

ECO 495: Undergraduate Research Thesis

**The Impact of Religious Riots on
Household Consumption: Evidence
from Hindu-Muslim Riots in India**

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Abstract

Since the independence of India, the country has seen a surge in the incidence of religious violence. These religious riots often come at a very high cost with immeasurable loss of life and property while giving rise to civil unrest. While previous works have been done to understand the long-term effect of economic losses due to riots, there still seems to be disagreements which gives scope to new research. The aim of this thesis is to analyze the effect of religious riots on household consumption from 1983 to 2000 across India. Here, riot variables like count of casualties, killing and outbreaks in a region form our explanatory variable along with consumption variables like Hindu per capita expenditure and Muslim per capita expenditure as our dependent variables. Employing the use of Instrument Variables and Fixed Effects, we arrive at consistent causal estimates. Our instrument variable is a unique binary variable which takes the value one if three or more Hindu festivals fall on the Muslim holy day, Friday, in a given five-year period. We find that riots have a negative effect on consumption. Additionally, we conclude that Muslim households experience higher fall in consumption due to occurrence of riots when compared to Hindu household.

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1 Introduction

India is seen as the quintessential land of religion. Over 1.3 billion people practice and follow different religious faiths in the country. It is characterized by more ethnic and religious groups than most countries in the world. Consequently, India has had a brutal history of ethnic and religious violence. According to Varshney & Wilkinson (2004), more than 7,000 individuals have been killed in riots in India from 1950 to 1995. In recent years, the 2002 Gujarat Riots led to the death of over 1,000 individuals along with 223 people being reported as missing. The inter-communal violence period lasted three days leaving a wreck of havoc in its wake. In the past three decades, India particularly saw a surge in the incidence of religious intolerance and riots. A recent Pew Research Center analysis of 198 countries ranked India as the fourth worst in the world for religious intolerance only trailing behind Syria, Nigeria and Iraq (Pew Forum, 2017). These riots not only come with large human costs but also lead to severe destruction of property and disruption of social and economic activity (Bohlken & Sergenti, 2010). The much recent, 2020 Delhi riots spread across waves of bloodshed, property destruction and civil unrest. While a significant amount of research work has been done on the occurrence of riots in India and its relationship with the social, cultural and political factors (eg: Iyer & Shrivastava 2018, Dhattiwala & Biggs 2012), little focus has been given to the relationship between economic performance and riots in India. The works by Bohlken & Serengeti (2010) and Mitra & Ray (2014) examine the connection between economic growth and riots and economic changes within groups and conflict, respectively. Even then, there is a paucity of study about riots in India which try to understand how individuals and their families experience riots. The research is further limited in areas which

account for the consequences of religious riots and how within the same community different people experience riots differently.

This thesis aims to study the impact of religious conflict and consumption on Hindu-Muslim household in India. We analyze whether religious conflict has a sustained effect on consumption patterns of households. We use three dependent variables in the form of Hindu per capita expenditure, Muslim per capita expenditure and the overall average per capita expenditure spread across 14 states and 77 state regions. Through the use of comparative analysis, we see how riots affected these three variables and which group sustained the worst effects of the riot on their consumption.

There are no significant works studying the link between household consumption and the incidence of riots in the context of India. However, Serneels & Verpoorten (2012) explores the impact of armed conflict on consumption in Rwanda. Through their findings, they note that household and localities which experienced intense conflict are lagging in terms of consumption. The motivation for this study comes from recurrent episodes of religious, particularly, Hindu-Muslim violence in India. From an economic theory's perspective, there is a lack of consensus about the impact of conflict on economic performance. According to the Neoclassical growth theory, an economy recovers relatively quickly and goes back to its steady state (Serneels & Verpoorten 2012). However, riots in India lead to a large loss of lives and that could potentially disrupt the human capital. It could be argued that the number of deaths in riots is small compared to the overall population of India. If we look at the numbers purely from the perspective of arithmetic, they indeed are small, however, as discussed earlier, there are immeasurable consequences of communal violence like displacement and migration, segregation, insecurity, loss of livelihood, widespread fear and rise of mistrust in the society (Mitra & Ray, 2014). There are

also other studies (Barro and Sala-i-Martin 2004) which argue that it takes a long time for the economic performance to catch up since human capital can only recover slowly. Like many of the previous works in the field of communal riots and conflict this study will also focus only on one country, but it will differ also from existing studies since it takes a direct look at how within the same community different people experience riots differently. The primary goal of this thesis is to answer how riots affect consumption over a period of time. The thesis follows a standard structure of detailed background in second section and a literature review in the third section followed by the introduction of data sources in the fourth section with discussion of empirical strategy in the fifth section and then finally onto discussion of results in the sixth section.

2 Background on Hindu-Muslim Violence in India

Hindu-Muslim violence, even when restricted to a specific period in the Indian history, is a vast subject to study. The traces of Hindu-Muslim violence in India goes back to pre-partition era. It reached its peak during the partition, the brutal images of which have been in circulation for the past half-century in the Indian media. Post partition, India saw a drop in the incidence of violence when it settled down to sporadic episodes and today the condition is almost the same, if not worse. These regular episodes of religious conflict have led to countless loss of lives, livelihoods and property. The foundation of religious identity was first seen towards the end of the nineteenth century in India when the lines of religion, language and script were becoming established. Along with this, the Hindu and Muslim communities adopted an interpretation of their history and role in India. This interpretation was mostly expressed a sense of loss and a feeling of being under threat due to the actions of other community (Thursby 1975). This communal jealousy only grew and in 1925-26, the antagonism between Hindus and Muslims became widespread. The Hindu-Muslim rioting happened on a larger scale with Calcutta, the United Provinces, the Central

Provinces and the Bombay presidency witnessing scenes of riots (Jha 2018). The consequent years from 1926 witnessed continuous period of communal riots. Before the partition, on 20th November 1939, a serious riot occurred in Sukkur, Sind. The riot happened due to the agitation by the Muslims taking possession of a building called Manzilgah, by force, which was earlier a government property. Not long after this, the tragedies of partition swept across northern India from 1946 to 1948 challenging the dream of a secular, modern state. The partition led to the one of the greatest migrations in the human history as millions of Muslims moved to Pakistan while Hindus headed in the opposite direction. The communities which had coexisted in peace for centuries, attacked each other in a terrifying outbreak of communal violence with Hindus and Sikhs on one side and Muslims on the other. The Hindu refugees settled in well in the now divided India but the Muslims who chose not to leave were seen as traitors to their own land. The sentiment stayed and a soon became a political agenda for many.

While the communal violence between Hindus and Muslims settled down after partition, India still witnessed the brutality of riots on a regular frequency. In 1969, a few years after Independence, a communal riot between Hindus and Muslims erupted in Ahmedabad. Over 1000 lives were lost and many believed the riot to be an orchestrated event with a prior political agenda. The 1980s soon followed and this is when India observed a spectacular rise of Hindu nationalism with riots becoming a recurring feature of Indian politics. One of these riots occurred in 1987 in Meerut which lasted for over two months. The Meerut riots also had an economic motive where Muslim business owners suffered when entire rows of shops and business establishments belonging to Muslims were reduced to ashes (Mitra and Ray). In their paper on Hindu-Muslim conflict, Mitra and Ray (2014) noted that “Economic targeting during conflict is not confined to eliminating rival businesses or workers. It can consist in direct attacks on entire localities so as to

drive out an ethnic group and affect either housing prices or the opportunity to buy and build.” The most recent and brutal incidence of Hindu-Muslim riot was the 2002 Gujarat riots leading to the deaths of over 750 Muslims and 250 Hindus. The 2002 riot is also known for its political agenda when the then Chief Minister of Gujarat, Narendra Modi, being accused of initiating the violence and condoning the actions of police and government officials who allegedly directed the rioters and provided them with a list of Muslim-owned properties.

Through the history of riots in India, it seems reasonably clear through most of these accounts that Muslims suffered a share of losses that were entirely out of proportion to their minority population. Wilkinson (2004) notes this rather aptly when drawing upon the ninth and tenth annual reports of the Minorities’ Commission. He mentions:

“Muslims suffer disproportionately as a result of Hindu-Muslim riots. Hard numbers are difficult to obtain, but of 526 Hindu-Muslim incidents that occurred from 1985 to 1987 in 10 major states, Muslims (12% of the population) accounted for 60% of the 443 deaths, 45% of the 2,667 injuries, and 73% of the property damage. Given that Muslims are, as a community, much poorer than Hindus the relative effect of communal riots on Muslims economic life is even greater than these percentages suggest. ... The fact that Muslims suffer disproportionate losses in riots and that Muslim businessmen are more often the victims of looting has convinced many scholars and activists that riots are nothing more than a particularly brutal method of protecting Hindu merchants’ market share.”

Communal riots have had a brutal history for all in India however, the history of these riots for minority groups, especially Muslims, is gruesome. No matter the agenda of the riots – political or economic – the loss of life, livelihood and property is always worse for the minority group. We try

to establish similar results in this thesis when we look at the how riots have affected the consumption of Hindu and Muslims in India.

3 Literature Review

The economics of religion is a fairly new and unexplored field of research in economics (Iyer, 2016). The field of research saw its first work in 1776 but was introduced to a wider audience by Laurence Iannaccone through his 1998 article published in the *Journal of Economic Literature*. With time, more literature emerged in the field with some of them examining the relationship between religious riots and social, political and economic factors. In the context of India, religious violence saw a surge after the partition of India in 1947 and with a focus on that period Varshney & Wilkinson (2004) found that between 1950-1995, 1,186 separate riots were reported. The overall loss of life accounted for 7,052 individuals. They noted that the trends declined in the 1950s followed by a slight rise in the 1960s and again a decline in the 1970s. However, between 1982 and 1995, the number of riots reported reached an all-time high, averaging at more than 48 per year for India. In the same period, 4,687 individuals were killed which makes up more than half of the reported riots in the total time from 1950 and 1995. Within the field of research of ethnic riots, a large number of studies have been conducted to examine the relationship between political factors and the incidence of riots. There is a widespread agreement that riots in India are very rarely a result of some spontaneous breakout (Bohlken & Sergenti, 2010). Wilkinson (2004) notes how most riots are planned events, growth was conducted by Bohlken & Serengeti (2010). The study reported that it was not able to find any evidence of a relationship between the wealth level in a state and the incidence of riots. This was because, while they investigated the interaction among growth and state election, they were not able to identify the process underlying the correlation between growth and conflict. Hirshleifer (2001) and Fearon & Laitin (2003) are some

of the other works studying the relationship between riots and economic growth. Another study by Mitra & Ray (2014) derived a relationship between conflict and economic changes within groups. They found that an increase in per capita Muslim expenditure generated an increase in future religious conflicts. Caruso & Gavrilova (2012) analysed the relationship between youth unemployment and Palestinian violence and found a positive association between the two.

The literature on ethnic and religious violence is vast, especially in the context of India. However, as mentioned earlier, most of the research work on riots in India is done to assess the impact of political factors. Taking inspiration from works in the international context like Serneels & Verpoorten (2012), this paper tries to address the economic consequences of a riot.

4 Data

To understand the prolonged impact of religious violence in India, the study requires data from two specific sources. For riots, we use data between 1979 and 2000. Data for monthly household consumption expenditure is obtained from National Sample Survey Rounds 38th, 43rd, 50th, and 55th. All the variables in the data are consolidated at the level of state regions in accordance with the state regions of round 38 of the National Sample Survey (NSS). Our main explanatory variable is the total number of casualties in a state region. Additionally, we use total number of killed and total number of outbreaks in a state region as other explanatory variables.

4.1 Riots

For riots, we use a data set compiled by Steven Wilkinson and Ashutosh Varshney (Varshney-Wilkinson (2004)). The dataset is available free of cost for research purposes and has been used extensively in the literature related to riots in India. The data set provides comprehensive data on all Hindu-Muslim riots and was collected using Indian newspaper records from the Mumbai

edition of The Times of India, from January 1950 through December 1995. This data set includes information on the date of incidence of the riot; location (town, village, state, district, country); casualties (killed, injuries); duration, reported causes; official involvement; policing arrangements, and other characteristics. The data set reports 1,186 separate riots with overall 7,052 individuals killed. Between 1950 and 1981 the average number of riots was 16. However, between 1982 and 1995, the number of riots reported reached an all-time high, averaging at more than 48 per year for India. In the same period, 4,687 individuals were killed which makes up more than half of the reported riots in the total time period from 1950 and 1995. We utilize the Varshney-Wilkinson data from 1979 to 1995. The data set was further extended by a period of 5 years, that is, from 1996 to 2000 by Anirban Mitra and Debraj Ray (2014)¹. With the use of the extended data set, we use a consolidated data set ranging from 1979 to 2000 for our riots.

Riots	
Number of Observations	1,290
No. of Variables	40
Size of the dataset	1,803,420

Table 1: Summary Statistics of Riots

	Observations	Mean	St. Deviation	Max	Min
All Killed	220	21.89091	77.39973	774	0
All Injured	220	62.67273	174.461	1673	0
All Casualties	220	84.56364	240.4839	2447	0
All Outbreaks	220	3.245455	6.519639	59	0
<i>N</i>	220				

Source: Varshney-Wilkinson data set on Religious Riots (1950-95) extended from 1996 to 2000 by Mitra and Ray (2014)

¹ In conducting this exercise, Mitra and Ray adhered to the same data collection protocol as followed in the construction of the original data set.

We use three different count measures from the data set: the number of people killed, the number of casualties (people killed or injured) and the number of outbreaks. In all these cases, we take aggregate of casualties, killed and outbreak over 5-year period prior to each NSS round (38, 43, 50, 55) in each location.

4.2 Household Consumption

We match our riots dataset to large-scale household consumption expenditure data which is obtained quinquennially as a part of National Sample Surveys (NSS). We use data from four consecutive “thick rounds²”: the thirty-eighth in 1983, the forty-third in 1987–88, and the fiftieth in 1993–94 and the fifty-fifth in 1999-2000. For all these rounds there is information on the religious affiliation of the household, or, more precisely, the head of the household. This enables us to compute the per-capita monthly expenditures of Hindu and Muslim households.

Table 2: Summary Statistics of Consumption

	Observations	Mean	St. Deviation	Min	Max
Average Per Capita Expenditure	220	329.6353	215.2038	89.50213	1132.137
Per Capita Expenditure (weighted)	220	7.93e+08	8.98e+08	6.60e+07	5.44e+09
Hindu-PCE	220	328.1421	213.0749	88.51322	1113.748
Muslim-PCE	219	333.6749	251.4436	87.34283	2319.467
Muslim Hindu Expenditure Ratio	219	1.02104	.3027355	.5173814	3.646174
Gini (Hindu)	219	.3188393	.0390315	.2137422	.4569733
Gini (Muslim)	219	.2808456	.0652447	.0505314	.7653071
<i>N</i>	220				

Source: National Sample Survey, 38th, 43rd, 50th and 55th rounds

² NSS surveys, which occur annually, utilize smaller samples and hence are referred to as “thin” rounds. However, the rounds performed quinquennially draw on larger samples about 120,000 households per survey; hence the term “thick.”

However, the 38th and 50th rounds are restricted by a lack of spatial disaggregation where we are unable to identify households all the way down to the district level. Because of this restriction we need to aggregate all the other rounds of NSS (43rd and 55th) as well as the Varshney-Wilkinson data set on riots to regional levels (state regions) in accordance with the state regions of NSS round 38. We do so for 77 such state regions, which together span 14³ major Indian states and account for more than 90 percent of the Indian population.

Round 38 and 43 of the NSS follow different set of state codes and consequently different state region codes from round 50 and 55. To maintain uniformity across all the four rounds we use the State codes mentioned in the round 38 NSS handbook for all the different rounds. Similarly, for each reported riot, we utilize the information on the district and the state to assign a region code to every such incident. This is done in the following manner. NSS publishes a list of all the surveyed regions providing the names of their respective constituent districts. These lists are made available along with the raw data files. We used these lists to match the districts from the conflict dataset to the NSS rounds, utilizing the district names. For example, “Hyderabad” district is assigned a region code of “022” based on the NSS list. Now, Hyderabad is a district in the state of Andhra Pradesh. The first two characters of the region code stand for the state (“02” in the case of Andhra Pradesh) and the last character represents the region’s serial number within the state (“2”

³ We leave out border states with their own specific sets of problems: Jammu and Kashmir and Himachal Pradesh in the north and the northeastern states of Assam, Arunachal Pradesh, Manipur, Meghalaya, Nagaland, Sikkim, and Tripura. There are two specific issues with these areas: (i) the NSS does not survey all regions within these states owing to hilly terrain, safety issues, national security reasons due to border skirmishes, etc. and (ii) for the border states it is sometimes difficult to tell whether a reported riot is indeed civilian in nature or is due to the army clashing with extremist groups. In addition, the northeastern states which happen to be sparsely populated have an insignificant Muslim population: they are primarily Hindus, Christians, Buddhists, and Scheduled Tribes. So even in the violence data set, there are almost no reports of riots there.

in this case). We use round 38 state regions from the handbook to assign state region codes in the Varshney-Wilkinson data set.

Our final data set is a panel of consumption data with consistent state regions during the years 1983, 1988, 1994 and 2000. We match this to 5-year aggregate riots data set corresponding to the intervals: 1979-83, 1984-88, 1989-93 and 1994-98. Specifically, consumption from the 38th round (1983) is matched with conflict during 1979-83, the 43rd round (1987-88) consumption is matched with conflict during 1984-88, the 50th round (1993-94) consumption is matched with conflict during 1989-1993 and the 55th round (1999-00) consumption is matched with 1994-98. What additionally made matching datasets a tedious process, apart from mapping region across time using the NSS handbook, is the fact that district, city and state names are not necessarily consistent between different datasets. Hence, we were required to manually go through weak matches, and identify issues with district names in the datasets we used.

5 Empirical Strategy

Before we look at the empirical strategy followed in this study, we must note that we cannot simply regress our outcome variable (average per capita expenditure, average hindu per capita expenditure and average muslim per capita expenditure) ($\log Y_{rt}$) on our explanatory variables, ($Casualties_{rt}$, $Killed_{rt}$, $Outbreaks_{rt}$) to get causal estimates. It is highly probable that we will not get causal estimates because there may be omitted variables that are correlated with the pattern of household consumption expenditure. In simpler terms, there could be unobserved factors that bias the estimates while performing a simple linear regression. For this reason, we require a more sophisticated estimation strategy to show the causal estimates of the impact of religious riots on consumption.

We estimate the effect of Riots on Consumption using a panel dataset and the following specification:

$$\log Y_{rt} = \alpha + \beta_1 \text{Casualties}_{rt} + \beta_2 \text{Killed}_{rt} + \beta_3 \text{Outbreaks}_{rt} + \beta_4 \text{Demographic Controls}_{rt} + \beta_5 \text{Inequality Controls}_{rt} + \tau_t + \delta_r + \varepsilon_{rt} \quad (1)$$

Here, $\log Y_{rt}$ can be either average per capita expenditure, average Hindu per capita expenditure or average per capita Muslim expenditure. τ_t and δ_r are our time and region fixed effects, respectively. The data used for the study are country-level panel data and since we have two levels of variation in the sample (region and time) we use both district and time fixed effects. This is done to minimize endogeneity. Casualties_{rt} is our main explanatory variable and is the aggregate of all the casualties (killed + injured) over a 5-year period prior to an NSS round in a location. Similarly, Killed_{rt} and Outbreaks_{rt} are our additional explanatory variables. We also employ several controls: population by region; religious polarization across Hindus and Muslims; urbanization; and Gini coefficients as controls for expenditure inequality among Hindu and Muslims.

For estimating the relation between consumption and riot variables (Casualties_{rt} , Killed_{rt} and Outbreaks_{rt}) we use Ordinary Least Squares (OLS) Regression. Using OLS gives us the advantage easier interpretation of coefficients compared to some other models. However, as mentioned earlier, while estimating this specification would give us the correlation between riots and consumption, interpreting it as a causal effect would be problematic. It is probable that there could be time-varying unobservables that affect both consumption and the likelihood of riots.

In order to establish the causal effect of riots on consumption we construct an instrument for riots. We borrow the concept of an Instrument Variable used by Sriya Iyer and Anand

Shrivastava in their paper *Religious Riots and Electoral Politics in India*. In their paper Iyer and Shrivastava employ the use of a unique instrument variable which takes up value 1 when an important Hindu festival in a region falls on a Friday, the holy day for Muslim. 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, they 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. Evidence also suggests that religious riots are aggravated by festivals which have visible public displays of religious faith such as processions. This leads to dispute over public spaces which often results in violence. In order to have an effective Instrument we need it to be completely exogenous with both spatial and temporal variation. We achieve this by first, selecting five most important Hindu festivals for each state. We choose these festivals with the help of public holidays declared and published officially in each state. Hence, major festivals such as Dussehra and Diwali that are celebrated across the country can be used for all states but festivals such as Janmashtami or Ganesh Chaturthi, which are more local, can only be 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 the [Appendix](#). Secondly, like our riot variables, our Instrument is supposed to be aggregated over 5-year time period. Therefore, to have variation in our instrument variable data, our instrument takes the value 1 only if in a particular state region

three or more festivals fall on a Friday in the 5-year time period. This gives us a slight variation from the instrument employed by Iyer and Shrivastava.

6 Results and Discussion

First, we will take a look at important figures. *Figure 1*⁴ shows the distribution of the mean of per capita expenditure in both, Hindu and Muslim household, across 14 states. *Figure 2* shows the mean of our dependent variables *logwtmpcH*, *logwtmpcM* and *logavpce* spread across states. Finally, *Figure 3* deals with our explanatory variables and shows the maximum people killed and injured in the different states. The maximum number of casualties are simultaneously showed for the different states taken into consideration for this study.

Table 3 presents the results of $Casualties_{rt}$, $Killed_{rt}$ and $Outbreaks_{rt}$ on *logwtmpcH* using different specifications and control variables. The first column is a fixed effects OLS regression without any controls. The coefficient shows that there is negative relationship between our main explanatory variable, $Casualties_{rt}$ and *logwtmpcH*. With approximately 1% rise in casualties, the per capita expenditure of a Hindu household is expected to fall by 0.026%. The second column shows us fixed effects OLS regression with two controls: population and religious polarization. The results are more significant this time with an approximate expected decrease of 0.032%. Upon adding urbanization control in the third column, the expected decrease in expenditure due to rise in casualties due to riots goes up to 0.043%. Upon employing all the controls, along with, Gini for Hindu and Muslim expenditures, we get the most significant result where the expected decrease due to rise in casualties because of riots is 0.055%.

⁴ The Figures and Tables are included in the thesis from page 27 to page 34

Table 4 uses the same techniques as *Table 3* but we see the results of $Casualties_{rt}$, $Killed_{rt}$ and $Outbreaks_{rt}$ on $logwtmPCM$. The trends followed by *Table 4* are quite similar to *Table 3* where results become more significant as we add controls. However, the interesting observation here is that in all the different specification with or without control, the expected decrease in per capita expenditure in Muslim households is always higher than Hindu household. With all controls employed, a Muslim household's per capita expenditure is expected to decrease by 0.057% compared to 0.055% of Hindu household, if there is 1% rise in casualties caused by riots. Here, we also see if riot outbreaks were to increase by 1%, a Muslim household expenditure would go down by 0.5% compared to 0.4% for Hindus.

Finally, in *Table 5* we see the impact of $Casualties_{rt}$, $Killed_{rt}$ and $Outbreaks_{rt}$ on $logavpce$. If we compare the results to *Table 3* and *Table 4*, we again see that the Muslim households are impacted the worst by any form of rise in casualties or outbreaks caused by riots. They end up suffering more than the average while Hindu households experience more or less the impact due to an increase in violence due to riots as any other average household. Additionally, the negative relationship between $logavpce$ and $Casualties_{rt}$ in *Table 5* also tells us that riots have a negative effect on consumption expenditure of households, regardless of the faith followed by them.

We see that *Table 3*, *Table 4* and *Table 5* report consistent negative coefficients between casualties due to riots and consumption. However, it can be argued that the results are not very significant. We also see that the control variables have a significant correlation with average Hindu consumption, average Muslim consumption and average consumption altogether. However, it can be difficult to interpret this correlation without the presence of any exogenous variation.

6.1 Addressing Endogeneity

We have seen that there exists a negative correlation between casualties caused by riots and consumption. To interpret this as a causal effect of riots on consumption we need to first consider a few confounding factors. The first possibility could be reverse causation that these riots are caused to curb the consumption and living standards of a community. Another possibility could be the presence of a few unobservables that might affect both incidence of riots (and casualties) as well as consumption patterns of a household. 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 the value 1 if three or more festivals in region fall on a Friday in a given 5-year period. We hypothesize that occurrences like this might lead to disputes often ending in violence. The first stage regression is shown in *Table 6*. It supports our hypothesis and the coefficient of instrument festivals_{rt} is positive and highly significant. Hence, this instrument satisfies the requirement of being relevant. The second requirement is the need for the instrument to be exogenous. The dates of Hindu festivals depend on the lunar calendar and there should not be any reason that the consumption of a household might be affected if a festival falls on a certain day.

Table 7 shows the results of IV regression using festivals_{rt} as an instrument for Casualties_{rt} . We see that the coefficients for Casualties_{rt} is negative for all: $\log\text{wtmpcH}$, $\log\text{wtmpcM}$, $\log\text{avpce}$ and with controls follows the same trend as seen in *Table 3*, *Table 4* and *Table 5*. With controls, the average per capita expenditure is expected to fall by 0.465% for Hindus and 0.475% for Muslims. These results are also more significant compared to the earlier tables.

The results all show a negative correlation between riot variables and consumption but at the same time, it can be argued that these results are not very significant. Along with that, results also show that upon comparing, Muslim household's consumption are impacted the most because of religious riots. This falls in line with Wilkinson (2004) where he mentioned how Muslims always suffer disproportionately as a result of Hindu-Muslim riots.

7 Robustness Checks

7.1 Alternative explanatory variable

Our main explanatory variable was all casualties in a region due to religious riots. We construct a new explanatory variable Conflict_{rt} as the sum of casualties and outbreaks in a region due to riots. We then see the impact of Conflict_{rt} on all three: $\log\text{wtmpcH}$, $\log\text{wtmpcM}$, $\log\text{avpce}$. We use region and time fixed effects along with demographic controls to run the regression. The results in *Table 8* show a negative correlation between the dependent and explanatory variables are quite similar to our original regressions.

8 Conclusion

Religious riots have a complex history in India. They are even more complex to study as often, all three: social, economic and political factors are involved. This thesis tried to look at the economic aspect of riots and how riots affect household economically in a community. Our results showed consistency with negative correlation between consumption and riot variables. We also arrived at the conclusion, that if a region experiences religious riots, then the Muslim households in that region experience the highest drop in their consumption. The Hindu households also experience a fall in their per capita expenditure however, this drop is same as the drop experienced by any other household in the region, regardless of the religion. However, these results might have limited use

because they are not very significant. Future work in the field could employ the use of larger datasets to study the relationship between consumption and riots in India. A larger dataset could also help with arriving at significant estimates.

9 References

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12 Figures

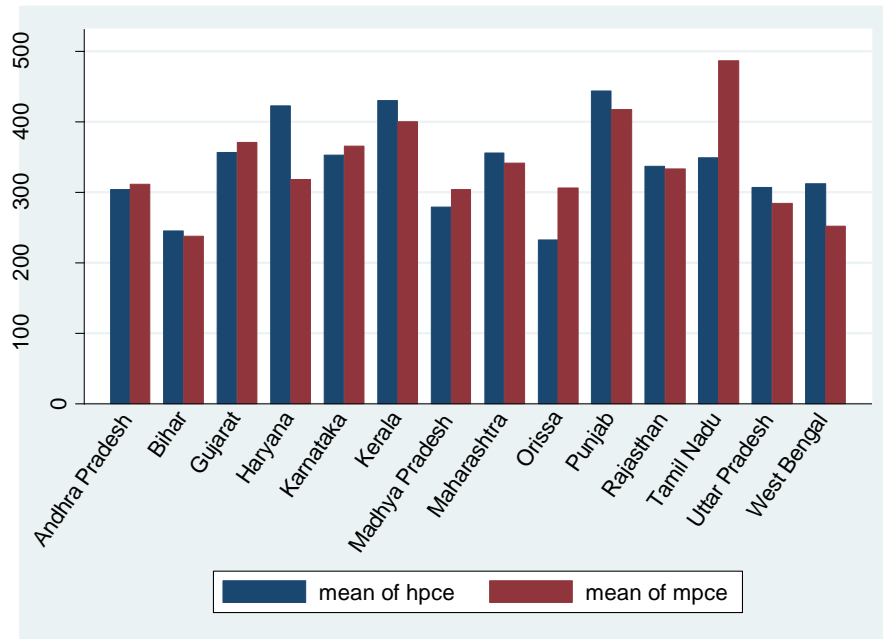


Figure 1 Mean of Hindu and Muslim Household Per Capita Expenditure in every state.

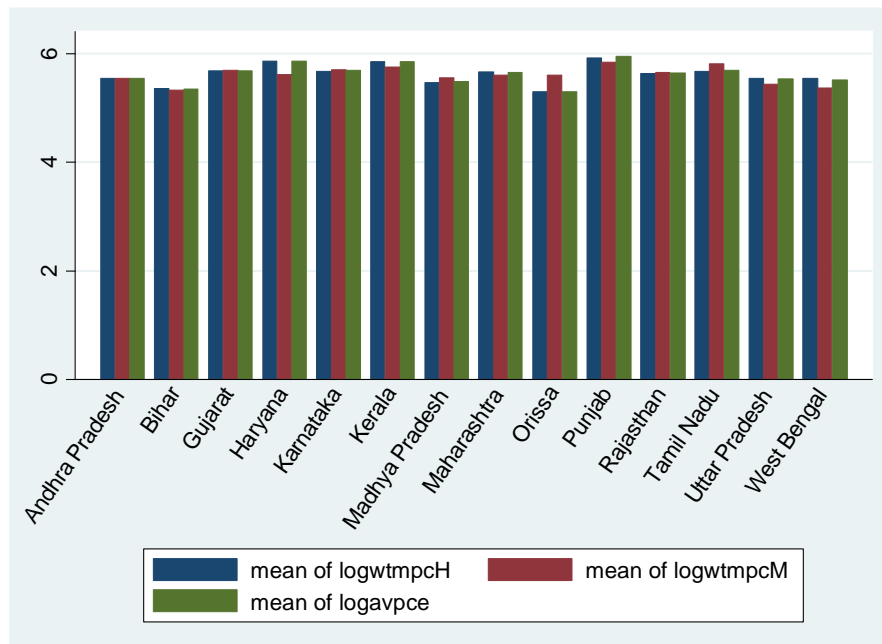


Figure 2 Mean of the dependent variables in every state.

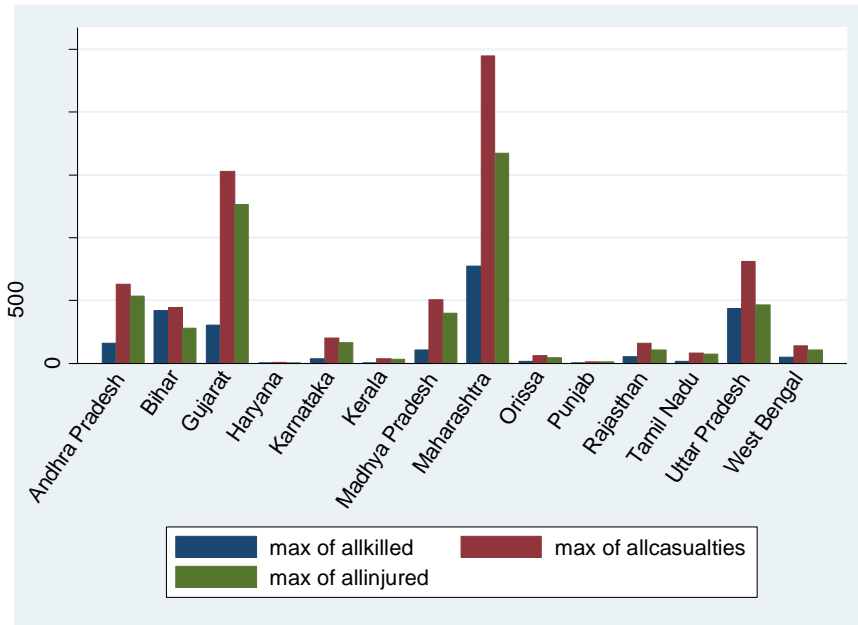


Figure 3 Max of Killed, Casualties and Injured in every state.

11 Tables

Table 3: The Effect of Riots on Log of Average Hindu Per Capita Expenditure

	logwtmpeH	logwtmpeH	logwtmpeH	logwtmpeH
All Casualties	-0.000260 (0.000447)	-0.000321 (0.000383)	-0.000431 (0.000324)	-0.000550 (0.000341)
All Killed	0.00154 (0.00107)	0.00112 (0.000930)	0.00135 (0.000840)	0.00131 (0.000843)
All Outbreaks	-0.0193** (0.00876)	-0.00783 (0.00584)	-0.00655 (0.00520)	-0.00414 (0.00633)
Population		4.869*** (0.548)	3.180*** (0.787)	3.432*** (0.700)
Religious Polarity		1.885** (0.939)	1.661* (0.961)	1.786* (1.041)
Urbanization			6.950*** (1.630)	5.571*** (1.615)
Gini (Hindu)				-8.493*** (1.767)
Gini (Muslim)				0.353 (0.788)
Constant	5.647*** (0.0244)	25.73*** (2.381)	16.92*** (3.664)	20.91*** (3.315)
State Region Fixed Effects	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes
R-Square	0.0209	0.270	0.348	0.473
Observations	220	219	219	219

Source: Varshney-Wilkinson data set on Religious Riots (1950-95) extended from 19996-2000 by Mitra and Ray (2014) and National Sample Survey 38th, 43rd, 50th and 55th rounds. The dependent variable in this table is the log of per capita expenditures in Hindu households.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4: The Effect of Riots on Log of Average Muslim Per Capita Expenditure

	logwtmpeM	logwtmpeM	logwtmpeM	logwtmpeM
All Casualties	-0.000291 (0.000480)	-0.000341 (0.000430)	-0.000448 (0.000378)	-0.000573 (0.000371)
All Killed	0.00168 (0.00116)	0.00126 (0.00107)	0.00149 (0.00101)	0.00131 (0.000945)
All Outbreaks	-0.0217** (0.00968)	-0.0107 (0.00706)	-0.00950 (0.00647)	-0.00495 (0.00677)
Population		4.602*** (0.649)	2.955*** (0.946)	3.300*** (0.781)
Religious Polarity		1.414 (0.907)	1.196 (0.885)	1.463 (1.016)
Urbanization			6.776*** (1.723)	5.550*** (1.672)
Gini (Hindu)				-10.88*** (1.800)
Gini (Muslim)				2.647*** (0.876)
Constant	5.652*** (0.0280)	24.74*** (2.772)	16.15*** (4.352)	20.56*** (3.625)
State Region Fixed Effects	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes
R-Square	0.0246	0.227	0.296	0.487
Observations	219	219	219	219

Source: Varshney-Wilkinson data set on Religious Riots (1950-95) extended from 19996 to 2000 by Mitra and Ray (2014) and National Sample Survey 38th, 43rd, 50th and 55th rounds. The dependent variable in this table is the log of per capita expenditures in Muslim households.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5: The Effect of Riots on Log of Average Per Capita Expenditure

	logavpce	logavpce	logavpce	logavpce
All Casualties	-0.000268 (0.000450)	-0.000327 (0.000385)	-0.000437 (0.000327)	-0.000556 (0.000342)
All Killed	0.00156 (0.00108)	0.00114 (0.000939)	0.00136 (0.000851)	0.00132 (0.000850)
All Outbreaks	-0.0194** (0.00874)	-0.00792 (0.00584)	-0.00665 (0.00520)	-0.00407 (0.00632)
Population		4.876*** (0.556)	3.190*** (0.804)	3.449*** (0.714)
Religious Polarity		1.790* (0.928)	1.567 (0.944)	1.703 (1.028)
Urbanization			6.933*** (1.629)	5.568*** (1.617)
Gini (Hindu)				-8.672*** (1.765)
Gini (Muslim)				0.532 (0.800)
Constant	5.651*** (0.0242)	25.79*** (2.406)	17.00*** (3.737)	21.01*** (3.365)
State Region Fixed Effects	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes
R-Square	0.0214	0.269	0.348	0.476
Observations	220	219	219	219

Source: Varshney-Wilkinson data set on Religious Riots (1950-95) extended from 19996 to 2000 by Mitra and Ray (2014) and National Sample Survey 38th, 43rd, 50th and 55th rounds. The dependent variable in this table is the log of average per capita expenditures in households.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6: First Stage IV Regression of festivals on Riot variables

	All Casualties	All Killed	All Outbreaks	All Casualties	All Killed	All Outbreaks
festival	65.08** (28.79)	23.31*** (7.850)	1.929*** (0.682)	68.84** (31.04)	24.27*** (8.519)	1.926*** (0.715)
Constant	40.78** (19.37)	6.211 (5.281)	1.948*** (0.459)	-338.3 (556.9)	74.28 (101.7)	-37.29* (20.32)
Demographic Controls	No	No	No	Yes	Yes	Yes
State Region Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
R-Square	0.0260	0.0330	0.0404	0.0319	0.0367	0.0571
Observations	220	220	220	219	219	219

Source: Varshney-Wilkinson data set on Religious Riots (1950-95) extended from 19996 to 2000 by Mitra and Ray (2014). The dataset for binary Instrument Variable festival was created manually for 14 States and their corresponding State Regions.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 7: IV regressions using festival as instrument variable for All Casualties.

	logwtmpc H	logwtmpc M	logavpce	logwtmpc H	logwtmpc M	logavpce
All Casualties	-0.00612*	-0.00608*	-0.00613*	-0.00465*	-0.00475*	-0.00467*
	(0.00331)	(0.00331)	(0.00331)	(0.00243)	(0.00251)	(0.00244)
Constant	6.114***	6.110***	6.118***	16.25**	15.58**	16.33**
	(0.297)	(0.298)	(0.297)	(6.700)	(6.931)	(6.717)
Demographic Controls	No	No	No	Yes	Yes	Yes
State Region Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	220	219	220	219	219	219

Source: Varshney-Wilkinson data set on Religious Riots (1950-95) extended from 19996 to 2000 by Mitra and Ray (2014). The dataset for binary Instrument Variable festival was created manually for 14 States and their corresponding State Regions.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 8: Robustness Checks

	logwtmpcH	logwtmpcM	logavpce
Conflict	-0.000148 (0.000112)	-0.000167 (0.000119)	-0.000150 (0.000114)
Population	3.282*** (0.777)	3.085*** (0.934)	3.293*** (0.793)
Religious Polarity	1.627* (0.966)	1.154 (0.891)	1.532 (0.949)
Urbanization	6.913*** (1.628)	6.743*** (1.713)	6.896*** (1.627)
Constant	17.36*** (3.616)	16.70*** (4.297)	17.44*** (3.684)
State Region Fixed Effects	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes
R-Square	0.342	0.288	0.341
Observations	219	219	219

Source: Varshney-Wilkinson data set on Religious Riots (1950-95) extended from 19996-2000 by Mitra and Ray (2014) and National Sample Survey 38th, 43rd, 50th and 55th rounds. The dependent variable in this table is the log of per capita expenditure in Hindu households and the log of per capita expenditure in Muslim households

***Significant at the 1 percent level. **Significant at the 5 percent level. *Significant at the 10 percent level.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Appendix

State Code	State	Festivals				
2	Andhra Pradesh	Ramnavami	Durga ashtami	Navami	Dushehra	Diwali
4	Bihar	Holi	Durga ashtami	Navami	Dushehra	Diwali
5	Gujarat	Holi	Durga ashtami	Navami	Dushehra	Diwali
6	Haryana	Shivratri	Ramnavami	Janmashtami	Dushehra	Diwali
9	Karnataka	Shivratri	Ganesh Chaturthi	Navami	Dushehra	Diwali
10	Kerala	Shivratri	Janmashtami	Navami	Dushehra	Diwali
11	Madhya Pradesh	Holi	Ramnavami	Janmashtami	Dushehra	Diwali
12	Maharashtra	Ramnavami	Ganesh Chaturthi	Navami	Dushehra	Diwali
16	Orissa	Holi	Durga ashtami	Navami	Dushehra	Diwali
17	Punjab	Holi	Ramnavami	Janmashtami	Dushehra	Diwali
18	Rajasthan	Holi	Ramnavami	Janmashtami	Dushehra	Diwali
20	Tamil Nadu	Janmashtami	Ganesh Chaturthi	Navami	Dushehra	Diwali
22	Uttar Pradesh	Ramnavami	Janmashtami	Navami	Dushehra	Diwali
23	West Bengal	Holi	Durga ashtami	Navami	Dushehra	Diwali