrast between the HRS and the Tax Sharing Reform indicates significant variation in the formation and dissemination processes of key economic reforms. Such variation is evident in (i) the degree to which local governments initiate the reform experiments, and (ii) the extent to which the top-down directive influences the reform diffusion. Figure A.4 presents the diffusion process for all the reforms listed in Table 1, most falling between these two extremes.[13] In other words, rather than purely bottom-up or top-down, most reforms emerged through interaction between local and central governments. We therefore propose an index measuring bottom-up influence in each reform, constructed from two sub-indices: *Actions before Central Government's Partial Consent.* For each reform q, let $\underline{\tau}_q$ and $\overline{\tau}_q$ denote the years of central government's partial consent and full endorsement, respectively. We measure local government initiative using the ratio of early to total adopters, where early adopters are counties implementing the reform by $\underline{\tau}_q - 1$ (one year before partial consent) and total adopters are those implementing by $\overline{\tau}_q + 5$ (five years after full endorsement).

Structural Break of the Diffusion Process. For each reform q, we identify a significant structural break year t_q in its diffusion process. We measure the rate of reform adoption as $\Delta Num\ of\ Adopters_{q,t} - \Delta Num\ of\ Adopters_{q,t-1}$, starting from when the central government partially approves the reform. We define t_q as the year with the largest increase in this adoption rate. While t_q typically coincides with the year of full central government endorsement $\overline{\tau}_q$, some reforms like Housing Reform show breaks before $\overline{\tau}_q$ due to interim central policy

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[13]The figure tracks reform diffusion using both keyword matching and combined machine learning-manual annotation methods, which yield similar patterns.

Figure 3: Correlation Between Sub-Indices
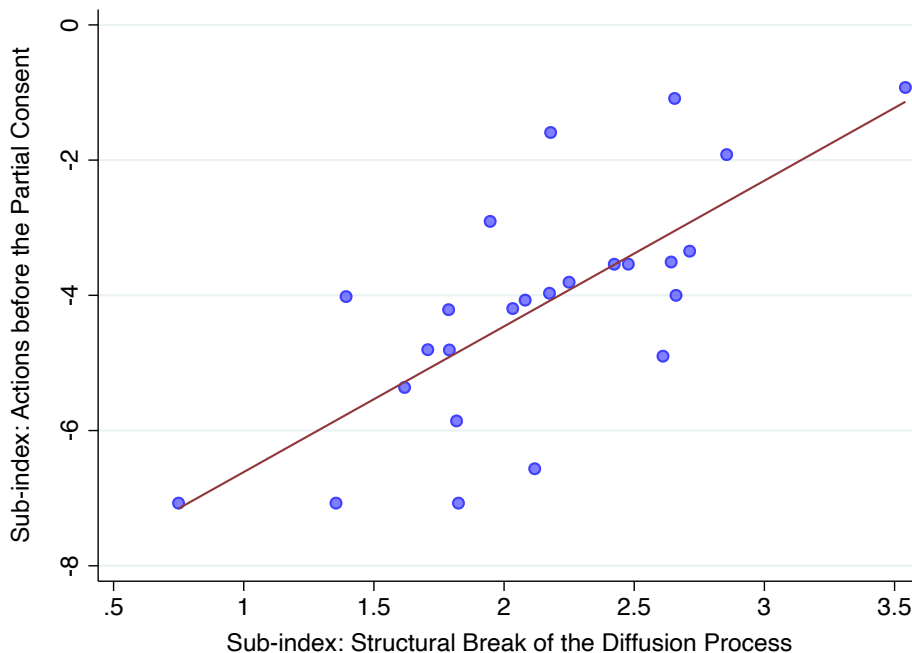
measures. The magnitude of the structural break is calculated as $\Delta Num\ of\ Adopters_{q,t_q} - \Delta Num\ of\ Adopters_{q,t_q-1}$. The Tax Sharing Reform exemplifies this pattern, with its largest diffusion jump ($> 40\%$) occurring in 1994.

The first subindex captures bottom-up reform momentum through temporal variations: a larger ratio of early-to-total adopters indicates stronger local initiative before central government's partial consent. The second subindex measures top-down influence through spatial discontinuities, reflecting how central directives drive county-level reform adoption. Note that we normalize both ratios using zero-skewness log transforms to create the two sub-indices.

Figure 3 displays the scatter plot of the two sub-indices, revealing a positive correlation coefficient of 0.722. We construct an aggregate $Bottom\text{-}Up\ Index_q$ for each reform q using principal component analysis of these sub-indices. The resulting index is standardized with mean zero and standard deviation 1.312. This baseline index uses keyword matching measures, and correlates strongly (coefficient 0.961) with the alternative index constructed using combined machine learning and manual annotation.

Column (3) of Table 1 reports the index values across reform policies. The highest index values correspond to reforms known for strong local initiative: the Household Responsibility System (HRS), SOE privatization, urban credit cooperative development, and township and village enterprise development. Conversely, the lowest values appear in reforms directed from above: the tax-sharing system, profit-to-tax conversion, rural tax and fee reform, and wage

system reform. The alignment between these index values and historical accounts of reform origins and implementation patterns validates our index construction.

3 Innovators of the Reform Policies

3.1 Characteristics of the Reform Policy Innovators

We begin by examining the characteristics of reform policy innovators - counties that pioneered specific reforms. For each reform q, we define $Innovator_{i,q}$ as a binary variable equal to 1 if county i is among the first 3 percent of adopters, and 0 otherwise. Reforms are categorized based on their $Bottom\text{-}Up\ Index_q$ into Bottom-Up Reforms (top quartile) and Centrally-Sponsored Reforms (remaining quartiles).

Figure 4 displays the geographic distribution of policy innovations across Chinese counties, based on county-level aggregation of innovation counts. Policy innovation shows no clear geographic concentration. While political and economic centers like Beijing and Tianjin show high innovation intensity, many inland and rural counties also emerge as leading innovators. Figure 5 presents the geographic distributions of bottom-up and centrally-sponsored reforms separately, where we do not observe much overlap.

Column (1) of Table 2 examines determinants of reform innovation by regressing $Innovator_{i,q}$ on key county characteristics. These include education levels (shares of population with college education and with middle/high school education), economic structure (employment shares in agricultural and industrial sectors), economic size (log population), infrastructure access (log distance to railway), fiscal capacity (log fiscal revenue), economic development (log per capita agricultural and industrial output), and geographic location (coastal province indicator).

Our findings indicate that counties with a higher share of college-educated workers, larger populations, and greater agricultural and industrial output per capita are more likely to be innovators, demonstrating the importance of human capital and economic scale for reform innovation. This pattern is consistent with the fixed-cost theory of policy innovation (Mulligan and Shleifer, 2005; DellaVigna and Kim, 2022). Local industry composition and fiscal capacity, however, show no significant relationship with reform innovation.

The absence of correlation between coastal location and policy innovation aligns with the stylized facts and anecdotes presented in Sections 2.2 and 2.4. Given the diverse nature of China's economic reforms during 1976-2005, different regions likely faced varying potential gains and comparative advantages across policy domains. This diversity in reform opportunities helps explain why innovations emerged across varied geographic and industrial contexts, rather than

Figure 4: Spatial Distribution of Reform Policy Innovations

>=4
3
2
1
0
No Data
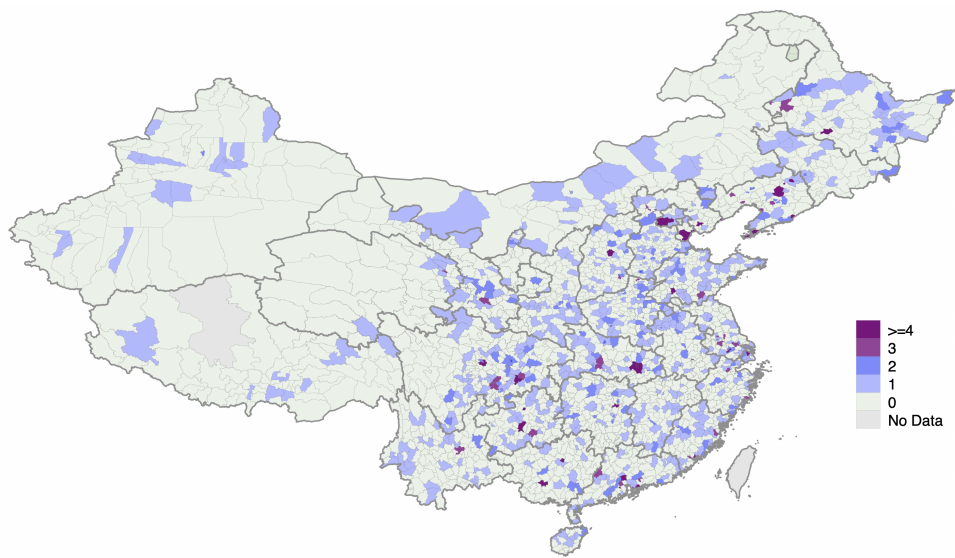
Notes: The figure illustrates the spatial distribution of reform policy innovations. For each county, we calculate the number of policy innovations implemented from 1976 to 2005, i.e., $\sum_q Innovator_{i,q}$. Counties with a higher number of policy innovations are depicted in a darker color.

concentrating in coastal areas.

In Column (2), we control for province and reform fixed effects, basing our estimation on within-province and within-reform variations. The results remain consistent. Column (3) introduces interactions between county characteristics and the bottom-up reform index to test for systematic differences between innovators of bottom-up versus centrally-sponsored reforms. None of these interactions yield statistically significant coefficients.

Interestingly, counties more distant from railway networks show a higher propensity for policy innovation, suggesting that political remoteness provided an advantage in reform experimentation through reduced visibility and political risk. This relationship is particularly pronounced for bottom-up reforms, as evidenced by the significant interaction terms between the bottom-up index and both railway distance ($Bottom\text{-}Up\ Index_q \times Log\ Dist.\ to\ Railway_i$) in Column (3). These results support the interpretation that local governments faced higher political costs when initiating reforms without central sponsorship, making geographic remoteness especially valuable for bottom-up innovation.

The significant negative interaction between the bottom-up index and fiscal revenue indicates that fiscally stronger counties were less likely to initiate bottom-up reforms. This finding

Figure 5: Spatial Distribution of Reform Policy Innovations:
Bottom-Up versus Centrally-Sponsored Reforms

A. Bottom-Up   B. Centrally-Sponsored
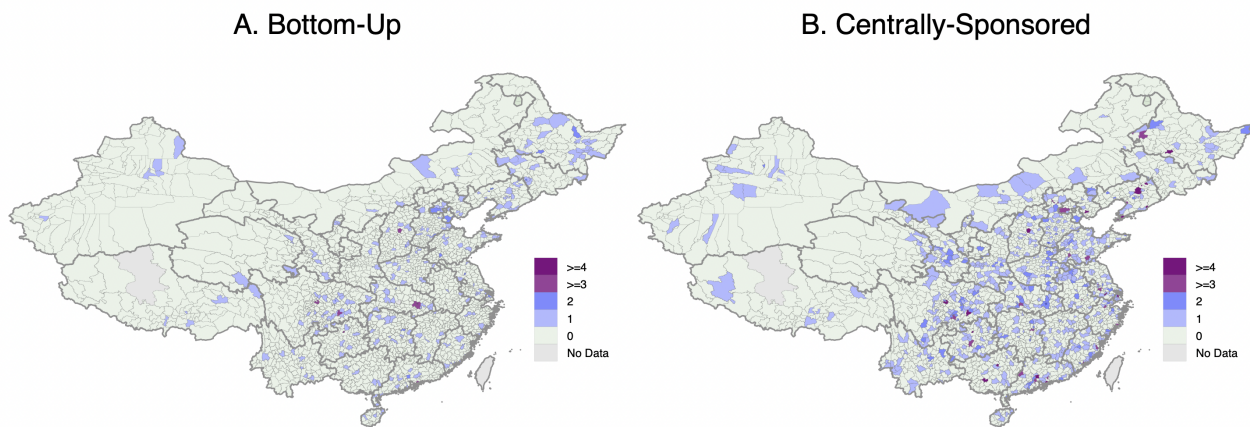
Notes: In this figure, we categorize the reforms into two groups: (i) Bottom-Up Reforms (BU), and (ii) Centrally-Sponsored Reforms (CS), depending on whether the index $Bottom\text{-}Up\ Index_q$ falls within the top quartile or not. Panels A and B illustrate the spatial distribution of policy innovations for bottom-up reforms and centrally-sponsored reforms, respectively. For each county, we calculate the number of bottom-up policy innovations and the number of centrally-sponsored policy innovations implemented from 1976 to 2005 (i.e., $\sum_{q \in BU} Innovator_{i,q}$ and $\sum_{q \in CP} Innovator_{i,q}$, where BU and CP denote the set of policies classified as Bottom-Up Reform and the set of policies classified as Centrally-Sponsored Reform, respectively.). Counties with a higher number of policy innovations are shown in darker colors.

suggests that higher fiscal capacity may actually disincentivize local experimentation, particularly when reforms required local initiatives.

Appendix Table B.1 confirms the robustness of our findings using the alternative bottom-up index constructed from machine learning and manual annotation. We employ this alternative measure as an instrument for our baseline keyword-matching index to address potential attenuation bias from measurement error. The results remain consistent, with details provided in Appendix B.1.

3.2 Reform Policy Innovations and Visits by the Politburo Standing Committee Members

While our previous analysis shows that geographic remoteness might reduce political risks by shielding counties from scrutiny, we now examine a complementary dimension of political remoteness: the level of attention these counties received from the central government. Specifically, we assess central government attention through inspection visits by Politburo Standing

Table 2: 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-Up Index$_q$ × 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-Up Index$_q$ × 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-Up Index$_q$ × Share Agri$_i$			0.0053
			(0.0064)
Share Ind$_i$	-0.0257	-0.0328	-0.0328
	(0.0225)	(0.0244)	(0.0244)
Bottom-Up Index$_q$ × Share Ind$_i$			0.0040
			(0.0046)
Log Pop$_i$	0.0263***	0.0262***	0.0262***
	(0.0078)	(0.0068)	(0.0068)
Bottom-Up Index$_q$ × 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-Up Index$_q$ × 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-Up Index$_q$ × 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-Up Index$_q$ × 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

Notes: All regressions are weighted by county population in 1982. Robust standard errors are clustered at the province level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Committee (PSC) members, who constitute the core leadership of the CCP.[14] Data on these

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[14]The PSC includes the CCP General Secretary, State Council Premier, and other top leaders. Our sample covers the 11th to 16th Central Committees, when membership ranged from five to nine individuals.

high-level visits come from our county-level major events dataset described in Section 2.1.[15]

The visits of national political leaders carried significant policy implications in China's political system, as exemplified by the SOE privatization reforms in Zhucheng, Shandong province. In 1992, facing mounting fiscal pressures from underperforming state enterprises, this county-level city took the bold step of selling numerous SOEs to their employees, despite privatization being unconstitutional at the time. The reform initiative faced widespread criticism and uncertainty until Premier Zhu Rongji's 1996 inspection visit, during which he explicitly approved Zhucheng's approach. This high-level endorsement proved pivotal, as the central government formally sanctioned SOE privatization nationwide in 1997, marking Zhucheng's experiment as a pioneering reform model.

We investigate the interactions between reform innovators and the central government by the Possion quasi-maximum likelihood (Poisson MLE) model as follows:

$$
NumVisit_{it} = \exp\left(\sum_{\tau=-3}^{3} \beta^\tau NumInnov_{i,t-\tau}^{BU} + \sum_{\tau=-3}^{3} \gamma^\tau NumInnov_{i,t-\tau}^{CS} + X_{i0}'\delta + D_p + D_t\right)\varepsilon_{it},
$$

(1)

where $NumVisit_{it}$ denotes the number of visits made by members of the PSC; τ indicates the number of years relative to reform innovation; $NumInnov_{i,t-\tau}^{BU}$ represents the number of policy innovations classified as Bottom-Up Reform in county i and year $t-\tau$; and $NumInnov_{i,t-\tau}^{CP}$ represents the number of policy innovations classified as Centrally-Sponsored Reform in county i and year $t-\tau$. Specifically, to construct these measures, we consider county i an innovator of reform q if it belongs to the first 3 percent of counties to adopt reform q. Then, $NumInnov_{i,t-\tau}^{BU} = \sum_{q \in BU} Innovator_{i,q,t-\tau}$ and $NumInnov_{i,t}^{CP} = \sum_{q \in CP} Innovator_{i,q,t-\tau}$, where $Innovator_{i,q,t-\tau}$ is an indicator variable equal to 1 if county i is a policy innovator of reform q and the innovation occurs in year $t-\tau$, and 0 otherwise. BU and CP denote the set of policies classified as Bottom-Up Reforms and Centrally-Sponsored Reforms, respectively. As with the previous analysis, these two types of reforms are the classified based on whether the index $Bottom\text{-}Up\ Index_q$ falls within the top quartile or not.[16] Additionally, X_{i0} is a vector of baseline characteristics. D_p and D_t denote the province and year fixed effects, respectively. These fixed effects account for unobserved characteristics that influence the baseline likelihood of receiving visits from top leaders across different provinces and years. Robust standard errors are clustered at the province level to account for autocorrelation and correlations among counties within the same province.

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[15]See Appendix A.5 for details on the extraction of PSC visit records.

[16]To assess robustness, we adopt an alternative grouping where Bottom-Up Reforms are those with a bottom-up index in the top tertile. The regression results (available upon request) remain stable.

Figure 6: Reform Innovations and Visits by the Purliburo Standing Committee Members
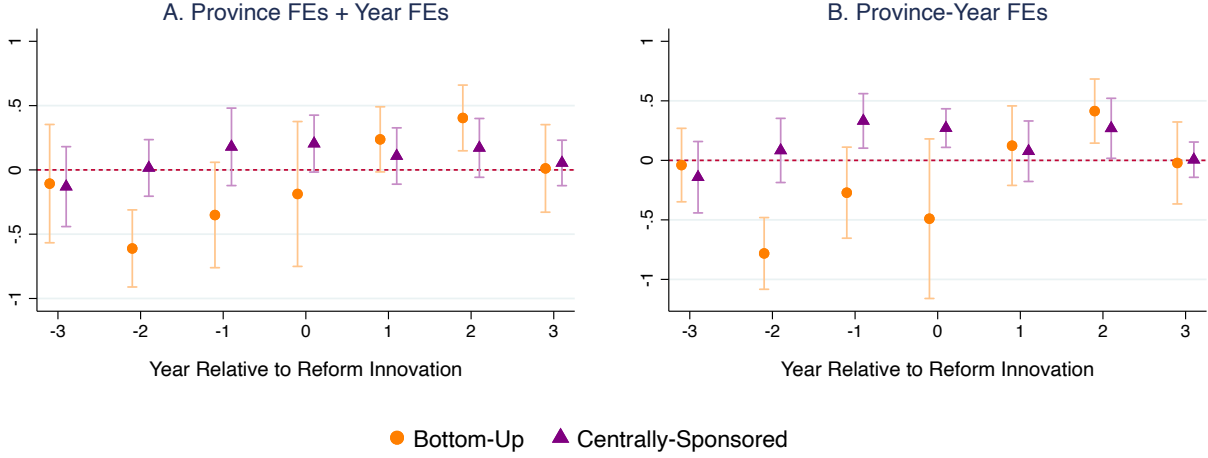
● Bottom-Up   ▲ Centrally-Sponsored

Notes: The figure plots the estimated coefficients of β^τ and γ^τ and their 90% confidence intervals for the Poisson MLE regression in (1).The specification in Panel A includes the province dummies and year dummies, while that in Panel B controls for province-year dummies. For both panels, the controls of baseline county characteristics include the share of the population with college education or above, the share of the population with middle- or high-school education, the share of employment in the agricultural sector, the share of employment in the industrial sector, log population, log agricultural and industrial output per capita, log distance to the railway network, and an indicator variable for whether the county is located in the provincial capital. Standard errors are clustered at the province level.

The lead-lag structure in specification (1) allows us to examine how the frequency of visits by PSC members changes in response to different types of policy innovations occurring within a seven-year time window. Panel A of Table 6 presents the estimates of β^τ and γ^τ from the baseline model. Panel B further includes province-year fixed effects as additional controls. The estimation results reveal distinct patterns in the interactions between central and local governments before, during, and after policy innovations, depending on the type of reform.

For centrally-sponsored reforms we find that PSC members are more likely to visit the innovators one year before and during the innovation (i.e., when $\tau = -1$ and $\tau = 0$), consistent with the top-down selection of experimental sites.[17] We also observe increased visits two years post-innovation ($\tau = 2$), likely for outcome evaluation.

For bottom-up reforms, PSC members are less likely to visit innovators before and during the innovation ($\tau = -2$, $\tau = -1$, and $\tau = 0$), contrasting sharply with the pattern observed in centrally sponsored reforms. The negative estimates when $\tau = -1, -2$ suggest that reduced central attention may provide local authorities greater latitude to initiate politically uncertain

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[17]The correlation between PSC visits and reform adoption may reflect several mechanisms: central leaders gathering local information for site selection, successful lobbying by career-motivated local officials, or underlying patronage networks influencing both visits and experiment allocation. The latter two scenarios suggest potential selection bias in policy experiments (Wang and Yang, 2024).

policy experiments. The negative estimate when $\tau = 0$ likely reflects central leaders' strategic avoidance of early-stage visits to politically risky reforms, as such visits could be interpreted as endorsement. This cautious approach allows central leaders to maintain distance if local experiments fail (Xu, 2011). The coefficient turns positive and significant two years post-innovation ($\tau = 2$), consistent with both policy outcome inspection and implicit central approval—as illustrated by the Zhucheng SOE privatization case.[18]

4 Spatial Diffusion of the Reform Policies

To study the spatial diffusion of the key reforms, we follow DellaVigna and Kim (2022) and estimate a harzard model of diffusion. For each reform, the estimation sample starts in the first year when at least 5 counties have adopted the reform, and concludes five years post the final endorsement of the reform by the central government. Specifically, for all counties labeled as i that have yet to adopt reform q by year t, we employ a logit specification to model the discrete-choice decision pertaining to reform adoption:

$$\ln\left(\frac{P(Y_{iqt} = 1)}{1 - P(Y_{iqt} = 1)}\right) = \alpha\Lambda_{iqt} + \beta Sim_{i,\Omega_{q,t-1}} + X'_{i0}\gamma + D_{rq} + D_{qt} + D_{rt} + \varepsilon_{iqt}, \qquad (2)$$

where Y_{iqt} indicates whether county i adopted reform q in year t. Λ_{iqt} and $Sim_{i,\Omega_{q,t-1}}$ capture learning and suitability channels of reform diffusion, respectively.

First, to operationalize the learning channel in Equation (2), we measure county i's exposure to reform q in year t as:

$$\Lambda_{iqt} = \sum_j \frac{(Dist_{ij})^{-1} \cdot Pop_{j0}}{\sum_{j'} (Dist_{ij'})^{-1} \cdot Pop_{j'0}} \mathbf{1}(j \in \Omega_{q,t-1}), \qquad (3)$$

where $\Omega_{q,t-1}$ represents counties that adopted reform q by year $t-1$. Each early adopter is weighted by its inverse distance ($Dist_{ij}^{-1}$) and baseline population (Pop_{j0}). Higher Λ_{iqt} indicates greater reform exposure through spatially proximate and populous early adopters, allowing potential adopters to better assess reform returns and political costs.

Second, to measure the suitability channel, we compute county i's similarity to the average

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[18]Figure B.1 confirms the robustness of these patterns using alternative measures of $NumInnov_{i,t-\tau}^{BU}$ and $NumInnov_{i,t-\tau}^{CS}$ derived from the machine learning and manual annotation approach.

early adopter of reform q as:

$$Sim_{i,\Omega_{q,t-1}}^{Avg} = -\frac{1}{K}\sum_k \left[\frac{1}{N_{q,t-1}}\sum_{j\in\Omega_{q,t-1}}\left|x_{i0}^k - x_{j0}^k\right|\right],\tag{4}$$

where x_{i0}^k represents county i's standardized baseline characteristic k. The K characteristics include education levels (college and secondary shares), sector employment shares (agricultural and industrial), population size (log), and per capita output (log of agricultural and industrial). $N_{q,t-1}$ denotes the number of early adopters in set $\Omega_{q,t-1}$. Higher $Sim_{i,\Omega_{q,t-1}}^{Avg}$ indicates greater similarity between county i and previous adopters, suggesting higher reform suitability.

In equation (2), X_{i0} contains county i's baseline characteristics. The fixed effects include region-reform (D_{rq}), reform-year (D_{qt}), and region-year (D_{rt}) dummies, where regions comprise East Coast, Central, Northeast, and Western areas. D_{rq} controls for region-specific reform propensities, D_{qt} absorbs nationwide reform shocks, and D_{rt} captures region-specific implementation capacity over time. Standard errors are clustered at the province level to account for spatial and policy correlations.

Table 3 presents the estimation results. Column (1) shows that both learning and suitability channels significantly predict reform adoption. A one-standard-deviation increase in reform exposure (λ_{iqt}) raises the hazard rate by 47.8 log points ($0.1851 \times 2.5846 \times 100$), while a one-standard-deviation increase in reform suitability ($Sim_{i,\Omega_{q,t-1}}^{Avg}$) increases the hazard rate by 26.2 log points ($0.422 \times 0.6198 \times 100$).

Column (2) explores the heterogeneous effects of learning and suitability on the diffusion process across reforms with different bottom-up indices. We incorporate interaction terms between the bottom-up index and our key variables of interest to empirically test these heterogeneous effects. For the learning channel, theoretical predictions about the sign of the interaction effect are ambiguous. In reforms with a high bottom-up index where diffusion is locally driven, learning from peer experiences may play a more prominent role in adoption decisions as local governments actively seek and process information from early adopters. However, in centrally-sponsored policy experiments, a higher value of Λ_{iqt} often signals stronger directives from the central government, potentially leading to more pronounced responses to peer adoption in reforms with a low bottom-up index. Our empirical analysis reveals that the interaction term $Bottom\text{-}Up\ Index_q \times \Lambda_{iqt}$ is positive but statistically insignificant, suggesting these opposing forces may offset each other in the diffusion process.

For the suitability channel, we find that the interaction term ($Bottom\text{-}Up\ Index_q \times Sim_{i,\Omega_{q,t-1}}^{Avg}$) is positive and significant at the 1% level. This pattern indicates that when reforms originate

Table 3: 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)
$Bottom\text{-}Up\ Index_q \times \Lambda_{iqt}$		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)
$Bottom\text{-}Up\ Index_q \times Sim^{Avg}_{i,\Omega_{q,t-1}}$		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

Notes: County baseline characteristics include: share of population with college degree or above, share of population with middle- or high-school education, share of employment in the agricultural sector, share of employment in the industrial sector, log population, and log agricultural and industrial output per capita. All these measures are constructed using data from the 1982 Population Census. For each year t, the sample is restricted to counties that have not yet adopted reform q. For each reform, the estimation sample starts in the first year when at least 5 counties have adopted the policy, and concludes five years post the final endorsement of the reform by the central government. Robust standard errors are clustered at the province level. *** p<0.01, ** p<0.05, * p<0.1

more from local initiative rather than central mandate, counties are better positioned to evaluate and incorporate local conditions into their adoption decisions. This particular feature of bottom-up reforms—that local conditions play a role in adoption—may have important implications for reform effectiveness: when counties select reforms based on local suitability, they are more likely to implement them successfully and realize their intended economic benefits, compared to situations where reforms are adopted primarily in response to central directives regardless of local conditions.

Columns (3)-(4) further strengthen our findings by incorporating a comprehensive set of region-reform-year fixed effects. These fixed effects absorb the region-reform-specific baseline hazard rate for each year, allowing us to control flexibly for any unobserved region-specific shocks that might influence the adoption decisions of a particular reform. The estimation results are rather stable under this more demanding specification, which reinforces the robustness of our main findings.

Additional Heterogeneity Analysis and Robustness. We have conducted additional heterogeneity analyses and performed a series of checks to establish the robustness of our findings. While the full details are reported in Appendix B.2, we summarize the key highlights below.

In the baseline analysis, we construct the measures of reform exposure and similarity based on the set of early adopters across the country. In Column (1) of Table B.2, we replace Λ^{iqt} and $Sim_{i,\Omega_{q,t-1}}^{Avg}$ with their within-province and outside-province counterparts, and re-estimate the hazard model. Specifically, the within-province version of Λ_{iqt} quantifies the exposure to early adopters inside the province where i is situated, while the outside-province version captures exposure to adopters in other provinces. Similarly, the within-province counterpart of $Sim_{i,\Omega_{q,t-1}}^{Avg}$ measures the similarity to early adopters within the province where i is located, while the outside-province version reflects similarity to adopters elsewhere. Our findings indicate that the estimated coefficient for similarity with early adopters outside the province is significantly larger compared to that with early adopters within the province.

In Columns (2)-(4), we separately estimate the specification for each of the three decades in our sample: 1976-1985, 1986-1995, and 1996-2005. The effect of the suitability channel declines monotonically over time, yet remains significantly positive throughout the entire period. This finding echoes the pattern observed in Figure A.3, which shows that the bottom-up index has declined over time.

We have conducted a battery of additional checks, including: (i) contrasting the differences in the diffusion process for bottom-up versus centrally-sponsored reforms using a less parametric approach, which classifies the reforms into three groups based on whether the bottom-up index falls in the top quartile, the middle two quartiles, or the bottom quartile (Figure B.2); (ii) adopting an alternative measure of similarity that emphasizes the influence of early adopters that bear the most resemblance (Panel A of Table B.3); (iii) estimating a linear probability model instead of a logit model (Panel C of Table B.3); and (iv) using measures of Y_{iqt}, Λ_{iqt} and $Sim_{i,\Omega_{q,t-1}}$ constructed through an alternative textual analysis approach, which combines machine learning techniques with manual annotation as described in Section 2.3. It is reassuring that our baseline results remain stable across these alternative specifications and measurements.

5   Institutional Innovation, Diffusion, and Economic Growth

In this section, we examine the economic impacts of reform policies in China from the early 1980s to the early 2000s, building on our earlier analysis of reform innovation and diffusion patterns. We distinguish between two key aspects of the reform process: reform policy inno-

vation—where regions initiate new reforms as innovators—and reform policy adoption—where regions implement existing reforms as followers. This distinction allows us to quantify how institutional innovation and its subsequent diffusion have contributed to China's economic growth and development.

5.1 GDP, Capital and Productivity: Province-Level Evidence

5.1.1 Effects of Reform Policy Innovation and Diffusion

We first examine how economic reforms contributed to GDP growth, capital investment, and the growth of total factor productivity (TFP). To this end, we combine provincial-level economic data with our local events dataset to create a provincial-level panel dataset. Each period in the dataset spans three years, covering intervals from 1981 to 2004, such as 1981-1983, 1984-1986, subsequent periods in between, and 2002-2004. We label these periods as τ, encompassing the years $t-2$, $t-1$, and t.

In our analysis, we first define $Innovation_{i,\tau}$ as the total number of new reforms initiated by county i during the years $t-3$, $t-2$, and $t-1$, i.e., one-year lagged period of the designated three-year period τ. We use one-year lags to construct this variable to accommodate the fact that the effects of newly introduced reforms on economic growth often take time to materialize.

We aggregate this measure to the provincial level as follows:

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

where Pop_{i0} and Pop_{p0} denote the baseline population of county i and province p, respectively. By construction, $Policy\ Innovator_{p\tau}$ measures the share of the population in province p that was exposed to policy innovations during the period τ. In a similar vein, we denote $Adoption_{i,t}$ as the total number of new policies implemented by county i as a follower during the years $t-3$, $t-2$, and $t-1$. We aggregate this measure to the provincial level according to:

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

which quantifies the share of the population in province p embracing new reform policies as followers during the period τ.

Next, we estimate the following specification:

$$\Delta \ln y_{p\tau} = \alpha Policy\ Innovator_{p\tau} + \beta Policy\ Follower_{p\tau} + X'_{p0}\gamma_\tau + D_p + D_\tau + u_{p\tau}, \quad (5)$$

Table 4: Reform Policy Innovation, Adoption, and Economic 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)	$\Delta Investment$ 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

Notes: Province baseline characteristics include: log employment in 1978, log GDP per capita in 1978, log capital per capita in 1978, a dummy indicating whether the province is in the coastal area, and a dummy variable indicating whether the province is a municipality. Robust standard errors are clustered at the province level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

where $\Delta \ln y_{p\tau}$ represents growth in province p over three-year period τ (from $t-2$ to t), measured as either log GDP per worker, log TFP, or investment rate. *Policy Innovator*$_{p\tau}$ and *Policy Follower*$_{p\tau}$ measure reform innovation and adoption intensities in province p during the lagged period ($t-3$ to $t-1$). X_{p0} includes province-level baseline controls: log employment, GDP per capita, and capital per capita (all from 1978), plus coastal area and municipality dummies. These controls are interacted with period dummies to capture time-varying effects. D_p and D_τ represent province and period fixed effects. Thus, the identification arises from variations in the intensities of reform innovation and adoption within provinces over time. Standard errors are clustered at the province level.

We present the estimation results in Table 4. Column (1) reports the impact on the growth of GDP per capita. The coefficient for reform innovation is positive and statistically significant, indicating that a higher number of reform policy innovations in a province p is associated with faster economic growth in the subsequent period. In Column (2), we include capital accumulation as a control variable. Given a Cobb-Douglas production function with constant returns to scale, conditional on $\Delta \ln Capital$ per worker$_{p\tau}$, the estimated effects of policy innovation and adoption reflect their impacts on TFP. The estimates suggest that institutional innovation not only boosts economic growth but also does so by improving productivity. Furthermore, adopting policies as a follower enhances productivity, though the estimated effect is significantly smaller than that of pioneering economic reforms (0.0170 versus 0.0608).

Next, we construct TFP directly as a Solow residual following Brandt et al. (2008). The

value of capital intensity is set to 0.5 to match China's average capital income share, as reported in the national accounts. Using TFP as the dependent variable, we re-estimate Equation (5) and present the results in Column (3). We observe that the estimated coefficients for *Policy Innovator*$_{p\tau}$ and *Policy Follower*$_{p\tau}$ are both positive and significant, a pattern consistent with the results reported in column (2). Column (4) examines the impact of reform policy innovation and adoption on the investment rate, which is defined as the ratio of investment in fixed capital to GDP. Interestingly, we find that while policy innovation has an insignificantly impact on investment rate, embracing reform as a follower is associated with a lower investment rate. This finding indicates that for followers of reform during the studied period, productivity growth and capital accumulation could potentially serve as strategic alternatives.

5.1.2 Heterogeneous Effects: The Role of Bottom-Up Forces

Our next step is to analyze whether the growth effects vary across economic reforms with differing bottom-up intensities. To do this, we introduce the following measures:

$$Bottom\text{-}Up\ Policy\ Innovator_{p\tau} = \sum_{i \in p} \sum_{q} Bottom\text{-}Up\ Index_q \times \frac{Pop_{i0}}{Pop_{p0}} \times Innovation_{i,q,\tau},$$

$$Bottom\text{-}Up\ Policy\ Follower_{p\tau} = \sum_{i \in p} \sum_{q} Bottom\text{-}Up\ Index_q \times \frac{Pop_{i0}}{Pop_{p0}} \times Adoption_{i,q,\tau}.$$

By construction, the value of *Bottom-Up Policy Innovator*$_{p\tau}$ is larger for provinces that initiate more local policy experiments and when these experiments have larger bottom-up components. Similarly, *Bottom-Up Policy Follower*$_{p\tau}$ is larger for provinces that adopt more reforms with larger bottom-up components.[19]

We then estimate the extended model as follows:

$$\begin{aligned} \Delta \ln y_{p\tau} =\, &\alpha_1 Policy\ Innovator_{p\tau} + \alpha_2 Bottom\text{-}Up\ Policy\ Innovator_{p\tau} \\ &+ \beta_1 Policy\ Follower_{p\tau} + \beta_2 Bottom\text{-}Up\ Policy\ Follower_{p\tau} \\ &+ X'_{p0}\gamma_\tau + D_p + D_\tau + u_{p\tau}. \end{aligned} \tag{6}$$

Therefore, α_2 and β_2 in equation (6) reveal how bottom-up forces embedded in policy innovation and diffusion, respectively, influence growth.

The estimation results are presented in Table 5. While Column (1) shows a positive but statistically insignificant relationship between reform policy innovation and GDP per worker

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[19]Since, by construction, the *Bottom-Up Index*$_q$ has a mean of zero, provinces that only innovate reform policies with the average bottom-up index will have *Bottom-Up Policy Innovator*$_{p\tau}$ = 0. Similarly, provinces that only adopt reforms with the average bottom-up index will have *Bottom-Up Policy Follower*$_{p\tau}$ = 0.

growth (α_1), the impact on economic growth becomes more substantial and significant when innovations have a stronger bottom-up component (α_2). Quantitatively, when 10% of a province's population is exposed to a reform policy innovation, a one-standard-deviation increase in the bottom-up reform index is associated with 1.1% ($= 0.0838 \times 0.1 \times 1.312 \times 100$) higher GDP per worker growth (α_2). Similarly, the benefits of reform diffusion are amplified by bottom-up forces (β_2): when 10% of a province's population adopts a reform policy, a one-standard-deviation increase in the bottom-up reform index corresponds to 0.4% ($= 0.0303 \times 0.1 \times 1.312 \times 100$) higher GDP per worker growth.

We examine reform's effects on productivity through two approaches. In Column (2), we add physical capital growth as a control variable to isolate the impacts of policy innovation and adoption on TFP. The results show that reforms with higher bottom-up component, whether through innovation or adoption, have significantly larger positive effects on subsequent productivity growth. We observe that the estimated effect is statistically smaller for reform followers compared to reform pioneers, indicating that the benefits of bottom-up reforms diminish as they diffuse.[20] This pattern aligns with expectations in an innovation-diffusion process driven by bottom-up forces: regions with higher potential returns are more likely to initiate reforms, as they are better positioned to overcome substantial fixed costs and political risks. As reforms spread geographically, they eventually reach regions where the suitability for such changes is weaker, resulting in smaller observed policy returns.

In Column (3), we further validate our findings by using an alternative measure of productivity–the Solow residual–as the dependent variable. The consistent results confirm the differential impacts of bottom-up reforms on TFP growth.

Lastly, Column (4) investigates the impact on the investment rate. While reform policy innovation generally increases investment, this positive effect diminishes significantly with higher bottom-up components. Our estimates suggest that in a province where 10% of the population experiences a reform policy innovation with a *Bottom-Up Index$_q$* $= 1$, the investment rate increases by merely 0.25%, a change statistically indistinguishable from zero. Consistent with the findings in Table 4, reform diffusion appears to lower the investment rate, with this effect remaining homogeneous across reforms regardless of their bottom-up components.

Combined with the results in Columns (1) through (3), this finding suggests that bottom-up reforms drive GDP growth mainly through the channel of TFP growth. In contrast, the growth effect of centrally-sponsored policies is more driven by the increase in the investment

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[20]When 10% of a province's population is exposed to a reform policy innovation with a *Bottom-Up Index$_q$* $= 1$, the predicted productivity growth is 0.92% (calculated as $(0.0267 \times 0.1 + 0.0654 \times 0.1 \times 1) \times 100$). In contrast, when the same province acts as a policy adopter, the corresponding productivity growth is only 0.38% (calculated as $(0.0175 \times 0.1 + 0.0201 \times 0.1 \times 1) \times 100$).

Table 5: Reform Policy Innovation, Adoption, and Economic Growth: 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)	$\Delta Investment$ $Rate_{p\tau}$ (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×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

Notes: Province baseline characteristics include: log employment in 1978, log GDP per capita in 1978, log capital per capita in 1978, a dummy indicating whether the province is in the coastal area, and a dummy variable indicating whether the province is a municipality. Robust standard errors are clustered at the province level. *** p<0.01, ** p<0.05, * p<0.1

rate Columns (4). This constrast demonstrates that bottom-up and centrally-sponsored reforms may have markedly different implications for growth experiences in China during the period under study.

5.2 Structural Transformation: County-Level Evidence

Conceptually, productivity and income growth can drive structural transformation through various channels. Firstly, positive shocks to agricultural productivity act as "push factors," freeing up labor from agriculture. Secondly, positive shocks to non-agricultural productivity serve as "pull factors," inducing a shift of labor from the agricultural to the non-agricultural sector. Thirdly, given nonhomothetic preferences, a positive income effect may raise the relative demand for non-agricultural goods to agricultural goods, reinforcing the reallocation of workers towards non-agricultural sector. To corroborate the findings on the growth-enhancing effects of reform policy innovation and diffusion from the previous province-level analysis, this subsection examines the impact on structural transformation across counties, which serves as a proxy for local productivity and income growth.

To this end, we employ the county-level data from the population censuses and estimate a

stacked first-difference model that relates the change in log agricultural employment share over three periods 1982-1990, 1990-2000, and 2000-2005, to reform policy innovations and adoptions over respective one-year lagged period:[21]

$$\Delta \ln Share\ Agri_{i\tau} = \alpha Policy\ Innovator_{i\tau} + \beta Policy\ Follower_{i\tau} + X'_{i0}\gamma_{\tau} + D_{p\tau} + u_{i\tau}, \quad (7)$$

where $Policy\ Innovator_{i\tau}$ and $Policy\ Follower_{i\tau}$ represent the number of reform policy innovations and adoptions by county i in the one-year lagged period of τ. Specifically,

$$Policy\ Innovator_{i\tau} = \sum_{q} Innovation_{i,q,\tau} \quad and \quad Policy\ Follower_{i\tau} = \sum_{q} Adoption_{i,q,\tau}. \quad (8)$$

Additionally, we control for the time-varying effects of county-specific baseline characteristics X_{i0}, including the share of population with college education or above, the share with middle-school education, the share of employment in agricultural and industrial sectors, log population, log agricultural and industrial output per capita, and log distance to the railway network. $D_{p\tau}$ represents the province-period fixed effects. Standard errors are clustered at the province level.

Furthermore, we extend the model to investigate the differential impacts driven by bottom-up forces by incorporating additional explanatory variables into Equation (7):

$$\begin{aligned} Bottom\text{-}Up\ Policy\ Innovator_{i\tau} &= \sum_{q} Bottom\text{-}Up\ Index_{q} \times Innovation_{i,q,\tau}, \\ Bottom\text{-}Up\ Policy\ Follower_{i\tau} &= \sum_{q} Bottom\text{-}Up\ Index_{q} \times Adoption_{i,q,\tau}. \end{aligned} \quad (9)$$

The estimation results are reported in Table 6. Column (1) shows that counties with more reform policy innovations experience faster declines in agricultural employment share, consistent with Table 4's finding that policy innovation positively correlates with GDP and TFP growth. Column (2) reveals that structural transformation accelerates even faster when innovations involve policies with stronger bottom-up components. As a robustness check, in Columns (3) and (4), we exclude the data from 2005, where the agricultural employment share is imputed and may be subject to inaccuracies. The estimation results remain consistent.

While adopting reform policies as followers appears to slow structural transformation, as shown in Columns (1) and (2), this effect is smaller in magnitude and not always statistically significant, as demonstrated in Columns (3) and (4).

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[21]Using the population census data in 2000 and 2010, we impute the agricultural employment share in 2005 by averaging the shares observed for these two census years. We also rescale the variables to ensure that the data across the three periods are on a comparable decadal scale. Given the controls for period fixed effects, the rescaling has minimal impact on the estimates of interest.

Table 6: Reform Policy Innovation, Adoption, and Structural Change

Dependent Variable: $\Delta \ln Share\, Agri_{i\tau}$	(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)
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
Observations	6,806	6,806	4,539	4,539
R-squared	0.2872	0.2879	0.1798	0.1814

Notes: Columns (1)-(2) stack the first differences for three periods: 1982-1990, 1990-2000, and 2000-2005, while Columns (3)-(4) stack the first differences for two periods: 1982-1990 and 1990-2000. The control variables for baseline county characteristics include the share of the population with college education or above, the share of the population with middle-school education, the share of employment in the agricultural sector, the share of employment in the industrial sector, log population, log agricultural and industrial output per capita, and log distance to the railway network. Robust standard errors are clustered at the province level. *** p<0.01, ** p<0.05, * p<0.1

5.3 Firm Entry: Prefecture-Level Evidence

Having studied the role of bottom up reform on the structural changes in the rural sector, we now turn to another crucial dimension of China's economic transformation: the rapid growth of new firms in the urban sector. The surge in firm creation was driven by several factors, with reforms reducing entry barriers and measures enhancing potential returns playing particularly important roles. This massive entry of new firms contributed significantly to total factor productivity growth through two channels. First, new entrants typically demonstrated above-average productivity levels and growth rates. Second, the exit of inefficient incumbent firms enabled more productive resource reallocation. The magnitude of this effect was substantial – according to Brandt et al. (2011), net entry accounted for over two-thirds of manufacturing TFP growth during 1998-2007. In this section, we examine how bottom-up reform innovations shaped firm entry using prefecture-level firm registry data.

For this purpose, we construct a prefecture-level panel data. As with the province-level analysis, each period spans three years, covering the intervals from 1981 to 2004. Specifically, firm entries of prefecture j of over the periods 1981-1983, 1984-1986, ..., 2001-2004 are linked to policy innovation and adoption of in the same prefecture in the one-year lagged periods of

1980-1982, 1983-1986, ..., 2000-2003. The measures of prefecture-level policy innovation and adoption are analogous to the county-level measures in equations (8). We then estimate the Poisson MLE model as follows:

$$Entries\ per\ Capita_{j\tau} = \exp\left(\alpha Policy\ Innovator_{j\tau} + \beta Policy\ Follower_{j\tau} + X'_{j0}\delta + D_{p\tau}\right) u_{jt}. \tag{10}$$

The estimated results are presented in Table 7. Column (1) shows that both reform policy innovation and adoption encourage private firm entry per capita, though the effect of policy adoption is significantly smaller in magnitude. Column (2) explores heterogeneity in bottom-up intensities by extending model (10) with two additional explanatory variables: $Bottom$-$Up\ Policy\ Innovator_{j\tau}$ and $Bottom$-$Up\ Policy\ Follower_{j\tau}$. These variables are constructed analogously to the county-level measures in equation (9). The estimates indicate that reform policies with higher bottom-up intensity, whether through innovation or diffusion, lead to more private firm entries. Column (3) further controls for prefecture fixed effects, effectively accounting for prefecture-specific linear time trends in firm entry. The results remain qualitatively similar under this more stringent specification, though the estimates are smaller in magnitude.

Columns (4)-(6) repeat the analyses using the number of state-owned enterprises (SOEs) and collectively-owned enterprises (COEs) entries per capita as the dependent variable. In contrast to the patterns observed for private firms, bottom-up policy innovations tend to discourage the entry of SOEs and COEs.

These findings, together with those in Tables 4 and 5, suggest that institutional reforms, especially those driven by bottom-up forces, are associated with more efficient entrants capturing a larger share of the market, consequently increasing aggregate productivity.

5.4 Discussion and Robustness

Drawing on diverse yet related outcomes and data variations at different levels, our findings in Sections 5.1-5.3 paint a consistent picture: China's productivity growth during the reform period is closely linked to key reform policy innovations and their diffusion, particularly those driven by bottom-up forces.

5.4.1 Mechanisms

Although our regression analyses incorporate a comprehensive set of fixed effects and time-varying effects of regional initial characteristics, concerns about reverse causality may persist. Specifically, regions experiencing faster growth might have both stronger demand for economic

Table 7: Reform Policy 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

Notes: Poisson MLE models are used to estimate regressions across all columns. In Columns (1)-(3), the dependent variable is the number of domestic and foreign private firm entries per capita during period τ in prefecture j. In Columns (4)-(6), the dependent variable is the number of state-owned enterprise (SOE) and collectively-owned enterprise (COE) entries per capita during period τ in prefecture j. The control variables for baseline prefecture characteristics include the share of the population with college education or above, the share of the population with middle-school education, the share of employment in the agricultural sector, the share of employment in the industrial sector, log population, log agricultural and industrial output per capita, and log distance to the railway network. Robust standard errors are clustered at the province level. *** p<0.01, ** p<0.05, * p<0.1

reforms and better capacity to initiate or participate in policy experimentation, as well as to adopt and implement new reform policies. In Appendix B.3, we conduct a series of Granger tests relating our outcomes of interest to future reform policy innovation and adoption. As shown in Tables B.4, B.6 and B.8, our baseline findings regarding GDP and TFP growth, structural change, and firm entry are not driven by region-specific pre-determined trends.

While we do not claim causal interpretation of the estimates in Tables 4 to 7, we propose several mechanisms that may account for the observed stronger growth effects of bottom-up policy innovation and diffusion.

First, unlike centrally-sponsored experiments, local governments and entrepreneurs possess informational advantages that enable them to initiate reforms better suited to address region-specific distortions, thus enhancing local productivity growth. Similarly, our findings in Section 4 indicate that counties are more likely to adopt reform policies aligned with local conditions when the diffusion process is less centralized. This alignment may explain the stronger growth effects observed from bottom-up policy diffusion.

Second, since bottom-up reforms carry higher political risks compared to centrally sponsored policy experiments, bottom-up policy innovators and early adopters tend to be those who anticipate greater benefits from institutional changes. This selection process may explain why

early adopters of bottom-up reforms achieve stronger productivity gains than later followers.

While we cannot separate these mechanisms in our study, we emphasize that bottom-up policy innovations generate an independent source of reform ideas, complementing those conceived and implemented by central policymakers. More importantly, these bottom-up innovations tend to be more effective in enhancing TFP and promoting economic growth.

5.4.2 Robustness Checks

In Appendix B.3, we perform additional robustness checks to demonstrate that the baseline findings in Sections 5.1-5.3 remain consistent across alternative measurements and specifications. In particular, we employ the alternative measures of policy innovation and adoption that are constructed based on the method combining machine learning and manual annotation. We also adopt an IV strategy that uses these alternative measures as instruments for the corresponding variables derived from the keyword matching approach. To the extent that measurement errors associated with different textual analysis methods are independent, this strategy helps to mitigate potential attenuation bias.

6   Conclusion

During China's reform period (1978-2005), the country underwent significant institutional reforms that replaced administrative planning with market mechanisms and established private property rights across most economic sectors. As noted by Xu (2011, 2022), this period's limited economic and ideological pluralism created space for bottom-up reform experiments that ultimately led to transformative institutional changes. Using a comprehensive dataset of county-level major events from local gazetteers, we analyze how key reform policies emerged and spread through varying combinations of top-down central directives and bottom-up local initiatives, and examine their differential impacts on economic growth.

These findings raise two important questions: (i) If the central government had dismissed bottom-up policy innovations, how much economic growth would have occurred during the reform period? (ii) With the recentralization of power to upper-level governments (Martinez-Bravo et al., 2022), the rise of top-down industrial policies (Zhu, 2024), and declining incentives for local governments to initiate policy experiments (Xu, 2022), the supply of bottom-up reforms has diminished over the past decade. What implications might these institutional changes have for China's recent economic slowdown? We leave these quantitative analyses to future research.

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Appendix

A Data Appendix

A.1 Missing Status of Local Gazetteers and County Characteristics

A potential concern is that some counties are not covered by our dataset, and hence the sample is not nationally representative, especially in the later years when geographic coverage is lower (Figure 1). To investigate this issue, in Figure A.1, we relate the missing status of a county in a given year to different county characteristics. Specifically, the dependent variable is an indicator that equals 1 if no event is recorded for the county in a given year, and 0 otherwise. To facilitate the interpretation, we standardize the estimates using the standard deviation of the independent variable. Most of the standardized coefficients are statistically indifferent from zero. For the significant estimates, their economic magnitude is small. For example, we find that a one standard deviation increase in the share of the population with a high school education or above is associated with at most a 2% higher likelihood that the county is missing in our data. These findings suggest that the incomplete geographic coverage is unlikely to significantly undermine the national representativeness of our data.

A.2 Keywords

In this appendix, we list the keywords selected for each policy in Table 1. The keywords are provided in Chinese, along with their English translations (sourced from ChatGPT 4.0).

– **Household Responsibility System**

- Events are flagged as 1 when the following keywords are present:
  '联产承包、包产到户、包干到户、生产责任制、定额计酬、分田到户、包群到户、大包干、联产到劳、包产到劳、小段包工、联产计酬、包产到组、联产到组、包干到组、承包&地、承包&耕、承包&田、承包&林、承包&水面、承包&塘、承包&果、承包&山、承包&牧、承包&渔、承包&畜、承包&禽、承包&树、承包&家庭、承包&农村、承包&农业、承包&农户、承包&农民、包养到户、三包一奖' (Joint production contract, household responsibility system, household contract responsibility system, production responsibility system, quota-based remuneration, allocation of land to households, group contract to households, large-scale contract system, joint production tied to labor, production contracts tied to labor, small-section contract work, joint production remuneration, production contracts to groups, joint production

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to groups, contract responsibility to groups, land contracting, cultivation contracting, field contracting, forest contracting, water surface contracting, pond contracting, orchard contracting, mountain contracting, pasture contracting, fishery contracting, livestock contracting, poultry contracting, tree contracting, household contracting, rural contracting, agricultural contracting, farmer household contracting, farmer contracting, rearing to households, three contracts and one reward)

- The above events are re-flagged as 0 in the following cases:

  - Containing the '承包责任制 or 经济责任制 or 联产计酬 (contract responsibility system, or economic responsibility system, or quota-based remuneration), excluding '农牧业 & 农业 & 农村 & 农户' ('farming and animal husbandry & agriculture & rural areas & and farmer households'), but including '企业 or 厂 or 商业' ('enterprises, or factories, or commerce')

  – Containing '纠正 or 打击' ('correction or crackdown') ;

  – Containing '安全生产" ("safety production')

– **Development of Individual Economy**

- Events are flagged as 1 when the following keywords are present:
'个体' (Individual)

– **Substitution of Profit with Taxes**

- Events are flagged as 1 when the following keywords are present:
'以税代利、利改税、利税改革、利（润）改税（收）、"利"改"税"、税&交利润&without偷税、税&缴利润&without偷税、利润制&税收制、交利&交税' (Replacing profit with tax, converting profit to tax, profit and tax reform, converting profit (earnings) to tax (revenue), replacing 'profit' with 'tax', tax & pay profit & without tax evasion, tax & remit profit & without tax evasion, profit system & tax system, paying profit & paying tax)

– **Importing Tech and Complete Sets of Euip**

- Events are flagged as 1 when the following keywords are present:
'引进&国外，引进&外国，引进&技术&外资，采用&技术&国外，采用&技术&外国，采用&技术&外资，利用&技术&国外，利用&技术&外国，利用&技术&外资，引进&设备&外资，采用&设备&国外，采用&设备&外国，购买&设备&国外，购买&设备&外国，进口&设备，进口&技术，引进&（美国、日本、德国、法国、英国、瑞士、瑞典、澳大利亚、加拿大、荷兰、丹麦、意大利、比利时、奥地利、西班牙、西德），技术&洽谈&（美国、日本、

德国、法国、英国、瑞士、瑞典、澳大利亚、加拿大、荷兰、丹麦、意大利、比利时、奥地利、西班牙、西德），技术&合同&（美国、日本、德国、法国、英国、瑞士、瑞典、澳大利亚、加拿大、荷兰、丹麦、意大利、比利时、奥地利、西班牙、西德），设备&洽谈&（美国、日本、德国、法国、英国、瑞士、瑞典、澳大利亚、加拿大、荷兰、丹麦、意大利、比利时、奥地利、西班牙、西德），设备&合同&（美国、日本、德国、法国、英国、瑞士、瑞典、澳大利亚、加拿大、荷兰、丹麦、意大利、比利时、奥地利、西班牙、西德）' (Introduction & foreign, introduction & foreign country, introduction & technology & foreign capital, adoption & technology & foreign, adoption & technology & foreign country, adoption & technology & foreign capital, utilization & technology & foreign, utilization & technology & foreign country, utilization & technology & foreign capital, introduction & equipment & foreign capital, adoption & equipment & foreign, adoption & equipment & foreign country, purchase & equipment & foreign, purchase & equipment & foreign country, import & equipment, import & technology, introduction & (USA, Japan, Germany, France, UK, Switzerland, Sweden, Australia, Canada, Netherlands, Denmark, Italy, Belgium, Austria, Spain, West Germany), technology & negotiation & (USA, Japan, Germany, France, UK, Switzerland, Sweden, Australia, Canada, Netherlands, Denmark, Italy, Belgium, Austria, Spain, West Germany), technology & contract & (USA, Japan, Germany, France, UK, Switzerland, Sweden, Australia, Canada, Netherlands, Denmark, Italy, Belgium, Austria, Spain, West Germany), equipment & negotiation & (USA, Japan, Germany, France, UK, Switzerland, Sweden, Australia, Canada, Netherlands, Denmark, Italy, Belgium, Austria, Spain, West Germany), equipment & contract & (USA, Japan, Germany, France, UK, Switzerland, Sweden, Australia, Canada, Netherlands, Denmark, Italy, Belgium, Austria, Spain, West Germany))

- The above events are re-flagged as 0 in the following cases:

  - Containing '牛、猪、羊、兔、鸡、鸭、品种、鱼、种植、树、菜、种子、胚、种子、饲养、良种、培育、试种、优良' (Cow, pig, sheep, rabbit, chicken, duck, breed, fish, planting, tree, vegetable, seed, embryo, breeding, good breed, cultivation, trial planting, high-quality)

– **Developing Township and Village Enterprises**

- Events are flagged as 1 when the following keywords are present:
'镇企业、乡镇企业、社队企业、乡镇集体企业、乡镇集体工业、乡镇办企业、乡镇工业、村办企业、乡村企业、乡镇&社队、户办企业、联户办&企业、乡镇属企业、乡镇街道企业、乡办企业、"乡镇、街道企业"、"乡镇、区街企业"、乡镇股份制、乡镇集体股份制、乡镇承办企业、乡镇集体、镇村企业、"乡镇、县属企业"、乡镇办的&厂、乡镇办的&企业、乡镇所属&企

业、乡镇重点企业、乡镇骨干企业、乡镇"明星企业"、乡企' (Town enterprise, township enterprise, commune and brigade enterprise, township collective enterprise, township collective industry, township-run enterprise, township industry, village-run enterprise, rural enterprise, township & commune, household-run enterprise, joint household-run & enterprise, township-affiliated enterprise, township street enterprise, township-run enterprise (xiangban qiye), "township, street enterprise", "township, district street enterprise", township shareholding system, township collective shareholding system, township-run enterprise (xiangzhen chengban qiye), township collective, town and village enterprise, "township, county-affiliated enterprise", township-run & factory, township-run & enterprise, township-affiliated & enterprise, key township enterprise, backbone township enterprise, township "star enterprise", township enterprise)

– **Rural Financial Reform**

- Events are flagged as 1 when the following keywords are present:
  '信用社&浮动、信用社&自负盈亏、信用社&改革、信用社&民主、信用社&民办、信用社&民间、信用社&选举、信用社&入股、信用社&扩股、信用社&成立、信用社&承包经营、信用社&经营承包、信用&联合社、信用&合作社、信用&联社、农村&金融改革、农村金融&改革、信用合作、合作基金会、民间信用、民间借贷' (Credit union & floating, credit union & self-financing, credit union & reform, credit union & democratic, credit union & private, credit union & non-governmental, credit union & election, credit union & shareholding, credit union & expanding shares, credit union & establishment, credit union & contracted management, credit union & management contract, credit & joint cooperative, credit & cooperative, credit & cooperative association, rural & financial reform, rural financial & reform, credit cooperation, cooperative foundation, non-governmental credit, private lending)

- The above events are re-flagged as 0 in the following cases:

  - Containing '城市' (City)

– **Wage System Reform**

- Events are flagged as 1 when the following keywords are present:
  '按劳分配、行政级别工资、工资制度改革、工资改革、工资浮动、浮动工资、工资分配&放开、工资分配&权、计件工资、结构工资、效益工资制、记件工资、工资&浮动&固定、工资&浮动&效益、工资&浮动&指标、奖金&挂钩、工资&挂钩、工资&浮动&试行、工资&浮动& 实行、计件付酬、按劳取酬、工资奖励、工效挂钩' (Distribution according to work, administrative level salary, salary system reform, salary reform, salary fluctuation, floating salary, salary distribution & liberalization, salary distribution & rights, piecework salary, structural

salary, benefit-based salary system, piece-rate salary, salary & fluctuation & fixed, salary & fluctuation & benefits, salary & fluctuation & indicators, bonus & linked, salary & linked, salary & fluctuation & trial, salary & fluctuation & implementation, piecework remuneration, remuneration according to work, salary rewards, work efficiency linked)

- The above events are re-flagged as 0 in the following cases:

  - Containing '公社、生产队、农村、农业、社员、包产到户、包产到组' (Commune, production team, rural, agriculture, member, household responsibility system, group responsibility system)

– **Horizontal Economic Cooperation**

- Events are flagged as 1 when the following keywords are present:
  '经济联合、联合经营、联合体、推动联合、横向联合、联合企业、横向协作' (Economic union, joint operation, union, promoting union, horizontal union, joint enterprises, horizontal cooperation)

– **Urban Credit Cooperative Development**

- Events are flagged as 1 when the following keywords are present:
  '信用合作、信用社、信用联社、信用联合社、信用中心合作社、金融服务社、金融服务部&市、市商业银行、城市合作银行' (Credit cooperation, credit union, credit cooperative association, credit joint cooperative, credit center cooperative, financial service cooperative, financial service department & city, city commercial bank, urban cooperative bank)

- The above events are re-flagged as 0 in the following cases:

  - Containing '农村、农行、农业银行、农民、农业' (Rural, Agricultural Bank, Agricultural Bank of China, farmer, agriculture)

– **SOE Managerial Responsibility Contract**

- Events are flagged as 1 when the following keywords are present:
  '经济责任制&企业、经济责任制&公司、经济责任制&厂、经济责任制&国有、经济责任制&国营、经济责任制&系统、经济责任制&工业、经济责任制&财贸、经济责任制&商业、经济责任制&服务、经济责任制&工交、经济责任制&行业、承包&企业、承包&公司、承包&厂、承包&国有、承包&国营、承包&系统、承包&工业、承包&财贸、承包&商业、承包&服务、承包&工交、承包&行业、利润包干&企业、利润包干&公司、利润包干&厂、利润包干&国有、利润包干&国营、利润包干&系统、利润包干&工业、利润包干&财贸、利润包干&商业、利润

包干&服务、利润包干&工交、利润包干&行业、租赁&企业、租赁&公司、租赁&厂、租赁&国有、租赁&国营、租赁&系统、租赁&工业、租赁&财贸、租赁&商业、租赁&服务、租赁&工交、租赁&行业、自负盈亏&企业、自负盈亏&公司、自负盈亏&厂、自负盈亏&国有、自负盈亏&国营、自负盈亏&系统、自负盈亏&工业、自负盈亏&财贸、自负盈亏&商业、自负盈亏&服务、自负盈亏&工交、自负盈亏&行业、厂长&负责制、经理&负责制、厂长&责任制、经理&责任制、自主权&扩大、利润留成、利润提留、利润&留成' (Economic responsibility system & enterprise, economic responsibility system & company, economic responsibility system & factory, economic responsibility system & state-owned, economic responsibility system & state-run, economic responsibility system & system, economic responsibility system & industry, economic responsibility system & financial trade, economic responsibility system & commerce, economic responsibility system & service, economic responsibility system & transport and communication, economic responsibility system & sector, contract & enterprise, contract & company, contract & factory, contract & state-owned, contract & state-run, contract & system, contract & industry, contract & financial trade, contract & commerce, contract & service, contract & transport and communication, contract & sector, profit contract & enterprise, profit contract & company, profit contract & factory, profit contract & state-owned, profit contract & state-run, profit contract & system, profit contract & industry, profit contract & financial trade, profit contract & commerce, profit contract & service, profit contract & transport and communication, profit contract & sector, lease & enterprise, lease & company, lease & factory, lease & state-owned, lease & state-run, lease & system, lease & industry, lease & financial trade, lease & commerce, lease & service, lease & transport and communication, lease & sector, self-financing & enterprise, self-financing & company, self-financing & factory, self-financing & state-owned, self-financing & state-run, self-financing & system, self-financing & industry, self-financing & financial trade, self-financing & commerce, self-financing & service, self-financing & transport and communication, self-financing & sector, factory director & responsibility system, manager & responsibility system, factory director & accountability system, manager & accountability system, autonomy & expansion, profit retention, profit allocation, profit & retention)

- The above events are re-flagged as 0 in the following cases:

  - Containing '企业&工业&农民、企业&工业&农村、企业&工业&公社、社队企业、乡镇企业、领导下的&厂长负责制、工程&without 负责制&without 责任制&without 自主权&without 厂长' (Enterprise & industry & farmer, enterprise & industry & rural, enterprise & industry & commune, commune and brigade enterprise, township enterprise, under the leadership & factory director responsibility system, project & without responsibility system & without accountability system & without autonomy & without factory director)

– **Urban Pension System Reform**

- Events are flagged as 1 when the following keywords are present:
  '养老保险、社会养老、养老&保险、退休&保险、养老&统筹、退休&统筹、养老&社会发放、退休&社会发放、养老&社会保障、退休&社会保障、养老金&企业、养老金&工人、养老&社会&发放、养老&银行&发放、退休&社会&发放、退休&银行&发放、养老金&发放、养老&改革、养老&制度' (Pension insurance, social pension, pension & insurance, retirement & insurance, pension & overall planning, retirement & overall planning, pension & social distribution, retirement & social distribution, pension & social security, retirement & social security, pension funds & enterprises, pension funds & workers, pension & social & distribution, pension & bank & distribution, retirement & social & distribution, retirement & bank & distribution, pension funds & distribution, pension & reform, pension & system)

- The above events are re-flagged as 0 in the following cases:

  - Containing '结扎、农村&without 企业、农民、村&干部&without 企业、兵' (Sterilisation, rural & without enterprises, farmers, village & cadres & without enterprises, soldier)

– **FDIs and SEZs**

- Events are flagged as 1 when the following keywords are present:
  '外资、三资、中外合资、中外合作、中外合营、经济开发区、技术开发区、产业开发区、中日合资、中美合资、出口特区、广东省经济特区条例、招商&外、外企&合资、外企&投资、外企&独资、外企&办企业、外企&开业、收购&外企、转让&外企、经营&外企、引资&外企、外商&合资、外商&投资、外商&独资、外商&办企业、外商&开业、收购&外商、转让&外商、经营&外商、引资&外商' (Foreign capital, joint ventures, Sino-foreign joint ventures, Sino-foreign cooperation, Sino-foreign joint operations, economic development zone, technology development zone, industrial development zone, Sino Japanese joint ventures, Sino American joint ventures, export special zone, Guangdong province special economic zone regulations, investment promotion & foreign, foreign enterprise & joint venture, foreign enterprise & investment, foreign enterprise & wholly owned, foreign enterprise & establish enterprise, foreign enterprise & commence business, acquisition & foreign enterprise, transfer & foreign enterprise, management & foreign enterprise, investment introduction & foreign enterprise, foreign investor & joint venture, foreign investor & investment, foreign investor & wholly owned, foreign investor & establish enterprise, foreign investor & commence business, acquisition & foreign investor, transfer & foreign investor, management & foreign investor, investment introduction & foreign investor.)

- The above events are re-flagged as 0 in the following cases:

- Containing '预算外' (extrabudgetary)

– Transformation of SOEs into Shareholding Companies

- Events are flagged as 1 when the following keywords are present:
'股份制&企业、股份制&公司、股份制&厂、股份制&国有、股份制&国营、股份制&城市、股份制&城镇、股份制&银行、股份制&金融、股份制&机构、股份制&商业、股份制&商店、股份&企业、股份&公司、股份&厂、股份&国有、股份&国营、股份&城市、股份&城镇、股份&银行、股份&金融、股份&机构、股份&商业、股份&商店、股票&企业、股票&公司、股票&厂、股票&国有、股票&国营、股票&城市、股票&城镇、股票&银行、股票&金融、股票&机构、股票&商业、股票&商店、入股&企业、入股&公司、入股&厂、入股&国有、入股&国营、入股&城市、入股&城镇、入股&银行、入股&金融、入股&机构、入股&商业、入股&商店、分红&企业、分红&公司、分红&厂、分红&国有、分红&国营、分红&城市、分红&城镇、分红&银行、分红&金融、分红&机构、分红&商业、分红&商店' (Shareholding system & enterprise, shareholding system & company, shareholding system & factory, shareholding system & state-owned, shareholding system & state-operated, shareholding system & city, shareholding system & town, shareholding system & bank, shareholding system & finance, shareholding system & institution, shareholding system & commerce, shareholding system & store, shares & enterprise, shares & company, shares & factory, shares & state-owned, shares & state-operated, shares & city, shares & town, shares & bank, shares & finance, shares & institution, shares & commerce, shares & store, stock & enterprise, stock & company, stock & factory, stock & state-owned, stock & state-operated, stock & city, stock & town, stock & bank, stock & finance, stock & institution, stock & commerce, stock & store, equity participation & enterprise, equity participation & company, equity participation & factory, equity participation & state-owned, equity participation & state-operated, equity participation & city, equity participation & town, equity participation & bank, equity participation & finance, equity participation & institution, equity participation & commerce, equity participation & store, dividend & enterprise, dividend & company, dividend & factory, dividend & state-owned, dividend & state-operated, dividend & city, dividend & town, dividend & bank, dividend & finance, dividend & institution, dividend & commerce, dividend & store)

- The above events are re-flagged as 0 in the following cases:

  - Containing '农民、农村、村民、农户' (Farmers, rural, villagers, rural households)

– Price Reform

- Events are flagged as 1 when the following keywords are present:
  '价&浮动、价&改革、价&放开、价&市场调节、企业&定价、价&随行就市、价&开放、自主定价、自由交易、自由&价、放开&上市交易、定价权、流通&改革、商品&市场、商品&集市、取消&粮票、停止&粮票、合同订购、合同定购、取消&猪&派购' (Price & floating, price & reform, price & liberalization, price & market regulation, enterprise & pricing, price & follow the market, price & open, independent pricing, free trade, free & price, liberalization & listing trading, pricing power, circulation & reform, commodity & market, commodity & bazaar, cancel & grain coupon, stop & grain coupon, contract purchase, contract procurement, cancel & pork & allocation)

– **Land Use System Reform**

- Events are flagged as 1 when the following keywords are present:
  '土地&拍卖、土地&转让、土地&出让、土地&估价、土地&定级、土地&评估、土地&招标、土地&无流动&可流动、土地&交易、交易&使用权、土地&有偿、土地使用制度、地价、土地增值、土地&批租' (Land & auction, land & transfer, land & conveyance, land & valuation, land & grading, land & assessment, land & bidding, land & non-transferable & transferable, land & transaction, transaction & usage rights, land & compensated, land use system, land price, land appreciation, land & leasehold)

- The above events are re-flagged as 0 in the following cases:

  - Containing '农业、农场、农民、农村、农户、公社、社员、大队、土地承包、四荒、耕地、有偿承包。以上事件必须不包含企业、城镇这些关键词。' (Agriculture, farm, farmer, rural, household, commune, member, brigade, land contracting, barren land, cultivated land, compensated contracting. The above cases must not contain the keywords enterprise and town.)
  - Containing '非法、滥用、不准、禁止' (Illegal, abuse, not allowed, prohibited)

– **Tax Sharing Reform**

- Events are flagged as 1 when the following keywords are present:
  '分税制、新税制、中央税、共享税、分级预算、分税财政、两套税务、税制改革&国家税、新&财税制、新&财税体制、国家税务局&地方税务局、国税局&地税局、"国、地税"、"国税、地税"、"地税、国税"、国地税、国税与地税、"国家、地方税"、国家税务局&成立、国家税务&成立、国税局&成立、地方税局&成立、地方税务&成立、地税局&成立、国家税务局&挂牌、国家税务&挂牌、国税局&挂牌、地方税局&挂牌、地方税务&挂牌、地税局&挂牌、国家税务局&设立、国家税务&设立、国税局&设立、地方税局&设立、地方税务&设

立、地税局&设立、国家税务局&分设、国家税务&分设、国税局&分设、地方税局&分设、地方税务&分设、地税局&分设、国家税务局&组建、国家税务&组建、国税局&组建、地方税局&组建、地方税务&组建、地税局&组建、国家税务局&建立、国家税务&建立、国税局&建立、地方税局&建立、地方税务&建立、地税局&建立、国家税务局&设、国家税务&设、国税局&设、地方税局&设、地方税务&设、地税局&设、税务机构&分设、国家税局&地方税局、国家税务&地方税务' (Tax division system, new tax system, central tax, shared tax, graded budget, tax-divided finance, two sets of taxes, tax reform & national tax, new & fiscal tax system, new & fiscal tax system, state administration of taxation & local taxation bureau, national tax bureau & local tax bureau, 'national, local tax', 'national tax, local tax', 'local tax, national tax', national and local tax, national tax and local tax, 'national, local tax', state administration of taxation & , state taxation & establish, national tax bureau & establish, local tax bureau & establish, local taxation & establish, local tax bureau & establish, state administration of taxation & establish separately, state taxation & establish separately, national tax bureau & establish separately, local tax bureau & establish separately, local taxation & establish separately, local tax bureau & establish separately, state administration of taxation & establish, state taxation & establish, national tax bureau & establish, local tax bureau & establish, local taxation & establish, local tax bureau & establish, state administration of taxation & split, state taxation & split, national tax bureau & split, local tax bureau & split, local taxation & split, local tax bureau & split, state administration of taxation & formation, state taxation & formation, national tax bureau & formation, local tax bureau & formation, local taxation & formation, local tax bureau & formation, state administration of taxation & establish, state taxation & establish, national tax bureau & establish, local tax bureau & establish, local taxation & establish, local tax bureau & establish, state administration of taxation & establish, state taxation & establish, national tax bureau & establish, local tax bureau & establish, local taxation & establish, local tax bureau & establish, tax authorities & split, national tax bureau & local tax bureau, state taxation & local taxation)

– **Labor Contract System**

• Events are flagged as 1 when the following keywords are present:
'劳动合同、合同工制、"合同工"制、用工制度&改革、转为合同工、转为合同制、劳动制度&改革、合同工&保险、合同制工人&保险、合同制职工&保险、合同工&养老金、合同制工人&养老金、合同制职工&养老金、合同工&试行、合同工&招、合同工&录取、合同工&录用、合同工&聘用、合同制&招、合同制&录取、合同制&聘用、改固定工、固定工改、铁饭碗、劳动法、职工合同制、工人合同制、合同制&用工、合同制&全员' (Labor contract, contract worker system, "contract worker" system, employment system & reform, converted

to contract worker, converted to contract system, labor system & reform, contract worker & insurance, contract system worker & insurance, contract system staff & insurance, contract worker & pension, contract system worker & pension, contract system staff & pension, contract worker & trial, contract worker & recruitment, contract worker & admission, contract worker & employment, contract system & recruitment, contract system & admission, contract system & employment, change to permanent worker, permanent worker change, iron rice bowl, labor law, staff contract system, worker contract system, contract system & employment, contract system & all employees)

- The above events are re-flagged as 0 in the following cases:

  - Containing '农村、粮食、农业、经济合同制、经济责任制、厂长（经理）负责制、经营责任制' (Rural, grain, agriculture, economic contract system, economic responsibility system, factory director (manager) responsibility system, management responsibility system)

– **Development of Private Economy**

- Events are flagged as 1 when the following keywords are present:
  '私营、民营、私人企业、私人经商、私人经营、私人股份制、私人&买断、私人&办&企业' (private, private sector, private enterprise, private business, private management, private joint-stock, private & buyout, private & run & enterprise)

- The above events are re-flagged as 0 in the following cases:

  - Containing '留民营' (liuminying village)

– **Privatization of SOEs**

- Events are flagged as 1 when the following keywords are present:
  '国有&出售、国有&转让、国有&放小、国有&拍卖、国有&改制&民营、国有&改制&私营、国有&出让、国有&买断、国有&民营化、国有&民营转变、国有转民营、国有&购买、国有&收购&民营、国有&成为&民营、国有&转制&民营、国有&转制&私营、国营&出售、国营&转让、国营&放小、国营&拍卖、国营&改制&民营、国营&改制&私营、国营&出让、国营&买断、国营&民营化、国营&民营转变、国营转民营、国营&购买、国营&收购&民营、国营&成为&民营、国营&转制&民营、国营&转制&私营、国有企业&卖、国有&卖&民营、国有&卖&小、国有&卖&产权、国有&收购&外企、国有&收购&外资、市属&出售、市属&转让、市属&放小、市属&拍卖、市属&改制&民营、市属&改制&私营、市属&出让、市属&买断、市属&民营化、县属&出售、县属&转让、县属&放小、县属&拍卖、县属&改制&民营、县

属&改制&私营、县属&出让、县属&买断、县属&民营化、国有&转为&私营、国营&转为&私营、转为&民营、国有民营、社有民营、公有民营、私营&改制、民营&改制、改制&私、改制&转让、改制&拍卖、国营&退出、国有&退出、转制&私营、转制&民营、改制&民营、民有民营、国有&变&民营、国有&变&私营、国营&变&民营、国营&变&私营' (State-owned & sale, state-owned & transfer, state-owned & downsizing, state-owned & auction, state-owned & restructuring & privatization, state-owned & restructuring & private, state-owned & assignment, state-owned & buyout, state-owned & privatization, state-owned & transition to private, state-owned to private, state-owned & purchase, state-owned & acquisition & private, state-owned & becoming private, state-owned & transition & private, state-owned & transition & private, state-run & sale, state-run & transfer, state-run & downsizing, state-run & auction, state-run & restructuring & privatization, state-run & restructuring & private, state-run & assignment, state-run & buyout, state-run & privatization, state-run & transition to private, state-run to private, state-run & purchase, state-run & acquisition & private, state-run & becoming private, state-run & transition & private, state-run & transition & private, state-owned enterprise & sell, state-owned & sell & private, state-owned & sell & small, state-owned & sell & property rights, state-owned & acquisition & foreign enterprise, state-owned & acquisition & foreign capital, municipal-owned & sale, municipal-owned & transfer, municipal-owned & downsizing, municipal-owned & auction, municipal-owned & restructuring & privatization, municipal-owned & restructuring & private, municipal-owned & assignment, municipal-owned & buyout, municipal-owned & privatization, county-owned & sale, county-owned & transfer, county-owned & downsizing, county-owned & auction, county-owned & restructuring & privatization, county-owned & restructuring & private, county-owned & assignment, county-owned & buyout, county-owned & privatization, state-owned & transition to private, state-run & transition to private, transition to private, state-owned private, cooperative-owned private, public-owned private, private & restructuring, private & restructuring, restructuring & private, restructuring & transfer, restructuring & auction, state-run & exit, state-owned & exit, transition & private, transition & private, restructuring & private, private-owned private, state-owned & change & private, state-owned & change & private, state-run & change & private, state-run & change & private.)

- The above events are re-flagged as 0 in the following cases:

  - containing '土地、用地、地块、房地产、房产' (land, site, plot, real estate, property)

– **Housing Reform**

  - Events are flagged as 1 when the following keywords are present:

'住房&售、住房&改革、房产&售、住宅&售、住宅商品、商品住宅、住房商品、商品住房、商品房、商品楼、公房&售、私房交易、职工购房、住房制度、售房、房地产交易、房地产开发、房地产业、房地产公司、房地产企业、房地产股份、房地产市场、房地产&售、房地产&开发、房产&信贷、房地产&贷款、购房&贷款、住房&市场化、住房&商品化、住房&商品性、住宅&商品性、公积金、安居工程、经济适用房、经济适用住房、租金&改革、租金&调整、租金&提高、租金&补贴、职工&购买&住房、房贷、按揭、房改&without改造&without改建&without改为&without改成' (Housing & sale, housing & reform, real estate & sale, residential & sale, residential commodities, commodity housing (shangpin zhuzhai), housing commodities, commodity housing (shangpin zhufang), commodity house, commodity building, public housing & sale, private house transaction, employee house purchase, housing system, house sale, real estate transaction, real estate development, real estate industry, real estate company, real estate enterprise, real estate shares, real estate market, real estate & sale, real estate & development, real estate & credit, real estate & loan, house purchase & loan, housing & marketization, housing & commodification, housing & commodity nature, residential & commodity nature, housing fund, Anju project, affordable housing, economically affordable housing, rent & reform, rent & adjustment, rent & increase, rent & subsidy, employee & purchase & housing, housing loan, mortgage, housing reform & without transformation & without reconstruction & without conversion & without change)

– Setting Up A Modern Enterprise System

- Events are flagged as 1 when the following keywords are present:
'公司制&改革、公司制&实行、现代工业制度、现代&企业制度、现代&产权制度、国家试点企业集团、国有&重组&公司、国有&改组&公司、国有&改制&公司、国有&转制&公司、国营&重组&公司、国营&改组&公司、国营&改制&公司、国营&转制&公司、国企&重组&公司、国企&改组&公司、国企&改制&公司、国企&转制&公司、产权清晰&权责明确&政企分开&管理科学、企业制度&创新、国有资产监督、国有资产管理委员会' (Company system & reform, company system & implementation, modern industrial system, modern & enterprise system, modern & property rights system, national pilot enterprise group, state-owned & restructuring & company, state-owned & reorganization & company, state-owned & reform & company, state-owned & conversion & company, state-run & restructuring & company, state-run & reorganization & company, state-run & reform & company, state-run & conversion & company, state enterprise & restructuring & company, state enterprise & reorganization & company, state enterprise & reform & company, state enterprise & conversion & company, clear property rights & defined responsibilities & separation of government and enterprise & scientific management, enterprise system & innovation, state-owned asset supervision, state-owned assets

management committee)

- The above events are re-flagged as 0 in the following cases:

  - Containing '民营、民有、私营、出售' (Private, privately-owned, privately-operated, sale)

– **Advancing Western Development**

- Events are flagged as 1 when the following keywords are present:
  '西部&大开发、西部开发' (Western development & great development, western development)

– **Hukou Reform**

- Events are flagged as 1 when the following keywords are present:
  '落户&进城、落户&进县城、农转非、自理口粮、户口&放开&价、户口&放宽、户口&蓝、户籍制度&改革、户口&非农&转、户口&城市&转、户口&城镇&转、户籍&改革、城镇户口&办理、户口&同等&待遇、城市&外来&户口、户口政策&新、户籍政策&新、暂住人口、暂住人员、暂住证' (Settle & move to city, settle & move to county town, agricultural to non-agricultural, self-managed grain ration, household registration & open & price, household registration & relaxed, household registration & blue, household registration system & reform, household registration & non-agricultural & transfer, household registration & urban & transfer, household registration & town & transfer, household registration & reform, town household registration & processing, household registration & equal treatment, city & external & household registration, household registration policy & new (hukou zhengce & xin), household registration policy & new (huji zhengce & xin), temporary population, temporary residents, temporary residence permit)

- The above events are re-flagged as 0 in the following cases:

  - Containing '知青、知识青年、平反、下放、右派、倒卖、非法、不合法、不合政策、不正、不符合、罪犯、插队、军人、清退、清理、清查、违反、违犯、党风、违纪、文化大革命、职权、土地承包、犯罪' (Educated youth, intellectual youth, rehabilitation, sent down, rightist, trafficking, illegal, unlawful, against policy, improper, non-compliant, criminal, sent to countryside, soldier, expulsion, clearance, investigation, violation, breach, party conduct, disciplinary violation, Cultural Revolution, authority, land contracting, crime)

– **Rural Tax and Fee Reform**

- Events are flagged as 1 when the following keywords are present:
'税费改革、农业税改革、取消&税&农业、取消&税&牧业、农业税&降低、农业税&下调、农业税&免征、农业税&终止、农业税&全免、农业税&免除、农业税&减免、农业税&停征、农业税&停止征收、农业税&停止&征收、农业税&改革、农业税&废止、农业税&废除、农业税&减征、农业税&试点、牧业税&降低、牧业税&下调、牧业税&免征、牧业税&终止、牧业税&全免、牧业税&免除、牧业税&减免、牧业税&停征、牧业税&停止征收、牧业税&停止&征收、牧业税&改革、牧业税&废止、牧业税&废除、牧业税&减征、牧业税&试点' (Tax and fee reform, agricultural tax reform, abolish & tax & agriculture, abolish & tax & animal husbandry, agricultural tax & reduction (nongyeshui & jiangdi), agricultural tax & decrease, agricultural tax & exemption, agricultural tax & termination, agricultural tax & full exemption, agricultural tax & waiver, agricultural tax & reduction or exemption, agricultural tax & suspension, agricultural tax & stop collection, agricultural tax & stop & collection, agricultural tax & reform, agricultural tax & abolishment, agricultural tax & repeal, agricultural tax & reduction (nongyeshui & jianzheng), agricultural tax & pilot, animal husbandry tax & reduction (muyeshui & jiangdi), animal husbandry tax & decrease, animal husbandry tax & exemption, animal husbandry tax & termination, animal husbandry tax & full exemption, animal husbandry tax & waiver, animal husbandry tax & reduction or exemption, animal husbandry tax & suspension, animal husbandry tax & stop collection, animal husbandry tax & stop & collection, animal husbandry tax & reform, animal husbandry tax & abolishment, animal husbandry tax & repeal, animal husbandry tax & reduction (muyeshui & jianzheng), animal husbandry tax & pilot)

- The above events are re-flagged as 0 in the following cases:

  - Containing '灾、贫困' (Disaster, poverty)

– **Bankruptcy Regulation**

- Events are flagged as 1 when the following keywords are present:
'破产、倒闭、濒临倒闭' (Bankruptcy, closure, on the verge of closure)

A.3 Details of Supervised Machine Learning Approach

Training sample. We construct the training sample by randomly selecting 800 counties, resulting in a subsample of 590,080 entries of local events. The key step is to label these events as either related or unrelated to the representative reforms, which will then be used to train and test our classification model.

This task is challenging due to the large number of events. To address this, we adopt a "seed-expansion" approach. We begin by using keywords to construct "seed sets" of 50 entries for each reform type within the subsample of 800 counties. These seed entries are then manually validated, and false positives are replaced to ensure each reform type has exactly 50 entries.

The expansion phase relies on using textual similarity to reduce workload and increase precision. Specifically, for each reform type, we calculate the textual similarity between each event in the "seed sets" and each event in the subsample, generating a $50 \times 590,080$ similarity matrix. For each event, we then average the similarity with the 50 seed events, resulting in a $1 \times 590,080$ matrix. The events are sorted by average similarity, and we manually identify up to 350 events that belong to each specific reform. This procedure is repeated for all 25 reforms. To construct the sample of non-reform events, we classify events that fall below the 50th percentile of the average similarity with the "seed sets" across all reform types, resulting in a total of $N = 105,890$ events.

Training. To train a classification model, we face the challenge of a highly imbalanced dataset, with significantly fewer reform events compared to non-reform events. Specifically, non-reform events are approximately 12 times more frequent than reform events. To address this, we utilize the Focal Loss function to calculate the loss value during training. This function addresses the sample imbalance problem by giving more weight (increasing the punishment intensity) to incorrectly classified samples.

The training procedure consists of two steps. First, we train a binary classification model to distinguish between reform-related events and non-reform events. Second, within the predicted reform sample, we train a multi-class model with 25 classes to further classify the events into specific reform policies.

Manual Annotation. For each reform policy, we manually review and annotate each labeled related event to exclude any remaining false positives. This step is crucial because the machine learning model can sometimes confuse events related to different policies that share similar expressions. For example, events associated with the Household Responsibility System and the SOE Managerial Responsibility Contract often use similar terms such as '承包责任制' (contract responsibility system), '经济责任制' (economic responsibility system), or '联产计酬' (quota-based remuneration).

A.4 Geographic Spread of Reforms: Additional Details

Figure A.2 illustrates the diffusion process of the Household Responsibility System (HRS) across several provinces, including Anhui, Heilongjiang, Jiangsu, Jilin, and Sichuan. Figure A.4 presents the diffusion process for all transformative economic policy reforms listed in Table 1. For all the policies under study, the diffusion processes inferred from the keyword matching approach closely resemble those derived from the approach combing machine learning techniques and manual annotation.

A.5 Identifying Events Related to Visits by PSC Members

From *A Dictionary of the CCP Central Committee Members of Various Plenums, 1921-2003* (Organization Department of the CCP and Party History Research Center of the CCP Central Committee, 2004), we obtain the name list of PSC members for each year and month. For each year and month, we search the names in our dataset on county-level major events. We label an event as related to visits by PSC members if a name appears alongside one of the following keywords: '视察、考察、检查、调研、看望、探望、莅临、亲临、指导工作、作重要讲话、作了重要讲话、作重要指示、作了重要指示' (Inspect, survey, check, research, visit, call on, be present, personally present, guide work, make an important speech, make an important speech, give important instructions, give important instructions). We also exclude the events related to visits prompted by disasters and accidents, identified by the following keywords: '灾、事故、伤、亡' (Disaster, accident, injury, death).

Some events feature multiple names of PSC members. Therefore, for each identified event, we count the number of visits based on the number of unique names mentioned. We aggregate the data to the county-year level, so the variable $NumVisit_{it}$ represents the number of visits made by PSC members to county i in year t.

Figure A.1: Missing Status and County Characteristics
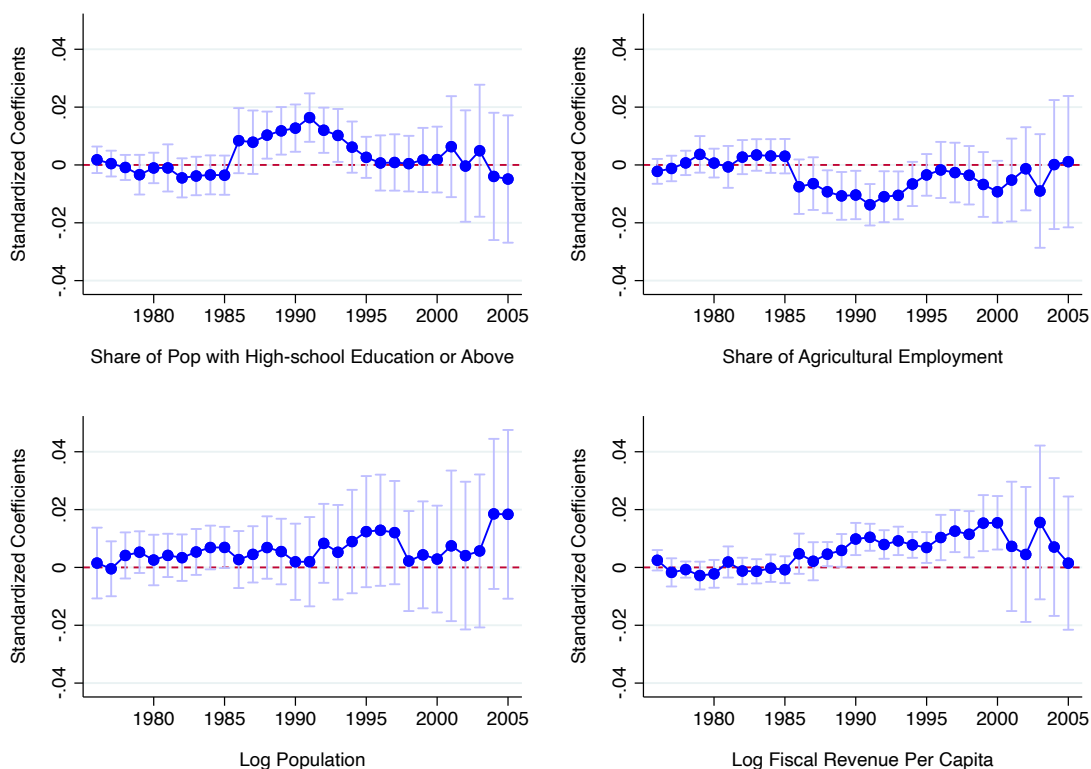
Notes: This figure reports the regression results of county missing status on various county characteristics. The regression is conducted separately for each year. The estimates are standardized by the standard deviation of the independent variable, and the vertical bars indicate the corresponding 90% confidence intervals. The measures of share of population with high-school education or above, share of agricultural employment, and population are constructed using data from the 1990 Population Census. The measure of fiscal revenue per capita is obtained from *Statistical Material for Prefectures, Cities, and Counties Nationwide* (Ministry of Finance, 1993).

Figure A.2: Share of Population Living in Counties That Have the HRS in Place
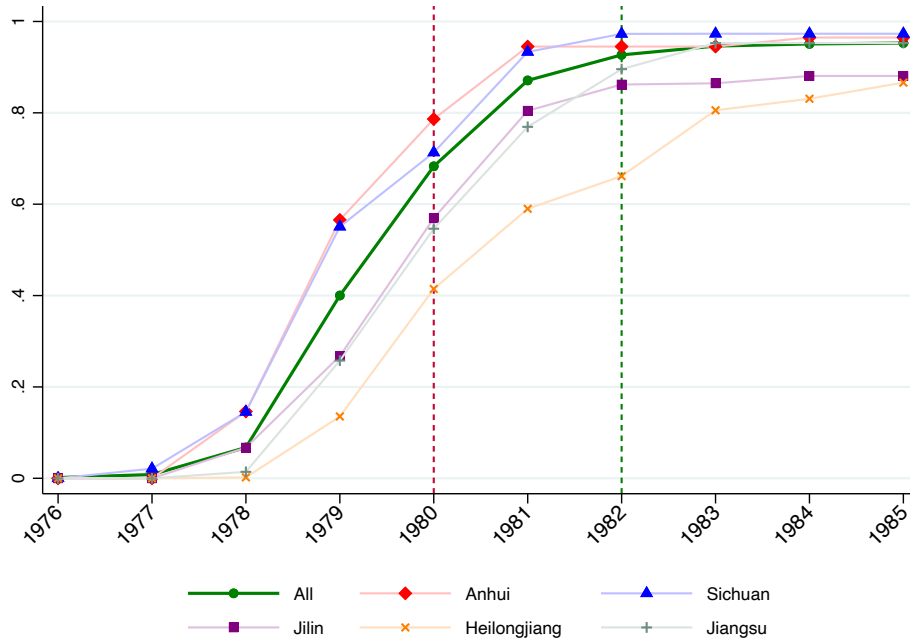
Notes: This figure presents the spread of HRS over time, captured by the share of population living counties that have adopted the policy, across different provinces—Anhui,Heilongjiang,Jiangsu,Jilin and Sichuan—as well as for China as a whole. There are two key time points: (i) the year the central government granted partial consent to experiment with the reform policy (indicated by a red dashed line), and (ii) the year the central government endorsed the reform policy for nationwide adoption (indicated by a green dashed line).

Figure A.3: Changes in Bottom-Up Reform Index Over Time
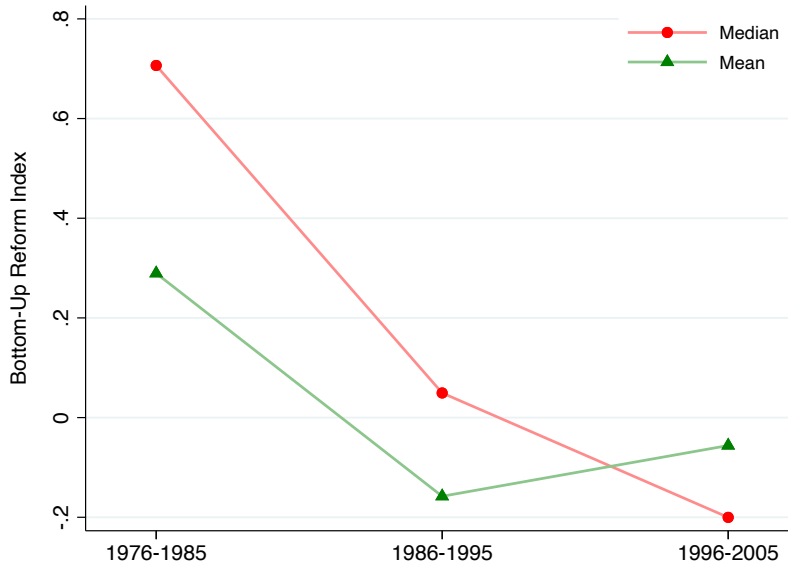
Notes: This figure shows the median and average values of the bottom-up reform index for policies endorsed during the periods 1976-1985, 1986-1995, and 1996-2005.

Figure A.4: Diffusion of Transformative Economic Reform Policies

Household Responsibility System
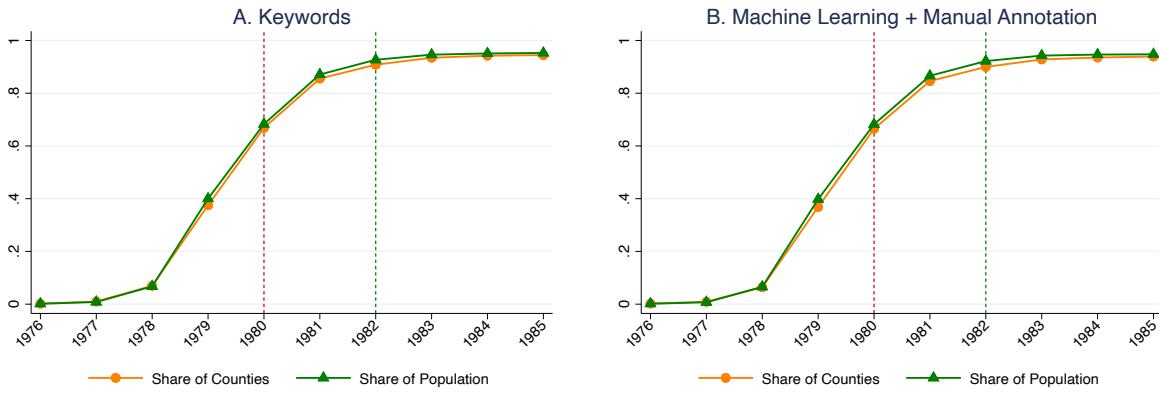
Development of Individual Economy
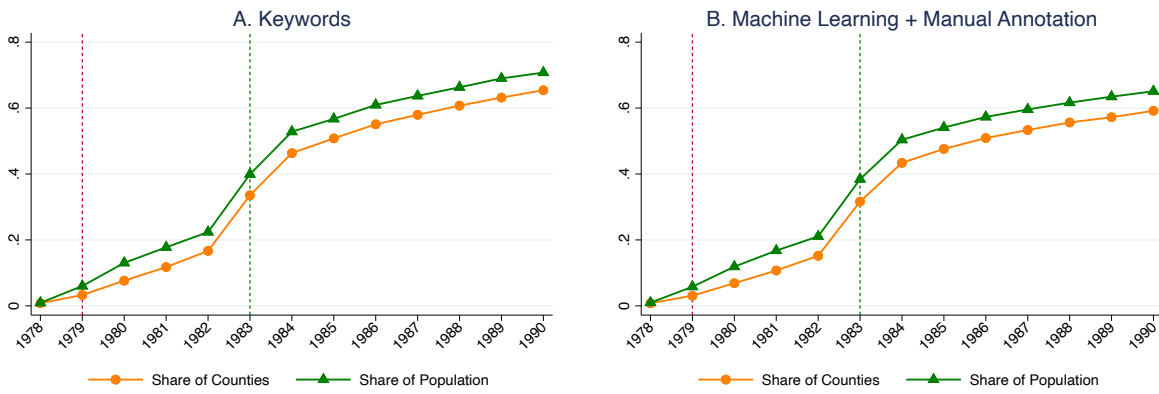
Substitution of Profit with Taxes
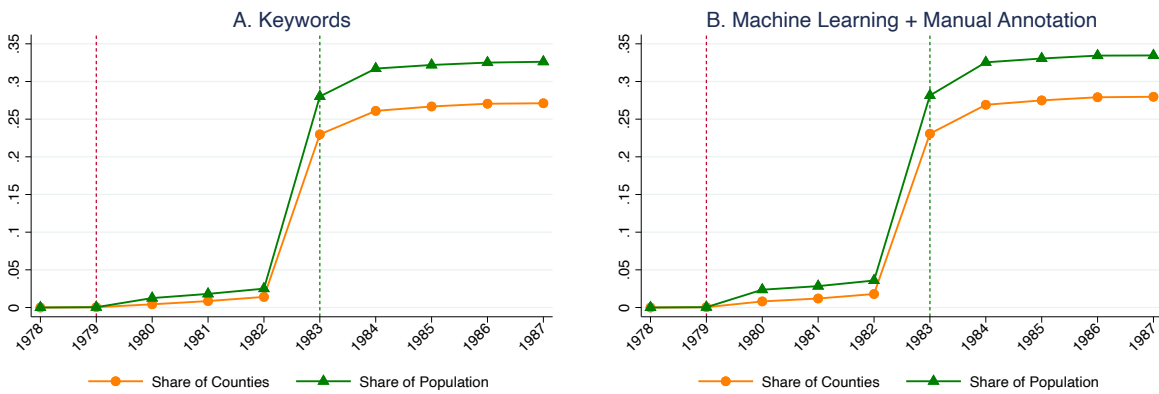
Importing Technology and Complete Sets of Equipment
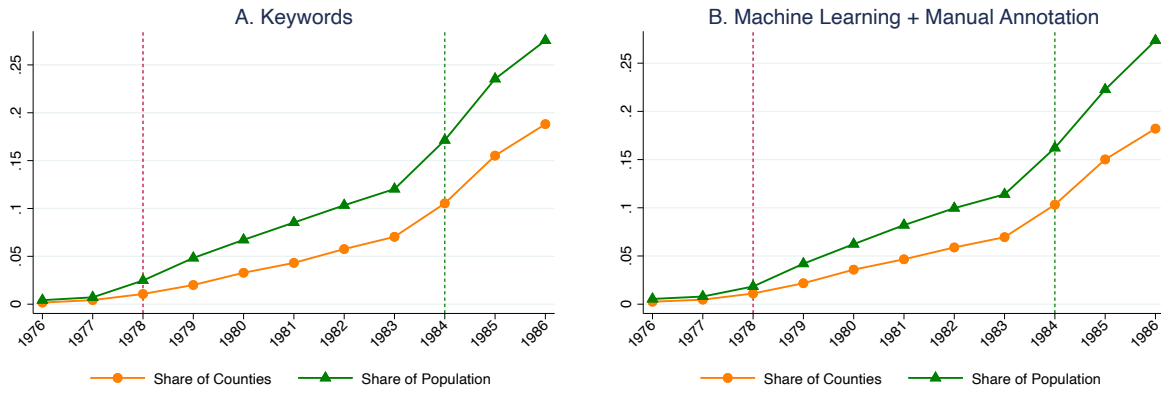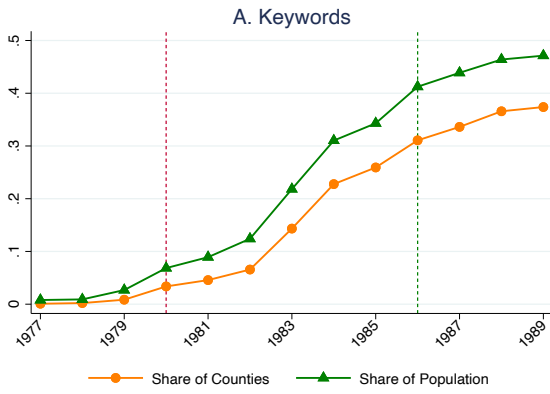

Developing Township and Village Enterprises
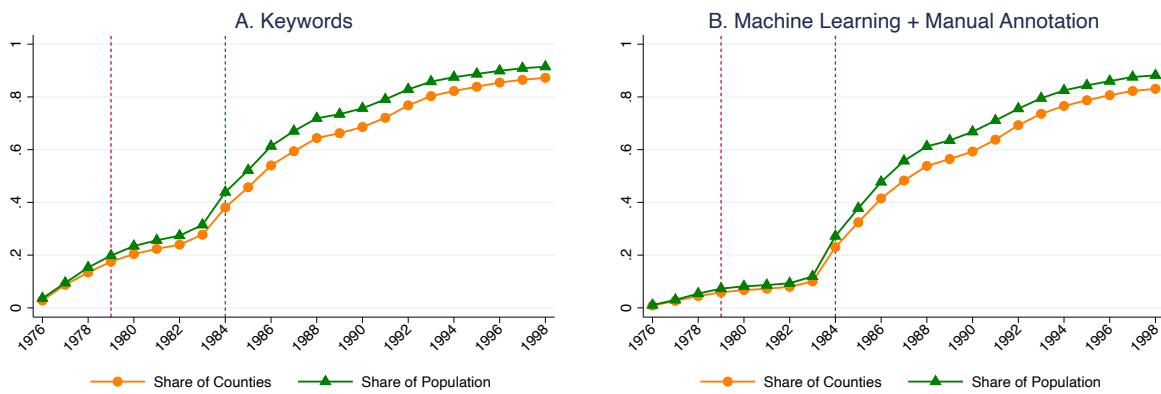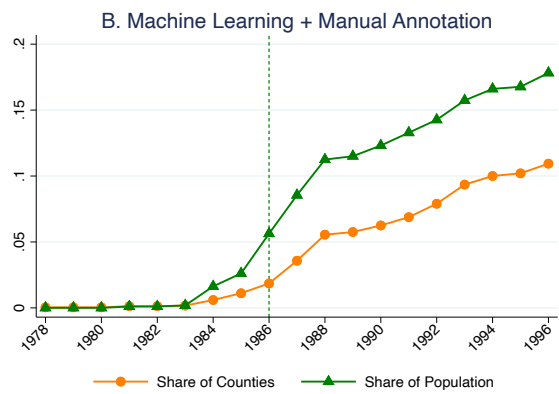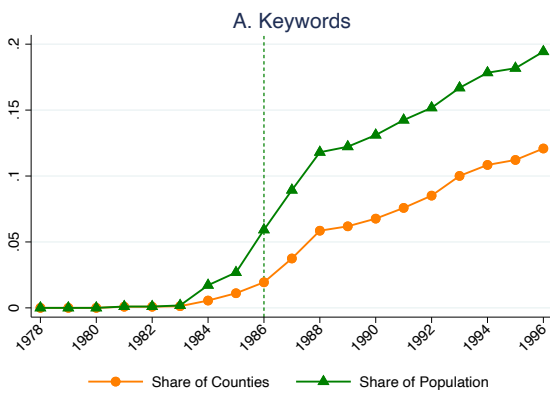

Rural Credit Coorporative Reform
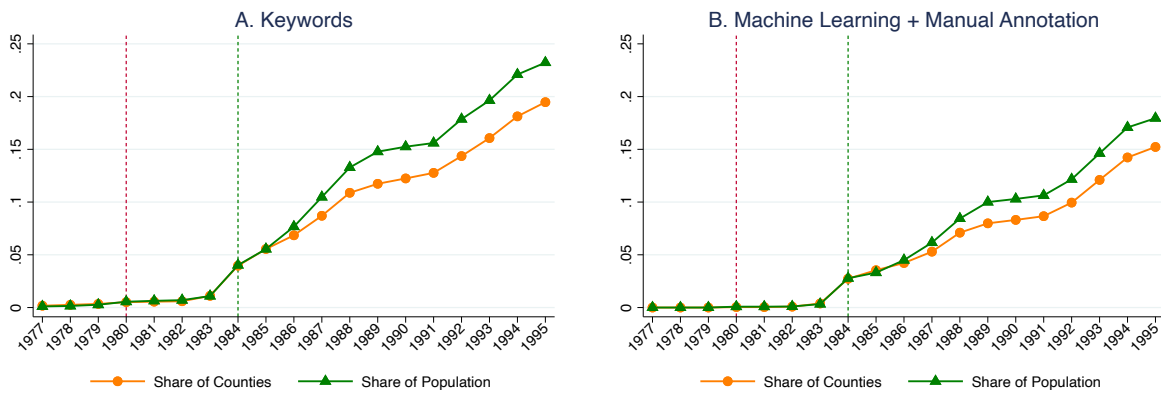
Wage System Reforms
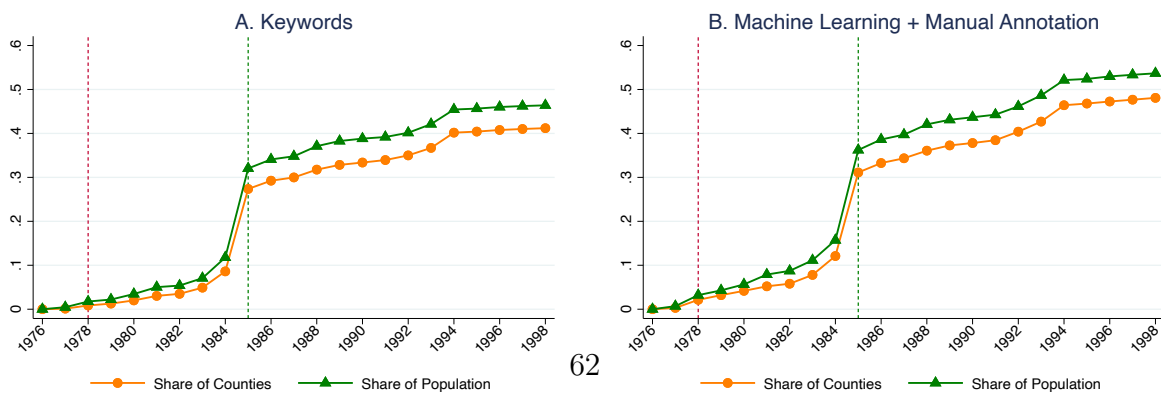
Horizontal Economic Cooperation
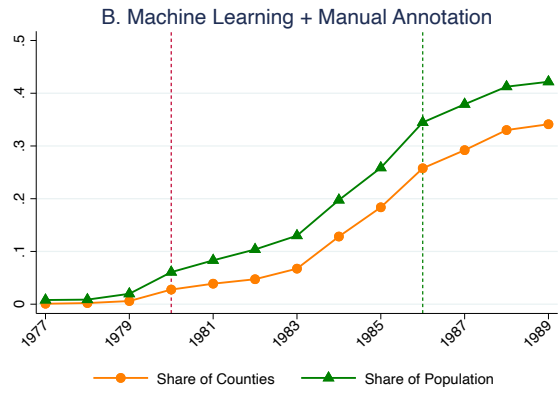
A. Keywords
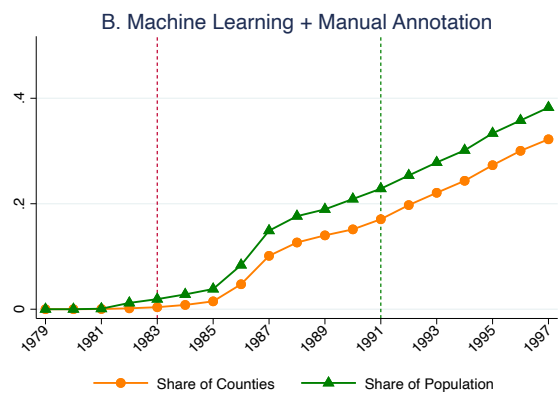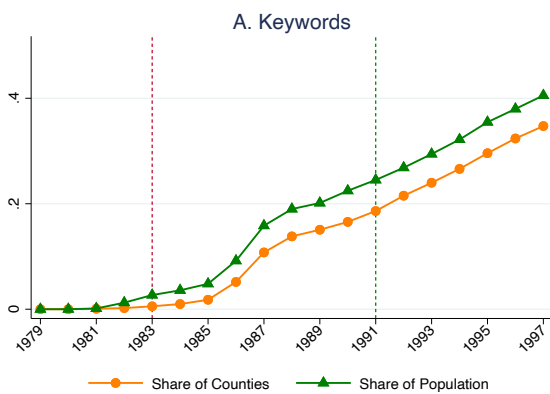
B. Machine Learning + Manual Annotation

Urban Credit Coorporative Development

A. Keywords

B. Machine Learning + Manual Annotation

SOE Managerial Responsibility Contract

A. Keywords

B. Machine Learning + Manual Annotation

Urban Pension System Reform

A. Keywords

B. Machine Learning + Manual Annotation

FDI and Special Economic Zones

A. Keywords

B. Machine Learning + Manual Annotation
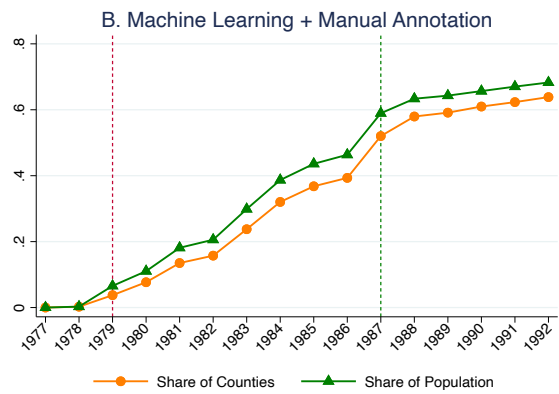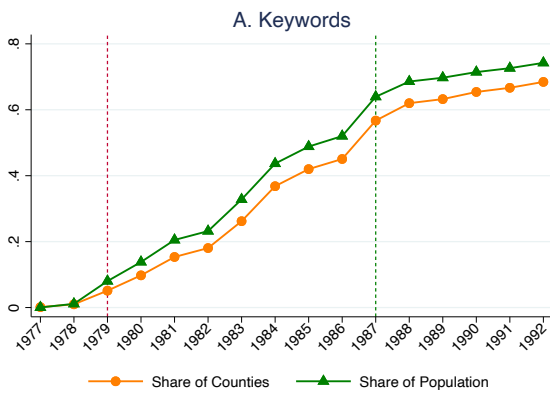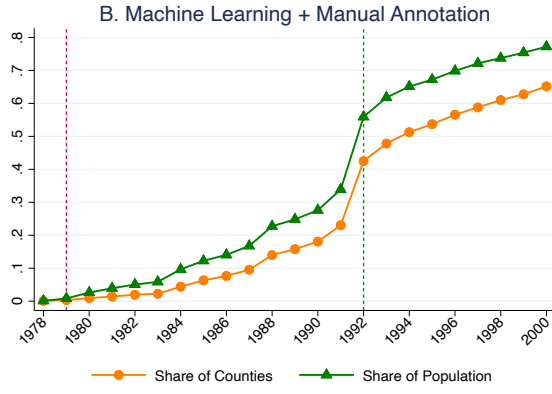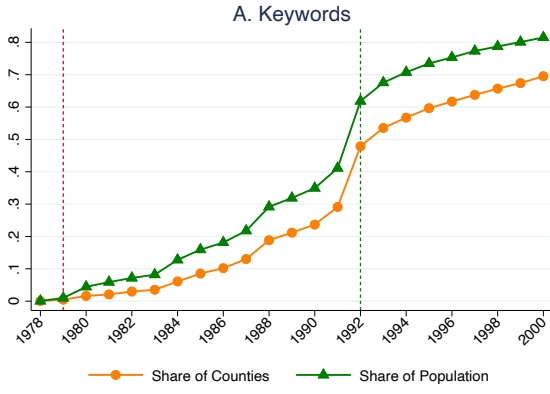
Transforming SOEs into Shareholding Companies
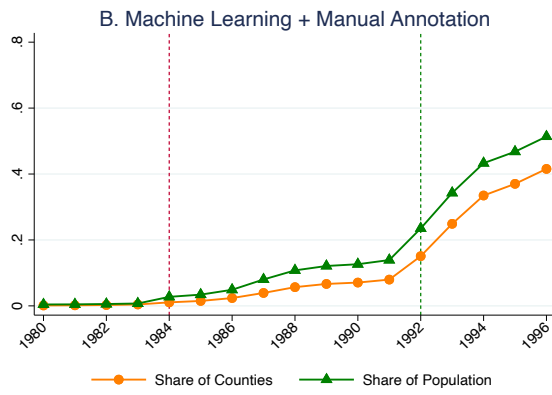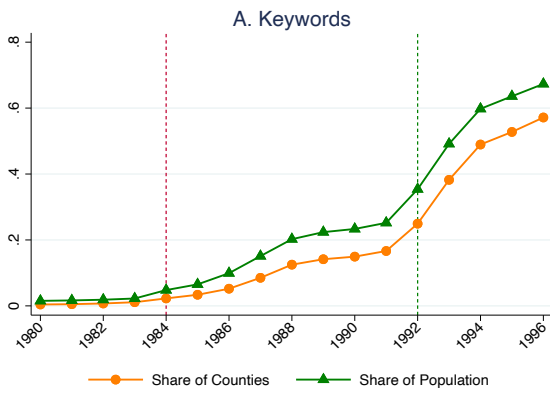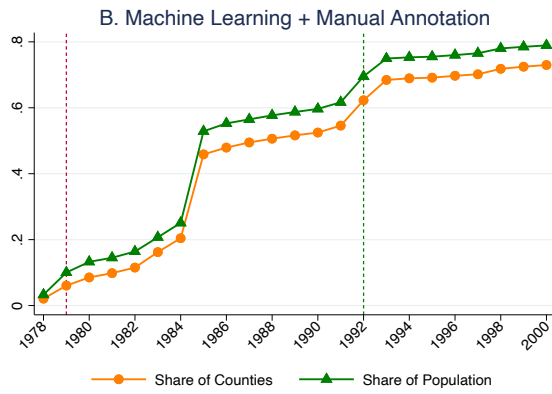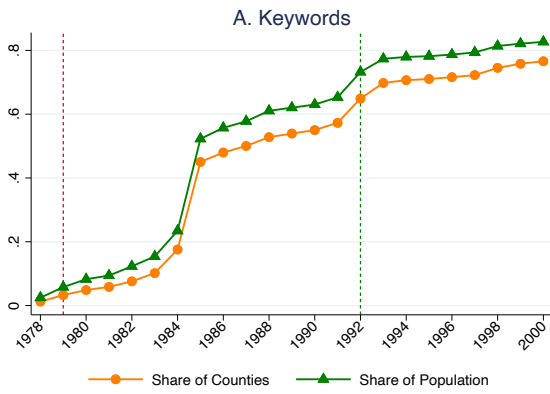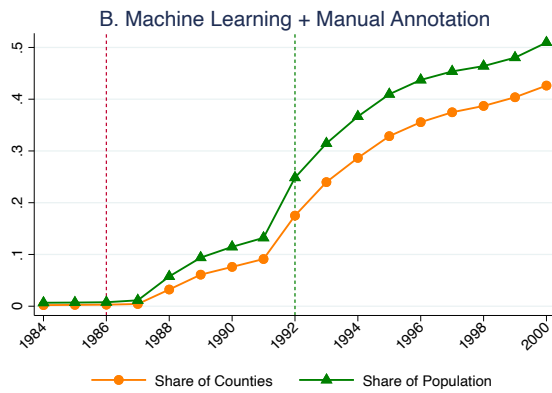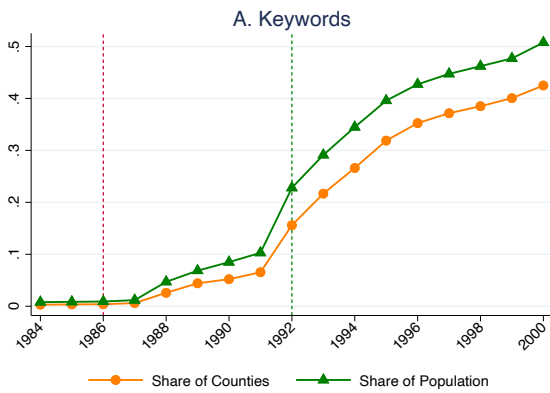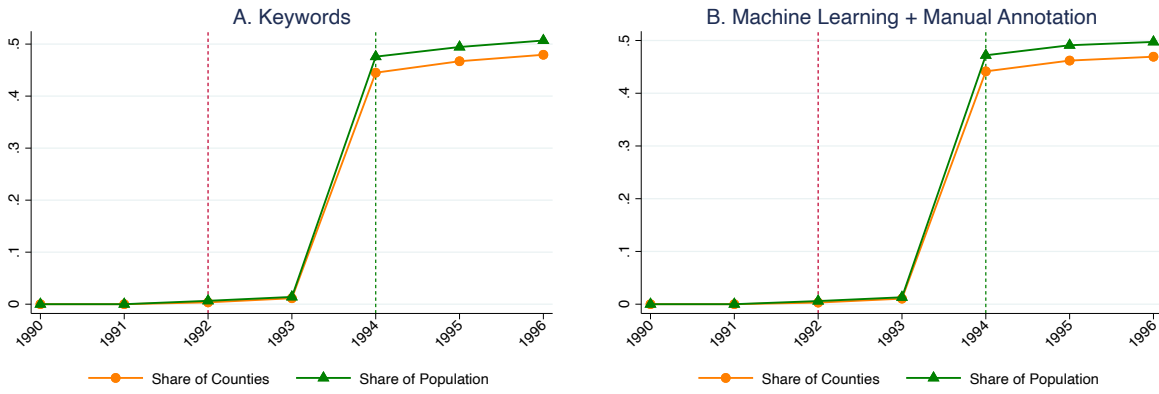
A. Keywords

B. Machine Learning + Manual Annotation

Price Reform

A. Keywords

B. Machine Learning + Manual Annotation

Land Use System Reform

A. Keywords

B. Machine Learning + Manual Annotation

Tax Sharing Reform

A. Keywords

B. Machine Learning + Manual Annotation

Labor Contract System

A. Keywords

B. Machine Learning + Manual Annotation

Development of Private Economy

A. Keywords

B. Machine Learning + Manual Annotation

Privatization of SOEs

A. Keywords

B. Machine Learning + Manual Annotation

Housing Reform

A. Keywords

B. Machine Learning + Manual Annotation

Setting Up A Modern Enterprise System

A. Keywords

B. Machine Learning + Manual Annotation

Advancing Western Development

A. Keywords

B. Machine Learning + Manual Annotation

Hukou Reform

A. Keywords

B. Machine Learning + Manual Annotation

66
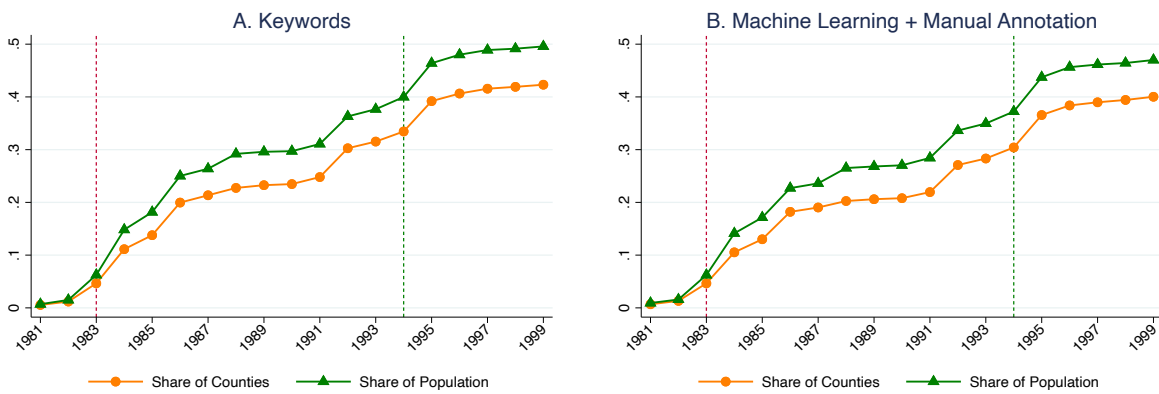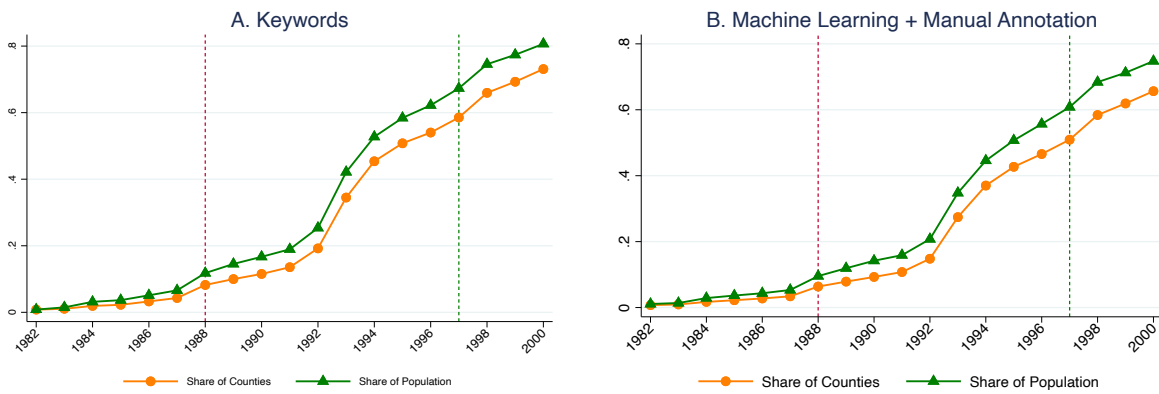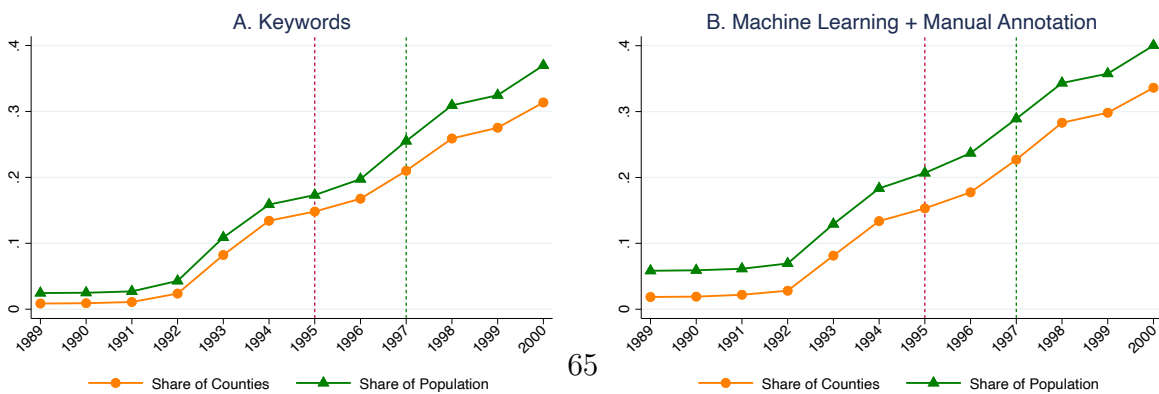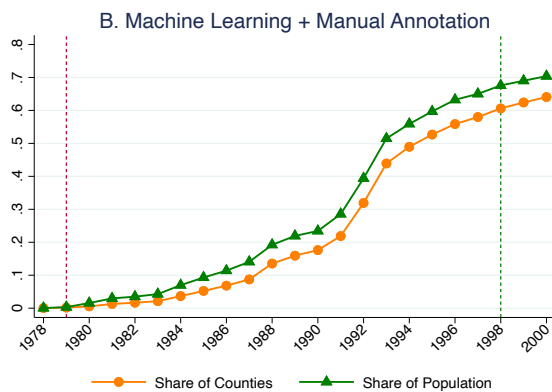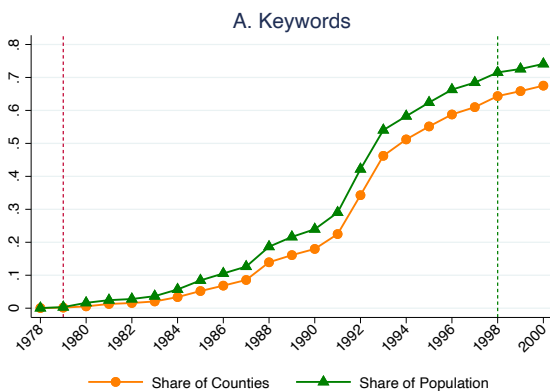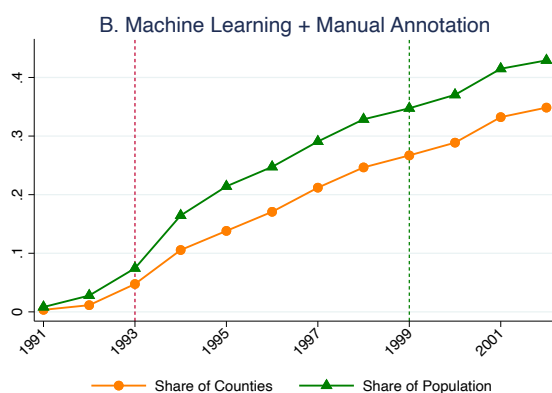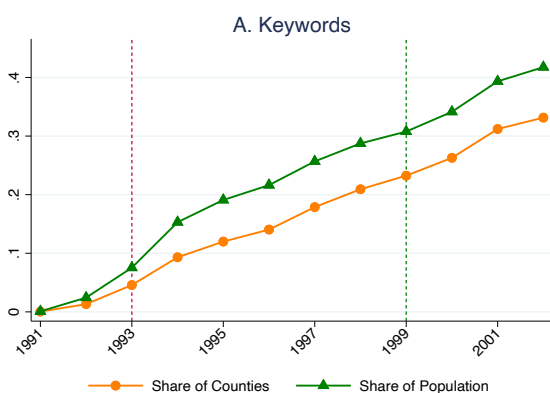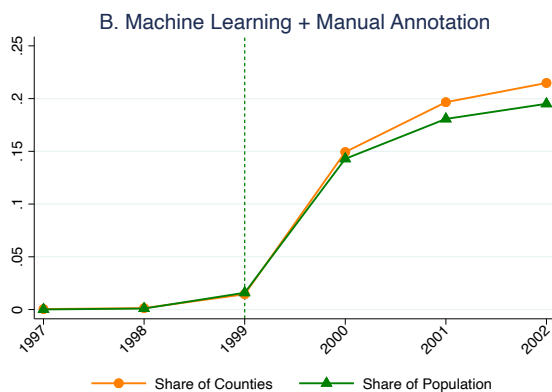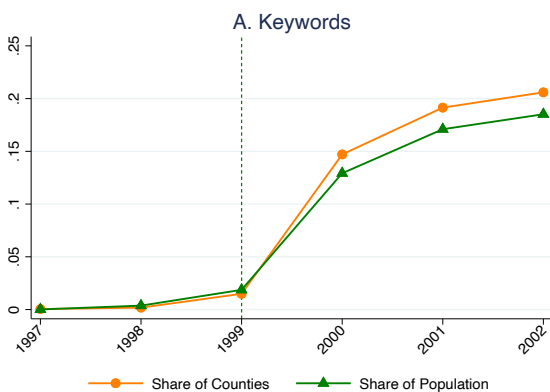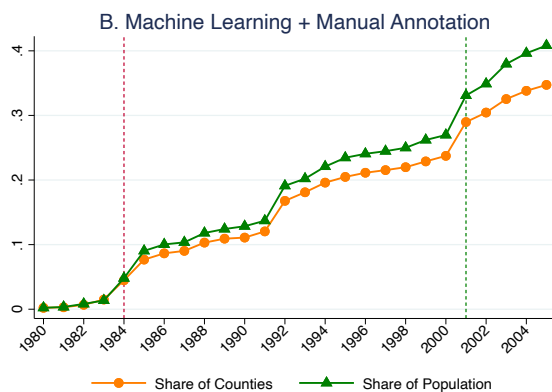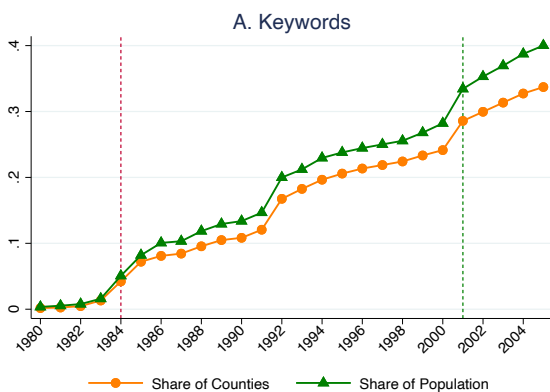
Rural Tax and Fee Reform
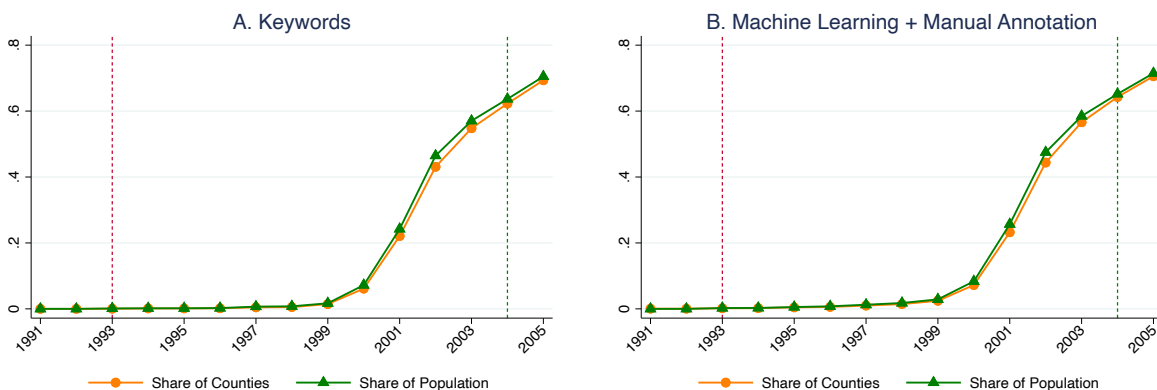
Bankruptcy Reform
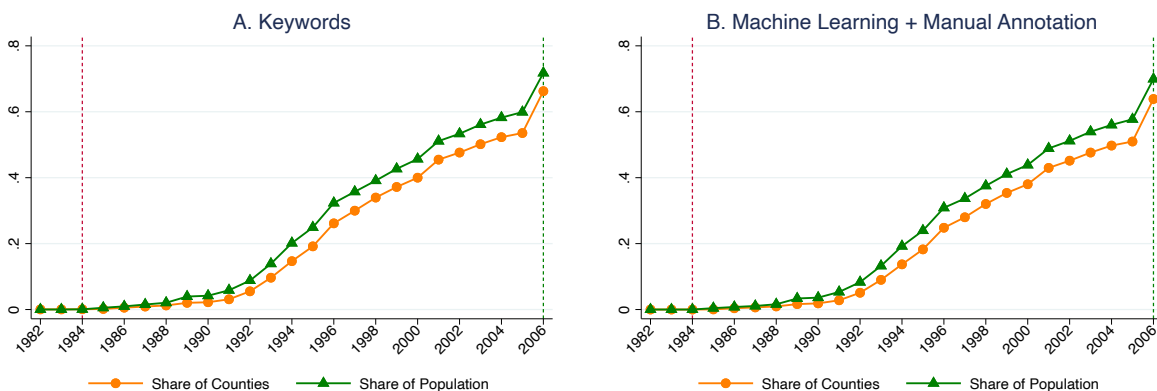
Notes: Panel A illustrates the dispersion of reform policies across counties over time using the keyword matching approach. Panel B depicts the diffusion of these policies based on the combined machine learning and manual annotation approach. For each policy, we report two key time points: (i) the year the central government granted partial consent to experiment with the reform policy (indicated by a red dashed line), and (ii) the year the central government endorsed the reform policy for nationwide adoption (indicated by a green dashed line). For two specific policies—Urban Credit Cooperative Development and Advancing Western Development—these two time points coincide. We report, for each year, the share of counties that have adopted the reform policy (indicated by a connected orange line with circles) and the share of the population living in those counties (indicated by a connected green line with triangles).

B   Additional Empirical Results

B.1   Reform Policy Innovation

In Columns (1)-(3) of Table B.1, we re-estimate the regressions from Table 2, but replace the measures of $Innovator_{i,q}$ and $Bottom\text{-}Up\ Index_q$ with their alternatives constructed using a method that combines machine learning with manual annotation.

Additionally, the measures of policy innovation and adoption from a single textual analysis approach may be prone to false positives and false negatives, resulting in measurement errors for some explanatory variables, such as $Bottom\text{-}Up\ Index_q$. To mitigate this concern, we employ alternative approaches not only to cross-validate the measures but also to design an IV strategy. This strategy addresses the attenuation bias introduced by classical measurement errors specific to each individual method, insofar as the measurement error associated with the two approaches is uncorrelated.Specifically, in Column (4), $Bottom\text{-}Up; Index_q$ is measured using the keyword matching approach, and the interaction terms are instrumented by the corresponding interaction terms with the bottom-up index constructed using the combined method of machine learning and manual annotation. In sum, our baseline results are robust to alternative measures and IV specification.

In Figure B.1, we use alternative measures of $NumInnov^{BU}i, t - \tau$ and $NumInnov^{CS}i, t - \tau$, derived from a combined approach of machine learning and manual annotation, to re-estimate equation (1). The detected patterns closely resemble those observed in Figure 6.

B.2   Reform Diffusion

Additional Heterogeneity Analysis.   In the baseline analysis, we construct the measures of reform exposure and similarity based on the set of early adopters across the country. In Column (1) of Table B.2, we replace Λ^{iqt} and $Sim^{Avg}_{i,\Omega_{q,t-1}}$ with their within-province and outside-province counterparts, and re-estimate the hazard model. Specifically,

$$\Lambda_{iqt}^{Within} = \sum_{j} \frac{(Dist_{ij})^{-1} \cdot Pop_{j0}}{\sum_{j'} (Dist_{ij'})^{-1} \cdot Pop_{j'0}} \mathbf{1}(j \in \Omega_{iq,t-1}^{Within}), \ \Lambda_{iqt}^{Outside} = \sum_{j} \frac{(Dist_{ij})^{-1} \cdot Pop_{j0}}{\sum_{j'} (Dist_{ij'})^{-1} \cdot Pop_{j'0}} \mathbf{1}(j \in \Omega_{iq,t-1}^{Outside});$$

$$Sim^{Avg,Within}_{i,\Omega_{iq,t-1}} = -\frac{1}{K} \sum_{k} \left[\frac{1}{N_{q,t-1}} \sum_{j \in \Omega_{iq,t-1}^{Within}} \left| x_{i0}^k - x_{j0}^k \right| \right], \ Sim^{Avg,Outside}_{i,\Omega_{iq,t-1}} = -\frac{1}{K} \sum_{k} \left[\frac{1}{N_{q,t-1}} \sum_{j \in \Omega_{q,t-1}^{Outside}} \left| x_{i0}^k - x_{j0}^k \right| \right].$$

Here, $\Omega_{q,t-1}^{Within}$ (respectively, $\Omega_{q,t-1}^{Outside}$) denotes the set of counties that had adopted reform q by $t - 1$ within (respectively, outside) the province that county i is located. We find that

the estimated coefficient for similarity with early adopters outside the province is significantly larger compared to that with early adopters within the province. This finding suggests that there could be common preferences across counties within the same province in policies, reducing the influence of suitability that a county might infer from other counties in the same province.

In Columns (2)-(4), we separately estimate the specification for each of the three decades in our sample, namely 1976-1985, 1986-1995, and 1996-2005. The effect of the suitability channel declines monotonically over time, yet remains significantly positive throughout the entire period. This pattern could be related to the changing attributes of the reform policies across different decades. As illustrated in Figure A.3, the median bottom-up indices are 0.729, 0.071, and -0.182 for policies endorsed during the periods 1976-1985, 1986-1995, and 1996-2005, respectively.

Robustness. In Figure B.2, we explore the heterogeneous effects of reform exposure and similarity on diffusion processes across reforms in a less parametric way. Specifically, we categorize reforms into three groups by their bottom-up index—those in the top quartile, the middle two quartiles, and the bottom quartile, and estimate equation 2 separately for each group. We observe the smallest learning effect for policies characterized by top-down forces (i.e., those in the bottom quartile) and the largest suitability effect for policies driven by bottom-up forces (i.e., those in the top quartile).

Panel A of Table B.3 assesses the robustness of the baseline results to an alternative measure of similarity. Specifically, we replace $Sim_{i,\Omega_{q,t-1}}^{Avg}$ with the measure defined as follows:

$$Sim_{i,\Omega_{q,t-1}}^{p10} = -\frac{1}{K} \sum_k \left[\underset{j \in \Omega_{q,t-1}}{10\%\text{ile}} \left(|x_{i0}^k - x_{j0}^k| \right) \right],$$

where $\underset{j \in \Omega_{q,t-1}}{10\%\text{ile}}$ refers to the 10th percentile of the absolute differences in characteristic k between county i and the counties in $\Omega_{q,t-1}$. This alternative measure captures how adoption decisions are influenced by counties that have characteristics most similar to those of county i. By concentrating on the 10th percentile of these disparities, we underscore the influence of counties that bear the most resemblance, which arguably offer the most pertinent experiences for county i. The estimated coefficient on $Sim_{i,\Omega_{q,t-1}}^{p10}$ remains positive and statistically significant, which is consistent with our previous results that similarity to early adopters increases the likelihood of a county adopting the reform. It is also significantly larger than that of the baseline measure. This is expected: the experiences shared by counties with the most similar characteristics should have a larger influence on policy adoption decisions.

In Panel B, we estimate a linear probability model instead of logit. The results are qualitatively similar to the baseline findings. Lastly, Panel C demonstrates the robustness of the

findings to alternative measures constructed based on the approach of machine learning and manual annotation.

B.3 Institutional Innovation and Economic Growth

Pre-trend Tests. Our baseline analysis in Table B.4 examines the economic growth across different provinces over the periods 1981-1983, ..., 2002-2004, in relation to their policy innovation and adoption activities during the preceding one-year periods (1980-1982, ..., 2001-2003). A potential issue is that the observed effects may be influenced by province-specific pre-existing trends in income and productivity growth that also determine the localities' policy innovation and adoption activities. To address this concern, we conduct a Granger test to assess whether economic growth is correlated with future policy shocks. Specifically, we connect the outcomes of interest from the three-year periods 1978-1980, ..., 1998-2000, to policy innovation and adoption activities during the periods 1980-1982, ..., 2001-2003. Table B.4 reports the regression results. It is reassuring that none of the estimates is statistically or economically significant, suggesting that our baseline findings is unlikely be driven by confounding trends. Columns (3)-(4) of Table B.8 implement similar pre-trend tests corresponding to the specifications in Columns (3) and (6) of Table 7, focusing on firm entry outcomes and future policy shocks at the prefecture level. The estimated coefficient for *Bottom-Up Policy Follower*$_{j\tau}$ is negative and significant, suggesting that, if anything, the pre-existing trends in private firm entry may lead us to find an opposite effect of adopting bottom-up policies.

In Table B.6, we regress the change in agricultural employment shares to over the periods 1982-1990 and 1990-2000 to policy shocks in the subsequent decades.[22] Again, none of the estimates is statistically significant, except for the estimate of *Bottom-Up Policy Follower*$_{j\tau}$ which is significantly negative. The findings suggest that the observed effect of bottom-up policy diffusion on structural change, as shown in Table 6, may be overstated.

Alternative Measurements and Specifications. Here, we perform additional robustness checks to demonstrate that the baseline results remain stable across alternative measurements and specifications. In Panel A of Tables B.5 and B.7, as well as in Table B.9, we use alternative measures of policy innovation and adoption, which are constructed using a method that combines machine learning with manual annotation. In Panel B of Tables B.5 and B.7, we adopt an IV strategy that uses these alternative measures as instruments for the corresponding variables derived from the keyword matching approach. This strategy helps mitigate potential attenuation bias due to classical measurement errors, to the extent that the errors across the

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[22]All the measures are rescaled so that they are on a comparable decadal scale.

two different textual analysis methods are independent. As anticipated, the IV estimates are larger in magnitude than the corresponding OLS estimates in Tables 5 and 6. The difference is smaller in the province-level analysis, likely because measurement errors tend to cancel out when aggregating county-level measures to the province level. Furthermore, the attenuation bias seems to be more pronounced for the estimated effect of *Bottom-Up Policy Innovator*$_{i\tau}$ in the county-level analysis. This suggests a higher incidence of false positives and negatives in identifying policy innovators at the disaggregated level, as well as additional measurement errors introduced by the bottom-up reform index in Equation (9).

Figure B.1: Reform Innovations and Visits by the Purliburo Standing Committee Members: Alternative Measures
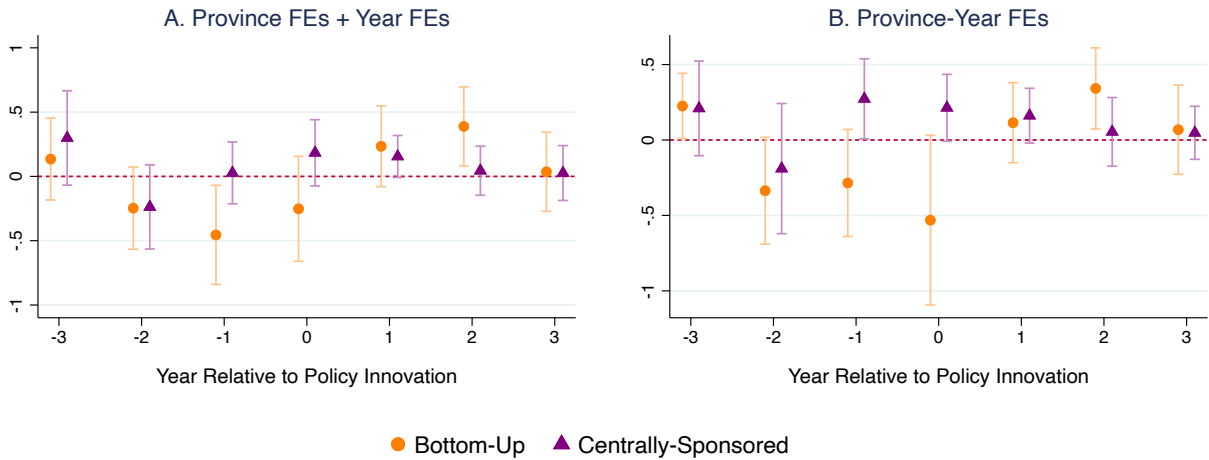
Notes: The figure plots the estimated coefficients of β^τ and γ^τ and their 90% confidence intervals for the Poisson MLE regression in (1). The specification in Panel A include the province dummies and year dummies, while that in Panel B controls for province-year dummies. For both panels, the control variables for baseline county characteristics include the share of the population with college education or above, the share of the population with middle-school education, the share of employment in the agricultural sector, the share of employment in the industrial sector, log population, log agricultural and industrial output per capita, log distance to the railway network, and an indicator variable for whether the county is located in the provincial capital. Standard errors are clustered at the province level.

Figure B.2: Spatial Diffusion of Reform Policies: Alternative Groupings
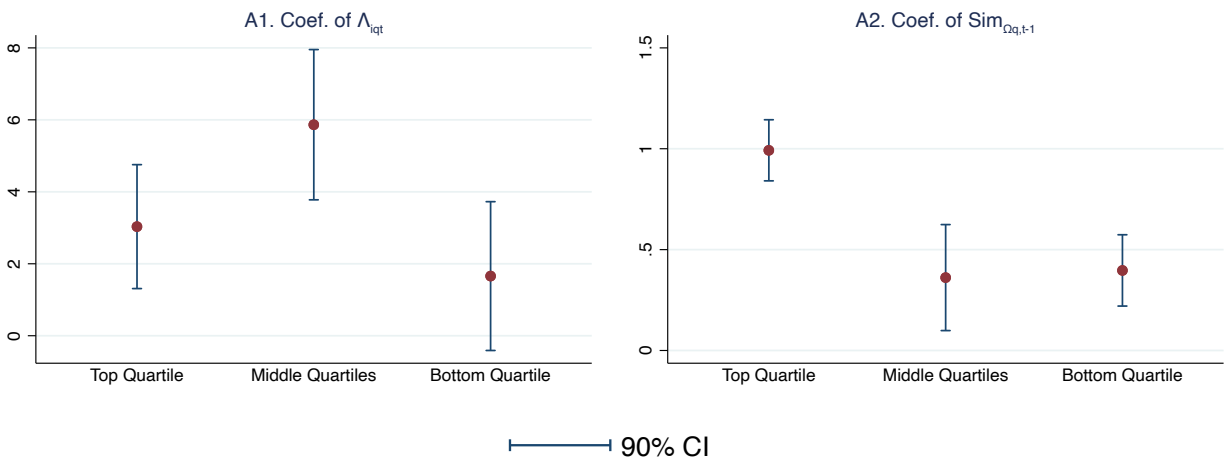
Notes: This figure presents the estimated coefficients of λ_{iqt} and $Sim_{i,\Omega_q,t-1}$ from equation (2), along with their corresponding 90% confidence intervals, for three distinct groups of reform policies: those with a bottom-up index in the top quartile, the middle two quartiles, and the bottom quartile. Standard errors are clustered at the province level.

Table B.1: 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-Up Index$_q$ × 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-Up Index$_q$ × 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-Up Index$_q$ × 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-Up Index$_q$ × 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-Up Index$_q$ × 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-Up Index$_q$ × 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-Up Index$_q$ × 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-Up Index$_q$ × 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	–

Notes: Regressions in Columns (1)-(3) employ the bottom-up index which is constructed using a method that combines machine learning with manual annotation. In Column (4), $Bottom\text{-}Up; Index_q$ is measured using the keyword approach, and the interaction terms are instrumented by the corresponding interaction terms with the bottom-up index constructed using the combined method of machine learning and manual annotation. All regressions are weighted by county population in 1982. Robust standard errors are clustered at the province level. *** p<0.01, ** p<0.05, * p<0.1

Table B.2: 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

Notes: County baseline characteristics include: share of population with college degree or above, share of population with middle- or high-school education, share of employment in the agricultural sector, share of employment in the industrial sector, log population, and log agricultural and industrial output per capita. All these measures are constructed using data from the 1982 Population Census. For each year t, the sample is restricted to counties that have not yet adopted reform q. For each reform, the estimation sample starts in the first year when at least 5 counties have adopted the reform, and concludes five years post the final endorsement of the reform by the central government. Robust standard errors are clustered at the province level. *** p<0.01, ** p<0.05, * p<0.1

Table B.3: 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)
$Bottom\text{-}Up\ Index_q \times \Lambda_{iqt}$		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)
$Bottom\text{-}Up\ Index_q \times Sim^{p10}_{i,\Omega_{q,t-1}}$		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)
$Bottom\text{-}Up\ Index_q \times \Lambda_{iqt}$		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)
$Bottom\text{-}Up\ Index_q \times Sim^{Avg}_{i,\Omega_{q,t-1}}$		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)
$Bottom\text{-}Up\ Index_q \times \Lambda_{iqt}$		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)
$Bottom\text{-}Up\ Index_q \times Sim^{Avg}_{i,\Omega_{q,t-1}}$		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

Notes: County baseline characteristics include: share of population with college degree or above, share of population with middle- or high-school education, share of employment in the agricultural sector, share of employment in the industrial sector, log population, and log agricultural and industrial output per capita. All these measures are constructed using data from the 1982 Population Census. For each year t, the sample is restricted to counties that have not yet adopted reform q. For each reform, the estimation sample starts in the first year when at least 5 counties have adopted the reform, and concludes five years post the final endorsement of the reform by the central government. Robust standard errors are clustered at the province level. *** p<0.01, ** p<0.05, * p<0.1

Table B.4: 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 $\Delta Investment$ $Rate_{p\tau}$ (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×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

Notes: In Columns (1) and (2), the dependent variables are the change in log GDP per worker during the three-year lagged period of τ in province p. In Column (3), the dependent variable is the change in log TFP during the three-year lagged period of τ in province p. In Column (4), the dependent variable is the change in investment rate during the three-year lagged period of τ in province p. Province baseline characteristics include: log employment in 1978, log GDP per capita in 1978, log capital per capita in 1978, a dummy indicating whether the province is in the coastal area, and a dummy variable indicating whether the province is a municipality. Robust standard errors are clustered at the province level. *** p<0.01, ** p<0.05, * p<0.1

Table B.5: 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)	$\Delta Investment$ $Rate_{p\tau}$ (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×Period	Y	Y	Y	Y
Province	Y	Y	Y	Y
Year	Y	Y	Y	Y

Notes: Panel A employs the measures of *Policy Innovator$_{p\tau}$*, *Bottom-Up Policy Innovator$_{p\tau}$*, *Policy Follower$_{p\tau}$*, and *Bottom-Up Policy Follower$_{p\tau}$* constructed based on the method combining machine learning and manual annotation. Panel B uses these these measures as IVs for the corresponding variables derived from the keyword matching approach. Province baseline characteristics include: log employment in 1978, log GDP per capita in 1978, log capital per capita in 1978, a dummy indicating whether the province is in the coastal area, and a dummy variable indicating whether the province is a municipality. Robust standard errors are clustered at the province level. *** p<0.01, ** p<0.05, * p<0.1

Table B.6: 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

Notes: The regressions in the table examine the changes in the logarithm of agricultural employment share over the periods 1982-1990 and 1990-2000, respectively, in relation to the measures of policy innovation and adoption during the periods 1990-2000 and 2000-2005.The control variables for baseline county characteristics include the share of the population with college education or above, the share of the population with middle-school education, the share of employment in the agricultural sector, the share of employment in the industrial sector, log population, log agricultural and industrial output per capita, and log distance to the railway network. Robust standard errors are clustered at the province level. *** p<0.01, ** p<0.05, * p<0.1

Table B.7: 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

Notes: Panel A employs the measures of *Policy Innovator$_{i\tau}$*, *Bottom-Up Policy Innovator$_{i\tau}$*, *Policy Follower$_{i\tau}$*, and *Bottom-Up Policy Follower$_{i\tau}$* constructed based on the method combining machine learning and manual annotation. Panel B uses these these measures as IVs for the corresponding variables derived from the keyword matching approach. Columns (1)-(2) stack the first differences for three periods: 1982-1990, 1990-2000, and 2000-2005, while Columns (3)-(4) stack the first differences for two periods: 1982-1990 and 1990-2000. The control variables for baseline county characteristics include the share of the population with college education or above, the share of the population with middle-school education, the share of employment in the agricultural sector, the share of employment in the industrial sector, log population, log agricultural and industrial output per capita, and log distance to the railway network. Robust standard errors are clustered at the province level. *** p<0.01, ** p<0.05, * p<0.1

Table B.8: 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

Notes: Poisson MLE models are used to estimate regressions across all columns. In Columns (1) and (2), the dependent variables are the number of state-owned enterprise (SOE) entries and collectively-owned enterprise (COE) entries during period τ in prefecture j, respectively. In Columns (3), the dependent variable is the number of domestic and foreign private firm entries per capita during the three-year lagged period of τ in prefecture j. In Column (4), the dependent variable is the number of SOE and COE entries per capita during three-year lagged period of τ in prefecture j. The control variables for baseline prefecture characteristics include the share of the population with college education or above, the share of the population with middle-school education, the share of employment in the agricultural sector, the share of employment in the industrial sector, log population, log agricultural and industrial output per capita, and log distance to the railway network. Robust standard errors are clustered at the province level. *** p<0.01, ** p<0.05, * p<0.1

Table B.9: 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

Notes: Poisson MLE models are used to estimate regressions across all columns. In Columns (1)-(3), the dependent variable is the number of domestic and foreign private firm entries per capita during period τ in prefecture j. In Columns (4)-(6), the dependent variable is the number of state-owned enterprise (SOE) and collectively-owned enterprise (COE) entries per capita during period τ in prefecture j. The control variables for baseline prefecture characteristics include the share of the population with college education or above, the share of the population with middle-school education, the share of employment in the agricultural sector, the share of employment in the industrial sector, log population, log agricultural and industrial output per capita, and log distance to the railway network. Robust standard errors are clustered at the province level. *** p<0.01, ** p<0.05, * p<0.1