Appendix

Appendix to "The Management of Aid and Conflict in Africa"

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Abstract

This is an appendix that accompanies the paper "The Management of Aid and Conflict in Africa." Section A1 provides additional detail on the value-added approach to estimating the first stage and reduced form. Section A2 presents a series of robustness tests of the baseline results. Section A3 discusses the estimation of a series of supplementary results in more depth. Section A4 reports additional table and figures not reported in the paper.

A1 First Stage and Reduced Form: Detailed Discussion

This section discusses first stage and reduced form estimates in greater detail. In order to limit estimation-error variance in the project leader effect estimates, when presenting the first stage results, I report empirical Bayesian (EB) shrinkage estimators $\hat{\phi}_\ell^{EB}$ (see Koedel et al., 2015) – of course, this adjustment is not necessary when estimating IV-2SLS or IV-LIML models and is only used to estimate the reported leader fixed effect estimates. I follow the shrinkage procedure outlined in Chetty et al. (2014) and Koedel et al. (2015). After estimating the raw coefficients, $\hat{\phi}_k$ (where k indexes leaders), I compute the empirical Bayesian (EB) shrinkage estimator $\hat{\phi}_\ell^{EB}$ as a weighted average of the estimated coefficient and the mean of all coefficients, interpreted as the Bayesian prior:

$$\hat{\phi}_\ell^{EB} = a_\ell \hat{\phi}_\ell + (1 - a_\ell)\bar{\phi}.$$

where

$$a_\ell = \frac{\hat{\phi}^2}{\hat{\phi}^2 + \hat{\lambda}_\ell}$$

where $\hat{\phi}^2$ is the variance of the estimated coefficients, corrected for estimation error, and $\hat{\lambda}_\ell$ is the estimated error variance of coefficient k (i.e. the squared standard error). Figure A2(a) displays a histogram of the EB leader indicator coefficient estimates – this figure demonstrates substantial variation across project leaders in project quality "value added." In order to benchmark this effect, I follow the same procedure to compute project sub-sector indicators, displayed in Figure A2(b). Variation in project performance driven by project leaders is similar to variation in project performance driven by project sub-sector.

Table A1 explores these estimates in more depth. Having a project leader that is one standard deviation higher in the value added distribution would increase project performance by 0.47 standard deviations (0.41 points on a scale of 1-6). The variance of the leader and sub-sector coefficients are similar, 0.171 and 0.234 respectively. Project leaders at both ends of the value added distributions are associated with large differences in overall project quality.[1]

A histogram of the EB estimators when (log of) the number of conflict incidents is the outcome are displayed graphically in Figure A3 and more detailed statistics are reported in Table A1. Having a project leader that is one standard deviation higher in the value added distribution would increase the probability of conflict by 0.15 (or 0.39 standard deviations). Variation in project management drives meaningful variation in conflict on the ground. When the (log of) the number of conflict events is the dependent variable, the variance of project leader effects is 0.049, and when the conflict indicator is the outcome, it is 0.022 (variance estimates of the sub-sector effects are 0.053 and 0.008 respectively).

[1] While the first stage regression (1) is estimated at the grid-cell-level, it is also possible to estimate project leader value added at the project level. This does not correspond to the first stage regression in the main analysis, but is still potentially of independent interest. Estimating a regression specification analogous to (1) at the project-level, where the outcome variable is the project level IEG score and a broad set of project-level controls are included, I find similar results. Estimates of the variance of project leader and project sub-sector effects are again similar, 0.876 and 0.855 respectively. The variance of the country indicators are substantially lower (0.069) – this is surprising in light of the fact that most prior work on the consequences of development aid has focused on variation in recipient country characteristics.

A2 Robustness Tests

This section describes and reports a series of robustness checks of the baseline results.

A2.1 Alternative IV Estimators

The estimation strategy relies on the inclusion of many instruments and this may introduce inconsistency. In order to address this concern, in the baseline results I present LIML IV estimates Flores-Lagunes (2007); Anderson et al. (2010).. Table A6 shows that the results are robust to either 2SLS or Fuller estimation. In all cases, the coefficient of interest is very similar. Moreover, the similarity between LIML and 2SLS estimates suggests that the presence of many instruments does not bias the baseline results Angrist and Pischke (2008, p. 157).

A2.2 Additional Controls

As an additional test of the identification strategy and robustness of the main finding, I control for trends in a range of baseline characteristics that have been shown in prior work to affect conflict dynamics. Estimates from regressions that include these additional controls are reported in Table A7. The controls include year indicators interacted with (i) the grid-cell-level agricultural suitability; (ii) variables that equal one if petroleum or diamonds are present in the grid-cell; (iii) a variable that equals one if a grid cell is intersected by a national border; and (iv) light density at night, a common income proxy in developing contexts Michalopoulos and Papaioannou (2013). Natural resource presence has dynamic effects on conflict onset and escalation (e.g. Humphreys, 2005; Weinstein, 2006; Ross, 2004, 2006) and arbitrary national boundaries play a particularly important role in African conflict Michalopoulos and Papaioannou (2016). Light density at night proxies local economic performance in contexts where detailed information about wealth and income is not available Michalopoulos and Papaioannou (2013). Column 5, for example, reports estimates from a regression that includes all of the above controls (80 in total, on top of the baseline fixed effects and controls). Columns 6 and 7 also include lag(s) of the dependent variable, in addition to the full control set.[2] The coefficient of interest is similar across specifications.

A remaining possibility is that regions respond differentially to receiving aid – that is, aid leads to more conflict in some regions than others. If factors that drive differential responses to aid are correlated with the assignment of project leaders, the identification strategy could be called into question. This would be the case, for example, if high quality TTLs manage projects in regions where aid does not lead to conflict while low quality TTLs manage projects in regions where aid does lead to conflict. I address this issue directly in Table A8 by controlling for not only time interactions with all of the baseline characteristics listed above, but also interactions between these controls and the aid project

[2]Including lags of the dependent variable in this fixed effects regression model is unlikely to result in substantial bias since the panel contains many time periods. Nickell (1981) derives the formula for the bias in the case without covariates as: $\text{plim}_{N\to\infty}(\hat{\gamma}-\gamma) \approx -(1-\gamma)/(T-1)$, where γ is the correlation between the dependent variable in period t and period $t-1$. In my setting, $T = 18$; when (log of) the number of conflicts is the outcome variable $\hat{\gamma} = 0.77$; and when the conflict indicator is the outcome variable, $\hat{\gamma} = 0.54$. Note also that this formula gives an upper bound for the bias since the bias is strictly lower when controls are include, as shown in Nickell (1981).

indicator. This is designed to absorb heterogeneity in the direct effect of aid across regions. I find no evidence that heterogeneous effects of aid receipt explain the main result. Across specifications, the coefficient of interest remains statistically significant and similar in magnitude.

Finally, Table A9 for project size as measured by total project-level commitments and disbursements from the World Bank. it is worth noting that disbursements could be considered a bad control if, over time, the Bank sends fewer resources to poorly managed projects (for example). Therefore, estimates from specifications controlling for disbursements should be interpreted with caution. Commitments values capture the pre-determined amount that the Bank planned to spend on the project. Reassuringly, across specifications controlling for either commitments (columns 1 and 3), disbursements (columns 2 and 4), or both (columns 3 and 6), the baseline results remain very similar. Thus, the main results are not driven by differences in the project size or total spending.

A2.3 Sample Period and Instrument Set Restrictions

One shortcoming of the World Bank aid data is that only completed projects have been reviewed by the IEG. Therefore, only completed projects are included in my analysis, and this might generate selection bias. One solution is to estimate the baseline specification using only the earlier part of the sample period when nearly all ongoing projects were subsequently completed. Table A10 shows that the results are very similar if the time period is restricted to 1997-2005, 1997-2010, 2000-2010, 2000-2014, 2005-2014. If anything, the estimated coefficient of interest is larger in magnitude using data from only 1997-2005 (column 2). This set of estimates suggests that the main result is not driven by selection driven by project completion or by any particular set of years during the sample period. Another strategy to account for the fact that uncompleted are not reviewed by the IEG is to control directly for the presence of ongoing projects – this also has no effect on the main result.

A second shortcoming of the empirical setting is that not all TTLs in the data have managed a large number of projects; therefore, there are some TTL indicators that are measured more precisely than others. Imprecise first stage coefficients might lead to "own observation" bias in the IV estimation so, in order to address this concern, Table A11 presents results from a set of specifications using a restricted instrument set. While this concern is theoretically already addressed by the LIML estimator, restricting the instrument set explicitly serves as an additional check. These results are presented in Table A11, and the coefficient estimates are, if anything, larger than in the baseline results.

A2.4 Project Score Parameterization

Next, I show that the results do not depend on any particular parameterization of the project score variable or aggregation of multiple project scores. In the baseline specification, if there are multiple in a grid-cell-year I calculate the grid-cell-level project score as the average of all the scores of ongoing projects. The results are very similar if the project score measure is computed as: (i) an indicator that equals one if there are any "successful" projects in the grid-cell, (ii) log of the number of successful projects in a grid-cell, or (iii) the fraction of projects in a grid-cell that were successful.[3] Estimates each

[3] A project is considered "successful" by the World Bank if its score is greater than 3.

of these parameterizations of the grid-cell level project score variable are presented in Table A12; the results are very similar across specifications.

A3 Detailed Discussion of Additional Results

This section discusses the details of the estimation of supplementary results referenced in the main text.

A3.1 Geographic Spillovers

In order to better understand the equilibrium effects of better project management, I investigate spatial spillover effects. High-quality project performance may reduce overall conflict in a region or shift where conflict tales place. For example, conflict actors might move toward poorly executed projects if resources are easier to steal, thereby reducing conflict in nearby regions. This substitution pattern would dampen the overall benefit of high quality project performance.

To distinguish between these two possibilities, I estimate the relationship between conflict and aid project quality in nearby regions (i.e. adjacent grid cells).[4] Analogous to the main analysis, I use indicators for the presence of project leaders in adjacent grid cells as instruments for project quality in those grid cells (the spillover effect), and I continue to use project leader indicators as instruments for the direct effect of project quality. Thus, the first stage estimating equations are:

$$P_{ict} = \alpha_i + \delta_{ct} + \sum_{\ell} \phi_\ell \text{Leader}^{\ell}_{ict} + \sum_{\ell} \phi^{\text{SPILL}}_{\ell} \text{Leader}^{\text{SPILL},\ell}_{ict} + \zeta_1 A_{ict} + \eta_1 A^{\text{SPILL}}_{ict} + \mathbf{Z}'_{ict}\Sigma_1 + e_{ict} \tag{A1}$$

$$P^{\text{SPILL}}_{ict} = \alpha_i + \delta_{ct} + \sum_{\ell} \psi_\ell \text{Leader}^{\ell}_{ict} + \sum_{\ell} \psi^{\text{SPILL}}_{\ell} \text{Leader}^{\text{SPILL},\ell}_{ict} + \zeta_2 A_{ict} + \eta_2 A^{\text{SPILL}}_{ict} + \mathbf{Z}'_{ict}\Sigma_2 + u_{ict} \tag{A2}$$

where $\text{Leader}^{\ell}_{ict}$ are indicators that equal one if leader ℓ is operating a project in a grid cell and $\text{Leader}^{\text{SPILL},\ell}_{ict}$ are indicators that equal one if leader ℓ is operating a project in an adjacent grid cell (i.e. in the spillover region). A^{SPILL}_{ict} is an indicator that equals one if there is an aid project in an adjacent grid cell and P^{SPILL}_{ict}, the independent variable of interest in this part of the analysis, is the IEG score of the project in the adjacent grid cell.[5] The second stage estimating equation is:

$$\text{Conflict}_{ict} = \alpha_i + \delta_t + \gamma A_{ict} + \beta P_{ict} + \gamma^{\text{SPILL}} A^{\text{SPILL}}_{ict} + \beta^{\text{SPILL}} P^{\text{SPILL}}_{ict} + \mathbf{X}'_{ict}\Omega + \epsilon_{ict} \tag{A3}$$

The coefficient on P_{ict} (β) captures the direct effect of project quality on conflict, and the coefficient on P^{SPILL}_{ict} (β^{SPILL}) captures the spillover effect from project quality in nearby regions. If $\beta^{SPILL} < 0$, high quality projects reduce conflict in nearby regions (negative spillover) while if $\beta^{\text{SPILL}} > 0$, high quality projects increase conflict in nearby regions (positive spillover).

[4] In the main analysis, each observation is a one-by-one degree – or approximately 111 square kilometer – grid cell. All grid cells that are not adjacent to the coast or other large bodies of water have eight adjacent grid cells: four with which they share an edge and four with which they share a corner. Therefore, for the vast majority of observations, the spillover region is $8 \cdot 111 = 888$ square kilometers in size.

[5] As in the baseline analysis, if there are multiple aid projects in grid cells adjacent to grid cell i in year t, then P^{S}_{ict} is computed as the average IEG project score.

Both OLS and IV estimates of (8) are reported in Table A3.[6] OLS estimates of β^{SPILL} (columns 1-3) are negative and significant. However, IV estimates of β^{SPILL} are positive and in one specification attain statistical significance. This suggests that – compared to regions adjacent to low-quality aid projects – regions adjacent to high-quality aid projects experience (somewhat) more conflict. However, the spillover effect estimates are imprecise and small in magnitude compared to the direct effect. Spillover effects do not come close to counteracting the direct effect.

A3.2 Conflict Onset and Duration

While the main results suggest that high-quality project performance reduces conflict incidence, this could either be because it affects conflict onset, or conflict duration, or both. This section investigates these possibilities by estimating discrete-time logistic hazard models of conflict onset and offset.[7] In the case of conflict onset, the regression sample includes all years that are "at risk" for conflict onset (that is, all years when there was no conflict in the previous period). Defining $T_i > 0$ as the length of continued peace, the discrete-time hazard is: $h_{it}^{\text{onset}} = \mathbb{P}(T_i = t | T_i \geq t)$. I assume that h_{it} follows a logistic distribution. Similarly, when evaluating conflict duration (offset), the regression sample includes all years that are "at risk" for offset (that is, all years when there was conflict in the previous period) and $T_i > 0$ is defined as the length of continued conflict. h_{it}^{offset} is then defined analogously as $h_{it}^{\text{offset}} = \mathbb{P}(T_i = t | T_i \geq t)$ with the appropriate definition of the "at risk" period and duration variable T_i.[8]

Estimates of the effect of aid project performance on both conflict onset and offset are presented in Table A14. All columns report IV estimates computed using the control function approach Nunn and Qian (see 2014). The specification in column 1 includes a third degree polynomial of "duration" on the right hand side; in column 2, country fixed effects are added; in column 3, sub-sector indicators are added; and in column 4, both country fixed effects and sub-sector indicators are included.

Results from this analysis are imprecisely estimated, possibly because of the small sample size after dropping observations that are not "at risk" of either conflict onset or offset. Nevertheless, when conflict offset is the outcome the coefficient on project score is never significant, is close to zero, and switches sign across specifications. When conflict onset is the outcome, the coefficient of interest is consistently negative, larger in magnitude, and statistically significant in columns 1-2.

Thus, I find no evidence that project quality affects the duration of existing conflict. Weak evidence suggest that, compared to low quality projects, better managed projects cause fewer conflicts to start. These results are consistent with a narrative in which good project performance and quality management prevent the arrival of aid from spurring conflict.

[6] I report both OLS and IV estimates in this table because this is the one set of supplementary results in which OLS and IV estimates do not coincide.

[7] See Jenkins (1995) for the finer details of estimation.

[8] This strategy for estimating effects on conflict onset and offset follows from Nunn and Qian (2014).

A3.3 Conflict Types

Aid project performance may have different effects on conflicts of different types. For example, project management may affect small, localized conflicts, but have no impact on conflicts that are part of civil wars. Most qualitative evidence focuses on conflict initiated by local actors, suggesting that project management may not play a role in conflicts involving the government; nevertheless, they also cite cases in which resources diverted from aid projects are used to finance conflict with the government, and government outposts and personnel are attacked directly through their involvement in the aid disbursement process.

To investigate the relationship between project management and conflict of different types, I use information about conflict actors in the ACLED data to construct measures of three main types of conflict: (i) Civil conflicts (conflicts in which one side is the government)[9]; (ii) Non-civil conflicts (conflicts in which neither side is the government)[10]; and (iii) Local conflicts (conflicts in which both conflict participants are local actors).[11] Non-civil conflicts and local conflicts are not mutually exclusive. Table A13 presents instrumental variable estimates of (2) where, in each column, the dependent variable is a different type of conflict. The estimated effect of aid project performance is similar for all conflict types, suggesting that project management affects not only localized conflicts but also conflicts involving the government.

References

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Chetty, Raj, John N Friedman, and Jonah E Rockoff, "Measuring the impacts of teachers II: Teacher value-added and student outcomes in adulthood," *American economic review*, 2014, *104* (9), 2633–79.

Flores-Lagunes, Alfonso, "Finite sample evidence of IV estimators under weak instruments," *Journal of Applied Econometrics*, 2007, *22* (3), 677–694.

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Jenkins, Stephen P, "Easy estimation methods for discrete-time duration models," *Oxford bulletin of economics and statistics*, 1995, *57* (1), 129–136.

Koedel, Cory, Kata Mihaly, and Jonah E Rockoff, "Value-added modeling: A review," *Economics of Education Review*, 2015, *47*, 180–195.

[9] In the ACLED database, this includes all incidents for which the interaction variable is any integer from 10-28.

[10] In the ACLED database, this includes all incidents for which the interaction variable is any integer from 30-67

[11] This includes values of the interaction variable from 40-47, 50-57 and 60-67. I exclude conflicts in which one of the participants is listed as "other," defined as "outside/external force (e.g., UN)."

Michalopoulos, Stelios and Elias Papaioannou, "Pre-colonial ethnic institutions and contemporary African development," *Econometrica*, 2013, *81* (1), 113–152.

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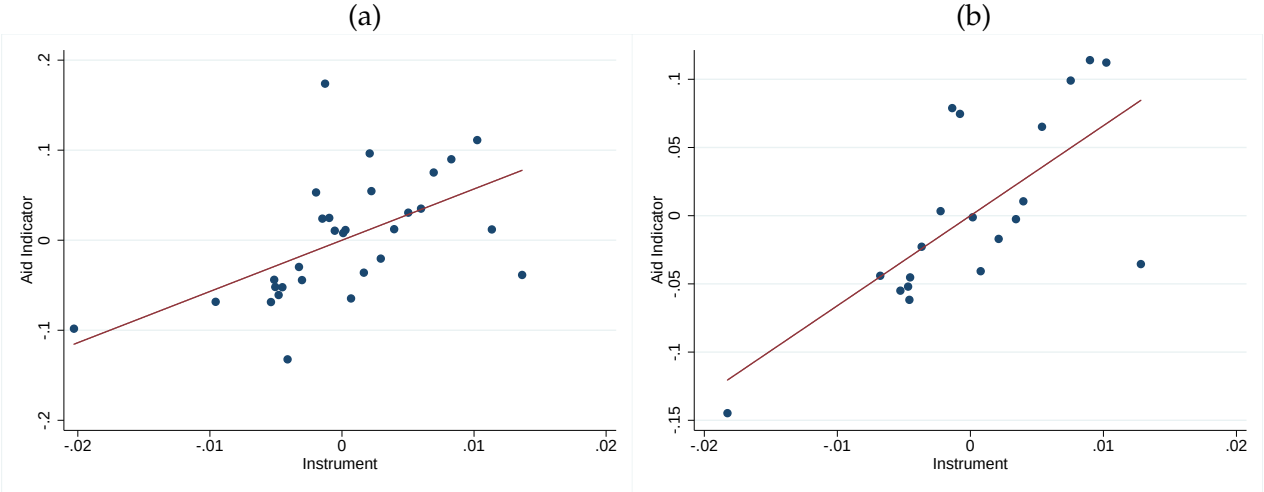
A4 Supplementary Figures and Tables

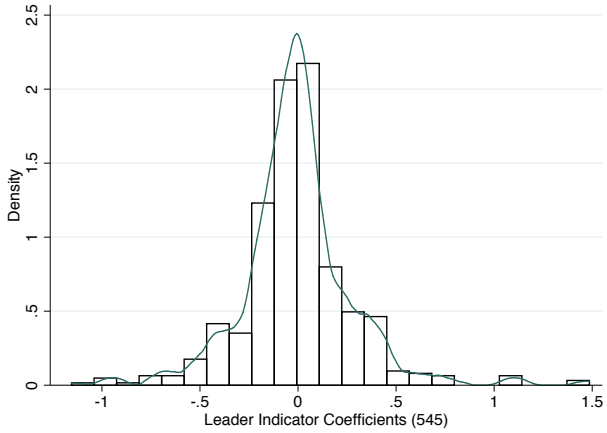
Figure A1: Partial Correlation Between A_{ict} and $\hat{A}_{ict}$



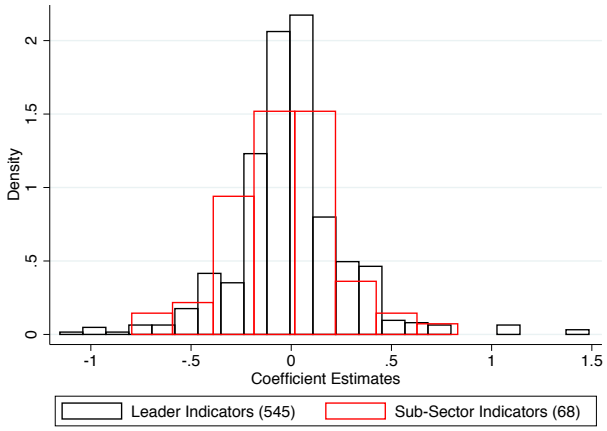
Notes: Both figures present partial correlation plots of the relationship between actual aid receipt and the instrument for aid receipt. In Figure A1(a) the instrument is constructed as an interaction between (i) the total number of World Bank aid projects outside of Africa and (ii) the fraction of years, excluding the year in question, during which the grid cell had an ongoing aid project. In Figure A1(b) the instrument is constructed as an interaction between (i) the total number of World Bank aid projects in Africa, excluding the grid cell in question and (ii) the fraction of years, excluding the year in question, during which the grid cell had an ongoing aid project. Grid cell and year fixed effects are partialled out in both figures.

Figure A2: Project Leader Value Added – Project Performance

(a) Leader Effects



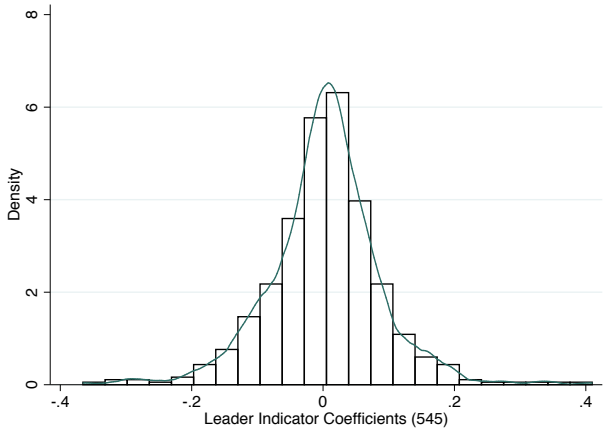
(b) Leader & Sub-Sector Effects



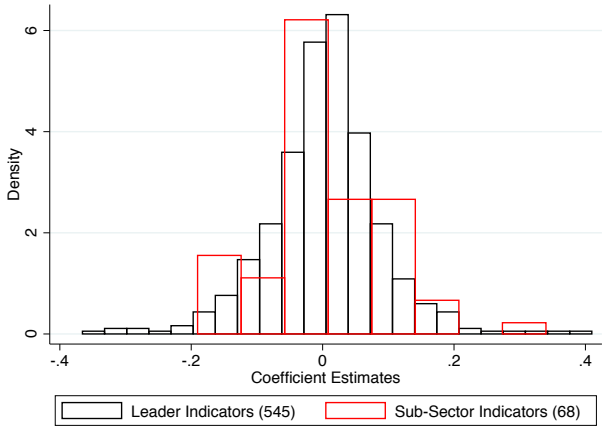
Notes: This figure displays a histogram empirical Bayesian shrinkage estimators of project leader and project sub-sector effects when the dependent variable is the grid-cell-level project performance score. The project leader effects, displayed in both (a) and (b), are in black, and the sub-sector effects, displayed only in (b), are in red. The estimating equation is (1); the regression is estimated at the grid-cell-level and includes time fixed effects and country-by-year fixed effects.

Figure A3: Project Leader Value Added – Conflict

(a) Leader Effects



(b) Leader & Sub-Sector Effects



Notes: This figure displays a histogram empirical Bayesian shrinkage estimators of project leader and project sub-sector effects when the dependent variable is (log of) the number of conflict events in the grid cell. The project leader effects, displayed in both (a) and (b), are in black, and the sub-sector effects, displayed only in (b), are in red. The estimating equation is (1); the regression is estimated at the grid-cell-level and includes time fixed effects and country-by-year fixed effects.

Table A1: VAM Analysis of First Stage and Reduced Form

	(1) Observations	(2) Variance	(3) Maximum	(4) Minimum
	Panel A: Outcome Var. is Project Score (First Stage)			
Project Leader Coefficients	545	0.171	1.486	-1.155
Sub-Sector Coefficients	68	0.234	0.831	-0.796
	Panel B: Outcome Var. is ln(1 + Conflicts) (Reduced Form)			
Project Leader Coefficients	545	0.049	0.410	-0.366
Sub-Sector Coefficients	68	0.053	0.340	-0.190
	Panel C: Outcome Var. is Conflict Indicator (Reduced Form)			
Leader Coefficients	545	0.022	0.289	-0.353
Sub-Sector Coefficients	68	0.008	0.105	-0.088

Notes: This table presents summary statistics for the empirical Bayesian effect estimates computed in Section 4.2 and displayed in Figures I and II. Raw coefficient estimates were computed by estimating equation (1); the outcome variable is listed at the top of each panel and summary statistics for both the project leader and project sub-sector effect estimates are reported. The mean of each set of estimates is zero by construction.

Table A2: First Stages: Direct Effect of Aid

	(1)	(2)	(3)	(4)
Dependent Variable:	Project Indicator		Project Score	
Predicted Project Indicator	1.830***	1.162***	0.379	0.493
	(0.191)	(0.237)	(0.522)	(0.647)
Grid Cell FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	.	.
Year x Country FE	No	No	Yes	Yes
Observations	49644	49554	49644	49554
R-squared	0.975	0.981	0.987	0.988

Notes: The outcome variable is an indicator that equals 1 if there is an aid project in a grid-cell-year (columns 1-2) or the performance score of the project in the grid-cell-year (columns 3-4). Predicted Project Indicator is the instrument for whether or not there is any aid in a grid-cell-year. All specifications include year and grid-cell fixed effects. Country-by-year fixed effects are included in columns 3-4. Standard errors, clustered by grid-cell, are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels respectively.

Table A3: Geographic Spillover Effects

Specification:	(1) OLS	(2) OLS	(3) OLS	(4) IV-LIML	(5) IV-LIML	(6) IV-LIML
	Outcome variable is ln(1+Conflict Incidents)					
Project Indicator	0.0945*	0.165***	0.127***	0.186**	0.287***	0.202***
	(0.0508)	(0.0551)	(0.0376)	(0.0830)	(0.0890)	(0.0577)
Project Indicator Spillover	0.0302	0.0413	0.0179	-0.0824	-0.0813	-0.0843**
	(0.0354)	(0.0350)	(0.0247)	(0.0570)	(0.0549)	(0.0369)
Project Score	-0.0330***	-0.0399***	-0.0276***	-0.0567***	-0.0714***	-0.0469***
	(0.0126)	(0.0136)	(0.00933)	(0.0213)	(0.0228)	(0.0148)
Project Score Spillover	-0.0177**	-0.0181**	-0.00783	0.0113	0.0136	0.0185**
	(0.00851)	(0.00846)	(0.00600)	(0.0142)	(0.0137)	(0.00929)
Year & Grid Cell FE	Yes	Yes	Yes	Yes	Yes	Yes
Sub-Sector Indicators	No	Yes	Yes	No	Yes	Yes
Lag of Outcome	No	No	Yes	No	No	Yes
Observations	49,644	49,644	49,644	49,644	49,644	49,644
R-squared	0.071	0.084	0.227	0.070	0.083	0.227

Notes: The unit of observation is a grid-cell-year. Project Indicator is an indicator variable that equals 1 if there is a world bank aid project in a grid-cell-year. The Project Score was determined by the IEG and is on a scale from 1-6 in order of increasing overall project performance. Project Indicator Spillover is an indicator variable that equals 1 if there is a world bank project in an adjacent grid cell. Project Score Spillover is the average Project Score of all projects in adjacent grid-cells in a grid-cell-year. In columns 4-6, a set of indicators for project leaders working in a grid-cell-month, along with a set of indicators for project leaders working in adjacent grid-cells, is used as the instrument set for the spillover effects. LIML specifications are used for all IV estimates. All columns include year and grid-cell fixed effects and columns 2-3 and 5-6 also include project sub-sector indicators. Columns 3 and 6 also include a lagged dependent variable. Standard errors are clustered by grid-cell. *, **, and *** denote significance at the 10%, 5%, and 1% levels respectively.

Table A4: Baseline Results, IV for Aid Receipt Constructed Using Only Aid to Africa

Outcome Variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ln (1+Conflict Incidents)				**Conflict Incident Indicator**			
Variables Instrumented:	Both	Both	Both	Both	Both	Both	Both	Both
Project Indicator	0.129*	0.123*	0.208***	0.208*	0.0619**	0.0829**	0.0773**	0.0773**
	(0.0708)	(0.0703)	(0.0756)	(0.108)	(0.0301)	(0.0322)	(0.0357)	(0.0351)
Project Score	-0.0588***	-0.0570***	-0.0585***	-0.0585***	-0.0232***	-0.0271***	-0.0243***	-0.0243***
	(0.0177)	(0.0173)	(0.0169)	(0.0225)	(0.00752)	(0.00788)	(0.00812)	(0.00777)
Grid Cell FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	.	.	.	Yes	.	.	.
Year x Country FE	.	Yes	Yes	Yes	.	Yes	Yes	Yes
Sub-Sector Indicators	No	No	Yes	Yes	No	No	Yes	Yes
Observations	49,644	49,644	49,644	49,644	49,644	49,644	49,644	49,644
R-squared	0.069	0.259	0.269	0.269	0.052	0.158	0.160	0.160

Notes: The unit of oservation is a grid-cell-year. Project Indicator is an indicator variable that equals 1 if there is a world bank aid project in a grid-cell-year. Project Score was determined by the IEG and is on a scale from 1-6 in order of increasing overall project performance. All columns report IV-LIML estimates. In columns 1-4 the outcome variable is ln(1 + Conflict Incidents) while in columns 5-8 it is an indicator that equals one if there is any conflict in the grid-cell-year. In all specifications, the instrument set includes the full set of project leader indicators and a variable constructed from the interaction between (i) the total number of World Bank aid projects in Africa, excluding the grid cell in question and (ii) the fraction of years, excluding the year in question, during which the grid cell had an ongoing aid project. The control set included on the right hand side is noted at the bottom of each column. Standard errors, reported in parentheses, are clustered by grid-cell in columns 1-3 and 5-7 and clustered by country in columns 4 and 8. *, **, and *** denote significance at the 10%, 5%, and 1% levels respectively.

Table A5: Leader Performance and Past Conflict

	(1)	(2)	(3)	(4)
	Outcome Variable is Predicted Project Score			
	Conflict is measured as log(1 + Conflict Incidents)		*Conflict is measured as an indicator variable*	
Conflict, first lag	-0.00712	-0.00849	-0.00408	-0.00420
	(0.00887)	(0.00811)	(0.0118)	(0.0116)
Conflict, second lag		0.00633		0.00313
		(0.00818)		(0.0122)
Grid Cell FE	Yes	Yes	Yes	Yes
Year x Country FE	Yes	Yes	Yes	Yes
Sector Indicators	Yes	Yes	Yes	Yes
Aid indicator	Yes	Yes	Yes	Yes
Observations	10,908	10,908	10,908	10,908
R-squared	0.938	0.938	0.938	0.938

Notes: The unit of oservation is a grid-cell-year. The outcome variable, predicted project score, is the grid-cell-year project score predicted from the first stage as regression, in which a full set of project leader indicators was included on the right hand side. Lag(s) of either log(1 + conflict incidents) (columns 1-2) or a conflict indicator are included on the right hand side. The sample is restricted to observations where a project leader either arrives in or leaves a particular grid cell. All specifications include year and grid- cell fixed effects and a full set of sub-sector indicators. Standard errors, clustered by grid-cell, are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels respectively.

Table A6: Alternative IV Specifications: LIML, 2SLS, Fuller

	(1)	(2)	(3)	(4)	(5)	(6)
Outcome Variable:	**ln(1+Conflict Incidents)**			**Conflict Indicator**		
IV Specification:	LIML	2SLS	Fuller(1)	LIML	2SLS	Fuller(1)
Project Indicator	0.199***	0.191***	0.199***	0.0693**	0.0678**	0.0693**
	(0.0669)	(0.0638)	(0.0669)	(0.0321)	(0.0314)	(0.0321)
Project Score	-0.0561***	-0.0542***	-0.0561***	-0.0235***	-0.0231***	-0.0235***
	(0.0168)	(0.0160)	(0.0168)	(0.00811)	(0.00792)	(0.00811)
Grid Cell FE	Yes	Yes	Yes	Yes	Yes	Yes
Year x Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector Indicators	Yes	Yes	Yes	Yes	Yes	Yes
Observations	49,644	49,644	49,644	49,644	49,644	49,644
R-squared	0.269	0.269	0.269	0.160	0.160	0.160

Notes: The unit of oservation is a grid-cell-year. Project Indicator is an indicator variable that equals 1 if there is a world bank aid project in a grid-cell-year. Project Score was determined by the IEG and is on a scale from 1-6 in order of increasing overall project performance. Project Score is instrumented using the full set of project leader indicators. All specifications include year and grid-cell fixed effects and a full set of sub-sector indicators Columns 1 and 4 report LIML estimates; 2 and 5 report 2SLS estimates; and 3 and 6 report Fuller estimates, using 1 as the Fuller constnat. Standard errors clustered by grid-cell are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels respectively.

Table A7: Additional Controls

	(1) IV-LIML	(2) IV-LIML	(3) IV-LIML	(4) IV-LIML	(5) IV-LIML	(6) IV-LIML	(7) IV-LIML
			Panel A: Outcome Variable is ln (1+Conflict Incidents)				
Project Indicator	0.188***	0.189***	0.191***	0.162**	0.158**	0.118**	0.116**
	(0.0677)	(0.0677)	(0.0678)	(0.0668)	(0.0673)	(0.0496)	(0.0486)
Project Score	-0.0538***	-0.0541***	-0.0545***	-0.0458***	-0.0449***	-0.0316**	-0.0310**
	(0.0170)	(0.0170)	(0.0170)	(0.0168)	(0.0169)	(0.0124)	(0.0122)
R-squared	0.274	0.275	0.276	0.285	0.290	0.363	0.365
			Panel B: Outcome Variable is a Conflict Incident Indicator				
Project Indicator	0.0663**	0.0663**	0.0669**	0.0669**	0.0653**	0.0611**	0.0607**
	(0.0322)	(0.0322)	(0.0322)	(0.0321)	(0.0323)	(0.0298)	(0.0297)
Project Score	-0.0228***	-0.0228***	-0.0229***	-0.0227***	-0.0223***	-0.0207***	-0.0205***
	(0.00813)	(0.00814)	(0.00813)	(0.00811)	(0.00814)	(0.00753)	(0.00749)
R-squared	0.163	0.164	0.164	0.162	0.165	0.173	0.173
Grid Cell FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year x Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Indicators	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Agricultural Suitability interactions	Yes	Yes	Yes		Yes	Yes	Yes
Diamond Indicator Interactions		Yes	Yes		Yes	Yes	Yes
Petroleum Indicator Interactions		Yes	Yes		Yes	Yes	Yes
National Border Interactions			Yes		Yes	Yes	Yes
Light density interactions				Yes	Yes	Yes	Yes
First lag of outcome						Yes	Yes
Second lag of outcome							Yes
Observations	49,644	49,644	49,644	49,644	49,644	49,644	49,644

Notes: The unit of oservation is a grid-cell-year. Project Indicator is an indicator variable that equals 1 if there is a world bank aid project in a grid-cell-year. Project Score was determined by the IEG and is on a scale from 1-6 in order of increasing overall project performance. All columns report IV-LIML estimates. All specifications include grid-cell and country-by-year fixed effects, along with a full set of sub-sector indicators. The controls included in each regression vary and are reported at the bottom of each column. Each control (agricultural suitability, the diamond and petroleum indicators, the national border indicator, and ln of light density at night) is interacted with a full set of time indicators. Standard errors, clustered by grid-cell, are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels respectively.

Table A8: Detailed Controls and Interactions

	(1)	(2)	(3)	(4)	(5)	(6)
Outcome Variable:	ln(1 + Conflict Incidents)			Conflict Indicator		
Project Indicator	0.134*	0.158**	0.118	0.0394	0.0344	0.0363
	(0.0759)	(0.0773)	(0.0755)	(0.0390)	(0.0403)	(0.0401)
Project Score	-0.0477***	-0.0483***	-0.0379**	-0.0208**	-0.0208**	-0.0209**
	(0.0167)	(0.0168)	(0.0166)	(0.00817)	(0.00817)	(0.00815)
Grid Cell FE	Yes	Yes	Yes	Yes	Yes	Yes
Year x Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector Indicators	Yes	Yes	Yes	Yes	Yes	Yes
Agricultural Suitability interactions	Yes	Yes	Yes	Yes	Yes	Yes
Agricultural Suitability interactions x Project Indicator	Yes	Yes	Yes	Yes	Yes	Yes
Diamond Indicator Interactions	Yes	Yes	Yes	Yes	Yes	Yes
Diamond Indicator Interactions x Project Indicator	Yes	Yes	Yes	Yes	Yes	Yes
Petroleum Indicator Interactions	Yes	Yes	Yes	Yes	Yes	Yes
Petroleum Indicator Interactions x Project Indicator	Yes	Yes	Yes	Yes	Yes	Yes
National Border Interactions		Yes	Yes		Yes	Yes
National Border Interactions x Project Indicator		Yes	Yes		Yes	Yes
Light density interactions			Yes			Yes
Light density interactions x Project Indicator			Yes			Yes
Observations	49,644	49,644	49,644	49,644	49,644	49,644
R-squared	0.281	0.282	0.296	0.166	0.167	0.169

Notes: The unit of oservation is a grid-cell-year. Project Indicator is an indicator variable that equals 1 if there is a world bank aid project in a grid-cell-year. Project Score was determined by the IEG and is on a scale from 1-6 in order of increasing overall project performance. All columns report IV-LIML estimates. All specifications include grid-cell and country-by-year fixed effects, along with a full set of sub-sector indicators. The controls included in each regression vary and are reported at the bottom of each column. Each control (agricultural suitability, the diamond and petroleum indicators, the national border indicator, and ln of light density at night) is interacted with a full set of time indicators. These controls also interacted with the aid project indicator are included on the right hand side in the noted columns. Standard errors, clustered by grid-cell, are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels respectively.

Table A9: Controlling for Project Size (Commitments and Disbursements)

	(1)	(2)	(3)	(4)	(5)	(6)
Outcome Variable:	ln(1 + Conflict Incidents)			Conflict Indicator		
Project Indicator	0.227***	0.220***	0.225***	0.0789**	0.0675**	0.0706**
	(0.0657)	(0.0657)	(0.0658)	(0.0324)	(0.0324)	(0.0325)
Project Score	-0.0543***	-0.0538***	-0.0543***	-0.0229***	-0.0229***	-0.0233***
	(0.0163)	(0.0163)	(0.0163)	(0.00806)	(0.00805)	(0.00805)
Grid Cell FE	Yes	Yes	Yes	Yes	Yes	Yes
Year x Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector Indicators	Yes	Yes	Yes	Yes	Yes	Yes
ln (Total Commitments, $)	Yes	No	Yes	Yes	No	Yes
ln (Total Disbursements, $)	No	Yes	Yes	No	Yes	Yes
Observations	49,469	49,554	49,469	49,469	49,554	49,469
R-squared	0.650	0.649	0.650	0.518	0.517	0.519

Notes: The unit of oservation is a grid-cell-year. Project Indicator is an indicator variable that equals 1 if there is a world bank aid project in a grid-cell-year. Project Score was determined by the IEG and is on a scale from 1-6 in order of increasing overall project performance. All specifications include grid-cell and country-by-year fixed effects, along with a full set of sub-sector indicators. The controls included in each regression vary and are reported at the bottom of each column. Standard errors, clustered by grid-cell, are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels respectively.

Table A10: Robustness to Sample Period Restrictions

	(1)	(2)	(3)	(4)	(5)	(6)
Sample Period:	1997-2014	1997-2005	1997-2010	2000-2010	2000-2014	2005-2014
			Panel A: Outcome Variable is ln (1+Conflict Incidents)			
Project Indicator	0.291***	0.323***	0.193***	0.191***	0.298***	0.253***
	(0.0747)	(0.0871)	(0.0705)	(0.0672)	(0.0732)	(0.0851)
Project Score	-0.0747***	-0.0879***	-0.0588***	-0.0562***	-0.0739***	-0.0613***
	(0.0191)	(0.0221)	(0.0181)	(0.0172)	(0.0186)	(0.0214)
Observations	49,644	24,822	38,612	30,338	41,370	27,580
R-squared	0.083	0.034	0.022	0.016	0.090	0.101
			Panel B: Outcome Variable is a Conflict Incident Indicator			
Project Indicator	0.0770**	0.117***	0.0369	0.0336	0.0832***	0.0351
	(0.0305)	(0.0383)	(0.0308)	(0.0329)	(0.0318)	(0.0362)
Project Score	-0.0257***	-0.0359***	-0.0175**	-0.0144*	-0.0257***	-0.0141
	(0.00773)	(0.00955)	(0.00767)	(0.00820)	(0.00804)	(0.00911)
Observations	49,644	24,822	38,612	30,338	41,370	27,580
R-squared	0.057	0.017	0.012	0.010	0.061	0.069
Year & Grid Cell FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector Indicators	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The unit of oservation is a grid-cell-year. Project Indicator is an indicator variable that equals 1 if there is a world bank aid project in a grid-cell-year. Project Score was determined by the IEG and is on a scale from 1-6 in order of increasing overall project performance. Project Score is instrumented using the full set of project leader indicators. All specifications include year and grid-cell fixed effects and a full set of sub-sector indicators. The time period used to estimate the regression is reported at the top if each column. Panel A reports OLS estimates; Panel B reports IV estimates with just the project score instrumetned; Panel C reports IV estimates with both project score and the project indicator instrumented. Standard errors clustered by grid-cell are reported in parentheses.

Table A11: Robustness to Restricted Instrument Sets

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Outcome Variable	**ln (1+Conflict Incidents)**				**Conflict Indicator**			
Project Indicator	0.367***	0.444***	1.085***	0.995***	0.118***	0.123***	0.218***	0.241***
	(0.0975)	(0.0966)	(0.263)	(0.232)	(0.0425)	(0.0449)	(0.0833)	(0.0862)
Project Score	-0.110***	-0.120***	-0.297***	-0.262***	-0.0364***	-0.0374***	-0.0624***	-0.0681***
	(0.0251)	(0.0248)	(0.0682)	(0.0600)	(0.0110)	(0.0114)	(0.0217)	(0.0223)
Grid Cell FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year x Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sub-Sector Indicators	No	Yes	No	Yes	No	Yes	No	Yes
Instrument set	Leaders with at least 2 projects		Leaders with at least 3 projects		Leaders with at least 2 projects		Leaders with at least 3 projects	
Observations	49,644	49,644	49,644	49,644	49,644	49,644	49,644	49,644
R-squared	0.258	0.267	0.237	0.253	0.158	0.160	0.156	0.158

Notes: The unit of oservation is a grid-cell-year. Project Indicator is an indicator variable that equals 1 if there is a world bank aid project in a grid-cell-year. Project Score was determined by the IEG and is on a scale from 1-6 in order of increasing overall project performance. The project leaders included in the instrument set is listed at the bottom of each column, along with the set of fixed effects and controls included in each specification. All columns report IV-LIML estimates. Standard errors, clustered by grid-cell, are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels respectively.

Table A12: Robustness to Alternative Parameterizations of Project Performance

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Specification	IV-LIML	IV-LIML	IV-LIML	IV-LIML	IV-LIML	IV-LIML	IV-LIML	IV-LIML	IV-LIML
Variables Instrumented:	Score	Score	Both	Score	Score	Both	Score	Score	Both
				Panel A: Outcome Variable is ln (1+Conflict Incidents)					
Project Indicator	0.168***	0.196***	0.204***	0.0910***	0.120***	0.135**	-0.0412***	0.00962	-0.0140
	(0.0433)	(0.0427)	(0.0627)	(0.0284)	(0.0309)	(0.0547)	(0.0151)	(0.0188)	(0.0420)
Project Success Indicator	-0.272***	-0.273***	-0.277***						
	(0.0541)	(0.0552)	(0.0562)						
ln(Number Successful Projects)				-0.0629***	-0.0823***	-0.0841***			
				(0.0122)	(0.0174)	(0.0178)			
Share Successful Projects							-0.139*	-0.213***	-0.212***
							(0.0780)	(0.0785)	(0.0787)
R-squared	0.068	0.081	0.081	0.071	0.082	0.082	0.069	0.082	0.082
				Panel B: Outcome Variable is a Conflict Incident Indicator					
Project Indicator	0.0432**	0.0454**	0.0472*	0.00794	0.0184	0.0224	-0.0230***	-0.0190**	-0.0264
	(0.0188)	(0.0188)	(0.0264)	(0.0123)	(0.0130)	(0.0218)	(0.00774)	(0.00904)	(0.0169)
Project Success Indicator	-0.0864***	-0.0951***	-0.0969***						
	(0.0227)	(0.0234)	(0.0239)						
ln(Number Successful Projects)				-0.0149***	-0.0283***	-0.0291***			
				(0.00477)	(0.00662)	(0.00680)			
Share Successful Projects							-0.0894***	-0.109***	-0.109***
							(0.0284)	(0.0288)	(0.0289)
R-squared	0.051	0.056	0.056	0.052	0.057	0.057	0.052	0.056	0.056
Year & Grid Cell FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Indicators (75)	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Observations	49,644	49,644	49,644	49,644	49,644	49,644	49,644	49,644	49,644

Notes: The unit of oservation is a grid-cell-year. Project Indicator is an indicator variable that equals 1 if there is a world bank aid project in a grid-cell-year. Project Score was determined by the IEG and is on a scale from 1-6 in order of increasing overall project performance. Project Success Indicator is an indicator variable that equals 1 if there is a project in a grid-cell-year with a score over 3. The number of successful projects is defined as the number of projects in a grid-cell-year with scores greater than 3 and the fraction of successful projects is this number divided by the total number of projects in a grid-cell-year. In columns 1-2, 4-5, and 7-8, a set of indicators for world bank task team leaders working in a grid-cell-month is used as the instrument set. In columns 3, 6, and 9, an instrument constructed from the interaction between a time specific variable (fraction of grid cells with any aid project) and a grid-cell specific variable (fraction of months with at least one aid project) is also included. All columns include year and grid-cell fixed effects and columns 2-3, 5-6, and 8-9 also include project sector controls (a set of 75 indicator variables corresponding to each project sub-sector that equal 1 if a project within that sector is ongoing in a grid-cell-year). Standard errors, clustered by grid-cell, are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels respectively.

Table A13: Conflict Types

Outcome Variable [as ln (1+x)]:	(1) Civil Conflict	(2) Non-Civil Conflict	(3) Local Conflict
Project Indicator	0.225***	0.207***	0.132***
	(0.0688)	(0.0471)	(0.0366)
Project Score	-0.0575***	-0.0478***	-0.0287***
	(0.0177)	(0.0116)	(0.00901)
Year & Grid Cell FE	Yes	Yes	Yes
Sub-Sector Indicators	Yes	Yes	Yes
Observations	49,644	49,644	49,644
R-squared	0.049	0.098	0.101

Notes: The unit of oservation is a grid-cell-year. Project Indicator is an indicator variable that equals 1 if there is a world bank aid project in a grid-cell-year. Project Score was determined by the IEG and is on a scale from 1-6 in order of increasing overall project performance. roject Score is instrumented using the full set of project leader indicators. All specifications include year and grid-cell fixed effects and projet sub-sector indicators. In column 1 the outcome variable is log of civil conflict incidents, or conflicts with the government; in column 2, it is log of non-civil conflict incidents, or conflicts that do not involve the government; in column 3 it is log of local conflict incidents, or conflicts in which both participants are local actors. Standard errors, clustered by grid-cell, are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels respectively.

Table A14: Conflict Onset vs. Duration

	(1)	(2)	(3)	(4)	(5)
Specification	IV	IV	IV	IV	IV
		Panel A: Outcome Variable is Conflict Onset			
Project Indicator	1.114***	0.969***	0.674***	0.617***	0.812***
	(0.162)	(0.193)	(0.190)	(0.216)	(0.210)
Project Score	-0.102**	-0.0925*	-0.0713	-0.0617	-0.105**
	(0.0410)	(0.0490)	(0.0471)	(0.0534)	(0.0521)
Observations	38,961	37,693	38,951	37,684	36,046
		Panel B: Outcome Variable is Conflict Offset			
Project Indicator	-0.287	-0.272	0.0131	-0.0606	0.352
	(0.235)	(0.263)	(0.246)	(0.276)	(0.332)
Project Score	0.0404	-0.00218	0.00994	-0.00673	-0.0669
	(0.0601)	(0.0666)	(0.0634)	(0.0700)	(0.0856)
Observations	8,690	8,663	8,667	8,640	5,209
Third degree polynomial of duration	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	No	Yes	No	Yes	No
Sector Indicators	No	No	Yes	Yes	Yes
Lagged conflict	No	No	No	No	Yes

Notes: The unit of oservation is a grid-cell-year. Project Indicator is an indicator variable that equals 1 if there is a world bank aid project in a grid-cell-year. Project Score was determined by the IEG and is on a scale from 1-6 in order of increasing overall project performance. Panel A estimates discrete time hazard models for the incidence of conflict onset and Panel B estimates the same for conflict offset. All columns include a third-degree polynomial of duration. The remaining controls in each speciication are listed at the bottom of each column. The control function approach is used for all IV specifications. Standard errors, clustered by grid-cell, are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels respectively.