

# Making Reform Work: Evidence from A Quasi-Natural Experiment in Rural China<sup>1</sup>

Shuo Chen  
School of Economics, Fudan University  
600 Guoquan Road, Shanghai, China  
cs@fudan.edu.cn

Xiao Ma  
Department of Political Science, University of Washington  
101 Gowen Hall, Seattle, WA, USA  
maxiao@uw.edu

**Abstract:** Why are some reforms successfully adopted while others not? This paper addresses this question by exploiting the variation in the adoption of China's "One-Issue-One-Meeting" reform. The reform initiated by the central government in 2000 encourages rural villages to voluntarily adopt a new governing procedure that can help to enhance local public goods provision. We explore the determinants of adoption by paying particular attention to heterogeneities in village characteristics. Using data from the 2005 China General Social Survey, we find that villages with a more homogenous population measured by lineage fractionalization and a higher average household income are more likely to participate in the reform program. Applying Generalized Spatial Two Stage Least Square estimation, we also discover a spatial spillover in the adoption of the reform: the chance of a village undertaking the reform increases when its neighboring villages also do so, and such effect is more pronounced if the neighboring village is economically better off, suggesting a potential learning mechanism underlying the neighborhood spillover.

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<sup>1</sup> We thank Susan Whiting, Victor Menaldo, Margaret Levi, Judith Thornton, Richard Wesley, Jennifer Noveck, and Daniel Yoo for helpful comments and suggestions. All errors are our own.

## **I. Introduction**

Structural reforms are conducive to economic development, yet not all reforms play out in a way idealized by reformers. While some reforms get smoothly adopted as they accrue mass support, others face great difficulties just to begin. These inconsistencies raise several questions. Why are reforms successfully adopted in some places but not in others? How do local idiosyncrasies facilitate or block institutional changes imposed from above (or from the outside)?

Although the answers to these questions are of great interest to policymakers, scholars have not yet reached a conclusive agreement.<sup>2</sup> The lack of consensus might be attributable to the methodological challenges posed by studies of reforms. First, each reform differs remarkably from one another in terms of content and context. The difference in the outcome of reforms could be caused jointly by the difference in the nature of the reforms, and by differences in some exogenous factors beyond the attributes of the reforms. Second, reforms are often implemented as a result of central mandate, making localities mere policy takers. The variation in the adoption of reform across regions therefore could be a function of the central leader's intention to prioritize the implementation in certain areas, or it could be the result of heterogeneities in the local factors. To study the underpinnings of reforms that are successfully carried out, we need a setting in which not only the attributes of reform but also the degree to which the reform is implemented can be held constant.

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<sup>2</sup> Impediments to successful reform might include incumbent risk (North 1981; Acemoglu and Robinson 2006b), short time horizon of the ruling elites (Besley and Persson 2011), the absence of veto players (Gehlbach and Malesky 2010), entrenched interests groups (Fernandez and Rodrik 1991; Bueno de Mesquita et al. 2003), the absence of external threats (Bates 2001), the lack of a proper federal system (Weingast 1995; Montinola, Qian, and Weingast 1995), and persisting conflicts (Colliner 2007; North, Wallis, and Weingast 2009), among many others.

This paper explores the factors underpinning successful adoption of reforms by exploiting local variation in the adoption of the “One-Issue-One-Meeting” (*yishi yiyi*) reform (hereafter OIOM reform) in rural China. The reform is an attempt by the central government to transform the ways in which decisions regarding local public goods are made in rural areas. The key element of the reform is the voluntary adoption of a democratic meeting procedure by the localities that would allow the village authority to raise funds and laborers from its own members to finance local public goods projects.<sup>3</sup>

Several features of the OIOM reform make it an ideal setting to isolate the impact of local factors contributing to successful adoption of reforms. First, the reform was introduced by the central government as a standard program. It does not include designs that are tailored to different regions. Second, the adoption of OIOM procedure is, in principle, voluntary. Each village has the right to decide whether they want to adopt the procedure. Typically, localities are forced by the center to adopt certain policies. Third, not all villages responded to the reform with the same degree of enthusiasm. By 2005, five years after the central government legalized the OIOM, about 69% of the villages across China have adopted the procedure, with notable variations within and across provinces.

The central empirical question of this paper therefore is why do some villages embrace the reform while others do not. We apply a nation wide sample of 401 villages from the 2005 China General Social Survey to examine the effects of various village characteristics on the chance of adoption. We conceptualize the adoption of the reform as a process of consensus making among villagers, and pay particular attention to community homogeneity and level of economic development, two factors that are most commonly associated with the problems of collective action and conflict. Results from our baseline estimates suggest that the reform is

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<sup>3</sup> This procedure requires a meeting of all village members whenever the village authority proposes a new project, and the proposal is not passed unless it has the support from the majority of villagers.

more likely to be adopted in villages with a less fractionalized lineage composition, higher per household income, and more competitive village elections. Moreover, by creating a spatially weighted lag of the dependent variable—whether a village adopted OIOM—and applying Generalized Spatial Two Stage Least Squares (GS2SLS) estimation, we find a spatially independent pattern in the adoption of the reform. The chance of a village adopting OIOM increases by 10 to 20 percent if all the other villages located in the same county also adopted it. We further argue that the spillover in adoption is a result of village's desire to purposely emulate those neighboring villages that are economically more successful, instead of simply engaging in herd behavior. We corroborate this argument by showing that the spillover effect is not randomly patterned: the adoption of OIOM by those relatively richer villages has a more salient and pronounced impact on the chance of their neighbor's adoption than by those villages that are relatively poor.

These results echo several influential findings in the literature on comparative institutional change. First, the results suggest that consensus and cooperation regarding political issues are more likely to emerge in places where the composition of population is more homogenous (Alesina, Baqir, and Easterly 1999; Collier and Hoeffler 1998; Habyarimana et al. 2007; Khwaja 2009; Miguel and Gugerty 2005). Encompassing and embedded social entities like lineage groups serve as effective focal devices through which members in a community can coordinate collective behaviors with each other (Tsai 2007a, 2007b).

Our results, to a degree, also accord with the predictions of endogenous institutional change theory (Lipset 1959; Barro 1999; Boix and Stokes 2003). The within-country variation we exploit suggests that even after holding the macro-level environment constant, localities with a higher level of economic development are more likely to embrace voluntary institutional changes.

Finally, our study joins an emerging body of literature studying the relation between institutional spillovers and economic growth (e.g., Kelejian et al. 2013; Acemoglu et al. 2014). The mechanism underlying the spillover of OIOM adoption that we uncover buttresses the influential conceptualization of the micro-foundations of China's reform: the reform deepens as a process of "experimentation, learning, and imitation" (Montinola, Qian, and Weingast 1995: 73) among the localities (Cai and Treisman 2009; Xu 2011).

The remainder of the paper proceeds as follows. Section 2 provides background information on the OIOM reform, focusing on factors that are theoretically pertinent to the adoption of reform at the village level. After introducing our data and measurement in Section 3, we present our empirical estimation and our discussion of the results in Section 4. Section 5 concludes the paper.

## **II. Village Governance and OIOM Reform in China**

China's village governance has undergone several waves of major changes in the past decades. The introduction of village elections in 1987 marked the first effort in establishing autonomous local governance. While the election of village committees has acquired saliency in the political life of China's countryside, empirical researchers have not yet found a conclusive relationship between village elections and the quality of local governance. For example, Manion (1996) and Martinez-Bravo et al. (2011) argue that the local electoral process leads to congruence between village leaders and their electorates, and Shen and Yao (2008) find that village elections help to alleviate inequality among villagers. Tsai (2007a,b) however finds a null relationship between the presence of village elections and local public goods provision.

A key issue of village elections is that elections only address the problem of leader selection and does not oversee a leader's day-to-day behavior in village governance. An

increasing amount of local grievances have emerged as a result of local officials' malpractice in village management during recent years, some of which have led to violent conflicts between villagers and local authorities (e.g., O'Brien and Deng forthcoming). Prominent rural "mass incidents" such as the one in Wukan village of Guangdong province in 2011 have demonstrated the possibility that even the formally elected village committees sometimes cannot stop corrupted officials from misallocating and appropriating village-owned resources.<sup>4</sup> Such tension is further complicated by the gradual reduction in (and eventually the complete abolishment of) agriculture taxes from 2000, which has left many localities in the dire situation of continuing the finance of local public goods (e.g., Takeuchi 2013).

The OIOM reform was introduced under this background in 2000 with the passage of *The Provisional Regulation of Funding and Labor Raising at Village Level* by the central government. The goals of reform are twofold. First, it gives the villages a greater degree of autonomy in proposing and financing a wide range of local public goods projects, such as dams, roads, bridges, and land clearing. Village authorities are allowed to raise labor and funding needed for the projects from their own members. Second, it fosters more active participation in village management by ordinary villagers. According to the "*Provisional Regulation*," each time village officials propose a new project a meeting of all village members must be convened. The passage of any proposal not only needs the approval from the majority of the meeting attendants, but it also requires an attendance to be at least half of the villagers above the age of 18, or by representatives from at least two thirds of all the households (Article 8). In some ways, the procedure of OIOM resembles that of referendums in the democratic context, except the former is limited to the members of each village.

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<sup>4</sup> For the cause of Wukan protest, see Chi-yuk Choi, "Rioting in model village attests to graft woes." *South China Morning Post*, (7 October 2011).

A major feature of OIOM reform is that it is not backed the threat of coercion from the central government (as the village election). Instead, the decision to adopt OIOM is left to the village. Once a proposal regarding public goods project is passed through OIOM, the village authority needs to report the case to the township government for final approval and documentation. Evidence suggests that localities have experienced discernible improvements in village finance and public goods provisions after their adoption of OIOM (e.g., Zhou and Zhang 2009; Kung et al. 2009).

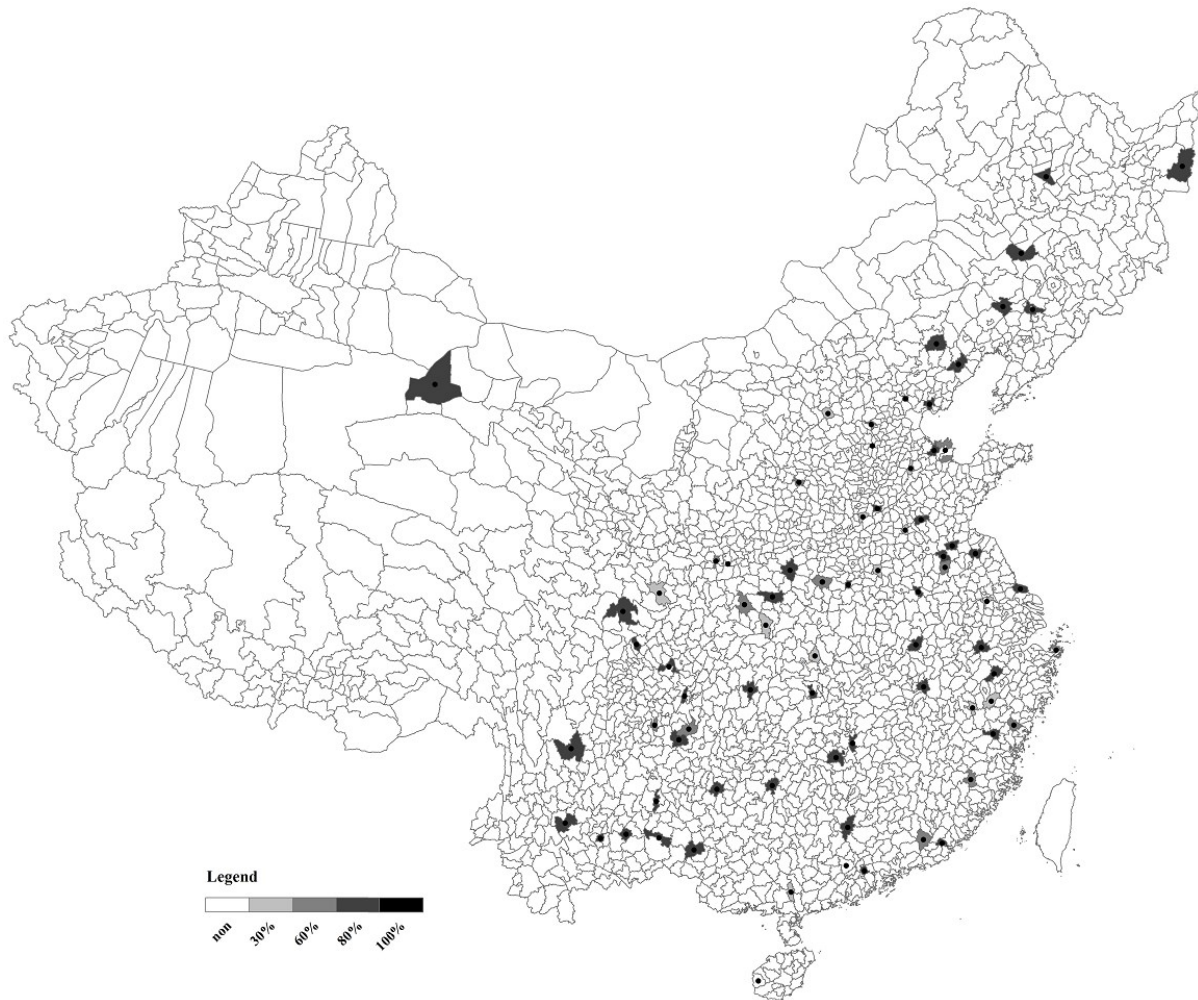
Despite its obvious benefits, OIOM reform has not been adopted with equal vigor by the localities. The nation-wide sample shows that about 69% of the villages have adopted the procedure by 2005, yet with substantial variation both across and within each province (see Table 1 and Figure 1). Why do some villages adopt the reform while others do not?

Table 1 : Percentage of Villages Adopting OIOM, by province (Source: CGSS 2005)<sup>5</sup>

Province	%
Hebei	72.7
Shanxi	25.0
Inner Mongolia	75.0
Liaoning	72.2
Jilin	100.0
Heilongjiang	100.0
Jiangsu	80.0
Zhejiang	50.0
Anhui	87.5
Fujian	75.0
Jiangxi	58.3
Shandong	50.0
Henan	52.8
Hubei	58.3
Hunan	95.0
Guangdong	73.3
Guangxi	66.7
Hainan	0.0
Chongqing	75.0
Sichuan	82.8
Guizhou	61.1
Yunnan	100.0
Shaanxi	66.7
Gansu	40.0
National Average	69.9

<sup>5</sup> Sample does not include villages in Tibet, Xinjiang, Ningxia, Beijing, Tianjin and Shanghai.

Figure 1: Percentage of Villages Adopting OIOM, by county (Source: CGSS 2005)<sup>6</sup>



### a. Lineage Fractionalization

A logical place to start the analysis is by examining the internal factors that govern the formation of consensus among village members. As OIOM exclusively targets public goods provision, it is naturally associated with a collective action problem. Whether social institutions within the village can mitigate the collective action problem determine whether

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<sup>6</sup> Counties with black dots denote those entering the CGSS sample, and the brightness of color represents the share of villages adopting OIOM in that county.



consensus can emerge among village members (Ostrom 1990; Putnam 1993; Ferrara 2003; Greif 2006). A large body of comparative studies point to the fact that homogeneity among community members is conducive to cooperation (e.g., Horowitz 1985; Collier and Hoeffler 1998; Alesina, Baqir, and Easterly 1999; Alesina and La Ferrara 2005; Habyarimana et al. 2007). The underlying logic is that people belonging to the same groups tend to share similar preferences or “culture materials” (i.e. language and norms of interaction), making the coordination of collective actions easier than among people of different groups. Others point to the role of “selective incentives” (Olson 1965) created by the existing social arrangement. In-depth studies on rural China (e.g., Tsai 2007a, 2007b) find that encompassing and embedding solidary groups, such as a village temple and lineage groups, facilitate the advancement of common interests by imposing a “moral cost” on the non-compliant members.

Lineage groups—as a typical type of solidary group—have performed important social and political functions in the Chinese countryside. The presence of dense lineage networks help to mediate disputes among villagers (Huang 1985, 1993) and enhances local public goods provision (Tsai 2007a, 2007b). Anecdotal evidence also suggests an association between the presence of shared surnames and a high level of trust and cooperation within the villages (e.g., Xiao 2001; He 2009). Consensus regarding the adoption of OIOM is therefore expected to emerge in localities with more homogenous lineage networks. Homogeneity in lineage affiliations provides a focal point for the villagers to coordinate with each other, prevents members from forming polarized camps along the narrow family interests line, and also ensures enough coherent supporters that would make the adoption of democratic decision-making procedure like OIOM a viable option. Dominance by a single, large lineage group in the village also reduces the number of “exit options” for non-compliant members and therefore makes the cost of opposition relatively high.

## **b. Economic Development**

Another important factor to consider is the level of economic development. Cross-national comparative studies have long debated the role of economic development in institutional change (e.g., Lipset 1959; Przeworski and Limongi 1997; Przeworski et al. 2000; Boix and Stokes 2003; Svobik 2008; Acemoglu and Robinson 2012), and its role in shaping sub-national institutions. Studies on China's village elections have found that a high (O'Brien 1994), median (Zweig 1997; Epstein 1997), or low level of local economic development (Shi 1999) can all be associated with the enforcement of competitive village elections. Some others have argued a null relationship between economic development and village elections (Oi 1996; Howell 1998).<sup>7</sup> A potential cause underlying these contradictory findings is that the empirical analyses of these studies are based on regional small-N samples, yielding conclusions not easily generalizable to other parts of the country. The OIOM reform provides us with a unique opportunity to examine the effect of economic development on local institutional changes with a nation-wide representative sample.

We anticipate the chance of a village to adopt OIOM to be positively associated with its level of economic development. Economic wellbeing provides a material base for an individual's active participation in village governance. In the context of this study, OIOM asks for villagers' voluntary contribution, either in the form of labor or money, to the collective welfare, and such a contribution is unlikely to happen if the economic situation does not suffice even the basic life needs of the individual. A higher level of economic development also means that the failure to reach a consensus regarding public goods provision would incur higher costs—more valuable collective or individual assets might be endangered due to the lack of certain public goods such as infrastructure (e.g., roads, dams).

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<sup>7</sup> For studies on the relation between local governance and public goods provision, see Zhang et al. (2004) and Luo et al. (2007).

### **c. Spatial Spillover of Reforms**

An often-neglected yet important aspect in assessing the dynamics of reforms is the spatial interdependence of local policies. The scholarship in international political economy has revealed the tendency of policy convergence among different countries, due to factors such as geographic proximity (Easterly and Levine 1998) and trade (Simmons and Elkins 2004). Yet much less scholarly attention has been paid to such dynamics at the sub-national level.<sup>8</sup> A major obstacle in studying local policy diffusion in authoritarian regimes like China is that policy adoptions at the local level are often done by a central mandate, making it difficult to empirically parse out the autonomous policy choices formed as a result of interactions among local actors.

The voluntary principle of the OIOM reform provides an opportunity to examine whether local policy choices are subject to the pattern of spatial interdependence. The history of China's economic reform has been a process by which underdeveloped regions learned and replicated the policies of the "early developer" regions (Montinola, Qian, and Weingast 1995; Xu 2011). The fact that officials at the very local level are given a certain degree of freedom in local governance and are subject to a merit based evaluation system (Whiting 2001; Edin 2003) creates strong incentives for the localities to emulate the policies of the economically more successful regions.

A key difference between villages and higher levels of local government is that the scope of village authority is often very limited. They lack the organizational capacity to systematically gather information on regions that are far away. Also, rural areas draw much less media attention, which means the exemplary effect of a successful policy in the countryside usually will not travel as far as those in the cities or at the provincial level. These

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<sup>8</sup> Some recent works include Kelejian et al. (2013), and Acemoglu et al. (2014).

facts suggest that villages tend to be influenced more heavily by those villages close to them, rather by some distant “examples.” If the decision to adopt OIOM indeed follows a “learning mechanism,” such a pattern is more likely to emerge among villages that are close to each other.

In the following sections we present our data and empirical strategies to test these hypotheses.

### III. Data and Variables

We use a nation-wide sample of 401 villages from the 2005 China General Social Survey.<sup>9</sup> Our dependent variable is a dummy of whether the village has adopted the OIOM procedure. As noted earlier, about 69% of the villages in the sample have chosen to adopt OIOM by 2005.

The covariates include a range of village characteristics. The first one measures the degree of lineage fractionalization in a village ( $LG\_FRAC$ ), or the distribution of village population among different lineage groups. We follow the same coding strategy for the measurement of ethno-linguistic fractionalization developed by Taylor and Hudson (1972).

$$LG\_FRAC_i = 1 - \sum_{s=1}^S \pi_s^2 = \sum_{s=1}^S \pi_s(1 - \pi_s)$$

$$\text{and: } i = 1, 2, \dots, N; s = 1, 2, \dots, S \quad (1)$$

In (1),  $\pi_s$  denotes the share of village population by people with the surname  $S$  in village  $i$ . A small  $LG\_FRAC$  purports the dominance by a single, large lineage group in a village, whereas a large  $LG\_FRAC$  suggests greater heterogeneity in villagers’ lineage affiliations.

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<sup>9</sup> There are in total 76 counties in the CGSS sample, and in each county there are 5.28 sample villages on average.

We use average household income as a proxy for the level economic development in a village. To ensure the normality of the data, we take the natural logarithm of the income data (*LN\_INCOME*). We also control for the influence by village elections—the most important political institution in rural area. Recent studies suggest that the quality of the local election also matters (Landry et al. 2010; Manion 2013), we therefore identify different forms of village election. Villages where more than half of the villagers reported that the candidates in the elections were nominated by the villagers are coded 1 for the dummy *NOMINATED*, whereas villages in which the majority of the villagers reported that the candidates were appointed by the village party secretaries or township cadres are coded 1 for the dummy *APPOINTED*. If both types were reported without either one having a majority, the village is coded 1 for the dummy *MIXED*. 63% of the villages in the samples have their candidates being nominated by villagers, 25% are through appointment by village party secretaries or township cadres, and 12% are by mixed methods.

Because local policy preferences are often considered to be a function of leadership idiosyncrasies (e.g., Kung and Chen 2011), we also control for the education level of the village committee head (*VIL\_EDUCATION*)—a categorical variable ranging from no education to high school and above, as well as the total number of years the current village head has been in office (*VIL\_TENURE*).

As the OIOM targets exclusively on the problem of village public goods provision, how well the localities are endowed with public goods might also affect the decision to adopt OIOM. We use three measures to account for the public goods stock: the literacy rate (*LITERACY*), the number of teachers per villager (*PC\_TEACHER*), and the number of doctors per villager (*PC\_DOCTOR*). For the descriptive statistics of these variables, please see Table 2.

Table 2: Descriptive Statistics of the Variables

Variables	Observation	Mean	SD
Number of Villages	401		
Adopted OIOM	277		
Not Adopted	124		
Lineage Fractionalization ( <i>LG_FRAC</i> )	401	0.400	0.170
Per Household Income ( <i>LN_INCOME</i> )	401	9.001	0.521
How Candidates for Village Election are Selected	401		
<i>APPOINTED</i>	101		
<i>NOMINATED</i>	252		
<i>MIXED</i>	48		
Education Level of Village Head ( <i>VIL_EDUCATION</i> )	395		
No Education	2		
Primary School	26		
Middle School	162		
High School and Above	205		
Years of Village Head in Office ( <i>VIL_TENURE</i> )	394	8.282	7.937
Literacy rate (%)	393	9.103	11.006
Number of Doctors Per Villager ( <i>PC_DOCTOR</i> )	363	0.003	0.006
Number of Teachers Per Villager ( <i>PC_TEACHER</i> )	299	0.009	0.012

As we noted in Section 2, the chance of a village adopting the OIOM might differ notably depending on whether its neighboring villages also did so. To account for this geographical association, we create a spatial weighted lag of the dependent variable (*LAG\_OIOM*). We first construct a 401 by 401 matrix, with each row denoting one of the 401 villages in the sample ( $V_i$ ), and the value of each unit on the columns representing its relationship with the remaining 400 villages (i.e., weights). Villages located in the same county with  $V_i$  each receive a weight of  $1/\theta$  ( $\theta$  is the number of villages located in the same county as  $V_i$ ), whereas other villages receive a weight of 0. We then multiply the weights by the dichotomous measure of whether a village has adopted the OIOM and sum up the results by rows to obtain the spatially weighted impact of the nearby village's decision to adopt OIOM for each village.

## **IV. Estimation and Results**

### **a. Baseline Models**

We first analyze how each village's internal characteristics might affect the adoption of the reform. Because our dependent variable—whether the village has adopted OIOM—is a binary one, we apply logistic estimation in our models.

We only include our two key variables of interests—lineage fractionalization and per household income—in the baseline estimation (model 1). In model 2, we add other village level control variables including how candidates are selected in village election, the education qualification of the village leader, the cumulative numbers of years the current village leader has been in office, and the literacy rate among villagers. We further account for public goods stock in each village, measured by the numbers of doctors and teachers per villagers, in model 3. We cluster the standard errors of the observations within the same county. The results are presented in Table 3.

Table 3: Baseline Estimation on the Determinants of OIOM Adoption			
Logistic Estimation	DV: Adoption of OIOM		
	(1)	(2)	(3)
<i>LG_FRAC</i>	-1.081*** (0.426)	-0.899** (0.443)	-0.955** (0.534)
<i>LN_INCOME</i>	0.251** (0.133)	0.211 (0.136)	0.374** (0.178)
Village Election:			
<i>NOMINATED</i>		0.482*** (0.157)	0.563*** (0.184)
<i>MIXED</i>		0.406* (0.238)	0.497** (0.280)
<i>APPONITED</i> (reference)			
<i>VIL_EDUCATION</i>		0.053** (0.028)	0.023* (0.012)
<i>VIL_TENURE</i>		-0.005** (0.002)	-0.022** (0.010)
<i>LITERACY</i> (%)		0.006 (0.006)	0.003 (0.009)
<i>PC_TEACHER</i>			-6.879 (8.102)
<i>PC_DOCTOR</i>			-12.923 (13.178)
Intercept	-1.296 (1.206)	-1.817 (1.286)	-2.495 (1.645)
Joint <i>p</i> -value	0.007	0.039	0.050
No. of Observations	393	387	279
Pseudo <i>R</i> <sup>2</sup>	0.021	0.052	0.073
Standard errors in parentheses, corrected for clustering within each county.			
* <i>p</i> <0.1; ** <i>p</i> <0.05; *** <i>p</i> <0.001.			

The results from the baseline models support several of our hypotheses. First, the variable measuring lineage fractionalization has remained significant at the 0.05 level across 3 models. Because a higher value of *LG\_FRAC* denotes a more diverse body of villagers in terms of lineage affiliations, the negative coefficient suggests that OIOM is more likely to be adopted in villages with a more homogenous population. The effect of lineage fractionalization also remains stable after controlling various other factors (from -0.899 to -1.081). A one-unit increase in *LG\_FRAC* (i.e., from a state in which all villagers belong to a same lineage to a



situation in which every single villager belongs to a different lineage) reduces the chance of adoption by 30% to 37%.<sup>10</sup>

The positive effect of per household income is significant at the 0.05 level in our baseline model with only two covariates, but not after we control for a range of other village characteristics in model 2. After we take into account the level of public goods stock of each village in model 3, the positive effect is significant at the 0.05 level.<sup>11</sup> The non-robust result in model 2 might be caused by the endogeneity problem. The covariate—the average household income—might be inversely affected by our dependent variable, or by some unmeasured heterogeneities. We address this problem by treating the average household income as an endogenous regressor when using GS2SLS, and obtain robust result (see Part b of this section).<sup>12</sup>

The form of village elections also affects the chance of adoption. In models 2 and 3, we control for whether the candidates in the village elections are nominated by the villagers, or through mixed methods, and use the villages in which candidates are appointed by the township cadres or village party secretary as a reference group. The result suggests that villages that have their candidates being nominated by the villagers are 16.9% more likely to

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<sup>10</sup> We also conduct additional test by accounting for county fixed effects, and our main findings are robust to the unmeasured heterogeneities at the county level.

<sup>11</sup> The current level of public goods stock does not have a salient impact on the chance of adoption. One potential explanation is that the current level in public goods might work in two opposite directions. On the one hand, a higher level of public goods stock indicates a strong preference for collective goods. On the other hand, a higher level of stock also suggests little room for future improvement, so there is no urgent demand among the villagers to acquire additional collective goods through OIOM.

<sup>12</sup> We also conduct a joint test for *LG\_FRAC* and *LN\_INCOME*, and the joint p-values are 0.007, 0.039, and 0.05 for each of the three baseline models, suggesting the two variables have a significant joint effect on the outcome variable.

adopt OIOM than the villages in which the candidates are appointed (for the mixed method, 12.5% more likely), and such an effect is significant at the 0.01 level. This result is consistent with existing understandings on the role of local elections in Chinese countryside: that the fairness of the elections influence people's enthusiasm in political participation (Landry et al. 2010), and that officials nominated by the voters are more responsive to the preferences and demands of the population (Manion 2013).

Personal characteristics of the village leaders also seem to matter. We control for the level of village leader's education using an ordinal variable *VIL\_EDUCATION*, and as shown in models 2 and 3, villages with better-educated leaders are more likely to adopt the OIOM procedure. The effect of the length of the current village leader's tenure is negatively associated with the probability of adoption, speaking to the intuition that entrenched interests in the *status quo* might constitute an impediment to progressive institutional changes (e.g., Fernandez and Rodrik 1991). Although OIOM does not directly weaken the power of the village leaders, it nevertheless places them under some informal checks by empowering ordinary villagers with more say in village governance. These leaders thus are expected to be the potential opponents of the adoption. Their prolonged tenure also suggests that they might have accumulated enough political or economic resources to prevent it from happening (e.g. by buying off a key portion of the community members).

## **b. Spatial Spillover of the OIOM Adoption**

We now proceed to look at how external factors might affect the pattern of adoption of the OIOM procedure. As we argued earlier, the chance that a village adopting the reform might also be a function of the interactive learning process among localities close to each other. To operationalize such an influence, we create a spatially weighted lag of the OIOM adoption status (*LAG\_OIOM*), and the weights are based on whether two villages are located in the

same county. The spatial lag of the adoption status alone however does not capture the totality of neighborhood externalities. Each village is also subject to the influence by some unobserved, random characteristics of the neighboring villages. Formally, the relationship is shown as follows:

$$y_i = \rho W y_i + X_i \beta + X_i' \delta + \mu_i$$

$$\text{and: } \mu_i = \sigma W \mu_i + \varepsilon_i, i = 1, 2, \dots, N \quad (2)$$

In equation (2),  $y_i$  is the outcome variable—the adoption of OIOM.  $W y_i$  is the spatially weighted lag of the adoption status for villages within the same county, and  $\rho$  is the coefficient for the spatial lag.  $X_i$  is a matrix of key explanatory variables including lineage fractionalization and per household income, and  $\beta$  is a vector of coefficients for these covariates.  $X_i'$  and  $\delta$  represent matrix of other control variables and their coefficients, respectively.  $\mu_i$  represents the residual of the model, which is a function of the spatially weighted lag of the residuals of other villages  $W \mu_i$ , plus an error term  $\varepsilon_i$ .

Because  $y_i$  is a function of  $\mu_i$ , which means its spatial lag  $W y_i$  is also a function of  $\mu_i$ , the use of standard maximum likelihood estimation for equation (2) will face the problem of endogeneity. In the context of this study, the decision of a village to adopt OIOM is influenced by the decisions of its neighboring villages, but its own decision will in turn have an impact on the decisions of its neighbors. To deal with this endogeneity problem, we apply the Generalized Spatial Two Stage Least Squares (GS2SLS) procedure developed by Kelejian and Prucha (1998, 1999, and 2004) in our estimation. This approach is a special form of Generalized Method of Moments (GMM) for models with spatial interdependent variables. It uses exogenous factors and their spatial lags (in our case, covariates in vector  $X_i$  and  $X_i'$ , and their spatial lags  $W X_i$ , and  $W X_i'$ ) as instruments for endogenous regressors. The estimators of GS2SLS are considered to be consistent and asymptotically normal (Kelejian

and Prucha 2004), and are not subject to the influence by the “omitted common factors” in the spatial interdependence (Das et al. 2003; Kelejian et al., 2013).<sup>13</sup>

We estimate only the spatial lag of our dependent variable, lineage fractionalization, and per household income in the first model, and include other village level control variables in the second model. We treat the spatial lag of the dependent variable (*LAG\_OIOM*) as the endogenous regressor. In the third model, we also treat per household income as an endogenous variable (along with *LAG\_OIOM*). We do not include the variables that were not significant in the baseline estimation. The p-values of Hansen J-statistics of over-identification tests for the instruments are not significant across the three models, suggesting endogeneity is a less concerned source of biases.<sup>14</sup> We present the result in Table 4.

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<sup>13</sup> Although the form of our dependent variables suggests the use of a logistic estimator, the maximum likelihood estimator is invalid when variables and/or errors are spatially dependent (because of the violation on the identically and independent distribution assumption). For the use of linear model in the estimation of spatially dependent dummy outcome, see Wooldridge (2007).

<sup>14</sup> Hansen J-test was not developed in the context of spatial models with spatial lags in both the dependent variable and the error terms, but it is still an informative criterion for the over-identification test. For example, see Kelejian et al. (2013).

Table 4: Spatial Interdependence of OIOM Adoption

GS2SLS estimation	DV: Adoption of OIOM		
	(1)	(2)	(3)
<i>LAG_OIOM</i>	0.113*** (0.019)	0.140*** (0.021)	0.214*** (0.035)
<i>LG_FRAC</i>	-0.192** (0.097)	-0.179** (0.084)	-0.103*** (0.031)
<i>LN_INCOME</i>	0.070* (0.039)	0.076* (0.040)	0.113*** (0.028)
Village Election: <i>NOMINATED</i>		0.532*** (0.147)	0.411* (0.231)
<i>MIXED</i>		0.311*** (0.098)	0.408 (0.321)
<i>APPONITED</i> (reference)			
<i>VIL_EDUCATION</i>		0.103 (0.410)	0.089* (0.050)
<i>VIL_TENURE</i>		-0.074* (0.048)	-0.028*** (0.009)
Intercept	-0.487 (0.690)	-0.418 (0.710)	-0.892 (0.638)
No. of Observations	393	387	387
Spatial Autocorrelation coefficient ( $\sigma$ )	0.078	0.070	0.189
Adjusted R2	0.418	0.470	0.470
Standard errors in parentheses.			
* $p < 0.1$ , ** $p < 0.05$ , *** $p < 0.01$ .			

The result suggests that the effect of neighborhood externalities is substantial and significant. The chance of a village adopting OIOM reform increases by 10% to 20% if all the other villages in the same county also adopt it, equivalent to the effect brought by 5% to 7% of increases in average household income. The effect of lineage fractionalization is consistent with our estimation in the baseline model, that the more fragmented a village population is in terms of lineage affiliation, the less likely it is to adopt OIOM, holding all else constant. The variable of average household income has remained significant, and its effect increases by 50% when we treat it as an endogenous factor (along with the spatial lag of the dependent variable) in model 3. Having competitive village elections in which villagers themselves nominate the candidates also continues to be a crucial determinant of adoption, and the prolonged tenure of current village leaders reduces the chance of adoption.

### c. “Herd Mentality” vs. Learning: The Mechanism Underlying Spatial Spillover

Having found evidence for the spatial spillovers of OIOM adoption, we now turn to verifying the underlying mechanisms. We have argued that the spatial spillover in the adoption of OIOM is due to a village's desire to learn and imitate the policies of those who are more successful. But a parallel explanation, in which villages adopt the policy simply by emulating what neighboring villages have done without a particular goal in mind, would result in an observationally equivalent pattern. We term this alternative explanation the “herd mentality” mechanism. In China, “herd mentality” is not a rare phenomenon among local officials, which often leads to the formulation of policies with disastrous consequences. Prominent examples of such include bandwagons in reporting inflated output figures among localities during the Great Leap Forward, or the fever to construct costly but largely useless “showpiece projects” (e.g. such as fancy government buildings and squares) in recent years.

While both learning and “herd mentality” mechanisms to some extent reflect the common career incentives shared by the local officials, a key distinction is that the former is considered to be a behavior that involves the calculation of the long-term good for the localities, whereas the latter is considered to be a result of quick and short-sighted decisions informed by the surrounding environment. A policy adopted as a result of “herd mentality” might not necessarily benefit the localities, especially in the long run. Is the spread of OIOM also due to “herd mentality?”

We conduct additional robustness checks to identify the underlying mechanisms. We create two separate spatial lags of the dependent variable,  $LAG\_OIOM\_H$  and  $LAG\_OIOM\_L$ .  $LAG\_OIOM\_H$  is the spatially weighted impact of adopting OIOM by those in-county villages that have a higher per capita revenue than the village being influenced, and  $LAG\_OIOM\_L$  is the spatially weighted impact by those that have a lower per capita revenue. If the “herd mentality” were the underlying mechanism for the spatial spillover, we should expect  $LAG\_OIOM\_H$  and  $LAG\_OIOM\_L$  to have equal influence on a village's chance to

adopt OIOM. In other words, whether a village will be affected by its neighbors is not conditioned on its neighbors' economic wellbeing. If the spatial spillover were subject to the "learning mechanism," the one that we argued, we would expect  $LAG\_OIOM\_H$  to have a more pronounced impact on the outcome variable. The model for our test is as follows:

$$y_i = X_i\beta + \rho_1 W_1 y_i + \rho_2 W_2 y_i + \mu_i$$

$$\text{and: } \mu_i = \sigma W \mu_i + \varepsilon_i; i = 1, 2, \dots, N \quad (3)$$

In equation (3),  $X_i\beta$  represents the vectors of our key covariates and their coefficients.  $W_1 y_i$  and  $W_2 y_i$  are the two separate spatial lags  $LAG\_OIOM\_H$  and  $LAG\_OIOM\_L$ , respectively, and  $\rho_1$  and  $\rho_2$  are their coefficients. The instruments we use to estimate model 3 include  $X_i$ ,  $W_1 X_i$ , and  $W_2 X_i$ .

Table 5: Exploring Mechanism for the Spatial Interdependence		
GS2SLS estimation	DV: Adoption of OIOM	
	(1)	(2)
$LAG\_OIOM\_H (\rho_1)$	0.261*** (0.078)	0.279*** (0.061)
$LAG\_OIOM\_L (\rho_2)$	0.102* (0.056)	0.089 (0.078)
$FRAC$		-0.114*** (0.042)
$LN\_INCOME$		0.098** (0.051)
Intercept	-0.441 (0.528)	-0.625 (0.692)
No. of Observations	397	387
Spatial Autocorrelation Coefficient ( $\sigma$ )	0.113	0.079
Adjusted $R^2$	0.311	0.503
Standard errors in parentheses.		
* p<0.1; **p<0.05; *** p<0.001.		

Table 5 presents the results of our test. In model 1, we only include the two spatial lags.  $LAG\_OIOM\_H$  is not only significant at the 0.01 level, its effect is also substantively larger than that of  $LAG\_OIOM\_L$ , which is only significant at the 0.1 level. After we controlling for lineage fractionalization and average household income in model 2, the  $LAG\_OIOM\_H$  remains significant (and its effect even increases slightly), while the  $LAG\_OIOM\_L$  is no

longer significant at the 0.1 level. Localities are indeed influenced by their neighbors, but a closer look here reveals that such an influence comes exclusively from those neighbors that are economically better off, not from those that are worse off. This result lends strong support to our theory on a learning mechanism in explaining the spatial spillover of the reform.

#### **d. Discussion**

The above tests lend support to our main hypotheses. The chance of a village adopting the OIOM increases when there are fewer fractions among its population, when it has a higher average household income, and when its neighbors also adopt the procedure. Several of our control variables also appear to have a consistent and robust effect on our outcome, which might merit further discussion.

Our analysis suggests that villages where the candidates for elections are nominated by the villagers are more likely to adopt the OIOM than those whose candidates are appointed by the township cadre or village party secretary. This pattern is consistent with the findings of several recent studies in Chinese local politics. First, how villagers perceive and trust the village authority might influence their willingness to participate in village governance. Using a survey data on rural elections in China, Landry, Davis and Wang (2010) find that precedents of contested elections increase villager's political participation—measured by voter turnout and the chance of ordinary villagers running for office in the subsequent elections. An important feature of contestation, as they reveal, is whether voters have choices between candidates. In villages where the current leader came to office via uncontested means, the degree to which villagers want to participate in and contribute to village governance is expected to be relatively low. OIOM reform is not feasible without the active participation and support from the majority of the villagers. Second, the connectedness between the village leaders and the ordinary villagers might also matter. Manion (2013) finds



that local congressmen/women (at the township and county level) who are nominated by the voters instead of by the party organ not only have better knowledge in the local affairs, but are also more responsive to the demands of the local population. Although OIOM takes place at the village level, the same mechanism should also apply. OIOM requires the collective consensus among members of the community regarding public goods projects, and village leaders can play a pivotal role in accelerating the process by coordinating and adjusting a conflict of interest among villagers. All these however cannot be done if the village leaders are not well connected with the villagers and are willing to respond to their preferences.

It is beyond the scope of this article to further differentiate between the above two mechanisms, and the two mechanisms to some extent supplement each other in the context of OIOM adoption. The result regarding the effect of competitive village elections once again suggests that the substance of the election matters more than the mere presence of the electoral institution.

## **V. Conclusion**

In this paper we ask why reforms are successfully adopted in some places but not in others. We answer this question by exploiting the local variation in the adoption of the OIOM reform in rural China. We find that the reform is more likely to be adopted in villages with a more homogenous population in terms of lineage affiliation, higher household income, and more competitive village elections. We further discover a spatially interdependent pattern in the spread of the reform, that a village's chance of adopting OIOM is affected by whether its neighboring villages also do so. We argue that such spillover is due to a village's desire to learn and imitate the policies of those villages that are more successful, and we corroborate this argument with additional evidence.

The findings in this study buttresses the claim that China's market reform is a process of "experimentation, learning, and imitation" among localities (Montinola, Qian, and Weingast 1995; Xu 2011). It renders several important policy implications for future reformers. In order for a new policy to be successfully implemented, the reformer is best to start in places with fewer divisions within the population, a higher level in economic development, and stronger local institutions that can hold local officials accountable. Once the policy succeeds in these places, it is expected to generate an exemplary effect on the neighboring areas, lowering the future cost of implementation in these areas.

We should, however, also avoid over-extrapolating from the results of this study. Our results are robust to reforms that focus particularly on the problem of rural public goods provision in developing countries like China. Whether the factors we have found to influence OIOM reform will also affect the adoption of reforms in other issue areas, such as land ownership, or reforms at higher levels of government (e.g., municipal, provincial levels), remains largely unknown. This study also focuses mainly on the adoption phase of reform, but not on the implementation. We do not address how the adoption of OIOM could affect the level of local public goods provision, which is also a crucial dimension of a successful reform. These important questions are left for future studies.

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