

Land Reform and Civil Conflict: Theory and Evidence from Peru

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Abstract: *How does land reform impact civil conflict? This article examines this question in the prominent case of Peru by leveraging original data on all land expropriations under military rule from 1969 to 1980 and event-level data from the Peruvian Truth and Reconciliation Commission on rural killings during Peru's internal conflict from 1980 to 2000. Using a geographic regression discontinuity design that takes advantage of Peru's regional approach to land reform through zones that did not entirely map onto major preexisting administrative boundaries, I find that greater land reform dampened subsequent conflict. Districts in core areas of land reform zones that received intense land reform witnessed less conflict relative to comparable districts in adjacent peripheral areas where less land reform occurred. Further tests suggest that land reform mitigated conflict by facilitating counterinsurgency and intelligence gathering, building local organizational capacity later used to deter violence, undercutting the Marxist left, and increasing opportunity costs to supporting armed groups.*

Replication Materials: The data and materials required to verify the computational reproducibility of the results, procedures and analyses in this article are available on the *American Journal of Political Science* Dataverse within the Harvard Dataverse Network, at: <https://doi.org/10.7910/DVN/KKQFKA>.

What is the relationship between land reform and civil conflict intensity? Many scholars argue that because land access is foundational to rural life, scarcity in access or inequality in the distribution of landholding can foment grievances and conflict (Paige 1975; Russett 1964). Land reform, as the chief policy tool to deliver land to the landless and thereby ameliorate land inequality and rural grievances, should therefore have the potential to mitigate rural unrest (Huntington 1968; Wood 2003). Recent empirical evidence, however, provides mixed support for this hypothesis (Albertus and Kaplan 2013; Finkel, Gehlbach, and Olsen 2015).

This article marshals original data on land expropriations and exploits a unique land reform program design to investigate how land reform impacted conflict in the prominent yet puzzling case of Peru. Peru had one of Latin America's broadest land reforms: A military government expropriated and redistributed half of all private agricultural land from 1969 to 1980. The brutal Shining Path

insurgency subsequently arose and killed roughly 70,000 people from 1980 to 2000, making Peru's internal conflict one of the most intense in Latin America's history (CVR 2004).

Scholars and policy makers alike see Peru's civil conflict as one of the great examples of the unintended consequences of social policy in Latin America in the last half century. Why did Shining Path gain strength in rural areas in the aftermath of extensive land reform? And how did the land reform impact patterns of conflict in the countryside?

In areas where inequality in rural social relations and landholding prevails, I argue that land reform should mitigate conflict when conducted at a sufficient scale. Small-scale land reform, relative to an absence of land reform, can exacerbate conflict by disrupting rural social hierarchy and order, raising but not meeting peasant expectations of land reform benefits, and generating local grievances between winners and losers. This is the grist

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that enables guerrilla groups to make inroads into communities by promising to fight for land access on behalf of losers. It simultaneously complicates the state's ability to conduct effective counterinsurgency: Civilian groups are more likely to be fractionalized than organized and are less likely to support the state, complicating intelligence gathering on rebels. More land reform intensity, however, can cauterize civil conflict that would otherwise transpire amid less reform. In high-intensity reform areas, the absence of popular grievances within and between communities given the lack of non-beneficiaries saps guerrilla groups of civilian support. A peasantry converted into landowners by the state also has strong incentives to support the state over anti-system insurgents, facilitating logistical and intelligence cooperation between civilians and the state in counterinsurgency. Finally, high-intensity land reform can cohere peasant communities, enhancing collective action potential that can be used to repel armed actors.

Given the broad scale of land reform in Peru, an analysis of the Peruvian case is best suited to test the differential impact of high land reform intensity over less land reform. Land reform occurred at low intensity in many areas and was much more intense in others. Very few districts where large landowners were powerful were completely untouched by the reform.

The analysis relies on original expropriation-level land reform data paired with event-level conflict data and a unique feature of Peru's land reform that enables a well-identified causal empirical analyses of the effects of land reform on conflict intensity. Land reform implementation occurred through "agrarian reform zones" that did not fully map onto major divisions in Peru's political geography and that were initially constructed for entirely different purposes linked to agricultural production a decade prior to reform. I utilize agrarian reform zone boundaries and their operational impact on land reform in a geographic regression discontinuity design that compares outlying "peripheral districts" in agrarian zones with "core districts" that are interior to an agrarian zone's core administrative area to determine how exposure to land reform treatment impacted subsequent violence under the Shining Path.

Contrary to the conclusions of some Peru scholars but consistent with early theoretical literature on land reform, I find that greater land reform is associated with lower conflict intensity. The palliative effect of land reform runs through a reduction in guerrilla attacks and a reduction in state armed actions after 1988. Further empirical tests suggest that land reform mitigated conflict by facilitating counterinsurgency and intelligence gathering once Peru's armed forces turned away from indiscriminate repression

in the late 1980s, and by facilitating civilian organizational capacity used to repel guerrillas. Land reform also undercut the legal Marxist left, Shining Path's chief ideological rival and a target of assassinations, and increased the opportunity costs of supporting armed groups.

Land Reform and Civil Conflict

Existing work typically hypothesizes a negative relationship between land reform and civil conflict. There are several main mechanisms. First, land reform policies can diminish guerrilla activity by restructuring land tenure patterns that are conducive to peasant support for rebels. Landlessness and wage labor often hold the most conflict potential (Huntington 1968). Landless peasants have little stake in the status quo and are therefore more likely than landholders to support radical social movements (Prosterman and Riedinger 1987).

Second, converting the landless or those with precarious land tenure into smallholders can reduce disparities between beneficiaries and existing landholders. Gross disparities in landholding inequality can fuel grievance and antipathy due to feelings of relative deprivation, injustice, or class-based animus (Huntington 1968). Redistributive land reform can ameliorate these grievances, complicating the ability of guerrilla groups to make inroads into communities by promising reform (Kalyvas 2006).

Finally, land reform increases the opportunity costs of joining or supporting armed groups. Compared to the landless, peasants with land may be unwilling to risk losing it by supporting anti-system insurgents (Wood 2003), especially if commodity prices are high or they have risk-sharing land tenure arrangements (Guardado 2018).

Empirical evidence, by contrast, points to mixed effects of land reform on conflict. Scholars and policy makers grappling with cases such as Brazil, Colombia, Iran, Italy, Peru, the Philippines, and Russia have reached varying conclusions regarding the failure of reform to deflate conflict. One hypothesis is that disparate policies, such as military repression (Mason 1998), or landowner capture or policy distortion (Finkel, Gehlbach, and Olsen 2015), can undermine land reform's efficacy. A second hypothesis holds that if the state does not maintain supplementary agrarian infrastructure such as irrigation and market access formerly provided by landlords, peasant earnings may fall despite receiving land, rendering them susceptible to insurgent appeals (Kapstein 2017). A third hypothesis is that land reform implementation—in particular, low-intensity, demand-driven reforms—can stoke conflict by providing incentives for would-be beneficiaries to

use violence to demonstrate need (Albertus, Bramor, and Ceneviva 2018; Albertus and Kaplan 2013).

While these important contributions have advanced the scholarly understanding of how land reform impacts conflict, critical gaps in knowledge remain. Part of the reason is empirical: Only a handful of studies have ever statistically examined local-level patterns of land distribution alongside event-level conflict data to assess competing hypotheses and alternative explanations at a very fine-grained level (e.g., Albertus, Bramor, and Ceneviva 2018; Finkel, Gehlbach, and Olsen 2015).

The other reasons lie at the juncture of theory and empirics. Even the most detailed empirical studies rarely examine “classic” top-down redistributive land reforms in which states prohibit certain forms of land tenure or create landholding ceilings (see Lipton 2009, chap. 3). Such programs account for 85% of all major land reforms since 1900 (Albertus 2015) and have affected roughly 1.5 billion people since World War I (Lipton 2009, 1). Illustrative examples include postrevolutionary Russia, Peru in the 1970s, Portugal under military rule in the mid-1970s, and Zimbabwe under Mugabe.

Furthermore, existing studies rarely connect land reform directly to the informational and operational relationships between the state, civilians, and rebel groups that are so central to conflict studies.

Building from existing work, I hypothesize that the effect of land reform on conflict should be conditional. Small-scale land reform may exacerbate conflict relative to districts unaffected by reform. Districts entirely unaffected by reform leave large landowners in place. These landowners can use their position at the apex of rural social relations to undermine workers’ capacity to organize violent resistance and coerce them into supporting the status quo (Rueschemeyer, Stephens, and Stephens 1992). Low-intensity reform “backfire” can occur by generating local grievances between winners and losers and by raising but not meeting peasant expectations, stoking resentment against the state. Guerrilla groups can use these grievances to make inroads into communities by promising to fight for land access on the part of losers. Patchwork, low-intensity land reform can also fractionalize communities, undermining collective organization that could be used to repel guerrillas and partner with the state in counterinsurgency.

Relative to low-intensity reform, more widespread land reform should dampen conflict. High-intensity land reform in a district largely or entirely removes traditional landowners and converts peasants into smallholders in blanket fashion. This leaves guerrilla groups fewer popular grievances to appeal to given few non-beneficiaries and raises the opportunity costs of conflict for peasants.

The social and economic importance of land reform also has the potential to rewire state–peasant relations. The physical and geographically disparate process of high-intensity land reform renders peasant populations more legible to the state and can create long-lasting links between government agencies and peasants through oversight, monitoring, and agricultural support such as credits, subsidies, and rural infrastructure projects. This can win peasant “hearts and minds” but can also be used coercively by the state to gain strategic leverage over peasant populations (Albertus 2015). Regardless, it provides a “hook” into rural areas that states can exploit for informational and logistical purposes during counterinsurgency.

Finally, high-intensity land reform—especially when implemented under communal tenure structures—can cohere peasant communities by creating shared experiences and gains to collectively petitioning the state for further support such as subsidies and credits. Collective action potential can then be activated for self-defense or collaborating with state forces during violent conflict.

Peru is particularly amenable to examining the differential effects of high land reform intensity relative to less land reform. Very few districts in the areas around agrarian reform zone core/periphery boundaries that I principally examine were unaffected by land reform. Many received high-intensity reform and others experienced less reform. Relative to privately held, non-communal agricultural land, the mean percentage of land redistributed was 34.6%.¹ This is even more impressive given that a portion of private land was held in small or medium-sized plots not subject to expropriation. In the core areas of land reform implementation, the government expropriated the majority of privately held agricultural land in nearly half of the districts. I consequently anticipate more land reform to *negatively* impact local civil conflict around the agrarian reform zone core/periphery boundaries that I mainly focus on below. But in Peru overall, the theory anticipates an inverted U-shape link between land reform and conflict: Low-intensity land reform can exacerbate conflict vis-à-vis no reform, but high-intensity land reform should mitigate conflict.

Land Reform and Civil Conflict in Peru

Peru’s economy until the 1960s largely revolved around land: According to census calculations, 50% of the

¹ Communal land was not subject to expropriation. I classify agricultural land that had already been redistributed by the 1972 census as previously pertaining to its former private owners.

economically active population in 1965 worked in agriculture. Demonstrating stark inequalities, however, the 1961 agricultural census documented that 1% of landowners held 80% of private land, whereas 83% of farmers held properties of 5 hectares or less, representing only 6% of private land. Land tenure relations varied widely but were archaic in many regions, especially in the semifeudal haciendas of the highland sierras.

A wide range of political entrepreneurs long appealed to peasants by promising land reform. Major redistributive land reform only occurred, however, once the military seized power from democratically elected president Fernando Belaúnde in an October 1968 coup. General Velasco's Decree Law 17716 in 1969 set strict landholding ceilings at 150 hectares or lower (depending on location) and expropriated land, capital assets, and animals on properties larger than the stipulated threshold. It typically redistributed expropriated land as cooperatives to former enterprise or hacienda workers who had labored on the property; in some cases, it also distributed land to adjacent indigenous communities living on marginal lands (Cleaves and Scurrah 1980; Mayer 2009).

Law 17716 drastically altered land tenure relationships and property ownership. It was implemented most rigorously from 1969 to 1976, after which land reform tapered precipitously due to the rise to power of General Morales Bermúdez and a severe late-1970s economic crisis.

The tail end of land reform in Peru coincided with the onset of major civil conflict. From 1980 to 2000, an estimated nearly 70,000 people were killed. Many more suffered from torture, imprisonment, rape, and displacement. The violence began with the guerrilla group Sendero Luminoso (Shining Path) seeking to bring down Peru's central government with a Maoist-style insurgency and to construct a form of agrarian communism rooted in indigenous peasant communities.

The Peruvian Truth and Reconciliation Commission (Comisión de Verdad y Reconciliación [CVR]) attributed slightly over half of all deaths to Shining Path activities. However, violence was exacerbated by a government crackdown on the rebels that snowballed into broad human rights violations, the rise of paramilitary groups and self-defense groups (especially *rondas campesinas*) that sought to repel guerrillas and at times government forces, and the development of additional, smaller guerrilla movements such as the Movimiento Revolucionario Túpac Amaru.

Numerous authors connect Shining Path's origins in the rural highland department of Ayacucho to deteriorating economic conditions in the late 1970s and a threat to subsistence (e.g., McClintock 1984; Palmer 1986). Infant

mortality was high, access to healthcare and public services was sparse, and growing university enrollment was met disproportionately with unemployment for graduates (McClintock 1998). Furthermore, government personnel declined during the early 1970s when the military regime was promising broad social and economic transformations (Palmer 1986). The CVR blamed this "status inconsistency" gap between expectations and realities for generating the conflict. This gap widened again in the late 1980s with runaway inflation and deep economic contraction, contributing in part to a spike of violence in the early 1990s. Furthermore, the radicalized faculty and outreach of the University of Huamanga in Ayacucho was critical to Shining Path's ideological platform and development of community support (Degregori 1990).

Although these accounts help explain the *origins* of Peru's internal conflict, what explains the *spread* of violence well beyond its origins? Shining Path was present in every department throughout the country by 1985. The scholarship on this question is rich. De la Calle and Sánchez-Cuenca (2009), for instance, argue that weak state capacity enabled Shining Path to form as a guerrilla insurgency and then expand dramatically, especially in mountainous areas where state control was weak and the military reaction was indiscriminate and disproportionate, driving peasants to side with Shining Path. La Serna (2012) argues that Shining Path made inroads into communities where peasants faced corrupt or ineffective local authorities who ignored their demands, and where indigenous peasants engaged in interethnic struggles over land, resources, and religious symbols.

One critical factor long hypothesized to have impacted the spread of Peru's internal conflict is the 1970s-era land reform, given its wide geographic scope and transformational economic and political consequences (Mason 1998; McClintock 1984; Seligmann 1995). Yet scholars disagree as to how—and in which direction—the land reform impacted conflict.

Peru's Agrarian Reform Zones

To examine the net effects of Peru's land reform on its civil conflict along with transmission mechanisms, I make use of a unique design feature of Peru's land reform: It was conducted through 12 regionally based agrarian reform zones covering the country. These zones did not generally map onto the borders of Peru's 24 departments or other major administrative borders. A thirteenth agrarian reform zone was created in 1974.

The agrarian reform zones were conceived and delimited for entirely different purposes a decade prior to

General Velasco's land reform.² Peru's Agrarian Research and Promotion Service (SIPA) first created them in 1960 to promote agricultural development, with technical support from the Organization for American States and US-AID. SIPA supported agricultural development and extension through research, experimentation, technical assistance such as introducing new crops, and promotion (e.g., market development). It took a regional approach to "incentivize the zonal diversification of agricultural production in order to maximize producer profits" and create regional economies of scale and expertise (SIPA 1967, 2). SIPA delineated 12 "agrarian zones" on the basis of "ecological conditions, social conditions, transportation routes, and access to markets" (SIPA 1967, 10). All but one transcended department borders.

A decade later, General Velasco's government grafted land reform implementation on top of existing agrarian zones and their operational offices for several reasons. First, creating an entirely new administrative structure would have threatened the reform's rapid rollout, which was key to eliminating powerful landowners before they could organize resistance (Albertus 2015, chap. 7). Second, the small number of zones had development and planning advantages: Zones would encompass swathes of expropriated haciendas along with smallholders and indigenous communities that could be reorganized into large cooperatives and vertically integrated into regional economic centers and national economic goals (García 1970, 392). Finally, the mandate for top-down control and careful selection of regional managers militated toward a small number of zones (Cleaves and Scurrah 1980).

When agrarian reform was routed through agrarian zones, it became operationally rooted in region-specific land reform offices for zonal reform implementation. These offices were centered in the highest-priority areas for land reform. They often operated out of department capitals, where they interfaced with local bureaucracies.

In practice, the utilization of agrarian zones led some areas to receive much more Ministry of Agriculture attention than others, even when these areas were adjacent and had similarly pervasive haciendas. Several contemporary accounts document a discontinuous shift in land reform "treatment" probability for districts within a given agrarian zone that were inside versus outside the core department where the agrarian zone (and regional land reform office) was centered, with districts in the zonal core more likely to experience land reform than districts "trapped" in the zonal periphery.

Echevarría (1978, 151), for instance, points out that "peripheral areas or provinces, other than the central department where the corresponding agrarian zone is located . . . receive little attention." Internal Ministry of Agriculture documents acknowledged that zonal training of land reform officials was limited and that resources were insufficient to train land reform officials in non-core areas (Ministry of Agriculture 1971). Interestingly, the cradle of the Shining Path insurgency—Ayacucho—was long carved up into agrarian zones centered in Ica, Huancavelica, and Arequipa.

To reiterate, districts in the department where the regional agrarian reform office was located within a given agrarian reform zone became the "core" part of the zone. Districts in other departments inside the zone that were not the host of the zone's central office were effectively deemed peripheral. This implies that there were not districts in the same department that belonged to different core/peripheral areas of the same agrarian reform zone. But districts in a single department could belong to different agrarian reform zones if that department was split between zones.

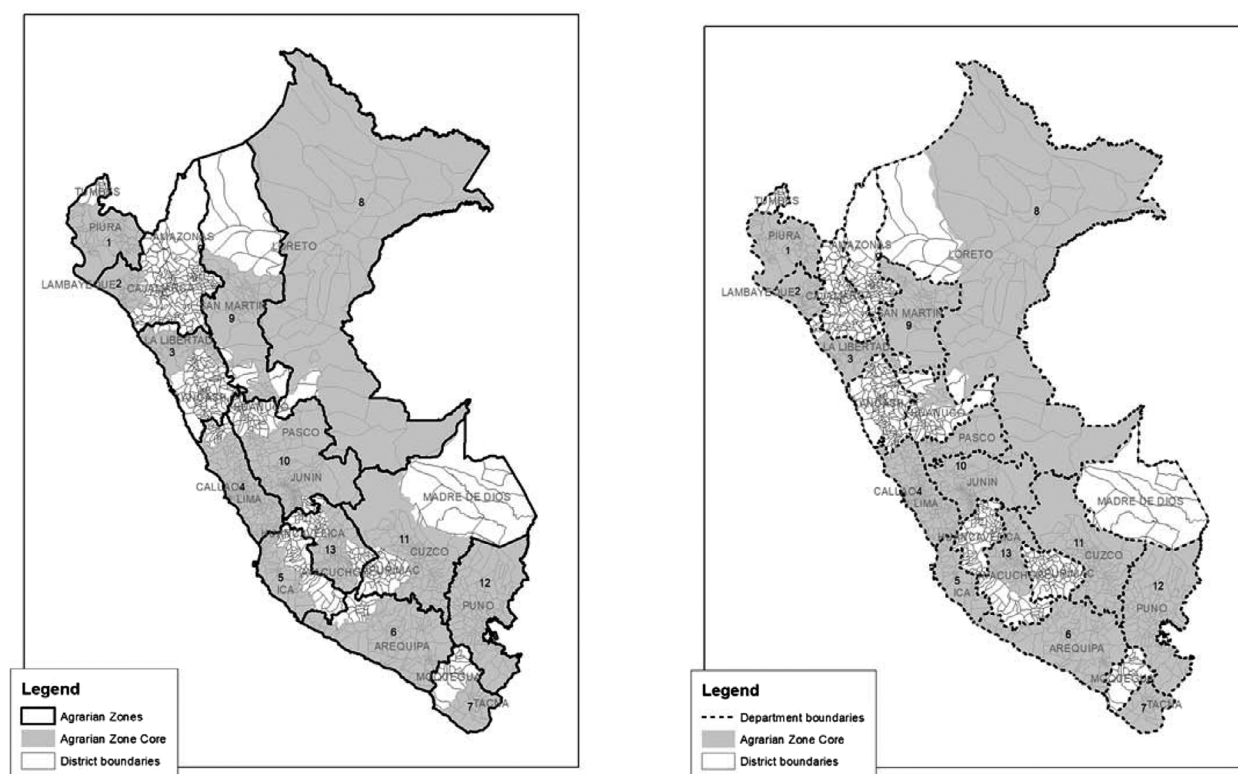
Figure 1 displays two maps of Peru that illustrate agrarian reform zone boundaries, core and peripheral zonal areas, and department boundaries. Figure 1 shows the final agrarian reform zone boundaries and numeric identifiers after Zone 13 split from Zone 10 in 1974—the only major zonal change during the reform.

The discrepancy between Peru's political-administrative divisions and its agrarian reform zones presents a unique opportunity to examine how land reform impacted later conflict intensity while avoiding common sources of bias due to confounders. Within a given agrarian reform zone, the assignment of districts to a zonal core or periphery in areas close to the core/periphery geographic boundary can be viewed as quasi-random. Indeed, districts located close to these borders are statistically indistinguishable from their counterparts on the other side of the border.

However, identification in this case requires an additional assumption given that the core/periphery boundaries trace department boundaries: the compound treatment irrelevance assumption (Keele and Titiunik 2015). I return to this below, but it is important to underscore that Peru is a unitary country and had a high degree of centralization before and throughout this period. Departments had common institutions and served as administrative units of the central government.

Departments do matter, however, for implementing central government policy initiatives. There is a department-level bureaucracy with department-level knowledge suited to local policy implementation. For a

²See the supporting information (SI) for more details on agrarian reform zone origins, consequences, and operation.

FIGURE 1 Agrarian Reform Zones in Peru

Note: Boldfaced solid lines indicate agrarian reform zone boundaries (left subfigure). Dotted lines indicate department boundaries (right subfigure). Departments are labeled. Shaded areas of the maps cover districts in a zonal core, and the white areas cover districts in a zonal periphery.

typical agrarian zone spanning multiple departments, this implies that the central government directed the core department to deploy its administrative apparatus to implement land reform in concert with zonal Ministry of Agriculture bureaucrats to a greater degree than neighboring peripheral departments. Peripheral areas within agrarian reform zones *were therefore not administrative peripheries overall in Peru, but only in the context of the agrarian reform zone geography used for land reform implementation.*

Data

To test the effects of land reform on the conduct of Peru's civil conflict, I analyze data on the distance of districts to the nearest geographic boundary between an agrarian reform zone's core and periphery; the proportion of a district's land redistributed from 1969 to 1980; data on conflict events, victims, and perpetrators from 1980 to 2000; and covariates such as state capacity. The unit of analysis is the district. I aggregate variable values to dis-

trict boundaries at the time land reform began and also create several composite units of districts where large expropriated properties spanned district boundaries. This yields 1,571 districts.

Agrarian Reform Zones and the Extent of Land Reform

A district's exposure to land reform treatment is determined by whether it is located in the core department of an agrarian reform zone or in a peripheral area. To construct agrarian reform zone boundaries and to determine whether districts were located in the core or periphery of an agrarian reform zone, I accessed district-level maps constructed by Peru's Ministry of Agriculture for land reform implementation. I scanned these maps and georeferenced them to current maps. This yielded information on which agrarian reform zone a district is located within, whether a district is in a zonal core or periphery, and the distance between a district's centroid and nearest agrarian reform zone core/periphery boundary.

In practice, although the likelihood of a district's receiving land reform shifted discontinuously when moving from outside to inside an agrarian reform zone's core, the probability of reform did not shift from 0 to 1: Some peripheral districts received land reform and some core districts did not. In the context of a regression discontinuity, this scenario calls for specifying a variable for potential land reform treatment to capture the land reform "take-up" effect.

To capture land reform take-up, I constructed an original data set that registers all land expropriations from 1969 to 1980. This data set documents nearly 21,000 expropriations covering 11 million hectares of land in active private use, abandoned or long-fallowed private land, and agriculturally unproductive (often public) land (*eriazos*). In collaboration with a Peruvian research team, these expropriations were identified in a comprehensive search through publications of the official government daily, *El Peruano*. *El Peruano* published all supreme decrees, supreme resolutions, and ministerial resolutions that expropriated individual properties. These decrees and resolutions contain information regarding the property owner, district location, and amount of land expropriated.

The variable I construct captures the share of a district's land redistributed via the main land reform legislation from 1969 to 1980. This variable includes land in active private use (74.6% of land distributed) and abandoned or long-fallowed private land (12.2% of land distributed).³

Figure 2a depicts the geographical distribution of land reform. Land expropriations are spread across Peru's 24 departments, though the areas most affected were northern coastal departments and the southern highlands.

In the core districts of agrarian reform zones included in the analyses below, the mean percentage of land redistributed represents 41.4% of privately held, non-communal land. For core districts within 50 kilometers of the core/periphery boundary, redistribution averages 52.9% of privately held, non-communal land. For peripheral districts within 50 kilometers of the boundary, comparable redistribution averages 37.8% of land.

³Remaining lands were agriculturally unproductive and typically public (13.2% of land distributed) and were covered by different legislation than private lands. I also tested a second land reform intensity measure capturing the value of land redistributed per capita. Results were similar (see the SI).

Conflict

The main dependent variables capture civil conflict intensity, though below I also examine the establishment of local guerrilla control. Conflict intensity data are from Peru's Truth and Reconciliation Commission (CVR), a well-funded organization run by reputable commissioners. Following Peru's conflict, the CVR collected evidence and testimonies of human rights abuses through various regional centers. Documented human rights abuses include murders, forced disappearances, extrajudicial killings, illegal detentions, kidnappings, forced recruitment, torture, rape, and woundings. This information was centralized and cross-checked for consistency, veracity, and duplicates, with the help of top academics and young professionals. The CVR gathered testimonies for several years and ultimately published several detailed conflict databases in 2004. These databases are widely viewed as the most comprehensive accounts of Peru's internal conflict.

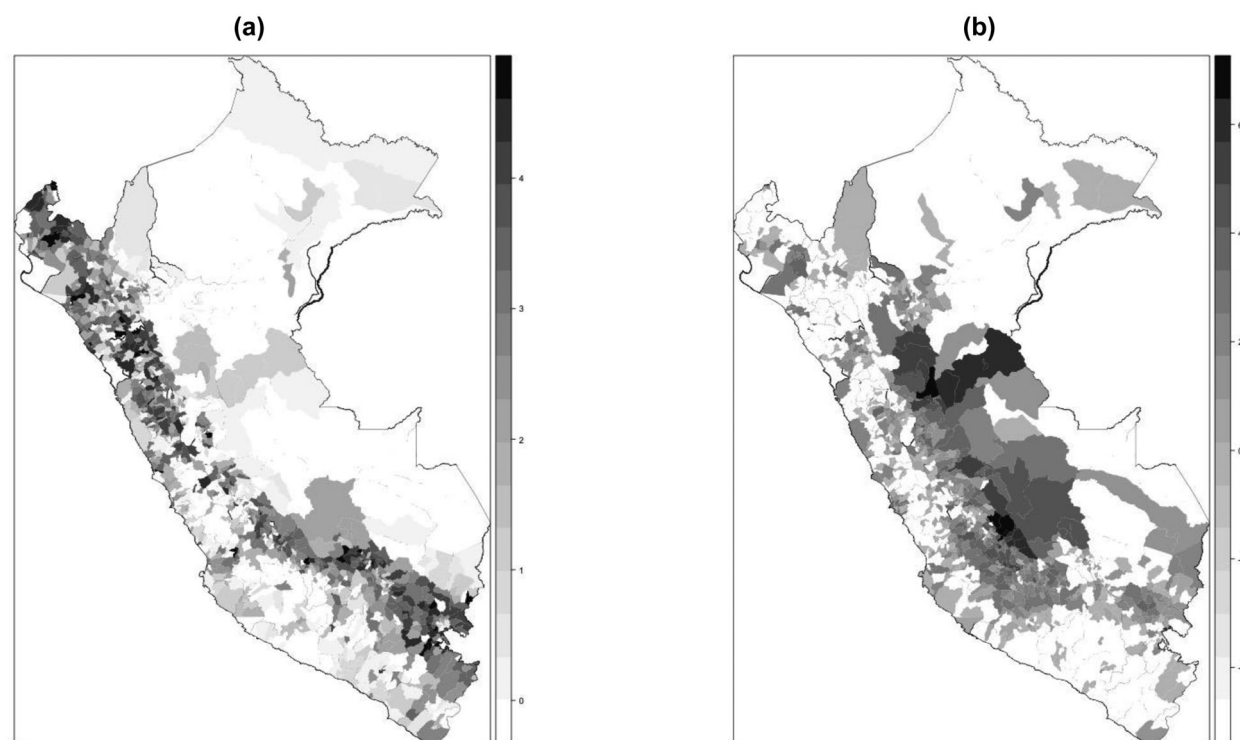
The main analyses employ an event-level database that codifies attacks by government forces, guerrilla groups, self-defense groups, paramilitaries, and civilian or other groups. These events consist of one or more acts of violence within a clearly established geographical location and specific date and with a clear sequence of events and protagonists. These events also identify the number and characteristics of victims, types of violence involved, and the district where the event occurred. Consequently, I also examine conflict deaths.

Figure 2b maps the geographical distribution of total attacks by armed actors from 1980 to 2000. Conflict events occurred in all departments. Some departments, however, saw more conflict than others, with Ayacucho, Junín, and Huánuco particularly hard hit. Yet conflict varied substantially in intensity across districts in these departments, and there was also considerable conflict in other regions.

Covariates

I also gathered data on covariates relevant to conflict and land reform activity. Data on these covariates serve two functions: to aid in assessing balance across districts on either side of the agrarian reform zone core/periphery boundary and to control for any residual imbalance attributed to differences between these groups of districts that could confound the findings.

The first covariate is district population size from the 1972 population census. Since the dependent variable captures the number of conflict events and conflict

FIGURE 2 Land Reform and Civil Conflict in Peru

(a) Log percent land area expropriated by district, 1969–80. (b) Log total attacks by district, 1980–2000

victims, it may take higher values where populations are larger.

A second set of variables captures several dimensions of state capacity. The first is road density, which taps coercive capacity and is calculated as the number of meters of roads per square kilometer. Greater road penetration enables the state to extend control and deploy the military more easily, reducing conflict. Road density data are calculated via GIS using a 1973 Peruvian map of road networks produced by the national Touring and Automobile Club and the Banco de Crédito del Perú.

To measure state administrative capacity, I use the number of state employees per district calculated from the 1961 census. State employees are individuals who worked for a government entity or agency and received a salary or commission for that work. Examples include members of the Civil Guard, Republican Guard, and Investigative Police. I log this variable to normalize its distribution.

Because the projection of state power can vary by terrain, I include district elevation and average terrain slope. These variables are calculated on the basis of satellite data from the Food and Agriculture Organization's Global Agro-Ecological Zones database. Insurgents may be better able to hide and conduct attacks in rough, mountainous terrain. Indeed, Shining Path spread north from

Ayacucho in remote high-elevation *puna* areas where insurgents understood the territory.

The data set also includes several variables for district land characteristics. The first is district area from the National Statistics Institute. Larger districts present greater land area for potential contestation and for expropriation. The second is the percentage of land that is cultivable, which raises the value of contestation over property. This variable is calculated from the Global Agro-Ecological Zones database using five arc-minute grid cells averaged within districts. A third land-related variable is the number of hectares of land under private ownership from the 1972 agricultural census, adjusted for pre-1972 land expropriations. This variable captures the potential stock of land available for reform.

The final variables capture the potential for conflict dynamics. The first is whether a district is located in the colonial-era *mita* catchment zone, a geographic region within the highlands that was under a forced mining labor regimen. Haciendas were less likely to develop within this region. Data are constructed from Dell (2010). This variable also links to state extractive capacity.

The second variable capturing conflict dynamics measures conflictive social movements prior to the late 1960s. This helps to account for possible persistence in

conflict over time and whether land reform was delivered to areas with a greater propensity for violence. For instance, two movements that greatly concerned elites and the military were an Andean guerrilla campaign in 1965 and land invasions from 1963 to 1964. I construct this variable from Kammann (1982), who details rural social movements, their causes, and participants dating from Peru's independence from Spain until the late-1960s. Most conflictive movements are documented from the 1920s to 1960s.

Research Design

The analyses utilize a regression discontinuity design (RD). In an RD design, units with a score above a given cutoff receive treatment, whereas those below the cutoff do not. Provided units just above and just below the cutoff are not abruptly different, these two groups of units near the cutoff can be compared to study the causal effect of treatment on some outcome subject to some assumptions.

In the present context, the unit of analysis is the district and a district's exposure to land reform treatment is determined by whether it is located in the core department of an agrarian reform zone. Consequently, land reform treatment depends on the distance of a district to an agrarian reform zone core/periphery boundary (the score): Districts with negative scores located outside a zonal core do not receive land reform, whereas districts inside a zonal core with a positive score do. An RD design enables an examination of the (local) average effect at the boundary of land reform exposure on subsequent civil conflict.

The discontinuity I examine is fuzzy rather than sharp: The likelihood of a district receiving land reform shifted discontinuously, but not from 0 to 1, from outside to inside an agrarian reform zone core. This fuzzy parameter is estimated as the ratio of two sharp RD effects: the effect of treatment assignment on the outcome (intention-to-treat effect) and the effect of treatment received on the outcome (take-up effect) using two-stage least-squares methods. I define the estimand as follows:

$$\tau_{FRD} = \frac{\lim_{x \downarrow 0} \mathbb{E}(Y_i | X_i = x) - \lim_{x \uparrow 0} \mathbb{E}(Y_i | X_i = x)}{\lim_{x \downarrow 0} \mathbb{E}(D_i | X_i = x) - \lim_{x \uparrow 0} \mathbb{E}(D_i | X_i = x)}, \quad (1)$$

where τ_{FRD} identifies the effect of land reform exposure on conflict, Y_i is the conflict outcome observed in each district i , D_i is a variable for potential land reform treatment, and X_i is the distance from each district's

centroid to the agrarian reform zonal core/periphery boundary.

I use nonparametric local polynomial methods to fit two separate regression functions, one above and one below the cutoff (Imbens and Lemieux 2008). The estimated RD effect is calculated as the difference between the two separate regression intercepts. I utilize local linear regression to estimate the following:

$$Y_i = \alpha + \widehat{\tau_{FRD}} C_i + \beta_1 Z_i + \beta_2 X_i + \beta_3 C_i \cdot X_i + \varepsilon, \quad (2)$$

where C_i is an indicator for land reform treatment exposure coded 1 when a district is within an agrarian reform zone core, X_i is located within a bandwidth b of the agrarian reform zonal core boundary, and Z_i is a vector of covariates.

Importantly, I estimate the first-stage treatment equation for τ_{FRD} using D_i as an instrument, measured as the proportion of a district's land area that is affected by land reform, while including other exogenous covariates.⁴

Following Cattaneo, Idrobo, and Titiunik (2018), the local linear regressions I estimate employ weights calculated by applying a triangular kernel function to the distance between each unit's score and the cutoff. This requires choosing a bandwidth for implementation. I draw on methods developed by Calonico, Cattaneo, and Titiunik (2014) to choose an optimal bandwidth that minimizes mean squared error (MSE), while employing robust confidence intervals that account for the asymptotic bias ignored by conventional inference in the context of MSE minimization. Observations outside the bandwidth receive zero weight. I use separate MSE-optimal bandwidth selectors below and above the cutoff since peripheral areas within agrarian zones tend to be smaller than core areas. Finally, because land reform and conflict may exhibit cluster dependence, I cluster standard errors by department.⁵

For theoretical consistency and clean empirical identification, the analysis restricts the sample to agrarian reform zones where (1) the major land reform legislation applied, (2) reform zone boundaries did not change, and (3) there was both a core and peripheral area. The first criterion eliminates Zones 8 and 9. These sparsely populated Amazon jungle zones were not covered by the military's 1969 Decree Law 17716; land reform in these zones mainly focused on colonizing public lands. The second criteria eliminates the initial Zone 10, which was

⁴Although D_i is continuous rather than binary in this case, τ_{FRD} will still converge to the ratio of limits in Equation (1) (see, e.g., Dong, Lee, and Gou 2018). Results are similar when D_i is binary and equal to 1 when over half a district's land is reformed (see the SI).

⁵Results are similar clustering standard errors by agrarian zone.

TABLE 1 Summary Statistics

Variable	Mean	Std. Dev.	Min.	Max.	N
Distance to ag. zone core (km)	27.74	112.07	−987.89	775.23	1,571
Land reform (prop. of district area)	0.14	0.24	0	1	1,571
Total attacks	7.82	37.87	0	661	1,571
Total deaths	14.03	77.25	0	1981	1,571
Population (ths.)	7.60	17.99	0	230.81	1,571
Road density	34.97	67.57	0	992.94	1,571
State personnel	2.68	1.46	0	8.37	1,571
Elevation (ths. of meters)	2.69	1.45	0	5.12	1,571
Slope (degrees)	5.66	3.67	0	19.53	1,571
Cultivable land (% area)	7.02	9.20	0	90.00	1,571
Land area (hds. sq. km)	8.17	27.48	0.02	516.69	1,571
Inside mita zone	0.33	0.47	0	1	1,571
Previous social movements	0.15	0.75	0	13	1,571
Private land area (ths. ha.)	12.21	71.20	0	2680.50	1,571

later split into two zones (Zones 10 and 13). The status of some districts as core or peripheral in this zone shifted over time. The third criteria eliminates Zone 12 (Puno). Puno was the only agrarian reform zone whose boundaries aligned entirely with its department boundaries; it therefore had no within-zone peripheral districts. I also drop the most urban districts from the sample where land reform was less relevant and especially high state capacity could drive results.⁶

Results

First, I provide results that test balance on covariates across the RD threshold, which is important for identification. Second, I discuss issues tied to compound treatments. Third, I provide the main RD results. Finally, I conduct a set of placebo tests.

Testing Covariate Balance across the Threshold

The RD approach taken here assumes that all relevant factors other than treatment vary smoothly at the agrarian reform zonal core boundary. This identification assumption is required for districts located just outside a zonal core to be appropriate counterfactuals for districts located just inside a zonal core. To assess this assumption,

I estimate “placebo” RD effects across the following district characteristics: population size, road density, state personnel, elevation, slope, percentage of cultivable land area, district area, whether or not a district is located in the *mita* catchment zone, prior social movements, and privately held land area. These tests use local linear estimation with a two-sided MSE-optimal bandwidth and robust confidence intervals.⁷

Table 2 presents the results for these covariates. There is no evidence of a treatment effect for any covariates except slope. Balance is therefore similar to what one would expect if the treatment had been randomly assigned. Given that the covariates vary smoothly around the cutoff, this supports the RD continuity assumptions that are key for a valid RD design.

Compound Treatment Irrelevance

Whereas districts in the same department can belong to different agrarian reform zones (if a given department is split between zones), districts in the same department *cannot* belong to different core/peripheral areas of the same agrarian reform zone. Consequently, the core/periphery boundary within an agrarian reform zone always traces department boundaries. This raises the potential for compound treatment effects along the department borders that constitute core/periphery boundaries within agrarian reform zones.

⁶These are districts with populations greater than 75,000. Results are similar including them (see the SI).

⁷The density of distance from the zonal core is continuous at the cutoff (see the SI).

TABLE 2 Covariate Balance Across Agrarian Reform Zonal Core Boundary

	Estimated Difference	p-value	Bandwidth [Left, Right]	Treated Obs.	Control Obs.
Population	1.71	0.50	[64.33, 49.69]	198	259
Road density	0.26	0.77	[35.81, 41.30]	166	162
State personnel	−0.04	0.69	[60.49, 64.29]	235	253
Elevation	−0.53	0.23	[60.87, 48.35]	196	253
Slope	−2.76**	0.01	[25.16, 41.85]	168	121
Cultivable land	−0.48	0.35	[38.90, 38.93]	158	179
District area	0.59	0.55	[35.74, 37.16]	149	162
Mita zone	−0.39	0.14	[109.31, 72.09]	258	375
Prior social movements	0.04	0.18	[27.48, 23.81]	90	132
Private land area	16.00	0.23	[43.32, 158.43]	401	193

Note: Running variable is distance from agrarian reform zonal core boundary. Columns 3–5 report the main optimal bandwidth on either side of the cutoff, the number of treated observations within the bandwidth, and the number of control observations within the bandwidth.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ (two-tailed).

As Keele and Titunik (2015, 135–36) observe, “The presence of compound treatments is very common in GRD [geographic regression discontinuity] designs.” Given that the nature of this RD does not enable isolating a single treatment, which is often difficult, identification requires invoking an additional assumption: the compound treatment irrelevance assumption (see Keele and Titunik 2015, 133–36). This assumption is analogous to the exclusion restriction in instrumental variables contexts in that, like an instrument, the irrelevance assumption requires that the only feature of geographic units that affects the outcome is the treatment of interest (Keele and Titunik 2015, 136, note 8). Like the exclusion restriction, this cannot be completely verified. However, both theory and a range of empirical tests can probe the likelihood that compound treatments along the core/periphery boundary are driving the RD results in this particular case.

Table 3 presents a series of “most likely” potential compound treatments tied to department borders at the RD boundary that could directly impact conflict. The table also presents a summary of theoretical and empirical evidence on these effects. The supporting information contains the primary underlying evidence.

In assessing the potential compound treatments in Table 3 and the appropriateness of the irrelevance assumption in this case, it is critical to recognize that Peru is a unitary state. Peruvian departments before and throughout this period were policy takers with common institutions; they were administrative units of the central government (Arce 2014, 140 note 3). With the exception of a brief period from 1990 to 1992, the central government directly appointed governors from before the land

reform until after the conflict.⁸ Their position was “largely limited to supervising the implementation of the central government’s programmes” (Mauceri 1997, 907).

Taxation and spending were conducted nationally. Indeed, Peru ranked near the lowest of all Latin American countries on expenditure decentralization (Monaldi 2010, 202).

Velasco’s land reform reflects this centralization: it was designed and implemented from Lima by a unified military command without regional input (Cleaves and Scurrah 1980). Furthermore, the judiciary was centralized and lacked independence, and the police were eclipsed by the more centralized, largely autonomous military in fighting the counterinsurgency and largely patrolled urban areas far from the hinterlands. Judicial and police jurisdictions that traced departmental boundaries were unimportant in the conflict.

The historiography on the delineation of Peru’s departmental borders supports the lack of early and long-standing border discontinuities or consequential jurisdictions that could drive the findings (see the SI). Departments were long based on population centers rather than territoriality that tightly incorporated hinterlands. Consequently, as Table 3 indicates, districts around department borders do not exhibit discontinuous jumps in state presence, schooling, or other indicators that could impact violence. Furthermore, Table 2 demonstrates that rural unrest was similar in districts across core/periphery boundaries *prior to* the land reform when other “irrelevant” treatments operated.

⁸Even from 1990–1992, transfers to regions were withheld, undermining governors.

TABLE 3 Assessing Potential Compound Treatments at RD Boundary

Potential Compound Treatments at Boundary	Evidence of Irrelevance
Role of governors	Theoretical: Governors appointed by president (except 1990–92); principal role to supervise implementation of central government policy Empirical: Results robust to dropping conflict from years governors elected
Judicial jurisdictions	Theoretical: Judicial independence from executive low; within-judiciary autonomy from superiors very low; regional jurisdictional authority very low (and only at appeals level for departments); no consistent or effective oversight over military and counterinsurgency
Police jurisdictions	Theoretical: Counterinsurgency largely run by centralized and autonomous military; police driven into patrolling urban centers away from zonal core/periphery boundaries
State capacity	Empirical: Balance tests indicate no discontinuous jumps in historical caudillo presence, autonomous communal uprisings, Spanish-language penetration, and state personnel
Quality and penetration of schooling	Empirical: Balance tests indicate no discontinuous jumps in illiteracy, Spanish-language penetration

Note: See the SI for further evidence and sources on each of these factors.

Although Table 3 does not obviate the need to invoke the compound treatment irrelevance assumption, it provides important and consistent suggestive evidence that compound treatments along the RD boundary are not driving the results in this particular case.

The Effect of Land Reform on Civil Conflict Intensity and Guerrilla Control

Table 4 presents the main RD results. These results take into account the geographical nature of the discontinuity in three complementary ways. First, following Dell (2010), I estimate a polynomial function that controls for smooth functions of geographic location. I model this using a second-order polynomial in latitude and longitude. Second, I introduce controls for latitude and longitude coordinates of the nearest point along the zonal border cutoff. Third, following Dell (2010), I modify the regression model expressed in Equation (2) to include boundary segment fixed effects. These segments correspond to the boundaries separating each agrarian reform zone core from its periphery.

Civil Conflict Intensity. The first column of Table 4 reports the baseline results for land reform exposure on overall civil conflict intensity. The first-stage results show that the effect of treatment assignment on actual treatment status is statistically significant and in the expected direction. When a district is just inside an agrarian reform zonal core, 9.5% more of its land area is subjected to land reform on average than when it is just outside an agrarian reform zonal core.

The column 1 treatment effect indicates that when a district is barely inside an agrarian reform zonal core, it experiences on average 11.7 fewer overall attacks than when it is barely outside the core.

Column 2 of Table 4 includes the Table 2 covariates to account for any residual imbalance. If the covariates are properly balanced, their inclusion should increase the RD estimator's precision without substantially affecting its consistency. Indeed, the treatment effect estimates remain stable in column 2 while the confidence interval tightens.

Column 3 uses total conflict deaths rather than attacks as the dependent variable. The results are consistent: Zonal core districts experience an estimated 35.6 fewer conflict deaths than districts just outside a zonal core.

Guerrilla Control. Did land reform exposure also diminish the probability that Shining Path controlled certain areas versus others? Guerrilla control entails the displacement of the state and an ability to shape local social life and conduct operations. At its peak around 1989, Shining Path controlled about 25% of Peru's districts (McClintock 1998, 73–81). This figure comes from what McClintock (1998, 80) calls “the best (although imperfect) indicator” for guerrilla control: “the ability of the guerrillas to prevent official elections from being held in the area.” It is based on the percentage of districts that lacked mayors after the 1989 district-level elections because (1) there were no candidates for mayor; (2) elections were not held; (3) elections were cancelled because more than two-thirds of the votes cast were invalid; (4) the elected mayor was assassinated; or (5) the elected mayor

TABLE 4 RD Effect of Land Reform on Total Conflict Events

Land reform measure:	Prop. land area redistributed	Prop. land area redistributed	Prop. land area redistributed	Prop. land area redistributed	Prop. land area redistributed
Dependent variable:	Total attacks	Total attacks	Conflict deaths	Guerrilla control (no mayor in 1989)	Guerrilla control (> 3 attacks)
Treatment Effect Estimate	−11.704** (0.043)	−12.176** (0.011)	−35.598** (0.032)	−1.759* (0.084)	−0.456* (0.085)
First-Stage Estimate	0.095** (0.020)	0.102*** (0.002)	0.104*** (0.001)	0.111*** (0.001)	0.096*** (0.006)
Bandwidth [Left, Right]	[34.45, 39.82]	[33.32, 47.48]	[31.05, 44.43]	[34.10, 68.28]	[35.86, 51.03]
Treated Observations	161	192	177	247	203
Control Observations	161	154	144	157	162
Geographic Controls	Yes	Yes	Yes	Yes	Yes
Includes Covariates	No	Yes	Yes	Yes	Yes

Note: Running variable is distance from agrarian reform zonal core boundary. Robust p-values in parentheses. Each model reports the main optimal bandwidth on either side of the cutoff, the number of treated observations within the bandwidth, and the number of control observations within the bandwidth. Geographic controls include a second-order polynomial in district latitude and longitude, the latitude and longitude coordinates of the nearest point along the zonal border cutoff, and boundary segment fixed effects.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ (two-tailed).

abandoned the post after being elected, typically due to threats by guerrillas.

I constructed district-level data on the nonrenewal of mayors from Pareja and Gatti (1990). Column 4 of Table 4 indicates that greater land reform mitigated not only conflict intensity but also the likelihood of local guerrilla control.

Because this control measure, like any from the conflict, is imperfect, I construct another proxy from active presence indicators. This proxy codes guerrilla control where guerrillas were able to mount three or more attacks during the time period. This is the 80th percentile of guerrilla attacks, which corresponds closely to the figure above accepted by many experts of the conflict. Guerrillas likely had a more robust command infrastructure where they were able to mount attacks repeatedly. The column 5 results again indicate a negative impact of land reform on guerrilla control.

Placebo Tests

To demonstrate that the research design is not simply uncovering a false positive or reflecting an anomaly of the data structure, I next conduct a set of placebo tests.

I first conduct tests to ensure that the RD is unable to uncover effects at a location other than the true boundary line (Imbens and Lemieux 2008). In particular, I create “placebo” cutoffs on either side of the true boundary line and rerun the regressions using these alternative cutoffs. The results are displayed in columns 1–7 of Table 5. Aside

from cutoffs very close to the true boundary at 2 km distant—which should behave similarly given that the treatment exhibits a discontinuity at the cutoff but is continuous rather than discrete—none of the alternative placebo borders return significant second-stage results.⁹

I also conduct a separate placebo test that exploits the fact that uncultivable lands (*eriazos*) were distributed differently than cultivable land in Peru’s land reform. Uncultivable land was classified as land not cultivated or occupied due to a lack or excess of water. Most was arid land that the government sought to incorporate into agriculture through large-scale irrigation works. A substantial portion was held by municipalities, state-owned enterprises, and other government bodies. Because it was smaller in extent and more readily identifiable and transferable by the government, this land was not subject to the same discontinuity in reform intensity across agrarian reform zonal core/periphery boundaries. Neither did land reform on uncultivable lands displace large landowners or center on properties farmed with residential serf-like tenants, mitigating its relevance for conflict. Column 8 bears this out.

As a final placebo test, I examine whether, as anticipated, there is no discernible difference in land reform across agrarian reform zone periphery/periphery boundaries. There are several boundaries within agrarian reform zones where a “peripheral” department borders

⁹ At 5 km inside the true border, land reform is greater but attacks are short of statistical significance, likely given the larger and noisier sample. See the SI for additional tests.

TABLE 5 Placebo Tests

	15 km Outside	5 km Outside	2 km Outside	True Boundary	2 km Inside	5 km Inside	15 km Inside	Land Reform Treatment: Uncult. Land	Ag. Zone 2 Periph/Periph Boundary
Treatment Effect Estimate	-4.433 (0.230)	15.942 (0.408)	-15.518** (0.037)	-12.176** (0.011)	-9.261** (0.010)	-3.651 (0.375)	113.800 (0.821)	784.56 (0.900)	178.42 (0.868)
First-Stage Estimate	-0.092** (0.035)	-0.044 (0.284)	0.072* (0.050)	0.102*** (0.002)	0.123*** (0.000)	0.143*** (0.000)	0.004 (0.896)	-0.002 (0.182)	0.004 (0.912)
Bandwidth (Left)	55.03	51.15	37.04	33.32	32.50	32.52	44.65	26.28	30.43
Bandwidth (Right)	49.74	44.99	46.90	47.48	49.74	66.87	51.44	44.87	28.51
Treated Observations	209	177	177	192	207	244	183	177	29
Control Observations	206	219	180	154	142	143	195	123	34

Notes: Running variable is distance from agrarian reform zonal core boundary in columns 4 and 8 and distance to the placebo boundary indicated for columns 1-3 and 5-7. In last column, running variable is distance from Agrarian Zone 2 periphery/periphery boundary between Cajamarca and Amazonas/La Libertad. Robust p-values in parentheses. All models include the full set of geographic controls and covariates. Each model reports the main optimal bandwidth on either side of the cutoff, the number of treated observations within the bandwidth, and the number of control observations within the bandwidth. The last column uses the zonal periphery/periphery as the cutoff.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ (two-tailed).

another peripheral department. The longest such boundary is in Agrarian Zone 2, where the eastern border of Cajamarca abuts the western boundary of Amazonas and Bolívar province in La Libertad (see Figure 1). Column 9 demonstrates that treating the Cajamarca side as a placebo agrarian reform zone core reveals no discontinuity in land reform intensity or conflict.

Mechanisms Linking Land Reform and Conflict

The main results indicate a robust, causal relationship between land reform and less conflict. But what processes drove this relationship? Table 6 demonstrates that land reform had critical consequences for counterinsurgency strategy and success, civilian organization, ideological competition between guerrillas and the legal Marxist left, and opportunity costs to join the conflict.¹⁰ The Table 6 models follow the same setup as the Table 4 models and therefore include all Table 2 covariates.

The Peruvian government largely ignored Shining Path in its first several years of operation. But in 1983, President Belaúnde radically shifted tactics, declaring five Ayacucho provinces emergency zones and granting the armed forces administrative control (Palmer 1986, 129). Security personnel flooded the streets, civil liberties were suspended, and human rights violations skyrocketed (Strong 1992). Peru's armed forces and police ini-

tially knew little about the rural environment they faced and used indiscriminate repression rather than targeted counterinsurgency, driving peasants toward supporting guerrillas (de la Calle and Sánchez-Cuenca 2009; Mason 1998). President García tried to crack down on human rights violations and prioritized investment in rural areas after his 1985 election—including a dramatic expansion in credits and loans to peasant farmers (McClintock 2001, 92), many of whom were land reform beneficiaries. But his antagonism to the military backfired as it dialed back its efforts and Shining Path grew.

García placed the military back in charge of counterinsurgency in 1988. The state's strategy critically shifted in 1989 to coordinating their actions with organized civilian self-defense groups and *rondas campesinas* and to targeted intelligence gathering. After all, peasants in many places were openly hostile to Shining Path, which assassinated peasant leaders and forcibly recruited civilians. García began promoting *rondas* vigorously, publicly handing over guns, cash aid, and tractors to communities that had begun to organize and turn against Shining Path (Taylor 1998, 49–50). García also created an antiterrorist police unit that gathered intelligence and infiltrated Shining Path's secretive, tight-knit operational cells.

Alberto Fujimori was elected in 1990. He quickly doubled down on García's counterintelligence investments and blanketed roughly half the country in emergency zones. The military unleashed a barrage of violence against insurgents and in some areas forced peasants into *rondas* (McClintock 1999, 237; Schubiger and Sulmont 2019, 62–63). While human rights violations continued, however, selected military commanders innovated more effective “hearts and minds” strategies

¹⁰See the SI for descriptive statistics on the Table 6 dependent variables.

TABLE 6 Mechanisms

Dependent Variable	Treatment Effect Estimate	First-Stage Estimate	Bandwidth (Left)	Bandwidth (Right)	Treated Observations	Control Observations
Panel A: Counterinsurgency and Government Strategy						
Deaths from Guerrilla Forces, 1980-1988	-10.156* (0.064)	0.105*** (0.000)	31.74	55.53	215	147
Deaths from Guerrilla Forces, 1989-2000	-4.246** (0.031)	0.095*** (0.006)	36.17	51.37	205	164
Deaths from State Forces, 1980-1988	-2.042 (0.527)	0.086** (0.011)	39.32	54.53	212	181
Deaths from State Forces, 1989-2000	-11.010** (0.010)	0.120*** (0.000)	31.66	74.64	265	146
Emergency Zone Declaration	-2.191** (0.037)	0.106*** (0.002)	21.03	49.30	164	85
Panel B: Civilian Organization						
Participation in <i>Ronda Campesina</i>	1.070** (0.046)	0.096*** (0.005)	33.55	39.34	157	156
Participation in Producer Organization	-0.462 (0.289)	0.076* (0.078)	40.94	40.25	161	186
Panel C: Ideological Competition						
Marxist Vote, 1980	-0.316* (0.092)	0.103*** (0.000)	36.34	65.71	237	164
Panel D: Opportunity Costs						
Total Attacks in Districts Higher than 1500m in Elevation	-14.339** (0.011)	0.122*** (0.002)	28.36	35.26	91	121
Total Attacks in Districts Higher than 2500m in Elevation	-16.015** (0.025)	0.120** (0.032)	21.97	48.29	108	81

Note: Running variable is distance from agrarian reform zonal core boundary. Robust p-values in parentheses. All models include covariates and the full set of geographic controls. Each model reports the main optimal bandwidth on either side of the cutoff, the number of treated observations within the bandwidth, and the number of control observations within the bandwidth.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ (two-tailed).

in key theaters. For instance, military units in Junín provided military and economic aid to communities that formed *rondas* and provided counterinsurgency intelligence (Taylor 1998, 50). These tactics dovetailed with the capture of top-level Sendero commanders, including Abimael Guzmán, to dismantle Sendero's core by the mid-1990s and effectively destroy it by 2000.

Panel A of Table 6 indicates that land reform played an important role in counterinsurgency. Throughout the period, and especially in the 1980s as land beneficiaries received more government support through longstanding government links (e.g., through the Agrarian Bank), areas of greater land reform were better equipped to rebuff

Shining Path and had more to lose economically by supporting them. The military could also operate more easily in these communities given government ties. Government forces intervened in and used some land reform cooperatives as military outposts (CVR 2004, Annex 1, 267).

Land reform is therefore tied to fewer deaths by guerrilla hands. But the armed forces initially meted out indiscriminate violence against civilians. Only when the government shifted to targeted counterinsurgency and a "hearts and minds" strategy after 1988 did land reform communities become valued as critical partners and deaths at the hands of government forces plummeted. Finally, because of stronger government links to land reform

zones, these zones were less likely to be declared as emergency zones during the height of the crisis since the state had other, more effective means of fighting insurgents in these areas. Data on emergency zones are coded from Strong (1992).

Panel B examines how land reform impacted rural civilian organization. I use data from the 1994 agricultural census on participation rates in *rondas campesinas* and other agricultural producer organizations for the dependent variables. This is the most comprehensive source of such data. As anticipated, land reform is tied to greater participation in a *ronda campesina* but not other producer organizations. This again suggests an important and unique counterinsurgency link. The unique position of land reform communities vis-à-vis the government through agencies that provided credits, subsidies, and inputs to land reform beneficiaries made it easier for the government to force or entice these communities into *rondas campesinas*.

Panel C investigates an electoral link between land reform and conflict. The left grew sizably in the late 1970s and became enmeshed in internal debates over whether to participate in electoral democracy. While Shining Path decided to reject elections, much of the left embraced them. The legal left in Peru “competed directly with Sendero for the same resources and recruits” (Ron 2001, 584), prompting Shining Path to launch a campaign of terror to assassinate leftist leaders and co-opt their resources and recruits. This was particularly true of the Marxist left, which was ideologically closest to Shining Path and represented a chief competitor (Gorriti 1999, 93). Parties like the United Left (IU), a popular Marxist party that emphasized its commitment to the poor, criticized Shining Path’s tactics and vigorously supported electoral politics.

Land reform stemmed support for the Marxist left where it was implemented most intensely, mitigating violent intra-left competition and guerrilla incursions into areas that electorally supported the Marxist left. First, Marxist parties had greater electoral success in marginal regions such as Ayacucho that the military regime left relatively neglected through the land reform (McClintock 1984, 55–66). Second, the military was explicitly anti-communist, and the corporatist peasant union (the CNA) it created and pushed land reform beneficiaries to join bled support from its independent Marxist-led rival, the CCP, in the run-up to elections reinstituting democracy in 1980 (McClintock 1984, 79–80).

Panel C demonstrates that greater exposure to land reform was indeed associated with a smaller vote share for Marxist parties in the 1980 elections that returned Peru to

democracy.¹¹ Electoral data are from the Jurado Nacional de Elecciones.

Panel D examines heterogeneous spatial effects of land reform on conflict events to examine an opportunity cost mechanism. Large coastal enterprises growing capital-intensive and export-oriented crops were quickly expropriated and converted into cooperatives during the land reform. Enterprise workers got a bigger share of cooperative profits than in highlands areas characterized by labor-intensive agriculture since coastal land and production were more valuable (Caballero and Alvarez 1980).

Consequently, land reform in coastal areas should have inoculated peasants against Shining Path’s appeals to a greater degree than in the highlands (McClintock 1984).

The Panel D models examine the effect of land reform in highlands areas above 1,500 meters and, separately, above 2,500 meters. The coefficient magnitudes are slightly larger than those in column 2 of Table 4, but, critically, attacks were nearly *twice as numerous* at high elevations within the sample. Consistent with many accounts, then, and the raw Figure 2 patterns, land reform inoculated against violence more effectively on the coast. This is consistent with an opportunity cost mechanism.

Toward a Broader Understanding of Land Reform and Conflict

Recall the broader theoretical expectation of an inverted U-shaped relationship between land reform and conflict. The RD evidence is only one, albeit important, piece of this that indicates that land reform, when undertaken broadly, can decrease rural conflict intensity and the likelihood of state challengers gaining local control. I next conduct negative binomial analyses on conflict events across all Peru’s districts covered by Decree Law 17716 to provide a more global picture of the conflict. This analysis also reveals the direct impact of factors that may have affected Peru’s conflict writ large but were balanced along agrarian reform zone core/periphery boundaries.

The analyses use total attacks as the dependent variable. The key independent variables are linear and quadratic terms for the district-level proportion of land

¹¹I use Chamber of Deputies valid vote share for the UI, UNIR, UDP, PRT, and Fenatraca; this last group, while not strictly Marxist, gathered leftist peasant organizations that Shining Path also sought to mobilize. I do not include FOCEP, a small party that folded quickly after the 1980 elections and therefore did not represent a major competitor to Shining Path.

TABLE 7 Land Reform and Conflict Across Peru

Sample:	All Districts	Southern Highlands	Northern Coast
	Model 1	Model 2	Model 3
Land Reform	1.832*** (0.631)	2.601*** (0.814)	4.544** (2.263)
Land Reform Squared	−1.464** (0.730)	−2.317** (0.917)	−5.490** (2.429)
Population	0.041*** (0.005)	0.031*** (0.009)	0.034*** (0.006)
Road Density	−0.003*** (0.001)	−0.005*** (0.001)	0.003 (0.003)
State Personnel	0.161*** (0.038)	0.205*** (0.057)	0.046 (0.082)
Elevation	0.148** (0.066)	−0.122 (0.096)	0.684 (1.077)
Slope	−0.005 (0.018)	−0.050** (0.023)	0.070 (0.202)
Cultivable Land	0.004 (0.007)	0.008 (0.011)	0.013 (0.015)
District Area	0.033*** (0.006)	0.034*** (0.007)	0.079*** (0.020)
Mita Zone	−0.238 (0.233)	0.147 (0.271)	
Prior Social Movements	0.018 (0.072)	0.160* (0.084)	−0.367** (0.166)
Private Land Area	−0.000 (0.002)	−0.002 (0.003)	0.005 (0.008)
Department Fixed Effects	YES	YES	YES
Observations	1445	646	167

Notes: Dependent variable is total attacks. Models are estimated with a negative binomial specification. Standard errors in parentheses. Constants are not shown. Southern highlands in Model 2 includes the departments of Ayacucho, Apurímac, Arequipa, Cusco, Junín, Huancavelica, and Puno. Northern coast in Model 3 includes districts under 2,000 meters elevation in the departments of Ancash, Lambayeque, La Libertad, Lima, and Piura.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ (two-tailed).

redistributed. The analyses include the Table 2 covariates and department fixed effects.

Table 7 provides the results. Model 1 encompasses all districts. As expected, the linear term for land reform is positive and its square is negative. Land reform is positively associated with conflict intensity at low levels, but the marginal impact of greater land reform at high levels mitigates conflict. Larger and more populous districts unsurprisingly saw more conflict. Interestingly, road density is negatively linked to conflict, perhaps due to facilitating troop deployment, whereas state personnel are positively

linked to conflict, likely because they represented guerrilla targets (McClintock 1998).

Model 2 examines strictly the southern highlands where Shining Path originated. The land reform coefficients are even larger in magnitude, and the ratio of the square term coefficient to linear term coefficient is higher, indicating that the negative marginal effect of land reform on conflict kicked in at lower levels here. Interestingly, prior social movements are linked to later conflict.

Model 3 examines strictly northern coastal districts where capital-intensive agriculture dominated. Again, the land reform coefficients are larger and the square/linear term coefficient ratio is higher. The negative marginal effect of land reform on conflict therefore operated earliest on the northern coast—a finding consistent with the opportunity cost mechanism in Table 6. State capacity measures are insignificant, but the prior social movements variable is negative and significant, indicating that previous patterns of political violence were broken during the land reform.

Conclusion

Beyond speaking in new ways to existing scholarship on one of Latin America's most brutal conflicts, this article adds several contributions to the broader literatures on land reform and on civil conflict. First, it demonstrates that major social policies such as land reform can impact civilian organization, which is critical in fighting guerrillas. Second, because of variation in the Peruvian state's counterinsurgency tactics over time, it aids in connecting typical accounts of grievances to state–peasant relations that can be leveraged for informational and logistical purposes during counterinsurgency. Third, it shows that because land reform is a transformational social and economic policy, it can have profound political effects that impact the constraints and opportunities that guerrillas face in terms of resources and recruitment.

These insights can potentially enhance the understanding of conflict dynamics between rural dwellers, insurgents, and the state in other countries where land reform has coincided with or immediately preceded rural conflict. There are at least 28 such civil wars from 1945 to 2009, ranging from immediate post-WWII cases such as China, India, and Myanmar to Cold War cases like Cuba, El Salvador, Iran, and Iraq, to contemporary civil wars in Colombia and the Philippines (see the SI). Furthermore, insights here could also apply to a broader range of countries with widespread rural unrest (e.g., land

invasions and rural militias) that does not meet the civil war threshold.

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Supporting Information

Additional supporting information may be found online in the Supporting Information section at the end of the article.

Section I: Land Reform and Civil War Globally

Section II: Additional Details on Peru's Agrarian Reform Zones

Section III: Compound Treatment Irrelevance Assumption at Departmental Borders

Section IV: Further Testing RD Design Validity

Section V: RD Plots

Section VI: Additional Robustness Tests

Section VII: Additional Placebo Boundary Tests

Section VIII: Additional Descriptive Statistics