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RELIGIOUS RIOTS AND ELECTORAL POLITICS IN INDIA

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The effect of ethnic violence on electoral results provides useful insights into voter behaviour and the incentives for political parties in democratic societies. Religious riots have claimed more than 14,000 lives in India since 1950. We study the effect of Hindu-Muslim riots on election results in India. We combine data on riots with electoral data on state legislature elections and control variables on demographics and public goods provision to construct a unique panel data set for 16 large states in India over a 25 year period commencing in 1977. We use a new instrument that draws upon the random variation in the day of the week that important Hindu festivals fall on in each year to isolate the causal effect of riots on electoral results. We find that riots occurring in the year preceding an election increase the vote share of the Bharatiya Janata Party in the election. We find suggestive evidence that communal polarisation is the likely mechanism driving our results.

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Abstract

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1 Introduction

'How do voters choose to cast their vote?' - this question fascinates economists and has many answers, each of which explain part of the complexity of real voting decisions. Voting behaviour has been studied theoretically and empirically in great depth (see Ansolabehere, 2008 for an overview).The rational choice models have voters comparing their expected utilities under different candidates or parties and choosing their vote to maximise their expected utilities (Downs, 1957). The most basic interpretation of this model would have only differences in economic policies and expected economic outcomes between candidates as factors influencing voting behaviour. These would include allocation of public goods and public services, macroeconomic policies and plausibly administrative policies influencing bureaucratic efficiency and corruption. There is an extensive theoretical and empirical literature establishing that these factors do affect voter choice and electoral outcomes (Kramer, 1971; Stigler, 1973; Fair, 1996).

Broadening this model of voter behaviour, we can include identity in the individual voter's preferences, thus making the ethnic, religious or racial identity of the candidate or the party an important factor in elections (Glaeser, 2005; Fearon, 1999). Empirically, there are studies analysing the influence of ethnic divisions on politics in sub-Saharan Africa (Eifert et al, 2010; Posner, 2004) and others examining the effect of incumbents from multiethnic parties on riots in India (Nellis, Weaver and Rosenzweig, 2015). Within this broader literature on identity and politics, our contribution is to assess the impact of ethno-religious riots on the results of democratic elections. Investigating this question provides insights into the direction and magnitude of the effect of ethno-religious polarisation, or increased salience of ethno-religious identity, on voters' decisions. Our work is in keeping with a broader literature that uses economic and statistical methods to evaluate the role of religion in society (see Iyer, 2016 for an overview).

Identity politics and political parties based on ethnic identity are widespread across the world. The literature from political economics lists two main reasons for electoral politics being conducted along ethnic lines. One is that different ethnicities may have different preferences over public goods and hence, political parties evolve around ethnic identities to reflect these preferences. The other reason is that it is easier to form coalitions within an ethnicity to acquire and distribute political rents. Neither of these reasons explain why ethnic violence should lead to increased support for an ethnic party. That could be because the violence makes salient that particular identity and results in polarisation of voters along those lines. This salience-based explanation may be another factor, other than the ones mentioned earlier, behind the existence and success of identity politics across the world.

We investigate the effect of Hindu-Muslim riots on state government elections in 16 Indian states from 1977 to 2001. The riots data is obtained from a data set constructed first by Varshney and Wilkinson (2004) and extended by us, using individual news reports on Hindu-Muslim riots from The Times of India (Mumbai) newspaper. This event-study data is supplemented with electoral data from publicly available data on state assembly elections. The delimitation document (Election Commission, 1976) is used to map electoral constituencies onto administrative districts. The riots and electoral data combined with data on demographics and public goods provision from decennial Indian Censuses are used to construct our unique dataset.

We examine the effect of riots occurring in a district in the year preceding an election on the vote share obtained by the Hindu nationalist Bharatiya Janata Party (BJP) in the election. We find that the effect is positive and significant and remains robust to using different control variables and using fixed effects specifications to account for district-specific unobservables. We establish the causal effect of riots on electoral results by using a unique instrument for riots. Our instrument is a binary variable that takes the value 1 when an important Hindu festival in a state in a given year falls on a Friday, which is the holy day for Muslims. Anecdotal evidence suggests that religious riots are exacerbated by festivals which are salient for particular religious groups, mainly because these festivals are often associated with very visible public displays of religious faith such as religious processions and collective worship. We hypothesize that such occurrences, whose dates are based completely on lunar cycles, increase the probability of riots occurring and find that the data supports this hypothesis. Using this variable to instrument for riots we find a positive and significant causal effect of riots on the vote share of the BJP.

We also analyse the impact of possible under-reporting of riots on both our OLS and IV estimates and show that while the bias in the OLS estimate will be negative and bounded, the bias in the IV estimate will be positive and unbounded. We obtain a crude measure of under-reporting by comparing our dataset to other sources and use the derived expressions for the biases to correct our estimates. We find that a riot in the year preceding an election can lead to an increase in the BJP's vote share by 6 - 8 percentage points, which is the upper bound for our estimate. We also find that riots effect election outcomes in adjoining districts and the effect decays with distance.

Hindu-Muslim riots in India have been the subject of a number of studies, most of which have examined what causes the riots. These causes are social (Brass, 1997, 2003; Varshney, 2002), economic (Bohlken and Sergenti, 2010; Mitra and Ray, 2014, Field et al, 2008) and political (Wilkinson, 2004; Jha, 2014; Pathania and Tandon, 2011; Blakeslee, 2013). There are very few studies in the economics of India which examine

the political implications of the occurrence of riots.

While both Blakeslee (2013) and Varshney and Gubler (2012) do discuss incentives, of a political party in the first case and of the state in the second, to incite ethnic tensions to obtain better electoral results, they do not demonstrate the effect explicitly. The main reason for the lack of studies demonstrating this effect is because of the methodological challenge of establishing exogenous causes for the riots. The major contribution of our paper is that it overcomes this challenge by using a unique religious festival instrument which also demonstrates the magnitude and direction of the effect of riots on electoral results. The most important implication of our work is that it provides a solid basis for the argument that the majority identity party has a clear incentive to incite ethnic tensions or even to cause riots. Recent events in India have shown that this was used as a strategy in Western Uttar Pradesh (Muralidharan 2014; Rao et al 2014).

Section 2 provides a brief historical background of inter-communal relations and electoral politics in India and reviews the literature on identity politics and ethnic violence, both in India and more widely. Section 3 contains a description of the data used. Section 4 explains the econometric specification and describes the instrument used to identify the causal effect of religious riots on election results. Section 5 describes the regressions and their results. Section 6 concludes.

2 Religious Riots and Indian Electoral Politics[3]

The history of religious riots and politics in India can be divided into 4 phases: pre-Independence, between 1947-1977, between 1977-2001, and from 2001 to the present.

In India, there is evidence of religion-related incidents of violence as early as the eighteenth century. In the eighteenth century, there were communal riots in Ahmedabad in 1714; in Kashmir in 1719-20, in Delhi in 1729 and in Vidarbha in 1786. For the nineteenth century, historians report evidence of incidents in Benaras (1809-15), Koil (1820), Moradabad and Kashipur (1833), Bareilly, Kanpur and Allahabad (1837-52) (Bayly 1983). However, communal incidents were not a regular aspect of provincial life in the nineteenth century (Indian Statutory Commission Report, 1930: 97-107). Riots were localised in East Bengal (1907), Peshawar (1910), Ayodhya (1912), Agra (1913), Shahabad (1917) and Katarpur (1918). Between 1920 and 1924 there were riots in Malegaon, Multan, Lahore, Saharanpur, Amritsar, Allahabad, Calcutta, Delhi, Gulbarga, Kohat, Lucknow and Nagpur. In southern and western India, there were no significant riots until 1928 when they affected Bangalore, Nasik, Surat and Hyderabad.

[3]Our account here of the political history of post-Independent India draws heavily on the work of Guha (2007). The history of religious riots is drawn from Iyer (2002).

There were major riots in Calcutta and Bombay in 1926 and 1928 (see Iyer, 2002 for a more detailed discussion).

As the movement against colonial rule led by the Indian National Congress gathered momentum, domestic politics began to be more communalised. The Muslim League which claimed to represent the Muslims of the country, expressed mistrust in the secular rhetoric of the Congress, claiming that it represented the interests of Hindus only. The Civil Disobedience movement of 1942 yielded fresh outbursts of communal violence, which have been attributed by some historians to imperial forces that tried to control the struggle for independence (Sarkar, 1981). With the end of British rule imminent, the Muslim League's demand for the partition of India along religious lines became the flash point. Serious communal clashes took place, at times repeatedly, in Ahmedabad, Calcutta, Noakhali, Bhagalpur, Dacca, Patna, Bombay and Allahabad in 1946-47. The riots leading up to and continuing through the eventual partition of India and the creation of Pakistan remain the most devastating episode of communal violence in modern India with estimates of the death toll ranging from 200,000 to 1 million people (Pandey, 2001).

After gaining independence in 1947, India formally became a democratic republic and adopted a written constitution in 1950, with the first general elections being held in 1951. Although the Indian National Congress (INC), the party credited with fighting for independence and then establishing a functioning democracy in India, had had uninterrupted control of the central government under Prime Minister Jawaharlal Nehru, its control was by no means unchallenged. Among the many parties opposing the Congress was the Bharatiya Jana Sangh (BJS), a Hindu nationalist party formed in 1951 by Shyama Prasad Mukherjee, who resigned from Nehru's cabinet, in consultation with the Rashtriya Swayamsevak Sangh (RSS), a Hindu nationalist social organisation. Although there were other smaller Hindu nationalist parties such as the Hindu Mahasabha and the Rama Rajya Parishad, the BJS was the main representative of the Hindu nationalist view. Its vote share grew from 3% in the first national elections in 1951 to 14% in the fifth national elections in 1971.

Post-independent India from 1947 to 1949 is not part of our dataset although riots in the aftermath of partition continued during this period. In fact 1950, the first year in our dataset, has the highest number of reported riots, 50, till the 1980s. The period from 1950-1976 was relatively calmer with an average of about 15.4 riots reported per year. The period that we are concerned with in this paper, 1977-2001, witnessed a much higher rate of incidents of about 42.7 riots reported per year from across the country. The political events that accompanied this increase in violence are described below.

The 1970s saw division in the ranks of the INC and the Prime Minister Indira Gandhi

adopting increasingly populist rhetoric to counter it. Democracy was suspended by Indira Gandhi with the imposition of Emergency in 1975. Leaders of opposition parties including BJS were arrested and the press was censored. The Emergency was lifted in 1977 and elections were conducted at the centre as well as in several states. The Janata Party, an agglomeration of parties ranging from the left-leaning Socialist Party to the Hindu nationalist BJS, came to power to form the first non-Congress government at the centre since independence. The government was short lived and collapsed in 1980. The next round of elections saw the resurgence of the INC under Indira Gandhi at the centre as well as in several states. The leaders of the erstwhile BJS left the Janata party to regroup and formed the Bharatiya Janata Party (BJP) in 1980.

The INC retained control of the centre first under Indira and later under her son Rajiv Gandhi, till 1989. The assassination of Indira Gandhi by her Sikh bodyguards in 1984 was followed by a spate of anti-Sikh riots. During this time, the BJP along with other subsidiary associations of the RSS started a movement to build a temple at the site of the disputed Babri Mosque or Babri Masjid in Ayodhya. The movement helped the BJP gain popular support and it came to power in several states. In the general election of 1989 the BJP gathered 11% of the votes and was the third largest party in parliament after the INC and the Janata Dal, a centrist remnant of the erstwhile Janata Party. It supported a government of the National Front, a coalition of the Janata Dal with some regional parties, under Prime Minister V.P. Singh. This government also did not last long, with the BJP withdrawing support primarily because of V.P.Singh's efforts to stop the Babri Masjid agitation being supported by the BJP. In the subsequent elections in 1991, the BJP gathered 20% of the votes and established itself as the main opposition party to the INC government led by P.V. Narasimha Rao. In December 1992, the Babri Masjid movement led by the BJP culminated in the demolition of the disputed structure by militant Hindu nationalists. A spate of riots erupted in different parts of the country including Mumbai and Surat.

These riots were followed by a period of comparative calm till 2001. During this time a BJP led government came to power for the first time in 1996, albeit only for a period of 13 days. Eventually the BJP led National Democratic Alliance ruled at the centre from 1998 to 2004. In 2002, a series of riots erupted in the state of Gujarat, where BJP leaders were allegedly directly involved. These riots left at least a thousand people dead and forced approximately 98,000 people into refugee camps (Jha 2014). This was followed by a period of relative calm until 2013, where riots have again broken out in Kishtwar in Jammu and in Muzaffarnagar in Uttar Pradesh. The involvement of political leaders in both these riots has been the subject of many articles (Muralidharan 2014; Rao et al 2014) and the results of the general elections overwhelmingly and in an

unprecedented manner favoured the BJP in both these regions. The question of whether this substantial swing towards the BJP was because of the riots or was part of a nation-wide swing that led to the party's victory in the elections, is difficult to answer. This paper answers exactly the same question, but for previous state elections during 1977-2001 and finds that riots did indeed contribute substantially to increasing the BJP's vote share in that period.

2.1 Riots and politics

Fearon (2008) provides an excellent overview of the literature examining the causes and the relationship between ethnic politics and ethnic violence. He concludes that the relationship between the two has not been adequately addressed. Ethnoreligious conflicts themselves have been widely researched. Arguably starting with Horowitz (1985), the study of the causes of ethnic conflict has generated a substantial literature. Esteban and Ray (2008) describe how economic polarisation along ethnic lines can lead to ethnic conflict. DiPasquale and Glaeser (1998) focus on the 1960's urban race riots in the USA and find that the individual costs and benefits of rioting, in terms of the probability and size of punishment, unemployment and ownership of property, matter. Hindu-Muslim riots in India have also been well documented: for example, Varshney (2002) describes the role of civic institutions in preventing inter-ethnic violence. Bohlken and Sergenti (2010) find that low economic growth increases the probability of riots occurring, while Mitra and Ray (2014) find that growth in Muslim per-capita expenditures increases the chances of future communal violence while the increase in Hindu per-capita expenditures has negative or no effect. Field et al (2008) find that rent control restricted the locational choices of workers thus preventing segregation and hence leading to riots in Gujarat. These examples show that the causes of riots are complex and multi-faceted. The findings on economic and social causes of riots does not preclude the presence of other factors such as electoral politics. The fact that communal riots were happening in India before electoral politics existed in the country implies that this cannot be the sole cause.

The relationship between electoral politics and Hindu-Muslim riots in India has been explored in a few studies. Wilkinson (2004) shows that riots are less likely in states with higher effective number of political parties and where the ruling party depends on minority votes. At the local level, using data from 167 towns in the state of Uttar Pradesh, he finds that higher electoral competition measured as the closeness of state elections in towns leads to the higher likelihood of riots. Varshney and Gubler (2012) present criticisms of both results. They imply that the role of the state govern-

ments might have been overstated with respect to the first result and they raise certain methodological objections about the mapping of electoral constituencies onto towns for the second one. Wilkinson's second result finds support from Jha (2014), whose study focussed on the state of Gujarat finding that close elections do indeed predict a higher likelihood of riots at the level of towns. Jha (2014) also finds significant effects of historical inter-ethnic relationships on the duration of riots.

Apart from electoral competition, another strand of the literature focusses on the relationship between the electoral results of the majority identity party, in this case the Bharatiya Janata Party (BJP) and the incidence of riots. Pathania and Tandon (2011) investigate the relationship between the BJP's results in the 1989 and 1991 national elections and the incidence of riots. They find that the share of close elections won by the BJP is positively correlated with the severity of subsequent riots, as measured by the number of people killed or injured or as the duration of the riot. They do not find any correlation between the results of the BJP and the frequency of riots. They do find a correlation between riots and the number of close elections, similar to the electoral competition literature discussed above. Nellis, Weaver and Rosenzweig (2015) find that a victory of the Indian National Congress in close elections for the state assembly between 1962 and 2000 led to a reduction in Hindu-Muslim riots. Blakeslee (2013) shows that the BJP's campaign involving its leaders touring northern India as part of the Babri Masjid agitation led to an increase in the party's vote share in the subsequent national elections in 1991, as well as an increase in the probability of riots.

Although many scholars refer to the relationship between riots and politics, more so in the case of India, there have been few studies of the effect of ethnic violence on electoral politics. Blattman (2009) finds that in northern Uganda, violence led to increased political participation in the form of increased voting and community leadership. Aidt and Franck (2015) show that the so-called Swing riots in England in 1830-31 increased the votes polled by pro-electoral reform politicians. In India, although the causes of riots and the role political competition may play in them have been studied in great detail, there is no evidence regarding the impact of the riots themselves on electoral results. The assessment of this impact is essential to understand the incentives that ethnic identity-based political parties have in planning their electoral strategy.

The theoretical background for expecting ethnic riots to have a bearing on politics was provided as early as Coser (1956) who argued that inter-group conflict serves to increase within group cohesion. To extend the argument, increased within group cohesion would benefit a political party that seeks votes on the basis of group identity.

In the Indian context, Jha (2014) finds a positive correlation between the duration of riots and an increase in BJP's vote share but makes no attempt to establish a causal rela-

tionship. The main focus of the paper is the effect of historical inter-ethnic relationship on present day inter-ethnic dynamics reflected in riots and elections . Brass (2003) in his detailed study of riots and politics in Aligarh in Uttar Pradesh describes the complex relationship between politics and ethnic relations. He writes,

> "The gist of my argument on the relationship between party politics and riots were stated in one of my earlier works as follows: "there is a continuum from political rivalry leading to communal riots to political rivalry feeding on communal riots." The continuum may, however start at either end, that is, from political rivalry to riots as well as from communal riots to intensified political rivalry. However, the sequence in Aligarh has been primarily in the latter direction, that is, communal riots have preceded and have led to intensification of interparty competition. The mechanisms that lead to this intensification arise from the tendencies that follow from riots to foster increased communal solidarity and polarization, which in turn are promoted by political parties and/or individual candidates who stand to benefit from such solidarity and polarization. The resultant communalization and polarization in turn reduce the electoral prospects of parties and candidates who stand for secular political practices, intercommunal cooperation, and class or caste/baradari mobilization rather than communal mobilization."

It is this change in "electoral prospects" that we attempt to elucidate more clearly in this paper.

3 Data

India has a quasi-federal system of government where power is shared between the central government and the state governments. The control over law and order, and hence the handling of riots, is within the state government's ambit. As of 2001, India consisted of 25 states. For this analysis we only look at large states with population greater than 10 million as at the 2001 census. There are sixteen such states that account for 96% of India's population. These states are Andhra Pradesh, Assam, Bihar, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal. This includes three states – Jharkhand, Chattisgarh and Uttarakhand - that were created in 2000. We collected data for 25 years from 1977 to 2001 because this was the period during which the delimitation done in 1977 is valid. Data for all variables is consolidated at the level of the district. These are administrative divisions and most public data is available at this level. Over time the districts have been divided

and merged to create new ones. We use the district as defined in 1977 and match the rest of the data to that. This gives us a panel dataset of 338 districts over 25 years.

3.1 Elections

Electoral data for state elections was collected from statistical reports released by the Election Commission. We have used data from state elections rather than from national elections as there were only eight national elections during the 25 year period and it would be difficult to disassociate the effects of the elections with that of random events happening coterminously. If we consider state elections then there were elections in at least one of the sixteen states in 21 of the 25 years in consideration.

India has a five-year electoral cycle. So, we have at least five elections for every state except Jammu and Kashmir, which has four, in this twenty-five year period. Some states have more (up to seven) elections because sometimes early elections are called due to various reasons (no party getting a clear majority or the state government being dismissed by the central government). Only state-wide election results were considered – by-election results were ignored. Each state has a number of electoral constituencies, ranging from 87 for Jammu and Kashmir to 425 for Uttar Pradesh that elect representatives for the state legislative assemblies. These electoral constituencies are grouped into administrative districts each containing on average eleven constituencies. We use the district instead of the electoral constituency as our geographical unit as all the other data is available at district level. It is still a reasonably small unit since we have 338 districts in the 16 states we are considering. We aggregate the election data that is available at the constituency level to the district level using the official delimitation order (Election Commission, 1976). We construct the vote share of a party as a fraction with the numerator being the total votes polled by the party in the district and the denominator being the total number of valid votes cast in all those constituencies in the district in which the party fielded a candidate. The main dependent variable we use is the *vote share of the BJP in a district in an election*.

We also construct a control variable *BJP government*, which is a binary variable that has a value of 1 when the BJP is part of the state government for a given district in a given year. This is important because which party controls the state government may play an important role in influencing both electoral results and the occurrence of riots.

3.2 Riots

Our main explanatory variable is the occurrence of riots. Data for the riots that occurred between 1977 and 2001 in these 16 states was extracted from a larger dataset

that extends from 1950-2006. The initial dataset from 1950-1995 was constructed by Varshney-Wilkinson (2004) and it was extended using individual newspaper reports on riots from the Mumbai edition of The Times of India, held in the India Office archives of The British Library. Most of the observations included the names of towns, villages, and in some cases districts. Using this information, each riot happening in one of the 16 states was matched with one of the 338 districts. The data includes the number of riots that occurred in a year, the duration of the riots and the reported cause of the riot. In many cases the number of people injured, killed and arrested was also reported.

Since each observation is a newspaper report of a riot, the actual intensity of the riot that is being reported varies. As shown in Table 1, there are riots that go on for many days. In other cases, reports of riots from the same place are reported over several days and are hence coded as separate riots in our data. So, it is acknowledged that there is some ambiguity over the intensity of violence that each reported incident represents. For this reason we choose to focus on the extensive rather than on the intensive margin. We construct the primary variable of concern as a binary variable indicating if at least one riot occurred in a given district in a given year. Of a total of 8450 district-year observations, 555 had at least one riot, so the unconditional probability of having at least one riot in a year in a district is 7%.

The reported causes of the riots range from fights between individuals to clashes over religious processions. These represent proximate causes that may or may not result in a full-fledged riot depending on the prevailing atmosphere of communal tension. Varshney and Gubler (2013) use the metaphor of 'sparks and fires', where 'sparks' of small clashes happen everywhere but in an atmosphere of general communal harmony these sparks get doused, whereas in a communally polarised area they may result in a 'fire' or riot.

We also geo-coded the location of each riot. Mapping this on to the location of each district allowed us not only to assign the district in which the riot occured but also measure the distance of any other district to the location of the riot.

Table 1 below provides further details of our riots data. More than 70% district-years that had riots had only one riot in that year. Most of the district-years that had riots had them for only 1 day, but the number of observations of more than 5 days is also significant.

Total observations: 8450 Observations with at least one riot: 555			
Number of riots	Obs.	Duration	Obs.
1	397	1 day	303
2-5	146	2-5 days	179
>5	12	>5 days	73

Table 1. The reported causes, number and duration of riots in 338 Indian districts between 1977-2001

3.3 Demographics and public goods

Demographics play an important role in electoral results and may also be a factor in the occurrence of riots. Hence, we use religious demographic composition, urbanisation and literacy as control variables. The district-wise distribution of the Muslim population across the country was obtained from four Censuses from 1971 to 2001. A number of changes in the organisation of districts have occurred between 1971 and 2001. A number of new districts were created and old districts were re-named. We conducted a mapping of the districts in each Census year compared to those in 1971. The Muslim population of the district in non-Census years was obtained by linearly interpolating between two consecutive Censuses. Hence we obtain an approximate value of the Muslim population in each year in each district. The Muslim population share ranged from almost 0 to more than 98%. However, the distribution is highly skewed with the median at 8.55% and with three-fourths of the districts having less than 14% of Muslims. Similarly, data on urbanisation and literacy levels of the districts was collected from the Censuses.

The provision of public goods may be a factor influencing the choice of voters. Its effect on riots is not self-evident but there is some literature linking economic factors to ethnic violence (Bohlken and Sergenti, 2010; Mitra and Ray, 2014) and we use public goods provision to control for these effects. We again use Census data to obtain the percentage of households that have access to tap water and the percentage of households that have access to electricity. As before, we interpolate linearly between Census years to obtain values for other years.

4 Econometric specification and identification strategy

We estimate the effect of riots on electoral results using this panel dataset. Our specification is as follows. The subscripts have their usual meanings.

$$BJP\ vote\ share_{it} = \alpha + \beta\ Riot_{it-1} + \gamma_1 BJP\ government_{it-1} + \gamma_2 Demographic\ controls_{it} + \gamma_3 Public\ goods\ provision_{it} + \gamma_4 Time\ trends_t + \delta_i + \varepsilon_{it}$$

Here δ_i represents district fixed effects. Our main explanatory variable is $Riot_{it-1}$, which indicates the occurence of at least one riot in the district in the year before the elections. Here we use the calendar year rather than a twelve month period preceding the election. This is because the year of election is largely pre-decided as it follows the electoral cycle, but the month of election is fixed by the election commission taking many factors into account, and riots could be one of them. We do use the preceding tweleve month period in one of the robustness checks and find that the results are unchanged.

While estimating this specification would give us the correlation between riots and BJP vote share, but interpreting it as a causal effect would be problematic. It may be the case that riots may be caused in expectation of a good result by the BJP. Another possibility could be the presence of time-varying unobservables that affect both electoral results and the likelihood of riots.

In order to establish the causal effect of riots on electoral results we construct an instrument for riots. Anecdotal evidence from the newspaper reports that is used to construct the riots data show that a number of riots tend to occur when religious processions are taken out on days of religious significance. These processions are both visible and vocal. For Muslims, Fridays are important religiously as special weekly prayers are held in mosques on those days. These generally result in a large congregation of people in the area surrounding the mosque. The Hindus have a number of festivals of differing importance depending on the state and region. The day on which these festivals fall depends on the Hindu lunar calendar. Hence, we contend that a year when, in a given region, an important Hindu festival also falls on a Friday, the chances of a riot happening is higher. Moreover, these riots may happen on the festival day itself or may be the result of communal tensions created on the festival day or in anticipation of it. Hence, in keeping with our logic, we construct an instrument, *Festival*, as follows: First we select the five most important Hindu festivals for each state. In this we are guided by the public holidays declared and published officially in each state by the state government. Hence, major festivals such as Dussehra and Diwali that are celebrated across the country were used for all states but festivals such as Holi or Ganesh Chaturthi, which are more local, were used for the respective states in which they are predominantly celebrated (for example in this case in Uttar Pradesh and Maharashtra respectively). The festivals chosen for each state is given in Appendix 1. For districts in each state, the instrument was set equal to one for the year in which one of these festivals fell on a Friday, and it was set equal to zero for all other years. Hence, we construct a completely ex-

ogenous instrument with variation in both cross-sectional and time dimensions. As we use this instrument in fixed effects regressions, any state-specific endogeneity inherent in the historical importance of a festival in a given state, is eliminated.

A list of variables with summary statistics is provided in Table 2 below.

Name	Type	Definition	Mean (S.D.)	Observations
BJP vote share$_{it}$	Fraction	The aggregate vote share of BJP in election in district *i* in year *t* across all those constituencies in which BJP fielded a candidate.	0.24 (0.16)	1571
Riot$_{it}$	Binary	Equals one if a riot occurred in district *i* in year *t*	0.07 (0.25)	8450
BJP government$_{it}$	Binary	Equals one if BJP is part of the government of the state in year *t*	0.12 (0.32)	8450
Muslim population share$_{it}$	Percentage	Percentage of the population that is Muslim in district *i* in year *t*	11.81 (13.90)	8214
Urbanisation$_{it}$	Percentage	Percentage of the population that lives in urban areas in district *i* in year *t*	22.15 (15.33)	6998
Literacy$_{it}$	Percentage	Percentage of the population that is literate in district *i* in year *t*	22.15 (15.33)	6998
Tap Water$_{it}$	Percentage	Percentage of households in district *i* in year *t* that have access to tap water	27.77 (19.21)	6878
Electricity$_{it}$	Percentage	Percentage of households in district *i* in year *t* that have access to electricity	40.63 (24.22)	6978
Festival$_{it}$	Binary	Equals 1 if an important Hindu festival in district *i* falls on a Friday in year *t*	0.55 (0.50)	8450

Table 2. Description of the main variables

The number of observations of the dependent variable, *BJP vote share,* is only 1571 because we include only election years, and hence this results in a very unbalanced panel data set. The observations for some of the control variables is also lower than the maximum of 8450 because of some missing data in the Censuses.

5 Results

5.1 Basic specification

Table 3 presents the results of regressions of $Riot_{it-1}$ on $BJP\ voteshare_{it}$ using different specifications and control variables. The first column is an OLS regression where we control for having a BJP government in the year before the election and use state fixed effects. We find that the effect of riots in the previous year on the vote share of the BJP is positive and statistically significant.

As we have panel data we can use fixed effects regression to account for district specific time invariant heterogeneity, which could be biasing the OLS results. Columns 2-6 present the results of district level fixed effects regressions. The standard errors are clustered at the district level to account for the possibility of correlation in the error terms of observations from the same district. In the third column we introduce a quadratic time trend to account for country level variation in the popularity of the BJP. We are not able to use year fixed effects because we have an unbalanced panel and many years with very few observations, hence we lose power on account of using year dummies and lose significance in other estimates as well. In the robustness checks subsection we show some regressions with five year fixed effects and the coefficients are similar to the ones shown here. Returning to Table 3, in the fourth, fifth and sixth columns we add controls for demographic variables, namely the percentage of Muslims in the population, urbanisation and literacy; and variables that capture public goods provision, namely the availability of electricity and tap water.

We find that the coefficient of $Riot_{it-1}$ is consistently positive and significant across all specifications and is robust to the addition of various control variables. The magnitude of approximately 0.03 indicates that a riot is correlated with an increase in the vote share of the BJP by approximately 3 percentage points. The magnitude is significant for close elections but does not suggest that riots are correlated with large swings in the electoral results. The control variables for literacy and those for public goods are also significantly correlated with the dependent variable, but it is difficult to interpret these correlations in the absence of exogenous variation in these variables.

Dependent variable is BJP voteshare$_{it}$						
	1	2	3	4	5	6
	OLS	FE	FE	FE	FE	FE
Riot$_{it-1}$	0.056 ***	0.034 ***	0.034 ***	0.033 ***	0.034 ***	0.033 ***
	(0.013)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
BJP government$_{it-1}$	0.054 **	0.055 ***	-0.009	-0.002	-0.008	-0.003
	(0.021)	(0.006)	(0.007)	(0.006)	(0.006)	(0.006)
Muslim population share$_{it}$				-0.008		-0.012 *
				(0.006)		(0.006)
Urbanisation$_{it}$				0.003		0.003
				(0.002)		(0.002)
Literacy$_{it}$				-0.008 ***		-0.007 ***
				(0.002)		(0.002)
Electricity$_{it}$					-0.003 ***	-0.003 ***
					(0.001)	(0.001)
Tap water$_{it}$					0.003 ***	0.003 ***
					(0.001)	(0.001)
State fixed effects	Yes	No	No	No	No	No
District fixed effects	No	Yes	Yes	Yes	Yes	Yes
Quadratic time trend	No	No	Yes	Yes	Yes	Yes
Number of districts	337	337	337	336	336	335
Number of observations	1571	1571	1571	1331	1314	1311

Standard errors are clustered at the state level for column 1 and at district level for the remaining columns, and are shown in parentheses
Significance levels: *** - 1%. ** - 5%, * - 10%

Table 3. Regression on $BJP\ voteshare_{it}$ of $Riot_{it-1}$ and other variables

5.2 Addressing endogeneity

We have shown that a significant positive correlation exists between the BJP's vote share and riots occurring in the year before elections. To interpret this as a causal effect of riots on vote share, we need to consider a few confounding factors. The first possibility is reverse causation. It may be the case that riots may be caused in expectation of a good result by the BJP. Another possibility could be the presence of time-varying district specific unobservables that affect both electoral results and the likelihood of riots. To deal with these problems, we use an instrument variable to isolate the exogenous variation in riots.

The instrument we use, as described earlier, is a dummy variable that takes a value 1 whenever an important Hindu festival in a district in a given year falls on a Friday, which is a holy day for Muslims. We hypothesize that such occurrences will lead to increased communal tensions and increased probability of riots. The first stage regression shown

in Table 4, supports this hypothesis. The coefficient of the instrument $Festival_{it-1}$ is positive and highly significant and with an F-statistic much above the cut-off norm of 10. The magnitude of the coefficient indicates that when an important Hindu festival falls on a Friday, this increases the probability of riots by 3 percentage points, which is quite significant as the unconditional probability of a riot occurring is 7%.

	Dependent variable is $Riot_{it-1}$									
	1		2		3		4		5	
	FE		FE		FE		FE		FE	
$Festival_{it-1}$	0.029	***	0.029	***	0.029	***	0.028	***	0.030	***
	(0.005)		(0.005)		(0.005)		(0.005)		(0.005)	
$BJP\ government_{it-1}$	-0.001		-0.002		-0.002		-0.002		-0.001	
	(0.009)		(0.010)		(0.010)		(0.010)		(0.010)	
Demographic controls	No		No		Yes		No		Yes	
Public goods controls	No		No		No		Yes		Yes	
District fixed effects	Yes		Yes		Yes		Yes		Yes	
Quadratic time trend	No		Yes		Yes		Yes		Yes	
F-Stat	36.42		35.67		29.87		26.35		29.28	
Number of districts	338		338		338		338		338	
Number of observations	8112		8112		6978		6878		6858	

Standard errors are clustered at district level and are shown in parentheses
Significance levels: *** - 1%. ** - 5%, * - 10%

Table 4. First stage regression on $Riot_{it-1}$ of instrument variable $Festival_{it-1}$

Hence, this instrument satisfies the first requirement of being relevant, i.e. it is correlated with the endogenous variable. The second requirement for the instrument is that it should be exogenous. The dates of Hindu festivals depend on the Hindu lunar calendar and there cannot be any reason to think that the dates on which Hindu festivals fall should affect election results other than through riots. Any possible endogeneity introduced by state specific choice of festivals is eliminated in the fixed effects regression.

However, there are two reasons why the exclusion restriction required for the validity of the instrument may be violated. The first reason is that while we have assumed that a riot occurring in a district will influence the election results only in that district, this may not be the case. The area of the electoral effect of the riot may extend beyond the district in which it occurs. If this is the case then the instrument variable, which is common for all districts within the same state, can affect election results in a district not only through riots occuring in that district but through riots occuring in adjoining districts as well. This would violate the exclusion restriction. The second reason could be the under reporting of riots. The instrument could affect the election results through

riots which are not reported in the newspaper, thus leading to a bias in the IV coefficient. For the remainder of this subsection, we will ignore these two issues and proceed with using the instrument as if it is valid. In the next subsection, we will formulate ways to correct for both of these issues and will present our final set of results.

Table 5 shows the results of the reduced form regressions as well as that of the fixed effects 2-stage least squares regressions using $Festival_{it-1}$ as an instrument for $Riot_{it-1}$. We find that the coefficient of $Riot_{it-1}$ is positive and significant. The number of observations here is substantially reduced compared to the first stage regression shown above because of the nature of the dependent variable, hence it is essential to check for weak instrument bias. We use the Kleibergen-Paap F-statistic since the standard errors are not i.i.d. but clustered at the level of districts (Kleibergen and Paap, 2006). The Stock-Yogo critical value (Stock and Yogo, 2005) for i.i.d. errors at 10% maximal IV size is 16.38. In comparison to that the F-statistic is higher in all but one case, in which it is marginally below. Hence, we conclude that weak instrument bias is not significant in our case.

The IV coefficients shown above should be interpreted as Local Average Treatment Effects (LATE). The effect here is the average effect of the increase in probability of riots that occurs because of Hindu festivals falling on Fridays. It may be the case that the effect of riots on vote share is heterogeneous and is particularly high in those places where riots do result from the coincidence of a festival falling on a particular day. Even then, a 30% vote share gain implies that whenever a riot happens in a year where a Hindu festival falls on a Friday, an election in the next year will almost certainly result in a BJP victory. This seems unrealistic and could be the result of biases discussed earlier viz. larger area of effect of riots and under reporting of riots. We deal with these two issues in the next subsection.

Dependent variable is BJP vote share$_{it}$				
	1	2	3	4
	FE	FE	IV FE	IV FE
Riot$_{it-1}$			0.314 **	0.286 **
			(0.140)	(0.142)
Festival$_{it-1}$	0.021 **	0.023 **		
	(0.008)	(0.010)		
BJP government$_{it-1}$	-0.014 *	-0.009	-0.010	-0.004
	(0.007)	(0.007)	(0.009)	(0.008)
Demographic controls	No	Yes	No	Yes
Public goods controls	No	Yes	No	Yes
District fixed effects	Yes	Yes	Yes	Yes
Quadratic time trend	Yes	Yes	Yes	Yes
Kleibergen-Paap F stat			18.51	16.78
Number of districts	337	335	334	322
Number of observations	1571	1311	1568	1298

Standard errors are clustered at district level and are shown in parentheses
Significance levels: *** - 1%. ** - 5%, * - 10%

Table 5. Reduced form and IV regressions using $Festval_{it-1}$ as instrument variable for $Riot_{it-1}$

5.3 Area of effect of riots

The reduced form estimates reported in Table 5 can be crudely interpreted as the difference in average vote share of the BJP between the election years that did and did not have a Hindu festival falling on a Friday in the preceding year. As the mean value of the *Festival* variable is around 0.55, this coincidence is fairly common. Hence, a little more than half of the election years would have had this coincidence in the previous year. But the occurence of a riot in a district is very rare. The exclusion restriction would imply that the increase in the average of the vote shares in all the election years that had the festival coincidence is because of that rare incidence of riot that may have happened in one of those years. As mentioned earlier, this may not be the case. The election years in which the festival coincidence did not cause a riot in the same district in the preceding year could have experienced a riot in one of the adjoining districts, and the increased average vote share could be because of these riots as well. Hence, if we control for the riots in adjoining districts, we should be able to overcome this violation of the exclusion restriction.

Since we have the geographical coordinates of the riots, we can construct a control variable that is 1 for district i in year t, when there is no riot in district i and there is at least one riot within a radius of x km from the district centre. (The district centre is defined as the location of the largest city in the district. Please refer to the Data Appendix

for details). Introducing this control in the regression does result in a smaller coefficient of $Riot_{it-1}$, but it leads to two problems. One is that the occurence of riots in adjoining districts is very likely endogenous and since it is correlated with the explanatory variable and the instrument, it would be contaminating the coefficient estimate. The second problem is that the choice of the radius of effect x is arbitrary and the coefficent estimates are found to be sensitive to the value chosen. This is to be expected as the effect of riots happening just outside x is assumed to be zero, and any change in the value may just include or just exclude some riots leading to changes in the coefficient.

To overcome these limitations, we construct a new explanatory variable by making the assumption that when there is no riot in district i itself, the election results are influenced by the nearest riot occurring the preceding year and the effect is lower as the distance of the riot from the district is higher. We define the new variable as $\phi(d_{it-1})$, where d_{it-1} is the distance of the riot nearest to district i in year *t-1,* and ϕ is a decay function such that $\phi(0) = 1$ and $\phi(x) \to 0$ as $x \to \infty$. The specification now is

$$BJP\ vote\ share_{it} = \alpha + \beta_a \phi(d_{it-1}) + \gamma_1 BJP\ government_{it-1} + \gamma_2 Demographic\ controls_{it} + \gamma_3 Public\ goods\ provision_{it} + \gamma_4 Time\ trends_t + \delta_i + \varepsilon_{it}$$

The coefficient β_a has the same interpretation as the earlier coefficient. It implies that the vote share of the BJP in state elections in a district will increase by β_a if at least one riot happened in the same district in the previous year. The first stage regression with the instrument also has a simple interpretation. A Hindu festival falling on a Friday may lead to a riot in the district or in nearby areas and the probability of it leading to a riot decreases as the distance from the district increases.

To estimate this specification, we need to specify the function ϕ. We choose a Gaussian decay function as it is simple and widely used. The selection of the standard deviation for the distribution still poses a problem. We tabulate the results for a number of values for the standard deviation. The average area of a district as of the 1981 Census was around 8000 square kilometres[4], which corresponds to a circle with radius of approximately 50 kms. Hence, we start with a value of 100 kms and increase in steps of 50 kms. The coefficient is relatively stable and is approximately in the range of 0.08 to 0.1 for the standard deviation up to the value of 300 kms. The value of 200 kms provides the best fit as measured by the smallness of the root mean squared error, Akaikie's information criterion as well as the Bayesian information criterion. Hence the corresponding estimate of 0.081 is the best estimate for the coefficient β_a.

[4]The surface area of India is 3.288 million square kilometres, which is divided into 412 districts to obtain the average district size.

Standard deviation in km	Coefficient estimate	SE	First stage KP F-stat	Root mean squared error	Akaike's Information Criterion	Bayesian Information Criterion
100	0.090**	0.040	107.5	0.1012	-2615.1	-2568.5
150	0.079**	0.035	137.5	0.1005	-2632.1	-2585.6
200	**0.081****	**0.036**	**147.9**	**0.1005**	**-2633.5**	**-2587.0**
250	0.087**	0.039	143.3	0.1007	;-2628.0	-2581.5
300	0.097**	0.044	131.8	0.101	-2620.0	-2573.5

Standard errors are clustered at district level
Significance levels: *** - 1%. ** - 5%, * - 10%

Table 6. Regression results for different standard deviations for $\phi(.)$

5.4 Under-reporting of riots

As we are using newspaper reports of riots, it is likely that not every riot gets reported. This under-reporting may bias our estimates, as discussed earlier. In order to derive an expression for this bias, we make three assumption regarding the nature of reporting of riots.

1. There is no over reporting, i.e. the newspaper never reports a riot that has not actually happened.

2. Conditional on a district having had one or more actual riots, the probability of at least one riot from that district getting reported is independent of the instrument variable, i.e. riots that are caused because of Hindu festivals falling on a Friday are as likely to be reported as other riots.

3. If a district has had one or more riots in the year before elections, then the effect of those riots on the election results is independent of whether they are reported or not.

The third assumption is most likely not true - simply because newspaper reporting of the riots may increase the effect on elections. But making the assumption leads to over-estimation of the bias. This implies that the coefficient estimate after correcting for under reporting would be a lower bound for the coefficient.

Let the actual probability of at least one riot occurring in a district be λ and given that one or more riots have occurred in the district, the probability of at least one riot being reported be p. We show in Appendix 2 that for regressions without other covariates, the OLS and IV estimates, $\hat{\beta}_{OLS}$ and $\hat{\beta}_{IV}$ respectively, calculated using the reported riots would be related to the actual OLS and IV estimates, $\hat{\beta}^*_{OLS}$ and $\hat{\beta}^*_{IV}$ respectively, as follows.

$$\hat{\beta}_{OLS} = \frac{1-\lambda}{1-p\lambda}\hat{\beta}^{*}_{OLS}$$

$$\hat{\beta}_{IV} = \frac{1}{p}\hat{\beta}^{*}_{IV}$$

The bias on the OLS estimate is negative and bounded by λ, while the bias on the IV estimate is positive and unbounded. We can calculate the bias by getting an estimate of the reporting rate p. We use two studies that provide data on all the riots that happened in a particular place in a given time period. We compare these with the riots reported in the newspapers that we used to get an estimate of the reporting rate.

Jha (2014) investigates Hindu-Muslim riots in Gujarat between 27th February and 15th April, 2002. He augments newspaper and online reports with eye witness refugee testimonials and finds a total of 30 riots in this time period. The Times of India, Mumbai edition, that we have used in our dataset, following the methodology adopted by Varshney-Wilkinson, reports only 23. This leads to a reporting rate $p = 0.77$. But this is not strictly comparable to our case as all riots happen in a very short span of time and this particular year 2002 is also outside of our sample period 1977-2001.

A similar exercise using data from Brass (2003) consisting of riots in the city of Aligarh from 1977 until 1995 is more informative. Brass provides information on riots and "riotous periods" using various records including bureaucratic reports and data from NGOs allowing us to check for reporting rates over a long time span. The resulting reporting rate is $p = 0.83$ and is comparable to the one obtained from Jha (2014).

If we use the average value of $p = 0.8$ and apply the under reporting correction to the coefficient estimate obtained in the previous section, we get the value of the estimate as 0.065. As mentioned earlier, this value is a lower bound and the actual coefficient will be between this and 0.081 to the extent that assumption 3 is violated.

5.4.1 Other concerns with the exclusion restriction

The validity of the instrument can still be questioned if the occurence of Hindu festivals on Friday affects vote share directly and not only through riots. It can be argued that the tensions created between Hindus and Muslims due to contestations over public space during such a coincidence could directly lead the Hindus to vote for the BJP. Such tensions at the local level may well change the voting behaviour of the small number of people actually involved in a particular altercation, but will not create any significant impact in the vote share across a district with a population of around a million people.

A riot can change voting behaviour through a number of mechanisms, discussed in the next section, through which people who were not directly involved in the rioting change their voting behaviour as they are made more aware of the incident or are indirectly affected by it. An altercation that does not result in any 'incident' cannot affect other people in this way. The other argument could be that the festival coincidence leads to a number of such small unreported altercations across the district that can then lead cumulatively to a change in voting behaviour. If such a phenomenon was so widespread then it would be surprising that it has escaped the attention of journalists and academics who scrutinise Indian elections in great detail. On the other hand, the effect of festivals on riots and that of riots on elections have been widely reported, as mentioned earlier.

There could be any number of explanations for how the festival coincidence creates something, as Alfred Marshall (1920) wrote albeit in a different context, "in the air"[5] that leads people to change their voting behaviour, but in the absence of a quantifiable measure of such an effect, it is impossible for us to check or indeed to control for it. We would argue that even if such an effect is present, it is likely to be small and local and may not create a significant bias in our estimates.

5.5 Mechanisms

In this section we discuss the different mechanisms through which riots can impact the voting decisions of electors. Most of the arguments in this section are speculative as it is difficult to pin down the exact mechanism of individual behaviour using district level aggregates, but we think it is still important to try and interpret some of the trends and correlations that we see in the data. There are three ways in which religious riots could change voting behaviour.

1. Turnout: Riots could leave in their wake an atmosphere of fear and lack of security in public spaces. This could make some electors choose not to go out and vote. It can be argued that voters from the minority religion are going to be more at risk and they are more likely to stay at home for fear of violence. This can result in an increase in the vote share of the party that represents the majority religion, which is the BJP in our case. This is one possible explanation for the results that we have observed in the previous section.

2. Learning: It may be the case that a riot would lead to a change in a person's

[5]Alfred Marshall was interested in manufacturing in Victorian Britain, specifically, why firms in the same industry located geographically close to each other. He argued that proximity created something "in the air" because "... if one man starts a new idea, it is taken up by others and combined with suggestions of their own; and thus it becomes the source of further new ideas." (Marshall, 1920, p.271).

ideology and/or party affiliation. It is not very clear if this would lead to more or fewer people voting for the party representing the majority religion, but this still can be a feasible explanation for the results that we observe.

3. Polarisation: Religious riots could lead to the religious identity of voters becoming salient causing them to vote for political parties that represent that identity as suggested by Brass (2003) and many others. In this case, if we assume that a certain fraction of the population of both communities votes according to religion, then the gain for the party representing the majority community would be higher, thus explaining the increased vote share of the BJP. This effect would be temporary compared to point 2, which would lead to a more permanent change in voting behaviour.

To check for the presence of the first mechanism, we look for the effect of the nearest riot distance variable $\phi(d_{it-1})$ described in section 5.3.1, on election turnout. We find that the impact on turnout is negative but not statistically significant. Ideally, we would want to check if the impact is different for Hindus and Muslims, but in the absence of individual-level data we can only conduct an approximate check using the religious composition of the district. If the turnout of Muslims reduces more than that of Hindus, then the districts with a higher proportion of Muslims should mechanically have a larger reduction in turnout after riots. To check this we conduct a series of regressions over a rolling window of 500 observations in increasing order of the proportion of Muslims in the population. The results are shown in Figure 1 below. The middle line indicates the point estimate for the coefficient while the other two lines indicate the confidence interval of two times the standard error. We can see that the turnout remains unaffected in districts with more than 5% Muslim population. In districts with very few Muslims, the turnout may be decreasing because of security threats to a very small minority or because religious polarisation makes the election uncompetitive when one of the religions is very small in numbers. In any case, it is very unlikely that turnout reduction is the reason for increased BJP vote share as a result of riots.

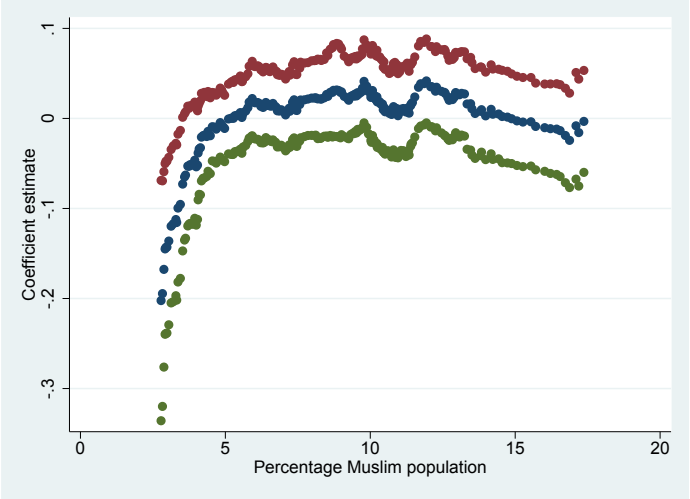
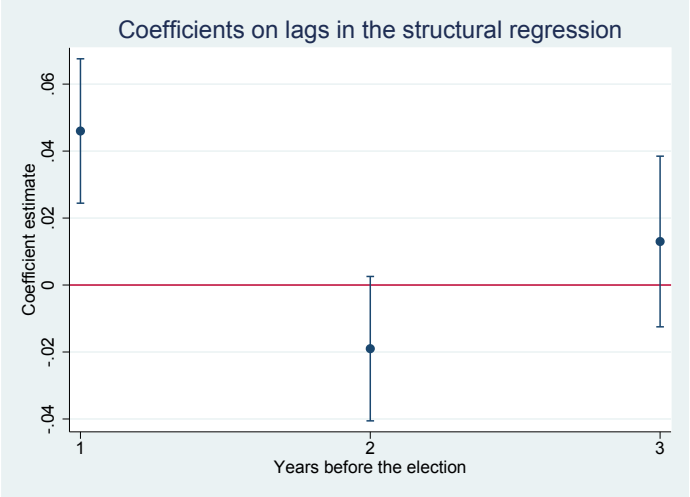


Figure 1. Change in the effect of riots on turnout with respect to percentage of Muslims

To check if riots lead to a permanent change in voting behaviour, we look at the effect of riots at higher lags. We find that the instrument is weak at higher lags as Hindu festivals falling on Fridays do not lead to as much of an increase in riots as they do in the year just preceding the election.[6] Hence we show the reduced form and the structural estimates at 1, 2 and 3 year lags in Figure 2. We stop at 3 years because the average gap between elections is 4.4 years. As we can see, both the structural and reduced form estimates are not significantly different from zero at higher lags, indicating that riots change voting behaviour only for the election happening in the year after and not beyond that. This suggests that a possible 'learning' mechanism may not be driving our results.



[6]If we take this as evidence that political parties or their supporters are using the festival coincidence to instigate riots in the year before elections, then this would suggest that the electoral effect of riots does decay with time, which is why they are being orchestrated in the year before elections.

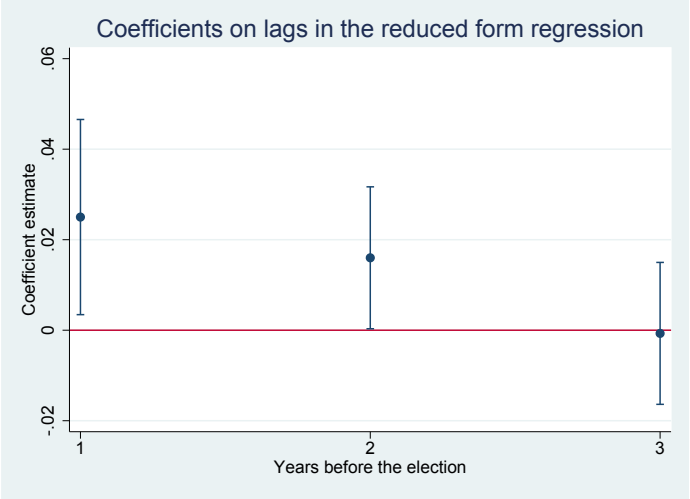


Figure 2. Coefficients on different lags

By excluding the other two possibilities, polarisation seems to be the most likely explanation. Comparing the average BJP vote share of 24%, and the increase in vote share of 8 percentage points, with the average population share of Hindus of about 80%, it is obvious that a very small section of the Hindu population changes their voting behaviour as a result of experiencing a riot. In Figure 3, we plot the change in the coefficient on $\phi(d_{it-1})$ with variation in the Muslim population share. The coefficient is reasonably stable, with a small dip for districts with population share of Muslims greater than about 13%. This shows that the proportion of the population becoming polarised and changing their voting behaviour is not dependent on the population share of Muslims.

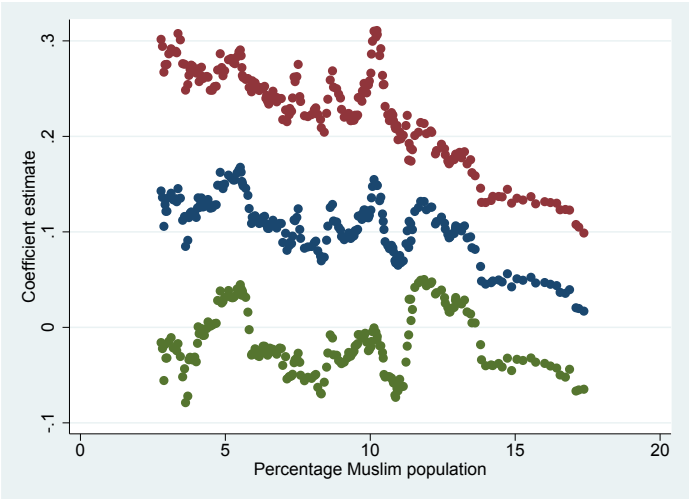


Figure 3. Change in the coefficient with respect to percentage of Muslims

5.6 Robustness checks

5.6.1 Fractional response

All the regressions shown above are linear, whereas the dependent variable $BJP\ voteshare_{it}$ is a fraction and is thus bounded. To estimate the main regression while allowing for the fractional dependent variable, we use the method suggested by Papke and Wooldridge (2008). The explanatory variable is $\phi(d_{it-1})$, which we name $Riot'_{it-1}$. This method involves controlling for district level fixed effects by explicitly controlling for the time-means of the dependent variables. The resulting regression is essentially a random effects regression which allows for specifying the estimating equation as a logit or a probit function. The endogeneity correction using the instrumental variable is achieved using the control function approach. The residuals from the first stage regression, also called the control function, are used as additional regressors in the main regression. Papke and Wooldridge suggest two methods for conducting fractional dependent variable regressions controlling for fixed effects and allowing for endogeneity and we conduct both types of regressions. The first is a Bernoulli quasi maximum likelihood estimation and the second is a pooled panel generalised estimating equation approach. In both cases we assume the link function to be probit. We present the results and the estimated average marginal effects in Table 7. Note that we do not use demographic and public goods controls as then the relevant coefficient loses significance in the first stage. Also, we include five year fixed effects as time fixed effects are recommended in the Papke-Wooldridge procedure - dropping this does not change the results. The marginal effects obtained are very similar to the linear estimates and hence demonstrate that a linear approximation may not be incorrect in this case.

Dependent variable is BJP vote share$_{it}$				
	Pooled QMLE		GEE	
	Coefficient	Marginal effect	Coefficient	Marginal effect
Riot'$_{it-1}$	0.231 *	0.068 **	0.193 *	0.057 *
	(0.118)	(0.035)	(0.116)	(0.034)
Other controls	Lagged BJP rule		Lagged BJP rule	
Quadratic time trend	Yes		Yes	
District fixed effects	Yes		Yes	
Five year fixed effects	Yes		Yes	
Number of districts	337		337	
Number of observations	1571		1571	

Standard errors are clustered at the district level, and are shown in parentheses
Significance levels: *** - 1%. ** - 5%, * - 10%

Table 7. Regressions using the Papke-Wooldridge method

5.6.2 Alternative explanatory variable

Our main explanatory variable is an indicator of at least one riot having taken place in the district in the calendar year before the year in which the election occurred. But elections can take place in different months in a year. So, now we construct the explanatory variable using riots occurring in a 12-month period preceding the election. The results using this variable are shown below and they are very similar to our original regressions.

Dependent variable is BJP vote share$_{it}$		
	1	2
	FE	IV FE
Riot'$_{it\text{-}12months}$	0.064 ***	0.087 **
	(0.011)	(0.038)
Other controls	Yes	Yes
Quadratic time trend	Yes	Yes
District fixed effects	Yes	Yes
KP Wald F stat		116.9
Number of districts	335	322
Number of observatior	1311	1298

Standard errors are clustered at the district level, and are shown in parentheses
Significance levels: *** - 1%. ** - 5%, * - 10%

Table 8. Regressions using riots in a 12-month period before the election as an explanatory variable

5.6.3 Time fixed effects and time trends

We have not used time fixed effects in our regressions. Here we first show that if we use year fixed effects then we lose power in our regressions. We divide the total period of 22 years in which the BJP contested elections (1980-2001) into four periods of 5-6 years viz, 1981-1986, 1987-1991, 1992-1996, 1997-2001 and we use these dummies as 'five-year fixed effects'. The logic is that within each one of these four periods, we would have elections in all states, thus capturing any country-wide fixed effects. We can see in the results below that using time fixed effects leads to the IV regression losing power. This is because of the nature of the instrument where most of the variation comes from temporal variation as it is highly correlated in the cross-sectional dimension. We also use region specific time trends, dividing the states into five regions.[7]We can see that the results are robust to using region specific linear trends.

[7]North- Punjab, Haryana and Jammu & Kashmir, Central- Uttar Pradesh, Rajasthan, Madhya Pradesh and Bihar, East- West Bengal, Assam and Orissa, West- Gujarat and Maharashtra, South- Andhra Pradesh, Karnataka, Tamil Nadu and Kerala.

Dependent variable is BJP vote share$_{it}$							
	1	2	3	4	5	6	7
	FE	FE	FE	FE	IV FE	IV FE	IV FE
Riot'$_{it-1}$	-0.006	0.030 ***	0.055 ***	0.020 *	0.022	0.079 **	0.002
	(0.013)	(0.011)	(0.011)	(0.012)	(0.034)	(0.036)	(0.037)
Year fixed effects	Yes	No	No	No	No	No	No
Five-year fixed effects	No	Yes	No	Yes	Yes	No	Yes
Region specific linear trends	No	No	Yes	Yes	No	Yes	Yes
Other controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quadratic time trend	Yes	Yes	Yes	No	Yes	Yes	No
District fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
K-P Wald F stat					157.4	151	145.9
Number of districts	335	335	335	335	322	322	322
Number of observations	1311	1311	1311	1311	1298	1298	1298

Standard errors are clustered at the district level, and are shown in parentheses
Significance levels: *** - 1%. ** - 5%, * - 10%

Table 9. Regressions with time fixed effects and region specific time trends

Time fixed effects are intended to account for unobservable time shocks that affects both the dependent variable and the explanatory variable or the instrument. In our case, the instrument is completely exogenous and so the purpose of time fixed effects would be to check for the possibility that by chance in a few of the election years in which BJP did well, a Hindu festival happened to fall on a Friday in the preceding year and this is driving our result. While we do indirectly check this by dropping some years and states in the next subsection, we cannot directly check for this possibility using time fixed effects because of the lack of cross-sectional variation in the instrument.

We can introduce cross-sectional variation in the instrument by changing our specification slightly. So far we have been looking at the extensive margin of riots to avoid making any assumptions about the nature of the cumulative effect of multiple riots. We now assume a linear cumulative effect, which implies that we can add all the (distance weighted) riots and check for their total effect on elections. The specification would now be

$$BJP\ vote\ share_{it} = \alpha + \beta_b \sum_{j=1 \text{ to } n(t)} \phi(d_{ijt-1}) + \gamma_1 BJP\ government_{it-1} + \gamma_2 Demographic\ controls_{it} + \gamma_3 Public\ goods\ provision_{it} + \eta_t + \delta_i + \varepsilon_{it}$$

Here, j indicates an individual riot and $n(t)$ indicates the total number of riots in year t. $\phi(.)$ is the same Gaussian weighting function that we have used earlier. d_{ijt-1} indicates the distance between district i and riot j in year t-1. We have replaced the quadratic time trend with individual year fixed effects η_t. We call this explanatory variable *All riots.* We construct a similar expression for the instrument variable for *All riots,*

given by $\sum_{k=1 \text{ to } 338} \phi(d_{ik}) Festival_{kt-1}$. Here, k is a district and d_{ik} denotes the distance between districts i and k. Using this instrument implies that a district that is closer to a lot of other districts that are experiencing the coincidence of a Hindu festival falling on a Friday, is likely to have more riots happening near it. This specification allows us to exploit the variation in distances between districts that have the coincidence and those that do not, to generate the cross-sectional variation necessary for using year fixed effects. The results for the regression are given below. The coefficient is positive and significant but has a different interpretation to coefficients of earlier regressions. This coefficient implies that every riot that happens in a district in the year before elections increases the BJP's vote share by 2.8 percentage points. This exercise allows us to reject the possibility that our results are driven by chance.

Dependent variable is BJP voteshare$_{it}$		
	1	
	IV FE	
All riots$_{it-1}$	0.028	***
	(0.007)	
Other controls	Yes	
District fixed effects	Yes	
Year fixed effects	Yes	
Kleibergen-Paap F stat	43.7	
Number of districts	322	
Number of observations	1298	

Standard errors are clustered at district level and are shown in parentheses
Significance levels: *** - 1%. ** - 5%, * - 10%

Table 10. Regressions using the cumulative of all riots in the preceding year

5.6.4 Dropping states and years

During the period covered in our study, two of the states that we include - Punjab and Jammu & Kashmir - underwent a spate of violence between separatist organisations and the state. These separatist movements had communal undertones and would have affected riots as well as electoral politics. These two states are also different from the rest of our sample as they are not Hindu majority states - Punjab has a majority population of Sikhs and Jammu & Kashmir has a majority population of Muslims. Hence we drop these two states and conduct the main regressions on a sample of 14 Hindu majority states. The results are presented in the first two columns of Table 11. We find that the coefficients in the first two specifications are unchanged but that in the last two they are considerably larger than in the full sample.

The demolition of the Babri Mosque in Ayodhya in 1992 was a major event in the history of independent India and the riots occurring in its aftermath in 1992 and in 1993 were widespread, and were covered widely in the national media and in academic writing soon after (Gopal 1993). To check that our results are not being driven mainly by this one major event, we drop the years 1993 and 1994 and run the regressions. The results are presented in columns 3 and 4. We find that the coefficients are still positive but they lose some significance in the IV specifications. This may be because in non-Hindu majority states, the riots may be having different effects compared to Hindu majority states. To check this we run the regressions without Jammu and Kashmir, and Punjab (columns 5 and 6), and find that the coefficients are similar in magnitude and significance to earlier regressions.

Dependent variable is BJP voteshare$_{it}$						
	Dropping states Punjab and Jammu & Kashmir		Dropping years 1993 and 1994		Dropping states Punjab, J&K and years 1993, 1994	
	1	2	3	4	5	6
	FE	IV FE	FE	IV FE	FE	IV FE
Riot'$_{it-1}$	0.046 ***	0.101 ***	0.045 ***	0.053 *	0.045 ***	0.072 **
	(0.011)	(0.036)	(0.011)	(0.032)	(0.011)	(0.032)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
District fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Quadratic time trend	Yes	Yes	Yes	Yes	Yes	Yes
Number of districts	316	307	335	315	316	300
Number of observations	1267	1258	1145	1125	1101	1085

Standard errors are clustered at district level and are shown in parentheses
Significance levels: *** - 1%. ** - 5%, * - 10%

Table 11. Regressions without observations from Jammu and Kashmir, and Punjab

5.6.5 Alternative instrument

In constructing the instrument *Festival*, we exploited the inter-state differences in the importance of festivals to generate the variation required to obtain a strong instrument. To investigate if our results are robust to changes in the methodology used for constructing the instrument, we construct two alternative instruments. *Festival 1* disregards the interstate differences. We select five of the most important Hindu festivals - Dushehra, Diwali, Ramanavami, Janmashtami and Shivaratri and set the instrument as 1 (and 0 otherwise) for all states whenever one of these festivals falls on a Friday. *Festival 2* includes only the festivals that vary across states and excludes the two all-India festivals - Dushehra and Diwali. The results are shown in Table 12, and they are very similar to the earlier results.

Dependent variable is BJP voteshare$_{it}$				
	Festival 1		*Festival 2*	
	IV FE		IV FE	
Riot'$_{it-1}$	0.049	*	0.075	**
	(0.026)		(0.036)	
Other controls	Yes		Yes	
District fixed effects	Yes		Yes	
Quadratic time trend	Yes		Yes	
Kleibergen-Paap F stat	121.7		159.2	
Number of districts	322		322	
Number of observations	1298		1298	

Standard errors are clustered at district level and are shown in parentheses
Significance levels: *** - 1%. ** - 5%, * - 10%

Table 12. Regressions using *Festival 1* and *Festival 2* as instruments

5.6.6 Results for the Indian National Congress

In all our regressions we have only examined until now the effect of riots on the vote share of the BJP. We can also investigate their effect on the other major national party, the Indian National Congress. Since these two parties compete against each other in most elections, we expect to see a negative effect on the vote share of the Congress and that is what we observe as shown in Table 13 below. This is consistent with other studies from political science which have also suggested that the Congress's vote share in state assemby elections was affected adversely by the outbreak of an additional riot (Nellis, Weaver and Rosenzweig, 2015).

Dependent variable is INC vote share$_{it}$				
	1		2	
	FE		IV FE	
Riot'$_{it-1}$	0.016	*	-0.131	***
	(0.009)		(0.031)	
INC government$_{it-1}$	-0.019	***	-0.021	
	(0.006)		(0.006)	
Other controls	Yes		Yes	
Quadratic time trend	Yes		Yes	
District fixed effects	Yes		Yes	
K-P Wald F stat			158.1	
Number of districts	336		326	
Number of observations	1375		1365	

Standard errors are clustered at the district level, and are shown in parentheses
Significance levels: *** - 1%. ** - 5%, * - 10%

Table 13. Regressions for the Indian National Congress

5.6.7 Lagged dependent variable

Another issue that may be important is the effect of the vote share of the BJP in the last election. This may affect both riots and the vote share in the next election. We argue that the effect of the previous election on riots would work through the government and we do control for having a BJP government in the state. We also find that even if we explicitly control for the BJP's vote share in the last election, the coefficient is not statistically significant, as shown in Table 14.

Dependent variable is BJP vote share$_{it}$				
	1		2	
	FE		IV FE	
Riot'$_{it-1}$	0.064	***	0.072	***
	(0.011)		(0.026)	
BJP vote share in last election	-0.043		-0.043	
	(0.037)		(0.038)	
Other controls	Yes		Yes	
Quadratic time trend	Yes		Yes	
District fixed effects	Yes		Yes	
K-P Wald F stat			203.8	
Number of districts	323		303	
Number of observations	1182		1162	

Standard errors are clustered at the district level, and are given in parentheses
Significance levels: *** - 1%. ** - 5%, * - 10%

Table 14. Regressions with lagged vote share

All the robustness checks above confirm that the results observed in the main regressions are robust to different samples and specifications. We conclude therefore that our results do represent the causal effect of religious riots on the vote share of the BJP in India.

6 Conclusion

Religious riots have complex underpinnings - frequently social, economic and political factors are involved. This paper demonstrates how these riots may influence voter behaviour and the incentives of political parties. Using data on Hindu-Muslims riots in India over 25 years, combined with electoral and demographic data, we demonstrate a causal link between electoral politics and communal riots. We use an innovative instrument that draws upon the random variation in the day of the week that important Hindu festivals fall on each year to isolate the causal effect of riots on electoral results. We

find that riots occurring in the year preceding an election increase the vote share of the Hindu nationalist Bharatiya Janata Party in the election. Our results are robust to various robustness checks on the data and econometric analysis. This result does not imply that riots are not caused by electoral reasons. It may be the case that most of the riots are in fact the result of political calculations. Our attempt here is to disassociate those political reasons for riots and to examine the effect on electoral results of exogenously caused riots. The fact that our results show that a party systematically benefits from the riots, may establish that there is a clear incentive for this party to cause riots for electoral benefit. Therefore, our findings have important implications for the relationship between ethnic violence and electoral politics not just in India, but also in other diverse democratic societies.

Appendix 1

List of Hindu festivals by state used in the instrument *Festival*

	State	Festivals				
1	Andhra Pradesh	Ramnavami	Durga ashtami	Navami	Dushehra	Diwali
2	Assam	Janmashtami	Durga ashtami	Navami	Dushehra	Diwali
3	Bihar	Holi	Ramnavami	Navami	Dushehra	Diwali
4	Gujarat	Holi	Ramnavami	Navami	Dushehra	Diwali
5	Haryana	Shivratri	Holi	Janmashtami	Dushehra	Diwali
6	Jammu and Kashmir	Shivratri	Ramnavami	Janmashtami	Dushehra	Diwali
7	Karnataka	Shivratri	Ganesh Chaturthi	Navami	Dushehra	Diwali
8	Kerala	Shivratri	Janmashtami	Navami	Dushehra	Diwali
9	Madhya Pradesh	Holi	Ramnavami	Janmashtami	Dushehra	Diwali
10	Maharashtra	Ramnavami	Ganesh Chaturthi	Navami	Dushehra	Diwali
11	Orissa	Holi	Durga ashtami	Navami	Dushehra	Diwali
12	Punjab	Holi	Ramnavami	Janmashtami	Dushehra	Diwali
13	Rajasthan	Holi	Ramnavami	Janmashtami	Dushehra	Diwali
14	Tamil Nadu	Janmashtami	Ganesh Chaturthi	Navami	Dushehra	Diwali
15	Uttar Pradesh	Ramnavami	Janmashtami	Navami	Dushehra	Diwali
16	West Bengal	Holi	Durga ashtami	Navami	Dushehra	Diwali

Appendix 2

Let,

y be the dependent variable, the *BJP vote share*

x be the explanatory binary variable, *Riot*

z be the instrument variable, *Festival*

Now, let x be the result of under-reporting of the actual incidences of riots x^*, with only a fraction p of the actual riots getting reported.

Therefore, $E[x|x^* = 1] = p,\ \ 0 < p < 1$, and $E[x|x^* = 0] = 0$

Also, let the overall probability of riots happening $E[x^*] = \lambda,\ \ 0 < \lambda < 1$.

This implies that if a riot is reported, then the probability of an actual riot is 1, i.e.

$$E[x^* = 1|x = 1] = 1 \tag{1}$$

But if no riot is reported, then the probability of an actual riot is

$$E[x^* = 1|x = 0] = E[x^* = 1, x = 0]/E[x = 0] = \frac{\lambda(1-p)}{1-p\lambda} \tag{2}$$

Also, let us assume that the reporting or non-reporting of the riots is independent of our dependent variable.

$$\therefore E[y|x,x^*] = E[y|x^*] \tag{3}$$

Now, we want to look at how this biases our estimates.

The OLS estimate using only the reported riots would be,

$$\begin{aligned}
\hat{\beta}_{OLS} &= E[y|x=1] - E[y|x=0] \\
&= E[y|x=1,x^*=1]E[x^*=1|x=1] + E[y|x=1,x^*=0]E[x^*=0|x=1] \\
&\quad -E[y|x=0,x^*=1]E[x^*=1|x=0] - E[y|x=0,x^*=0]E[x^*=0|x=0]
\end{aligned}$$

Rearranging and using (3)

$$\begin{aligned}
\hat{\beta}_{OLS} &= E[y|x^*=1](E[x^*=1|x=1] - E[x^*=1|x=0]) \\
&\quad -E[y|x^*=0](E[x^*=0|x=0] - E[x^*=0|x=1])
\end{aligned}$$

Using (1) and (2)

$$\begin{aligned}
\hat{\beta}_{OLS} &= E[y|x^*=1](1 - \frac{\lambda(1-p)}{1-p\lambda}) \\
&\quad -E[y|x^*=0](\frac{1-\lambda}{1-p\lambda} - 0) \\
&= \frac{1-\lambda}{1-p\lambda}(E[y|x^*=1] - E[y|x^*=0]) \\
&= \frac{1-\lambda}{1-p\lambda}\hat{\beta}^*_{OLS}
\end{aligned}$$

Since, $\frac{1-\lambda}{1-p\lambda} < 1$, the OLS estimate will be biased towards zero.

Now, let us look at the IV estimate. Again, the main assumption is that reporting is independent of *Festival.*

$$\therefore E[x=1|z] = pE[x^*=1|z] \tag{4}$$

The IV estimate calculated using the reported riots x is given by

$$\hat{\beta}_{IV} = \frac{E[y|z=1] - E[y|z=0]}{E[x|z=1] - E[x|z=0]} = \frac{1}{p}\frac{E[y|z=1] - E[y|z=0]}{E[x^*|z=1] - E[x^*|z=0]} = \frac{1}{p}\hat{\beta}^*_{IV}$$

Since $0 < p < 1$, the magnitude of the IV estimate will be biased upwards. we have

shown the proofs here using simple regressions but the principles apply to regressions with other covariates.

Now let us look at the probable magnitudes of the bias in our case. Let us assume that the actual probability of a riot happening in a district in a given year is $\lambda = 0.1$, and the rate of reporting is $p = 0.7$. This gives us the observed probability of riots as we see in the data of $p\lambda = 0.07$.

The OLS is biased by 1-$\frac{1-\lambda}{1-p\lambda} = 1 - \frac{0.9}{0.93} \simeq 3\%$

The IV is biased by $1/p - 1 = 1/0.7 - 1 \simeq 43\%$

Hence, the bias in the IV estimate is very large, and this may explain the estimates that we obtain. This is because the effect of the reporting rate p on the OLS estimate is moderated by the overall probability λ, whereas the IV estimate is directly impacted by p. The lower the reporting rate the higher the bias in both cases, but the magnitude of the bias in bounded above by λ in the OLS case, whereas in the case of IV, it is unbounded.

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