

Does Economic Distress Stimulate Religious Fundamentalism?

Daniel L. Chen*

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Abstract

When social conflict occurs along ethnic-religious lines instead of class lines is a subject of much debate. This paper exploits relative price shocks induced by the 1997 Indonesian financial crisis and variation in religious institutions across Indonesia before the crisis to identify the effect of economic distress on the relationship between religious institutions and social violence. In the cross-section, high religious intensity areas before the crisis have more social violence after the crisis. Stronger measures of religious intensity are more strongly associated with social violence. In the panel, social violence increases fastest where participation in Koran study also increases the fastest. In the two-stage least squares, instrumenting for economic distress using relative price shocks shows a causal relationship between economic distress and the relationship between religious intensity and social violence. These results are unlikely to be driven by omitted environmental variables. Credit availability mitigates this effect. Economic distress alone did not stimulate social violence but stimulates it in the presence of religious institutions. I explain these findings in a model where high marginal utilities during economic distress increase incentives for group conflict where group conflict increases the budget of insurance groups. With volatility, religions with stronger sanctions or violence are more stable and successful. As volatility declines, benign groups and religions become relatively successful.

Keywords: Religion, Club Goods, Conflict, Fundamentalism

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1 Introduction

Whether social violence rises or falls with religious intensity is a subject of much debate. Some credit religion's role in reducing social violence as a means of keeping potential violent actors off of streets (Berrien and Winship 2003, McRoberts 2003, Freeman 1986). Others cite religion's role in increasing social violence as a means of organizing individuals into potential violent actors (Glaeser 2002, Berman 2003). Why might religious intensity be linked with social violence in some environments but not others? Does the link depend on economic conditions? Social scientists have long speculated on the connection between religious intensity and social violence; answers to these questions may suggest appropriate policies to address ideological extremism.

This paper exploits differences in religious intensity across Indonesia before and during the financial crisis and relative price shocks induced by the crisis to identify the effect of economic distress on the relationship between religious intensity and social violence. A priori, there appears to be prima facie evidence of a rise in religious-based violence during and after the financial crisis. Even if violence began for non-religious reasons, the lines of demarcation often became religious. I first show a strong relationship between religious intensity before the crisis and social violence after the crisis. I then document a relationship between changes in religious intensity and changes in social violence during the crisis. I next exploit the fact that relative price shocks induced by the crisis favored growers of staples, namely rice, and hurt sticky wage-earners, particularly government employees whose salaries are set by federal law. I instrument for economic distress using pre-crisis hectares of wetland ownership and government occupation to identify the impact of economic distress on the relationship between religious intensity and social violence. This paper extends the analysis presented in Chen (2007), a conference proceedings book chapter, by showing causality and by providing a theoretical model. The descriptive background and the non-causal analysis are repeated here for clarity.

In the following sections, I present an analysis of data from the Database on Social Violence in Indonesia 1990-2001, collected by the UN Support Facility for Indonesian Recovery, and data from the Hundred Villages Survey, a panel of 8,140 households, conducted by the Indonesian Census Bureau. Section 2 presents background and data on religion and social violence in Indonesia and a model of the link between religious intensity and social violence. To the extent religious groups provide mutual insurance (Berman 2000, Chen 2004), high marginal utilities during economic distress increase incentives for group conflict as group conflict may increase the budget of mutual insurance groups. If religious intensity is a function of the degree to which someone participates in mutual insurance, increasing the number of participants in insurance matters more for those who are participating at higher levels of religious intensity. Social conflict of one group by another can directly appropriate resources or lower the outside opportunities of club members in order to increase the religious intensity of the less intense.

Between 1997 and 1998, Indonesia's Rupiah fell dramatically from 2400 to the US dollar to 16000 to the US dollar and the CPI for food increased from 100 to 261. Section 3 establishes that religious intensity and social violence are indeed related during the financial crisis. OLS estimates indicate

that in high religious intensity areas, violence is more likely to arise, where violence is measured by total number of incidents of social violence as well as number of incidents with minimum of 1 death. These results hold even after controlling for a large set of village and environmental characteristics.

Because most religious intensity measures are collected before the crisis and are relatively time-invariant and because villages are unlikely to build schools, seminaries, or religious buildings in anticipation of social violence that mostly occurred after the crisis, reverse causality is an unlikely confound. In fact, the relationship between pre-crisis measures of religious intensity and social violence largely begins after the crisis. In addition, certain forms of religious intensity, such as religious schools and seminaries, are more strongly associated with violence than are weaker forms, such as Koran study and worship buildings. Multiplying the estimated coefficients by the mean of the religious intensity measures sums up to the mean of the violence incidents, suggesting religious intensity may explain practically all the violence that occurred if the vector of religious measures are taken as exogenous. The R^2 of the specifications suggest religious intensity may explain one-third of the variance of violence that occurred.

Social violence is negatively associated with other social activities. This suggests omitted variables that are associated with both Koran study groups and “placebo” social activities are not driving the relationship between religious intensity and social violence.

A fundamental issue in the interpretation of the OLS specification is the presence of fixed unobservable factors that are correlated with religious intensity and social violence across provinces. To address this potential source of bias, I use longitudinal data on Koran study, which is tracked over time. I find that Koran study remains associated with communal violence after controlling for province and time fixed effects but is unrelated to state or industrial violence. This last finding lessens the concern that omitted variables drive changes in both Koran study and violence since there is something specific about communal violence rather than violence in general that is associated with Koran study during the financial crisis.

The variety of evidence presented in Section 3 suggests a strong relationship between religious intensity and social violence during the crisis. Section 4 estimates models with interaction terms to explore why religious intensity and violence are linked. Pre-crisis religious intensity—schools, worship buildings, and seminaries—is more strongly linked with social violence in regions that are more economically distressed. Economic distress alone does not stimulate social violence. (Identity-based violence has typically been found to be unrelated to economic hardship alone (Green, McFalls, and Smith 2001, Krueger and Pischke 1997, Ruhm 2000).) I instrument for economic distress using pre-crisis hectares of wetland ownership and government occupation following the identification strategy in Chen (2010).

Importantly, alternative social insurance mitigates this effect. The effect of economic distress on the link between religious intensity and social violence is roughly half as strong when credit is available in the form of banks, microfinance institutions, or BRI loan products.

Understanding the relationship between religious intensity and social violence is not limited to violence prevention. Researchers have traditionally focused on the private return to religious

intensity (Iannaccone 1998), but are now beginning to look beyond the private returns, for example, on the impact of religious intensity on economic growth, the attitudes that underlie economic growth, and gender violence (Barro and McCleary 2002, Guiso, Sapienza, and Zingales 2003, Chen 2005). Violence is a negative externality with enormous social costs (e.g. Abadie and Gardeazabal (2003) and Alesina, et.al (1999)), so to the extent religious intensity and social violence are related, the social returns may be different than the private returns. The results in this paper suggest economic volatility decreases the social returns to religious intensity: groups with stronger sanctions or violence are more stable with economic volatility. As volatility declines, benign groups or religions becomes relatively successful.

2 Religion and Social Violence in Indonesia

Between 1990 and 2001, social violence led to more than 6,208 deaths in Indonesia, increasing sharply after the financial crisis of 1997 (Tadjoeddin 2002). In one year, asset values dropped by 91%. In contrast, it took three years for asset values to drop 87% during the US Great Depression (Friend 2003). Millions of people lost jobs or shifted to the informal sector (Irawan, et. al., 2000). The crisis reached a peak in early 1998 and led to riots and lootings in every province but one. It stimulated mass frustration among marginal groups many of whom lost jobs due to economic crisis and company bankruptcy.

The empirical analysis draws from the UNSFIR Database on Social Violence in Indonesia 1990-2001 (Tadjoeddin 2002), which contains every incident of social violence reported by the national news agency, *Antara*, and the national daily, *Kompas*. The database tracks property damage as well as interpersonal violence. Social violence refers to physical acts of destruction, killing, looting, attacks, burning, clashes, taking hostages, etc., by a group of people. Because press policies differ before and after the crisis, the analysis uses cross-sectional as well as longitudinal data to avoid relying solely on time-series variation of media coverage.

Communal violence accounts for 77% of the total deaths due to social violence; the other categories are state-community and industrial violence. Communal violence is defined as violence between two groups of community, one group being attacked by the other. State-community violence is violence done by communities protesting against state institutions, such as the military, the administration, or security officials. Industrial violence is violence that arises from problems of industrial relations. Communal violence has the widest regional distribution. It is found in 116 of 295 district/cities and 22 of 26 provinces.

Ethnic, religion, and migration-related violence, is the most severe type of communal violence, accounting for 68% of total deaths due to communal violence. While both ethnic and religious violence are coded together (ethnic groups are usually associated with a particular religion in Indonesia), at least some of these acts of communal violence are definitely religious in nature: descriptions in Tadjoeddin (2002) include "killing by evoking black magic shaman" (a form of voodoo), "mass rage as someone recognized himself as God's messenger", "church ruined", "immoral location ruined",

"man taken hostage by Islam holy warrior", "gambling and prostitution location destroyed", and "burning of entertainment place". Violence as a result of difference in political views accounts for only 3.3% of deaths due to communal violence (Table 2). This is defined as violence due to conflicts between and within political parties and their supporters. Figure 1 indicates that the scale of violence increased sharply in 1998. Tables 1 and 2 and Figure 1 are from Tadjoeiddin (2002).

Since the national media often do not record localized conflicts, the data may underreport levels of conflict. UNSFIR captures 1,093 incidents of conflict and 6,208 deaths over 12 years. Under a broader definition of conflict, the PODES data (Potensial Desa/Village Potential Statistics) documents almost 5000 villages as reporting conflicts in one year alone (Barron, et. al. 2004).

2.1 Theory

Religious intensity as insurance provides a theory for why violence and religious intensity may be linked in some environments but not others. Following the model in Chen (2010), suppose agents receive a high (H) or low (L) income shock. Let religious intensity, Q , represent the degree to which someone participates in mutual insurance, i.e. the fraction of income shock shared with the insurance group. More precisely, let the utility of an agent receiving x income shock be, $U_x = u[(1 - Q_x)x + \frac{Q_x}{Q}(\bar{\mu})] - V(\frac{\bar{Q}}{Q_x}) - C(Q_x)$, where $(1 - Q)$ represents the fraction of the shock x agents keep for themselves, Q_x/\bar{Q} is the relative religious intensity, \bar{Q} is the average religious intensity, and $\bar{\mu}$ is the budget of the religious group. $V(\frac{\bar{Q}}{Q_x})$ is the social sanction function and is increasing in relative lack of intensity, \bar{Q}/Q_x , and $C(Q_x)$ is the cost of displaying religious intensity. In the model, the greater is one's religious intensity the more mutual insurance given and received. If $Q = 1$, it is as if the agent participates in a commune, sharing all his shocks with the group. If $Q = 0$, the agent keeps all his positive shocks and suffers all his negative shocks.

Chen (2010) exploits relative price shocks induced by the Indonesian financial crisis to demonstrate a causal relationship between economic distress and religious intensity and finds suggestive evidence of the role of religion as ex-post social insurance: credit availability reduces the effect of economic distress on religious intensity by roughly 80%, religious intensity alleviates needing alms or credit to meet basic needs at the peak of the crisis, and religious institutions facilitate consumption smoothing among villagers.

Now consider the extreme choice of full deviation or non-participation by $M < N$ number of agents. Let $\mathbf{E}^h(Q)$ denote the expected value of social insurance when h individuals participate at Q level of insurance. Then $\mathbf{E}^N(Q) - \mathbf{E}^{N-M}(Q)$ is the value to participants of encouraging participation by M individuals.

Social sanctions increase with religious intensity, Q , because $\frac{\delta}{\delta Q} \mathbf{E}^N(Q) - \mathbf{E}^{N-M}(Q) > 0$. Intuitively, as $Q \rightarrow 0$, the value of encouraging participation also approaches 0. In other words, in a model where religious intensity represents the degree to which someone participates in mutual insurance, increasing the number of participants in insurance matters for those who are participating at higher levels of religious intensity.

More precisely, at higher levels of religious intensity, groups set a higher $V'(\cdot)$, so social sanctions

will be increasing in relative lack of intensity if $Q > 0$, and will increase more sharply, the higher the religious intensity.

For concreteness, suppose there are $N - M$ individuals receiving low shocks who desire a high degree of mutual aid. They set a high religious intensity Q , the fraction of income shared or received from the religious group, while the M individuals receiving positive shocks who desire a low degree of mutual aid choose a low level of religious intensity. Since religious intensity can be chosen after individuals receive their shocks, to encourage the M individuals to provide more mutual aid, the $N - M$ individuals set a high level of social sanction against low religious intensity Q . Individuals with high Q are willing to impose sanctions: empirically, Fehr and Gächter (2000) find that people are willing to pay to punish in public goods games even in the last period when there is no possible benefit to themselves.

Both intergroup and intragroup conflict are captured by the model. The previous example suggests intragroup conflict, but one can also interpret $V(\cdot)$ as a form of direct appropriation of the H individuals by the L individuals from another religious group. Or, one can think of a club model, where $V(\cdot)$ lowers the outside opportunities of club members: escalating conflict (a war on perceived terror) and mutual antagonism increases the religious intensity of the less intense. Social conflict of one group by another can directly appropriate resources or lower the outside opportunities of club members in order to increase the budget of the religious group.

Anecdotal evidence suggests this may be the case. According to personal interviews, neighbors found it more difficult to talk with neighbors of a different religion during times of group conflict. Youth attending Islamic school say that there are tensions between Muslim youth who attend mosque and those who do not. Conflict with non-Muslims may act as a unifying force as individuals do not want to be mistaken for being or helping a non-Muslim. Conflict can also directly appropriate resources, such as land or property. In this case, encouragement or sanctions can take the form of intimidation or conversion. Interviews indicate some individuals converted to Islam during group conflict. Both intragroup and intergroup conflict can increase the budget of mutual insurance groups.

A key prediction of the model is that economic distress increases the incentive to enact sanctions because of high marginal utilities during economic distress. Alternative forms of social insurance should mitigate this effect. Chen (2010) shows how groups without strong sanctions such as rotating savings groups tend to decline during crisis. This suggests religions with harsher punishment or violence are more stable and successful in an environment with high volatility. As volatility declines, benign groups and religions become relatively successful.

2.2 Religion and Economic Data

Household religion and economic data come from The Hundred Villages Survey, collected by the Indonesian Central Statistics Office. The panel dataset follows 8,140 households from May 1997 to August 1999, beginning before the crisis and continuing in four waves after the crisis (Figure 2). Religious intensity at the household level is measured using the response to “In the past 3

months, has your household increased, decreased, stayed the same, or not participated in the study of Koran (Pengajian)?” This question is asked after the crisis and is coded as 1/0. Chen (2010) verifies Pengajian participation actually measures religious intensity by examining its correlation with other measures of religious intensity, such as Islamic school attendance, Koran ownership, worshipping, and measures of belief such as answering, “It is up to God,” in response to “What is your ideal number of sons?” as well as religious opposition to contraception use.¹

Village-level religiosity measures of per capita number of mosques, Islamic chapels, churches, Hindu temples, and Buddhist temples are taken from the 1997 PODES data (Potensial Desa/Village Potential Statistics), which asks for 1996 information. The religiosity measures of per capita number of Islamic boarding schools, religious schools, and seminaries are taken from 1998 PODES. Since it is unlikely that new religious institutions were built during the crisis, I interpret these as pre-crisis numbers and divide by the 1997 PODES population accordingly (1998 PODES population numbers would be affected by crisis-induced migration).

Since the Hundred Villages Survey does not cover separatist areas such as Aceh, no incident of separatist violence is included in the following analysis. The Hundred Villages Survey and the Database on Social Violence overlap for the following eight provinces: Bali, Jawa Barat, Jawa Timur, Kalimantan Timur, Lampung, Nusa Tenggara Timur, Riau, and Sulawesi Tenggara. Since violence data is recorded at the province level, province-level clusters are included in specifications where religious intensity is measured at the village level.

3 Estimating the Relationship between Religious Intensity and Social Violence During the Financial Crisis

I examine the relationship between religious intensity recorded in the Hundred Villages Survey and violence recorded in the Database on Social Violence in Indonesia 1990-2001.

3.1 Cross-Sectional Variation

Is violence more likely to arise in high religious intensity areas? Are stronger measures of religious intensity more strongly associated with social violence? Table 3 reports OLS estimates of an equation linking social violence and religious intensity:

$$V_{jp} = \beta' \mathbf{R}_{jp} + \alpha' \mathbf{X}_{jp} + \varepsilon_{jp}$$

where V_{jp} represents all social violence incidents from 1990-2001 or all social violence incidents with minimum 1 death in village j in province p , \mathbf{R}_{jp} is a vector for village j in province p representing percentage of Pengajian participation in a village, religious worship buildings per 1000 population, religious schools per 1000 population, and seminaries per 1000 population and \mathbf{X}_{jp} represents vil-

¹An important limitation to this study is that this paper does not analyze beliefs. However, it is possible that an increase in Islamic school attendance translates subsequently into stricter beliefs.

lage, geographic, and fiscal control variables (urban dummy, population, area, number of shops per 1000 population, mean pre-crisis monthly per-capita non-food expenditures, dummies for geographic characteristics flat, steep, beach, forest, valley, and river, 1996-1997 INPRES funds per 1000 population for economic activity, building and facilities, offices and institutions, human resources, and IDT, another village assistance program).

The estimates show a strong association between each measure of religious intensity and violence. The strong association remains after controlling for village, geographic, and fiscal characteristics (Columns 2 and 4). In fact, stronger measures of religious intensity—religious schools and seminaries—are much more strongly associated with violence. Religious schools per 1000 population and seminaries per 1000 population are associated with violence at 1% statistical significance in most specifications (Table 3 Columns 1-4). Percentage of Pengajian participation and worship buildings per 1000 population are associated with violence at 5% to 10% statistical significance in these specifications. These results corroborate Barron, et. al. (2004) who also find in their cross-sectional analysis of the 2003 PODES data, higher presence of faith groups is associated with higher levels of conflict.

In magnitudes, multiplying the coefficient β by the mean of the religious intensity measures sums up to the mean of the violence incidents. Thus, if we take \mathbf{R}_{jp} as exogenous, this suggests religious intensity may explain practically all the violence that occurred in averages. The R^2 of the regression displayed in Column 1 is 0.34, suggesting religious intensity may explain one-third of the variance of violence that occurred. The R^2 of the regression displayed in Column 3 is 0.32. Columns 2 and 4 have R^2 of 0.49 and 0.48 respectively.

3.2 Reverse Causality

A possible explanation for a link between religious intensity and violence is the response of religious intensity to social violence instead of vice versa. The empirical setup precludes this possibility because of the fact that most religious intensity measures are relatively time-invariant and are pre-crisis measures. Since it is unlikely that new religious institutions were built during the crisis, these measures can be interpreted as pre-crisis numbers. Most violence (96%) occurs after the crisis (Figure 1). It seems unlikely villages build schools, seminaries, or religious buildings in anticipation of social violence, so reverse causality is an unlikely confound.

Separately regressing violence year-by-year on pre-crisis religious intensity, with the following regression,

$$V_{jpt} = \beta'_t \mathbf{R}_{jp} + \alpha'_t \mathbf{X}_{jp} + \varepsilon_{jpt},$$

suggests the strong relationship between pre-crisis religious intensity and social violence begins after the crisis. Estimates are reported in Table 4. For example, the estimates of β_t in 1993 comparing with 1998 rise from 0.252 to 12.107 for Pengajian participation and 1.449 to 23.659 for seminaries (Columns 1 and 3). Figure 3 Panel A displays the relationship between August 1998 Pengajian

participation and year-by-year social violence. Figure 3 Panels B-D display the relationship between pre-crisis per-capita worship buildings, religious schools, and seminaries, respectively, and year-by-year social violence. Table 4 and Figure 3 have no information displayed for 1990-1992 and 1994 because there are no reported incidents of social violence that overlap with the Hundred Villages Survey in those years.

3.3 Other Social Activities

Social violence is negatively associated with other social activities. Table 5 displays separate partial correlations between social violence and each recorded social activity. While Pengajian is positively correlated with social violence and statistically significant at the 5% level, social violence is not significantly associated with any other surveyed social activity: sports (Olahraga), burial society (Kematian), club for obtaining skills (Karang Taruna), family welfare movement (PKK and “occasional training for women”), and “10 helps for housing” (Dasawisma). These results suggest omitted variables that are associated with both religious and non-religious social activities are not driving the relationship between religious intensity and social violence.

In fact, the estimates suggest participation in non-religious social activities is negatively associated with social violence. Each percentage point of Pengajian participation is associated with 0.39 more incidents of social violence whereas each percentage point in participation in women’s training, housing help, skill learning, or burial societies is associated with 0.30 to 0.50 fewer incidents of social violence. These results again corroborate Barron et.al (2004) who find that networks of engagement across ethnic-religious lines reduce likelihood of conflict. The remainder of the study moves beyond Barron, et. al (2004) to more carefully isolate the relationship between religious intensity and social violence, and to estimate the causal impact of economic distress on this relationship.

3.4 Panel Data

The significant relationship between some measures of religious intensity and social violence before the crisis (Table 4) suggests some unobserved environmental variables may be correlated with religious intensity (for example, if ethnic-religious diversity is greater where there are more religious institutions, and diversity is correlated with violence, this may bias the relationship between religious intensity and social violence upwards). To address this possibility, I also examine the relationship between Pengajian participation and social violence controlling for province and time fixed effects. Pengajian participation is the only measure of religious intensity that is time-varying. Fixed effects controls for environmental characteristics such as religious or ethnic diversity across regions.

To construct the panel of religious intensity and social violence, recall that information on Pengajian participation is collected for 3-month periods. I match the average Pengajian participation rate of each province for a 3-month period to the number of incidents of social violence for the same 3-month period. Since the Hundred Villages Survey collected Pengajian participation at 3 different times, this gives me 8 provinces and 3 time periods for a total of 24 observations to estimate:

$$V_{pt} = \beta R_{pt} + \kappa_p + \tau_t + \varepsilon_{pt}$$

where V_{pt} represents incidents of social violence, R_{pt} represents percentage Pengajian participation in province p at time t , κ_p are province fixed effects, and τ_t are time fixed effects. I show specifications with and without weighting by the number of households in the Hundred Villages Survey per province.

The estimate of about 4.4 in Column 4 of Panel A in Table 6 indicates Koran study is associated with communal violence incidents with minimum 1 death at 10% statistical significance. The estimate of 5.1 in Column 2 indicates Koran study is positively associated with incidents of communal violence. The coefficient 4.3 in Column 4 is smaller than the coefficient 11 in Column 3 of Table 3, one reason for which is that violence is restricted to a 3-month period here whereas in Table 3, violence was aggregated for 1990-2001. The estimates are roughly the same with and without population weights (Columns 1 and 3).

Even with controls for fixed effects, omitted variables may be driving changes in both Koran study and violence. To the extent the economic distress that stimulates Koran study would stimulate any kind of social violence, observing the relationship between changes in Koran study and changes in other types of social violence provides a test of this possibility. When different types of violence are considered in Panels B and C, the association between Koran study and other types of violence, state-community and industrial, is weaker, with coefficients of -0.11 and 0.91 respectively. The sum of state-community and industrial violence also is weakly associated with Koran study. There is not enough variation in state-community and industrial violence incidents with minimum 1 death to run fixed effects regressions. These findings lessen the concern that omitted variables drive changes in both Koran study and violence since there is something specific about communal violence rather than violence in general that is associated with Koran study.

4 The Interaction of Economic Distress and Religious Intensity

The preceding sections find that social violence is more likely to arise in areas with greater religious intensity and that social violence increases more quickly where religious intensity also increases more quickly. To examine why, I estimate models with interaction terms. A key prediction of a social insurance theory of religious intensity is that religious intensity is more strongly linked with social violence in regions that are more economically distressed. I examine places where the financial crisis had more or less economic impact using the identification strategy established in Chen (2010). Rapid inflation during the financial crisis favored growers of staples, particularly rice, and disfavored sticky wage-earners. Hectares of wetland ownership and government occupation before the crisis act as instruments for economic distress while hectares of dryland ownership and service occupation act as placebo instruments.

Since most measures of religious intensity are collected before the financial crisis, the association

between religious intensity and social violence is unlikely to be due to economic distress stimulating both religious intensity and social violence. Even if economic distress explains the relationship between changes in religious intensity and changes in social violence, we might have expected state and industrial violence to also increase with Koran study, but this is not the case. Interestingly, there is no strong relationship between social violence and the instruments for economic distress and the point estimates are of the opposite sign (not shown), which is consistent with identity-based violence being typically unrelated to economic hardship alone (Green, McFalls, and Smith 2001, Krueger and Pischke 1997, Ruhm 2000). Instead, the interaction of pre-existing religious intensity with economic distress increases social violence, suggesting there may be something particular about religious intensity that allows economic distress to translate into social violence.

4.1 Reduced Form Evidence

To examine whether religious intensity is more strongly linked with social violence in regions that are more economically distressed, Table 7 Panel A estimates the following reduced form specification:

$$V_{jp} = \beta_0 R_{jp} + \beta'_1 R_{jp} \mathbf{Z}_{jp} + \beta'_2 \mathbf{Z}_{jp} + \alpha' \mathbf{X}_{jp} + \varepsilon_{jp}$$

where \mathbf{Z}_{jp} represents the instruments for village j in province p , where the instruments are the average hectares of wetland owned in village and percentage of household heads who work in government. R_{jp} represents pre-crisis religious intensity for village j in province p , defined as the sum of standardized per capita religious worship buildings, religious schools, and seminaries.

The coefficient -14.2 in Column 1 indicates that where there was more pre-crisis religious intensity, wetland, which cushioned a village from the crisis because villagers can grow more rice, is linked to fewer incidents of social violence. The coefficient 94.5 in Column 1 for the interaction of religious intensity and % government workers indicate villages hit harder by the crisis, because more villagers had sticky wages, and with more pre-crisis religious intensity saw more incidents of social violence. A similar pattern holds for incidents with minimum 1 death (Column 3). These relationships are robust to including village, geographic, and fiscal controls (Columns 2 and 4).

The average hectares of wetland owned is 0.17 (Appendix Table A) and the fraction of government workers is 0.06. Multiplying -14.2 by 0.17 gives -2.41 and multiplying 94.5 by 0.06 gives 5.67. This suggests the average hectares of wetland owned reduces the effect of religious intensity on social violence by roughly 30% (2.41 divided by 8.2 in Row 1 Column 1 of Table 7) while the average fraction of government workers increases the effect of religious intensity on social violence by roughly 70%. These calculated relative effects are larger for Columns 2-4.

In Panel B of Table 7, I replace \mathbf{Z}_{jp} with placebo instruments for village j in province p , the average hectares of dryland owned in village and percentage of household heads who work in service occupations. Comparing -4.2 on the religious intensity * dryland interaction with -14.2 for religious intensity * wetland interaction in Column 1 is consistent with the finding in Chapter 1 that dryland hectares provide roughly half the cushion that wetland hectares provide. Comparing 53.1 on

religious intensity * service interaction and 94.5 on religious intensity * government interaction in Column 1 also suggests the placebo instruments display a much smaller and statistically insignificant effect as compared to the actual instruments.

4.2 2SLS Estimates

Table 8 estimates the analogous 2SLS specification:

$$V_{jp} = \beta_0 R_{jp} + \beta_1 (R_{jp} \Delta E_{jp}) + \beta_2 \Delta E_{jp} + \alpha' \mathbf{X}_{jp} + \varepsilon_{jp}$$

where ΔE_{jp} is the average economic distress for village j in province p , instrumented using \mathbf{Z}_{jp} instruments, average hectares of wetland and percentage of government workers. R_{jp} represents pre-crisis religious intensity for village j in province p , defined as the sum of standardized per capita religious worship buildings, religious schools, and seminaries. The coefficient -5.9 in Column 1 suggests social violence rising mostly through the interaction of pre-crisis religious infrastructure and economic distress. The average household suffered a \$4.70 shock in per capita nonfood expenditures (Appendix Table A). Multiplying -5.9 by \$4.7 and adding -5.4, the coefficient on pre-crisis religious intensity in Column 1, indicates social violence is positively related with pre-crisis religious intensity at the average economic distress level.

4.3 Social Insurance and Social Violence

Does social insurance mitigate social violence? I first find that in the cross-section, social violence is negatively associated with credit availability, defined as having banks, microfinance institutions, or BRI loan products. To address the possibility credit availability proxies for general economic development, I also include an urban dummy and the number of shops. Incidents of social violence are positively associated with those characteristics, suggesting there is something particular about credit availability, rather than urbanness or commercial development, that is negatively associated with social violence. These estimates are not statistically significant, but the interpretation is similar considering incidents with minimum 1 death and after including controls, and corroborate the finding that loan provision reduces crime (Garmaise and Moskowitz 2004).

In Table 9, I run the 2SLS specification separately for villages with credit availability ($n = 32$) and without credit availability ($n = 61$):

$$V_{jp} = \beta_0 R_{jp} + \beta_1 (R_{jp} \Delta E_{jp}) + \beta_2 \Delta E_{jp} + \alpha' \mathbf{X}_{jp} + \varepsilon_{jp}$$

In other words, I estimate

$$\begin{aligned} V_{jp} = & \beta_0 R_{jp} + \beta_1 (R_{jp} \Delta E_{jp}) + \beta_2 \Delta E_{jp} + \beta_3 C_{jp} R_{jp} + \beta_4 (C_{jp} R_{jp} \Delta E_{jp}) + \beta_5 C_{jp} \Delta E_{jp} \\ & + \beta_6 C_{jp} + \alpha'_0 \mathbf{X}_{jp} + \alpha'_1 C_{jp} \mathbf{X}_{jp} + \varepsilon_{jp} \end{aligned}$$

where C_{jp} represents credit availability in village j and province p and credit availability is defined as having banks, microfinance institutions, or BRI loan products. The BRI bank system is the backbone of the rural financial system in Indonesia (Holloh 2001) and BRI loan products are a special form of credit with low collateral requirements. According to personal interviews, in one village in the survey, BRI loan products were especially available during the crisis for government workers because they were considered to have "fixed" jobs. A feature of the BRI loan product that helps loan collection is the reduction of interest for timely repayments (Holloh 2001). Microfinance programs are also helpful for laid-off workers to start small businesses of their own (Akatiga 1999).

I display separate 2SLS specifications for ease of interpretation. Comparing the coefficients on the interaction of religious intensity and economic distress, -4.2 in Column 1 with -8.4 in Column 2 in Panel A suggest credit availability reduces the impact by roughly 50%. This ratio remains roughly the same for incidents with minimum 1 death (Columns 3 and 4) as well as for estimates when the full set of village, geographic, and fiscal controls are included (Panel B). The difference between the respective coefficients, i.e. β_4 , is not statistically significant at the 10% level, so these results should be taken as merely suggestive.

4.4 Alternative Explanations

One alternative explanation for the rise in social violence is that instead of economic distress, it is the political vacuum created during the crisis that allowed social violence to arise. However, between 1990 and 2001, violence as a result of difference in political views accounts for only 3.3% of deaths due to communal violence (Table 2). A related hypothesis is that violence arises when civic/polic institutions weaken and that religious institutions are correlated with the presence of civic/police institutions. This also does not appear to be the case.

Another possibility is that religious fragmentation is necessary for social violence. However, greater religious fragmentation of an area, as computed by the Herfindahl index of religious worship buildings, is not strongly associated with pre-crisis religious intensity. Moreover, the model in Section 2 suggests social violence associated with religion need not be limited to intergroup violence. A related hypothesis is that less violence occurs under a single religious regime and that there may be fewer incidents of social violence when there is exactly 1 mosque in the village. This also does not appear to be the case.

5 Conclusion

These results suggest that in a world of competing insurance groups, as volatility increases, religions with stronger sanctions or violence are more stable and successful, but as volatility declines, benign groups and religions become relatively successful.

In this paper, I present an analysis of data from the Hundred Villages Survey and data from the Database on Social Violence in Indonesia 1990-2001. OLS estimates show a large positive relationship between religious intensity and social violence. Because most religious intensity mea-

asures are relatively time-invariant and are pre-crisis measures and because villages are unlikely to build schools, seminaries, or religious buildings in anticipation of social violence, reverse causality is unlikely to explain this association. In fact, a strong relationship between pre-crisis measures of religious intensity and social violence begins after the crisis. In addition, stronger forms of religious intensity are more strongly associated with violence. To control for potential omitted variables bias, I use longitudinal data on Koran study, which is tracked over time. Koran study remains associated with communal violence after including province and time fixed effects but is unrelated to state or industrial violence.

Shedding light on why religious intensity and social violence are linked, religious intensity is linked to more social violence in regions that are more economically distressed. Alternative social insurance mitigates this effect. To the extent governments, international organizations, and NGOs are concerned about ideological extremism, in particular because it may lead to religious conflict and violence, the results here and in Chen (2010) suggest increasing their role in social insurance may mitigate fundamentalist tendencies. Countries that inordinately depend on natural resources may be subject to greater fluctuations and may find reducing fundamentalist tendencies to be yet another reason to diversify. If it is the case globalization increases the risk individuals face, providing insurance against that risk may be important in preventing ethnic-religious conflicts. Miguel (2003) and Miguel, Satyanath, and Sergenti (2003) find evidence that economic shocks increase conflicts.

The Great Depression may have affected group identity differently in the US and Germany because the provision of social insurance was affordable in the former but not in the latter. The results suggest one explanation for why some religions and group identities replace others. In the long-run competition between social insurance groups, social insurance with sanctions will be relatively successful, especially in a volatile environment. With volatility, religions with harsher sanctions are more stable and successful. As volatility declines, groups or religions with reduced sanctions or violence become relatively successful. The increase in income volatility from 1972-1998 (Krueger and Perri 2003) is consistent with the contemporaneous rise in religious intensity in US popular and public discourse as well as the shift from an inclusionary (social gospel movement) to exclusionary (religious right) religious intensity (Fogel 2000).

One can even imagine an evolutionary branching of social insurances. Early social insurances stayed within the family, which later became ethnicities and religions. Ethnicities and religions in time begat nationalities, political ideologies, and even gender identities each seeking to displace earlier forms of group identity, as technologies developed to better address imperfect information (improved ability to observe efforts and types necessary for social insurance to be self-enforcing and self-propagating).

6 Data Appendix

The empirical analysis draws from The Hundred Villages Survey, collected by the Indonesian Central Statistics Office. The panel dataset follows 8,140 households from May 1997 to August 1999,

beginning before the crisis and continuing in four waves after the crisis (Figure 1). In the pre-crisis period, the survey observes 120 randomly selected households in each of 100 communities. However between 1997 and 1998, the number of village enumeration areas increases from 2 to 3, necessitating a replacement of about 40 randomly selected households per village. The partial replacement of pre-crisis households is why the panel contains 8,140 instead of 12,000 households. The survey also collects village-level information in the first wave of 1997 and 1998. A more detailed description of the survey questions and variable construction used in the tables is provided below. The survey is in Indonesian and was translated with the help of two translators.

One measure of religious intensity is the response to “In the past 3 months, has your household increased, decreased, stayed the same, or not participated in the study the Koran (Pengajian)?” More precisely, the phrase is “Pengajian/kegiatan agama lainnya,” which translates to religious activity, however translators say the question would be interpreted by native Indonesians as specifically referring to Koran study; non-Muslims may interpret the question as referring to the equivalent in their respective religion. This question is asked after the crisis and is coded as 1/0.

The controls, \mathbf{X}_{ij} , include pre-crisis May 1997 values of: village characteristics—urban dummy, population, area, number of shops per 1000 population; geographic characteristics—dummies for flat, steep (the excluded topography dummy is slight angle), beach, forest, valley, river terrain (the excluded geography dummy is other); and fiscal characteristics—INPRES (Presidentially Instructed Program for Village Assistance, implemented during 1996-1997) funding received normalized to \$ per 1000 population, which divides into funds used for productive economic effort, for buildings and facilities, for offices and institutions, and for human resources, and total IDT (another village assistance program) funds received by the household between 1994-1996.

I use the entire sample of 8,140 households. Appendix Table A presents some descriptive statistics.

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Figure 1: Social Violence, 1990-2001

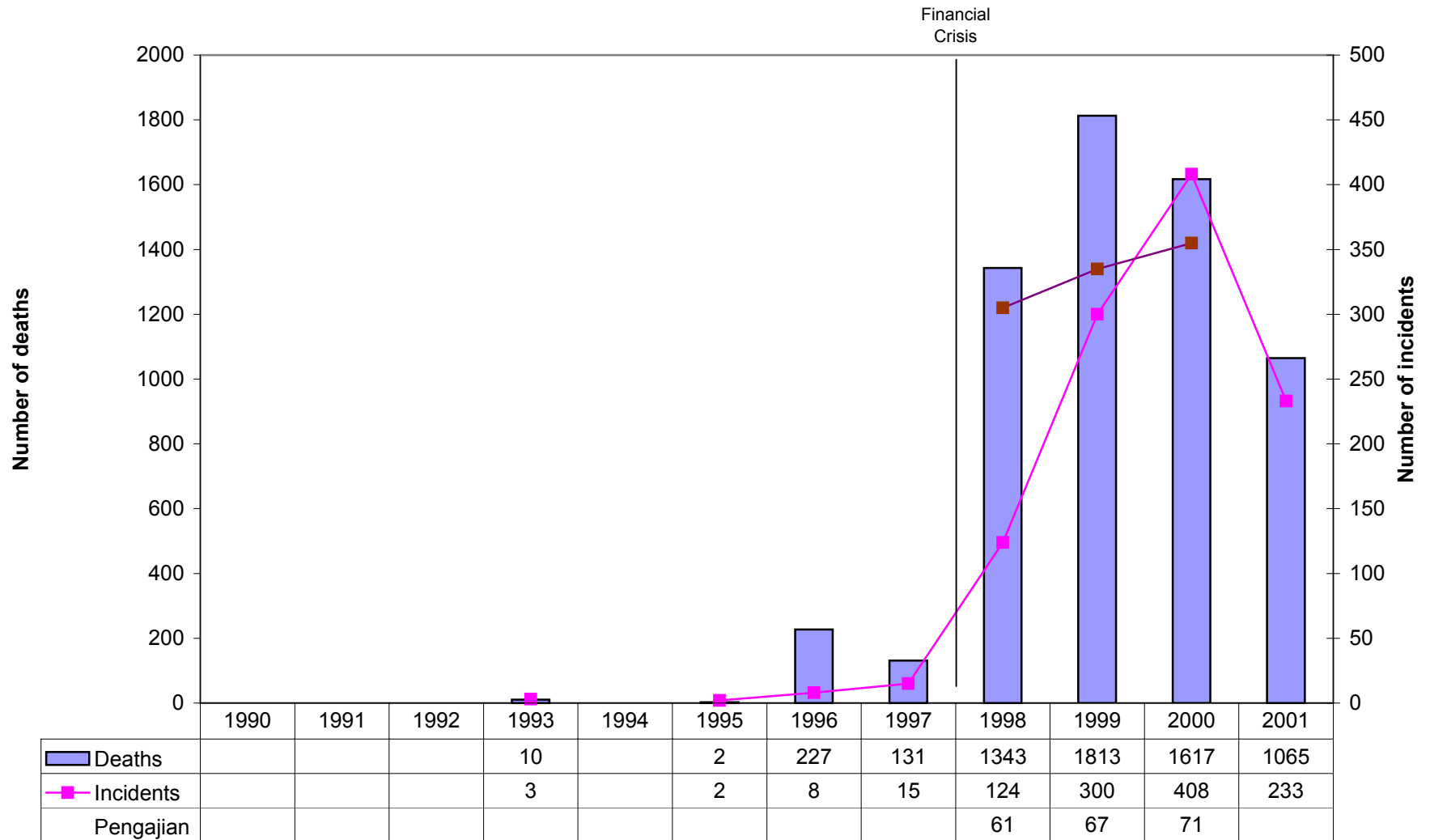


Figure 2: Timing of 100 Villages and PODES Survey Waves and the Rp/USD Exchange Rate

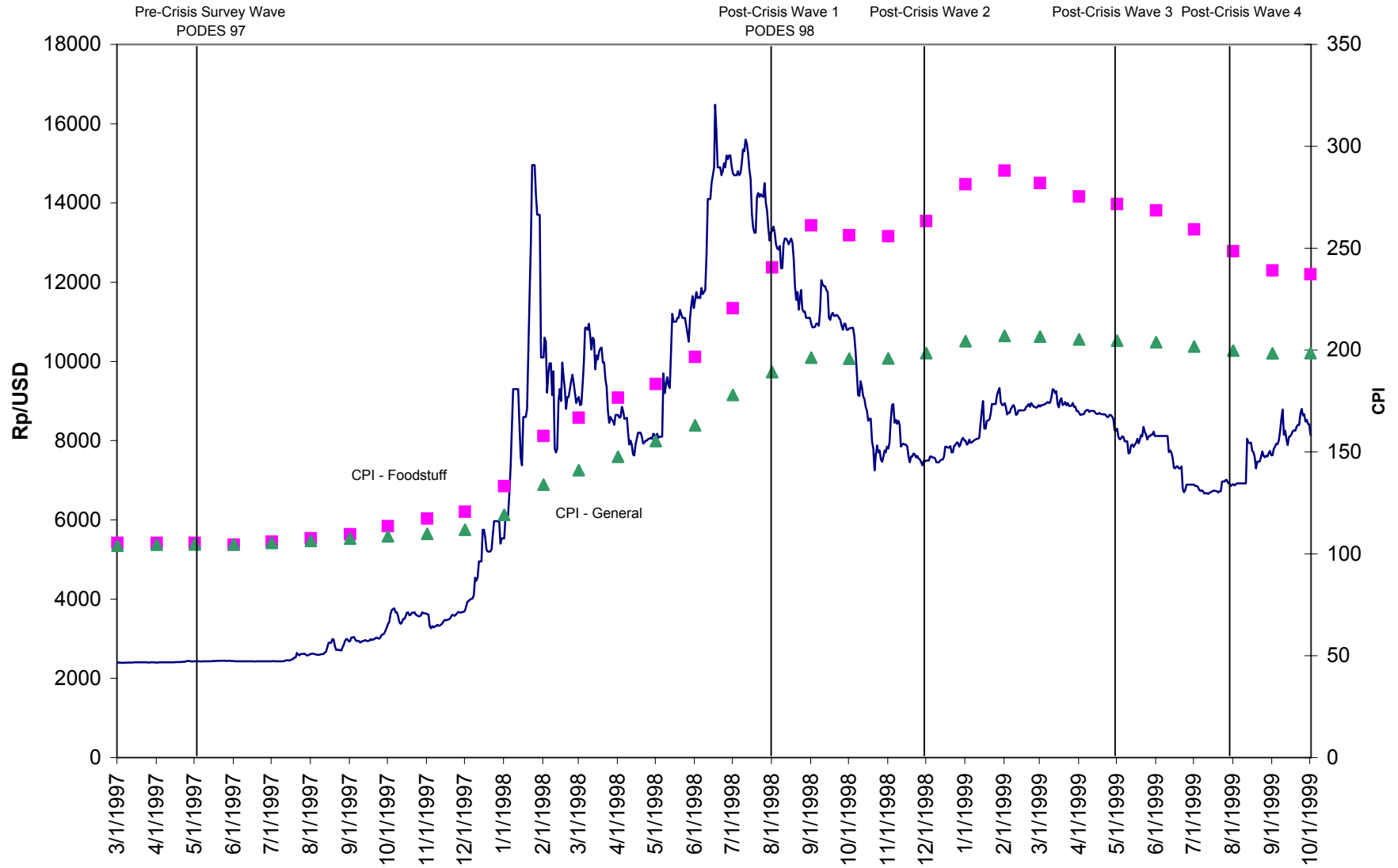


Figure 2A: August 1998 Pengajian Participation and Social Violence, 1990-2001

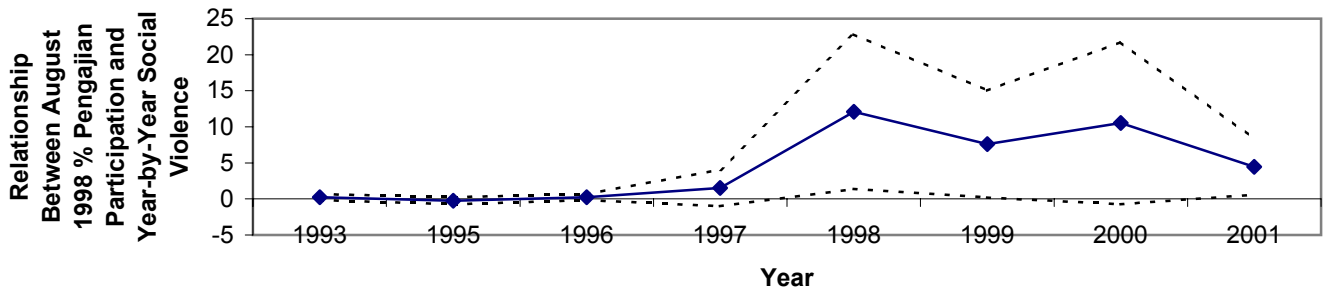


Figure 2B: Pre-Crisis Worship Buildings Per 1000 Population and Social Violence, 1990-2001

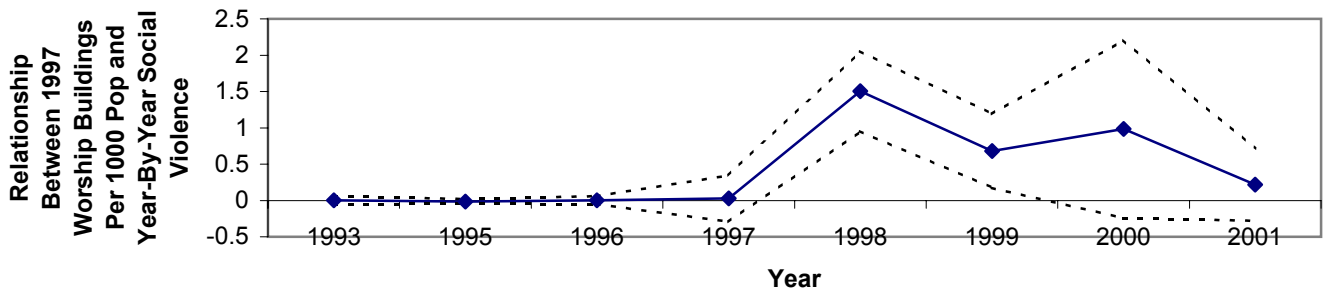


Figure 2C: Pre-Crisis Religious Schools Per 1000 Population and Social Violence, 1990-2001

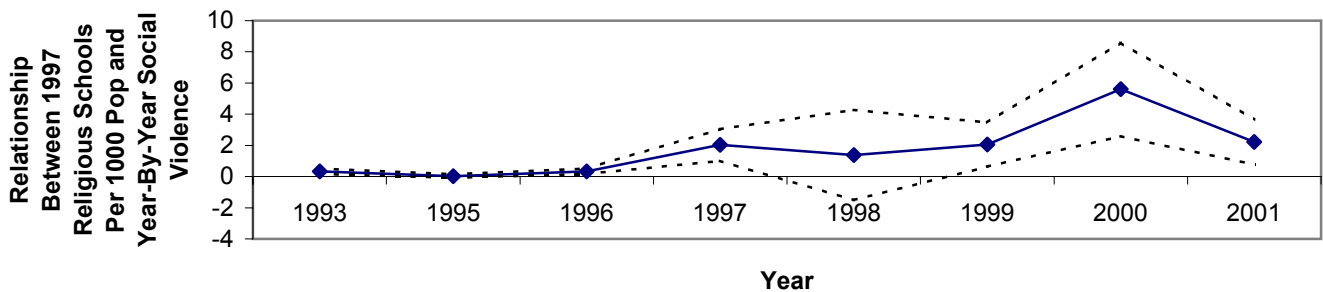


Figure 2D: Pre-Crisis Seminaries per 1000 Population and Social Violence, 1990-2001

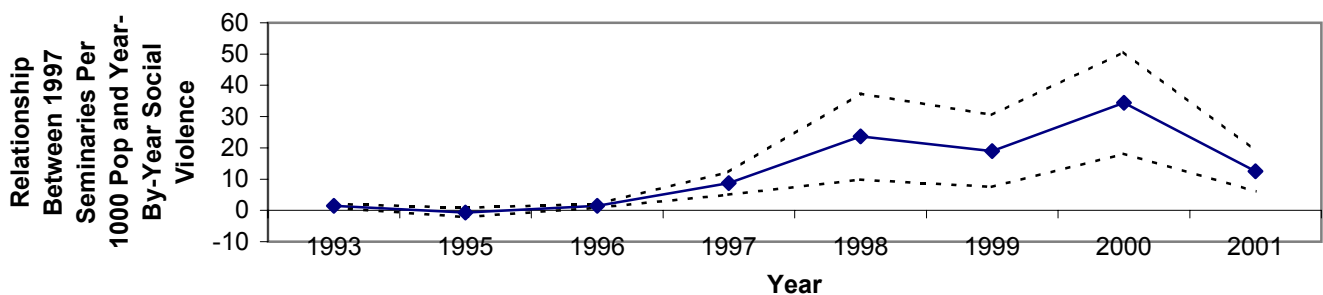


Table 1--Social Violence by Category, 1990-2001

Category	Number of Incidents (1)	Number of Incidents with Min 1 Death (2)	Number of Deaths (minimum value) (3)	% Death to Total Death (4)
Communal Violence	465	262	4771	76.9
Separatist Violence	502	369	1370	22.1
State-Community Violence	88	19	59	1.0
Industrial Relations Violence	38	4	8	0.1
Total	1093	654	6208	100

Social Violence data from UN Support Facility for Indonesian Recovery, "Database on Social Violence in Indonesia 1990-2001". An incident of social violence is recorded if the national news agency, *Antara*, or the national daily, *Kompas*, reported an incident with at least one victim, be it human (casualties or injuries) or material (such as houses, buildings, or vehicles damaged or burned). 96% of the incidents occur between 1998-2001; most are communal violence, defined as social violence between two groups of community, one group being attacked by the other.

Communal Violence: social violence between two groups of community, one group being attacked by the other.

Separatist Violence: social violence between the state and the people of a certain area because of regional separatism.

State-Community Violence: violence between the state and the community who are expressing protests against state institutions.

Industrial Violence: violence that arises from problems of industrial relations.

Table 2--Communal Violence by Sub-Category, 1990-2001

Sub-Category	Deaths		Incidents	
	Number	% of Total	Number	City/District
	(1)	(2)	(3)	(4)
Ethnic, Religion, and Migration	3230	67.7	233	39
The May 98 Riots	1202	25.2	6	10
Differences in Political Views	156	3.3	79	54
Civil Commotion (Tawuran)	87	1.8	70	28
Issue of 'Dukun Santet'	65	1.4	28	17
Competing Resources	16	0.3	16	10
Food Riots	5	0.1	23	22
Other	10	0.2	10	9
Total	4771	100	465	116

Social Violence data from UN Support Facility for Indonesian Recovery, "Database on Social Violence in Indonesia 1990-2001". An incident of social violence is recorded if the national news agency, *Antara*, or the national daily, *Kompas*, reported an incident with at least one victim, be it human (casualties or injuries) or material (such as houses, buildings, or vehicles damaged or burned). 96% of the incidents occur between 1998-2001; most are communal violence, defined as social violence between two groups of community, one group being attacked by the other.

Communal Violence: social violence between two groups of community, one group being attacked by the other.

Ethnic, Religion, and Migration: religion propagation related to particular regions and ethnic groups

The May 98 Riots: riots in big cities preceding fall of President Suharto in May 1998

Differences in Political Views: conflicts between and within political parties and their supporters

Civil Commotion (Tawuran): clashes between villages, neighborhoods, or groups

Issue of 'Dukun Santet': killings of people accused of evil magic and witchcraft

Competing Resources: disputes between community groups competing for economic resources

Food Riots: mass riots and lootings for staple foods between January to March 1998

Table 3--Relationship between Religious Intensity and Social Violence

	Incidents of Social Violence		Incidents with Minimum 1 Death	
	(1)	(2)	(3)	(4)
All Violence (OLS)				
% Pengajian Participation in Village, August 1998	35* (17)	36* (17)	11* (5)	11* (6)
Religious Worship Buildings Per 1000 Pop	4** (2)	3* (2)	1** (0)	1* (0)
Religious Schools Per 1000 Pop	16** (7)	14*** (4)	5* (2)	5*** (1)
Seminaries Per 1000 Pop	115*** (18)	101*** (25)	36*** (6)	32*** (8)
R ²	0.34	0.49	0.32	0.48
N	93	93	93	93
Controls	N	Y	N	Y

Regressions are OLS regressions of 93 villages and include province-level clusters.

Social Violence data from UN Support Facility for Indonesian Recovery, "Database on Social Violence in Indonesia 1990-2001".

An incident of social violence is recorded if the national news agency, *Antara*, or the national daily, *Kompas*, reported an incident with at least one victim, be it human (casualties or injuries) or material (such as houses, buildings, or vehicles damaged or burned).

96% of the incidents occur between 1998-2001; most are communal violence, defined as social violence between two groups of community, one group being attacked by the other.

Control variables are Village, Geography, and Fiscal Characteristics are listed below.

Village Characteristics -- Urban, Population, Size, Number of Shops Per 1000 Pop, Mean Pre-Crisis Per-Capita Non-Food Expenditures

Geography Characteristics -- Flat, Steep, Beach, Forest, Valley, River

Fiscal Characteristics -- 1996-1997 INPRES Funds Per 1000 Pop for Economic Activity, Building and Facilities, Offices and Institutions, Human Resources, and IDT funds

Table 4--Relationship between Religious Intensity and Year-by-Year Social Violence

Dependent Variable: Incidents of Social Violence	Pengajian	Worship	Religious	Seminaries
	Participation	Buildings	Schools	
	(1)	(2)	(3)	(4)
1993	0.252 (0.211)	0.004 (0.027)	0.339*** (0.085)	1.449*** (0.304)
1995	-0.251 (0.244)	-0.014 (0.016)	0.032 (0.058)	-0.668 (0.748)
1996	0.252 (0.211)	0.004 (0.027)	0.339*** (0.085)	1.449*** (0.304)
1997	1.509 (1.264)	0.027 (0.160)	2.033*** (0.509)	8.695*** (1.824)
1998	12.107* (5.352)	1.504*** (0.275)	1.388 (1.447)	23.659** (6.880)
1999	7.605* (3.704)	0.682** (0.254)	2.050** (0.706)	18.988** (5.761)
2000	10.521 (5.622)	0.983 (0.613)	5.598*** (1.508)	34.414*** (8.141)
2001	4.456* (1.935)	0.220 (0.249)	2.214** (0.722)	12.534*** (3.243)
Controls	Y	Y	Y	Y

Regressions are OLS regressions of 93 villages and include province-level clusters.

Social Violence data from UN Support Facility for Indonesian Recovery, "Database on Social Violence in Indonesia 1990-2001".

An incident of social violence is recorded if the national news agency, *Antara*, or the national daily, *Kompas*, reported an incident with at least one victim, be it human (casualties or injuries) or material (such as houses, buildings, or vehicles damaged or burned).

96% of the incidents occur between 1998-2001; most are communal violence, defined as social violence between two groups of community, one group being attacked by the other.

Control variables are Village, Geography, and Fiscal Characteristics are listed below.

Village Characteristics -- Urban, Population, Size, Number of Shops Per 1000 Pop, Mean Pre-Crisis Per-Capita Non-Food Expenditures

Geography Characteristics -- Flat, Steep, Beach, Forest, Valley, River

Fiscal Characteristics -- 1996-1997 INPRES Funds Per 1000 Pop for Economic Activity, Building and Facilities, Offices and Institutions, Human Resources, and IDT funds

Table 5--Relationship between Social Activities and Social Violence

	Incidents of Social Violence	Incidents with Minimum 1 Death
	(1)	(2)
All Violence (OLS)		
% Pengajian Participation in Village, August 1998	39** (12)	12** (4)
% Training for Women Participation, August 1998	-33 (30)	-9 (10)
% 10 Helps for Housing Participation, August 1998	-50 (30)	-15 (10)
% Club for Skill Learning Participation, August 1998	-32 (25)	-10 (8)
% Burial Society Participation, August 1998	-30 (18)	-9 (6)
% Sports Club Participation, August 1998	3 (10)	-0 (4)
% Savings Club Participation, August 1998	-1 (22)	-1 (8)
Controls	Y	Y

Each coefficient represents a separate OLS regression of 93 villages, conditional on controls, and include province-level clusters. Social Violence data from UN Support Facility for Indonesian Recovery, "Database on Social Violence in Indonesia 1990-2001". An incident of social violence is recorded if the national news agency, *Antara*, or the national daily, *Kompas*, reported an incident with at least one victim, be it human (casualties or injuries) or material (such as houses, buildings, or vehicles damaged or burned). 96% of the incidents occur between 1998-2001; most are communal violence, defined as social violence between two groups of community, one group being attacked by the other.

Control variables are Village, Geography, and Fiscal Characteristics are listed below.

Village Characteristics -- Urban, Population, Size, Number of Shops Per 1000 Pop, Mean Pre-Crisis Per-Capita Non-Food Expenditures

Geography Characteristics -- Flat, Steep, Beach, Forest, Valley, River

Fiscal Characteristics -- 1996-1997 INPRES Funds Per 1000 Pop for Economic Activity, Building and Facilities, Offices and Institutions, Human Resources, and IDT funds

Table 6--Relationship between Religious Intensity and Social Violence (Panel)

	Incidents of Social Violence		Incidents with Minimum 1 Death	
	(1)	(2)	(3)	(4)
Panel A: Communal Violence (Fixed Effects)				
% Pengajian Participation in Province	4.340 (4.598)	5.107 (5.850)	3.989* (2.209)	4.348* (2.335)
Panel B: State-Community Violence				
% Pengajian Participation in Province	-0.034 (1.090)	-0.108 (1.469)	n/a	n/a
Panel C: Industrial Violence				
% Pengajian Participation in Province	1.190 (1.215)	0.909 (1.311)	n/a	n/a
Population Weighted Fixed Effects	N Province, Time	Y Province, Time	N Province, Time	Y Province, Time

Regressions are Fixed Effects regressions of 8 provinces in each of 3 time periods, a total of 24 observations, with province and time fixed effects. Population weights are the number of households per province in the sample. Each coefficient represents a separate OLS regression of Pengajian Participation Rates for 3-month period on Violence. Social Violence data from UN Support Facility for Indonesian Recovery, "Database on Social Violence in Indonesia 1990-2001". An incident of social violence is recorded if the national news agency, *Antara*, or the national daily, *Kompas*, reported an incident with at least one victim, be it human (casualties or injuries) or material (such as houses, buildings, or vehicles damaged or burned). 96% of the incidents occur between 1998-2001; most are communal violence, defined as social violence between two groups of community, one group being attacked by the other.

Communal Violence: social violence between two groups of community, one group being attacked by the other.

State-Community Violence: violence between the state and the community who are expressing protests against state institutions.

Industrial Violence: violence that arises from problems of industrial relations.

n/a: Too few state-community and industrial violence incidents with minimum 1 death to run fixed effects regressions.

Table 7--Reduced Form Relationship Between Social Violence and Pre-Crisis Religious Intensity Interacted with Instruments

	Incidents of Social Violence		Incidents with Minimum 1 Death	
	(1)	(2)	(3)	(4)
Panel A: Main Experiment				
Pre-Crisis Religious Intensity	8.2** (2.8)	7.0** (2.8)	2.5** (0.9)	2.1** (0.9)
Pre-Crisis Religious Intensity * Wetland	-14.2* (6.2)	-15.5* (7.4)	-4.2* (1.8)	-4.4* (2.1)
Pre-Crisis Religious Intensity * % Govt	94.5** (35.3)	85.8** (28.2)	29.2** (11.4)	28.3** (9.7)
Wetland	-17.1 (13.2)	-21.1** (8.3)	-5.3 (4.2)	-6.5** (2.4)
% Govt	48.8 (26.4)	0.6 (56.0)	14.3 (8.2)	3.5 (18.2)
Panel B: Placebo Experiment				
Pre-Crisis Religious Intensity	7.8 (5.0)	9.2* (4.5)	2.1 (1.5)	2.5 (1.3)
Pre-Crisis Religious Intensity * Dryland	-4.2 (4.3)	-6.7 (3.9)	-1.1 (1.3)	-1.8 (1.2)
Pre-Crisis Religious Intensity * % Service	53.1 (33.0)	55.7 (31.8)	17.6 (10.4)	18.5 (10.7)
Dryland	-20.8** (8.8)	-18.7* (8.4)	-7.2** (2.6)	-6.5** (2.6)
% Service	-11.5 (30.3)	-29.7 (39.2)	-6.0 (8.6)	-8.5 (11.4)
Controls	N	Y	N	Y

Pre-Crisis Religious Intensity is the sum of standardized Religious Worship Buildings Per 1000 Pop, Religious Schools Per 1000 Pop, and Seminaries Per 1000 Pop. Wetland and Dryland are the average hectares owned in village. Government and Service are the % of household heads who work in that occupation.

Regressions are OLS regressions of 93 villages and include province-level clusters.

Social Violence data from UN Support Facility for Indonesian Recovery, "Database on Social Violence in Indonesia 1990-2001".

An incident of social violence is recorded if the national news agency, *Antara*, or the national daily, *Kompas*, reported an incident with at least one victim, be it human (casualties or injuries) or material (such as houses, buildings, or vehicles damaged or burned).

96% of the incidents occur between 1998-2001; most are communal violence, defined as social violence between two groups of community, one group being attacked by the other.

Control variables are Village, Geography, and Fiscal Characteristics are listed below.

Village Characteristics -- Urban, Population, Size, Number of Shops Per 1000 Pop, Mean Pre-Crisis Per-Capita Non-Food Expenditures

Geography Characteristics -- Flat, Steep, Beach, Forest, Valley, River

Fiscal Characteristics -- 1996-1997 INPRES Funds Per 1000 Pop for Economic Activity, Building and Facilities, Offices and Institutions, Human Resources, and IDT funds

Table 8--Relationship Between Social Violence and Pre-Crisis Religious Intensity Interacted with Economic Distress

	Incidents of Social Violence		Incidents with Minimum 1 Death	
	(1)	(2)	(3)	(4)
Pre-Crisis Religious Intensity	-5.4*	-12.4	-1.6*	-3.7
	(2.5)	(14.5)	(0.8)	(4.6)
Pre-Crisis Religious Intensity * Change in Per Capita Nonfood Expenditure (IV)	-5.9***	-6.9**	-1.8***	-2.2**
Change in Per Capita Nonfood Expenditure (IV)	(1.2)	(2.4)	(0.4)	(0.7)
	(4.0)	(6.6)	(1.3)	(2.0)
Controls	N	Y	N	Y

Pre-Crisis Religious Intensity is the sum of standardized Religious Worship Buildings Per 1000 Pop, Religious Schools Per 1000 Pop, and Seminaries Per 1000 Pop.

Change in Per Capita Nonfood Expenditure is the difference computed between August 1998 and May 1997.

Regressions are IV regressions of 93 villages and include province-level clusters.

The excluded instruments are wetland, government, and their interactions with pre-crisis religious intensity.

Social Violence data from UN Support Facility for Indonesian Recovery, "Database on Social Violence in Indonesia 1990-2001".

An incident of social violence is recorded if the national news agency, *Antara*, or the national daily, *Kompas*, reported an incident with at least one victim, be it human (casualties or injuries) or material (such as houses, buildings, or vehicles damaged or burned).

96% of the incidents occur between 1998-2001; most are communal violence, defined as social violence between two groups of community, one group being attacked by the other.

Control variables are Village, Geography, and Fiscal Characteristics are listed below.

Village Characteristics -- Urban, Population, Size, Number of Shops Per 1000 Pop, Mean Pre-Crisis Per-Capita Non-Food Expenditures

Geography Characteristics -- Flat, Steep, Beach, Forest, Valley, River

Fiscal Characteristics -- 1996-1997 INPRES Funds Per 1000 Pop for Economic Activity, Building and Facilities, Offices and Institutions, Human Resources, and IDT funds

Table 9--Evidence Suggesting Social Insurance Mitigates Social Violence

	Incidents of Social Violence		Incidents with Minimum 1 Death	
	Credit Available (1)	No Credit (2)	Credit Available (3)	No Credit (4)
Panel A: No Controls				
Pre-Crisis Religious Intensity	-4.2 (2.5)	-3.8 (5.6)	-1.3 (1.0)	-0.7 (1.7)
Pre-Crisis Religious Intensity	-4.2**	-8.4**	-1.3**	-2.8**
* Per Capita Nonfood Expenditure Change (IV)	(1.5)	(2.9)	(0.5)	(1.0)
Per Capita Nonfood Expenditure Change (IV)	-5.8 (5.1)	-11.7 (8.4)	-1.8 (1.6)	-4.0 (2.7)
Panel B: With Controls				
Pre-Crisis Religious Intensity	-5.8 (4.7)	-38.5 (94.5)	-1.9 (1.3)	-10.7 (26.7)
Pre-Crisis Religious Intensity	-4.2**	-6.7	-1.5**	-2.3
* Per Capita Nonfood Expenditure Change (IV)	(1.7)	(10.7)	(0.6)	(3.2)
Per Capita Nonfood Expenditure Change (IV)	-1.7 (5.1)	-4.8 (17.4)	-1.4 (1.5)	-1.9 (5.5)
N	32	61	32	61

Pre-Crisis Religious Intensity is the sum of standardized Religious Worship Buildings Per 1000 Pop, Religious Schools Per 1000 Pop, and Seminaries Per 1000 Pop.

Credit Availability is defined as having a Bank, Microfinance, or BRI Loan Product available in village.

Regressions are IV regressions of 93 villages and include province-level clusters.

The excluded instruments are wetland, government, interactions with pre-crisis religious intensity.

Social Violence data from UN Support Facility for Indonesian Recovery, "Database on Social Violence in Indonesia 1990-2001".

An incident of social violence is recorded if the national news agency *Antara*, or the national daily, *Kompas*, reported an incident with at least one victim, be it human (casualties or injuries) or material (such as houses, buildings, or vehicles damaged or burned).

96% of the incidents occur between 1998-2001; most are communal violence, defined as social violence between two groups of community, one group being attacked by the other.

Control variables are Village, Geography, and Fiscal Characteristics are listed below.

Village Characteristics -- Urban, Population, Size, Number of Shops Per 1000 Pop, Mean Pre-Crisis Per-Capita Non-Food Expenditures

Geography Characteristics -- Flat, Steep, Beach, Forest, Valley, River

Fiscal Characteristics -- 1996-1997 INPRES Funds Per 1000 Pop for Economic Activity, Building and Facilities, Offices and Institutions, Human Resources, and IDT funds

Appendix Table A--Descriptive Statistics

Household Summary Statistics		Village Summary Statistics	
Percentage Own Wetland	31%	Standard Deviation of Village Consumption Shock during Crisis (Aug 1998 - May 1997)	11.42 (1.56)
Percentage Own Dryland	66%	Standard Deviation of Village Consumption Shock Non-Crisis (May 1999 - Dec 1998)	9.22 (2.16)
Percentage in Farming	66%	Total Worship Buildings Per 1000 Pop	3.83 (0.28)
Wetland Ownership (Hectares)	0.17 (0.01)	Religious Schools per 1000 Pop	0.12 (0.04)
Dryland Ownership (Hectares)	0.72 (0.01)	Seminaries per 1000 Pop	0.01 (0.01)
Surname Indicates Haj Pilgrimage	1.0%	% Pengajian Participation in Village, August 1998	0.61 (0.03)
Number of Children attending Islamic School	0.15 (0.01)	Credit Available	0.34 (0.05)
Monthly Per-Capita Food Expenditure, May 1997	14.6 (0.1)	Number Shops Per 1000 Pop	0.07 (0.03)
Monthly Per-Capita Non-Food Expenditure, May 1997	7.3 (0.2)	Urban	0.20 (0.04)
Household Size	4.16 (0.02)	1996-1997 INPRES Funds in \$/1000 Pop	0.91 (0.09)
Government worker	6%		
Service Worker	10%		
N	8140	N	99

Crisis Summary Statistics

	1998 Aug	1998 Dec	1999 May	1999 Aug
Monthly Per-Capita Non-Food Expenditure, Change	-4.7 (0.2)	1.1 (0.2)	-0.1 (0.2)	0.2 (0.2)
Pengajian Participation Rate	61%	unavail.	67%	71%
Pengajian Increase in Last 3 Months	9%	unavail.	7%	7%
Pengajian Decrease in Last 3 Months	9%	unavail.	10%	11%

Violence Summary Statistics

Incidents of Social Violence	34.65 (3.20)
Incidents of Social Violence with Minimum 1 Death	11.26 (1.02)
Incidents of Communal Violence (3 month period)	0.83 (0.29)
Incidents of Communal Violence with Minimum 1 Death (3 month period)	0.33 (0.16)
Incidents of State-Community Violence (3 month period)	0.08 (0.06)
Incidents of Industrial Violence (3 month period)	0.17 (0.08)
% Pengajian Participation in Village, August 1998 (3 month period)	0.66 (0.03)
Number of Provinces	8