# Online Appendix to:

# Bases, Bullets and Ballots: The Effect of U.S. Military Aid on Political Conflict in Colombia

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# A Supporting Information Appendix

In this appendix, we first present a model of three-way conflict between paramilitaries, guerrillas, and the government. Then, we present supplemental empirical analyses, including: checking the sensitivity of the results to leave-one-out estimation; examining simple time-series relationships; disaggregating military and narcotics aid; additional functional forms of the dependent variable; Negative Binomial estimation; controlling for spatial heterogeneity; instrumenting base location; and accounting for new bases. Among the figures, we also include a map of the municipalities with bases that are in our sample.

## A.1 Theoretical Model

In this section we present a simple model that allows us to parametrize the channels through which military aid can increase paramilitary attacks delineated in the mechanisms section of the main text. We begin with the simplest parametric functional forms possible (linear benefits and quadratic costs).[1] Let $A_p$ designate the paramilitary's choice of attacks; $A_g$ designate the Colombian military's attacks; and $A_f$ designate attacks by the guerrillas — mainly FARC but also ELN. Additionally let $Y_g = Y_{Col} + Y_{US}$ be the government's military budget, where $Y_{Col}$ is the Colombian government's military expenditure and $Y_{US}$ is the United States' military aid. Following the resource sharing channel described above, the paramilitary are able to secure a share $\alpha$ of the budget, which represents diversion of resources. We normalize the cost of government attacks to 1, and for simplicity suppose that the government spends all of its budget on attacks, so that $A_g = (1 - \alpha)Y_g$. While this is a restrictive assumption in that it abstracts from strategic choices of the government, it allows us to focus on what we think is important for our local empirical context, the strategic interaction between the paramilitary and the guerrilla and the response to aid. Paramilitary attacks undertaken on own account cost $c(A_p) = A_p + \frac{1}{2}A_p^2$, but diverted government resources can be used to fund attacks at a cost $C > 0$. Thus leaked government aid subsidizes attacks at a rate $\frac{1}{C}$. We suppose the paramilitaries secure territory and counter guerrilla political objectives according to the following

[1] We presented a version with generic functional forms in an earlier draft of this paper.

objective function:

$$\pi^p(A_p|A_f, A_g, Y_g) = -\eta^0 A_f + \beta^0 A_p A_f + \gamma^0 A_p A_g - A_p - \frac{1}{2}A_p^2 + \frac{\alpha Y_g}{C} A_p \tag{1}$$

Similarly, the guerrilla cost of attacks is given by the convex function $c(A_f) = A_f + .5A_f^2$, and so their objective function (for achieving either territorial, economic, or political goals) is given by:

$$\pi^f(A_f|A_p, A_g, Y_g) = -\eta^1 A_p + \beta^1 A_p A_f + \gamma^1 A_f A_g - A_f - \frac{1}{2}A_f^2 \tag{2}$$

In both of these equation we suppose $\eta^0, \eta^1 > 0$; this means that the objectives of each side are reduced by the other sides' attacks. However this does not affect the strategic decisions of each actor and so is irrelevant to the equilibrium level of conflict. The core issue is what restrictions we make on the $\beta^i$ and $\gamma^i$. These response parameters reflect the underlying strategic environment between the three actors described above.

First, a natural requirement is that the equilibrium be locally stable, so $\beta^0\beta^1 < 1$, as this implies that small perturbations of strategies away from the equilibrium eventually return to equilibrium.[2] Note that $\beta^0$ and $\beta^1$ parameterize the effect that guerrillas have on the choice of attacks by paramilitaries, and the effect that paramilitaries have on the choice of attacks by guerrillas, respectively. The discussion of the guerrilla repression mechanism in the main text suggests that $\beta^0$ could be either greater than or less than 0, in that effective repression of the guerrilla could either contain or exacerbate paramilitary violence.

Second, $\gamma^0$ and $\gamma^1$ separately parameterize the effect that government attacks have on paramilitary and guerrilla attacks, respectively, and these can be either positive or negative. The most plausible *a priori* parameters are those where the government facilitates, or does not affect, the paramilitary as they are allies, so $\gamma^0 \geq 0$. However, the government also actively represses the guerrilla, so $\gamma^1 \leq 0$, although this is not a critical assumption for the model and we examine the implications of weakening it below.

We also think that smaller scale homicides imply less tactical complementarity between paramilitaries and governments than larger attacks and operations. In particular political assassinations

[2]This amounts to an assumption that violence by one side does not lead to a cycle of increasing violence.

during election years are not likely to be complementary with government attacks. Thus when $A_p$ is this type of violence, it corresponds to the scenario in the model where $\gamma^0$ is small.

## Solving the model

We can solve for the Nash equilibrium of this game quite simply. First we plug in the government's strategy of $A_g = (1-\alpha)Y_g$, differentiate the objective functions and solve the resulting linear system to get the solution for equilibrium paramilitary attacks as $A_p = \frac{\frac{\alpha Y_g}{C} - (1+\beta^0) + (1-\alpha)(\gamma^0 + \beta^0\gamma^1)Y_g)}{(1-\beta^0\beta^1)}$. Thus the overall effect of military aid on paramilitary violence is given by:

$$\frac{dA^p}{dY_g} = \frac{(\gamma^0 + \beta^0\gamma^1)(1-\alpha) + \frac{\alpha}{C}}{1-\beta^0\beta^1} \tag{3}$$

**Proposition:** If $\beta^0\beta^1 < 1$, then there exists $\alpha^* \in [0,1)$ such that $\alpha \geq \alpha^*$ implies $\frac{dA_p^*}{dY_g} > 0$.

Clearly as $\alpha \to 1$ the derivative $\frac{dA_p}{dY_g}$ will be positive, so there will always be a level of aid diversion that is high enough to guarantee that additional aid will produce a net increase in paramilitary attacks. This holds even if strategic interactions among the various attacks imply a reduction in paramilitary attacks. In other words, there is an $\alpha^* > 0$ such that aid increases paramilitary violence, even if the government represses both the guerrilla and the paramilitary ($\gamma^0 < 0$), or successful government repression of the guerrilla independently *reduces* the incentives for paramilitary violence (e.g. $\beta^0 > 0$ so that $\beta^0\gamma^1 < 0$).[3]

If strategic interactions instead *increase* in paramilitary attacks, either because of direct tactical and strategic complementarities between the government and the paramilitary ($\gamma_0 > 0$ is large), or indirectly via successful government repression of the guerrilla emboldening paramilitary violence ($\beta^0\gamma^1 > 0$ is large), then no leakage is required for there to be a positive association between paramilitary attacks and military aid ($\alpha^* = 0$).[4]

We can see how the different channels by which military aid increases paramilitary attacks in

[3] Note that $\beta^0\gamma^1$ captures the combined effect of the government reducing guerrilla attacks, and paramilitary attacks falling in response to reduced guerrilla attacks.

[4] If $\gamma^1$ is allowed to be greater than 0, then an increase in aid *increases* the level of guerrilla violence, and if $\beta^0 > 0$ then this increases violence by the paramilitary. We think this channel unlikely, given the type of attacks conducted by the government against the guerrilla are aimed at reducing guerrilla attacks (e.g. seizing weapons).

the model will imply different empirical patterns of violence across the different actors, given that we observe a positive effect of aid on paramilitary violence. Suppose that there is no aid diversion ($\alpha = 0$). Then all of the effect on paramilitary attacks would be occurring via government attacks, either directly through tactical complementarities between the government and the paramilitary or indirectly through successful repression of the guerrilla by the government resulting in a more aggressive paramilitary. In this case $\frac{dA_p}{dY_g} = \frac{dA_p}{dA_g} = \frac{\gamma^0+\beta^0\gamma^1}{1-\beta^0\beta^1}$. In a regression equation this would imply that controlling for $A_g$ should eliminate any correlation between $Y_g$ and $A_p$. This corresponds to our third empirical prediction in the main text.

Now suppose (keeping $\alpha = 0$) there are no strategic complementarities between the government and the paramilitaries ($\gamma^0 = 0$), and the channel is successful government repression of the guerrillas, i.e. $\beta^0\gamma^1 > 0$. This would imply that $\frac{dA_f}{dY_g} = \frac{\gamma^1}{1-\beta^0\beta^1} < 0$, so military aid would have a significant negative effect on *guerrilla* attacks.[5] This corresponds to our second empirical prediction.

The resource sharing channel is parameterized by $\frac{\alpha}{C}$, which gives the fraction of government resources diverted to the paramilitary divided by the rate at which government resources subsidize paramilitary attacks. If $\frac{\alpha}{C}$ is large then this channel is relatively weak, while if $\frac{\alpha}{C}$ is small then this channel is relatively strong. If there are no strategic complementarities between government and the paramilitaries and the government has no effect on the guerillas, then the only channel by which aid can increase paramilitary attacks is by resource sharing in our model.

# B Supplemental Empirical Analysis

## B.1 Leave-one-out Estimation

Our analysis uses a relatively small number of treatments regions (as 32 out of 936 municipalities have military bases). This raises concerns that the results may potentially be biased by an outlying treatment observation. To test the sensitivity of our estimates to individual municipalities, we re-estimate equation (1) 32 times, leaving out one of our base municipalities each time. This gives us 32 coefficients, the mean of which is .155. (The minimum is .114 and the maximum is.168). Figure A.II gives the histogram of the T-scores of each of these regressions, which shows that the lowest

[5] Again, this could be positive in the less realistic case of positive effects of government attacks on the guerilla.

T-score is 2.1, and that the coefficient is significant at the 95% level, regardless of which individual base municipality is excluded.[6]

## B.2 Time Series Relationships

In Panel A of Table A.I, we examine the time series relationships between aid and violence. In column (5), a simple annual-level regression of U.S. military and narcotics aid to Colombia and aggregate paramilitary attacks shows a positive relationship between these two variables. To check the sensitivity of this effect to unobserved heterogeneity, we explore the impact of including time trends. Columns (6)-(7) indicate that the relationship continues to remain positive but becomes insignificant with the inclusion of linear trends and its square. However, the coefficients remain relatively stable across these models of paramilitary attacks.

In contrast to the paramilitary effect, the relationship between aid and annual guerrilla attacks is shown to be insignificant and negative in the basic time series specification in column (8). The coefficients for this outcome variable also display greater instability with the inclusion of trends and it squares in columns (9)-(10), with the sign changing and standard errors rising dramatically in column (10).

For paramilitary attacks, the positive coefficient on the time series coefficient in Table A.I and the difference-in-differences estimates presented throughout the main text suggest that paramilitary attacks increase with aid and differentially so in municipalities with bases. The results for guerrilla attacks instead suggest insignificant effects of aid on guerrilla violence, with no evidence of differential increases in base municipalities.

However, the time series evidence should be taken as suggestive since it is based on 18 years of data, and is not able to account for other factors varying over time that may be correlated with aid and violence dynamics. The coefficient instability with the guerilla attacks outcome in Table A.I contrasts with the difference-in-differences results in the main paper, which are quite stable across specifications. This suggests that there are in fact other time-varying factors affecting aggregate conflict levels over this period.

[6] Our results are also robust to using the Conley-Taber estimator, which adjusts the standard errors for a small number of treatment groups in difference-in-differences type estimation, such as the one employed in our analysis. However, we do not report these results as the Conley-Taber estimator does not adjust for arbitrary heteroskedastcity.

Panel B of Table A.I also presents simple difference regressions of violence on aid separately for base and non-base regions, controlling only for municipality fixed effects and log population. The coefficients for paramilitary attacks (columns 3-4) show that there is a significant relationship in both base and non-base regions, but the effect is much larger in base regions. The coefficients for guerrilla attacks (columns 8-9) show a positive effect in non-base regions and a small effect close to zero in base regions, with a large standard error. As with the time-series estimates, this pattern again suggests some larger national trend in conflict, particularly around guerilla attacks, and indicates that the base municipalities are not a driver of this trend. By looking at the impact of aid un-interacted with bases in these simple differences, we are not able to account for such trends as we cannot simultaneously include arbitrarily flexible time trends in these specifications.

The difference-in-differences estimates also have the clear advantage that they pool together the base and non-base samples, and sweep out trends in violence, such as the one in guerrilla attacks, by using non-base municipalities as control areas. Thus the time series and simple difference estimates shown in Table A.I should be seen as suggestive, while the difference-in-differences estimates serve as our preferred estimates.

## B.3 Aid Type and Functional Form

In Columns (1)-(6) of Table A.III, we separately examine the effect of military and narcotics aid. The results show that the narcotics aid interaction exerts larger and statistically significant impacts on paramilitary violence, while the military aid interaction does not. This likely reflects the fact that U.S. narcotics assistance to Colombia was nearly six times as large as U.S. military aid, and thus dominates the aggregated aid category. In columns (7)-(9) we examine dynamic effects, by including the interacting of base presence with the one-period lag of Military and Narcotics Assistance. The coefficient on the lag interaction is significant in column (7), indicating that there are some dynamic impacts of last period's aid influencing paramilitary violence in the current period. However, the coefficient is much smaller in magnitude than the coefficient on the contemporaneous aid interaction, which leads us to focus on estimating the effects on current period aid.

Given the prevalence of zeroes in our dependent variables, we also verify that our estimates hold when we utilize different functional forms of the dependent variable with least squares estimation.

Columns (10)-(12) of Table A.III show that the aid interaction continues to exert significant impacts when we use discrete versions of our dependent variables, which equal one when there is an attack, and zero otherwise.[7]

## B.4 Negative Binomial Estimation

To further test for the robustness of our estimates, we present results from Negative Binomial (NB) estimation in Table A.IV. We opt for the Negative Binomial (NB) model as opposed to the Poisson model since our data are overdispersed. For example, as a first diagnostic step, when we estimate a simple NB model of paramilitary attacks on our aid interaction without municipality fixed effects, the over-dispersion parameter is 4.46, and significantly different from zero. While NB allows for over-dispersion, it is imperfect in accounting for fixed effects. Maximizing the conditional likelihood as proposed by Hausman et al. (1984) and as implemented in common software packages has been shown not to be a true fixed effect model, as it doesn't control for stable covariates (Allison and Waterman 2002; Greene 2005). On the other hand, estimating the fixed effects via inclusion of dummy variables is computationally infeasible as our data have over 900 municipalities and we cannot attain convergence with this approach. Additionally, since the within-transformation is also invalid for accounting for fixed effects in a non-linear model, we instead implement a hybrid model suggested by Allison (2005). This model de-means the independent variables to difference out time invariant municipal characteristics correlated with the independent variables, and includes a random effect and unit means to capture unobserved heterogeneity in the dispersion of the outcome variable. However, this estimator does not account for the excess zeros, and other estimators that do (such as the Zero-Inflated Negative Binomial) are both sensitive to the specification of the distribution of the outcome variable and also have the incidental parameters problem (Cameron and Trivedi 2009, Allison 2005). Columns (1)-(3) present these estimates.

In columns (4)-(6), we extend our IV strategy to this estimator by including residuals from the first stage linear regression in this second stage model, which is a "control function" approach (Cameron and Trivdei 2009). We bootstrap the standard errors with 100 replications in this two-step NB-IV

[7] Our results also hold when we take a log transformation of the dependent variables, by taking logs after adding a one to the number of attacks. These results are available from the authors upon request.

procedure.

We obtain the same pattern of results with NB estimation as with least-squares estimation. Note that the impact of the un-instrumented aid interaction is marginally insignificant for paramilitary attacks with a p-value of .102 in column (1), and the instrumented version exerts highly significant effects on paramilitary attacks in column (4). Moreover, both versions have significant effects on government attacks without showing any corresponding impact on guerrilla attacks.

## B.5 Accounting for Spatial Heterogeneity

Our empirical strategy compares changes in violence in municipalities with and without bases, as U.S. funding changes. It therefore presumes that the municipalities without bases serve as good controls for municipalities with bases. However, if regions with and without military bases differ from one another in terms of characteristics that determine conflict responsiveness, this spatial heterogeneity may confound our estimates.

In Table A.V, we attempt to improve the set of control municipalities by partitioning the sample in different ways. We present these results for just paramilitary and government attacks, since the aid interaction remains insignificant in all specifications where guerilla attacks is the dependent variable. In columns (1)-(2), we restrict the sample to municipalities which had a paramilitary presence in the beginning of the sample period, defined as whether the municipality experienced any type of paramilitary activity in each of the first three years between 1988 and 1990. Activity is not just limited to paramilitary attacks, but additionally includes events such as population displacement, kidnaps, blocked transport routes, and pirating or theft undertaken by paramilitary groups. We choose the three year window because activity in any one year may reflect a transitory or idiosyncratic incursion, but sustained activity over a three year period is a better indicator of persistent or more endemic paramilitary presence.

This restriction creates a subset of 224 municipalities (out of 936 in the baseline sample), and includes 22 of the 32 treatment regions with military bases. The coefficients on the aid interaction remain positive and significant for both paramilitary and government attacks, and insignificant for guerrilla attacks, even when we restrict attention to this more comparable subset. In columns (3)-(4), we look at the regions without paramilitary presence in early years. The insignificant coefficient on paramilitary attacks may reflect the fact that regions without a paramilitary presence in the beginning of the sample period continue to have low paramilitary presence throughout the sample period.[8] Alternatively, it may also reflect low power in treatment (as only 10 base municipalities are included in the sub-sample without a paramilitary presence).

Next, we partition the sample based on municipalities that do and do not border the municipalities with bases. If military bases have been constructed in strategic regions that are particularly responsive to violence, this raises the concern that overall increases in conflict correlated with U.S. military spending may have resulted in greater violence in these flashpoints for reasons unrelated to the aid *per se*. From this angle, bordering municipalities may make for better controls in the sense that they are more likely to share the strategic municipal characteristics. As shown in columns (5)-(6), when restricted to the 210 neighboring municipalities, the coefficients on the aid interaction remain unchanged for both the paramilitary and government attack outcome variables. (For example, the estimated coefficient was .15 for the paramilitary attacks outcome in the baseline specification in Table I).

On the other hand, restricting attention to border regions also makes it more likely that increases in paramilitary activity in the base municipality arises from substitution away from non-base municipalities, since its less costly to relocate armed activity away from nearby regions. To explore this idea, in columns (7)-(8), we remove the neighboring regions from the control set. Again, the coefficients on the aid interaction effectively remain unchanged: for the paramilitary attacks outcome, the coefficient is .148. This suggests that the effect is not driven by substitution or a substantial lowering of paramilitary violence in the control regions. In addition, suggestive time series evidence in column (4) of Table A.I indicates that at the annual level, as U.S. military aid increases, paramilitary attacks also increase. This suggests that even if the positive coefficient on the treatment interaction arises in part from substitution, the entire effect is not based on a simple re-allocation of paramilitary attacks from control to treatment regions.

Finally, we partition the sample into regions with and without coca production in columns (9)-(12) of A.V. Given its stated anti-narcotics objective, U.S. military spending may have a differential effect on conflict in coca regions relative to non-coca regions. If military bases are located in regions

[8] For example, mean paramilitary attacks is substantially lower in later years for the 712 municipalities without paramilitary presence in the beginning of the sample period.

cultivating coca, then it would be difficult to distinguish the effect of aid on violence that arises from the presence of a base, relative to the presence of drug crops. Indeed, 11 of the 32 bases are located in municipalities that have been recorded as producing coca. However, when we partition the sample, we find that the coefficient on the aid interaction remains highly significant for paramilitary and government attacks in the set of 684 municipalities that were recorded as never having produced coca over the sample period. This shows that the effect of U.S. military aid on paramilitary violence does not arise solely though a coca-related channel. In contrast, the aid interaction becomes marginally insignificant for paramilitary attacks in the set of 252 municipalities that were recorded as having produced coca during at least one year of the sample. In addition, the coefficient for the aid interaction on government attacks becomes insignificant and falls sharply in magnitude in the coca sample relative to the non-coca sample. Since aid continues to exert an effect on paramilitary attacks but not government attacks in the coca region, one interpretation is that the military outsources more of its counter-insurgency efforts to paramilitaries in the drug crop regions, where the rule of law may be weaker, or where state capacity may be lower.

### B.6 Instrumenting Base Location

In Table A.VI, we additionally address potential concerns that bases are located in municipalities that have high violence responsiveness by instrumenting the bases variable with the average slope of a municipality. Bases cannot be built in areas that are excessively steep, and thus tend be to located on relatively flat ground. For example, in our sample, the average slope of the municipalities without bases is nearly twice as large as the slope of municipalities with bases. The specifications in columns (1)-(2) utilize the slope-based instrument for the bases variable. Columns (3)-(4) account for both endogeneity in base location and the timing of aid (by instrumenting the interaction of U.S. military aid and the bases indicator with U.S. military aid to non-Latin American nations and the average municipal slope). The results are robust to both IV strategies, further indicating that the estimated effects are not driven by endogeneity in base location.

## B.7 Accounting for New Bases

In this sub-section, we account for the emergence of new bases, and the expansion of pre-existing base facilities over the duration of our sample. These locations are not included in the definition of base municipalities in the main text since their emergence as headquarter locations for brigades, or as areas targeted for further military investment, may be endogenous to rising violence levels. On the other hand, if paramilitary groups tend to operate where bases are located, and new bases are established in high violence municipalities during years when military aid happens to be high, then not controlling for these locations may bias the estimated effects. We explore this possibility below by examining the impact of including new bases in the analysis.

Between 1988 and 2005, two municipalities began to operate as active bases of operation when brigades of the Colombian military came to be stationed there: the 17th brigade was stationed in Carepa, Antioquia after 1993[9]; and the 2nd mobile brigade was stationed in San José Del Guaviare, Guaviare after 1996.[10] To account for these two new bases, we create a time-varying New Base indicator that equals one for these two municipalities in the relevant post periods, and control for this variable in Table A.VII. In addition, two bases in the sample were expanded as a result of U.S. military funding under Plan Colombia. After 2001, Apiay airforce base in Villavencio, Meta began hosting American military personnel as a part of this expansion, while Larandia base in Florencia, Caquetá started serving as the base of operations for a new U.S. trained ant-narcotics battalion (Ferrer, 2001).[11]

To account for the effect of this expansion, we interact an Expanded Base indicator for these two municipal locations with a post-2001 dummy, and include this interaction as an additional control in Table A.VII. Since this base expansion was funded by U.S. military assistance, including this variable may serve as an over-control in identifying how military aid affects paramilitary violence differentially in base municipalities. In addition, bases may be built in anticipation of both U.S. aid and future conflict. Nonetheless, Table A.VII shows that our results are robust to the inclusion of both the New Base and Expanded Base controls. It is also worth noting that the New Base variable

[9] See http://www.globalsecurity.org/

[10] See National Security Archives declassified document: http://www2.gwu.edu/~nsarchiv/NSAEBB/NSAEBB69/col44.pdf

[11] New radar facilities were also constructed at Tres Esquinas base in Solano, Caquetá (Kotler, 2001). However, this municipality doesn't appear in our sample owing to missing homicide data.

itself doesn't exert significant impacts on paramilitary violence. This indicates that the emergence of a base per se is insufficient to bring about increased paramilitary attacks. Rather, the ultimate influence of U.S. military aid on paramilitary violence operates through the "intensive margin" of channelling resources through existing bases rather than the "extensive margin" of constructing new bases.

# References


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**Table A.I**
**Time Series and Simple Difference Estimates**

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | *Panel A: Time-Series Estimates* | | | | | |
| | Log U.S. Mil and Narc Aid to Colombia | | | | Paramilitary attacks | | | Guerrilla attacks | | |
| U.S. All Non Latin American Military Aid | 3.570** | | 2.052* | 2.455 | - | - | - | - | - | - |
| | [1.336] | | [1.106] | [1.727] | - | - | - | - | - | - |
| U.S. Mil and Narc Aid to Colombia | - | | - | - | 0.982* | 0.938 | 1.126 | -1.213 | -0.264 | 0.814 |
| | - | | - | - | [0.479] | [0.726] | [0.760] | [1.647] | [2.476] | [2.451] |
| Year | - | | 0.135*** | 14.913 | - | 0.013 | 89.431 | - | -0.288 | 512.779 |
| | - | | [0.038] | [47.560] | - | [0.161] | [99.436] | - | [0.550] | [320.647] |
| Year squared | - | | - | -0.004 | - | - | -0.022 | - | - | -0.129 |
| | - | | - | [0.012] | - | - | [0.025] | - | - | [0.080] |
| Observations | 18 | | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 |
| | | | | | *Panel B: Simple Difference Estimates* | | | | | |
| | | | Paramilitary attacks | | | | | Guerrilla attacks | | |
| U.S. Mil and Narc Aid to Colombia | | | 0.040*** | 0.120*** | | | | 0.075*** | 0.008 | |
| | | | [0.004] | [0.045] | | | | [0.012] | [0.102] | |
| Sample | | | Non-base | Base | | | | Non-base | Base | |
| Observations | | | 16,035 | 571 | | | | 16,035 | 571 | |
| Number of municipalities | | | 904 | 32 | | | | 904 | 32 | |

*Notes.* In Panel A, columns 1, 3 and 4 show the time series relationship between U.S. military and narcotics aid to Colombia and U.S. military aid to non-Latin countries, which is the time variation in the first stage of the IV estimates. Columns 5-7 estimate the simple time series relationship between U.S. military and narcotics aid to Colombia and paramilitary attacks at an annual level, and columns 8-10 present analogous estimates for guerrilla attacks. Panel B shows panel level estimates of the relationship between U.S. military and narcotics aid to Colombia and paramilitary and guerrilla attacks separately in non-base and base municipalities. These specifications include log population and municipality fixed effects and show robust standard errors clustered at the municipality level in parentheses. *** is significant at the 1% level, ** is significant at the 5% level, * is significant at the 10% level.

**Table A.II**
**Summary Statistics**

| | Non-Base Municipalities | | | Base Municipalities | | |
|---|---|---|---|---|---|---|
| **Panel Level** | Obs. | Mean | Std. Dev | Obs. | Mean | Std. Dev |
| Paramilitary attacks | 16272 | 0.093 | 0.464 | 576 | 0.380 | 1.187 |
| Government attacks | 16272 | 0.106 | 0.524 | 576 | 0.368 | 1.083 |
| Guerrilla attacks | 16272 | 0.536 | 1.533 | 576 | 2.163 | 4.292 |
| Paramilitary homicides | 16272 | 0.989 | 4.474 | 576 | 11.632 | 23.639 |
| Guerrilla homicides | 16272 | 0.181 | 0.680 | 576 | 0.477 | 1.086 |
| Paramilitary assassinations | 16272 | 0.151 | 0.777 | 576 | 1.401 | 3.908 |
| Guerrilla assassinations | 16272 | 0.026 | 0.199 | 576 | 0.056 | 0.264 |
| Coca, 1000's hectares cultivated | 7212 | 0.116 | 0.758 | 255 | 0.116 | 0.534 |
| Population (in millions) | 16035 | 0.024 | 0.041 | 571 | 0.487 | 1.083 |
| Captives | 16272 | 1.442 | 5.070 | 576 | 28.514 | 57.560 |
| Weapons Seized | 16272 | 0.357 | 1.656 | 576 | 2.064 | 4.718 |
| Freed Kidnaps | 16272 | 0.455 | 1.248 | 576 | 3.431 | 5.807 |
| Anti-narcotics Operations | 16272 | 0.143 | 0.747 | 576 | 1.830 | 4.015 |
| **Municipal Level** | | | | | | |
| Sum casualties 1975-1987, per population 1988 | 890 | 0.383 | 0.993 | 32 | 0.233 | 0.666 |
| Sum guerrilla attacks 1975-1987, per population 1988 | 890 | 0.082 | 0.216 | 32 | 0.036 | 0.102 |
| Standard Deviation of height (ruggedness) | 903 | 364.948 | 260.479 | 32 | 319.362 | 339.043 |
| Mean height | 903 | 1320.408 | 952.889 | 32 | 925.442 | 930.323 |
| Ever produced coca indicator | 904 | 0.267 | 0.442 | 32 | 0.344 | 0.483 |
| Coca in 2000, 1000's hectares cultivated | 904 | 0.169 | 1.105 | 32 | 0.199 | 0.948 |
| Oil production or pipeline indicator | 904 | 0.247 | 0.431 | 32 | 0.375 | 0.492 |
| Above median Golosov competition index 2000-2003 (indicator) | 904 | 0.303 | 0.460 | 32 | 0.719 | 0.457 |

| **Annual Level** | Obs. | Mean | Std. Dev |
|---|---|---|---|
| U.S. military and narcotics aid to Colombia (billions 2000 USD) | 18 | 0.213 | 0.249 |
| U.S. military aid to Colombia (billions 2000 USD) | 18 | 0.039 | 0.037 |
| U.S. narcotics aid to Colombia (billions 2000 USD) | 18 | 0.174 | 0.247 |
| U.S. military aid to non-Latin American nations (billions 2000 USD) | 18 | 5.235 | 0.981 |
| U.S. narcotics aid to non-Latin American nations (billions 2000 USD) | 18 | 0.173 | 0.195 |
| Colombian government military expenditures (billions 2000 USD) | 18 | 6.745 | 4.786 |

**Table A.III**
**Aid Type, Dynamic Effects and Functional Form**

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Paramilitary attacks | Government attacks | Guerrilla attacks | Paramilitary attacks | Government attacks | Guerrilla attacks | Paramilitary attacks | Government attacks | Guerrilla attacks | Paramilitary attacks indicator | Government attacks indicator | Guerrilla attacks indicator |
| U.S. Narc. Aid x Base | 0.120** | 0.105** | -0.130 | - | - | - | - | - | - | - | - | - |
| | [0.049] | [0.049] | [0.101] | - | - | - | - | - | - | - | - | - |
| U.S. Mil. Aid x Base | - | - | - | 0.023 | 0.071** | 0.001 | - | - | - | - | - | - |
| | - | - | - | [0.039] | [0.033] | [0.081] | - | - | - | - | - | - |
| U.S. Mil. and Narc. Aid x Base | - | - | - | - | - | - | 0.126** | 0.111* | -0.174 | 0.029** | 0.043*** | 0.007 |
| | - | - | - | - | - | - | [0.052] | [0.058] | [0.136] | [0.014] | [0.016] | [0.018] |
| Lag U.S. Mil. and Narc. Aid x Base | - | - | - | - | - | - | 0.076* | 0.039 | 0.063 | - | - | - |
| | - | - | - | - | - | - | [0.041] | [0.034] | [0.079] | - | - | - |
| Observations | 16,606 | 16,606 | 16,606 | 16,606 | 16,606 | 16,606 | 15,710 | 15,710 | 15,710 | 15,710 | 15,710 | 15,710 |
| Number of municipalities | 936 | 936 | 936 | 936 | 936 | 936 | 936 | 936 | 936 | 936 | 936 | 936 |

*Notes.* Variables not shown include municipality and year fixed effects and log of population. Robust standard errors clustered at the municipality level are shown in parentheses. U.S. Narc. Aid is (log) U.S. narcotics aid to Colombia. U.S. Mil. Aid is (log) U.S. narcotics aid to Colombia. U.S. Mil and Narc Aid is the (log) sum of U.S. military and narcotics aid to Colombia.*** is significant at the 1% level, ** is significant at the 5% level, * is significant at the 10% level.

**Table A.IV**
**Negative Binomial Estimation**

| | (1) Paramilitary attacks | (2) Government attacks | (3) Guerrilla attacks | (4) Paramilitary attacks | (5) Government attacks | (6) Guerrilla attacks |
|---|---|---|---|---|---|---|
| U.S. Mil and Narc Aid X Base | 0.121 | 0.286*** | -0.100 | 0.423** | 0.379*** | 0.108 |
| | [0.102] | [0.127] | [0.065] | [0.195] | [0.146] | [0.100] |
| Estimator | NB | NB | NB | NB-IV | NB-IV | NB-IV |
| Observations | 16,606 | 16,606 | 16,606 | 16,606 | 16,606 | 16,606 |
| Number of municipalities | 936 | 936 | 936 | 936 | 936 | 936 |

*Notes.* Columns 1-3 implement Negative Binomial estimation after demeaning independent variables and including random effects as in Allison (2005). Columns 4-6 additionally uses a two-step control function approach with this Negative Binomial estimator, to instrument the interaction of base and military and narcotics aid to Colombia with the interaction of base and military aid to countries outside Latin America. Variables not shown include unit means, year fixed effects and demeaned log of population. Robust standard errors clustered at the municipality level are shown in parentheses. In the NB-IV, standard errors are bootstrapped with 100 replications. *** is significant at the 1% level, ** is significant at the 5% level, * is significant at the 10% level.

**Table A.V**
**US Military Aid and Violence: OLS Estimates Accounting for Spatial Heterogeneity**

| | Para Presence 88-90 | | No Para Presence 88-90 | | Neighbors Only | | Excluding Neighbors | | Non-Coca Areas | | Coca Areas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| | Paramilitary attacks | Government attacks | Paramilitary attacks | Government attacks | Paramilitary attacks | Government attacks | Paramilitary attacks | Government attacks | Paramilitary attacks | Government attacks | Paramilitary attacks | Government attacks |
| U.S. Military and Narc Aid X Base | 0.186** | 0.201*** | -0.024 | -0.058 | 0.156** | 0.135** | 0.148** | 0.131** | 0.171*** | 0.184*** | 0.106 | 0.030 |
| | [0.077] | [0.071] | [0.057] | [0.090] | [0.061] | [0.061] | [0.060] | [0.060] | [0.063] | [0.071] | [0.127] | [0.105] |
| Observations | 4,032 | 4,032 | 12,574 | 12,574 | 3,727 | 3,727 | 13,450 | 13,450 | 12,202 | 12,202 | 4,404 | 4,404 |
| Number of municipalities | 224 | 224 | 712 | 712 | 210 | 210 | 758 | 758 | 684 | 684 | 252 | 252 |

*Notes.* Variables not shown include municipality and year fixed effects and log of population. Robust standard errors clustered at the municipality level are shown in parentheses. Para Presence 88-90 indicates the set of municipalities that experience paramilitary attacks in every year between 1988-1990 inclusive. Neighbors refers to municipalities that border the municipality with the base. Coca areas are the municipalities that were recorded as having ever grown coca during the sample period. *** is significant at the 1% level, ** is significant at the 5% level, * is significant at the 10% level.

**Table A.VI**

**U.S. Military Aid and Violence: Geography Instrument for Base Location**

| | (1) Paramilitary attacks | (2) Guerrilla attacks | (3) Paramilitary attacks | (4) Guerrilla attacks |
|---|---|---|---|---|
| U.S. and Narc Military Aid X Base | 0.663** | -0.415 | 1.706** | 0.975 |
| | [0.293] | [0.648] | [0.695] | [1.149] |
| IV Base? | Y | Y | Y | Y |
| IV U.S. Mil and Narc Aid? | N | N | Y | Y |
| Observations | 16,557 | 16,557 | 16,557 | 16,557 |
| Number of municipalities | 933 | 933 | 933 | 933 |

*Notes.* Variables not shown include municipality and year fixed effects and log of population. Robust standard errors clustered at the municipality level are shown in parentheses. In columns 1-2, the interaction log U.S. military and narcotics aid and the base variable is instrumented by the interaction of log U.S. military and narcotics aid and the average slope of the municipality. In columns 3-4, the interaction log U.S. military and narcotics aid and the base variable is instrumented by the interaction of log military aid to non-Latin American nations and the average slope of the municipality. *** is significant at the 1% level, ** is significant at the 5% level, * is significant at the 10% level.

**Table A.VII**
**Accounting for New Bases**

| | (1) Paramilitary attacks | (2) Government attacks | (3) Guerrilla attacks | (4) Paramilitary attacks | (5) Government attacks | (6) Guerrilla attacks | (7) Paramilitary attacks | (8) Government attacks | (9) Guerrilla attacks |
|---|---|---|---|---|---|---|---|---|---|
| U.S. Mil and Narc Aid X Base | 0.150** | 0.133** | -0.078 | 0.147** | 0.123** | -0.116 | 0.147** | 0.123** | -0.116 |
| | [0.060] | [0.060] | [0.112] | [0.062] | [0.061] | [0.103] | [0.062] | [0.061] | [0.103] |
| New Base | 0.017 | 0.090 | -0.465 | | | | 0.017 | 0.090 | -0.463 |
| | [0.087] | [0.148] | [0.478] | | | | [0.087] | [0.149] | [0.479] |
| Expanded Base X Post-2001 | | | | 0.204 | 0.659*** | 2.536 | 0.204 | 0.659*** | 2.535 |
| | | | | [0.351] | [0.130] | [2.156] | [0.351] | [0.130] | [2.157] |
| Observations | 16,606 | 16,606 | 16,606 | 16,606 | 16,606 | 16,606 | 16,606 | 16,606 | 16,606 |
| Number of municipalities | 936 | 936 | 936 | 936 | 936 | 936 | 936 | 936 | 936 |

*Notes.* Variables not shown include municipality and year fixed effects and log of population. Robust standard errors clustered at the municipality level are shown in parentheses. U.S. Mil and Narc Aid is the (log) sum of U.S. military and narcotics aid to Colombia. New Base equals one for years after which a municipality begins functioning as a base. Expanded base is an indicator for municipalities with bases that received additional funding after the launch of Plan Colombia in 2001, and columns 4-9 include its interaction with an indicator for the post 2001 period. *** is significant at the 1% level, ** is significant at the 5% level, * is significant at the 10% level.

**Figure A.I**
**Attacks by Armed Actors in the Colombian Conflict**

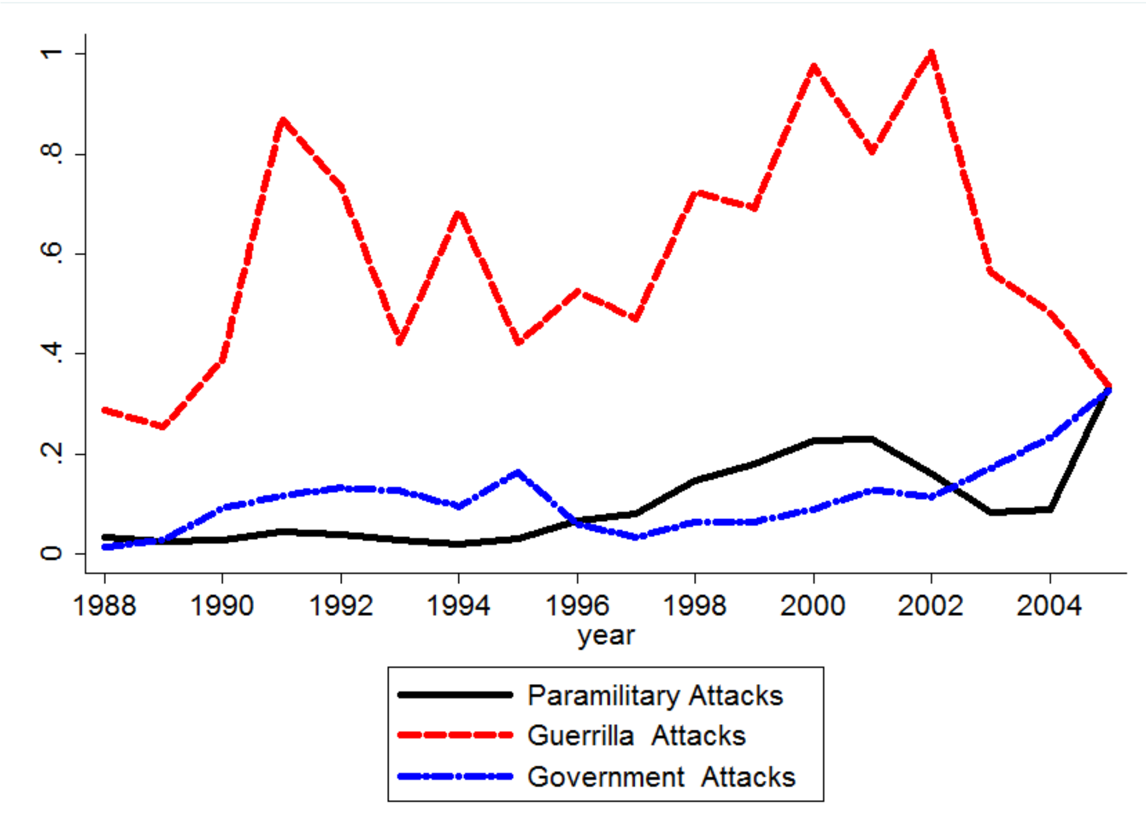
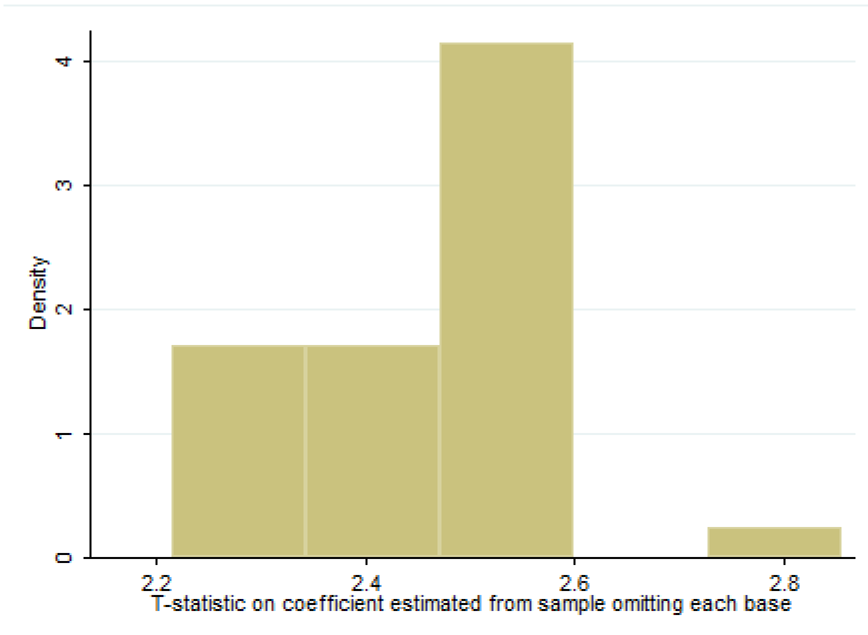


**Figure A.II**
**Density of T-scores from OLS Leave-One-Out Estimation**



Map 1: Municipalities with Military Bases