Reconstruction and Insurgency: The Importance of Sector in Afghanistan

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Abstract

We employ a model characterizing insurgency as the manifestation of popular dissatisfaction with the reconstruction effort. We contend the sector in which reconstruction projects are carried out has important implications for the success of spending. The model is tested using unique panel data on reconstruction projects and violence across Afghanistan from 2005 to 2009. Health and economy oriented projects are found to be most pacifying, while education and infrastructure projects are destabilizing. Our analysis builds on former work by addressing censoring and nonlinearities, and testing an alternative leading explanation for insurgency.

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More than a decade has passed since the 'War on Terror' began with the invasion of Afghanistan in October, 2001. The occupation of Iraq followed in March, 2003, ending eight years later in December, 2011. Major reconstruction efforts have been a central feature of the operations which ensued in both Afghanistan and Iraq, yet the impact of this economic intervention remains scarcely explored. The relationship between reconstruction work and 'terror' is not clear cut. At face value, attacks on coalition forces have exhibited an accompanying rise with the upward trend in the volume of reconstruction work carried out in Iraq and Afghanistan.[1] There exists a prevailing view on reconstruction work, however, as a mitigating force on violence.

Economic reconstruction is thought to facilitate stabilization through the development of a well-functioning market economy.[2] By providing attractive incentives in the form of economic growth opportunities, coalition forces have sought to win over the 'hearts and minds' of the community in the fight against insurgents. The reconstruction effort has therefore been geared towards rebuilding vital infrastructure and remodeling state institutions for the purpose of enhancing the potential for economic growth and development. While these ingredients may well prove to build economic capacity within a nation, it remains unclear whether economic capacity, built in this way, translates into stabilization.

The greater reconstruction effort is comprised of work carried out in a number of sectors including agriculture, health, education, and transport,

[1]US government outlays for reconstruction projects in both countries were increasing from 2003 to 2007 as evidenced by data obtained from the Federal Procurement Data System in 2007. Similarly, data obtained from NATO C3 Agency's Afghanistan Country Stability Picture indicates a consistent increase in outlays to Afghanistan over the period for which data is available (approximately 2005 to 2009). Data from the Global Terrorism Database (GTD) of the National Consortium for the Study of Terrorism and Responses to Terrorism (START) at the University of Maryland indicates a consistent upward trend in violence from the beginning of each respective operation until 2010 (the final year for which GTD data is available).

[2]The role of reconstruction in counterinsurgency was explicitly incorporated in the US Army Field Manual 3-24 (US Army, 2006).

amongst others. We postulate that local communities welcome the involvement of coalition forces in some sectors of the economy, but oppose it in other, more controversial sectors. Depending on its structure, the overall reconstruction effort could be met with approval or disapproval. Popular disapproval of foreign-led development can manifest as violent resistance.

This paper tests a simple model (from Scoones & Child, 2013) examining how community preferences interact with the objectives of external forces to create situations of persistent insurrection. This is the first empirical work which critically evaluates the *character* of reconstruction work. Our key contribution is distinguishing the differential effects of various types of reconstruction spending. According to our model, not all spending is equivalent in the view of potential insurgents. Depending on how mismatched are an occupier's objectives with preferences of potential insurgents, occupiers can choose equilibrium spending patterns that engender resistance. This occurs when the alternative, winning the hearts and minds of all potential insurgents, is too costly of a trade off for the occupier.

Our empirical analysis for Afghanistan indeed provides evidence that certain types of reconstruction can foment violence - a possibility heretofore ignored by the formal literature. Using panel data on 398 districts in Afghanistan from 2005 until 2009, we measure the impact of various types of reconstruction spending on violence. Health and economy-oriented projects appear to reduce violence, as do critical junctures over the course of state-building projects. Infrastructure projects seem to have the reverse effect, however, as do the beginning and end of education projects. Focusing on a particular reconstruction program highlighted by previous authors, we are unable to provide any evidence in support of a competing explanation for violence - that the success of reconstruction spending hinges on conditionality of projects.

The paper proceeds as follows. First we contextualize our study within the body of existing empirical literature. Then we briefly present our model (the full version of which is expounded by Scoones and Child, 2013) and derive testable implications. We also discuss our uniquely combined database on reconstruction work and violence in Afghanistan. Finally we conduct our analysis, testing our model against competing work, but also expanding to address important empirical issues.

1 Literature

A large formal literature on counterinsurgency in both academia and policy circles implicitly assumes that any development is itself positive.[3] Opportunity cost models of rebellion (surveyed by Blattman and Miguel, 2010) allow development to result in conflict because development increases the amount of resources to be fought over, but the resources themselves are treated as assets. Empirical work by Berman, Shapiro, and Felter (2011) suggests the value of development to community members can vary over a positive range, but the literature nowhere suggests development per se can be unwelcome. Iyengar, Monten, and Hanson (2011) suggest a mechanism by which spending projects, contingent on labour intensity, can have differential impacts on the prevailing level of violence (and provide empirical support to that end), but projects of all kinds remain mitigating forces on violence. The practically unanimous theoretical characterization of development as inherently beneficial is not well founded.

Empirical support for the negative link between income and violence (espoused by opportunity cost theories of insurrection) is limited. Blomberg and Hess (2002) and Blomberg, Hess, and Weerapana (2004) are able to link terrorism, and internal conflict more generally, to the state of economic recession using panel data at the country level. Testas (2004) finds the level of terrorism to be weakly correlated with income, again using country level data. Although suggestive of a link between violence and income, these macro

[3] Some qualitative works (see Barron, Diprose, & Woolcock, 2007; Patterson & Robinson, 2011) indeed explore the merits and drawbacks of various reconstruction project designs, and our work here seeks to formalize a discussion in this direction.

findings fail to shed light on the mechanism for violence, and are brought into question by other work in this field.

Bussman and Schneider (2007) positively link internal conflict to economic liberalization. Krueger and Maleckova (2003) fail to draw a link between poverty and the incidence of terrorism. Berrebi (2007) compares community-level living standards and educational attainment to those of individual Palestinians who died attacking Israeli targets, and finds a positive correlation between participation in the insurgency and the opportunity cost of doing so. Berman, Felter, and Shapiro (2009) find a negative correlation between unemployment and attacks on government and allied forces in Iraq and the Philippines. Each of the above undermine opportunity cost theories of insurgency and the notion that development is pacifying by nature.

Regarding foreign-led development in particular, Berman et al. (2011) are the first to analyze reconstruction work, and provide evidence that it mitigates violence in Iraq. Chou (2012) replicates their analysis for the case of Afghanistan, however, and yields no significant results. Extant empirical work on the relation between development and conflict appears mixed and often contradictory. The difficulty of previous literature in explaining the relation between development and conflict stems from a theoretical mischaracterization of insurgents, community members, and government (discussed at length by Scoones and Child, 2013). Here we place political discontent, instead of economic wellbeing, at the heart of resistance. By doing so we are able to reconcile the aforementioned empirical findings.

2 The model

Our model focuses on the nature of soft counterinsurgency. Insurgents do not resist because of poverty, desire for control, or love of violence, but for political principles in controversy with the developmental agenda. Nevertheless, reconstruction work is not irreconcilable with peace, and soft counterinsurgency can still be effective, at the cost of not achieving the ideal outcome in the eyes of the government.

Reconstruction and insurgency is a one shot game played between two types of agents: a single occupier, and a continuum of community members, normalized to a unit measure population. All possible reconstruction projects fall into one of two 'sectors', g and b. The occupier seeks to maximize utility through its allocation of a fixed amount of reconstruction spending across these two sectors. Each community member either joins the insurgency or co-operates with the occupier, depending on their relative distaste for the mix of reconstruction projects chosen by the occupier. The occupier moves first in anticipation of the reaction of the community; individual community members then choose whether or not to resist reconstruction. The combination of occupier spending and community resistance determines the level of reconstruction and payoffs, and the game ends.

2.1 Preferences

The occupier has Cobb-Douglas preferences over reconstruction in the two sectors:

$$V = gb^{\gamma} \tag{1}$$

where γ captures the occupier's relative preference for reconstruction type b over type g. The preferences of community member i is represented by

$$U_i = \alpha g - \beta_i b \tag{2}$$

where α is the common preference for sector g output, and β_i captures individual i's distaste for sector b output. We assume β_i is uniformly distributed on the unit interval.

The notation g and b is used as a shorthand for 'good' and 'bad' respectively in accordance with the community's perception of the reconstruction effort and the occupation at large. We do not assume community members dislike projects in sector b per se. Instead, these projects are unwelcome specifically because the work is undertaken by an occupying force. Intuitively, building prisons might fall into sector b. This wouldn't imply the community prefers to have no prisons, but rather that it would prefer not to have an occupying force[4] implicated in their construction and administration. On the other hand, the maintenance of hospitals would more intuitively settle in sector g. That is, even the views of those most predisposed to oppose the reconstruction effort are likely to be softened by humanitarian work of the occupier.

2.2 Reconstruction technology

The occupier faces a budget which it can allocate between sector b and sector g spending.

$$E = S_g + S_b \tag{3}$$

where E is the occupier's budget, S_g is spending in sector g and S_b is spending in sector b. The production function for the output in each sector takes the form

$$g = S_g(1 - R)^\theta \qquad\qquad b = S_b(1 - R)^\theta \tag{4}$$

where $R \in [0, 1]$ is the proportion of the community that chooses to participate in the insurgency and $\theta \in [0, 1]$ is a coefficient that captures the character, or effectiveness, of the insurgency.

2.3 Equilibrium

An equilibrium is a utility maximizing choice by the occupier of spending levels in each sector (S_g^*, S_b^*); and a utility maximizing decision by each community member whether to resist reconstruction, characterized by the threshold value β_i^* in the set of insurgents. Community members observe the spending allocation of the occupier before deciding whether to join the

[4]The controversial 'occupier' here includes private contractors in addition to military personnel. Projects implemented by members of the local population are less relevant to this framework, but project choice and design by an occupier can nevertheless render them subject to community resistance.

resistance; the occupier knows this and chooses an allocation with rational expectations of the coming level of resistance.

Substituting the production functions (4) into the community member utility function in (2), community member's utility can be written as a function of the insurgency's size R. Community members decide whether to join the insurgency independently, taking R as fixed, and recognize that their choice will contribute only infinitesimally to the resistance. By setting $\partial U_i/\partial R$ equal to zero, we can obtain β_i^* - the distaste for sector b spending of the community member who is just indifferent between resisting and cooperating, with $\beta_i^* \epsilon [0, 1]$. Given that there is a unit measure of community members, the size of the resistance is $R = 1 - \beta_i^*$, or

$$R = \max\left\{1 - \frac{\alpha S_g}{S_b}, 0\right\} \tag{5}$$

The choices of community members whether to resist reconstruction, the production functions for the two sectors and the overall budget constraint together determine the set of feasible reconstruction projects among which the occupier can choose. Parameter values for α and θ give shape to this production possibility frontier, and three cases, together with resulting equilibrium are depicted in Figure 1. In what follows, we explain each in turn.

Class 1: no resistance

From (5), it is clear there is no resistance if $S_b < \alpha S_g$. The production functions become simply $b = S_b$ and $g = S_g$. The solution is $S_g^* = E/(1+\gamma)$ and $S_b^* = E\gamma/(1+\gamma)$, so $S_b^* = \gamma S_g^*$. This is optimal from the occupier's perspective if and only if $\alpha > \gamma$, and this condition is necessary and sufficient for the equilibrium to be in class 1.

In this equilibrium class, the occupier naturally prefers a mix of spending that is acceptable to the community. Occupier and community preferences are sufficiently (but not completely) aligned, such that there is no resistance to reconstruction.

Class 2: active resistance

From (5), there is an active resistance if $S_b > \alpha S_g$. Substituting the production functions (4) and the equation for insurgency (5) into the occupier's objective function, yields the solution

$$S_b^* = E\left[\frac{\gamma}{1+\gamma} - \theta\right] \qquad S_g^* = E - E\left[\frac{\gamma}{1+\gamma} - \theta\right] \tag{6}$$

For this allocation to be optimal from the occupier's perspective, we need not only that $\alpha < \gamma$, but also the stronger condition

$$\alpha < \frac{\gamma - (1+\gamma)\theta}{1 + (1+\gamma)\theta} \tag{7}$$

In class 2 equilibria, the preferences of the occupier and the community are at greater variance, reconstruction proceeds in face of disruption from local insurgency. Despite the deadweight loss of output incurred from the resistance, the occupier's preferences are such that its payoff in terms of allocative efficiency offsets the production efficiency loss incurred.

Class 3: latent resistance

From (5), what can be deemed a latent resistance arises when $S_b = \alpha S_g$. In general, there is a set of values of α for which

$$\gamma > \alpha > \frac{\gamma - (1+\gamma)\theta}{1 + (1+\gamma)\theta} \tag{8}$$

For these values, the occupier's optimal solution is indeed at the threshold where active resistance unravels: $S_g^* = \frac{E}{1+\alpha}$ and $S_b^* = \frac{\alpha E}{1+\alpha}$.

For equilibria in class 3, preferences are not sufficiently divergent to induce the occupier to choose a spending mix which breeds insurgency. No actual insurgency exists, but the latent threat affects the choice of the occupier. Through the outside option of rebellion, the community forces the occupier to spend a greater share on public 'goods' than would be optimal absent the threat of violence.

2.4 Comparative statics

Our three class of equilibria are illustrated in Figure 1. In this diagram, the only parameter that varies is α. The range of equilibria can also be obtained, however, by varying γ instead. A summary of the three equilibria class is offered in Table 1. The conditions on α and γ are equivalent for each class of equilibria. We nevertheless present both conditions to show how variation in either parameter can induce shifts in both the class and level of equilibrium. Figure 2 exhibits comparative statics for value shifts (from 0 to 1) of these parameters. As α increases over the low range (corresponding to class 2), spending remains constant while resistance declines. In the intermediate range (class 3), resistance is nil and the ratio of bad to good spending increases. In the upper range (class 1), resistance remains at zero and the spending ratio plateaus. Variation in γ tells a different story, however. Over the low range (class 1), resistance is nil and the spending ratio increases. In class 3, both equilibrium values remain constant. Over class 2, as γ increases, so do resistance and the ratio of bad to good spending.

The difference between the comparative statics of these parameters holds important implications for empirical testing of our theory. Over the α range, equilibrium resistance and the spending ratio move in generally opposite directions, while over the γ range they move in tandem. In Afghanistan, we expect community preferences to vary over geographical space (from district to district), but remain relatively stable over time. Preferences of the occupier, however, will vary within an area over time. As various donors become more or less active in a certain district, for instance, the aggregate preferences of the occupier will change. As such, we can think of a spatial cross-section in Afghanistan as a source of variation in community preferences - α, and a spatial panel as a source of temporal variation in occupier aims - γ. Specifically, we introduce the following testable propositions:

Proposition I: *With variation in α, R^* and S_b^*/S_g^* are inversely related.* This follows from $\frac{\partial R^*}{\partial \alpha} \leq 0$ and $\frac{\partial (S_b^*/S_g^*)}{\partial \alpha} \geq 0$, which is seen clearly in Figure 2.

Proposition II: *With variation in γ, R^* and S_b^*/S_g^* are positively related.* This follows from $\frac{\partial R^*}{\partial \gamma} \geq 0$ and $\frac{\partial (S_b^*/S_g^*)}{\partial \gamma} \geq 0$, which is seen clearly in Figure 2.

3 Data

Throughout the analysis, our dependent variable of interest is the level of violence. In measuring the output of violence across Afghanistan, we make use of the Worldwide Incidents Tracking System (WITS), a US government database on incidents of violence directed at civilians and noncombatants, and military personnel outside of war-like settings. National Counterterrorism Center analysts assembled this database by including all publicly known, "premeditated, politically motivated violence perpetrated against noncombatant targets by subnational groups or clandestine agents" (NCTC, 2006). The WITS covers incidents in Afghanistan from 2005 to 2009, and has been geo-coded by the Empirical Studies of Conflict Project. Using the ESRI World Gazetteer and digital mapping software, we are able to district-locate 7,130 incidents included in the WITS (716 incidents do not contain sufficiently precise location details).[5]

Reconstruction spending data comes from NATO C3 Agency's Afghanistan Country Stability Picture (ACSP). The database covers reconstruction spending from 2002 until the third quarter of 2009. The ACSP contains detailed project information on all reconstruction carried out by USAID, the Provincial Reconstruction Teams (PRTs), the Combined Security Transition Command (CSTC-A), and a host of other foreign donors including the World

[5] As a robustness check, we previously employed a second source of violence data from the Global Terrorism Database (GTD) managed by the US Department of Homeland Security's START Center at the University of Maryland. Although the GTD covers a longer time horizon, its coverage is more sparse - we were able to geo-locate only 1,418 incidents. Running the forthgoing analysis using this alternative dependent variable, we obtain results generally supportive of those presented herein, albeit at a much lower level of significance.

Bank, the World Health Organization, and numerous United Nations agencies. ACSP project information includes sector classification, cost, timing, location, and donor. The data is country-wide, and 29,783 projects contain sufficient detail for inclusion in our analysis.[6]

Throughout the analysis, our unit of observation is the district-quarter ďż″ a three month period in a given district. We follow the 2005 Afghan Ministry of the Interior administrative designation of 398 districts spanning 34 provinces. Districts in which no violence occurred over the entire sample period are omitted when including district fixed effects, leaving 225 districts in a balanced panel. For fixed effects specifications, we are left with a panel of 4,050 district-quarter observations (7,164 observations in the cross-sectional analysis).

Reconstruction volumes for a district-quarter are calculated as the mean number of projects in progress. Alternatively put, it is the amount of projects carried out, with each project weighted by its total duration (measured in quarters).[7] Violence levels are obtained by summing up all incidents over the

[6]Altogether, the ACSP database contains a total of 118,322 projects, amounting to $28.2 billion, at minimum. Over half the ACSP database consists of projects funded by either Afghanistan's Ministry for Rural Rehabilitation and Development (MRRD), or the Ministry of Finance (MOF). MRRD data do not contain project end dates, while MOF data are not geographically coded. As such, domestic reconstruction data cannot be used in our analysis. Of reconstruction projects carried out under foreign donors, just over a third are date-miscoded, and therefore unusable. Over one fifth (22%) of foreign-led projects have been cancelled, suspended, or carry an unknown operational status. One tenth of foreign projects are spatially coded at a level broader than the district; it is unclear whether this reflects diffuse projects, or imprecision of data coding.

[7]Other authors (BSF) have previously weighted projects by dollar value rather than project length. We choose the latter for two reasons ďż″ one theoretical and one technical. Our theory places community perceptions at the heart of resistance. Perceptions are driven by the presence of ongoing projects (e.g. appearance of foreign contractors), and not necessarily their financial value. Two projects of equal cost are likely to have different impacts if their 'footprint' differs. Technically, cost data is only available for 10,076 projects, none of which are funded by USAID. By using project duration as a predictor of impact, we are able to include USAID projects, which comprise the majority of foreign

respective period. Reconstruction volumes are lagged one period in order to ensure we measure the impact of recent (not future) development on violence. Both violence and reconstruction variables are scaled by population (per thousand inhabitants). District population data is for 2011/12, and obtained from the Central Statistics Organization of the Government of Afghanistan.

Total reconstruction spending is disaggregated according to broad sector classification by the author. Sector groups are based on Afghanistan Standard Industrial Classification of Activities (ASIC) maintained by the Afghanistan Information Management Services (AIMS). Sector groups are at a broader level of aggregation than the ASIC categorization. Details and project examples are offered in Table 2. Descriptive statistics of per capita violence and reconstruction are presented in Table 3.[8] Variables are measured in terms of incidents per thousand inhabitants, and mean concurrent projects per thousand inhabitants, respectively.

4 Analysis

In keeping with our theoretical premise, our central concern is to test whether reconstruction projects in different sectors have differential impacts on violence. Our primary analysis is ultimately based on the level equation

$$violence_{it} = \eta + \beta RECON_{it-1} + \gamma_t + \delta_i + \theta violence_{it-1} + \epsilon_{it}$$

where i is a district index, t the quarter index, *violence* is violent incidents per thousand inhabitants, and *RECON* is the volume of reconstruction (mean

spending. In any case, it should be noted that project duration is a strong positive correlate of cost (also when sector is controlled for). Replicating our central analysis (Table 4 Panel B) using dollar-weighted metrics instead of duration-weighted values yields no obvious contradictions with the results presented here, but the explanatory power of each statistical model is considerably reduced.

[8] We have not found data on troop movements, which could alleviate potential bias from the omitted variable of hard counterinsurgency. But since we measure the impact of sector-specific projects, rather than total reconstruction, this bias is not of major concern.

concurrent projects) per thousand inhabitants. We begin, however, by following previous authors in not distinguishing between project sector. In column (1) of Table 4 Panel A, we estimate the cross-sectional relationship between total reconstruction work and violence, controlling only for time period. Mean projects are positively correlated with violence in the cross-sectional setting. This correlation may reflect targeted spending at violent districts, so we account for potential selection effects by controlling for district in column (2). When doing so, the amount of projects underway becomes an insignificant determinant of violence, suggesting endogeneity of spending is at play. Thus far, we are unable to refute popular characterizations of reconstruction spending as generally violence reducing (Berman et al., 2011), but neither is this supportive evidence for those notions. Since our theory affords a special relevance to the character of reconstruction work, we next explore whether meaningful effects of reconstruction are identifiable for some sectors (and whether these differ across sectors).

As an overview, Table 5 compares violence across quartiles of reconstruction volumes. Using deviations from district-means, we compute average violence for observations falling in each quartile of reconstruction work, for each sector. If violence were altogether unrelated to reconstruction work, violence would not deviate from its mean on expectation, conditional on any volume of reconstruction work observed. In expectation, we would therefore observe zero (mean-differenced) violence everywhere in Table 5. While few of the reported means significantly differ from zero at the 5% level (denoted with an asterisk), mean violence mostly appears to be a monotonic function of reconstruction volume quartile. The more abnormally high the works pertaining to infrastructure, health, and the economy, the lesser the subsequent violence, on average. The converse is true for state- and community-building projects. This suggests reconstruction work in different sectors carry different implications for violence, but we turn to more thorough regression analysis to further explore our theory.

In Panel B of Table 4, we test the impact on violence of reconstruction projects within various sectors. Proposition I suggests controversial spending will be targeted at communities with a low predisposition to violence. Proposition II, however, suggests controversial spending will increase violence within a given community (district). We are in no position to decide ex-ante which are the controversial sectors, but these propositions can nevertheless be tested in tandem. Taken together, they imply the sectors which are positively correlated with violence in a cross-sectional setting will be violence-reducing within districts, and vice versa. As such, we expect the coefficient sign of each sector group to switch as we move from the cross-section specification in column (1) to the fixed effects model in column (2).

For most sectors, our propositions jointly hold true. Health spending becomes significantly negatively correlated with violence, the effects of state- and community-building projects become indistinguishable from zero, and economy-oriented projects switch from being significantly positively correlated with violence, to the converse. Only infrastructure work does not comply with expectations, although the magnitude of the coefficient significantly declines, and loses statistical power.[9] An F-test rejects equivalence of effects across sector groups in both cross-sectional (1) and panel (2) settings, with p-value 0.0002 and 0.0031, respectively. At this stage, health and economy-oriented projects appear to most convincingly mitigate violence, according to the preliminary evidence of Table 5 and regression results here. Infrastructure projects appear violence-inducing, though do not comply with our expectations regarding theoretical equilibria. Nevertheless, evidence suggests different types of reconstruction can have opposite effects on the level of resistance, substantiating our theory's central claim.

By introducing district effects we overcome endogeneity from selection

[9] If we restrict the cross-sectional specification in column (1) to the 225 districts in which violence is observed over the sample period, the coefficients for economy-oriented and community-building projects are insignificant. The purpose of this test, however, is to assess whether high-controversial sector equilibriums obtain in communities less prone to violence. A proper test of the model should not exclude districts in class 1 (no resistance) equilibria, then, so we include all 398 districts.

based on fixed community characteristics (such as predisposition for violence). A dynamic course of endogeneity may run through recent violence though, if decisions regarding the sector mix of projects are made on a continual basis, and related to the state of instability. In an effort to further capture the causal effect of reconstruction projects on violence, we include lagged per capita violence as a control variable in column (3).[10] Infrastructure projects still appear to be violence inducing, while health and economy work is still pacifying. The magnitude of the coefficients changes very little, suggesting dynamic selection is not a major concern. Including further lags of per capita violence does not reduce the explanatory power of reconstruction variables, nor is past violence a significant predictor of present violence beyond the first lag.

4.1 Censoring

Because of the low frequency of violence in many districts, as recorded in the WITS database, censoring is a practical concern. Sixty-four percent of our district-quarter observations have no violence. As such, we point to the downward bias in both coefficient and variance estimators likely to arise from such censoring.[11] The ML estimator of the Tobit model is often computed for cross-sectional data to overcome these issues, but the inclusion of fixed effects and lagged dependent variables in a panel setting can bias the

[10]By controlling for lagged violence, autocorrelation is also mitigated. The fixed effects (FE) estimator is preferred to its first-difference (FD) counterpart for efficiency under the assumption of serially uncorrelated errors. Like the FD estimator, though, the FE estimator might retain the so-called Nickell bias, as lagged violence in the dynamic specification correlates with the mean-differenced error term. This latter problem is mitigated, however, as we are dealing with a long panel (Nickell, 1981).

[11]Berman et al. (2011) and Chou (2012) overlook censoring in the data. For the analysis in Iraq, the level of violence within district-half years is censored at zero for approximately one fifth of the observations. In Afghanistan, Chou (2012) does not mention the degree of censoring in her data, but suffice to note Afghanistan is considerably more peaceful than Iraq.

MLE. Heckman and Macurdy (1980) nevertheless use a Tobit fixed effects approach to estimate a dynamic model of female labour supply, arguing the ML estimator behaves well under sufficiently lengthy panels. Honordž″ (1993) acknowledges maximum likelihood estimation of the nonlinear dynamic fixed effects model will yield consistent estimators as $T \to \infty$. Consistency of MLE in the presence of fixed effects is supported a Monte Carlo study by Greene (2004) in which the Tobit estimator is unbiased in a long panel setting. Greene (2004) does identify a bias in the variance estimator, but this also declines in panel length. Because our panel includes 18 periods, we feel justified in employing the Tobit fixed effects model.

Conceptually, the Tobit model is a good statistical analogue of our theoretical model. District-quarters in which no violence is observed still vary in their proximity to violence. Some peaceful districts are subject to what we've termed latent resistance, whereas others are relatively stable. Improving popular perceptions of the reconstruction effort in peaceful areas will not produce observable effects in our data, but it nevertheless shifts communities yet further from the brink of conflict. The Tobit model reports linear effects on the latent (censored) resistance, whose level can be positive or negative. When positive, resistance is expressed as violence and observed in our data; negative values imply degrees of popular satisfaction which are not here observed.

As per Angrist and Pischke (2008), some readers may find the above conceptualization problematic. While cooperation and resistance may be flipsides of the same coin, it is not clear they respond similarly to reconstruction. Moreover, we do not measure cooperation, as violence is of much greater interest. Insofar as we elect to assess *average* effects on violence (across periods of both peace and instability), the OLS coefficients are superior to their Tobit counterparts. The linear model can accommodate a non-normal distribution of the disturbance term and heteroskedasticity, while the Tobit model cannot.[12] For all tests, we therefore also present the results of the

[12]The Tobit model handles heteroskedasticity only with explicit modelling of the

linear fixed effects model, with errors clustered at the district level, thereby presenting average effects alongside the effects conditional on violence.

Column (4) of Table 4 Panel B reports the Tobit model marginal effects of reconstruction work on the latent dependent variable (i.e. the observed effect on violence for districts in class 2 equilibria). As expected, the magnitude of the effects of reconstruction projects on violence is reportedly higher when censoring is taken into account. Projects oriented towards the economy still have a statistically significant negative impact on violence, while health and infrastructure coefficients are not quite significant at the 10% level.

4.2 Nonlinearities

The impact of reconstruction work on community perceptions and, by extension, instability need not be constant over the duration of a project. Yet the above analysis implicitly assumes an even impact from project start to finish. If instead the impact of reconstruction on perceptions and violence is manifested in a nonlinear way, then we miss important causal relationships by testing only for average effects. In an effort to better understand the importance of project timing, and whether critical junctures exist over the lifecycle of a project, we explore some intuitive nonlinearities below.

It is possible that the impact of a project on community perceptions grows or declines over its duration.[13] Perhaps negative assessments are fostered as projects in controversial industries drag on, or perhaps optimism is strongest at a project's outset. In order to test these potential nonlinearities in the impact of reconstruction work over time, we distinguish between the first and latter half of each project. For each quarter, we compute mean projects in the first phase of completion, and also those in the second. Using the OLS fixed effects model, per capita violence is then regressed on each of fourteen

individual variances.

[13]Even the material progress of a project is unlikely to be even over its duration. Without further data on how resources are doled out over a given project, though, we must assume the pace of a given project is not lumpy.

sector-stage categories. An F-test of equality between coefficients pertaining to equivalent sectors (but different stages of production) fails to reject the null hypothesis that impact is unrelated to the stage of a project. A project's impact does not appear to monotonically trend over time.

A mapping of project impact as a function of progress could also be U-shaped, inverse U-shaped, or simply contain spikes or troughs. In what follows, we afford a special significance to project inceptions and completions. One might imagine the sudden presence of NATO forces digging up roads, or building a refugee camp, carries a symbolic value exceeding that achieved by toiling away at a months-old endeavour. Similarly, the completion of a school's construction may be emphasized by authorities to the public, via a ceremony or other means.

In Table 6 we test whether the endpoints of a project play a special role in influencing violence (controlling for mean projects).[14] Columns (1) and (2) explore whether the amount of recent project initiations affects violence; columns (3) and (4) explore project conclusions. In both the OLS and Tobit fixed effects models, the onsets of state-building and education projects appear to have significant effects. The launch of state-building projects is violence-reducing, while initiation of foreign-led education programs appears destabilizing. The initiation of health and economy-oriented projects is weakly significant only in the OLS specification, so we refrain from speculating on those effects. The impact of project completions is less clear. In the OLS model, state-building and education projects again appear significant, but this statistical power is lost as we move to the Tobit model in column (4). We thus conclude, the impact on violence of state-building and education work over the course of a project may be inverse U-shaped and U-shaped, respectively (or at least contains a trough and spike, respectively, at the point of project initiation). It is noteworthy these findings further substantiate our key theoretical claim that reconstruction can be

[14] In the interest of brevity, we omit the coefficients on mean projects. It is worth noting, however, the results in Panel B of Table 4 are upheld here.

either pacifying or destabilizing, contingent on the type of work. They also highlight the symbolic importance of projects (a project's initiation carries no extraordinary material significance).

Health, economy, and infrastructure projects may have constant effects on violence because they lend themselves to continuous acknowledgement by the community - they affect everyday life. State-building projects, however, are more emblematic for the general population (they are a mark of progress towards some end), and so it is natural that their impact is largest at such critical junctures as the launch and completion of the project. Education projects certainly affect everyday life, but the controversial nature of foreign involvement in education of domestic youth and females (CTC, 2007b) is likely to spark strong emotions at the outset of engagement, or the opening of a school for instance (at project's end). Our findings here suggest governments should be mindful of the manner in which development is perceived by the population. It may be that long-run pacifying effects of development outcomes are overshadowed by negative emotions evoked when projects are most apparent in the stage of implementation.

4.3 Conditionality

Previous work has sought to measure the impact of reconstruction work on violence in Iraq and Afghanistan (Berman et al. 2011, and Chou 2012, respectively) by focusing exclusively on projects under the Commander's Emergency Response Program (CERP). This restriction is justified by arguing the CERP naturally lends itself to conditionality - the notion that projects can be doled out and revoked by commanders on the basis of community cooperation in the fight against insurgents. No evidence for conditionality of CERP projects is offered though, nor any degree of conditionality above projects carried out under different programs. In Iraq, CERP projects have been shown to be somewhat effective in reducing violence; in Afghanistan this is not the case. To suggest why the effectiveness of CERP spending is not always apparent, we highlight the sectoral composition of projects. Figure 3 depicts national CERP and non-CERP project shares across sector groups. It is apparent that CERP projects are of a different sectoral composition than non-CERP projects. We suggest CERP spending has been violence reducing in Iraq not because of the conditionality critical to the information-provision theory espoused by previous work, but because of substance.

To test whether CERP projects are generally more peace-inducing than their counterparts, we divide reconstruction work into CERP and non-CERP categories. We next employ the OLS and Tobit fixed effects models to compare the impact of the CERP against other reconstruction programs. Neither general CERP projects, nor those carried out under other programs, significantly affect violence. An F-test of equality between the impact of CERP and non-CERP projects fails to reject the hypothesis that they are the same (p-value 0.43).

Further disaggregating both categories by sector group in Table 7 provides more evidence against the information-based theory. An F-test does reject that the impact of CERP and non-CERP projects is the same within each sector (p-value 0.01), based on the OLS results in column (1). However, the pacifying effects of reconstruction work we've thus far established (the beneficial impact of health and economy-oriented projects) seem to be driven entirely by *non*-CERP work. The CERP outperforms other reconstruction programs only in the community-building sector (albeit at a weak level of significance). The Tobit model in column (2) suggest infrastructure projects in the CERP may dampen violence, but economy-oriented projects have the reverse effect (both significant at the 10% level). The sole category which significantly reduces violence at the 5% level is again economy-oriented projects under non-CERP reconstruction. There is no evidence the CERP possesses special violence-reducing properties by virtue of its alleged conditionality. If anything, CERP programs appear to have much weaker effects on violence (in either direction) than their counterparts.

5 Conclusion

Departing from existing theoretical and empirical work, we test a model by Scoones & Child (2013) which places community preferences at the heart of insurgency. We analyze a unique dataset on reconstruction spending and violence in Afghanistan to shed light on the importance of the *type* of reconstruction work carried out. The total volume of reconstruction work does not have a meaningful effect on violence. Sector-wise, reconstruction projects do have a measurable impact. Moreover, projects in some sectors appear controversial in the view of the community (in the sense that they exacerbate violence), while projects in other sectors are pacifying. Critical junctures of project implementation have a measurable effect for highly symbolic sectors, further justifying our theoretical focus on perceptions rather than material (economic) outcomes. Lastly, our model outperforms those espousing conditionality as a central tenet of the success of reconstruction spending. We find no evidence that projects under the CERP are more successful at reducing violence than their counterparts. The sector in which reconstruction work is carried out remains the most relevant characteristic in determining outcomes of violence.

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Table 1: **Equilibria class**

Eqm class	R^*	S_b^*/S_g^*	α condition	γ condition
1	$1-\alpha\left(\frac{1+\theta(1+\gamma)}{\gamma-\theta(1+\gamma)}\right)$	$\frac{\gamma-\theta(1+\gamma)}{1+\theta(1+\gamma)}$	$\alpha < \frac{\gamma-\theta(1+\gamma)}{1+\theta(1+\gamma)}$	$\gamma > \frac{\alpha+\alpha\theta+\theta}{1-\theta-\alpha\theta}$
2	0	α	$\frac{\gamma-\theta(1+\gamma)}{1+\theta(1+\gamma)} < \alpha < \gamma$	$\frac{\alpha+\alpha\theta+\theta}{1-\theta-\alpha\theta} > \gamma > \alpha$
3	0	γ	$\gamma < \alpha$	$\alpha > \gamma$

Table 2: **Project Descriptions**

Sector groups are based on Afghanistan Standard Industrial Classification of Activities (ASIC) maintained by the Afghanistan Management Information Services (AIMS). Sector groups are at a broader level of aggregation than the ASIC categorization. Typical Project Types describe the most common projects falling under each sector group.

Sector Group	ASIC Sectors	Typical Project Types
Infrastructure	Agriculture, Energy, Environment, Transport	dams; irrigation; generators; roads; bridges
Health	Emergency Assistance, Health, Water & Sanitation	refugee camps; humanitarian relief; compensation; medical clinics; drinking water
State	Capacity Building, Governance, Security	district offices; ministries; judiciary; police; fortification of government buildings
Economy	Commerce & Industry	bazaar infrastructure; training workshops; startup grants
Education	Education	primary and secondary schools; school infrastructure; girls schools
Community	Community Development	women's empowerment; orphanages; community service; media; mosques
Unknown	Unknown	*projects which do not fit into any above category* according to ACSP personnel

Table 3: **Descriptive Statistics**

Data cover 225 districts across Afghanistan, and are gleaned from the WITS and ACSP databases. Means and standard errors are weighted by district population. WITS data are measured in terms of incidents per thousand inhabitants. Reconstruction data are measured in terms of mean concurrent projects per thousand inhabitants.

Variable	Obs	Mean	St. Dev.	Min	Max
WITS	4050	0.025	0.054	0	0.755
Total Projects	4050	0.237	0.545	0	20.122
Infrastructure	4050	0.069	0.423	0	19.964
Health	4050	0.025	0.065	0	1.563
State	4050	0.027	0.072	0	1.339
Economy	4050	0.006	0.017	0	0.189
Education	4050	0.101	0.320	0	3.550
Community	4050	0.006	0.021	0	0.312
Unknown	4050	0.002	0.011	0	0.297
CERP	4050	0.027	0.079	0	1.425

Table 4: **Violence and Reconstruction Projects**

Cross-sectional specification covers 398 districts across Afghanistan; panel specifications cover 225 districts. Data are gleaned from the WITS and ACSP databases. Time period controls are used in all specifications, and t- or z-statistics are reported in parentheses. Z-statistics are based on 500 bootstrap replications. In linear specifications, regressions are weighted by district population, and standard errors are clustered by district. Dependent variable is violent incidents per thousand inhabitants.

	(1)	(2)	(3)	(4)
Time Period Effects	Y	Y	Y	Y
District Fixed Effects		Y	Y	Y
Lagged Violence			Y	Y
Tobit MLE				Y
Panel A:				
Reconstruction	0.0101***	0.000453		
	(3.580)	(0.423)		
Constant	0.00705***	0.0127***		
	(4.086)	(6.087)		
R-squared	0.046	0.074		
Panel B:				
Infrastructure	0.00799***	0.00199*	0.00184*	0.00322
	(2.736)	(1.683)	(1.880)	(0.945)
Health	0.00356	-0.0213***	-0.0187***	-0.0295
	(0.851)	(-3.307)	(-3.591)	(-1.298)
State	0.192***	0.0185	0.0179	0.0772
	(3.609)	(0.595)	(0.639)	(1.487)
Economy	0.197**	-0.126*	-0.103*	-0.357**
	(2.257)	(-1.917)	(-1.807)	(-2.518)
Education	0.00242	-0.00466	-0.00384	0.00917
	(0.583)	(-0.576)	(-0.539)	(0.358)
Community	0.0467*	-0.0297	-0.0287	-0.0979
	(1.899)	(-0.848)	(-0.920)	(-0.675)
Unknown	0.0295	-0.0280	-0.0260	0.121
	(0.463)	(-0.454)	(-0.457)	(0.738)
Lag Violence			0.143***	0.137**
			(3.632)	(2.487)
Constant	0.00423***	0.0164***	0.0153***	-0.00396
	(2.605)	(8.799)	(8.448)	(-0.183)
R-squared	0.093	0.083	0.099	
Observations	7,164	4,050	4,050	4,050
Number of district	398	225	225	225

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5: **Mean Violence across Reconstruction Volume Quartiles**

Data cover 225 districts across Afghanistan, and are gleaned from the WITS and ACSP databases. District-demeaned average concurrent projects per thousand inhabitants are used to establish reconstruction quartiles. The average of district-demeaned violence per thousand inhabitants is then calculated for each sector-quartile. Two fields are omitted because no reconstruction values for those sectors exceed 50%, but not 75%, of other district-quarter volumes.

Sector	Mean Violence			
	1st Quartile	*2nd Quartile*	*3rd Quartile*	*4th Quartile*
Infrastructure	0.00120	0.00085	-0.00073	-0.00134
Health	0.00278	0.00135	0.00065	-0.00481*
State	-0.00244	-0.00025	0.00070	0.00199
Economy	0.00262	0.00099	-0.00011	-0.00435*
Education	0.00242	-0.00016	0.00015	-0.00242
Community	-0.00111	0.00010	–	0.00135
Unknown	-0.00129	0.00016	–	0.00255

Table 6: **Violence and Project Endpoints**

Data cover 225 districts across Afghanistan, and are gleaned from the WITS and ACSP databases. Time period controls are used in all specifications, and t- or z-statistics are reported in parentheses. Z-statistics are based on 500 bootstrap replications. In linear specifications, regressions are weighted by district population, and standard errors are clustered by district. Dependent variable is violent incidents per thousand inhabitants.

	Initiations		Completions	
	(1)	(2)	(3)	(4)
Project Volume Controls	Y	Y	Y	Y
Time Period Effects	Y	Y	Y	Y
District Fixed Effects	Y	Y	Y	Y
Lagged Violence	Y	Y	Y	Y
Tobit MLE		Y		Y
Infrastructure	-0.00131	-0.00392	-7.43e-05	-0.00226
	(-0.969)	(-0.272)	(-0.0386)	(-0.200)
Health	-0.0518*	-0.153	-0.00983	-0.0191
	(-1.940)	(-1.454)	(-1.491)	(-0.922)
State	-0.0832**	-0.163*	-0.0509**	-0.0428
	(-2.136)	(-1.773)	(-2.101)	(-0.451)
Economy	-0.0859*	0.0233	0.0280	0.191
	(-1.763)	(0.0935)	(0.506)	(0.840)
Education	0.0301**	0.103**	0.0381*	0.0380
	(2.452)	(2.249)	(1.845)	(0.702)
Community	-0.0202	-0.0562	0.0641	0.0697
	(-0.489)	(-0.412)	(0.955)	(0.391)
Unknown	0.0703	-0.0342	0.0409	0.0347
	(1.593)	(-0.235)	(0.996)	(0.309)
Lag Violence	0.142***	0.136**	0.140***	0.135***
	(3.639)	(2.483)	-3.629	(2.690)
Constant	0.0161***	-0.00158	0.0154***	-0.00376
	-9.089	(-0.0705)	-8.631	(-0.145)
Observations	4050	4050	4050	4050
R-squared	0.105		0.103	
Number of district	225	225	225	225

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 7: **Violence and Project Conditionality**

Data cover 225 districts across Afghanistan, and are gleaned from the WITS and ACSP databases. Time period controls are used in all specifications, and t- or z-statistics are reported in parentheses. Z-statistics are based on 500 bootstrap replications. In linear specifications, regressions are weighted by district population, and standard errors are clustered by district. Dependent variable is violent incidents per thousand inhabitants.

	CERP	Non-CERP	CERP	Non-CERP
	(1)		(2)	
Time Period Effects	Y		Y	
District Fixed Effects	Y		Y	
Lagged Violence	Y		Y	
Tobit MLE			Y	
Infrastructure	0.0253	0.00188**	-0.122	0.00415
	(0.462)	(1.996)	(-1.444)	(1.18)
Health	0.12	-0.0199***	0.0162	-0.0294
	(1.249)	(-4.006)	(0.07)	(-0.999)
State	-0.104	0.0307	-0.0628	0.12
	(-0.845)	(1.123)	(-0.334)	(1.493)
Economy	0.686*	-0.122**	1.213*	-0.436***
	(1.821)	(-2.358)	(1.721)	(-3.287)
Education	0.09	-0.0042	0.262	0.00212
	(0.96)	(-0.608)	(1.169)	(0.0845)
Community	-0.239*	-0.0312	-0.329	-0.0521
	(-1.765)	(-0.909)	(-0.846)	(-0.467)
Unknown	-0.0178	-0.0824	0.155	0.142
	(-0.247)	(-1.05)	(0.737)	(0.51)
Lag Violence		0.141***		0.130***
		(3.516)		(2.755)
Constant		0.0154***		-0.00215
		(8.576)		(-0.105)
Observations		4050		4050
R-squared		0.105		
Number of district		225		225

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Figure 1: **Three Class of Equilibria**

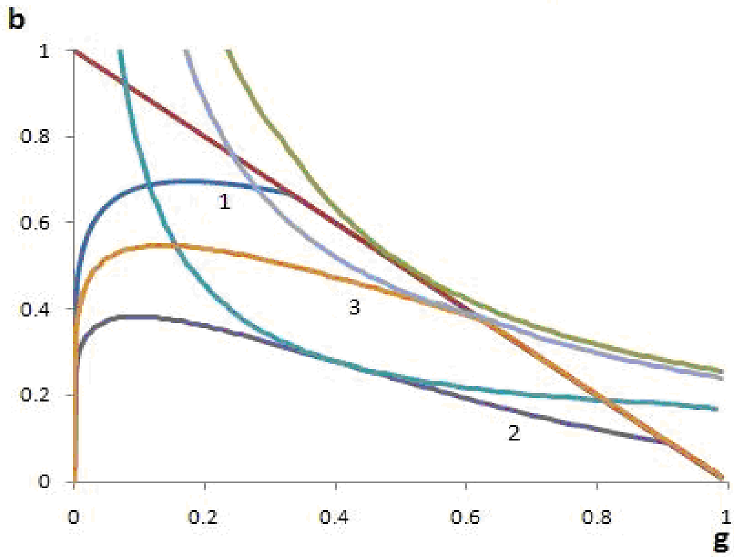

Figure 2: **Comparative Statics**

Figure 3: **CERP vs Non-CERP Project Types**