6. Social fragmentation, public goods, and local elections: evidence from China

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Summary

This study examines how the economic effects of local elections in rural China depend on voter heterogeneity, as captured by religious fractionalisation. We first document religious composition and the introduction of village-level elections for a nearly nationally representative sample of over 200 villages. Then, we examine the interaction effect of heterogeneity and the introduction of elections on village government provision of public goods. The interaction effect is robustly negative. We interpret this as evidence that voter heterogeneity constrains the potential benefits of local elections for public goods provision.

The introduction of municipal elections is often a component of governance reforms towards decentralisation. However, the national-level experience suggests that the introduction of democracy in developing countries during the 20th century has often failed to produce the public policy changes that Western European countries historically experienced when they democratised (for example, Acemoglu and Robinson 2000; Lizzeri and Persico 2004). One potential answer, as argued by the *modernisation* (Lipset 1959) and the *critical junctures* hypotheses (Acemoglu et al. 2008), is that democracy can only survive and succeed in contexts where certain historical preconditions exist. However, existing studies provide little concrete evidence on what the

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exact preconditions are and which economic outcomes are sensitive to these conditions. This chapter addresses this gap in the literature by examining how the introduction of village elections interacts with *voter fragmentation*, defined as the clustering of citizens in different groups with potentially distinct identities, in determining the allocation of government-provided public goods in rural China.

Our analysis here has four main sections, plus an online annex. We begin by giving a look ahead to the core approaches used and some of the most salient findings. Section 6.2 discusses the conceptual framework and the empirical strategy we used. We next describe the data in Section 6.3, and the results achieved in Section 6.4. The final main section (6.5) considers the robustness of our results. In addition, extensive background information is available in the chapter's Supplementary Materials, which cover more descriptive material on the overall role of village elections in China, the importance and measurement of religion across the country, and other issues relevant to understanding our approach and findings.[1]

6.1 The core approach and findings of our study

Village elections were introduced during the 1980s and 1990s to address challenges in local governance that had led to severe under-provision of public goods in rural China, among other problems. These elections partially replaced the Communist Party appointment system that had previously determined village leadership and represent a marginal shift towards democracy in village government (on which more below). Consistent with the belief that electoral accountability incentivises village leaders to improve public goods provision, several studies have found that the introduction of elections increases average local public goods provision (for example, Luo et al. 2010; Mu and Zhang 2011; Zhang et al. 2004; Martinez-Bravo et al. 2022). These results on the average effect of elections, together with the size and diversity of China's socio-geographic landscape, make China a natural context for studying the relationship between the underlying heterogeneity in villages and the effectiveness of elections in determining public goods.

A priori, the sign of the interaction between heterogeneity and elections on government-provided public goods is ambiguous. Following the seminal work of Alesina, Baqir, and Easterly (1999), an extensive literature suggests that a number of factors (lack of trust, lower altruism across groups, preference divergence) can cause social fragmentation to reduce the government's ability and willingness to raise revenues to provide public goods.[2] However, the literature has not addressed whether the advantages of introducing elections should be larger or smaller in more fragmented polities. The reason is that the mechanisms emphasised in the literature should, in principle, hold for both appointed and elected governments. However, the sign of the interaction depends on whether this relationship is *stronger* under an elected government or under an appointed one. For instance, if fragmentation limits the benefits

of elections because it weakens electoral accountability, the interaction would be negative. In contrast, if heterogeneous villages have more to gain from the introduction of elections, because elections better aggregate conflicting preferences, the interaction would be positive. Therefore, whether the benefits of introducing elections are larger or smaller in heterogeneous polities is ultimately an empirical question.

There are two main challenges in studying the interaction effect of democratisation and voter heterogeneity on public goods provision: identification and data. The main concern for identification is that voter heterogeneity is typically correlated with other factors (such as a history of conflict or weak administrative capacity) that could influence the quality of institutions. Similarly, voter heterogeneity could be an outcome of democratisation. For example, across countries, if democracies are more tolerant of diversity and are better able to provide public goods for reasons unrelated to diversity, the sign of the interaction effect would not necessarily reflect whether heterogeneity is an important precondition for a working democracy.

The second difficulty is finding high-quality data from the appropriate context. A study on the interaction effects of voter heterogeneity and the introduction of elections, or any democratisation reforms, requires a context that fulfils the following criteria:

(i) the units of observation must be responsible for determining and financing public goods;
(ii) these units must undergo a similar and well-defined shift towards democracy;
(iii) there must be variation in voter heterogeneity across the populations in these units;
(iv) the introduction of democracy should be exogenous to heterogeneity; and
(v) these units should be otherwise similar so that they are comparable for statistical analysis.

While cross-national analyses struggle with (ii), (iv) and (v), within-country comparisons tend not to satisfy (i) and (ii). The introduction of village-level elections in China and the natural variation in local population mixes across this large country provide a context in which these difficulties can be successfully addressed.

Our study proceeds in two steps. First, we document the introduction of elections, public goods expenditures and provision, and social composition of villagers in each village for a nearly nationally representative sample of over 200 villages and 20 years. The Village Democracy Survey (VDS), the main source of the data, is a unique survey conducted by the authors that digitised data from village records. This data set is supplemented with demographic variables from the National Fixed Point Survey (NFS), which is collected by the Ministry of Agriculture each year in the same villages as the VDS.

For practical reasons, we focus on religious fragmentation as a proxy for voter heterogeneity. Of the three dimensions of ethnic, religious, and linguistic fragmentation that dominate the literature on diversity, religion is the only one that varies substantially across the villages in our sample. Religious heterogeneity is interesting in its own right owing to the re-emergence of religion in China after years of state repression, its importance for economic performance, its salience for political attitudes around the world (for example, Alesina et al. 2003; Montalvo and Reynal-Querol 2005; Guiso, Sapienza, and Zingales 2003), and its place in the historical Chinese context (for example, Weber 1968).[3] Religious conflict is practically non-existent in our context. Therefore, we interpret religious fragmentation broadly as a proxy for social fragmentation. In practice, our study also reveals the importance of religion as a dimension for social clustering in post-Mao rural China.

The second step is to use the data to examine the interaction effect of the introduction of elections (which varied in time across villages) and a time-invariant measure of the level of average religious fragmentation that differs across villages.[4] Because data for religious population shares is not available every year, we use the *average* of religious fragmentation over time to maximise our sample size. The baseline specification controls for

- village fixed effects, which absorb all time-invariant differences across villages;
- year fixed effects, which control for all changes over time that affect all villages similarly, such as macroeconomic changes taking place in China during this period; and
- province–time trends, which control for the growing economic divergence across regions during the reform era.

Our strategy is similar to a triple differences estimate that compares public goods in villages before and after the introduction of elections, between villages that have already introduced elections to those that have not, and between fragmented and less fragmented villages.

Religious fragmentation is a non-random variable that is correlated with other factors that can influence elections and public goods. To address this problem our baseline equation controls for the *interaction* of year fixed effects with a large number of potential correlates of fragmentation: village size, the average share of religious population in the village, and, most importantly, religious fragmentation itself. The latter set of controls is extremely conservative because it controls for *all* time-varying omitted variables that correlate with fragmentation, allowing villages with different levels of fragmentations to evolve across different paths over time in a fully flexible manner. It forces our estimates to be identified only from a systematic change in the difference in public goods between fractionalised and less fractionalised villages from the year that elections are implemented.

Our interpretation of the interaction effect relies on two assumptions. First, our measure of religious fragmentation must not be an outcome of elections. We support this by showing that elections have no effect on the time-varying measure of religious fragmentation, and that average religious fragmentation is uncorrelated with the timing of the introduction of elections. Second, we assume that, conditional on our baseline controls, the interaction of the introduction of elections and religious fragmentation is not jointly determined with public goods. In other words, we assume that fragmentation is not correlated with other factors (beyond the baseline controls) that can influence the effect of elections on public goods. This is highly likely because of the baseline controls for the interaction of fragmentation and year fixed effects. Nevertheless, we provide a large body of evidence against alternative explanations in the section on robustness (Section 6.5). Note that the interpretation of the interaction effect as causal does not require that the timing in the introduction of elections was random.

The main results show that, prior to the introduction of elections, village government expenditure on public goods was very similar across villages with different degrees of fragmentation; elections increase public goods expenditure, and the magnitude of the effect *declines* with fragmentation. We find similar results when examining proxies for public goods provision as the dependent variable, which supports our interpretation of expenditure as reflecting provision. Taken literally, the estimates imply that approximately 92 per cent of the villages in rural China were homogenous enough to experience some increase in public goods expenditures after the introduction of elections, while 8 per cent of villages were so heterogeneous that elections reduced village public goods expenditure. The high share of villages that experienced some increase from elections is not surprising given the homogeneity of most Chinese villages.

In addition, we show that the changes in public goods expenditure occurred exclusively for village-raised funds (that is, funds collected from village households). In contrast, we found no effect of elections or the interaction for public goods funded by transfers from upper levels of government. Together with the large number of robustness checks we conduct, these results show that mechanisms local to the village were causing heterogeneous villages to experience lower gains from elections. In particular, there were two possible and non-mutually-exclusive mechanisms, both related to the fact that elections increase accountability: (i) heterogeneous villages have a lower preference for public goods, and elected village leaders better reflect this underlying preference; and (ii) homogeneous villages are better able to hold their elected leaders accountable.[5] Importantly, we were able to rule out the alternative explanation that our results are driven by poor implementation of the electoral reforms in fragmented villages by showing that there is no relationship between heterogeneity and the quality of election implementation.

In terms of its links to earlier work, this study complements a large empirical literature studying the relationship between heterogeneity and public

goods provision (for example, Alesina, Baqir, and Easterly 1999; Alesina and La Ferrara 2000; Alesina and La Ferrara 2002; Alesina and La Ferrara 2005).[6] Our analysis differs in that we investigate how heterogeneity modulates the effects of institutional change on public goods instead of the cross-sectional effect of heterogeneity on public goods. In focusing on heterogeneity, local governance and public goods in a developing country, we are approaching it in a similar way to studies such as Bardhan and Mookherjee (2006) and Bandiera and Levy (2010), which analysed the effect of heterogeneity on local governance in India and Indonesia; Khwaja (2009), Okten and Osili (2004), and Miguel and Gugerty (2005), who found that social fragmentation reduces collective action towards public goods in Pakistan, Indonesia, and Kenya; Chattopadhyay and Duflo (2004), Ferraz and Finan (2008), Olken (2010), and Besley, Pande, and Rao (2012), who examined local democratic governance in India, Brazil, and Indonesia; and Banerjee, Iyer, and Somanathan (2005), Banerjee and Somanathan (2007), and Munshi and Rosenzweig (2008), who examined how groups mobilise through the political system to obtain public goods in India.[7] In focusing on religious fragmentation as our measure of heterogeneity, we contribute to the macro-empirical literature on the effect of religious fragmentation on growth (for example, Alesina et al. 2003; Montalvo and Reynal-Querol 2005).

We also add to the studies discussed earlier on Chinese elections by taking a first step towards understanding the preconditions under which elections work. In our companion paper (Martinez-Bravo et al. 2022), we show that local elections pose a trade-off from the autocrat's point of view, which allows us to characterise the conditions under which they are introduced. In Martinez-Bravo et al. (2015), we explored the interaction of elections with social capital. Since the average effect reflects the conditions of a very specific context, an analysis of the preconditions is crucial towards obtaining generalisable lessons for policymakers. In addition, in the discussion of China's transition, religion has recently become an object of academic interest and systematic data collection.[8]

Our study is the first to provide direct and rigorous empirical evidence on the interaction of formal institutional reform and pre-existing conditions. For China, the results show that the presence of distinct groups in society can severely limit the effects of a democratic transition for public goods provision. To the best of our knowledge, we produce the first village-level data set that documents regional religious composition during the modern era, which, together with the other data we have collected, makes a general contribution by facilitating future research on the relationship between informal and formal institutions and economic outcomes in China.

6.2 Conceptual framework

This section surveys the theoretical mechanisms that link public goods provision, social heterogeneity, and democratic choice and accountability.

Throughout the discussion we refer to contextual factors in rural China to assess plausibility. For a deeper description of the background of this study, please refer to the chapter's Supplementary Materials.[9]

Social heterogeneity and public goods

The first step towards conceptualising the relationship between religious diversity, government-provided public goods, and elections is to focus on the different mechanisms that link social heterogeneity and public goods, regardless of institutions. Existing research has proposed several channels to explain the often-observed negative cross-sectional correlation between fragmentation and public goods provision. This literature, reviewed in Alesina and Ferrara (2005), often considers a public goods game in which citizens willingly contribute to the public good. In the case of rural China, the village government needs to collect contributions from villagers to provide goods, but has limited enforcement power. Hence, the insights of this literature are applicable to this context: by refusing to cooperate, villagers have the ability to significantly increase the cost of collecting contributions for the village government. These increased costs will decrease the provision of public goods through a mechanism similar to the voluntary contribution public goods game.

Among the proposed mechanisms, the most plausible in the context of rural China is that religious activity induces altruism, trust, and willingness to join efforts with other members of the religious group (Alesina and Ferrara 2000; Guiso, Sapienza, and Zingales 2003; Vigdor 2004). Rituals, practices, and festivals throughout the year induce repeated and intense interactions among those who share the same faith, facilitating communication, trust and empathy. As in many other contexts, each religious group builds a strong social identity that helps accumulate these different dimensions of within-group social capital. Theoretically, in the extreme case in which religious participants fully internalise the preferences of the other followers of their faith, a religiously homogeneous village would enjoy optimal voluntary contributions to the public good. By the same logic, to the extent that altruism and trust are limited to the religious group, the more fragmented the village, the lower the willingness to contribute to public goods.[10] Similarly, social sanctions might be weaker for members of other religious groups, which results in less social leverage for enforcing contributions in fragmented villages (Miguel and Gugerty 2005). Note that this mechanism would be active even if there were consensus on which public good to provide and what the ideal level of expenditure would be.

A different mechanism posits that preferences differ across groups. In particular, groups might prefer different varieties of public goods, and technological constraints may be such that only one variety can be provided (Alesina, Baqir, and Easterly 1999). In a fragmented village, villagers might refrain from contributing since they suspect they will not get their preferred variety. In the context of rural China, this mechanism would be most directly relevant when

the public good under consideration is schooling, since different religions might have diverging preferences over the religious orientation of education. However, note that, even if all citizens prefer the same public good, such as better irrigation, groups can still differ on their preferences over the location of the public amenity, since individuals of similar religions often cluster into neighbourhoods within villages (see Cohen 1992). Hence religious diversity may also result in preference divergence for public goods due to the geographic differences across groups.[11]

Finally, Tsai (2007) provided evidence suggesting that village officials who are embedded in encompassing social groups have an easier time discharging their duties. In fragmented villages, social groups will not generally encompass the entire village and officials cannot belong to all of them. To the extent that this mechanism applies, the effective cost of providing public goods in fragmented villages should be higher, likely resulting in lower expenditure. In the extreme case, divergent preferences can generate wasteful conflict between groups (Esteban and Ray 1999; Montalvo and Reynal-Querol 2005). Such conflict could also result in lower public good provision. However, given the scant anecdotal evidence of conflict across religious affiliations in China today, this does not appear to be a first-order mechanism for our context.

The interaction of social heterogeneity and elections in determining public goods

The mechanisms discussed so far predict a negative cross-sectional relationship between fragmentation and public goods provision given a fixed institutional environment. Hence, we would expect the level of public goods to be higher in homogeneous villages under *both* appointed leaders (for example, our baseline before the electoral reforms) and under elections (for example, after the electoral reforms). However, there are two main differences between the two institutional situations: elections increase the accountability of village government to villagers; and elections provide a mechanism for preference aggregation. As we now discuss, these two functions of elections have opposite predictions on the sign of the interaction effect of fragmentation and the introduction of elections.

If elected leaders are more directly accountable than appointed leaders to citizens, we can posit two reinforcing effects. First, accountable governments should better reflect the preferences of the population. If fragmented villages have a lower preference for public goods, the relationship between heterogeneity and public goods provision should be stronger (more negative) under elected leaders than under appointed leaders, since the former are more responsive to the underlying preferences of the village than the latter. Second, all else being equal, rational citizens are more willing to contribute to the village government for public goods when they feel that they can hold the government accountable. A necessary condition for effective government

accountability under elections is that some citizens need to gather and distribute information on government performance. Since these monitoring activities are public goods in themselves, and public goods are better provided in homogeneous villages for the reasons stated earlier, elected officials are more accountable in homogeneous villages.[12] This effect causes villagers to be more willing to contribute to the government for public goods when the government is elected rather than appointed, and more so in homogeneous villages. These two mechanisms predict that the interaction effect of elections and heterogeneity is *negative*.

On the other hand, elections also serve as a mechanism for aggregating voter preferences. In fragmented villages, with low communication and contentious relationships between groups, it is likely to be more difficult for appointed village leaders to determine the most preferred public goods by the majority of villagers. Their inability to propose the majority-preferred public good will cause villagers to resist contributing to the public goods that the leader chooses. Hence, in terms of preference aggregation, heterogeneous villages will have more to gain from the introduction of elections. This mechanism predicts that the interaction effect of elections and heterogeneity is *positive*. This mechanism is likely to be stronger if the pre-election correlation between heterogeneity and public goods is highly negative, since it is predicated on heterogeneous villages catching up to homogeneous villages.

As we show below (with context given in the chapter's Supplementary Materials), in rural China public goods provision was extremely low and not correlated with fragmentation prior to the implementation of elections. This was most probably a result of lack of accountability: since the village leaders were appointed by upper levels of government, they could both safely ignore the preferences of the villagers and shirk the work necessary to accomplish public goods provision, with two main consequences.

First, since the relationship between heterogeneity and public goods is non-existent before elections, and the theoretical discussion suggests that the interaction between elections and heterogeneity will be negative, there is very little catching up that heterogeneous villages can do. As a consequence, the accountability mechanisms described above should dominate. Hence, we will interpret a negative interaction between religious fragmentation and the introduction of elections as reflecting the mechanism that the accountability introduced by elections works better in homogeneous villages. This effect should be reinforced when in heterogeneous villages preferences are such that public goods games result in lower provision, and the newly introduced accountability induces the elected government to closely reflect this.

Second, because there is no relationship between heterogeneity and public goods under the appointment regime, our empirical analysis is silent regarding the different mechanisms that the existing literature proposes for the cross-sectional relationship between heterogeneity and public goods. For this reason, we focus on the well-identified change caused by the introduction of elections.

Case studies

In order to understand the likely mechanisms behind the patterns in the data, we spent significant time observing village meetings, interviewing villagers, reading local newspapers, and interviewing scholars of modern religion in China and religious activist groups to find detailed case studies to provide concrete examples of how fractionalisation matters for public goods provision. We summarise the insights here.

Consider fractionalised village A, where Muslims wished to provide religious education to their children outside of school and were legally prohibited from teaching religion in school or having private schools in China. They did not wish public funds to be spent in the village school. By contrast, the Buddhists, Daoists, and Animists/Atheists (that is, almost everyone else) wished to improve the village school, because their need for spiritual education was satisfied by the existing non-Judeo-Christian infrastructure (for example, village temple, ancestral temples, and so on).

In village B, all groups wished to improve irrigation, for example by drilling tube wells to increase agricultural profits. However, the availability of water for all farmers over time depended on correct usage (not over-pumping). Individuals belonging to the same religion interacted frequently with each other, and thus found it easier to monitor each other's water usage and also to punish bad behaviour with social sanctions. However, individuals could not easily monitor or punish those from different groups. In this context, increased fractionalisation would reduce investment in irrigation. It is interesting to note that in this village it was clear that increased interaction within a religion could crowd out interaction with others.

In village C, villagers disagreed about which roads to pave, and the village could only pave a few roads at a time. The Buddhists, Daoists, and Animists worshipped in different locations (there were no Christians or Muslims in this village). Each argued that the roads near their temple should be paved first, not trusting that more money could be raised in the future to pave other roads.

In village D, non-Christians and Christians were in verbal conflict. In village meetings, Christians accused others of being backwards and argued that the village needed to invest in modern infrastructure (for example, a computer for the village school). The others accused the Christians of acting superior and not really looking out for the interest of all villagers, and simply refused to contribute anything.

Note that these anecdotal accounts suggest the mechanisms discussed above can all be active in different villages, since they are not mutually exclusive. We also found that, in most villages, leaders had little incentives to raise funds and provide public goods prior to the introduction of elections. The introduction of elections forced leaders to address the pent-up demand for public goods. However, as leaders tried to do so, the issues generated by social fragmentation became a problem.

Religious fractionalisation

We measure religious fragmentation with an index of fractionalisation, which proxies for the lack of trust and altruism and the difference in preferences regarding the type of public goods across religious groups (for example, Alesina et al. 2003). This can be written as:

$$F_i = 1 - \sum_{j=1}^{N} s_{ij}^2 \quad [1]$$

The fractionalisation index for village i is equal to one minus the sum of the squares of s_{ij}, the population share of religion j in village i, where N is the total number of religions. This index captures the probability that two randomly drawn villagers belong to different groups.

An alternative index used to measure heterogeneity is the polarisation index (for example, see Esteban and Ray 1994; Montalvo and Reynal-Querol 2005). In principle, this index captures the conflict potential of a given group composition. However, in our context, there is little known conflict across religious groups. In addition the correlation with the fractionalisation score is 0.98 across villages and statistically significant at the 1 per cent level, as Figure 6.1 shows. So, we focus on the fractionalisation index for brevity. Nonetheless, when we present the baseline estimates, we will show that our results hold when we use the polarisation index. The polarisation index is:

$$P_i = 1 - \sum_{j=1}^{N} \left(\frac{0.5 - s_{ij}}{0.5} \right)^2 s_{ij} \quad [2]$$

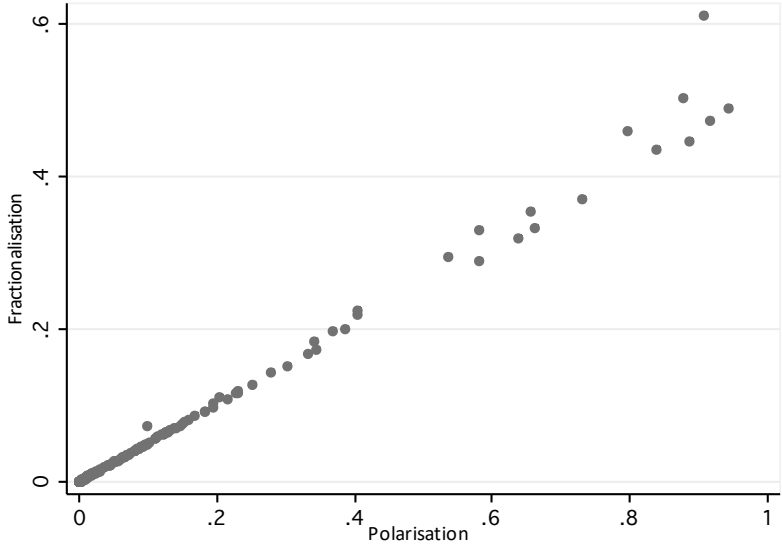
The main outcome we examine is village government expenditure on public goods. To estimate the impact of voter heterogeneity on expenditures induced by the introduction of elections, we estimate the following equation:

$$\begin{aligned} Y_{ijt} = {} & \alpha_1 E_{ijt} + \alpha_2 (E_{ijt} \times H_{ij}) + \beta_1 O_{ijt} + \beta_2 (O_{ijt} \times H_{ij}) \\ & + \mu_t H_{ij} + \gamma X_{ijt} + t\theta_j + \delta_i + \rho_t + \epsilon_{ijt} \end{aligned} \quad [3]$$

where the outcome of interest for village i in province j during year t is a function of: the interaction effect of fragmentation, H_{ij}, and the introduction of elections, E_{ijt}; the interaction term of fragmentation and the introduction of open nominations in each village, O_{ijt}; the main effects of the introduction of elections and open nominations; the interaction of fragmentation with year fixed effects, μ_t; a vector of village–year specific controls, X_{ijt}; province–year trends, $t\theta_j$; village fixed effects, δ_i; and year fixed effects, ρ_t.

Our main estimates cluster the standard errors at the village level to correct for serially correlated shocks within each village. Given the top-down nature of the reform, one may also be concerned about correlated shocks within

Figure 6.1: Fractionalisation versus polarisation scores in our full sample



provinces. To address this, we will also present the standard errors clustered at the province level and show that they are very similar.

In this equation, the village fixed effects control for all differences across villages that are time-invariant (for example, geography, the main effect of fragmentation), and the year fixed effects control for all changes over time that affect villages similarly (for example, macroeconomic growth, economic liberalisation). Province–time trends control for the regional economic and cultural divergence across China during our period of study (for example, the coastal regions experienced more rapid economic growth and were more exposed to outside cultural influences).[13] Because elections were introduced rapidly across villages within provinces, we do not have enough variation in the data to control for province–year fixed effects. However, after we present the main results, we will show that our estimates are robust to controlling for province–time trends with other functional forms.

To address possible concerns about omitted variables, the vector of controls, X_{ijt}, includes several variables. First, we control for village population, which addresses the fact that there may be economies of scale in public goods provision or that it may be more difficult to coordinate larger populations. Second, we control for the share of village population that is religious, which is highly correlated with religious heterogeneity and could affect the provision public goods. Since we use it as a time-invariant measure, we control for its interaction with the full set of year dummy variables to allow its influence to vary flexibly over time.

Finally, and most importantly, we control for the interaction of religious heterogeneity and year fixed effects, $\mu_t H_{ij}$. Since our heterogeneity measure

is time-invariant at the village level, we interact it with the full set of year fixed effects to allow villages to differ according to the level of fragmentation in a way that is fully flexible over time. Hence, our estimate of the interaction of heterogeneity and the introduction of elections is very conservative in that any underlying reason why villages with different levels of fragmentation evolve along different paths is absorbed by this exacting set of controls. The estimate is determined only by the systematic change in public goods after the introduction of elections in villages with higher versus lower levels of heterogeneity, net of any other time divergence across these villages.

To interpret the estimates, consider the case of religious fragmentation. For villages with no fragmentation, $H_i = 0$ and so α_1 is the total effect of the introduction of elections. For villages where there is a high ('infinite') degree of fragmentation, $H_i = 1$ and $\alpha_1 + \alpha_2$ is the total effect of the introduction of elections. So α_2 is the differential effect of the introduction of elections between these two types of village. The hypothesis that religious fragmentation limits the benefits of the introduction of elections predicts that $\hat{\alpha}_2 < 0$. In contrast, if fragmentation has no influence, then $\hat{\alpha}_2 \approx 0$.

Conceptually, our empirical strategy is similar to a triple differences estimate (DDD). We compare public goods investment: in villages before and after the introduction of elections (first difference); between villages that have already introduced elections to those that have not (second difference); and between villages that have high heterogeneity to villages with low heterogeneity (third difference). Our identification strategy makes two assumptions. One is that we assume our measure of religious fragmentation is not affected by the introduction of elections. We will demonstrate that this is true with the data before we present the main results. A second assumption is that, conditional on the baseline controls, our measure of heterogeneity is not correlated with other factors that influence the effects of elections on public goods expenditures. We do not take this as given and provide a large body of evidence to address this concern after our main results. It is important to note that our differences strategy does not rely on the timing of the introduction of elections being random.

6.3 Data

Our data forms the most comprehensive data on village-level reforms and village-level outcomes ever constructed, as well as the first data to document religious composition of rural villages in post-Mao China. It covers a larger and more nationally representative sample, and spans a longer time horizon than any other existing data of rural China that are available to researchers. It mainly uses village- and year-level data from a panel of 217 villages for the years 1986–2005 from the Village Democracy Survey (VDS), a unique retrospective survey conducted by the authors of this chapter. In 2006, our survey recorded the history of electoral reforms and public goods expenditures. In

2011, we returned to the same villages to collect data on the presence of voluntary social organisations and on the number of households per surname for the four most prevalent surnames in the village roster (in 2011), which we will use in the robustness exercises.[14] Our main variables are obtained from village records, and therefore are not subject to reporting or recall biases.

We supplement the VDS with annual data collected each year since 1986 by the Ministry of Agriculture in the National Fixed Point Survey (NFS), which surveys the same villages as the VDS. These surveys are nationally representative and the villages are updated over time. The two surveys are merged at the village and year level to form the sample that we use for estimating the main results. It comprises a balanced panel of 217 villages for the years 1986–2005.

In addition, the NFS surveys a random sample of approximately 100 households per village each year (out of approximately 420 households per village on average) with detailed questions regarding household expenditures. We were able to obtain this additional household data for approximately a third of the villages in the total sample. The panel aspect of our data means that we can control for village fixed effects and year fixed effects. Since we have many villages from each province, we can also control for province–year trends, which are important for addressing the growing economic divergence across regions in China. An additional advantage of the data is the accuracy and uniformity of the historical public expenditures data, which come from administrative records overseen by the Ministry of Agriculture.

In the supplementary material to this chapter, Section B provides a detailed account of how religion was measured in the NFS survey and how the religious fractionalisation index was calculated.[15] We also include full details of the descriptive statistics for our villages and of the correlates with religious fragmentation. It is important to note here that the average village has 420 households. By the end of our sample, all villages had introduced elections, but only half of them had introduced open nominations. Indeed, 50 per cent of villages introduced elections between 1984 and 1993. Looking at whether there were more candidates than positions, we find that 1,002 out of 1,071 elections we observed had more candidates than positions. Thus, around 94 per cent of elections were competitive.

Finally on data, it is important to note two pieces of information relating to our approach. First, religious fractionalisation is uncorrelated with the average pre-election level of government spending on public goods, and the fraction that is financed by villagers. This is consistent with the belief that there was little difference in government public goods provision across villages prior to elections because provision was universally low and that any existing differences were unrelated to social heterogeneity. Second, fractionalisation is uncorrelated with the timing in the introduction of elections (or open nominations), which supports the notion that fractionalisation did not affect the way elections were rolled out.

It is important to emphasise that the correlation between average fractionalisation and other variables does not confound our baseline estimates per se

because the baseline controls of the interaction of average fractionalisation and year fixed effects control for *all* differences between fragmented and less fragmented villages in a way that is fully flexible over time. In Section 6.5 we demonstrate the robustness of our baseline estimates by controlling for the interaction of these correlates (and other variables) with the introduction of elections.

6.4 Results

To allay concerns that our measure of average fractionalisation is endogenous, we first establish that the introduction of elections has no effect on a time-varying measure of religious fractionalisation. To support this claim, we regress the time-varying measure of fractionalisation on the introduction of elections.[16] The sample for this regression is smaller than the full sample because it is restricted to villages that held their first election after 1993, when the NFS began to collect religious population data. The post-election dummy in Table 6.1 column 1 shows that there is no effect: the coefficient is small in magnitude and statistically insignificant. Together with the descriptive statistics, which show that average fractionalisation and election timing are uncorrelated, we conclude that there is no direct relationship between religious fractionalisation and elections.[17] Henceforth, we only consider the time-invariant measure of average religious fractionalisation since this allows us to extend the empirical analysis to the mid-1980s.

For the rest of Table 6.1, the dependent variable is government public goods expenditure, measured in RMB 10,000s. In column 2 we estimate a similar equation to Equation [3], except that we replace the village fixed effects with the religious fractionalisation main effect to examine the pre-election difference in public goods expenditure across villages of different levels of fractionalisation. The estimate of the uninteracted fractionalisation effect, which reflects the effect of fractionalisation prior to the introduction of elections, is small in magnitude and statistically insignificant. This is consistent with the qualitative and correlational evidence shown earlier that fragmented and homogeneous villages had very similar public goods expenditures prior to the first election.

Column 3 presents our baseline estimate. The main effect of elections is positive and the interaction effect with religious fractionalisation is negative. Both are statistically significant at the 1 per cent level. To assess the magnitude of the coefficients, note that the estimates for the main effect of post-election in column 3 show that the introduction of elections increased government public goods expenditure by RMB 207,300 (Constant 2000 US$ 37,914) for villages with zero fractionalisation. For villages with the mean level of fractionalisation of 0.053, elections increased government public goods expenditure by 150,590 RMB (21,194 Constant 2000 USD, $(-107 \times 0.053 + 20.73) \times 10{,}000 = 150{,}590$). This is shown at the bottom of the table in column 3.

Table 6.1: The effect of religious fragmentation × the introduction of elections

	Dependent variables				
	Government public goods expenditure				
	(1) Time-varying measure of religious fractionalisation	(2)	(3) Baseline	(4)	(5)
Post 1st Election × Religious Fractionalisation		−4.645 (34.81)	−107.4** (46.84)	−142.1** (55.88)	
Post 1st Election × Religious Polarisation					−53.79** (23.42)
Religious Fractionalisation (Average)		−7.02 (35.94)			
Post 1st Election	0.00638 (0.007999)	10.65 (8.397)	20.73** (9.351)	21.35** (9.507)	20.61** (9.301)
Post-Open Nominations	−0.00116 (0.00557)		6.168 (10.20)	5.245 (9.963)	6.483 (10.25)
Post-Open Nominations × Religious Fractionalisation			−3.443 (49.68)	10.07 (71.15)	
Controls Village FE	Y	N	Y	Y	Y
Year FE	Y	Y	Y	Y	Y
Village Population	Y	Y	Y	Y	Y
Population Share of All Religions × Year FE	N	Y	Y	Y	Y
Religious Fractionalisation × Year FE	N	N	Y	Y	Y
Province–Year Trends	Y	Y	Y	Y	Y
Pop Share of Each Religion × Year FE	N	N	N	Y	N
Post-Open Nominations × Religious Polarisation	N	N	N	N	Y
Level of Clustering	Village	Village	Village	Village	Village
Observations	1773	4,340	4340	4,340	4340
R-squared	0.911	0.034	0.117	0.119	0.117
Avg Effect: Post 1st Election + Post 1st Election × Rel Frac × 0.053 (0.202 for Imputed Rel Frac)			*15.04*	*13.82*	

(Continued)

Table 6.1: Continued

	Dependent variables		
	Government public goods expenditure		
	(6) Cluster SE at the province level	(7) Cluster SE at the province level, wild bootstrap	(8) Imputed measure of fractionalisation
Post 1st Election × Religious Fractionalisation	−107.4** (42.76)	−107.4** (47.29)	−200.5** (85.02)
Post 1st Election × Religious Polarisation			
Religious Fractionalisation (Average)			
Post 1st Election	20.73** (9.058)	20.73** (10.00)	55.50** (23.24)
Post-Open Nominations	6.168 (9.466)	6.168 (9.90)	12.32 (19.85)
Post-Open Nominations × Religious Fractionalisation	−3.443 (44.26)	−3.443 (40.63)	−32.17 (82.09)
Controls Village FE	Y	Y	Y
Year FE	Y	Y	Y
Village Population	Y	Y	Y
Population Share of All Religions × Year FE	Y	Y	Y
Religious Fractionalisation × Year FE	Y	Y	Y
Province–Year Trends	Y	Y	Y
Pop Share of Each Religion × Year FE	N	N	N
Post-Open Nominations × Religious Polarisation	N	N	N
Level of Clustering	Province	Province	Village
Observations	4340	4340	4340
R-squared	0.117	0.117	0.118
Avg Effect: Post 1st Election + Post 1st Election × Rel Frac × 0.053 (0.202 for Imputed Rel Frac)	*15.04*	*15.04*	*15.00*

Notes: The variable Religious Fractionalisation (Average) was not used in Models 5 to 8.

Another way to assess the magnitude is to ask how many villages experienced increases in public goods due to the introduction of elections given their levels of religious fractionalisation. Dividing the absolute values of the main effect by the interaction effect (20.73 / 107), we find that a village with a fractionalisation index below 0.193 will experience some increase in public goods from the introduction of elections. This includes approximately 92 per cent of the villages in our sample. Therefore most villages were homogenous enough to experience some increase in public goods following the introduction of elections.

In terms of standard deviations, we find that a one standard deviation increase in fractionalisation (0.105) causes the increase in public goods expenditure due to elections to decline by RMB 112,350 ($0.105 \times -107 = 11.235$), which is 0.08 standard deviations of average public goods expenditure ($11.235 / 135.466 = 0.083$). Thus, our estimates imply a strong, yet plausibly sized effect of heterogeneity.

In column 4, we additionally control for the average population share of each religion, each interacted with year fixed effects. This addresses the concern that the presence of a particular religion may both be correlated with fractionalisation and affect public goods expenditure after the introduction of elections. Our main interaction estimate does not change.

In column 5 we examine the interaction of religious polarisation and the introduction of elections while controlling for all of the baseline controls. The estimated interaction effect is negative and statistically significant at the 1 per cent level, and the magnitude is about half of that of fractionalisation in column 1. Since the standard deviation of polarisation doubles that of fractionalisation, the implied effects for heterogeneity are essentially the same, which is not surprising since these two variables are highly correlated in the data.[18]

In column 6, we address the concern that the top-down nature of electoral reforms means that correlated shocks within provinces may cause our main estimates to under-reject hypotheses. Therefore, we alternatively estimate the baseline equation by clustering the standard errors at the province level. The standard errors are very similar to those clustered at the village level. However, one may be concerned that having 29 provinces can induce small-sample bias when we cluster at the province level. In column 7, we address this by correcting for potential biases with wild-bootstrapped standard errors as recommended by Cameron, Gelbach, and Miller (2008). The standard errors, presented in columns 6 and 7 are almost identical. Since the different levels of clustering make little difference to our estimates, we will continue to present standard errors clustered at the village level. Finally, we note that the estimated effect of the introduction of open nominations and religious fractionalisation is always small in magnitude and statistically insignificant, as is the main effect of open nominations. For this reason we will not report these coefficients in the rest of the regressions.[19] We return to discuss the estimate in column 7 later in the chapter.

These results, combined with the lack of correlation between fractionalisation and public goods expenditure before the introduction of elections, are consistent with our interpretation: prior to the elections, the village government was not incentivised to raise money and invest in public goods. Therefore, fractionalisation was not binding. With the introduction of elections, accountability increased and village leaders had to respond to the existing demand in public goods. Hence, it is only after elections are introduced that fractionalisation became binding in constraining the government's ability to raise money and invest for reasons discussed in Section 6.2. In other words, before elections, the village leaders did nothing, so disagreement among villagers was immaterial to public goods. After elections, village leaders tried to raise money to invest in public goods. This was harder to do in fractionalised villages, resulting in relatively lower provision in such villages, post-elections.

Timing of the effects

In order to ensure that the estimated effects are a consequence of the introduction of elections and not of spurious changes that may have occurred in the pre- or post-election periods, it is important to examine the timing of our estimated effects. We estimate the following equation:

$$y_{ijt} = \sum_{\tau=-3}^{4} \alpha_\tau e_{it\tau} + \sum_{\tau=-3}^{4} \beta_\tau (e_{it\tau} \times H_i) + \sum_{\tau=-3}^{4} \theta_\tau O_{it\tau} + \sum_{\tau=-3}^{4} \lambda_\tau (o_{it\tau} \times H_i) + \mu_t H_{ij} + \gamma X_{ijt} + t\theta_j + \delta_i + \rho_t + \epsilon_{it}$$

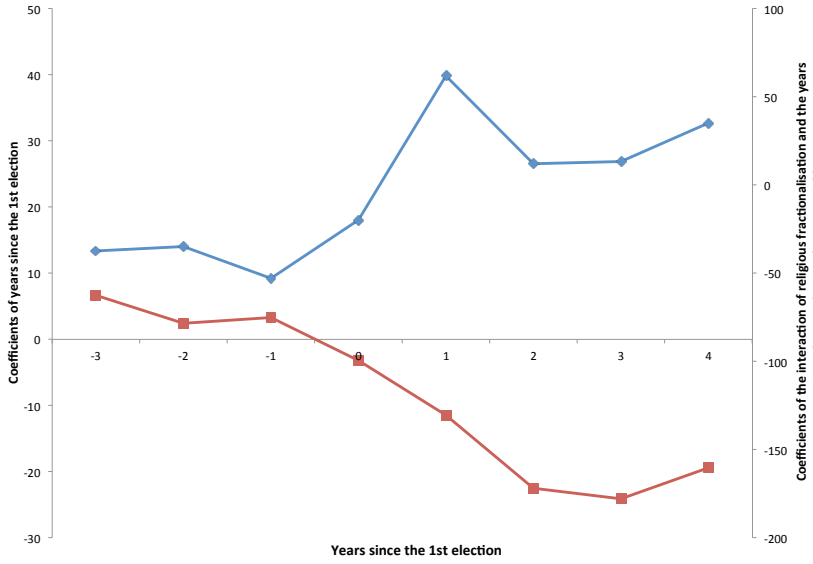
where $e_{it\tau} = 1$ if village i experienced the introduction of elections τ years ago in year t, and $o_{it\tau} = 1$ if village i experienced the introduction of open nominations τ years ago in year t. The other variables have the same notation as in the baseline equation.[20] α_τ is a vector of coefficients that capture the effect of the number of years since the first election for villages with zero fractionalisation ($H_i = 0$), and β_τ is a vector of coefficients that reflects the differential effect of elections between hypothesised villages with fractionalisation equal to 1 and villages with zero fractionalisation, for each year since the election. θ_τ and λ_τ are the analogous estimates for the introduction of open nominations.

For our identification strategy, we would like to establish that there are no pre-trends in public goods expenditure in the years leading up to the first election ($\hat{\beta}_\tau \approx 0$ when $\tau < 0$); that, for villages with no fractionalisation, the positive effect on public goods expenditure occurs with the introduction of elections ($\hat{\alpha}_\tau > 0$ when $\tau \geq 0$); and that public goods expenditure between homogenous and heterogeneous villages diverge when elections are introduced ($\hat{\beta}_\tau < 0$ when $\tau \geq 0$).

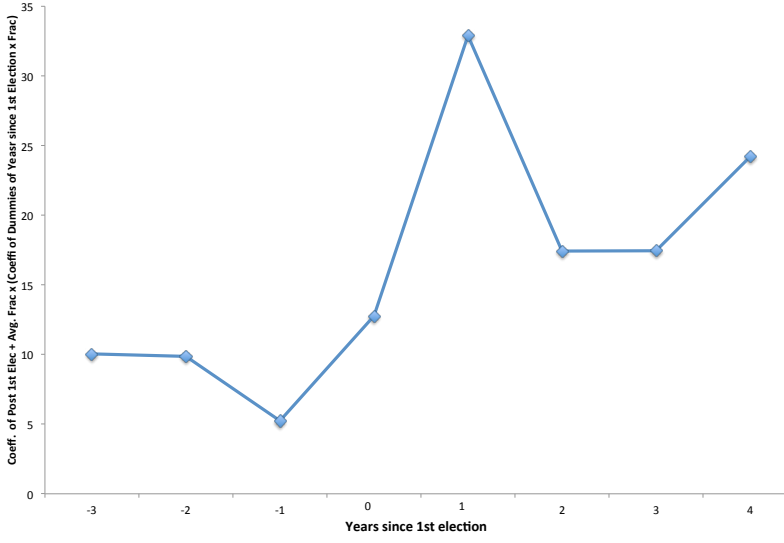
The coefficients of the dummy variables for the years since the first election and the coefficients of their interaction with religious fractionalisation are

Figure 6.2: The estimated effects on government public goods expenditure for each year since the first election

a. The coefficients for villages where fractionalisation = 0 and the differential effects between villages where fractionalisation = 0 and fractionalisation = 1



b. The effect for the average village with fractionalisation = 0.053



plotted in Figure 6.2a (on two different vertical axes for presentational purposes).[21] It shows that there is no pre-trend in government spending on public goods in the years leading up to the first election for either homogenous or heterogeneous villages. Consistent with the 'parallel trends' assumption, the pre-election coefficients move in parallel between the two types of villages. The spending in the two types of villages diverge exactly when elections were introduced – they increased for very homogenous villages and decreased for very heterogenous villages. These estimates provide strong support for our identification strategy and interpretation.

In Figure 6.2b, we plot the effect of elections on public goods provision over time for the village with the average level of fractionalisation ($\hat{\alpha}_\tau + 0.053\hat{\beta}_\tau$). This number shows that the average village experienced no change in public goods expenditure over time prior to the introduction of elections, but then experienced an increase when elections were introduced. The large increase in the first year after elections are introduced may reflect the newly elected government's response to latent demand for public goods. However, the important fact to note is that, although spending is somewhat lower in the second and third years after the first election, all post-election spending is nevertheless positive and much higher than pre-election years.[22]

Public goods provision and private expenditure

Our main results focus on public goods expenditure mainly because the data quality for this measure is better than for the data on public good provision. However, we are able to proxy for the provision of two public goods that together approximately constitute a quarter of total public goods expenditure by the village government; we proxy for irrigation with the amount of arable land in a village, and for schooling with primary school enrolment rates. This is based on the logic that increases in spending on irrigation should increase the amount of arable land and increases in spending in schooling should increase enrolment rates. In our sample, 83 per cent of the villages have a school and 94 per cent of these are primary schools (the others are middle schools). These data are not available for all years, which reduces the precision of our estimates. Table 6.2 columns 2 and 3 show that the estimated interaction effect of religious fractionalisation and the introduction of elections on these proxies for provision are negative and the main effects of the introduction of religion are positive, as in the baseline equation, restated in column 1. The interaction effects are statistically significant at the 15 per cent and 10 per cent levels. These results suggest that actual public good provision followed the same pattern as recorded expenditure and support our interpretation of changes public goods expenditure as reflecting changes in public goods provision.

Note that an interesting implication of the changes in provision is that the increase in public expenditure is unlikely to have completely crowded-out private expenditure on public goods. If there is complete crowd-out, we

Table 6.2: The effect of religious fragmentation × the introduction of elections on public goods provision and private expenditure

	Dependent variables						
	(1) Total government public expenditure	(2) Ln arable land	(3) Primary school enrolment rate	(4) Household expenditure on agricultural products	(5) Ln arable land	(6) Household expenditure on schooling	(7) Primary school enrolment rate
Dependent variable mean	**14.28**	**7.35**	**96.42**	**8.81**	**7.95**	**5.19**	**96.8**
Post 1st election × Religious fractionalisation	−107.4** (46.84)	−4.204 (2.864)	−30.02* (17.06)	−95.93** (36.68)	−8.511*** (2.847)	11.98** (4.827)	−6.422 (10.35)
Post 1st election	20.73** (9.351)	0.145* (0.0809)	1.752* (1.056)	10.73 (9.491)	0.391 (0.239)	−2.186 (1.415)	0.589 (1.25)
Observations	4340	3291	2682	873	769	873	841
R-squared	0.117	0.873	0.311	0.551	0.914	0.835	0.303

Notes: All regressions control for post-open nomination and its interaction with religious fractionalisation and the full set of baseline controls: religious fractionalisation*year FE, the share of religious population*year FE, village population, province–year trends, and village and year FE. The standard errors are clustered at the village level. Columns 1–3 use data from all village. Columns 4–7 use data from villages for which we have household-level data. The number of observations vary across columns 1–3 and across columns 4–7 because data on arable land and school enrolment is not available for every year.

should observe no change in provision.[23] For a third of the sample, we can investigate this more directly by examining private expenditures on irrigation and schooling as outcomes in columns 4 and 6 (columns 5 and 7 repeat the estimates for public goods provision on a similarly restricted sample of villages for comparison purposes). Column 4 shows that household expenditures parallel public expenditure for irrigation, but, interestingly, this is not the case for expenditure in schooling, in column 6. For the latter, it seems that there is some substitution of public and private expenditure.

Interpreting the results – local funds for public goods

The main results show that elections increased public goods expenditure, but that this increase was smaller in fragmented villages. Following the discussion in Section 6.2, we interpret our results as evidence that voter heterogeneity causes elected governments to be unwilling or unable to finance public goods. In Table 6.3, we examine alternative explanations that might threaten this interpretation.

First, we examine government expenditure on public goods separately according to the source of the funds. A comparison of columns 1 and 2 shows that the main results on total public goods is entirely driven by financing from villagers. In contrast, column 3 shows that there is no effect on funds from the upper government. Consistent with our interpretation, this provides strong evidence that the effect of heterogeneity is local to the village and that elections were not confounded with other reform at higher levels of government.

Column 4 examines tax payments made by households to local governments. Unfortunately, this measure includes payments to the county and township as well as to the village governments and is only available for a third of the villages in our sample. Nevertheless, it is interesting to note that the signs of the main effect and interaction effect are consistent with those in columns 1–3. This estimate is insignificant but it also points in the direction of our interpretation.

We interpret religious fragmentation as a proxy for reduced cross-group social capital caused by social clustering along religious lines. While we cannot test for this directly, we can investigate whether there is a difference in terms of the presence of social organisations between homogeneous and heterogeneous villages. The VDS survey measures the presence of organisations that are voluntary, do not exclude any villager, and are partly or wholly funded and organised by villagers. Approximately 14 per cent of our village–year observations have at least one such organisation. Column 5 shows that the interaction effect on voluntary village-wide social organisations is large in magnitude and negative in sign. However, it is not statistically significant. Thus, we interpret this as weak suggestive evidence consistent with heterogeneous villages having reduced village-wide social capital also after the introduction of elections.

Table 6.3: The effect of religious fragmentation × the introduction of elections on public goods expenditure from villagers and election quality

	Dependent variables				
	(1) All	(2) Villagers	(3) Non-villagers	(4) Township and county governments	(5) Voluntary social organisation dummy
Dependent variable mean	**14.279**	**9.769**	**4.422**	**176.19**	**0.143**
Post 1st Election × Religious Fractionalisation	−107.4** (46.84)	−97.20** (48.55)	−11.53 (11.68)	−54.99 (193.9)	−0.777 (0.566)
Post 1st Election	20.73** (9.351)	21.09** (9.586)	−0.159 (2.074)	32.71 (24.69)	0.0157 (0.0279)
Observations	4340	4340	4340	1300	3900
R-squared	0.117	0.107	0.076	0.573	0.805
SUR: p-value	0.047				

Alternative mechanisms

An obvious alternative to our preferred interpretation is that the central government changed public goods targeting when elections were introduced such that it favoured homogenous villages. However, our finding that the interaction effect of the introduction of elections and fractionalisation on public goods expenditures financed with funds from the upper government is 0 makes this alternative highly unlikely.

Another potential threat for our interpretation is that our main results may be driven by poor implementation of the electoral reforms in fragmented villages. For instance, this would be the case if the limited interaction across religions makes it more difficult to inform villagers of proper electoral procedures, and therefore allows more corrupt elections. If this were true, then the correct interpretation of our main results would be that heterogeneous communities underwent less formal institutional change. To investigate this hypothesis, we collected data on the occurrence of the most common aberrations in elections from village records. These include the presence of roving ballot boxes, not having anonymous ballots, and allowing voting by proxy without a signed permission form by the individual who is away. We create a dummy variable that equals 1 if any of these aberrations occurred. In our sample, 85 per cent of the observations have poor-quality elections. We examine this variable as the dependent variable in our main estimating equation. Table 6.4 column 1 shows that the coefficient of the interaction term between fractionalisation and post-first election is very small in magnitude and statistically insignificant. Thus, we conclude that our estimates are not driven by differences in electoral quality between heterogeneous and homogenous villages.

Similarly, we can examine other political outcomes that may reflect the quality of elections such as voter participation or the probability that the newly elected VC was persecuted during the Cultural Revolution, was from a family that was officially classified as a rich farmer or landlord in the initial communist land reforms during the early 1950s, or was a party member before entering office. As a placebo, we can also examine the characteristics of the party secretaries (PSs), who were not directly affected by elections. These data are recorded by the VDS and vary slightly in the number of observations because records were not always available. The estimates in columns 2–8 are all statistically zero. There is no evidence that elections were implemented or interpreted differently across villages of different levels of heterogeneity. Consistent with the anecdotal evidence, there is no effect on the PSs.

Finally, note that mean reversion is extremely unlikely to have caused our results, since we find that there is little difference in pre-election public goods expenditure between homogeneous and heterogeneous villages (Table 6.4 column 2).

Table 6.4: The effect of religious fragmentation × the introduction of elections on electoral quality and village leader characteristics

	(1) Electoral procedure error dummy	(2) Voter participation (%)	(3) VC was persecuted during Cultural Revolution	(4) PS was persecuted during Cultural Revolution	(5) VC family was rich farmer or landlord in 1949	(6) PS family was rich farmer or landlord in 1949	(7) VC was party member before entering office	(8) PS was party member before entering office
Dependent variable mean	**0.85**	**74.11**	**0.05**	**0.05**	**0.21**	**0.17**	**0.72**	**0.94**
Post 1st Election × Religious Fractionalisation	0.214 (0.291)	−7.253 (8.455)	0.022 (0.557)	−0.0108 (0.183)	0.594 (0.624)	0.368 (0.355)	−0.428 (1.271)	0.115 (0.155)
Post 1st Election	−0.213*** (0.0561)	87.59*** (1.854)	0.0614 (0.053)	0.0197 (0.025)	0.113* (0.0659)	0.0114 (0.0465)	0.0358 (0.169)	−0.00702 (0.0226)
Observations	4196	4112	3658	3984	3677	4004	3641	4024
R-squared	0.628	0.961	0.625	0.657	0.607	0.687	0.538	0.774

Notes: All regressions control for post-open nomination and its interaction with religious fractionalisation and the full set of baseline controls: religious fractionalisation*year FE, the share of religious population*year FE, village population, province–year trends, village FE and year FE. The standard errors are clustered at the village level.

6.5 Robustness

We examine five possible issues for the robustness of our analysis – mismeasurement of religious composition; breaking down fractionalisation; correlates of religious fractionalisation; additional controls; and sample selection.

Mismeasurement of religious composition

The NFS data on religious composition do not distinguish between Catholics and Protestants and only report officially sanctioned religions, which will cause individuals who follow folk religion to be miscategorised as non-religious. These errors in measurement will likely cause our data to understate fragmentation.

To address this, we construct an alternative measure of fractionalisation using the most reliable data available on actual religious populations in China. These data are collected by anthropologists, ethnographers, and sociologists and are only available at the national level. Lai (2003) summarises these estimates, which we report in Table A1 of this chapter's Supplementary Materials.[24] Column 6 shows that, according to these estimates, our data may underreport Buddhism (Mahayana) by 46.6 per cent and Christianity by 66.7 per cent (where Protestants are underreported by 67 per cent and Catholics are underreported by 100 per cent). They also show that approximately 28.5 per cent of Christians are Catholics.

To impute the true religious population, we first divide Christians in each village into two categories – Protestants and Catholics, where we assume that 28.5 per cent of the Christian population is Catholic. Then, we adjust the number of religious individuals for each group by the estimated difference shown in column 6. Then we add the category of folk religion by assuming that 20 per cent of the total village population follow folk religious practices. The descriptive statistics for the imputed measures are shown in the Supplementary Materials Table A1 columns 7–9. A comparison with the measures constructed from the raw NFS data shows that the share of all religious population increases from approximately 5 per cent to 26 per cent. Average fractionalisation increases from approximately 0.053 to 0.2. Note that the cross-sectional correlation between the imputed measure of religious fractionalisation and the reported measure is 0.71 and is statistically significant at the 1 per cent level.

We re-estimate the baseline equation using the imputed measure of religious fractionalisation. Table 6.1 column 7 shows that the estimated interaction effect of fractionalisation and the introduction of elections is very similar to the baseline estimate, which we restate in column 1. It is also statistically significant at the 5 per cent level.

A shortcoming of our imputation exercise is that it attributes mismeasurement equally across all villages. To be cautious, we have conducted several alternative imputations where we assigned higher mismeasurement to villages that gained more from elections. For example, we can divide the villages into two groups according to whether they are in the top half or bottom half in terms of the gains in public goods from elections. We can then assume that

religious composition is correctly reported by the NFS for the bottom half, but use the imputed measures for the top half, and re-estimate the baseline equation. This exercise yields very similar results as the ones presented.[25] We conclude that it is highly unlikely that our main results are driven mismeasurement of the religious population.

Breaking down fractionalisation

The fractionalisation index (or any measure of fragmentation) is a function of the number of groups and the distribution of the population shares across groups. In Table 6.5, we attempt to 'decompose' the fractionalisation index to examine whether our main results are driven by the number of groups, the distribution of groups sizes, or the combination of the two. We use several alternative ways to measure the number and sizes of the groups.[26] The results in columns 2–3 show that the number of groups does not interact with the introduction of elections. In columns 4–6, the interaction effects of elections with the standard deviation of groups sizes and the size of the largest group and have large but statistically insignificant coefficients. Together with the fact that our main interaction effect is always negative and similarly large in magnitude as the baseline in column 1, these results show that the fractionalisation index captures the combined effects of the number of groups and the distribution of group sizes, and is not driven by one component.

To check the sensitivity of the fractionalisation index to any particular religion, we can alternatively omit each religion and recalculate the fractionalisation index. Note that this does not require omitting observations. We simply group the given religion with non-religious individuals. In results available from the authors, we find that our estimates are similar in sign and statistically similar in magnitude to the baseline regardless of which religion we ignore.

Correlates of religious fractionalisation

The baseline controls of the interaction of average fractionalisation and year fixed effects control for *all* differences between fragmented and less fragmented villages in a way that is fully flexible over time. However, to fully eliminate concerns of omitted variable bias, it is important to show that our main effect is robust to allowing these correlates to have a differential effect when elections are implemented.

The correlates, shown in Table A2 of this chapter's Supplementary Materials,[27] are: the average share of villagers that belong to any religion, the presence of a village temple, the number of temples historically in the same county, dummy variables for whether the village is in a hilly or mountainous area, and average pre-election household income for the 10th-, 50th-, and 90th-percentile households.[28]

Table 6.5: The effect of religious fragmentation × the introduction of elections, the number of religious groups × the introduction of elections, and the distribution of religious group sizes × the introduction of elections

	Government public goods expenditure						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Post 1st Election × Religious Fractionalisation	−138.7 (61.41)	−191.7 (195.1)	−192.3 (264.5)	−172.6 (75.86)	−302.6 (179.5)	−168.3 (74.22)	−470.7 (242.4)
Post 1st Election × number of Religious Groups	8.934 (6.225)						10.19 (6.553)
Post 1st Election × number of Religious Groups (excl Non-Religious)		29.11 (33.15)					
Post 1st Election × Std. Dev. of Group Size			−239.5 (716.9)				−407.7 (241.3)
Post 1st Election × Std. Dev. of Group Size (excl Non-Religious)				144.8 (95.14)			
Post 1st Election × Pop Share of Largest Group					−241 (183.4)		
Post 1st Election × Pop Share of Largest Group (excl Non-Religious)						66.93 (44.83)	
Post 1st Election	10.03 (7.134)	−21.5 (36.14)	128.1 (320.3)	21.35 (9.475)	263.1 (188.5)	21.29 (9.452)	418.4 (242.3)
Observations	4340	1880			4340		
R-squared	0.119	0.141	0.117	0.117	0.117	0.117	0.12

Notes: All regressions control for post-open nomination and its interaction with religious fractionalisation and the full set of baseline controls: religious fractionalisation*year FE, the share of religious population*year FE, village population, province–year trends, village FE, and year FE. In addition, all regressions control for the interaction of post-open nominations and the relevant explanatory variable. The standard errors are clustered at the village level. The explanatory variables are the following. In column 1, we measure the number of religious groups as reported by the NFS data. In column 2, we measure the number of groups according to our imputed measures. In column 3, we calculate the standard deviation of groups sizes using the NFS data. In column 4, we calculate the standard deviation of groups for the religious population (non-religious individuals do not enter into this measure). In column 5, we calculate the population share of the largest group. In column 6, we calculate the population share of the largest group that is not the non-religious group.

Table 6.6: The effect of religious fragmentation × the introduction of elections – robustness to controlling for the correlates of religious fragmentation

	Dependent variable: total government public goods expenditure													
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Post 1st Election × Religious Fractionalisation	−107.4 (46.84)	−126.7 (61.15)	−162.9 (68.46)	−117.7 (51.16)	−89.63 (41.30)	−110.1 (48.19)	−106.2 (47.12)	−105.3 (46.97)	−100.7 (42.60)	−99.17 (43.20)	−109 (49.85)	−108.2 (47.76)	−132 (59.02)	−158 (69.14)
× Share of All Religious Population		24.87 (27.76)												
× Temple			49.85 (23.09)											42.25 (20.43)
× Temple in 1820				17.29 (13.92)										−12.91 (13.65)
× Hilly					−12.68 (17.30)									−9.815 (17.52)
× Mountainous					−18.82 (18.15)									8.864 (12.81)
× Surname Fractionalisation						41.62 (33.76)								5.54 (46.81)
× Surname Polarisation							−15.73 (56.82)							
× Pop Share of Top 2 Surnames								−17.81 (32.77)						−23.51 (55.61)

(Continued)

Table 6.6: Continued

	Dependent variable: total government public goods expenditure													
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
× Lineage Group									39.94 (16.96)					23.23 (15.07)
× Avg Pre-Election Tot Gov Pub Goods Exp										2.292 (1.198)				−1.37 (1.257)
× Average Pre-Election HH Income (10th Percentile)											0.0147 (0.0263)			0.0227 (0.0244)
× Average Pre-Election HH Income (50th Percentile)											−0.0208 (0.0219)			−0.0162 (0.0172)
× Average Pre-Election HH Income (90th Percentile)											0.00516 (0.00384)			0.00179 (0.00207)
× Average Pre-Election Gini												42.16 (98.56)		24.6 (149.7)
× Village Population													0.151 (0.0484)	0.109 (0.0403)
Post 1st Election	20.73 (9.351)	20.75 (9.400)	7.797 (4.681)	11.95 (6.827)	27.54 (16.26)	−6.754 (20.03)	30.83 (34.52)	29.88 (21.97)	0.733 (5.060)	12.2 (7.139)	30.12 (14.76)	9.004 (25.45)	−41.3 (16.00)	−30.83 (68.71)
Observations	4340	4340	4340	4340	4340	3880	3880	4340	4340	4340	4340	4340	4,340	3,880
R-squared	0.117	0.117	0.124	0.119	0.119	0.119	0.119	0.117	0.123	0.121	0.124	0.118	0.131	0.142

In addition, we also control for other potentially important factors: surname fragmentation, the presence of a lineage group (for example, the presence of a family that has an ancestral hall or family tree), the population share of the two most popular surnames, the pre-election average public goods expenditure, the pre-election average Gini coefficient, and village population each interacted with the introduction of elections and open nominations.[29]

The estimates for these tests are shown in Table 6.6. In column 2 we omit our usual baseline controls of the interaction of the average share of villagers that belong to any religion and year fixed effects when we control for the interaction of post-election and the average share of villagers that belong to any religion due to collinearity. In column 14, we control for all of these interactions in one equation (except the interaction of surname polarisation because it is highly correlated with surname fractionalisation, and the interaction of the average share of villagers that belong to any religion because it is highly correlated to our baseline controls that interact the same variable with all year fixed effects). Our main result is very robust and similar to the baseline, which we restate in column 1. This provides strong evidence that our main results are not driven by spurious correlations.

There are several interesting results to note in addition to the robustness of our main results. First, the interaction of surname fragmentation and the introduction of elections is small in magnitude and statistically insignificant. This suggests that religion is more important as a factor of social clustering in rural China than extended kinship networks in the context of the effectiveness of elections for increasing public goods.[30]

Additional controls

In Table 6.7 columns 2–4, we control for additional factors that could potentially influence the effect of elections on public goods: the interaction of a dummy variable indicating that a village is a suburb of an urban area and year fixed effects; a dummy variable indicating that the Tax and Fee Reform has been introduced; and a dummy variable for whether a village ever experienced an administrative merger interacted with year fixed effects. In columns 5 and 6, we alternately control for quadratic and cubic province–time trends.

In column 7, we control for all of the additional variables in columns 2–4 simultaneously. The estimates show that our main result is robust to controlling for any or all of these additional controls. In column 8, we omit the control for the introduction of open nominations. The results are nearly identical to the baseline. Finally, in column 9, we check whether the main results are driven by electoral accountability. We omit all years following an uncompetitive election (that is, where the number of candidates did not exceed the number of positions). The effects are, if anything, more pronounced than the full sample baseline estimate, which is consistent with the importance of electoral accountability.

Table 6.7: The effect of religious fragmentation × the introduction of elections – robustness to additional controls

	Dependent variable: total government public goods expenditure								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9) ~
Post 1st election × Religious fragmentation	−107.4** (46.84)	−97.64** (45.64)	−104.6** (46.54)	−105.0** (47.05)	−107.4** (46.85)	−107.4** (46.86)	−92.67 (45.43)	−106.3** (46.24)	−127.5** (55.21)
Post 1st Election	20.73** (9.531)	20.41** (9.390)	20.46** (9.207)	20.09** (9.705)	20.72** (9.348)	20.71** (9.345)	19.62** (9.621)	21.13** (9.858)	25.65** (11.16)
Controls Near City*Year FE	N	Y	N	N	N	N	Y	N	N
Post Tax and Fee Reform	N	N	Y	N	N	N	Y	N	N
Ever Merged*Year FE	N	N	N	Y	N	N	Y	N	N
Province–Year Squared	N	N	N	N	Y	N	N	N	N
Province–Year Cubic	N	N	N	N	N	Y	N	N	N
Open Nominations × Religious Fractionalisation	Y	Y	Y	Y	Y	Y	Y	N	Y
Observations	4340					4340			3,586
R-squared	0.117	0.123	0.118	0.122	0.117	0.117	0.129	0.117	0.149

Notes: All regressions control for the full set of baseline controls: religious fractionalisation*year FE, the share of religious population*year FE, village population, province–year trends, village FE and year FE. Regressions in columns 1 to 7, and 9 also control for post-open nomination and its interaction with religious fractionalisation. 'Y' and 'N' indicate the inclusion or exclusion of controls. The standard errors are clustered at the village level. Additional sample restrictions are stated in the column headings.
~ In Model 9 the years after uncompetitive elections are omitted.

Table 6.8: The effect of religious fragmentation × the introduction of elections – robustness to sample selection

	Dependent variable: total government public goods expenditure				
	(1) Full sample, baseline	(2) Omit if Religious Share = 0	(3) Omit if Religious Fractionalisation = 0	(4) Dep variable is a dummy for Gov Pub Exp > 0	(5) Omit if Pub Goods Exp = 0
Post 1st Election × Religious Fractionalisation	−107.4 (46.84)	−174.9 (88.57)	−174.9 (88.49)	−0.272 (0.161)	−135.2 (226.5)
Post 1st Election	20.73 (9.351)	33.64 (17.5)	33.66 (17.48)	0.0708 (0.0278)	51.59 (33.52)
Observations	4340	3280	3300	4340	954
R-squared	0.117	0.111	0.111	0.194	0.346

Notes: All regressions control for post-open nomination and its interaction with religious fractionalisation and the full set of baseline controls: religious fractionalisation*year FE, the share of religious population*year FE, village population, province–year trends, village FE and year FE. The standard errors are clustered at the village level.

Sample selection

In our context, the majority of the population is not religious, so one might be concerned that our results are mainly given by the comparison between fully atheist villages and the rest. Table 6.8 columns 2–3 show that our estimates are robust to the exclusion of villages with no religious population or zero fractionalisation. Similarly, public goods expenditures are not made every year, but the estimates in column 5 show that our results are robust to the exclusion of village–year observations that make no public goods expenditure. Alternatively, column 4 examines a dummy variable for whether any public expenditure is made. The estimated coefficients have the same sign as the main results in column 1. Thus, our main results on expenditures recorded reflect the frequency of expenditures as well as the total amount of expenditures. In summary, the results in this section show that the main results are extremely robust to a large set of additional controls and sensitivity checks.

Conclusions

Between 1970 and 2003, the average Polity Index for the world increased from approximately −2 to +3, meaning that the world as a whole experienced a dramatic increase in institutional openness. It is also true that this rise in democratisation was mainly driven by poor countries. Therefore, understanding the preconditions for successful democratisation and the underlying mechanisms must rank among the most important questions for researchers and policymakers in development economics and political economy.

This study takes a first step in providing rigorous empirical evidence on the necessary preconditions for successful democratisation in the context of grassroots elections in rural China and local public goods provision. The centrally determined electoral reforms in China provide a stark example of how an identical reform can have very different effects depending on the pre-existing level of voter heterogeneity. Specifically, we find that voter heterogeneity – that is, religious fragmentation – significantly reduces the gains from introducing elections.

The findings suggest that the dominant force behind the differential effects of elections in heterogeneous versus homogeneous villages was that elections increased the accountability of local governments towards villagers; this increase was larger in homogeneous villages owing to their capacity to better monitor the leader. In addition, the elected village leader was induced to implement policies that reflected the underlying preferences of villagers for public goods. It is particularly noteworthy that our main result on total government public goods expenditure is entirely driven by differences in expenditure financed by villagers. Neither the introduction of elections nor its interaction with religious fragmentation has any effect on expenditure financed by other revenue sources.

A general lesson from our results is that preconditions are very important for determining the impact of institutional reforms. Since the influence of religion

in China has been significantly weakened by the historical presence of a strong secular state, our estimates provide a striking illustration of a high lower bound on the influence of social fragmentation on elections and public goods.

Generalisations aside, we believe that understanding the determinants of the impact of electoral reforms in China is inherently important, since they are among the largest democratisation reforms in history and have changed the lives of almost one billion individuals. For those interested in the social organisation of rural China, our findings identify religion as an important dimension for group clustering during the post-Mao era. Indeed, we find that religion has overtaken other important traditional differences such as those across kinship groups.

There are two important caveats to keep in mind for interpreting our results. First, when attempting to extrapolate our results to other contexts, it is important to realise that the estimated sign and magnitude of the interaction effect are specific to our context. For example, we interpret the increase in public goods expenditure as beneficial because of the severe under-provision of public goods prior to the introduction of elections. Had public goods expenditure been excessive relative to demand from villagers prior to the electoral reforms (for example, high taxation and elite rent-seeking), the increased accountability caused by elections would reduce public goods expenditure on average, and would cause the interaction with heterogeneity to be positive. Second, although the severe under-provision of public goods prior to the electoral reforms is consistent with elections improving efficiency and heterogeneity reducing it, the inability to measure demand or total public goods provision means that welfare assessments are beyond the scope of this chapter. This is an important topic for future research.

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Endnotes

Supplementary material for this chapter is available on LSE Press's Zenodo site (https://zenodo.org/communities/decentralised_governance/). See: *Supplementary*

materials for: Monica Martinez-Bravo, Gerard Padró i Miquel, Nancy Qian, and Yang Yao (2023) 'Social fragmentation, public goods and local elections: evidence from China', in Jean-Paul Faguet and Sarmistha Pal (eds) *Decentralised Governance: Crafting Effective Democracies Around the World*, London: LSE Press. https://doi.org/10.5281/zenodo.7920700

[1] See *Supplementary materials for*: Monica Martinez-Bravo, Gerard Padró i Miquel, Nancy Qian, and Yang Yao (2023) 'Social fragmentation, public goods and local elections: Evidence from China', Chapter 6 in Jean-Paul Faguet and Sarmistha Pal (eds) *Decentralised Governance: Crafting Effective Democracies Around the World*, London: LSE Press. https://doi.org/10.5281/zenodo.7920700

[2] There is a large body of literature that finds a negative relationship between social heterogeneity and public goods in different contexts. Please see the discussions towards the end of the introduction and in Section 6.2.

[3] We discuss the re-emergence of religion in rural China in the chapter's Supplementary Materials. We do not have reliable data for other dimensions of heterogeneity such as the education composition of villagers, and income is not a stable dimension of social clustering since elections may have caused income redistribution. Another potentially relevant dimension of heterogeneity in this context is kinship networks. However, several studies by sociologists find that extended kinship networks have become less important in China over time owing to factors such as the collectivization of agriculture during the Maoist era and the rapid economic growth and social modernization that followed (for example, Cohen 1992; Jiang 1995). For completeness, we will examine the influences of fragmentation along kinship lines and other sources of heterogeneity such as pre-election income after we present the main results on religious fragmentation.

[4] In most of the chapter, we measure fragmentation by constructing an index of fractionalization. This particular choice of measurement is not important for our results, which are robust to using an alternative polarization index. This is shown and discussed in more detail later in the chapter. See Alesina et al. (2003), Duclos, Esteban, and Ray (2004), Esteban and Ray (2007), and Montalvo and Reynal-Querol (2005) for discussions of the different measures of fragmentation.

[5] Please see the discussion in Section 6.2.

[6] The seminal paper in the cross-sectional literature is Alesina, Baqir, and Easterly (1999), which generated a literature that is surveyed in Alesina and Ferrara (2005). Luttmer (2001) and Alesina and La Ferrara (2002) found that fragmentation affects preferences towards neighbors. See also Munshi, Rosenzweig and Wilson (2010) for an analysis of the origin and transmission of fragmentation in the United States.

[7] See also Glennerster, Miguel, and Rothenberg (2010) and Dayton-Johnson (2000) for analyses of this relationship in Sierra Leone and Mexico, and Habyarimana et al. (2007) for an experimental study in Uganda. Our study is loosely related to cross-country studies of the relationship between ethnic/linguistic/religious fragmentation and macroeconomic performance that was pioneered by Easterly and Levine (1997). See also Desmet, Ortuno-Ortin, and Wacziarg (2009) and Alesina et al. (2003).

[8] See for instance the recent release of the first Spatial Explorer of Religion (accessible at http://chinadataonline.org/religionexplorer), a joint initiative of Purdue University and University of Michigan.

[9] See *Supplementary materials*, https://doi.org/10.5281/zenodo.7920700

[10] For example, Guiso, Sapienza, and Zingales (2003) found that religious people are more intolerant of diversity than non-religious ones regardless of the type of religion, although some religions are worse than others.

[11] This has been documented historically in mainland China (for example, Yang 1961, pp.98, 158) and in a modern context in Taiwan (for example, Deglopper 1975, p.65). Unfortunately, our data does not allow us to identify the geographic location of households within villages.

[12] For a review of reasons why democracy works better in high social capital environments, see Boix and Posner (1998). See also Banerjee and Pande (2007), Bandiera and Levy (2010), and Padró i Miquel (2007) for other reasons strongly fragmented polities find it difficult to keep elected leaders accountable.

[13] We can alternatively control for distance to the coast interacted with year fixed effects, province GDP, province GDP growth, or other province-level time-varying controls. The estimates are very similar and we do not present these alternative results for brevity. They are available upon request.

[14] For administrative reasons, the 2011 wave includes only 195 of the original villages.

[15] See *Supplementary materials*, https://doi.org/10.5281/zenodo.7920700

[16] Workers in China often migrate temporarily for work. However, the household registration system (known as *hukou* or *huji*) that ties access to public goods and government benefits makes permanent migration costly. Also, rural residents are also disincentivized to migrate permanently away because that results in the loss of the right to farmland.

[17] Please see Table A.2 in the Supplementary Materials. One may also be concerned that religious fragmentation is affected by the implementation or the competitiveness of elections. In results available from the authors we show that there is no correlation between fragmentation and procedural aberrations or the competitiveness of elections.

[18] We do not control for fractionalisation and polarisation simultaneously owing to their high correlation. Hence, our results cannot distinguish the role of cross-group conflict from the other mechanisms discussed in Section 6.2. However, the lack of documented open conflict between religious groups in the provinces of our study suggests that the most plausible mechanism behind the deleterious effect of heterogeneity on elections is given by the interaction of the lack of trust, empathy and divergent preferences with the increase in accountability brought about by the reform.

[19] The results are also similar if we exclude the open nominations controls. They are available upon request.

[20] Note that, although we examine a similar window of time before and after each reform for consistency, we do not exclude any observation. Instead, we follow convention to maximize the information in our estimation and group all of the observations that are four or more years prior to the first reform together, and they constitute the reference group; and, similarly, we group all of the observations that are four or more years after the reform together.

[21] Results in the form of regression tables are available upon request.

[22] Our main pre–post estimates are very similar when we exclude the first year after the first election. For brevity, these estimates are not presented.

[23] See Hungerman (2007) and the studies referenced within for empirical evidence on private-expenditure crowd-out in other contexts. See our Online Annex for details on private provision of public goods.

[24] See *Supplementary materials*, https://doi.org/10.5281/zenodo.7920700

[25] We tried several alternative ways of assigning mismeasurement differentially across villages. For example, we can only adjust the number of Catholics upwards in the provinces known to have more Catholics (Hebei, Shaanxi, Guangxi, Gansu, and Xinjiang (Lai 2003)). Regardless of how we adjust the data, the results are always very similar. For brevity, they are not reported but are available upon request.

[26] In column 1, we measure the number of religious groups as reported by the NFS data. In column 2, we measure the number of groups according to our imputed measures. In column 3, we calculate the standard deviation of groups sizes using the NFS data. In column 4, we calculate the standard deviation of groups for the religious population (non-religious individuals do not enter into this measure). In column 5, we calculate the population share of the largest group. In column 6, we calculate the population share of the largest group that is not the non-religious group.

[27] See *Supplementary materials,* https://doi.org/10.5281/zenodo.7920700

[28] Controlling for the presence of temples is motivated by the concern that our main results may be confounded by the potential influence of other dimensions of social capital. Studies in political science such as Tsai (2007) interpret village temples as plausible proxies for social capital because they are not specific to any one religion and are used to worship a range of local deities by all villagers, are funded and maintained by voluntary villagers, and are an important venue for village events such as fairs, festivals, and public discussions. In short, functioning temples are civic organizations that could be behind the differential effect of elections.

[29] We use surname fragmentation and the presence of lineage groups to proxy for the presence of kinship networks, which are a historically important feature of rural life and could be another dimension of social clustering.

[30] Several scholars have observed that kinship networks have declined in importance relative to other dimensions of social clustering as China modernises (for example, Cohen 1992; Jiang 1995). The decline of the importance of kinship networks has also been observed for societies that are culturally Chinese outside the People's Republic of China. For example, in a description of villages in Taiwan during the 1970s, Deglopper (1975, p.65) states that '[n]eighborhoods … are composed of diverse populations who bear different surnames, who earn a living in different ways, and whose income ranges from high to very low. They have nothing in common except residence in an arbitrarily and rather vaguely defined area, and they do nothing in common except worship. This is because the other traditional social divisions – guilds and surnames – no longer matter today.'

References

Acemoglu, Daron and Robinson, James A. (2000) 'Why Did the West Extend the Franchise? Democracy, Inequality and Growth in Historical Perspective', *The Quarterly Journal of Economics*, vol.115, pp.1167–99. https://doi.org/10.1162/003355300555042

Acemoglu, Daron; Johnson, Simon; Robinson, James A.; and Yared, Pierre (2008) 'Income and Democracy', *American Economic Review*, vol.98, no.3, pp.808–42. https://doi.org/10.1257/aer.98.3.808

Alesina, Alberto; Baqir, Reza; and Easterly, William (1999) 'Public Goods and Ethnic Divisions', *The Quarterly Journal of Economics*, vol.114, no.4, pp.1243–84. https://doi.org/10.1162/003355399556269

Alesina, Alberto; Devleeschauwer, Arnaud; Easterly, William; Kurlat, Sergio; and Wacziarg, Romain (2003) 'Fractionalization', *Journal of Economic Growth*, vol.8, no.2, pp.155–94. https://doi.org/10.1023/A:1024471506938

Alesina, Alberto and La Ferrara, Eliana (2000) 'Participation in Heterogeneous Communities', *The Quarterly Journal of Economics*, vol.115, no.3, pp.847–904. https://doi.org/10.1162/003355300554935

Alesina, Alberto and La Ferrara, Eliana (2002) 'Who Trusts Others?' *Journal of Public Economics*, vol.85, no.2, pp.207–34. https://doi.org/10.1016/S0047-2727(01)00084-6

Alesina, Alberto and La Ferrara, Eliana (2005) 'Ethnic Diversity and Economic Performance', *Journal of Economic Literature*, vol.43, no.3, pp.762–800. https://doi.org/10.1257/002205105774431243

Bandiera, Oriana and Levy, Gilat (2010) 'Diversity and the Power of the Elites in Democratic Societies: A Model and a Test', STICERD Economic Organisation and Public Policy Discussion Papers Series 018, Suntory and Toyota International Centres for Economics and Related Disciplines, LSE. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1707855

Banerjee, Abhijit; Iyer, Lakshmi; and Somanathan, Rohini (2005) 'History, Social Divisions, and Public Goods in Rural India', *Journal of the European Economic Association*, vol.3, no.2–3, pp.639–47. https://doi.org/10.1162/jeea.2005.3.2-3.639

Banerjee, Abhijit and Pande, Rohini (2007) 'Parochial Politics: Ethnic Preferences and Politician Corruption', Discussion Papers 6381, C.E.P.R. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1136706

Banerjee, Abhijit and Somanathan, Rohini (2007) 'The Political Economy of Public Goods: Some Evidence from India', *Journal of Development Economics*, vol.82, no.2, pp.287–314. https://doi.org/10.1016/j.jdeveco.2006.04.005

Bardhan, Pranab and Mookherjee, Dilip (2006) 'Pro-poor Targeting and Accountability of Local Governments in West Bengal', *Journal of Development Economics*, vol.79, no.2, pp.303–27. https://doi.org/10.1016/j.jdeveco.2006.01.004

Besley, Timothy; Pande, Rohini; and Rao, Vijayendra (2012) 'Just Rewards? Local Politics and Public Resource Allocation in South India', *World Bank Economic Review*, vol.26, no.2, pp.191–216. https://doi.org/10.1093/wber/lhr039

Boix, Carles and Posner, Daniel N. (1998) 'Social Capital: Explaining Its Origins and Effects on Government Performance', *British Journal of Political Science*, vol.28, no.4, pp.686–93. https://doi.org/10.1017/S0007123498000313

Cameron, A. Colin; Gelbach, Jonah B.; and Miller, Douglas L. (2008) 'Bootstrap-Based Improvements for Inference with Clustered Errors', *The Review of Economics and Statistics*, vol.90, no.3, pp.414–27. https://doi.org/10.1162/rest.90.3.414

Chattopadhyay, Raghabendra and Duflo, Esther (2004) 'Women as Policy Makers: Evidence from a Randomized Policy Experiment in India', *Econometrica*, vol.72, no.5, pp.1409–43. https://doi.org/10.1111/j.1468-0262.2004.00539.x

Cohen, Myron L. (1992) 'Religion in a State Society: China', in *Asia Case Studies in the Social Sciences*, Armonk, NY: ME Sharpe, pp.17–31. https://doi.org/10.4324/9781315288178

Dayton-Johnson, Jeff (2000) 'Determinants of Collective Action on the Local Commons: A Model with Evidence from Mexico', *Journal of Development Economics*, vol.62, no.1, pp.181–208. https://doi.org/10.1016/S0304-3878(00)00080-8

Deglopper, Donald R. (1975) 'Religion and Ritual in Lukang', in Wolf, Arthur (ed.) *Religion and Ritual in Chinese Society*, Stanford, CA, and London: Stanford University Press.

Desmet, Klaus; Ortuno-Ortin, Ignacio; and Wacziarg, Romain (2009) 'The Political Economy of Ethnolinguistic Cleavages', NBER Working Papers 15360, National Bureau of Economic Research. https://www.nber.org/system/files/working_papers/w15360/w15360.pdf

Duclos, Jean-Yves; Esteban, John; and Ray, Debraj (2004) 'Polarization: Concepts, Measurement, Estimation', *Econometrica*, vol.72, no.6, pp.1737–72. https://doi.org/10.1111/j.1468-0262.2004.00552.x

Easterly, William and Levine, Ross (1997) 'Africa's Growth Tragedy: Policies and Ethnic Divisions', *The Quarterly Journal of Economics*, vol.112, no.4, pp.1203–50. http://www.jstor.org/stable/2951270

Esteban, Joan and Ray, Debraj (1994) 'On the Measurement of Polarization', *Econometrica*, vol.62, no.4, pp.819–51. https://doi.org/10.2307/2951734

Esteban, Joan and Ray, Debraj (1999) 'Collective Action and the Group Size Paradox', IEE Working Papers 23, El Instituto de Estudios Economicos de Galicia Pedro Barrie de la Maza 1999.

Esteban, Joan and Ray, Debraj (2007) 'A Comparison of Polarization Measures', UFAE and IAE Working Papers 700.07, Unitat de Fonaments de l'Analisi Economica (UAB) and Institut d'Analisi Economica (CSIC) https://ddd.uab.cat/record/45293

Ferraz, Claudio and Finan, Frederico (2008) 'Exposing Corrupt Politicians: The Effects of Brazil's Publicly Released Audits on Electoral Outcomes', *Quarterly Journal of Economics*, vol.123, no.2, pp.703–45. https://doi.org/10.1162/qjec.2008.123.2.703

Glennerster, Rachel; Miguel, Edward; and Rothenberg, Alexander (2010) 'Collective Action in Diverse Sierra Leone Communities', NBER Working Papers 16196, National Bureau of Economic Research. https://doi.org/10.3386/w16196

Guiso, Luigi; Sapienza, Paola; and Zingales, Luigi (2003) 'People's Opium? Religion and Economic Attitudes', *Journal of Monetary Economics*, vol.50, no.1, pp.225–82. https://doi.org/10.1016/S0304-3932(02)00202-7

Habyarimana, James; Humphreys, Macartan; Posner, Daniel N.; and Weinstein, Jeremy M. (2007) 'Why Does Ethnic Diversity Undermine Public Goods Provision?' *The American Political Science Review*, vol.101, no.4, pp.709–25. https://doi.org/10.1017/S0003055407070499

Hungerman, Daniel M. (2007) 'Diversity and Crowd-Out: A Theory of Cold-Glow Giving', NBER Working Papers 13348, National Bureau of Economic Research. https://doi.org/10.3386/w13348

Jiang, Lin (1995) 'Changing Kinship Structure and Its Implications for Old-Age Support in Urban and Rural China', *Population Studies*, vol.49, no.1, pp.127–45. https://doi.org/10.1080/0032472031000148286

Khwaja, Asim Ijaz (2009) 'Can Good Projects Succeed in Bad Communities?' *Journal of Public Economics*, vol.93, no.7–8, pp.899–916. https://doi.org/10.1016/j.jpubeco.2009.02.010

Lai, Hongyi Harry (2003) 'The Religious Revival in China', *Copenhagen Journal of Asian Studies*, vol.18, pp.40–64. https://doi.org/10.22439/cjas.v18i0.19

Lipset, Seymour Martin (1959) 'Some Social Requisites of Democracy: Economic Development and Political Legitimacy', *The American Political Science Review*, vol.53, no.1, pp.69–105. https://doi.org/10.2307/1951731

Lizzeri, Alessandro and Persico, Nicola (2004) 'Why Did the Elites Extend the Suffrage? Democracy and the Scope of Government with an Application to Britain's "Age of Reform"', *The Quarterly Journal of Economics*, vol.119, pp.707–65. https://doi.org/10.1162/0033553041382175

Luo, Renfu; Zhang, Linxiu; Huang, Jikun; and Rozelle, Scott (2010) 'Village Elections, Public Goods Investments and Pork Barrel Politics, Chinese-style', *Journal of Development Studies*, vol.46, no.4, pp.662–84. https://doi.org/10.1080/00220380903318061

Luttmer, Erzo F.P. (2001) 'Group Loyalty and the Taste for Redistribution', *Journal of Political Economy*, vol.109, no.3, pp.500–28. https://doi.org/10.1086/321019

Martinez-Bravo, Monica; Padró i Miquel, Gerard; Qian, Nancy; and Yao, Yang (2022) 'The Rise and Fall of Local Elections in China', *American Economic Review*, vol.112, pp.2921–58. https://doi.org/10.1257/aer.20181249

Martinez-Bravo, Monica; Padró i Miquel, Gerard; Qian, Nancy; Xu, Yiqing; and Yao, Yang (2015) 'Making Democracy Work: Formal Institutions and Culture in Rural China', Technical Report 21058, NBER Working Paper. https://gerardpadro.com/working-papers/scap_20170606.pdf

Miguel, Edward and Gugerty, Mary Kay (2005) 'Ethnic Diversity, Social Sanctions, and Public Goods in Kenya', *Journal of Public Economics*, vol.89, no.11–12, 2325–68. https://doi.org/10.1016/j.jpubeco.2004.09.004

Montalvo, Jose and Reynal-Querol, Marta (2005) 'Ethnic Diversity and Economic Development', *Journal of Development Economics*, vol.76, no.293–323. https://doi.org/10.1016/j.jdeveco.2004.01.002

Mu, Ren and Zhang, Xiaobo (2011) 'The Role of Elected and Appointed Village Leaders in the Allocation of Public Resources: Evidence from a Low-Income Region in China', IF-PRI Working Paper International Food and Policy Research Institute. http://www.ifpri.org/sites/default/files/publications/ifpridp01061.pdf

Munshi, Kaivan; and Rosenzweig, Mark (2008) 'The Efficacy of Parochial Politics: Caste, Commitment, and Competence in Indian Local Governments', NBER Working Papers 14335, National Bureau of Economic Research. https://doi.org/10.3386/w14335

Munshi, Kaivan; Rosenzweig, Mark; and Wilson, Nicholas (2010) 'Identity and Mobility: Historical Fractionalization, Parochial Institutions, and Occupational Choice in the American Midwest', Department of Economics Working Papers 2010–22, Williams College. https://core.ac.uk/download/pdf/6223838.pdf

Okten, Cagla and Osili, Una Okonkwo (2004) 'Contributions in Heterogeneous Communities: Evidence from Indonesia', *Journal of Population Economics*, vol.17, no.4, pp.603–26. https://doi.org/10.1007/s00148-004-0189-y

Olken, Benjamin A. (2010) 'Direct Democracy and Local Public Goods: Evidence from a Field Experiment in Indonesia', *American Political Science Review*, vol.2, pp.243–67. https://doi.org/10.1017/S0003055410000079

Padró i Miquel, Gerard (2007) 'The Control of Politicians in Divided Societies: The Politics of Fear', *The Review of Economic Studies*, vol.74, pp.1259–74. https://doi.org/10.1111/j.1467-937X.2007.00455.x

Tsai, Lily Lee (2007) *Accountability without Democracy: Solidary Groups and Public Goods Provision in Rural China*, New York: Cambridge University Press. https://doi.org/10.1017/CBO9780511800115

Vigdor, Jacob L. (2004) 'Community Composition and Collective Action: Analyzing Initial Mail Response to the 2000 Census', *Review of Economics and Statistics*, vol.86, no.1, pp.303–12. https://doi.org/10.1162/003465304323023822

Weber, M. (1968) *The Religion of China: Confucianism and Taoism*, New York: Free Press.

Yang, Ching Kun (1961) *Religion in Chinese Society: A Study of Contemporary Social Functions of Religion and Some of Their Historical Factors*, Los Angeles, CA: University of California Press.

Zhang, Xiaobo; Fan, Shenggen; Zhang, Linxiu; and Huang, Jikun (2004) 'Local Governance and Public Goods Provision in Rural China', *Journal of Public Economics*, vol.88, pp.2857–71. https://doi.org/10.1016/j.jpubeco.2003.07.004