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Election Fraud and Post-Election Conflict: Evidence from the Philippines

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Abstract: Previous studies have documented a positive association between election fraud and the intensity of civil conflict. It is not clear, however, whether this association is causal or due to unobserved institutional and cultural factors. This paper examines the relationship between election fraud and post-election violence in the 2007 Philippine mayoral elections. Using the density test developed by McCrary (2008), we find evidence that incumbents were able to win tightly contested elections through fraud. In addition, we show that narrow incumbent victories were associated with an increase in post-election casualties, which is consistent with the hypothesis that election fraud causes conflict. We conduct several robustness tests and find no evidence that incumbent victories increased violence for reasons unrelated to fraud.

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The anti-communist propaganda is calculated to pave the way for cheating the progressive forces and their allies and cutting down their votes. The impending electoral fraud at their expense will only further discredit the ruling system and will further justify the people's determination to intensify the revolutionary armed struggle.

– Prof. Jose Maria Sison, Chief Political Consultant, National Democratic Front of the Philippines

1 Introduction

Civil conflict is a major impediment to development and poverty-reduction (World Bank, 2012). Its negative effects include reductions in economic growth (Abadie and Gardeazabal, 2003), educational attainment (Leon, 2012), height-for-age Z-scores (Akresh et al., 2012), and birth weight (Mansour and Rees, 2012). Despite the large potential gains from ending or preventing civil conflict, its causes are not well understood.

Academics and practitioners point to electoral fraud as an important cause of internal conflicts, especially in the developing world. For instance, Callen and Long (2012) argued that fraudulent elections can exacerbate civil conflict by undermining the democratic process and increasing popular support for non-democratic, and potentially violent, political actors; a recently published World Bank report noted that "leaders lacking trust in 'winner-take-all' scenarios may manipulate [election] outcomes, which can trigger serious violence" (World Bank, 2012).[1] While there is strong evidence of a positive association between election fraud and civil conflict (Weidmann and Callen, 2013), this association could easily be due to difficult-to-measure cultural, historical, or institutional factors. Nevertheless, international

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[1]More generally, political scientists believe that grievances, including those stemming from political suppression and election fraud, are the principal cause of civil conflict (Schock, 1966; Hegre et al., 2001; Henderson and Singer, 2000; Tucker, 2007). For instance, Tucker (2007) argued that election fraud galvanized the public, triggered protests, and eventually led to the so-called "colored revolutions" in Eastern Europe.

donors spend substantial amounts on election monitoring and related programs in an effort to dampen civil conflict and its attendant ills (Kelley, 2008).

This study examines the impact of election fraud on post-election conflict between government forces and insurgents. Using data from the 2007 Philippine midterm elections, we begin our empirical analysis by showing that incumbent mayors were more likely to win tightly contested elections than their challengers, an indication of fraud (McCrary, 2008; Grimmer et al., 2011; Blakeslee, 2013). This result is consistent with the observation that incumbents in developing countries are typically better positioned to manipulate close elections (Pastor, 1999; Parashar, 2012), and are therefore more likely to commit election fraud than their challengers (Schedler, 2002; Weidmann and Callen, 2013; Parashar, 2012).

Next, we show that narrow incumbent victories were associated with a substantial increase in post-election conflict-related casualties, but were essentially unrelated to pre-election casualties. It is, of course, possible that narrow incumbent victories led to post-election conflict for reasons unrelated to fraud. For instance, opponents of the status quo may have hoped to affect change through the electoral process and turned to violence when the election outcome was not to their liking. We conduct several tests in an effort to rule out this possibility. For instance, we show that narrow incumbent victories only led to conflict in the poorer half of Philippine municipalities, where fraud was concentrated. In wealthier municipalities, where there is little evidence of fraud, narrow incumbent victories are not associated with post-election violence. We also show that the effect of a narrow victory did not depend on the incumbent's party affiliation, suggesting that fraud was the trigger as opposed to the candidate's political platform.

We conclude that election fraud is causally related to civil conflict. Although the precise mechanism through which fraudulent elections increase conflict is difficult to pin down, Section 2 provides anecdotal evidence that election fraud increases support for insurgents

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and makes it easier for them to recruit followers.

2 Background: Elections, Fraud and Armed Conflict in the Philippines

The Philippines is a constitutional republic with a population of more than 90 million. A new president is elected every 6 years, while congressional, provincial and municipal elections are held every 3 years. Our focus is on the midterm elections held on May 14, 2007. Although the presidency was not in contention, 1598 mayors were elected, 755 of whom were incumbents. The mayoral candidates belonged to over 40 different parties, most of which were affiliated with one of the two major political camps: the center-right governing coalition around then-president Gloria Macapagal-Arroyo's KAMPI party, and the opposition led by the center-left Liberal Party.

The 2007 Philippine elections were the last to be counted manually.[2] According to a report by USAID (2008), voters had to indicate the candidates they supported on ballots, which typically entailed writing between 20 and 30 names by hand. At the end of the voting process, the ballots were read aloud at each polling station by the Board of Election Inspectors and recorded on a tally sheet or black board. The results from each polling station were sent to the local Board of Canvassers for tabulation and then on to the Philippine Commission on Elections.

There is ample anecdotal evidence of widespread fraud in the 2007 elections in the form of ballot stuffing, miscounting of votes at the polling station, and mistabulation of votes by

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[2]In 1997, the Philippine's Congress passed a law to automate the voting process. Despite this law, an automated election system was used for the first time in 2010 (USAID, 2008).

the Board of Canvassers.[3] Election fraud through miscounting/mistabulation of votes is so common in the Philippines that a specific term has developed for it: "dagdag-bawas", which is literally translated as "subtract-add". International election observers of the 2007 election noted that ballots were tallied by hand and characterized the counting process as "prone to fraud and misuse". One observer reported "a general feeling among voters that their votes would not be counted, a sentiment provoked by acts of fraud and violence allegedly committed by politicians, election officials, and armed groups".[4]

During the 2007 elections, there were two major organized armed groups active in the Philippines: the New People's Army (NPA) and the Moro Islamic Liberation Front (MILF). Formed in 1981, the MILF is a separatist movement fighting for an independent Muslim state in the Bangsamoro region of the southern Philippines. Because of its narrow geographic focus, the MILF is not a major cause of conflict in our data. The NPA is the armed wing of the Philippine communist movement. Since taking up arms in 1969, the NPA has relied on pin-prick ambushes and harassment tactics rather than conventional battlefield confrontations against government forces. It operates in rural areas across most of the country and extorts considerable sums of money from business and private citizens (Rabasa et al., 2011). The NPA's political wing is the Communist Party of the Philippines (CPP), which is not recognized by the government and therefore cannot participate in elections. While a number of parties affiliated with the CPP fielded candidates for the House of Representatives in 2007, none fielded mayoral candidates.[5] The only far-left party that fielded mayoral candidates was Akbayan, which is a rival to the CPP. However, only two of their mayoral candidates were incumbents and neither of them were involved in tightly contested elections.

Many experts believe that election fraud decreases the population's trust in democracy and

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[3]These types of fraud are common in developing countries and were also documented during the most recent Afghan elections (Callen and Long, 2012).

[4]These quotes and a brief description of international efforts to monitor the 2007 Philippine elections are available from Solidarity Philippines Australia Network (2007).

[5]These parties are: Bayan Muna, Anakbayan, Gabriela, Migrante, Anakpawis and Sura (Holden, 2009).

leads to increased support for non-democratic and potentially violent actors (World Bank, 2012). In the case of the Philippines, the NPA specifically uses allegations of fraud in their propaganda material and when recruiting. For instance, a statement published on the NPA's website (philippinerevolution.net) less than a week before the 2007 elections read:

> [Philippine] elections has [sic] always been rotten, bloody and dirty which is but a result and extension of a degenerating rotten system beset by a chronic and worsening social, political and economic crisis. But to stand up and fight for truth, for justice and the democratic rights of the people will always be truly liberating, patriotic and noble (Madlos, 2007).

A statement released ten days after the election read:

> [t]he people must remain firmly united, vigilant and militant against the continuing manipulation of the real election results to favor the regime, and to frustrate the regimes use of the anti-terrorism law and the military and police against public outrage over yet another illegitimate electoral outcome. The protests against the violent and fraudulent elections will surely continue as part of the struggle to bring to account the corrupt, fascist and puppet regime (Salas, 2007).

Anecdotal evidence that propaganda based on allegations of election fraud can be successful comes from an interview conducted by the Armed Forces of the Philippines (AFP) with an anonymous former high-ranking NPA commander following his voluntary surrender to government forces. Describing the process through which he was recruited, he said:

> [The NPA organizers] frequently visited me and briefed me on how rotten our government was. I believed that they were telling the truth because during the election in 1969, it was publicized that it's prohibited to buy and sell votes. However, the Barangay Captain himself, went to see me and gave me money [to buy my vote]. That's why I believed that the organizers were telling the truth that the government is rotten.[6]

This anecdotal evidence is consistent with the argument that election fraud causes conflict by decreasing trust in the government and increasing support for the NPA; increased support for insurgent movements facilitates recruitment and makes the population less likely to share information with the government forces (Berman et al., 2011).

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[6]From an interview conducted by the AFP intelligence unit under the condition of anonymity.

3 Empirical Analysis

3.1 Did Incumbents Manipulate Close Elections?

Only one previous study has examined the effect of election fraud on post-election conflict. Using data on African elections held during the period 1997-2009, Daxecker (2012) found that if international observers publicly declared that an election had been manipulated, the number of post-election violent incidents increased substantially. Although this result is consistent with the hypothesis that election fraud leads to post-election unrest and violence, international observers are not randomly assigned to elections. To the extent that international observers were more likely to have been assigned to countries that were prone to post-election violence, Daxecker's estimates overstate the relationship between election fraud and post-election violence.

One method of addressing this issue would be to use so-called "forensic" measures of fraud. The most often-used forensic test compares the distribution of digits found in vote counts to the distribution predicted by Benford's Law (Mebane, 2006). An alternative method focuses on vote counts ending in 0 or 5, suggesting rounding (Weidmann and Callen, 2013; Beber and Scacco, 2012). While these approaches have the advantage of being independent of whether election observers were assigned to a particular polling station, they measure fraud with error, which could cause attenuation bias. Instead of relying on observer reports or forensic evidence, the analysis below uses the density test developed by McCrary (2008) to measure election fraud. Specifically, we examine the probability density function of the incumbent's vote margin.[7] If this difference is greater than zero, the incumbent won the election; if it is smaller than zero, the incumbent lost. In the absence of manipulation, the winner of a close election should have been, in effect, randomly assigned and therefore the probability of an

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[7]That is, the difference between the incumbent's vote share and that of the most successful challenger.

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incumbent victory should be equal to the probability of an incumbent loss. More precisely, the probability density function of the incumbent's vote margin should be smooth across the threshold of zero, so that (in the limit) the incumbent was equally likely to win or lose close elections. Below, we discuss possible reasons aside from fraud for why incumbents might have an advantage in close elections.

Following the method developed by McCrary (2008), we group observations into bins of equal width and estimate the following regression:

$$Y_b = \gamma_0 + \gamma_1 D_b + \gamma_2 X_b + \gamma_3 (D_b \times X_b) + \eta_b. \tag{1}$$

Here, Y_b is the fraction of observations in bin b, X_b is the incumbent's victory/loss margin (in percentage points) at the bin's midpoint, and D_b is an indicator for whether the bin is above the incumbent's victory threshold (all bins have to be either entirely above or entirely below zero). If the density of the incumbent's vote margin is smooth across the threshold of zero, the bins just above the threshold should contain as many observations as those just below the threshold and the parameter γ_1 will not be statistically distinguishable from zero.

Our election data are publicly available and can be obtained from the Republic of the Philippines Commission on Elections (COMELEC). We used mayoral election results from 2007 to identify winners/losers in each municipality and to calculate margins of victories/losses; we used returns from the 2004 election to identify incumbents.[8] We limited the sample to municipalities in which the incumbent mayor's vote margin was within a 5 percentage-point bandwidth of the zero threshold. This resulted in a sample of 153 municipalities. The incumbent won re-election in 81 of these municipalities and lost in the remaining 72.

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[8]We were able to match the majority of mayors elected in 2004 with the 2007 election results using an automated process. Unmatched observations were mostly due to the fact that not all mayors elected in 2004 ran for re-election and to spelling errors. In the latter case, we matched incumbent mayors manually.

Figure 1 plots the probability that a municipality falls into a particular bin against the margin of victory at the midpoint of the bin. The top panel plots results for the entire country, the middle panel for the poorer half of municipalities, and the bottom panel for the richer half.[9] Because there are no direct measures of poverty available at the municipal level, we constructed a poverty proxy by taking the first factor in a factor analysis of housing quality indicators. This method was proposed by Sahn and Stifel (2003) as a method of measuring poverty in the absence of data on income and expenditures.[10]

Figure 1 provides evidence that incumbent mayors in the poorer half of municipalities were more likely to win elections decided by a margin of between 0 and 1.5 percentage points. In contrast, there is little evidence that incumbents in the richer half of municipalities were more likely to win tightly contested elections. Below, we show that this pattern of electoral manipulation closely corresponds to the pattern of violence observed after the election.

Table 2 reports McCrary test results (i.e., estimates of equation (1)), based on 30 bins, 15 on each side of the threshold. The constant term represents the height at which the pdf intercepts the threshold of zero from below, which is an estimate of how likely incumbents were to lose tightly contested elections. The coefficient of the incumbent victory indicator reflects the discontinuous change in the pdf at the zero threshold. For the entire sample, we estimate a constant of 0.028 and a discontinuous increase of 0.016, which is statistically significant at the 5 percent level. Thus, incumbents were approximately 57 percent (0.016/0.028) more likely to win tightly contested elections than to lose them. This constitutes evidence that incumbents were able to manipulate tightly contested elections in order to secure victory.

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[9]In general, there is a strong association between poverty and corruption (Olken and Pande, 2012). This could be because populations in poor areas are less informed about the election process and the participating candidates (Ferraz and Finan, 2008; Besley and Burgess, 2002).

[10]We use all 5 indicators of housing quality recorded by the 2000 Philippine Census: access to electricity, piped water and indoor plumbing, as well as the material of the roof and walls. Table 1 shows the weights with which the housing characteristics enter the first factor. As expected, values that indicate higher housing quality influence the first factor in the same direction for all variables. If a municipality's predicted value of the first factor was below the median, we designated it as poor. If the predicted value was above the median, we designated it as rich.

The results in columns (2) and (3) show that manipulation took place primarily in poor municipalities. When the sample is restricted to the poorer half of municipalities, we obtain a constant of 0.027 and there is a discontinuous increase of 0.031 in the pdf at the zero threshold indicating that incumbents were more than twice as likely to win tightly contested elections than to lose them. In the richer half of municipalities, the discontinuous decrease of 0.009 is small relative to the constant of 0.038 and is not statistically significant at conventional levels.

The results presented in Table 2 are based on a bandwidth of 5 percentage points. In general, estimates with smaller bandwidths should be closer to the true value, since they are more strongly informed by observations closer to the threshold (McCrary 2008). However, reducing the bandwidth also decreases the effective sample size and therefore leads to less precise estimates. Table 3 provides evidence that our estimates are robust to limiting the bandwidth to 3 or 4 percentage points around the threshold.

An alternative explanation for the results presented thus far is that incumbents have a resource advantage over their challengers and, given accurate polling information, can expend precisely enough effort campaigning to secure a narrow victory. Consistent with this explanation, Grimmer et al. (2011) found that resource-advantaged candidates in races for the U.S. House of representatives were about 10 percent more likely to win elections decided by margins of between 0 and 5 percentage points. However, aside from elections to the U.S. House of Representatives, there is little evidence that incumbents (or other candidates with a resource advantage) can target campaigning effort in this fashion. Eggers et al. (2013) analyzed over 40,000 tightly contested mayoral and legislative races in the United States and seven other countries. They found no evidence that incumbents were more likely to win tightly contested elections. Moreover, this type of strategic application of effort should become increasingly difficult to successfully implement as the margin of victory approaches the zero-threshold. Figure 1 provides evidence that incumbent mayors in the Philippines

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were roughly twice as likely as their challengers to win elections decided by margins of between 0 and 0.5 percentage points (margins that correspond to 0-65 votes out of an average of 13,000 cast), and one-and-a-half times more likely to win elections decided by margins of between 0.5 and 1 percentage points (margins that correspond to 65-130 votes). These are substantially higher probabilities, at much narrower margins of victory, than those observed in U.S. House races. It is unlikely that polling data in the Philippines were sufficiently accurate to consistently secure such narrow victories simply through the precise calibration of campaigning effort.

3.2   Did Narrow Incumbent Victories Cause Conflict?

The second step in our analysis is to test whether conflict increased when incumbents won close elections. Specifically, we estimate the following equation, based on a regression discontinuity (RD) design, for a subsample of municipalities within a small bandwidth around the incumbent's victory threshold:

$$Y_i = \beta_0 + \beta_1 D_i + \beta_2 X_i + \beta_3 (D_i \times X_i) + Z_i + \varepsilon_i. \tag{2}$$

Here, Y_i is the number of conflict casualties in municipality i experienced in the 12 months after the 2007 elections, X_i is the incumbent's vote margin, D_i is an indicator for whether the incumbent won the election, and Z_i is a vector of municipality characteristics. The parameter β_1 represents the difference in casualties between municipalities in which the incumbent won a tightly contested election and municipalities in which the incumbent narrowly lost.

The discontinuous jump in the probability of an incumbent victory at the zero threshold documented in the previous section is a clear violation of the standard RD assumption that unobserved variables are continuous across the threshold and would bias the estimate of β_1

upwards if incumbents were more likely to manipulate narrow elections in municipalities especially prone to violence. We conduct two tests in an effort to explore this possibility. First, we estimate equation (2) using the number of casualties that occurred in the 12 months prior to the 2007 election as the outcome. If municipalities above the zero threshold were more violent for reasons unrelated to election fraud, we would expect them to have experienced more casualties before the election took place, not just afterwards. Second, we estimate a panel regression that explicitly controls for unobserved municipality characteristics.

The data on casualties come from records of conflict-related incidents collected by the Armed Forces of the Philippines (AFP); they include information on insurgents, government forces and civilian casualties. These incident-level data have been used to analyze the impact of aid and the impact of economic conditions on conflict intensity (Crost et al., forthcoming), and are similar to SIGACTS - the U.S. incident-level military data, which have been used to study the insurgency activities in Afghanistan and Iraq (Berman et al., 2011; Iyengar et al., 2011; Beath et al., 2011). The data also contain information on the date and the location of the incident and identify the insurgent group involved. During the period under study (November of 2006 through November 2007), 2745 conflict incidents leading to 1045 casualties were reported by security forces throughout the country. Our focus is on the number of casualties that occurred in the 153 municipalities in which the incumbent's vote margin was within a 5 percentage-point bandwidth of the zero threshold. In these municipalities, a total of 521 incidents occurred, leading to 315 casualties.[11] Information on the other municipality characteristics included in the estimation were obtained from the 2000 Philippines Census, available from the National Statistics Office of the Philippines.

Table 4 provides descriptive statistics for the variables used in the analysis by whether

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[11] As Crost et al. (forthcoming) noted, it is possible that the AFP troops misreported the number of casualties related to an incident. This type of misreporting, however, is likely to be limited since the field data were originally collected to be used internally by the AFP for intelligence purposes and for the planning of future operations. Moreover, casualties are typically easy to verify which makes misreporting more difficult, even if individual AFP units had an incentive to do so.

incumbents won by a narrow margin. The table shows that the number of casualties in the pre-election period was similar in municipalities in which incumbents went on to win and municipalities in which the incumbent went on to lose. Municipalities in which incumbents won averaged more casualties in the post-election period, although the difference is not statistically significant for the full sample. Overall, the number of casualties was larger in the pre-election period. Municipalities in which incumbents won were more populous and had better access to infrastructure, although the only statistically significant difference is for piped water (at the 10 percent level).

Figure 2 plots casualties during the 12 months before and after the 2007 election against the incumbent's margin of victory. Scatter dots represent the mean of casualties and are sized to reflect the number of municipalities in each bin.[12] The top panel shows that municipalities experienced substantially more casualties after the incumbent won an election by a margin of between 0 and 2 percentage points than after losing by a similar margin. The bottom panel shows that casualties in the 12 months before the election were essentially unrelated to incumbent victories.

Table 5 reports Poisson estimates of the regression discontinuity (RD) described by equation (2). The coefficient associated with incumbent victories represents the discontinuous increase in casualties across the incumbent's victory threshold. The results in columns (1) and (2) suggest that municipalities experienced between 0.89 and 1.22 additional casualties in the 12 months after a narrow incumbent victory as compared to a narrow loss. These estimates are large compared to the average of 0.50 casualties in the 12 months after the election and are statistically significant at the 5 percent level. The results in columns (3) and (4) provide no evidence of a statistically significant relationship between narrow incumbent victories and pre-election casualties.

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[12]To create the scatter plot, we divided the sample into bins of equal width on either side of the zero threshold.

One potential concern with the results reported in Table 5 is that the estimated effect of incumbent victories decreases substantially when we control for observable municipal characteristics in column (2). This raises the possibility that the results are driven by unobserved differences between municipalities in which incumbents were able to manipulate elections and municipalities where they were not. In an effort to explore this hypothesis, we estimate a panel regression that explicitly controls for systematic differences in unobserved characteristics. Specifically, we estimate the following equation based on observations from the 12 months before and after the 2007 election:

$$Y_{it} = \beta_0 + \beta_1 D_i + \beta_2 X_i + \beta_3 (D_i \times X_i) + \gamma_1 (D_i \times Post_t) + \gamma_2 (X_i \times Post_t) + \gamma_3 (D_i \times X_i \times Post_t) + \varepsilon_{it}.$$

(3)

Here, Y_{it} is the number of conflict casualties that municipality i experienced in month t, X_i is the incumbent's vote margin, and D_i is an indicator for whether the incumbent won the election. $Post_t$ is an indicator for whether the observation was made in the post-election period. The parameter β_3 represents the difference in pre-election casualties between municipalities in which incumbents narrowly won and municipalities in which incumbents narrowly lost. The parameter γ_1 represents the increase in casualties following a narrow incumbent victory, while the parameter β_1 captures differences in pre-election violence due to time-invariant unobserved municipal characteristics.

Table 6 presents estimates of equation (3). Those reported in the first column suggest that narrow incumbent victories were associated with 0.123 additional post-election casualties per month (or 1.48 per year). Including the control variables reduces this estimate to 0.103 casualties per month (or 1.24 per year). Both of these estimates are statistically significant at the 5 percent level. Table 7 shows that the results are robust to limiting the bandwidth to 3 or 4 percentage points around the threshold.

While the panel models in columns (1) and (2) of Table 6 controls for unobserved differences

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between municipalities where incumbents won/lost a narrow election, a remaining concern is that the two groups of municipalities were on non-parallel time trends. To explore this possibility, we control for group-specific linear and quadratic time-trends. The estimates in columns (3) and (4) are similar to those in columns (1) and (2). Specifically, an incumbent victory is associated with between 0.104 and 0.126 additional casualties per month (or between 1.25 and 1.51 additional casualties per year).

3.3 Did Election Fraud Cause Conflict?

Although the results presented thus far are consistent with the hypothesis that fraud leads to an increase in casualties, narrow incumbent victories may have led to post-election violence for reasons unrelated to fraud. For example, the insurgents might have typically preferred the challenger's political platform to the incumbent's and reacted with violence if their candidate lost. We conduct several robustness tests to explore this possibility.

First, we tested whether the relationship between narrow incumbent victories and casualties was driven by the political platform of the incumbent by interacting an indicator for whether the incumbent was affiliated with the governing coalition of President Arroyo with the other variables in the panel regression. The results are presented in column (4) of Table 6.[13] Out of the 153 incumbents who make up our sample, 116 were affiliated with the governing coalition. The results suggest that the insurgent reaction did not depend upon the incumbent's political affiliation. Specifically, none of the interactions between the governing coalition indicator and the variables in the panel regression are statistically significant at conventional levels. In addition, we re-estimated equation (1) redefining X_b to equal the victory/loss margin between the most successful candidate from the governing coalition and the most successful

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[13]As discussed in Section 2, the governing coalition consisted of center-right parties, while the opposition mostly consisted of center-left parties. Only two incumbents in the 2007 mayoral elections were members of a far left party and neither of them was involved in a tightly contested election.

candidate from the opposition party. Figure 3 plots the probability that a municipality falls into a particular bin against the coalition candidate's margin of victory at the bin's midpoint. There is little evidence of a discontinuous change in the probability at the zero threshold, suggesting that mayoral candidates from the governing coalition were as likely to win narrow elections as to lose them. This is confirmed by the results of a McCrary test presented in Table 8. The estimated coefficient associated with the coalition candidate winning is close to zero in magnitude and statistically insignificant. The top panel of Figure 4 plots the number of casualties in the 12 months before and after the mayoral elections against the coalition candidate's margin of victory. There is no indication that a narrow victory for the coalition candidate is associated with an increase in post-election casualties. Moreover, there is no evidence of a relationship between the coalition candidate's margin of victory and the pre-elections levels of violence. To confirm these results, we estimated modified versions of equations (2) to explore whether political party was related to violence. The results of this exercise are reported in Table 9. The coefficients associated with a governing coalition candidate winning are consistently insignificant in the RD regressions using either pre- or post-election violence as the outcome.

As an additional robustness test, we analyzed the relationship between incumbent victories and post-election casualties in poor and rich municipalities (measured by the index of infrastructure quality described in Section 3.1). Figure 1 provided evidence that fraud was concentrated in poor municipalities in which the incumbent's margin of victory was between 0 and 1.5 percentage points. If fraud had a causal effect on violence we would expect post-election violence to be highest in these municipalities. Figure 5 shows that this was in fact the case. There is a discontinuous jump in violence across the incumbent's victory threshold in poor municipalities but not in rich ones. Moreover, post-election violence in poor municipalities was highest for incumbent victories in which the margin was between 0 and 1.5 percentage points. In contrast, incumbent victories by larger margins do not appear to be

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associated with post-election violence. The bottom panels of Figure 5 plot the incumbent's victory margin against pre-election casualties. There is little evidence of a relationship between narrow incumbent victories and pre-election casualties in either the poorer half or the richer half of municipalities.

Table 10 presents the corresponding regression results. The RD estimates in column (1) suggest that an incumbent victory in a poor municipality was, on average, associated with 2.15 additional casualties during the 12 months after the election. In contrast, the RD estimate in column (2) provides little evidence that incumbent victories in poor municipalities were related to pre-election violence. The panel estimate in column (3) suggests that an incumbent victory led, on average, to an additional 0.161 casualties per month (or 1.93 per year) in poor municipalities. In rich municipalities there is no statistically significant relationship between incumbent victories and violence in either the pre- or the post-election period.

These results suggest that electoral fraud had a substantial impact on post-election violence. To gauge the magnitude of this impact, we focus on the 51 mayoral elections that were decided by a margin of between 0 and 1.5 percentage points. Under the assumption that manipulated victories would have been lost by a narrow margin, incumbents and challengers should have won an equal number of these tightly contested elections. In actuality, they won 31 and lost 20, suggesting that about 6 incumbent victories were secured through manipulation. According to this scenario, an incumbent victory secured through manipulation is associated with an additional 6.5 casualties ($\frac{39}{6}$) during the 12 month post-election period.[14] In comparison, the typical Philippine municipality experienced 0.7 casualties during this period.

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[14]If, on the other hand, we assume that manipulated elections would have been lost by a margin larger than 1.5 percentage points, then only 40 elections would have been tightly contested in the absence of fraud, 20 of which would have been won by the incumbent, and 20 of which would have been won by the challenger. This scenario suggests that 11 incumbent victories were secured through manipulation and a stolen election would be associated with an additional 3.5 casualties ($\frac{39}{11}$) in the 12 month post-election period.

4 Conclusion

There is a general consensus among practitioners that fraudulent elections can lead to political and civil unrest in developing countries (World Bank, 2012). It is not clear, however, whether election fraud and political violence are causally linked or whether this association simply reflects cultural or institutional factors. The present study contributes to the literature by examining the effect of election fraud in the 2007 mayoral elections in the Philippines on post-election violence between government forces and insurgents.

Our results suggest that incumbent mayors were more likely to win tightly contested elections compared to their challengers, an indication of election fraud (McCrary, 2008). In addition, we find that municipalities in which incumbent mayors were narrowly elected experienced between 0.6 and 1.6 additional post-election casualties during the 12 month period after the election as compared to municipalities in which the challenger won. However, there is no evidence of an association between narrow incumbent victories and pre-election violence.

These results are consistent with the hypothesis that election fraud is causally linked to civil conflict. In an effort to rule out competing explanations, we conducted several tests. For instance, we showed that narrow incumbent wins were associated with post-election violence only in poor municipalities. In richer municipalities, where there is little evidence of fraud, there was essentially no relationship between post-election violence and narrow incumbent victories. In addition, we showed that the increase in post-election violence was unrelated to the party affiliation of the incumbent, lending further support to the argument that fraud, as opposed to the incumbents political platform, was the causal mechanism.

To our knowledge, this is the first study to establish a causal link between election fraud and post-election violence. Although we are unable to pin down the exact mechanism at work, we report anecdotal evidence that election fraud increases support for insurgents and

makes it easier for them to recruit followers. Our results suggest that election monitoring could help to dampen post-election unrest. In addition, they suggest that future election monitoring should not focus on presidential and congressional races to the exclusion of local races if the goal is to reduce post-election violence.

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Figures and Tables

Figure 1. DID INCUMBENTS MANIPULATE CLOSE ELECTIONS?
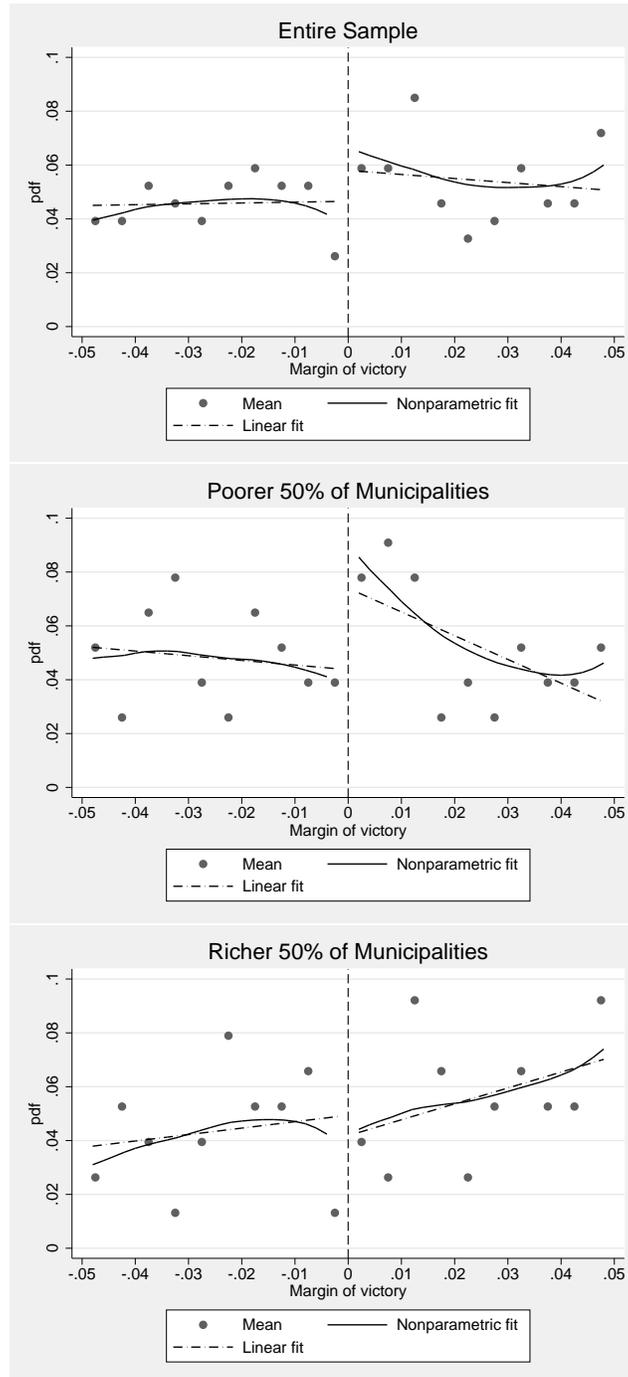
The figure presents the probability density of incumbent mayors' margin of victory in the 2007 election. Municipalities were grouped into 20 bins of equal width according to the incumbent's margin of victory. Each scatter dot represents one bin. Its horizontal coordinate represents the midpoint of the bin, its vertical coordinate represents the fraction of municipalities for which the incumbent's margin of victory was within the bin. Dashed lines are linear fits, separately estimated on both sides of the eligibility threshold. Solid lines are nonparametric fits from a local linear regression that uses triangular kernels with a bandwidth of 5 percentage points, separately estimated on both sides of the eligibility threshold.

Figure 2. DID INCUMBENT VICTORIES CAUSE VIOLENCE?
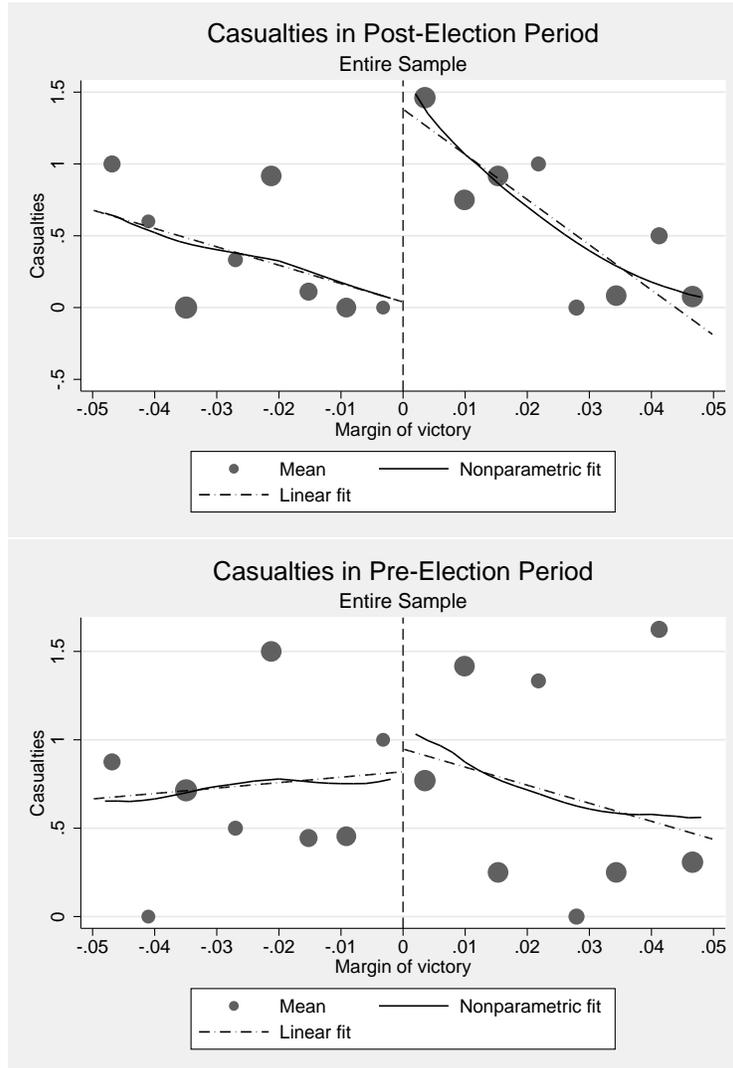
The figure presents the relationship between the incumbent's margin of victory and casualties experienced in the 12 months before and after the 2007 election. Scatter dots represent the mean of casualties per month and are sized to reflect the number of municipalities in each bin. Dashed lines are linear fits, separately estimated on both sides of the eligibility threshold. Solid lines are nonparametric fits from a local linear regression that uses triangular kernels with a bandwidth of 5 percentage points, separately estimated on both sides of the eligibility threshold.

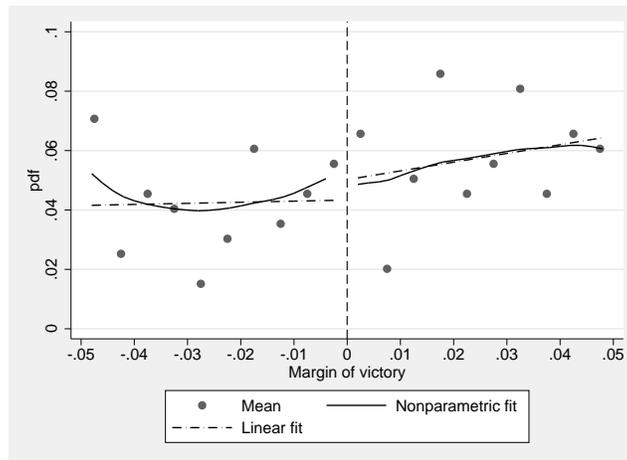Figure 3. DID THE GOVERNING COALITION MANIPULATE ELECTIONS?

The figure presents the probability density of coalition candidates' margin of victory in the 2007 election. Municipalities were grouped into 20 bins of equal width according to the incumbent's margin of victory. Each scatter dot represents one bin. Its horizontal coordinate represents the midpoint of the bin, its vertical coordinate represents the fraction of municipalities for which the incumbent's margin of victory was within the bin. Dashed lines are linear fits, separately estimated on both sides of the eligibility threshold. Solid lines are nonparametric fits from a local linear regression that uses triangular kernels with a bandwidth of 5 percentage points, separately estimated on both sides of the eligibility threshold.

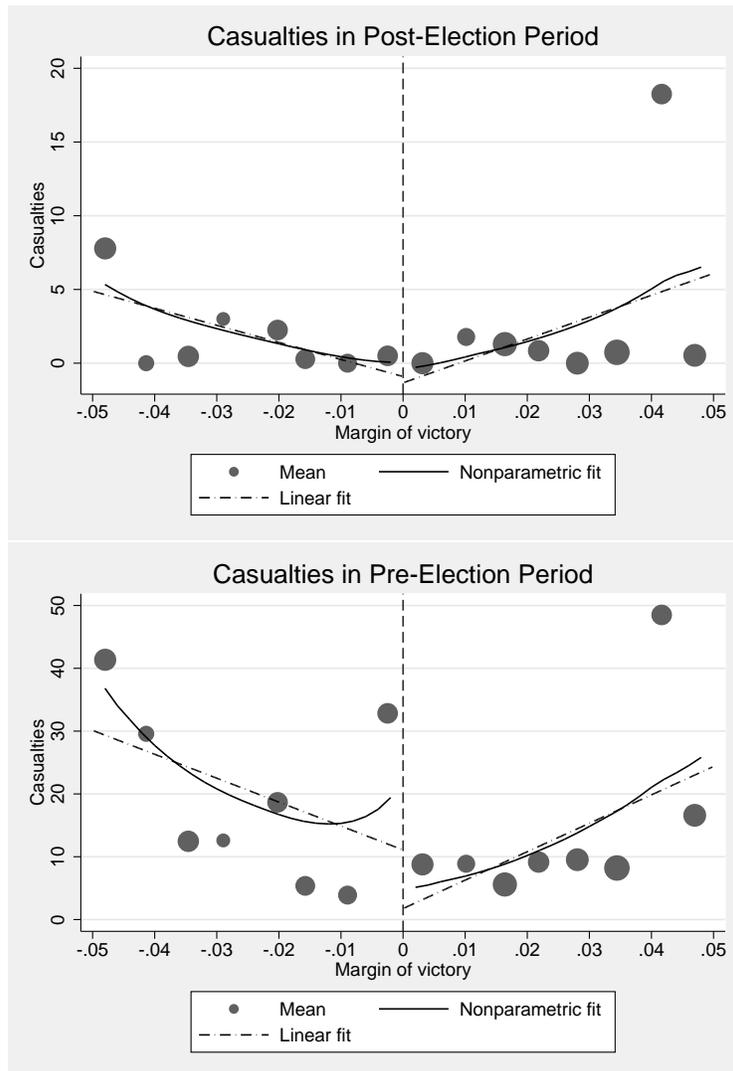Figure 4. Did Victories by Coalition Candidates Cause Violence?

The figure presents the relationship between the incumbent's margin of victory and casualties experienced in the 12 months before and after the 2007 election. Scatter dots represent the mean of casualties per month and are sized to reflect the number of municipalities in each bin. Dashed lines are linear fits, separately estimated on both sides of the eligibility threshold. Solid lines are nonparametric fits from a local linear regression that uses triangular kernels with a bandwidth of 5 percentage points, separately estimated on both sides of the eligibility threshold.

Figure 5. DID INCUMBENT VICTORIES CAUSE VIOLENCE? POOR VS. RICH MUNICIPAL-
ITIES
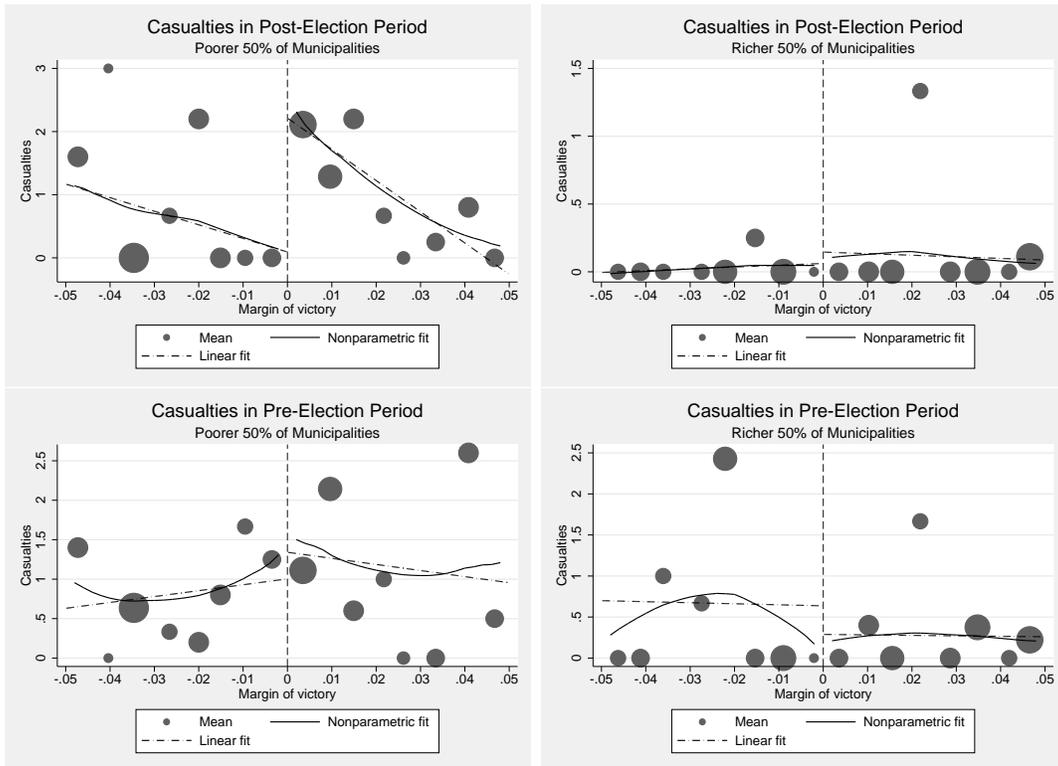
The figure presents the relationship between the incumbent's margin of victory and casualties experienced in the 12 months before and after the 2007 election, separately for poor and rich municipalities. Scatter dots represent the mean of casualties per month and are sized to reflect the number of municipalities in each bin. Dashed lines are linear fits, separately estimated on both sides of the eligibility threshold. Solid lines are nonparametric fits from a local linear regression that uses triangular kernels with a bandwidth of 5 percentage points, separately estimated on both sides of the eligibility threshold.

Table 1. Estimates of Infrastructure Deprivation: Factor Analysis

Coefficients of Infrastructure Variables in Factors

	First Factor	Second Factor
Share of households with electricity	0.39	-0.53
Share of households with piped water	0.11	0.29
Share of households with indoor plumbing	0.28	-0.05
Share of buildings with walls made of "strong" materials	0.20	0.10
Share of buildings with roofs made of "strong" materials	0.16	0.35
Eigenvalue of factor	2.66	0.21
Municipalities	153	153

The table presents coefficients of each variable in the first two factors derived from a factor analysis of the five variables. Data comes from the 2000 Census of the Philippines. Following the classification of the 2000 Census of the Philippines, "strong" building materials for walls are defined as: concrete, brick, stone, wood, galvanized iron or aluminum, and asbestos and glass. "Strong" building materials for roofs are defined as: concrete, galvanized iron or aluminum, and clay tiles and asbestos.

Table 2. McCrary Test for Election Manipulation by Incumbent Mayors

| | OLS Estimates | | |
| | Dependent variable: Fraction of municipalities within bin | | |
	Whole Sample	Poor Municipalities	Rich Municipalities
	(1)	(2)	(3)
Incumbent victory	0.016**	0.031***	-0.0087
	(0.0079)	(0.0090)	(0.012)
Margin	-0.17	-0.26	0.10
	(0.27)	(0.31)	(0.45)
Margin× incumbent victory	-0.24	-0.76	0.40
	(0.39)	(0.45)	(0.61)
Constant	0.028***	0.027***	0.038***
	(0.0056)	(0.0064)	(0.0094)
Municipalities	153	76	77
Observations (bins)	30	30	30

The table reports results of a probability density test for manipulation of the running variable (McCrary, 2008). The running variable is the incumbent margin of victory. All regressions are weighted by a triangular kernel with a bandwidth of 0.05. Observations are 30 bins of equal width. The dependent variable is the fraction of municipalities with an incumbent margin of victory that falls within the bin. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Table 3. McCrary-Test for Election Manipulation by Incumbent Mayors: Robustness to Varying Bandwidths

	OLS Estimates		
	Dependent variable:		
	Fraction of municipalities within bin		
Bandwidths:	0.05	0.04	0.03
Panel A: All Municipalities			
Incumbent Victory	0.016**	0.021*	0.023**
	(0.0079)	(0.011)	(0.0094)
Constant	0.028***	0.025***	0.022***
	(0.0056)	(0.0076)	(0.0066)
# of municipalities	153	123	92
Panel B: Poor Municipalities			
Incumbent Victory	0.031***	0.038**	0.040***
	(0.0090)	(0.014)	(0.011)
Constant	0.027***	0.022**	0.024***
	(0.0064)	(0.0095)	(0.008)
# of municipalities	76	61	46
Panel C: Rich Municipalities			
Estimate	-0.009	-0.006	-0.022
	(0.012)	(0.014)	(0.018)
Constant	0.038***	0.035***	0.042***
	(0.0094)	(0.011)	(0.015)
# of municipalities	77	62	46

The table reports results of a probability density test for manipulation of the running variable (McCrary, 2008). The running variable is the incumbent margin of victory. Each regression is weighted by a triangular kernel with the bandwidth shown at the top of the column. Observations are 30 bins of equal width. The dependent variable is the fraction of municipalities with an incumbent margin of victory that falls within the bin. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively

Table 4. Summary Statistics

	Incumbent victory	Incumbent loss	p-value of difference
	(1)	(2)	(3)
Casualties in 12 months before election	0.70	0.74	0.56
Casualties in 12 months after election	0.61	0.36	0.20
Population (1000s)	40594	32265	0.29
Area (km^2)	210	220	0.81
Share of households with electricity	0.57	0.55	0.57
Share of households with piped water	0.44	0.36	0.09
Share of households with indoor plumbing	0.66	0.61	0.18
Share of buildings with walls made of "strong" materials	0.64	0.59	0.21
Share of buildings with roofs made of "strong" materials	0.69	0.67	0.56
Municipalities	81	72	153

Summary statistics for the sample of municipalities in which incumbents won or lost the 2007 election by a margin of 5 percentage points or less. Following the classification of the 2000 Census of the Philippines, "strong" building materials for walls are defined as: concrete, brick, stone, wood, galvanized iron or aluminum, and asbestos and glass. "Strong" building materials for roofs are defined as: concrete, galvanized iron or aluminum, and clay tiles and asbestos

Table 5. Incumbent Victories and Violence: RD Design

	Poisson Estimates			
	Dependent variable: Casualties in the 12 months after the 2007			
	Post-Election			Pre-Election
	(1)	(2)	(3)	(4)
Incumbent victory	1.22***	0.89***	0.29	0.059
	(0.44)	(0.29)	(0.62)	(0.44)
Margin	-17.3***	-10.1	1.24	4.73
	(6.52)	(6.56)	(16.8)	(11.0)
Margin × incumbent victory	-17.5	-13.2	-22.3	-27.8
	(26.4)	(16.7)	(26.8)	(20.1)
Population (1000s)		0.0014		0.0042*
		(0.0024)		(0.0022)
Area (km^2)		-2.53		4.85*
		(4.01)		(2.56)
Share of households with electricity		-0.18		-1.68***
		(0.77)		(0.61)
Share of households with piped water		0.032		0.83*
		(0.45)		(0.49)
Share of households with indoor plumbing		-1.07		0.75
		(0.69)		(0.61)
Share of buildings with walls made of "strong" materials		-0.13		-1.64*
		(0.45)		(0.89)
Share of buildings with roofs made of "strong" materials		0.36		1.19*
		(0.50)		(0.66)
Observations	153	153	153	153

The running variable of the RD design is the incumbent margin of victory. All regressions are weighted by a triangular kernel with a bandwidth of 0.05. Reported values are marginal effects, calculated at the sample means. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels. Following the classification of the 2000 Census of the Philippines, "strong" building materials for walls are defined as: concrete, brick, stone, wood, galvanized iron or aluminum, and asbestos and glass. "Strong" building materials for roofs are defined as: concrete, galvanized iron or aluminum, and clay tiles and asbestos

Table 6. Incumbent Victories and Violence: Evidence from Panel Data

	Poisson Estimates				
	Dependent variable: Casualties				
	(1)	(2)	(3)	(4)	(5)
Incumbent victory × Post-election	0.123**	0.103**	0.104**	0.126**	0.139**
	(0.055)	(0.047)	(0.052)	(0.055)	(0.065)
Incumbent victory	0.017	0.005	0.004	0.008	-0.052
	(0.037)	(0.028)	(0.027)	(0.025)	(0.043)
Margin × Post-election	-2.07*	-1.81*	-1.81*	-1.76*	-1.58*
	(1.26)	(1.03)	(1.02)	(1.01)	(0.88)
Margin	0.074	0.29	0.29	0.28	0.30
	(1.01)	(0.76)	(0.75)	(0.73)	(0.64)
Margin× incumbent victory × Post-election	-0.68	-0.25	-0.25	-0.25	-0.22
	(3.15)	(2.35)	(2.35)	(2.28)	(2.04)
Margin× incumbent victory	-1.35	-1.47	-1.47	-1.43	-1.26
	(1.57)	(1.27)	(1.26)	(1.22)	(1.08)
Post-election period (12 months)	-0.091**	-0.078**	-0.071**	-0.095***	-0.113***
	(0.043)	(0.037)	(0.028)	(0.032)	(0.040)
Time trend (months)			-4.7×10^{-4}	0.0013	
			(0.0022)	(0.0016)	
Time trend squared (months)				2.6×10^{-4}**	
				(1.2×10^{-4})	
Time trend × Incumbent victory			-9.5×10^{-5}	-0.0018	
			(0.0038)	(0.0036)	
Time trend squared × Incumbent victory				-2.6×10^{-4}	
				(1.9×10^{-4})	
Gov. coalition× inc. victory× Post-election					-0.061
					(0.068)
Governing coalition× incumbent victory					0.057
					(0.039)
Governing coalition × Post-election					0.057
					(0.039)
Governing coalition					0.003
					(0.019)
Control variables	No	Yes	Yes	Yes	Yes
Municipalities	153	153	153	153	153
Observations	3672	3672	3672	3672	3672

All regressions are weighted by a triangular kernel with a bandwidth of 0.05. The unit of observation is the municipality-month. The sample is restricted to observations within 12 months of the 2007 election (the month of the election is dropped). Reported values are marginal effects, calculated at the sample means. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels. Standard errors are clustered at the municipality level. Control variables are the same as in Table 5

Table 7. Estimates from Difference-in-Differences Regressions: Testing the Robustness to Varying Bandwidths

| | Poisson Estimates | | |
	Dependent variable: Casualties		
Bandwidths:	0.05	0.04	0.03
Panel A: All Municipalities			
Incumbent Victory × Post-election	0.123**	0.138**	0.234***
	(0.055)	(0.061)	(0.079)
Incumbent Victory	0.017	0.030	0.024
	(0.037)	(0.042)	(0.048)
# of municipalities	153	123	92
# of observations	3672	2952	2208

All models flexibly control for incumbent margin of victory on both sides of the threshold and are identical to the specification in column 2 of Table 6. Each regression is weighted by a triangular kernel with the bandwidth shown at the top of the column. The unit of observation is the municipality-month. The sample is restricted to observations within 12 months of the 2007 election (the month of the election is dropped). Reported values are marginal effects, calculated at the sample means. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels. Standard errors are clustered at the municipality level.

Table 8. McCrary Test for Election Manipulation by Candidates Affiliated with the Governing Coalition

	OLS Estimates Dependent variable: Fraction of municipalities within bin
	(1)
Coalition victory	-0.002
	(0.009)
Margin	0.33
	(0.30)
Margin× Coalition victory	-0.045
	(0.43)
Constant	0.034***
	(0.006)
Municipalities	198
Observations (bins)	30

The table reports results of a probability density test for manipulation of the running variable (McCrary, 2008). The running variable of the RD design is the coalition candidate's margin of victory. All regressions are weighted by a triangular kernel with a bandwidth of 0.05. Observations are 30 bins of equal width. The dependent variable is the fraction of municipalities with an incumbent margin of victory that falls within the bin. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Table 9. Coalition Victories and Violence: RD Design

	Poisson Estimates			
	Dependent variable: Casualties in the 12 months after the 2007 election			
	Post-Election			Pre-Election
	(1)	(2)	(3)	(4)
Coalition victory	0.085	0.040	0.083	-0.072
	(0.451)	(0.34)	(0.51)	(0.46)
Margin	-14.9**	-12.3*	-14.3	-8.2
	(6.91)	(6.45)	(12.5)	(12.4)
Margin × coalition victory	30.6**	27.2**	31.8*	23.8
	(13.3)	(8.71)	(18.7)	(20.2)
Controls	No	Yes	No	Yes
Municipalities	198	196	198	196

The running variable of the RD design is the coalition candidate's margin of victory. All regressions are weighted by a triangular kernel with a bandwidth of 0.05. Reported values are marginal effects, calculated at the sample means. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels. All regressions control for the control variables listed in Table 4

Table 10. Incumbent Victories and Civil Conflict: Rich vs. Poor Municipalities.

	Poisson Estimates		
	RD estimates		Panel estimates
	Post-Election	Pre-Election	Full Time Period
Dependent variable:	Casualties/year		(Casualties/month)
	(1)	(2)	(3)
Panel A: All Municipalities (153 municipalities)			
Effect of Incumbent Victory	0.89**	0.059	0.103**
	(0.29)	(0.44)	(0.047)
Panel B: Rich Municipalities (77 municipalities)			
Effect of Incumbent Victory	-0.38	0.36	0.007
	(1.54)	(0.56)	(0.010)
Panel C: Poor Municipalities (76 municipalities)			
Effect of Incumbent Victory	2.15***	0.27	0.161**
	(0.77)	(0.49)	(0.080)

All models flexibly control for incumbent margin of victory on both sides of the threshold. Specifications in columns (1) and (2) are identical to those reported in columns (2) and (4) of Table 5. The specification in column (3) is identical to that in columnn (1) of Table 6. All regressions are weighted by a triangular kernel with a bandwidth of 0.05. Reported values are marginal effects, calculated at the sample means. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels. Standard errors are clustered at the municipality level. All specifications include the same control variables as the models in Tables 5 and 6.