Voter Heterogeneity and Public Goods: Evidence from Religious Fragmentation and Elections in China*

(Preliminary)

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Abstract

This study examines how heterogeneity in religious beliefs in rural villages interacts with the introduction of elections in determining local public goods. First, we document religious composition and the introduction of local elections in rural China during the post-Mao reform era. Then, to determine the extent to which pre-existing levels of voter heterogeneity interact with democratization in determining government spending on local public goods, we estimate the interaction effect of the introduction of village elections and religious fragmentation on government public goods expenditure. We find that elections increase government expenditure towards public goods, but the magnitude declines with religious fractionalization.

Key Words: Religion, Democracy, Elections

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1 Introduction

The economic literature has long recognized that heterogeneity in voter preferences may affect a government's ability to finance public goods. The interaction of voter heterogeneity with the introduction of elections, which increases accountability and improves information aggregation, is ambiguous *ex ante*. The traditional view that voter heterogeneity is associated with increased difficulty of coordination, inter-group conflict or outcomes aligned with the preferences of the median voter is likely to predict that elections generate smaller benefits in government provided public goods in regions with high levels of heterogeneity. This is because the counterfactual autocratic government is not directly accountable to voters and is therefore unhindered by heterogeneity. However, as elections also improve the aggregation of information, they can be more beneficial in regions with higher levels of voter heterogeneity. The effects of heterogeneity are potentially more binding when the government is democratically elected, since elected governments are more accountable to the preferences of voters relative to autocratic governments.

Our study addresses this question and investigates how pre-existing levels of voter heterogeneity influence the effect of the introduction of village elections on government spending and provision of local public goods in rural China. To the best of our knowledge, we are the first to explore this interaction effect.[1]

Village elections in China were introduced during the 1980s and 90s. The key motivation behind this reform was the desire to improve local governance. In particular, the central government was concerned about the deterioration of local public goods provision during the early reform era and believed that elections could make local leaders accountable to villagers. Thus, elections would incentivize village leaders to provide the appropriate amount of public goods as well as improve the monitoring of the village government.[2] In this paper, we hypothesize that, for the reasons

[1]The empirical evidence on the relationship between heterogeneity and public goods provision in the existing literature is mixed. For some examples, see Alesina et al. (1999), Alesina et al. (2004), Banerjee et al. (2001), Banerjee et al. (2005), Banerjee and Somanathan (2007), Bardhan et al. (2007), Dayton-Johnson (2000), Desmet et al. (2009), Glennerster et al. (2010), Habyarimana et al. (2007), Lizzeri and Persico (2001), Ray et al. (2007). Alesina and Ferrara (2005) reviews a large part of the literature. There is a large body of evidence on the influences of heterogeneity, constituency composition and group size more generally. Recent studies from developing countries include Banerjee and Pande (2007), Esteban and Ray (1999), Esteban and Ray (2001), Esteban and Ray (2011), Fafchamps et al. (1999) Munshi and Wilson (2010) and Munshi and Rosenzweig (2008). Also related are cross-country studies pioneered by Easterly and Levine (1997), which is reviewed by Patsiurko et al. (2012).

[2]See section 2 for a discussion on the policy reform. In our companion paper, Martinez-Bravo et al. (2011), we provide theoretical and empirical evidence that the introduction of elections successfully shifted accountability towards villagers and that villagers are better at monitoring the villager government than the upper-levels of government.

discussed earlier, the increase in government public goods expenditure is smaller for villages with higher pre-existing levels of heterogeneity.

The two main difficulties for the empirical analysis are the limited availability of data and the need to establish causality. There are no large sample panel data that include both democratization measures, voter heterogeneity, and reliable data on government public goods spending and provision. Our study addresses this difficulty by combining two sources of data. We conduct a large unique survey to construct a nearly nationally representative panel of villages across rural China for the years 1986-2005, the *Village Democracy Survey* (VDS). These data record the history of electoral reforms and detailed data on government public goods expenditure and the social structure of villages. We supplement this with additional demographic data from the *National Fixed Point Survey* (NFS), which is collected by the Ministry of Agriculture each year in the same villages as the VDS. The sample we use for analysis forms a panel of 217 villages for the years 1986-2005.

Our main measure of heterogeneity is religious fragmentation. This is motivated by the resurgence of religion in China in the reform era, the traditional alignment of rural Chinese along religious differences in determining local public goods, and the observation that the influence of traditional extended family networks has declined in recent years.[3] Following convention, we measure religious fragmentation by constructing an index of fractionalization.[4] Since our data on public expenditure is much higher quality than our data on public goods provision, the main outcome we examine will be village government spending on local public goods. However, we will provide evidence that the changes in expenditure are paralleled by changes in provision for the public goods in which we can measure provision. Similarly, we will also investigate the potential influence of other types of heterogeneity (e.g. kinship clans, income) after we present the main results.

To establish causality, our study takes advantage of the introduction of elections in rural China during the late 1980s and early 1990s. The timing of the introduction of elections varied across villages, but these reforms were implemented in a top-down fashion and were rolled out rapidly.

In another companion study, Martinez-Bravo et al. (2012), we show that the introduction of elections increased government spending on and provision of public goods in a way that corresponded to demand from villagers.

[3]See section 2 for a discussion of the resurgence of religion in China. We will examine the effect of kinship later after presenting the main results. In principle, another interesting dimension of pre-election heterogeneity to investigate is income. However, since our companion paper Martinez-Bravo et al. (2012) find that the introduction of elections caused significant income redistribution, it is unlikely that pre-election income inequality will affect how elections determine public goods. This result is shown later in the paper.

[4]See Alesina et al. (2003), Duclos et al. (2004), Esteban and Ray (2007) and Montalvo and Reynal-Querol (2003) for discussions of the different measures of fragmentation.

Therefore the timing across villages was a quasi-random and mostly unrelated to village characteristics.[5] To examine whether voter heterogeneity influences how democratization affects government public goods expenditure, we estimate the interaction effect of the introduction of elections, which varies over time, and a time-invariant measure of the pre-existing level of religious fragmentation. We control for village fixed effects, which absorb all time-invariant differences across villages (including the main effect of religious fragmentation); and year fixed effects, which control for all changes over time that affect all villages similarly, such as macro economic changes taking place in China during this period. We also control for province-time trends to control for the growing economic divergence across regions during the reform era.

If voter heterogeneity reduces an elected government's ability to provide public goods, the interaction effect of our heterogeneity measure and the introduction of elections should be negative. On the other hand, if heterogeneity has no effect, then the interaction term should be zero. Identification assumes that, conditional on our baseline controls, the interaction of the introduction of elections and social capital is not jointly determined with public goods – i.e. the presence of fragmentation is not correlated with other factors (in addition to the baseline controls) that can influence the effect of elections on public goods. We do not take this as given and provide a large body of evidence against alternative explanations.

The results indicate that the introduction of elections increased government expenditure on local public goods in villages with low levels of pre-existing religious fractionalization, but the increase due to elections is declining with fractionalization. Consistent with the hypothesis that voter heterogeneity affects the government's ability to raise taxes to fund public goods, we find that all of the results on public goods expenditure is driven by expenditure that is funded by villagers. In contrast, there is no effect on expenditure that is funded by the upper government. In addition, the evidence suggests that the effects on expenditure are paralleled by effects on provision. Our estimates imply that approximately 84% of villages in China had fractionalization levels low enough to experience some gains in public goods due to the introduction of elections.

There are three important caveats for interpreting the baseline results. The first is the concern that the NFS data on individuals belonging to official religions understate the actual number of

[5] Please see section 2 for a detailed discussion on the implementation of the reform, section 3 for a detailed discussion of identification and section 5 for robustness checks.

religious individuals. Although the post-Mao era (1978 -) government officially tolerates State-sanctioned religions, one may be concerned that its negative attitude towards unsanctioned religions causes individuals belonging to them to not report their beliefs to the NFS. One may also be concerned that some individuals belonging to sanctioned religions do not report their beliefs to the NFS because of the State's opposition to religion in the past. In that case, our data will mis-measure true fragmentation. To address this, we use the best available data on religious individuals constructed by ethnographers and sociologists and use them to impute "true" fragmentation. Doing this results in higher levels of religious population and fragmentation. However, the estimated interaction effect of fragmentation and the introduction of elections is very similar when we use this imputed measure.

The second concern arises from the fact that religious fragmentation is correlated with other factors, which may also interact with the introduction of elections in determining public goods. Therefore, our main results may capture the influences of other factors as well as those of religious fractionalization. To rule out alternative interpretations of our results, we examine the correlates of fractionalization in the data and perform an exhaustive series of robustness tests to show that they (and other factors) do not confound our results. Specifically, we show that our findings are robust to controlling for the interaction of the introduction of elections with potentially confounding factors such as the fragmentation of extended families, the presence of lineage groups, the stock of social capital within villages, the population share of the most popular two surnames, the average pre-election level of total government expenditure on public goods, the average pre-election level of household income at different points of the village income distribution, and the average pre-election level of income inequality (within villages). Interestingly, these additional estimates also show that kinship group fragmentation and pre-election inequality in income make little difference to the ability of an elected government to finance public goods.

To ensure the robustness of our empirical estimates, we conduct several additional exercises. First, we show that our results are not sensitive to the choice of measure. We find similar results when we measure fragmentation as religious polarization. Second, we show that the estimated interaction effect of fractionalization and the introduction of elections is robust to controlling for the interaction of the population share of specific religions and the introduction of elections. This provides strong evidence that the main results capture fragmentation rather than the influence of

voter specific religious beliefs. See the subsection on Robustness for a detailed discussion of these and other checks on our results.

The final caveat arises from the fact that we are unable to estimate the demand for public goods. Therefore, the welfare implications of our results are ambiguous. We discuss this further in the Conclusion.

In addition to the main results, we also investigate the extent to which the election-induced increase in government public goods spending in less fractionalized villages crowds out private spending on public goods. Unfortunately, we do not have direct measures of private spending, and the evidence from using household expenditure data is mixed. However, complete crowd out is unlikely given the finding that the provision of public goods that we can measure changes in parallel with government spending.

Setting this study in the context of rural China provides several advantages. First, the introduction of village elections offers a unique policy experiment to estimate the causal effect of the interaction of fractionalization and the introduction of elections. Second, relative to cross-country comparisons, villages within China are much more homogeneous. At the same time, Chinese villages are largely fiscally autonomous in terms of determining and financing village public goods such as irrigation and schools. Finally, the influence and role of religion in China is strongly mitigated by the presence of a strong state, which historically only tolerated religion to the extent that it espoused the values of the Imperial government. In the modern era, the Communist central government has only begun to tolerate religions since 1978. Thus, the estimated effect of religious fragmentation on democracy provides a lower bound.

Our study builds on several recent studies that have found that the introduction of elections increase local public goods provision in China (e.g., Martinez-Bravo et al., 2012); Mu and Zhang, 2011; Zhang et al., 2004) and a companion study that leaders are more likely to be re-elected if they increase public goods spending (Martinez-Bravo et al., 2011).[6] This paper differs from these earlier studies in exploring the heterogeneous effects of elections and is therefore related to cross-country studies that argue that the effect of democracy is heterogeneous (e.g., Persson and Tabellini, 2007) and another companion study that examines the role of social capital in determining the effects of

[6] Also, see the two closely connected studies by Luo et al. (2007) and Luo et al. (2010).

elections on public goods (PadróiMiquel et al., 2012).[7]

To the best of our knowledge, we are the first to provide rigorous empirical evidence for the influence of voter heterogeneity on the effect of elections on public goods. Since elections are commonly considered one of the two key components of democracy (the other being checks and balances), the results provide direct evidence that heterogeneity can hinder a democratic government's ability to finance public goods. Our study is related to a large empirical literature studying the relationship between voter heterogeneity and public goods provision.[8] In focusing on heterogeneity and the provision of public goods in a developing country, our study is particularly closely related to Banerjee and Somanathan (2007) which finds that heterogeneity affects provision in India; Khwaja (2009), which finds that social fragmentation can reduce community public goods in Pakistan; and Miguel and Gugerty (2005), which finds that ethnic heterogeneity reduces local public school spending in Kenya. In examining religious fragmentation, our study is closely connected to Alesina and La Ferrara (2002), which finds that religious fragmentation affects regional voting behavior in Italy. Our study is loosely related to cross-country studies of the relationship between ethnic/linguistic/religious fragmentation and macro economic performance that was pioneered by Easterly and Levine (1997).[9]

Our study differs from existing empirical studies in several ways. The most important difference is our empirical strategy, which exploits two sources of variation – religious fragmentation and the introduction of elections, instead of only examining the main effect of voter heterogeneity. This allows us to avoid the difficulty of finding a source of plausibly exogenous variation for voter heterogeneity.[10] Conceptually, this is also a more direct test of the hypothesis that heterogeneity

[7] PadróiMiquel et al. (2012) finds that elections increase public goods more in villages where there is a temple and interprets this as reflecting the additional social capital in villages with temples. These two papers differ and complement each other in that they explore very different mechanisms that can influence an elected government's ability to provide public goods. It is important to note that the results of the two papers are not mutually exclusive. We will show later in the paper that both the interaction effect of religious fractionalization and the presence of a temple with the introduction of elections are large in magnitude and significant when estimated together in one equation.

[8] The empirical evidence on the relationship between heterogeneity and public goods provision in the existing literature is mixed. For some examples, see Alesina et al. (1999), Alesina and Ferrara (2000) Alesina et al. (2004), Banerjee et al. (2001), Banerjee et al. (2005),, Bardhan et al. (2007), Dayton-Johnson (2000), Desmet et al. (2009), Glennerster et al. (2010), Habyarimana et al. (2007), Lizzeri and Persico (2001), Luttmer (2001), Poterba (1997). Ray et al. (2007). There is a large body of evidence on the influences of heterogeneity, constituency composition and group size more generally. Recent studies from developing countries include Banerjee and Pande (2007), Esteban and Ray (1999), Esteban and Ray (2001), Esteban and Ray (2011), Fafchamps et al. (1999), Munshi and Wilson (2010), and Munshi and Rosenzweig (2008).

[9] See Patsiurko et al. (2012) and the studies cited within for a review of this literature.

[10] Alesina and Ferrara (2005) provide a detailed discussion of the difficulties of identifying the effects of heterogeneity.

can lead to government failure in providing public goods in *democracies*. Another difference from previous studies is our examination of the Chinese context. To the best of our knowledge, we are the first to study voter heterogeneity and one of the few studies how religion can affect economic outcomes in China since the historical work of Weber (1968). Relative to the cross-country literature, we are able to examine finer measures of both public goods and institutional change. It is important to note that the large panel data we construct and the detailed discussion and descriptive analysis we provide can contribute to empirical research in political economy more generally as it opens up the context of China to future researchers in this field.

More generally, our study contributes novel and rigorous empirical evidence to two literatures. First, we add to studies on democratization, especially those that emphasize that pre-conditions are necessary for successful democracy.[11] Second, our study adds to the literature on the importance of social structure in determining economic performance and government policy.[12] The contribution of these factors have mostly remained distinct subjects in the empirical literature.[13] Thus, by showing that democratization interacts with pre-existing religious fragmentation, we make progress in bridging this gap and complement theoretical studies such as Greif and Tabellini (2010), which provides a model of the co-evolution of social structure and formal institutions to explain the historical economic divergence between China and Europe.

This paper is organized as follows. Section 2 discusses the background. Section 3 discusses the empirical strategy. Section 4 describes the data. Section 5 presents the results. Section 6 offers concluding remarks.

2 Background

2.1 Religion in China

The Chinese government officially recognizes five religions, which were initially sanctioned in the 1950s, but then abolished during the Cultural Revolution: Buddhism, Daoism, Islam, Catholicism and Protestantism (e.g. Cohen, 1992). The official statistics for religious population in 2003 are

[11] For example, both the modernization theory by Lipset (1959) and the critical junctures theory by Acemoglu et al. (2008) argue that certain pre-conditions are necessary for democracy to be beneficial. See Martinez-Bravo et al. (2012) for a review of empirical studies on democratization.

[12] For example, see the reviews of the literature on culture by Guiso et al. (2006) and Fernandez (2010), and on social capital by Guiso et al. (2011).

[13] There are exceptions to this. For example, Guiso and Pinotti (2012) examine the differential effects of enfranchisement in Italy according to pre-existing regional levels of social capital.

shown in Table 1 column (1).[14] The most popular one is Buddhism, which was introduced from India during the 4th Century. In 2003, 100 million Chinese were officially Buddhists. 90.5 million were of the Mahayana school, which is a distinctly Chinese branch of this religion. 7.6 million were Tibetan Buddhists, who mostly live in the province of Tibet. 1.5 million were Theravada Buddhists, who mostly live in the province of Yunnan. The second most popular religion is Islam, which was introduced through the area now known as Xinjiang during the 8th Century. In 2003, approximately 20.3 million of the Chinese population were Muslim. These are followed by the Christian religions, which were introduced in China during the 17th Century. In 2003, Protestantism officially comprised approximately sixteen million followers and Catholicism comprised approximately five million followers. The fifth most popular religion is Daoism, which began at the same time as Buddhism and is indigenous to China. Approximately three million Chinese were Daoists in 2003.

More popular than all of the official religions combined is what anthropologists refer to as folk religions (e.g., Cohen, 1992). While it is not recorded in official statistics, survey evidence suggests that approximately 20% of the rural population follows the practices of traditional fold religions (Le and Jiang, 1998: p. 75). Folk religions come in varied and diffused forms, including utilitarian ancestor or lineage worship (worshipping one's ancestors so that the ancestor's soul can intervene on behalf of its living descendants), the worship of local deities, divination, geomancy (e.g. *fengshui*), witchcraft (e.g., sorcery, exorcism and planchette writing), physiognomy, and certain taboos (e.g. Gao, 1994, p.330-55; MacInnis, 1989, p. 367-74, p. 385-410; Dean, 1993; Siu, 1989, p. 121-37). Folk religions tend to vary across regions, and their followers generally believe in several variants at any one time (e.g. Faure and Siu, 1995; Feuchtwang, 2001).

As in many other contexts, each religion has a strong identity.[15] The different beliefs of each religion can therefore cause individuals belonging to different religions to have different preferences for the type or the level of public goods. Scholars have noted that most practitioners of folk religion exchange faith for individual material benefits (e.g., Lai, 2003); Muslims and Christians are likely to adhere to the moral teachings of their religion that promote public goods (at least within the religion) such as sharing with their family members, neighbors and friends (e.g. Berlie, 2004; Israeli,

[14] These official statistics are taken from Gong (1998: Table 2).

[15] Religious associations actively promote the religion they represent. For example, by 1999, the official Protestant association printed 25 million copies of bibles and ten million copies of hymnals, set up 18 seminaries, trained 3,800 graduates and were publishing 100,000 copies of *Tianfeng* (a monthly journal) (Liaowang, 1999, p. 23-27).

2002); and Buddhism and Daoism encourage disciples to divorce themselves from everyday life and normal practices, which naturally reduces the disciples' value for both the public and private goods. Similarly, non-religious individuals may have different preferences for the type or level of public goods than religious individuals. Religion may also factor into village life indirectly by affecting the spatial organization of villages as residents typically cluster into neighborhoods according to religious belief.[16] However, there is little evidence on whether mainland Chinese villages have on average reverted to their traditional organization during the post-Map era.

The post-Mao regime (1978-) has been much more tolerant towards religion than its predecessor (1949-78), which peaked in anti-religion fervor during the Cultural Revolution (1966-76). The policy of the post-Mao regime is similar to the historical policy of the former Imperial governments – although it espouses and promotes one official belief (atheism), it tolerates other religions as long as they do not challenge the power of the central government. During the reform era, all forms of traditional practices were gradually revived.

The religions discussed above enjoy relatively well-demarcated and open places of worship (e.g., Lai, 2003). The revival of religion and state tolerance is consistent with the growth in the number of religious individuals over time. Folk religions were the first to rebound, resulting in a marked rise in the number of new temples being built and a boom in sales of manuals and books on folk religions. Also, survey evidence in Hubei province by Gong and Zhou (1999) show that the number of Buddhists and Daoists fell from 98,000 and 65,300 in 1966 to 93,000 and 46,000 in 1982, but then grew to be 800,000 and 300,000 in 1996. The number of places for worship and religious meetings in China exhibit the same pattern. They decreased from 120,000 during the early Communist era to 40,000 in the late 1980s, but then grew steadily to 100,000 by 2003 (Zhu, 1994; He, 1999). Similarly, the China Christian Council was re-established in 1980 to repair state-religious relationships with Chinese Christians. According to this organization's statistics, the number of churches grew from 4,000 in 1986, to 7,000 in 1991. Even more numerous were "gathering places", which grew from 25,000 in 1991 to over 50,000 in 2004, 70% of which are in rural areas (Luo, 2004, Ch. 2).

[16] This has been documented in historically in mainland China (e.g., Yang , 1961, p. 98, 158) and in a modern context in Taiwan (e.g., Deglopper, 1974, p. 65). In a description of villages in Taiwan during the 1970s, Deglopper, 1974, p. 65 states that "Neighborhoods... 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".

Unofficial religions comprise sects of Buddhism/Daoism (e.g., Falung Gong, Zhong Gong Fawen) and Christianity not recognized by the State and Tibetan Buddhists and Xinjiang Muslims who challenge Beijing's control (e.g. Cohen, 1992, Youngliang, 1994). Since our sample does not include Tibet and Xinjiang, and the unrecognized sects of Buddhism and Protestantism are typically urban, we will forego further discussion of these groups and focus on underground Catholics, which are believed to be concentrated in rural areas (e.g. Lai, 2003).

The under-ground Catholic church include individuals who follow the Vatican's appointed bishops instead of those appointed by the Chinese State (e.g., Madsen and Fan; Hunter and Chan, 2007, p. 241; Gong and Zhou, 1999, p. 73). It is believed to have attracted more followers than the official church by the early 1990s. This led to a gradual reconciliation between the Vatican and official Chinese Catholic Church. For example, the recent government appointment of the Bishop of Shanghai, one of the most prominent positions for Chinese Catholics, was neither officially sanctioned nor opposed by the Vatican and followed by members of both the official and under-ground Church (Madsen and Fan, 2009). Hence, our empirical analysis will take the undercounting of Catholics into account by enlarging the number of Catholics, but not distinguish between the two different types of Catholics.[17]

Beyond Catholics, it is generally the case that there is little tension between religious groups in China. For example, even before the Communist regime that subdued religion, conflict between followers of different religions in rural areas dominated by the Han-Chinese (who are over 92% of the total population today) were mostly about practical day-to-day issues (Sweeten, 2001). A potential exception is when religious affiliations overlap with ethnicity.[18]

There are several additional facts to keep in mind for our analysis. First, religious beliefs in rural China are typically uncorrelated with educational background or occupation (Lai, 2003). In fact, even village officials and Communist Party members are known to partake in religious ceremonies and rituals (e.g., Tsai, 2002, 2007). In a survey of Hubei province, Gong and Zhou (1999, p.71) find that 11% of the followers of Buddhism and Daoism were school teachers and Party cadres. Second,

[17] Although the current regime has been consistently tolerant towards the sanctioned religions, it is widely believed that the historical persecution of religious individuals causes the official data, which rely on individual's self-proclamation of beliefs, to under-count the number of religious persons. We will discuss this in more detail later in the paper.

[18] Islam is an accepted faith among 10 minorities, including Hui, Uygurs, Kazak, Dongxiang, Kirgiz, Salar, Tajik, Uzbek, Bonan and Tatar (e.g. Gong, 1998). There is little reliable evidence for ethnic conflict except between Tibetans, Uygurs and the Han.

while the revival of religion reflects the persistence of traditional beliefs, the State's past efforts to eliminate religion is believed to have significantly weakened religious beliefs and sociologists have documented that many popular religious rituals and teachings are mere fragments of their historical predecessors (e.g. Madsen, 1989; Siu, 1989). This is important for interpreting our results because it implies that the tensions or conflict that exist between religious groups are likely to be much weaker in China than in other contexts.

2.2 Village Government and Public Goods

Villages are the lowest level of administration in rural China. Village governments were first organized by the communist government during the early 1950s, with two groups of leaders in each village. The village committee, which typically comprises three to five members, is lead by the village chairman, henceforth VC. This position is also sometimes called the village chief or village head. The Chinese Communist Party (CCP) branch in the village is lead by the village party secretary, henceforth PS. Before elections were introduced, all these positions were filled by appointment by the county government and village party branch.[19] Since all levels of government above the village are dominated by the CCP, we will sometimes use the term *party* to refer to the village party branch and all the upper-levels of government as one body for simplicity.

The village government is extremely important for the well-being of its citizens and one of its main roles is to determine and finance village public goods (e.g., O'Brien, 1994; Oi and Rozelle, 2000; Rozelle, 1994, Brandt and Turner, 2007; Whiting, 1996). The village government is responsible for determining the object of public goods investment as well as raising most of the funds required for the investment. That this requires significant effort from village leaders is consistent with the widely held belief that there was a general under-provision of public goods in Chinese villages prior to the introduction of elections (e.g., Luo et al., 2007, 2010).

Note that village governments do not have the legal authority to tax. Thus, they finance public goods by imposing *ad hoc* fees and levies. In our paper, we refer to these tariffs as *taxes* for simplicity.[20]

[19] The Chinese government, led by the Chinese Communist Party (CCP), is broadly ordered in a vertical hierarchy, from the central government in Beijing down to the rural levels that comprise counties and townships. According to the *National Statistical Yearbooks*, rural population decreased from approximately 83% of total population in 1980 to approximately 75% by 2000.

[20] Such taxes can be controversial in cases when villagers believe them to be extortioner and misallocated by corrupt village governments. This led the central government to ban village taxes in the *Tax and Fee Reform* in 2003. For

2.3 Village Elections

Motivation The main motivation for the introduction of elections was to resolve information problems faced by the central government. China is a large, heterogeneous and quickly changing nation. There are almost 700,000 villages in China. Proponents argued that making local leaders accountable to villagers would impose checks on the VC's behavior and would also allow villagers to select the most competent candidates (Kelliher, 1997; O'Brien and Li, 1999). Public goods provision featured prominently in the discussion of whether elections should be introduced. It was hoped that local leaders with a democratic mandate would better determine which public good investments were necessary and would better facilitate the local coordination necessary for providing them.

Opponents, however, retorted that making rural leaders accountable to villagers would disrupt the implementation of unpopular policies, such as the One Child Policy, and generally weaken hierarchical control in an increasingly heterogeneous country. In particular, regional governments voiced concerns about the effect of elections in two types of "problematic" villages: those that were already resisting unpopular policies and those that were dominated by a large kinship clan.[21]

Thus, taking these potential costs into account, the democratization reforms were gradual and controlled. The VC and the village committee were to be elected by the villagers instead of appointed by the regional CCP. VCs were to be elected for three-year terms with no stipulated term limits. However, to ensure that village leaders would still be partially accountable to the CCP, there was no change in the selection method of the members of the village CCP branch and PS positions, who continued to be appointed. Moreover, the upper government maintained control of the democratization process and only gradually increased openness. Initially, the regional CCP nominated the candidates but was required by law to nominate more candidates than open positions. Only in a second wave of reforms were nominations opened to all villagers. This is commonly referred to as *haixuan*. Both reforms were irreversible – once elections or open nominations were introduced, they remained in place thereafter.

our study, this ban will have little effect as it occurred towards the end of our study period. But we will check that our estimates are robust to controlling for their introduction.

[21] In the latter case, the concern was that the elected position would be captured by the dominant clan, which would then implement policies for the benefit of its clan members at the cost of other villagers (O'Brien and Li, 2006: Ch. 3).

Timing Elections were introduced in a top-down fashion by the provincial and county governments. Once the provincial government decided to implement village elections, almost all villages within that province followed shortly (O'Brien and Li, 1999). By all accounts, villages had little discretion over the timing of introduction of elections, which is characteristic of reforms in rural China. "These [elections] should not be interpreted as bottom-up initiatives by the villagers themselves; they are not in a position to play any precedent-setting part in the initiation of new electoral reforms. There is a mistaken belief among some people outside China regarding this... elections are quietly being instituted at levels above the village, engineered first in selected districts at a distance from Beijing, through the connivance of the [central] Ministry of Civil Affairs and middle-ranking officials out in the regions." — Unger (2002, p. 222).[22]

Several innovative provincial governments began to experiment with elections in the early 1980s. After some debate within the CCP, village elections were formally codified by the central government in the *Organizational Law on Village Committees* (henceforth OLVC) in 1987. From this point onwards, all provinces were pushed to introduce elections for all rural areas. Finally, a revision of the OLVC in 1998 made elections of VCs mandatory and required candidate nominations to be open to all villagers.

The top-down process of introducing elections means that differences in timing across villages are largely driven by the upper governments' preferences of where to first introduce elections. Typically, elections would be first implemented in model villages, to test procedures and logistics. After that they would be rolled out to all villages. Anecdotal evidence from interviews that the authors conducted with county and province-level officials and the speed in which elections were rolled out within provinces suggest that the roll out was orthogonal to village characteristics for most villages.

The quantitative data on election timing is consistent with the qualitative evidence that timing was quasi-random. Our companion paper uses the same data that we use in this paper to show that the roll out of elections was consistent with top-down implementation and was very rapid. Most villages within a county implemented elections in the same year, and over 60% of villages within a province introduced elections within three years of the first election in the same province (Martinez-Bravo et al., 2012).[23] Moreover, we examine the timing of the introduction of village

[22] Unger (2002) notes the general passivity of villages in implementing rural reforms in his study of land reforms and the adoption of the *Household Responsibility Reform* during the mid 1980s.

[23] Note that all of the villages in our study had introduced elections by the end of the sample in 2005, but only half

elections and a large number of variables measuring pre-election income, inequality, human capital, geography, public goods, and unpopular central government policies such as the One Child Policy or the permanent expropriation of land by the upper government. Conditional on the introduction at the province level, the timing of the introduction at the village level is uncorrelated with any of these variables.

3 Conceptual Framework

3.1 Religious Fragmentation, Public Goods Provision and Elections

The first step to conceptualize the relationship between religious diversity, government-provided public goods and elections is to focus on the different mechanisms that can hinder public goods provision in the presence of social heterogeneity.

Existing research has proposed several different channels to explain cross-sectional negative correlations between diversity and public goods provision.[24] The most plausible mechanism in the context of rural China is that religious activity induces altruism, trust, and willingness to join other members of the religious group (Vigdor,2004; Guiso et al. (2003); Alesina and Ferrara,2000). Rituals, practices and festivals throughout the year induce repeated and intense interactions with those who share their faith and this facilitates communication, trust and empathy. As in many other contexts, each religious group ends up building a strong social identity that helps accumulate these different dimensions of within-group social capital.[25] Theoretically, in the extreme case in which religious participants fully internalize the preferences of the other followers of their faith, a religiously homogeneous village would enjoy optimal contributions to the public good. By the same logic, to the extent that altruism and trust are limited to the religious group, the more fractionalized the village, the lower the willingness to contribute to public goods.[26] An additional mechanism contributing to lack of cross-group trust is that social sanctions might be weak on members of other groups, and

had introduced open nominations.

[24] This literature, reviewed in Alesina and Ferrara (2005) and Banerjee and Somanathan (2008) sometimes considers a public goods game with no government with coercive power, in which citizens willingly contribute to the public good. In the case of rural China, to provide goods the village government needs to collect contributions with limited enforcement power. Hence the insights of the literature are applicable in this context as villagers have the ability to increase the cost of collecting contributions. This lowers government-provided public goods provision in the same circumstances that lower provision in the public goods game.

[25] Religious associations actively promote the religion they represent. For example, by 1999, the official Protestant association printed 25 million copies of bibles and ten million copies of hymnals, set up 18 seminaries, trained 3,800 graduates and were publishing 100,000 copies of *Tianfeng* (a monthly journal) (Liaowang, 1999, p. 23-27).

[26] For example, Guiso et al. (2003) finds that religious people are more intolerant of diversity than non-religious ones, regardless of the type of religion, albeit some religions are worse than others.

hence there is little social leverage to enforce contributions (Miguel and Gugerty, 2005).

A different mechanism in the literature suggests that different groups might prefer different varieties of public goods, and technological constraints are such that only one variety can be provided (Alesina et al., 1999). In a fractionalized village, villagers might refrain from contributing since they suspect they will not get their preferred variety.[27] For religions in rural China, this mechanism could be relevant when the public good under consideration is schooling, since different religions might have different preferences over the religious orientation of education. Note that for goods that every citizen wants, such as better roads or better irrigation, groups might still have diverging preferences over the location of the public amenity. Indeed, in rural China, individuals of similar religions typically cluster into neighborhoods within villages (e.g., Cohen, 1992).[28] It is therefore possible that religious diversity is a proxy for geographic differences across groups, which would be the ultimate cause of preference divergence.

It has also been noted that different religions might have different appreciation for the common good.[29] In the case of rural China, scholars argue that most practitioners of folk religion rely on the faith for individual material benefits (e.g., Lai, 2003), Muslims and Christians adhere more to moral teachings of the religion such as sharing with their family members, neighbors and friends (e.g. Berlie, 2004; Israeli, 2002), and Buddhism and Daoism encourage disciples to divorce themselves from everyday life and normal practices, which naturally reduces the disciples' value for both the public and private goods. This suggests that different religions induce different preferences for the *level* of public good provision. Note that this mechanism does not induce any obvious relationship between fractionalization and public good provision. Instead, it predicts a relationship between the fraction of the population that belongs to each religious group and public good provision, which we can test empirically.

While the mechanisms above predict a negative relationship between heterogeneity and public goods provision, the arguments do not make use of any specific institutional setting. Hence we would

[27] In the extreme, such situation can generate wasteful conflict between groups best captured by a polarization index of diversity (Esteban and Ray, 1999; Montalvo and Reynal-Querol, 2003). See Banerjee and Somanathan (2008) for a recent literature review. Given the scant anecdotal evidence of conflict across religious affiliations in China today, this does not seem a first order mechanism in our context.

[28] See the section on background.

[29] For example, Putnam et al. (1994) argues that less hierarchical religions (such as Protestant religions) teach people to take responsibility and internalize the common good of their small communities whereas hierarchical Catholicism does not share these features since the institution is supposed to look after the common good.

expect the level of public goods to be higher in low heterogeneity villages both under appointed leaders (baseline) and under elections. This makes the sign of the interaction effect of fragmentation and the introduction of elections ambiguous *ex ante*.

On the one hand, elected leaders are more directly accountable to citizens than appointed leaders. This should have two effects. First, accountable governments should reflect more tightly the preferences of the population, and hence the relationship between heterogeneity and public goods provision should be steeper under elections. Second, all else equal, citizens should be more willing to contribute to the village government the more they feel they can hold it accountable. Under elections, a necessary condition for effective government accountability is that some citizens need to gather and distribute information on government performance. These monitoring activities thus become public goods in themselves which, for the reasons stated above, should be better provided in homogeneous villages.[30] We would therefore expect elections to work better as mechanisms to control officials in homogeneous villages, leading to higher willingness to contribute. These two effects predict the interaction effect of elections and heterogeneity to be negative. But it makes no predictions on the pre-election correlation between heterogeneity and public goods.

On the other hand, elections also serve as mechanisms to aggregate preferences. In heterogeneous villages with low communication and contentious relationships across groups, it is probably very difficult for the appointed village leader to determine which public goods would be preferred by a majority and hence he is less likely to propose the majority-preferred public good and would consequently face strong resistance to contribute to whatever public good he proposes. This suggests that heterogeneous villages might particularly benefit from the introduction of elections. This is more likely to be true if heterogeneity is very binding in reducing public goods prior to elections. Thus, this mechanism predicts that the interaction effect of elections and heterogeneity is positive, and most likely, that the pre-election correlation between heterogeneity and public goods is highly negative.

In practice, both mechanisms can co-exist. Therefore, our empirical analysis will estimate the net of these opposing forces.

[30] For a review of reasons why democracy works better in high social capital environments see Boix and Posner (1998)

3.2 Measuring Heterogeneity

Heterogeneity is typically measured as the population share of each group, or with fractionalization and polarization indices. As we discussed above, each measure reflects a different mechanism. The first measure we examine is the fractionalization index, which captures differences in preferences of each religious group on the type of public goods. Following Alesina et al. (2003), this is calculated using the standard formula

$$F_i = 1 - \sum_{j=1}^{N} s_{ij}^2. \tag{1}$$

The fractionalization index for village i is equal to one minus the sum of the squares of s_{ri}, the population share of religion j in village i. N is the total number of religions.

Second, we will measure heterogeneity as the population share of each religion. As we discussed above, this captures differences in the value for the level of public goods across religions. Given the qualitative evidence from ethnographers, we have no prior on which one of these mechanisms are more important in the Chinese context and will infer their role from the empirical analysis.

Finally, we measure heterogeneity using a polarization index, which captures the level of wasteful conflict that results in the extreme of inter-group differences in preferences over public goods. Following the work of Montalvo and Reynal-Querol (2003) and Esteban and Ray (1994), we use the standard formula

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

Given that there is little conflict across religious groups in China, our prior is that polarization is less likely to matter than the other two measures.

3.3 Identification

The main outcome we examine is village government expenditure on public goods. To estimate the effect that voter heterogeneity has on the introduction of elections, we estimate the following equation:

$$Y_{ijt} = \alpha_1 E_{ijt} + \alpha_2 (E_{ijt} \times H_{ij}) + \beta_1 O_{ijt} \times + \beta_2 (O_{ijt} \times H_{ij}) + \gamma X_{ijt} + \tau \theta_j + \delta_{ij} + \rho_t + \varepsilon_{it}, \tag{3}$$

where the outcome of interest for village i in province j during year t is a function of: the interaction effect of a measure of heterogeneity, H_{ij}, and the introduction of elections, E_{ijt}; the interaction term of heterogeneity and the introduction of open nominations in each village, O_{ijt}; the main effects of the introduction of elections and open nominations; a vector of village-year specific controls, X_{ijt};

province-year trends, $\tau\theta_j$; village fixed effects, δ_i; and year fixed effects, ρ_t. Our main estimates cluster the standard errors at the village level, which we will show to be more conservative than clustering at the province level.

In this equation, village fixed effects control for all differences across villages that are time-invariant (e.g., geography), and year fixed effects control for all changes over time that affect villages similarly (e.g., macro economic growth, economic liberalization). Moreover, the province-time trends control for the regional divergence in economic growth in China during our period of study, which may also have been accompanied by cultural divergence (e.g. the coastal regions became more Westernized).

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 of course highly correlated with religious heterogeneity and could affect public goods. Since it is 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, we control for the interaction of the religious heterogeneity and year fixed effects. Since heterogeneity is a time invariant village-level measure, 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. Note that this means that our estimate of the interaction of heterogeneity and the introduction of elections is very conservative in that it captures the systematic change in public goods after the introduction of elections in villages with higher levels of heterogeneity that is not already captured by the interactions of heterogeneity and year fixed effects.

To interpret the estimates, consider the case of when we examine religious fractionalization. α_1 is the total effect of the introduction of elections for villages with no fractionalization, $H_i = 0$. $\alpha_1 + \alpha_2$ is the total effect of the introduction of elections for villages where there is a high ("infinite") degree of fractionalization, $H_i = 1$. α_2 is the differential effect of the introduction of elections between these two types of village. The hypothesis that religious fractionalization impedes the ability of an elected government's ability to provide public goods and predicts that $\hat{\alpha}_2 < 0$. In contrast, if fractionalization has no influence, then $\hat{\alpha}_2 \approx 0$.

Conceptually, our empirical strategy is similar to a triple differences estimate (DDD). We com-

pare public goods investment in: *i*) villages before and after the introduction of elections (e.g. first difference), *ii*) between villages that have already introduced election to those that have not (e.g., second differences), and *iii*) between villages that have high heterogeneity to villages with low heterogeneity (e.g., triple differences). Our identification strategy assumes 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 will provide evidence against this concern after presenting our main results.

4 Data

4.1 Measuring Religion

The NFS categorizes religions according to the official religions that are sanctioned by the State: Buddhists, Christians, Muslims and "other" religions, which is our context is believed to mostly comprise of Daoists. We categorize the remaining villagers as "atheists" such that $N = 5$. Note that in practice, a significant share of the latter group comprise individuals who practice the Chinese folk religions that we discussed earlier, but who do not adhere to one of the official religions.

The data on the share of population belonging to each religion is collected by the NFS for the years 1993, 94-2005. Although the number of religious individuals grow over time, it remains roughly constant as a share of population. Therefore, to maximize the number of observations, we take the average over time of these variables for each village and assume that the share is similar for our entire study period 1982-2005. Thus, the measures of the share of religious population and religious fractionalization we use for the analysis will be time-invariant. These descriptive statistics are presented in Table 1 columns (4)-(6). The population shares of each religion are also presented in Figure 2a. Note that although there are few religious individuals in the sample as a whole, religious individuals can be concentrated within villages. This is illustrated in the histogram of the share of religious populations (of any religion) across villages in Figure 3a. Figure 4a is a histogram of the fractionalization index which we calculate from the data on the population shares of each religion and non-religious individuals.

The main caveat for our measure is that it relies on data collected by a government Ministry, which may be mis-measured due to the State's attitude towards religion. We will address this by constructing imputed measures of religion using independent data collected by academics. As the

results using the imputed results are similar to those using the NFS data, we will use the NFS data as our main measure. See section **??** for more discussion.

4.2 The Village Democracy Survey

This study 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 paper. 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 organizations, 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.[31] To avoid recall bias, our main variables are obtained from village records. Thus, they are not subject to reporting error. For information not contained in records, our survey relies on the collective response of current and former living village leaders and elders, who were all invited to be present together to answer our surveyors. The only main variables in our study that rely on these responses are those with regard to family trees, which are used in the robustness exercises. Thus, although the VDS is a retrospective survey, our main results are not vulnerable to the difficulties faced by recalled data.

We supplement the VDS with annual data collected each year by the Ministry of Agriculture in the *National Fixed Point Survey* (NFS). This survey is nationally representative and the villages are updated over time. It began in 1986 and is collected each year with the exception in 1992 and 94 for administrative reasons. The VDS is conducted in the same villages as the NFS so that the data from the two surveys can be merged. The NFS surveys a random sample of approximately 100 households per village each year (there are approximately 420 households per village in our sample). The NFS provides us with village household income, inequality, the share of population that is religious and many other variables.

The merged sample we use for estimating the main results comprises a balanced panel of 217 villages for the years 1986-2005.

Our data have several advantages. First, these are the most comprehensive data on village-level

[31] For administrative reasons, the 2011 wave includes only 195 of the original villages. The VDS questionnaires are available at
http://www.econ.yale.edu/~nq3/NANCYS_Yale_Website/Village_Democracy_Survey.html

reforms and village-level outcomes ever constructed. Our data cover a larger and more nationally representative sample and span a longer time horizon than any other existing data of rural China that are available to researchers. The panel aspect of our data means that we can control for village fixed effects to control for time-invariant differences across villages. Having a large number of villages means that we can also control for year fixed effects to control for changes over time. Note that having many villages from each province means that we can also control for province-year trends, which are important for addressing the growing economic divergence across regions in China. The second advantage is the accuracy of the historical public expenditures data. These are based on administrative records and are therefore very accurate. Moreover, the Ministry of Agriculture required that each village record public goods expenditure by type and by the source of financing. This allows our analysis to be very detailed and the fact that all villages use the same book keeping rules means that our measures are directly comparable across villages.

Our data have two drawbacks. The first is the scarcity of demographic variables. The NFS reports only crude measures of human capital and does not report a good measure of population. In our study, we will proxy for population with the number of households.[32] Second, the variables that the NFS are interested in changed over time. Thus, not all variables are available for all years. In the text, we will note this when relevant for our analysis.

Note that government policy strictly limits permanent migration from rural areas.[33] There is little reason to believe that migration is correlated to the introduction of elections, religious fractionalization or the provision of public goods.

4.3 Descriptive Statistics

In this section, we describe the variables that are relevant for this study.[34] Table 2 describes the main (non-religion) variables for our analysis and lists the source of the data. The descriptive statistics show that the average village has 420 households and that 68% of all government spending on public goods is financed by funds raised from villagers.

[32]The NFS reports the number of permanent residents at the year end. However, 30% of the variables are reported as missing. While this variable is highly positively correlated to the number of households, we do not use it since that would significantly reduce our sample size.

[33]Workers in China often migrate temporarily for work. However, the household registration system that ties access to public goods and government benefits makes permanent migration costly. Also, rural residents are also dis-incentivized to migrate permanently away because that results in the loss of the right to farmland.

[34]For a more comprehensive discussion of the VDS data, see a companion study on the effect of the introduction of elections on economic policy by Martinez-Bravo et al. (2012).

Table 3 aggregates our data to the village level and presents the correlates of religious fractionalization. It shows that fractionalization is almost perfectly correlated with polarization. It is also positively correlated with total village population and the shares of religious populations. Fractionalization is uncorrelated with the fraction of high school graduates in a village. When we examine the cross-sectional relationship between fractionalization and polarization more closely in Figure 1, we find that the relationship is monotonic for the entire range of fractionalization. This differs from the non-monotonic cross-country relationship between ethnic fractionalization and polarization documented by studies such as Montalvo and Reynal-Querol (2003), and suggests that polarization is unlikely to an effect that is separate from fractionalization.

Interestingly, fractionalization is positively correlated with the average pre-election level of government spending on public goods, and the fraction of which that is financed by villagers. This is possibly partly due to the fact that fractionalized villages are more populous and there may be economies of scale in public goods provision. It could also be due to the fact that fractionalized villages have higher pre-election household incomes for all parts of the village income distribution. We also find that fractionalization is positively correlated with the pre-election level of income inequality in a village. The fact that fractionalization is correlated with many variables is consistent with the fact that it is not a random variable. Thus, we will be careful to control for the influences of these correlates on the effect of elections in our empirical analysis.

Fractionalization is uncorrelated with the timing in the introduction of elections and negatively correlated with the timing in the introduction of open nominations.

5 Results

5.1 Main Results

Table 4 presents the estimated effects of each measure of heterogeneity. In column (1), we examine fractionalization while controlling for all of the baseline controls. The interaction with the introduction of elections is negative and statistically significant at the 1% level. In column (2), we examine the interaction effect of elections and the population shares of each religion, where non-religious individuals form the omitted category. This specification controls for all of the baseline controls except for the interaction of the population share of all religious individuals and year fixed effects as it is highly collinear with the explanatory variables of interest. The coefficients vary across

religions in signs and magnitudes, but none are statistically significant. In column (3), we examine polarization while controlling for all of the baseline coefficients. The estimated interaction effect is negative and statistically significant at the 1% level, but the magnitude is much smaller than that of fractionalization in column (1).

Since fractionalization, the population share of each religion and polarization are correlated, we examine the effects of all of these measures simultaneously in one equation in column (4). This controls for all of the baseline controls except for the interaction of year fixed effects with the share of all religious individuals. In this estimate, we see that the interaction with fractionalization is as in column (1), large in magnitude, negative and statistically significant. The estimates for the interaction with the population share of each religion and polarization are reduced in magnitude and statistically insignificant.

In column (5), we re-estimate the same equation, but cluster the standard errors at the province level to address the possibility the province-level initiated electoral reforms induced serially correlated shocks for villages within each province. This alternative clustering method reduces the standard error for fractionalization. Therefore, for the remainder of the paper, we will present the more conservative village-level clustered standard errors.

These regressions provide several insights. The fact that only fractionalization is statistically significant in the horse-race in column (4) implies that the most relevant mechanism underlying the interaction of heterogeneity and elections is that individuals belonging to different religions have different preferences for the type of public goods. Differences in value for the common good and wasteful conflict are not important in our context.

Since only fractionalization is statistically significant in column (4) and the magnitude is more conservative when we estimate the simpler specification in column (1), we will use column (1) as our baseline specification henceforth. These estimates for the main effect of post-election in column (1) shows that the introduction of elections increased government public goods expenditure by 265,400 RMB (37,914 Constant 2000 USD) for villages with zero fractionalization. For villages with the mean level of fractionalization of 0.076, elections increased government public goods expenditure by 148, 361 RMB (21,194 Constant 2000 USD, $(-154 \times 0.076 + 26.54) \times 10,000 = 148,361$). 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 fractionalization. Dividing the

absolute values of the main effect by the interaction effect (26.54/154.2), we find that a village with fractionalization indices below 0.17 will experience some increase in public goods from the introduction of elections. This includes 86% of the villages in our sample. Thus, our results show that although increased religious fractionalization reduces the increase in government public goods expenditure that followed the introduction of elections, most villages were homogenous enough to experience some increase.

In column (1), we also show the estimated effect of the introduction of open nominations and religious fractionalization. The estimate is small in magnitude and statistically insignificant, as is the main effect of open nominations. We do not present these estimates in other specifications for brevity, even though all regressions in the paper control for the introduction of open nominations and its interaction with the same variable that is interacted with the introduction of elections.

Next, we examine the timing of our estimated effects. We estimate the following equation

$$y_{it} = \sum_{\tau=-3}^{4} \alpha_\tau e_{it\tau} + \sum_{\tau=-3}^{4} \beta_\tau (e_{it\tau} \times F_i) + \sum_{\tau=-3}^{4} \theta_\tau o_{it\tau} \times + \sum_{\tau=-3}^{4} \lambda_\tau (o_{it\tau} \times F_i) \tag{4}$$
$$+ \gamma X_{ijt} + \tau\theta_j + \delta_{ij} + \rho_t + \varepsilon_{it},$$

where $e_{it\tau} = 1$ if village i in year t experienced the introduction of elections τ years ago, and $o_{it\tau} = 1$ if the same village experienced the introduction of open nominations τ years ago. The other variables have the same notation as in the baseline equation. Note that the timing of the reforms is staggered across villages and while we examine a similar window of time before and after each reform for consistency, we do not exclude any observation. Instead, we follow convention and group all of the observations that are more than four or more years prior to the first reform together; and similarly, we group all of the observations that are more than four or more years after the reform together. The reference group comprises observations that are four years prior to the reform.

α_τ is a vector of dummy variables that captures the number of years since the first election for villages with zero fractionalization ($F_i = 0$) , β_τ is a vector of coefficients that reflect the differential effect of elections on villages with fractionalization indices that equal zero and one 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 for villages with high fractionalization relative to village with low fractionalization, but that the positive main result is driven by a positive

trend break in the coefficients when elections are introduced. In other words, we would like to see that $\beta_{-3} \approx \beta_{-2} \approx \beta_{-1} < \beta_0, \beta_1, \beta_2, \beta_3$. It would be additionally reassuring to find that the changes over time are driven by the effect of elections in high fractionalization villages rather than low fractionalization villages such that $\alpha_{-3} \approx \alpha_\tau$, $\tau = [-2, 4]$.

The estimates are presented in Appendix Table A.1. The coefficients of the dummy variables for the years since the first election are plotted in Figure 5a and the coefficients of their interaction with religious fractionalization are plotted in Figure 5b. Figure 5a shows that there is no pre-trend in government spending on public goods in the years leading up the first election for villages with zero fractionalization. It also shows that government spending on public goods increased immediately when elections were introduced and stayed high in the following years. Figure 5b show that there is similarly no pre-trend in the years leading up to the first election in the difference of government spending on public goods between villages with zero and one fractionalization. The difference emerges when elections are introduced and gradually increase over time. Finding that there are no pre-trends and that the differences emerge when elections are introduced supports our identification strategy.

The main issue with our measure of religious fragmentation is the potential mis-measurement of the size of the religious population in the NFS data. There are three closely related concerns. First, the NFS does not distinguish between Catholics and Protestants. This aggregation causes our data to under-measure fractionalization. Second, the NFS only reports officially sanctioned religions. The main implication for our study is that our data will undercount pro-Vatican Catholics and that individuals who follow folk religion will be mis-categorized as atheists. The effect of the former on fractionalization is ambiguous. The latter will cause our data to understate fragmentation. Finally, government repression of religion during the Maoist era may cause even followers of sanctioned religions to be reluctant to report their beliefs to the state. This means that our estimates of religious individuals of the sanctioned faiths may also be under-estimates of true figures. The effect of this on the bias of our measure is ambiguous.

To address this, we construct imputed measures of fractionalization by 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 aggregate level. Lai (2003) summarizes these estimates, which we show in Table 1. Column (3) shows that according to these estimates,

our data may underreport Buddhism (Mahayana) by 46.6% and Christianity by 66.7% (where Protestants are underreported by 67% and Catholics are underreported by 100%). They also show that approximately 28.5% of Christians are Catholics.

To impute the true religious population, we first divide Christians into two categories – Protestants and Catholics, where we assume that 28.5% of the Christian population is Catholic. Then, we adjust the number of religious individuals for each group by the estimated difference shown in column (3).[35] Then, we add the category of folk religion by assuming that 20% of the total village population follow folk religious practices.[36] The descriptive statistics for the imputed measures are shown in Table 1 columns (7)-(9). A comparison with the measures constructed from the raw NFS data show that the share of religious population is higher with the imputed measures. More importantly, the imputed measure shows more fragmentation. Figure 2b illustrates the population shares of each religion using the imputed measures. Figure 3b is a histogram of the religious population share (of all religions) across villages using the imputed data. Figure 4b is a histogram of the fractionalization index constructed from the imputed data across villages.

We re-estimate the baseline equation using the imputed measure of religious fractionalization. Table 1 column (2) shows that the estimated interaction effect of fractionalization and the introduction of elections is very similar to the baseline estimate, which we re-state in column (1). It is also statistically significant at the 1% level.[37]

In columns (3) and (4), we investigate whether the effects on government public goods expenditure are driven by funds raised from villagers or transfers from the upper levels of government. According to the theoretical literature that we discussed in section 3, heterogeneity and fractionalization, in particular, increases the difficulty for the village government to raise funds from villagers. Furthermore, our identification strategy assumes that the introduction of elections did not coincide with other changes such as a change in the upper-level government's preference to increase public goods expenditure in fractionalized villages. Therefore, both the theory and the qualitative mo-

[35] We can alternatively only adjust the number of catholics upwards in the provinces known to have more Catholics (Hebei, Shaanxi, Guangxi, Gansu and Xinjiang (Lai, 2003)). This does not affect our results and is omitted for brevity. The alternative imputed fractionalization measure and regression results when we use them are available upon request.

[36] We can alternatively assume that 20% of all villagers follow folk religion. This does not affect our results and is omitted for brevity. The alternative imputed fractionalization measure and regression results when we use this are available upon request.

[37] The estimates of the other measures of heterogeneity using the imputed shares of religious population are also similar. We do not present them for brevity. They are available upon request.

tivation for our empirical strategy implies that our main results are driven by expenditure raised from villagers and not by upper government transfers. Column (3) and (4) show that this is true. The interaction effect and the main effect on funds raised from villagers in column (3) is almost identical in magnitude to the baseline in column (1). In contrast, the estimate for funds from upper government transfers in column (4) are small in magnitude and statistically insignificant, which implies that elections did not change upper government transfers for public goods investment for any villages.

In column (5), we examine the main effect of religious fractionalization to investigate the pre-election differences in government public goods expenditure. Since fractionalization is time-invariant, we must exclude village fixed effects. In its place, we add the correlates of fractionalization from Table 3 that are not already controlled for in the baseline (the pre-election levels of income at the 10th, 50th and 90th percentiles of the village income distribution, and the village Gini coefficient) and their interactions with the introduction of elections. The main effect of fractionalization is positive, but small in magnitude and statistically insignificant. This suggests that prior to the introduction of elections, there was little difference in government expenditure on public goods. The implication that heterogeneous villages had similar pre-election levels of public goods is consistent with our not finding a positive interaction effect between heterogeneity and the introduction of elections since it means that heterogeneous villages most likely did not need to "catch up" to homogenous villages. Note that these interpretations are speculative since we do not know the optimal level of public goods expenditure in each village.

Since we are ultimately interested in the determinants of government public goods provision, we next examine the provision of public goods as dependent variables. Our data only allow us to measure the provision of for two of the categories included in the expenditure data. We use log total arable land in the village to proxy for the provision of irrigation, and primary school enrollment rate (for all village children age 7-13) to proxy for the provision of schooling.[38] These data are reported annually by the NFS. Arable land is available for the years 1986-91, 93, 95-2005. School enrollment rate is available for 1993, 95-2005.

[38]In our sample, 88% of the villages have a primary school, 15% of villages have a middle school, and no villages have a high school. The construction materials for schools are typically given by the upper levels of government. Village government are responsible for raising operating costs such as teacher salaries, equipment and utilities.

5.2 Additional Results

Given the large share of non-religious population, it is interesting to investigate the extent to which this drives our result. First, we examine whether the estimates change when we exclude the villages that are homogeneously non-religious (note that 38 out of 217 villages in our sample are homogenous according to the NFS data and they are all homogeneously non-religious). Table 6 column (2) re-estimates the baseline on a sample restricted to villages with some religious population. Although the sample size is smaller than the baseline in column (1), the estimates have the same sign, are slightly larger in magnitude and are statistically significant at the 1% level.

Second, we divide the sample into two groups of villages, according to whether they are below or above the sample median in terms of the share of non-religious population. Columns (3) and (4) show that the estimates have similar signs to the baseline in both subsamples. The estimates for the below median sample in column (3) is smaller in magnitude and more precisely estimated. They show that the estimates are not driven by villages where there are many non-religious individuals. However, neither are statistically significant and are not statistically different from each other.

In columns (5) and (6), we divide the sample according to whether a village is above or below the sample median level of fractionalization and re-estimate our baseline equation in each sub-sample to investigate whether our main results are driven by the high or low fractionalization villages. Both estimates are negative, but imprecise. They suggest that our main results are general in terms of the level of fractionalization. However, we cannot be conclusive due to the imprecision.

The estimates in columns (3)-(6) show that the influence of fragmentation on elections is quite general in terms of the level of religious population share and fractionalization.

Another interesting margin to investigate is the margin of government spending. We investigate the extent to which the main results are driven by villages with higher religious fractionalization making fewer versus smaller public goods investments. Column (7) examines a dummy variable for whether any investment is made by the government. The interaction effect is negative, but statistically insignificant. Column (8) examines the amount of investment and is restricted to the sample of observations with positive investments. The estimate is large and negative, but statistically insignificant. The imprecision is most likely due to the small sample size. The estimates in column (7) and (8) suggest that our main results reflect both changes on the intensive (e.g. larger

investments) and extensive (e.g. the number of investments) margin. But the lack of precision prevents us from being conclusive on this point.

5.3 Robustness

5.3.1 Correlates of Fractionalization and the Introduction of Elections

The main concern when interpreting our results is that religious fractionalization is correlated with factors that may reduce the benefit of elections in terms of increasing government spending on public goods. Given our findings, this omitted factor would need to only influence government spending that is raised from villagers and have no effect on government spending of funds from other sources. It would also need to result in paralleled changes in provision (see results in section 5.4).

To address this concern, we control the correlates shown in Table 3, each interacted with the introduction of elections and the introduction of open nominations. In addition, we investigate the potential influence of the presence of a village temple and the demographic structure of kinship/lineage groups. These estimates are shown in Table 7. In column (10), we control for all of these interactions in one equation. Our main result is very robust and similar to the baseline, which we re-state in column (1).

5.3.2 Additional Controls

In Table 5a, we control for a large number of 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; dummy variables for the presence of lineage groups, village temples, and for whether a village ever experienced an administrative merger, each interacted with year fixed effects; the pre-election average of household incomes at different parts of the village income distribution, each interacted with year fixed effects. The estimates show that our main result is very robust to controlling for any or all of these additional controls. Similarly, we find that our results are very similar when we control for a quadratic-province time trend instead of a linear one.

5.4 Private Expenditure Crowd Out

Finally, we investigate the extent to which the increase in public expenditure in villages with low religious fractionalization crowds out private expenditure on public goods in such villages.

Unfortunately, we do not have direct measures of private expenditure on public goods. Therefore, we address this question in the following two ways.

First, we examine whether there is *complete* crowd out, in which case, the changes in public spending due to elections will result in no change in the provision of public goods – i.e., when public spending increases, private spending declines such that provision remains the same. We are able to proxy for the provision of two public goods that correlate to our expenditure data; we proxy for irrigation with the amount of arable land in a village and for schooling with primary school enrollment 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 enrollment rates. Note that in our sample, 83% of the villages have a school and 94% of these are primary schools (the others are middle schools). These data are not available for all years, which will reduce the precision of our estimates. Table 9 columns (2) and (3) show that the estimated interaction effect of religious fractionalization and the introduction of elections on these proxies for provision are negative and the main effects of the introduction of religion are positive. The estimates for schooling in column (3) are statistically significant at the 1% level. The estimates imply that the introduction of elections increased school enrollment rates by 2.3 percentage-points in villages with zero fractionalization. In villages with the mean level of fractionalization, elections increased school enrollment rates by 0.33 ($2.23 - 26.01 \times 0.08 = 0.33$). Note that the mean enrollment rate is 96.4 percentage-points, which means that a 0.33 difference in enrollment rate is a large marginal difference. These results are inconsistent with complete crowd out.

Second, we investigate whether there is *any* crowd out by examining private expenditure on public goods. For this, we used the household level data on expenditures collected by the NFS. We were only able to obtain this for a subset of the villages and the data are only available for 1993, 95-2005. We use reported household expenditure on fixed assets for agricultural production to proxy for expenditure on irrigation and reported household expenditure for school tuition as a measure of expenditure on schooling. Column (4) shows that the interaction effect of religious fractionalization and the introduction of elections on household expenditure on agricultural production is negative, while the main effect is positive. The interaction effect is statistically significant at the 10% level. The similarity in the signs of the estimates between private spending in column (4) and public spending in column (1) implies that public spending in low fractionalization villages does not crowd

out private spending on irrigation in such villages.

In column (5), we re-estimate the effects on arable land for a restricted sample that only includes observations for which we have household expenditure data. The estimates have similar signs as those using the larger sample in column (2) and are statistically significant at the 1% level.

Column (6) presents the estimates for private expenditure on schooling. The interaction effect is positive and the main effect is negative. The fact that the signs are the opposite between the private expenditure estimates in column (6) and the public expenditure estimates in column (1) suggests that public spending may crowd out private spending on education. However, the estimates in column (6) are not statistically significant at conventional levels.

In column (7), we re-estimate the effect on enrollment rates using the restricted sample of villages with household expenditure data. The signs are similar to the larger sample estimates in column (3), but they are very imprecise.

The results in this section show that increases in public spending in less fractionalized villages after the introduction of elections are unlikely to have completely crowd out private spending. We cannot be conclusive since we can only examine the provision of two public goods. The evidence on the extent of any spending crowd out remains mixed and imprecise.

6 Conclusion

This paper provides novel and rigorous empirical evidence on how the introduction of local elections and the pre-existing level of religious fragmentation affects government spending on local public goods. Consistent with the view that heterogeneity affects a democratically elected government's ability to finance public goods, we find that there was no difference in government expenditure on public goods across villages of different levels of religious fragmentation prior to the elections, that the introduction of elections significantly increased public goods provision, but the increase was smaller for village with higher levels of fragmentation. As further evidence, we show that our results are entirely driven by public spending raised from villagers. Spending of funds raised from the upper levels of government is unchanged. These results are consistent with voter heterogeneity increasing the difficulty for an elected government to raise funds from its constituents and rule out the alternative explanation that the results are driven by changes in upper government preferences at the time that elections were introduced. To the extent that we can measure public

goods provision, the results also show that increases in government public goods spending in less fragmented villages resulted in increases in public goods provision. This also means that increases in public spending in less fractionalized villages after elections were introduced does not merely reflect changes in accounting or government stealing, and was unlikely to have completely crowded out private spending.

Given that we are unable to estimate demand for public goods, our results fall short of making welfare implications. However, we provide a speculative discussion here. On the one hand, several facts point to the influences of religious fragmentation as welfare reducing. For example, a large body of qualitative evidence find that village governments provided little public goods prior to elections and that provision was far below the demand of villagers (e.g., Luo et al., 2007; Luo et al., 2010). Similarly, Martinez-Bravo et al. (2012) find that the average increase in public goods after elections are introduced corresponds to villagers demand. In light of these, and the fact that the level of government spending on public goods did not differ across villages according to religious fractionalization prior to the first election, our results are consistent with a democratic government being better able to provide public goods when citizens are more homogenous. On the other hand, it may be that there are economies of scale in public goods (e.g. schooling) and that heterogeneous preferences over the type of the public good voters want means that it is inefficient for the government to provide public goods.

It is interesting to note that we find that the fragmentation of kinship groups and pre-election levels of income inequality have no influence on the effect of elections on public goods. This suggests that the main dividing line of group conflict, at least in terms of public goods provision, is along religious affiliations (or ethnicity to the extent that it overlaps with religion). This is a useful fact to note for future research of group dynamics in the Chinese context.

For policymakers in democratic countries, our results reinforce the notion that governments in regions or countries with higher voter heterogeneity will face more difficulties in raising funds to spend on public goods. For policy makers interested in democratization reforms, our results suggest that such reforms will improve government provision of public goods better in places with lower levels of voter heterogeneity. However, our evidence on this point should be cautiously interpreted as suggestive since we are unable to examine how well the changes in public goods provision correspond to villager demand.

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Table 1: Statistics on Religious Populations in China

	Aggregate Measures on the Number of Religious Individuals in China (Lai, 2003)			NFS Data on the Share of Religious Population per Village			Imputed Measures of the Share of Religious Population per Village		
	(1) Official	(2) Non-Official	(3) % Difference	(4) Obs	(5) Mean	(6) Std. Dev.	(7) Obs	(8) Mean	(9) Std. Dev.
Mahayana Buddhism (Han)	90.5	132.7	46.63%	4340	0.029	0.090	4340	0.043	0.132
Theravada Buddhism (Yunnan)	7.6	7.6	0.00%						
Tibetan Buddhism (Tibet)	7.6	7.6	0.00%						
Daoism	3	3	0.00%	4340	0.004	0.012	4340	0.004	0.012
Islam	20.3	20	-1.48%	4340	0.019	0.107	4340	0.019	0.105
Christian	21	35	66.67%	4340	0.012	0.038	4340	0.021	0.064
Protestanism	16	25	56.25%				4340	0.015	0.046
Catholicism	5	10	100.00%				4340	0.006	0.018
Folk Religions							4340	0.200	0.000
Non Religious				4340	0.936	0.157	4340	0.723	0.161
Religious Fractionalization				4340	0.076	0.127	4340	0.218	0.111
Religious Polarization				4340	0.140	0.226	4340	0.670	0.113

Notes: The statistics in columns (1) and (2) are for the year 2003 and are presented in Lai (2003) Table 2. See Lai (2003) for the original sources. The statistics in columns (4)-(9) are for the period of 1982-2005.

Table 2: Descriptive Statistics

	(1) Source	(2) Obs.	(3) Mean	(4) Std. Dev.
Village # Households	NFS	4340	414.19	275.47
Fraction of Highschool Graduates	NFS	1882	0.05	0.06
Avg. Pre-Election Pub Goods Exp (10.000 RMB)	VDS	4340	14.28	135.47
Financed by Villagers	VDS	4340	9.77	119.29
Avg. Pre-Election Income -- 10th Percentile	NFS	3778	5080.40	3638.01
Avg. Pre-Election Income -- 50th Percentile	NFS	3778	10512.98	8365.71
Avg. Pre-Election Income -- 90th Percentile	NFS	3778	24427.83	36802.13
Gini	NFS	3550	0.28	0.08
Year of 1st Election	VDS	4340	1988.51	5.24
Year of 1st Haixuan	VDS	2780	1997.45	5.26

The sample uses a panel of 195 villages for the years 1982-2005.

Table 3: The Correlates of Religious Fragmentation

	(1) Religious Fractionalization
Religious Polarization	0.9935*
Social Organization Organized and Funded by Villagers	-0.0312
Village Population	0.1883*
Share of Religious Population (Any Religion)	0.7863*
Christian	0.4407*
Muslim	0.3659*
Buddhist	0.8052*
Other	0.3925*
Fraction of Highschool Graduates	-0.0361
Avg. Pre-Election Pub Goods Exp	0.1742*
Financed by Villagers	0.1997*
Avg. Pre-Election Income -- 10th Percentile	0.1717*
Avg. Pre-Election Income -- 50th Percentile	0.2167*
Avg. Pre-Election Income -- 90th Percentile	0.2522*
Avg. Pre-Election Gini	0.0711*
Year of 1st Election	-0.0215
Year of 1st Haixuan	0.1163*

Observations are at the village level. * indicates that the correlations are statistically significant at the 5% level.

Table 4: The Effect of *Religious Fragmentation* × *the Introduction of Elections*

Dependent Variable: Government Public Goods Expenditure					
	(1)	(2)	(3)	(4)	(5)
	Baseline				
Post 1st Election x Religious Fractionalization	-154.2			-237.4	-237.4
	(70.80)			(150.7)	(136.9)
Post 1st Election x Buddhist Pop Share		-115.0		41.34	41.34
		(103.6)		(100.5)	(122.2)
Post 1st Election x Christian Pop Share		-151.6		-151.9	-151.9
		(248.6)		(207.8)	(159.4)
Post 1st Election x Muslim Pop Share		24.74		8.482	8.482
		(44.35)		(33.03)	(31.40)
Post 1st Election x Other Religion Pop Share		-941.2		-559.5	-559.5
		(625.3)		(450.5)	(480.2)
Post 1st Election x Religious Polarization			-69.96	54.56	54.56
			(31.84)	(70.73)	(68.29)
Post 1st Election	26.54	23.20	25.34	27.61	27.61
	(11.60)	(11.47)	(11.01)	(11.94)	(12.11)
Post Open Nomination x Religious Fractionalization	-28.66				
	(47.36)				
Post Open Nomination	8.348				
	(11.00)				
Level of Clustering	Village	Village	Village	Village	Province
Observations	4340	4340	4340	4340	4340
R-squared	0.126	0.126	0.126	0.122	0.122

Note: All regressions control for village population, the interaction of religious fractionalization interacted with year FEs, province-year trends, village and year FEs. Columns (1), (3) and (6) also control for the share of all religious individuals interacted with year fixed effects. Unless if stated in the table, columns (1)-(5) also controls for the interaction of post open nomination with the same variable that is shown to be interacted with post election.

Table 5: The Effect of *Religious Fragmentation* × *the Introduction of Elections* – Imputed Religious Populations, Religious Polarization, Religious Population Shares

	Dependent Variables				
	Government Public Goods Exp by Source of Financing				
	(1)	(2)	(3)	(4)	(5)
	All	All	Villagers	Non-Villagers	All
Post 1st Election					
x Religious Fractionalization	-154.2		-148.6	-7.146	36.71
	(70.80)		(91.54)	(16.15)	(33.39)
x Religious Fractionalization (Imputed)		-161.0			
		(76.62)			
Religious Fractionalization					10.96
					(26.44)
Post 1st Election	26.54	52.75	26.92	-0.155	3.073
	(11.60)	(23.25)	(12.88)	(2.186)	(4.910)
Observations	4340	4340	4340	4340	4340
R-squared	0.126	0.123	0.117	0.078	0.042

Notes: All regressions except column (5) control for the the full set of baseline controls: religious fractionalization*year FEs, the share of religious population*year FE, village population, province-year trends, andvillage and year FEs. Column (5) controls for the share of religious population* year FE, village population, province-year trends, year FEs, and the pre-election levels of income at the 10th, 50th and 90th percentiles of the village income distribution as well as the pre-election village Gini. The standard errors are clustered at the village level.

Table 6: The Effect of *Religious Fragmentation* × *the Introduction of Elections* – Sample Selection, Standard Error Correction

	Dependent Variable: Total Gov Public Goods Expenditure								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Full Sample, Baseline	Omit if Religious Share = 0	Few Non-Religious Individuals	Many Non-Religious Individuals	Low Fractionalization Villages	High Fractionliazation Villages	Dep Var is a Dummy for Gov Pub Exp > 0	Omit if Pub Goods Exp=0, Baseline	SE Clustered at Province Level
Post 1st Election x Religious Fractionalization	-154.2	-201.2	-226.4	-712.9	-327.1	-222.0	-0.170	-466.0	-154.2
	(70.80)	(103.0)	(158.3)	(1060)	(859.8)	(180.1)	(0.161)	(401.3)	(82.13)
Post 1st Election	26.54	40.35	48.65	20.84	19.98	46.31	0.0706	81.48	26.54
	(11.60)	(20.41)	(34.97)	(13.46)	(12.00)	(36.77)	(0.0292)	(46.15)	(12.04)
Observations	4340	3280	2057	2283	2118	2222	4340	954	4340
R-squared	0.126	0.114	0.172	0.110	0.106	0.179	0.194	0.381	0.126

Notes: All regressions control for the the full set of baseline controls: religious fractionalization*year FE, the share of religious population*year FE, village population, province-year trends, and year FE. The standard errors are clustered at the village level, except in column (9).

Table 7: The Effect of *Religious Fragmentation* × *the Introduction of Elections* – Robustness to Alternative Factors (e.g., social capital, lineage groups, income, inequality)

	Dependent Variable: Total Gov Public Goods Expenditure									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Post 1st Election										
x Religious Fractionalization	-152.5	-209.2	-162.2	-160.5	-152.1	-148.9	-145.3	-129.3	-151.3	-153.8
	(70.50)	(81.50)	(75.38)	(72.67)	(67.01)	(59.42)	(65.48)	(49.54)	(68.72)	(59.94)
x Temple		51.75								46.95
		(23.21)								(22.19)
x Surname Fractionalization			38.50							-105.8
			(31.18)							(162.3)
x Surname Polarization				-7.078						73.11
				(45.99)						(89.59)
x Pop Share of Top 2 Surnames					-16.48					-177.8
					(30.34)					(196.5)
x Lineage Group						40.75				36.00
						(16.45)				(14.77)
x Avg Pre-Election Tot Gov Pub Goods Exp							2.289			0.0975
							(1.163)			(1.081)
x Avg Pre-Election HH Income (10th Percentile)								0.0139		0.0299
								(0.0259)		(0.0300)
x Avg Pre-Election HH Income (50th Percentile)								-0.0200		-0.0241
								(0.0214)		(0.0209)
x Avg Pre-Election HH Income (90th Percentile)								0.00497		0.00381
								(0.00376)		(0.00264)
x Avg Pre-Election Gini									34.98	24.27
									(95.43)	(188.1)
Post 1st Election	26.46	13.83	1.237	31.76	34.96	6.029	17.90	34.72	16.60	133.2
	(11.58)	(6.338)	(17.07)	(27.44)	(22.88)	(5.816)	(9.122)	(15.44)	(24.78)	(209.8)
Observations	4340	4340	3880	3880	4340	4340	4340	4340	4340	3880
R-squared	0.126	0.133	0.133	0.132	0.126	0.131	0.129	0.132	0.126	0.151

Notes: All regressions control for the the full set of baseline controls: religious fractionalization*year FE, the share of religious population*year FE, village population, province-year trends, and year FE. The standard errors are clustered at the village level.

Table 8: The Effect of *Religious Fragmentation* × *the Introduction of Elections* – Robustness to Additional Controls

	Dependent Variable:Total Gov Public Goods Expenditure								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Post 1st Election x Religious Fractionalization	-152.5	-139.4	-149.7	-130.8	-163.7	-153.0	-149.8	-152.6	-137.3
	(70.50)	(64.58)	(69.90)	(62.69)	(72.08)	(71.77)	(64.25)	(70.52)	(59.94)
Post 1st Election	26.46	25.69	26.10	25.42	29.30	25.97	28.34	26.45	28.45
	(11.58)	(11.42)	(11.42)	(10.96)	(11.86)	(11.95)	(12.81)	(11.58)	(12.78)
Controls									
Near City * Year FE	N	Y	N	N	N	N	N	N	Y
Post Tax and Fee Reform	N	N	Y	N	N	N	N	N	Y
Lineage * Year FE	N	N	N	Y	N	N	N	N	Y
Temple * Year FE	N	N	N	N	Y	N	N	N	Y
Ever Merged * Year FE	N	N	N	N	N	Y	N	N	Y
Pre-Election HH Income (10th, 50th, 90th) * Year FE	N	N	N	N	N	N	Y	N	Y
Province-Year Squared	N	N	N	N	N	N	N	Y	N
Observations	4340	4340	4340	4340	4340	4340	4340	4340	4340
R-squared	0.126	0.131	0.126	0.135	0.139	0.130	0.154	0.126	0.182

Notes: All regressions control for the the full set of baseline controls: religious fractionalization*year FE, the share of religious population*year FE, village population, province-year trends, and year FE. The standard errors are clustered at the village level. `Y' indicates additional controls at the bottom of the table.

Table 9: The Effect of *Religious Fragmentation* × *the Introduction of Elections* on Public Goods Provision and Private Expenditure

	Dependent Variables						
	Gov Pub Exp Funded by Villagers	Ln Arable Land	Primary School Enrollment Rate	Household Exp on Agric Prod	Ln Arable Land	Household Exp on Schooling	Primary School Enrollment Rate
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Post 1st Election x Religious Fractionalization	-146.5	-2.514	-26.01	-80.86	-7.618	8.712	-0.754
	(74.03)	(2.172)	(13.23)	(42.38)	(3.517)	(5.562)	(9.595)
Post 1st Election	26.82	0.113	2.298	10.13	0.400	-1.907	0.923
	(11.91)	(0.0850)	(1.174)	(6.638)	(0.198)	(1.354)	(1.438)
Observations	4340	3291	2682	873	769	873	841
R-squared	0.117	0.872	0.310	0.569	0.935	0.829	0.305

Notes: All regressions control for the the full set of baseline controls: religious fractionalization*year FE, the share of religious population*year FE, village population, province-year trends, and year FE. The standard errors are clustered at the village level.

Figure 1: Fractionalization versus Polarization – Using Raw Data

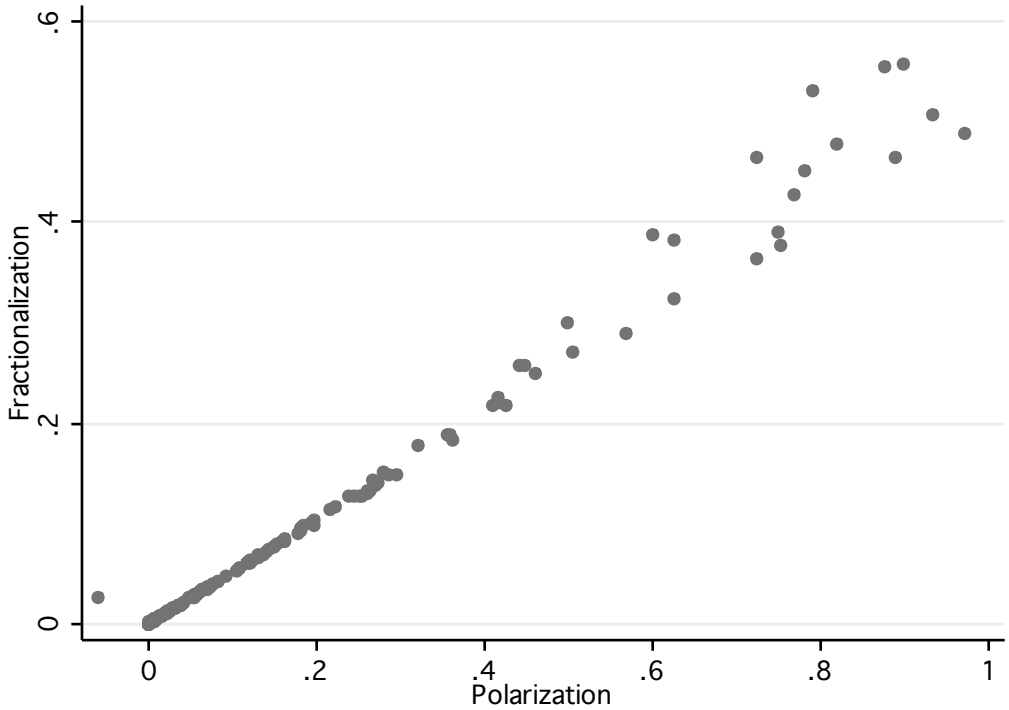
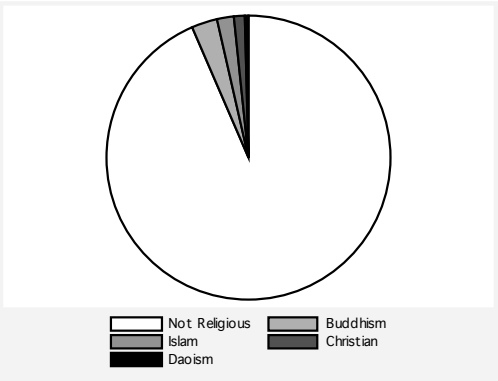


Figure 2: Average Religious Population Shares

(a) Raw Data



(b) Imputed Data

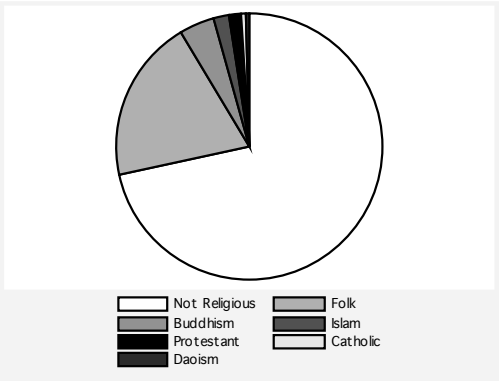
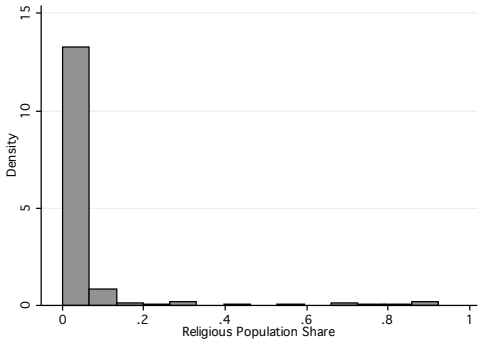


Figure 3: Histograms of Religious Population Shares Across Villages

(a) Raw Data



(b) Imputed Data

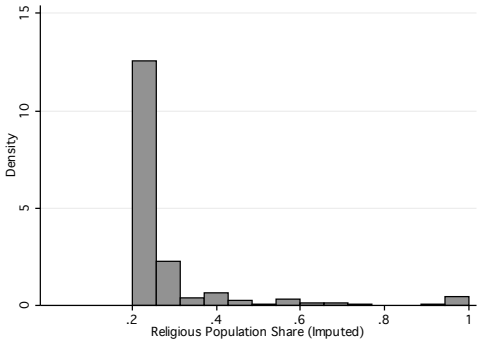
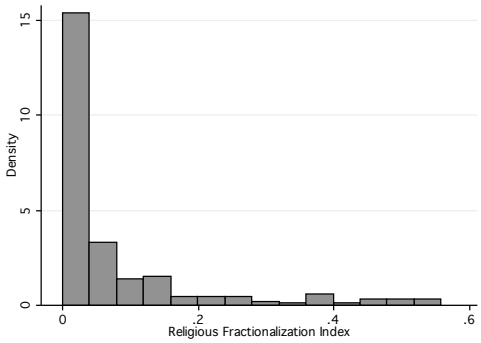


Figure 4: Histograms of Religious Fractionalization Across Villages

(a) Raw Data



(b) Imputed Data

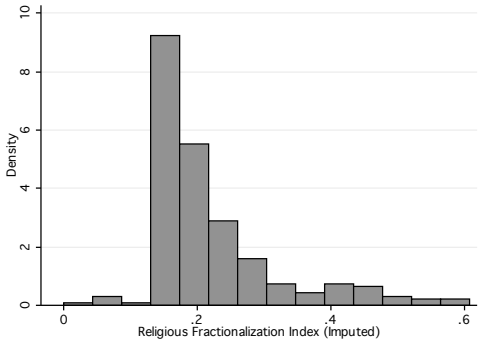
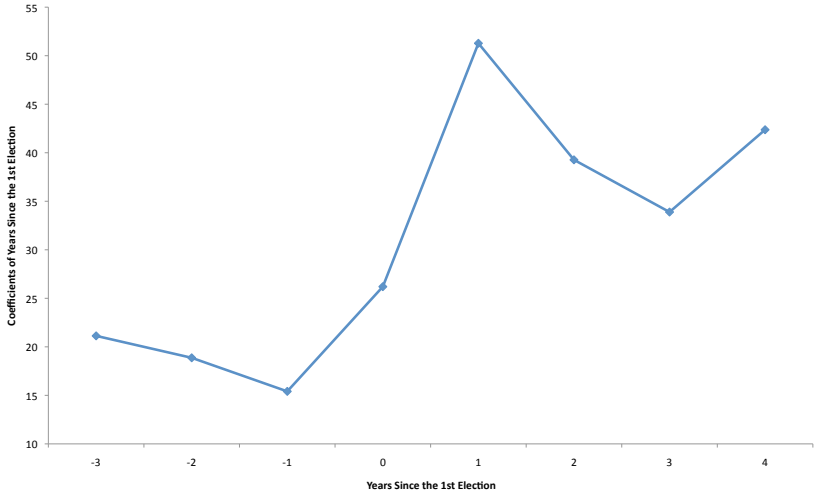


Figure 5: The Estimated Effects on Government Public Goods Expenditure for Each Year Since the First Election

(a) Coefficients for the Years Since the 1st Election Dummy Variables



(b) Coefficients for the Interaction Effects of the Years Since the 1st Election Dummy Variables and Religious Fractionalization

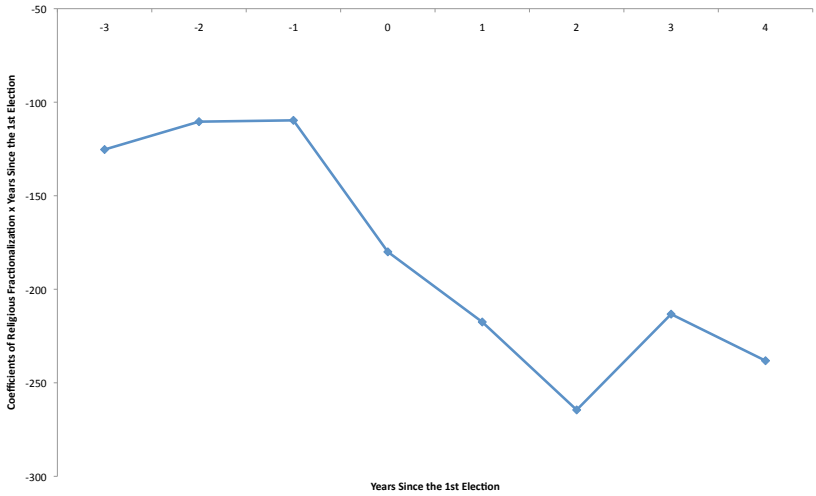


Table A.1: The Effect of Religious Fragmentation for Each Years Since the Introduction of Elections

	Dependent Variable: Gov Public Goods Exp (Funded by Villagers)				
	(1)	(2)		(3)	(4)
	coef	se		coef	se
Post 1st Election			Post 1st Open Nomination		
x Years Since Election = -3	-125.3	(95.86)	x Years Since Open Nomination = -3	-17.66	(48.76)
x Years Since Election = -2	-110.4	(103.7)	x Years Since Open Nomination = -2	-28.54	(49.16)
x Years Since Election = -1	-109.7	(107.2)	x Years Since Open Nomination = -1	-87.34	(97.80)
x Years Since Election = 0	-180	(111.1)	x Years Since Open Nomination = 0	-4.652	(38.02)
x Years Since Election = 1	-217.5	(132.6)	x Years Since Open Nomination = 1	-18.89	(53.77)
x Years Since Election = 2	-264.5	(119.0)	x Years Since Open Nomination = 2	-19.25	(61.95)
x Years Since Election = 3	-213.3	(126.1)	x Years Since Open Nomination = 3	-109.7	(124.3)
x Years Since Election = 4	-238.2	(123.2)	x Years Since Open Nomination = 4	-122.7	(101.2)
Years Since Election = -3	21.13	(11.13)	Years Since Open Nomination = -3	-4.071	(4.779)
Years Since Election = -2	18.87	(12.10)	Years Since Open Nomination = -2	-6.605	(4.446)
Years Since Election = -1	15.41	(13.53)	Years Since Open Nomination = -1	12.9	(23.79)
Years Since Election = 0	26.2	(13.79)	Years Since Open Nomination = 0	-7.213	(5.230)
Years Since Election = 1	51.28	(33.69)	Years Since Open Nomination = 1	19.89	(32.07)
Years Since Election = 2	39.27	(15.96)	Years Since Open Nomination = 2	-13.14	(10.44)
Years Since Election = 3	33.89	(19.43)	Years Since Open Nomination = 3	29.39	(26.35)
Years Since Election = 4	42.37	(20.78)	Years Since Open Nomination = 4	3.733	(18.35)
Observations			4340		
R-squared			0.129		

Notes: The regression controls for the the full set of baseline controls: religious fractionalization*year FE, the share of religious population*year FE, village population, province-year trends, and year FE. The standard errors are clustered at the village level.