Segregation, Rent Control, and Riots: The Economics of Religious Conflict in an Indian City

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Religious conflict is an important problem in many ethnically diverse countries (Horowitz 1985). A growing literature in economics suggests that conflict over resources is frequently at the root of such violence (see, for instance, Esteban and Ray 2007). A number of recent empirical papers provide evidence that negative economic shocks to a community, and the consequent struggle for control over resources, can help explain the eruption of historic tensions into acts of violence (Miguel et al. 2004, Oster 2004 and Miguel 2005).

We explore this link further by studying the relationship between Hindu-Muslim violence and living arrangements – in particular residential segregation – within cities in India. That is, conditional on city-level demographics and the overall degree of ethnic tension, what are the characteristics of specific locations within a city where communal violence tends to emerge and what can this tell us about why some neighborhoods erupt in this manner at certain points in time?

Communal violence at the neighborhood-level has rarely been documented or even explored in studies of ethnic violence. In fact, the link between population composition and violence has mainly been studied by comparing countries with differing levels of ethno-linguistic fractionalization (ELF). However, across countries, migration tends to be relatively limited and there tends to be little overlap in access to markets and economic resources. At that level of aggregation, the historic level of ethnic diversity is, to some extent, a mechanical predictor of communal violence, although existing evidence on the relationship between conflict and degree of ELF is mixed and very sensitive to how diversity is measured (Fearon and Laitin 2003).[1]

In contrast, at the neighborhood or building-level within a city, residential arrangements arguably should reflect individual preferences. Since people can always choose to rearrange themselves within a city if their distaste for communal living is sufficiently high, diversity within very localized living arrangements should not positively predict outbreaks of communal violence. If anything, frequent localized interactions with other types may have a positive effect on tolerance and therefore a negative causal effect on conflict (Varshney 2002).

To examine the relationship between neighborhood demographics and violence we combine detailed neighborhood-level data on religious diversity with data on the incidence of riot-related deaths in the city of Ahmedabad over a three-

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[1] The only measure of diversity that appears robustly correlated with conflict is polarization – a measure of diversity which is maximized when there are two equally sized groups (Montalvo and Reynal-Querol 2005). However, as Esteban and Ray 2006 point out there is an important difference between the intensity of conflict, conditional on conflict breaking out, and the likelihood that conflict actually occurs. The latter may be lower in more polarized settings.

day period of intense religious conflict that occurred in 2002. Recurring communal violence between Hindus and Muslims has become increasingly common in Indian cities over the last two decades of the twentieth century (Varshney 2002), and nowhere is it more acute than in Ahmedabad. Correspondingly, residential arrangements in this city are remarkably segregated: by 2002, 71 percent of the population in our sample lived in completely homogeneous neighborhoods, a fact that presumably reflects increasing intolerance for living with members of another religion.

We begin by documenting one striking fact that emerges from the data: in the 2002 riots, incidents of violence were more likely to occur in integrated neighborhoods. This poses a general puzzle for models of residential segregation. Presumably households with the strongest distaste for living with neighbors of a different religion should be the first to relocate to segregated neighborhoods, and also be the first to engage in communal violence. To pose the question differently, why would individuals with sufficiently strong animosity towards people unlike themselves so as to commit (or facilitate) acts of violence against them remain living among those individuals in the first place, particularly in an environment of active informal real estate markets and with a general trend of increasing residential segregation? Given the huge economic burden communal violence imposed on neighborhoods during the 2002 riots, it is hard to explain why highly unstable neighborhoods would not have "tipped" by way of voluntary segregation before reaching the point of intense conflict and thereby prevented economic catastrophe. If we follow the classic Schelling (1971) model, integrated neighborhoods should in fact be relative pockets of harmony, since individuals with the highest levels of tolerance locate in these places.

We argue that a likely explanation for the observed spatial patterns of violence in this setting is the influence of weak tenancy rights in generating inter-ethnic property conflict in Ahmedabad. We look for evidence for this channel by comparing the influence of religious fractionalization on violence in neighborhoods that are in the proximity of largely derelict textile mills to that in non-mill neighborhoods, in a difference-in-difference framework. Textile mills, which

had been the engine of both population and economic growth in city until the mid-1970s, employed both Hindus and Muslims. Importantly, they also established subsidized tenement housing (called 'chawls') for their workers close to the mills beginning in the mid-19th century, and rents were kept low even after mills had closed on account of the Bombay Rent Control Act of 1948 (Breman 2004). As a result, mill neighborhoods had among the highest religious diversity in 2002, and were also the ones in which real estate markets functioned the most poorly: Because property rights were based on tenancy on mill properties, and the mills had closed, they were not fully transferable on the informal market. We suggest that as a result, workers and ex-workers remained in more integrated neighborhoods even as the distaste for, or fear of, living among other religions rose on account of external events.

We show that, for a given level of religious diversity, violence was twice as likely in mill neighborhoods. This violence was predominantly directed against members of the minority group. Mill neighborhoods with no or low religious diversity did not see increased violence, suggesting that the causal effect on violence was not through being associated with a mill *per se.* These patterns are consistent with a story of intensified struggle for property resources in inner-city neighborhoods. Since mill residents could not easily be bought out, the period of heightened religious tensions served as a useful veil for forceful eviction of religious minorities, a view that was also expressed by scholarly observers in the popular press during the riots (Dréze 2003).

I. The Context: Ahmedabad

Between 1850 and 1914, India created the world's fifth largest cotton textile industry. This industry was concentrated in big textile spinning mills, most notably in two cities in Western India – Mumbai and Ahmedabad. The first textile mill in Ahmedabad was established in 1861, and the industry flourished up to the mid-1960s when over 70 mills employed roughly 130,000 workers. The advent of power looms, starting in the mid-1970s, led to a swift decline for this industry and by 1997 only 11 mills were still active (Breman 2004).

A. The Evolution of Demographics

Today Ahmedabad is India's sixth largest city with a population of 5.3 million. It is the largest city in the state of Gujarat. Hindus make up roughly 84% of the city's population and Muslims 11%.

Historically, low-caste Hindu and Muslim weavers formed the bulk of the labor force in Ahmedabad's textile industry (Gillion 1968). The 1890 Report of the Indian Factory Commission states that initially mill workers in Ahmedabad were drawn from the local pool of workers (Misra 1975). However, the fast expansion of the industry led to an excess labor demand, and the first half of the twentieth century saw significant in-migration and a sharp increase in the city population. Between 1872 and 1941 Ahmedabad's population increased fivefold from 116,000 to 591,000, of which 130,000 worked in the textile industry (Gillion 1968). The two main social groups from which mill workers were drawn, however, remained the same. Gillion (1968) argues that Ahmedabad appears to be the only great center of the cotton industry that possessed what may be called a separate mill population, consisting largely of low-caste Hindus and Muslims.

B. The Evolution of Housing

The city of Ahmedabad was founded on the banks of the Sabarmati river, and the main city center was enclosed by a wall in the late 15th century. The city consisted of wards, which were occupied by particular castes specializing in a certain economic activity (Gokhale, 1969: 190). There was little separation between work place and residence, and most people resided and worked in house clusters within these wards (Gillion 1968).

The first textile mills were located inside the walled city, but high population density and limited open space meant that subsequent mills were built outside. Mills tended to locate near the main railroad which ran alongside the walled city. Today mill areas cover roughly 350 hectares in downtown Ahmedabad.

Initially, the rapid in-migration of textile mill workers was accommodated by founding wards (Breman 2004). However, in the face of large population growth, this gave way to a haphazard expansion of residential areas with mud and straw hovels proliferating in the proximity of the textile mills. At the start of the twentieth century, mills began providing a significant fraction of their workers rental housing in one-room tenements or chawls with shared water supply and latrines. These chawls were owned by the mills, subsidized for employees, and had low rents (Lakha 1988).

Since 1948, rental charges for all private housing in Ahmedabad have been regulated by the Bombay Rent Control Act (Government of India 1947). This act defines the standard rent for a private premise as the rent at which the premises were let on September 1, 1940. Increases in rent above the standard rent are restricted to a maximum of 25 percent. The Act also gives tenants the right to sub-lease the property of heirs of the original tenants. The standard rent for mill housing was typically lower than for non-mill housing, since mill accommodation was given as part as the employment contract.

While over 80% of the textile mills stopped operations starting in the mid-1970s, most of these mills have yet to be legally shut down. Ex-mill workers enjoy tenancy rights, where they pay the standard rent but are unable to sell these tenancy rights on the market.

We suggest that price controls under the Bombay Rent Control Act kept rents extremely low on these properties even after the mills had shut, and granted unique tenancy rights to residents of these dwellings. Even after the mills closed, tenancy rights ensured that residents did not move out of these chawls. In fact, in many cases, they became de facto owners of their units, although they did not have the right to sell or rent out the dwellings (Mahadevia 1999).

C. The Evolution of Riots and Segregation

Over the last half century, Ahmedabad has gained a reputation as one of India's more riot-prone cities (Varshney 2002). After Independence, the first major Hindu-Muslim riots in the city broke out in 1969. Thereafter, there were riots in 1981, 1985, 1986, 1990-1991 and in 1992. The 1990s were a period of increased Hindu-Muslim tension across India, and this was particularly true of Ahmedabad. This period also

marked the beginning of significant residential segregation along religious lines in Ahmedabad (Mahadevia 2003).

In this paper we focus on the most recent episode of religious riots in 2002. A train-burning incident in the north Gujarat town of Godhra on 27th February triggered wide-scale Hindu-Muslim violence across the state. The most intense period of rioting occurred over three days, February 28-March 2, although sporadic violence continued until June 2002. Close to 2000 persons were killed across the state, and almost 200,000 households were economically or physically displaced. Ahmedabad was among the worst affected cities.

II. Findings

Every three to four years, the Gujarat State Election Commission compiles new electoral rolls through a complete enumeration of all households in every jurisdiction in the state. We use the 2002 electoral rolls for Ahmedabad which were completed in February 2002. These were finalized the week prior to the outbreak of the riots.

Our unit of analysis is an electoral part in Ahmedabad – a group of contiguous apartment complexes and chawls which share the same electoral booth. To identify whether a part includes a textile mill we use multiple sources. In the electoral roll data, we define a part in which at least one chawl bears the name of a mill as a mill part (a mill's chawls usually bear its name). We verify that all the mills we use are actual textile mills by comparing to a list of textile mills as of 1917 (Gillion 1968) and 1975 (Gazetteer of India). In addition, we use these lists to identify mills that we do not find directly in the electoral roll data. For mills with no chawls named after them, our field workers in Ahmedabad physically verified the part in which mill housing was located.

Our sample consists of the 2,440 parts which fall within the eleven electoral jurisdictions that contain at least one mill. The average part in our sample has 10 apartment complexes and chawls and 278 households. Approximately 4 percent of the parts are mill parts.

To construct our measure of religious fractionalization at the part-level, we first use a name-
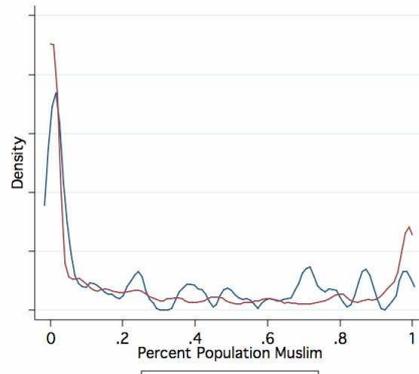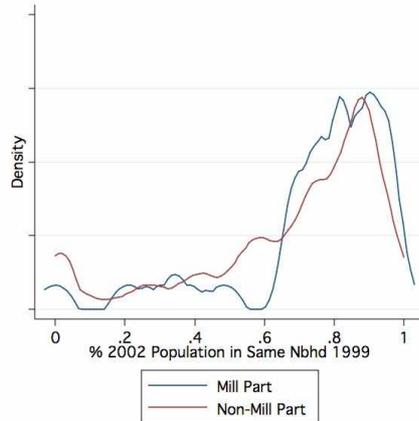

FIGURE 1: MOBILITY RATES AND MUSLIM POPULATION SHARE FOR MILL AND NON-MILL PARTS

based algorithm to identify whether a household listed in the 2002 electoral rolls is Muslim. Religious fractionalization for a part with a Muslim population share x is defined as $2x(1 - x)$. In 2002, just before the riots, religious fractionalization was 0.058 in non-mill parts and 0.124 in mill parts. A Kolmogorov-Smirnov equality-of-distributions test rejects the null hypothesis of samples coming from the same population (see Figure 1).

We hypothesize that greater religious fractionalization in mill parts reflects, in part, lower mobility of households driven by the particular tenancy arrangements that residents of mill housing faced. To check for lower mobility we matched households across the 1999 and 2002 electoral rolls for a subset of four jurisdictions in

TABLE 1: RIOT DEATHS, RELIGIOUS FRACTIONALIZATION AND MILLS

	Any[1]	Muslim	Non-Muslim
Frac.× Millpart	0.21 (0.15)	0.33 (0.11)	-0.14 (0.10)
Millpart	-0.03 (0.03)	-0.04 (0.02)	0.02 (0.02)
Frac.	0.19 (0.04)	0.19 (0.03)	0.01 (0.03)
N. Chawl	-0.001 (0.001)	-0.0002 (0.0005)	-0.001 (0.000)
Log N. Hholds	0.02 (0.01)	0.0003 (0.009)	0.02 (0.01)
Obs	2440	2440	2440

[1]Notes: Religious fractionalization is $2\times$(Muslim pop)$\times$(1-Muslim pop). All variables are defined at the part level. Any death is a dummy=1 if any riot related deaths occurred in the part. Muslim death = 1 if any Muslims were killed and non-Muslim death = 1 if any non-Muslims were killed. All regressions include jurisdiction fixed effects.

our sample. In mill parts, 73 percent of the 2002 population lived in that neighborhood in 1999, while in non-mill neighborhoods, this number was much lower at 64 percent (see Figure 1).

Finally, we construct a binary variable that measures whether any adult residents in that part were certified as killed in the 2002 riots and their families compensated by the government.[2] We matched victims to parts using the 2002 electoral data. We observe 272 deaths in our sample, of which 193 are Muslim deaths. The deaths are spread across 6 percent of the parts, and the incidence of deaths is significantly higher in mill parts (9.6 percent mill parts, but only 5.8 percent of non-mill parts, witnessed a death). This differential is driven by Muslim deaths.

We now turn to regression analysis. For part p in jurisdiction j we estimate regressions of the form

[2]We obtained the list of victims and their beneficiaries who received compensation from the Collector's office.

$$y_{pj} = \alpha_j + \beta_1(R_{pj} \times M_{pj}) + \beta_2 R_{pj} + \beta_3 M_{pj} + \epsilon_{pj}$$

where y_{pj} is a dummy which equals one if there was a riot-related death in the part, R_{pj} denotes religious fractionalization and M_{pj} is a dummy which equals one if the part has a mill. In column (1) of Table 1 we see that religious fractionalization positively predicts riots. However, this relationship does not differ significantly across mill and non-mill parts. In column (2) we see that the same is not true for Muslim deaths. For the same level of religious fractionalization, a Muslim death is significantly more likely in a mill part (than a non-mill part). In column (3) we observe that the religious fractionalization of a part has no predictive power for non-Muslim deaths in either mill or non-mill parts.

Overall, our findings suggest that in an atmosphere of heightened religious tensions, members of the minority group (Muslims) were at greater risk in parts with higher religious fractionalization. Of particular interest is the fact that the risk was significantly higher in mill areas. We hypothesize that greater rent subsidies in mill parts implied that residents were historically less mobile. At the same time, these mill lands also represented large economic returns from violence, in terms of emptying the neighborhood of households. Under the veil of the 2002 riots, this made Muslims in mill parts much more susceptible to violence than in non-mill parts (conditional on religious diversity). Future work will use more recent electoral data to investigate whether mill parts indeed became much more segregated as this hypothesis suggests, and incorporate detailed data on housing societies to better establish the absence of other potential differences between mill and non-mill housing that could be responsible for the observed patterns of violence.

III. Conclusion

Our findings on the location of religious violence are consistent with the hypothesis that tenancy rights granted to mill workers distorted residential relocation choices that may otherwise have mitigated the impact of rising religious ten-

sions on community deaths and property destruction. Once the mills closed, preferential treatment of these lands under the Bombay Rent Control Act implied that residents were granted stronger than average tenancy rights. Since tenancy rights are not transferable on formal real estate markets, mounting tensions between Hindus and Muslims in Gujarat led to a territory war rather than segregation in these locations. As tension mounted, acts of violence and intimidation were used to push out residents belonging to the religious minority group.

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