REBELS, RESOURCES AND REPRESSION

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ABSTRACT

CHELSEA LEIGH ESTANCONA: Rebels, Resources and Repression
(Under the direction of Navin Bapat.)

This paper addresses the question of how natural resources affect rebel and state strategic behavior toward noncombatants at the municipal level. Extant research demonstrates the importance of natural resources for conflict onset, severity, and duration but an analysis of *how* rebel groups capitalize on resource wealth and *how* the state minimizes resulting rebel capacity remains lacking. I suggest that the labor needed for the state or rebels to profit from certain resources is the missing mechanism for understanding this interaction. I propose a 3-player sequential game between the state, rebels, and civilians to evaluate when rebels form economic relationships with civilians and when the state preempts this cooperation with indiscriminate violence. Initial conclusions from the model suggest that the state's provision of public goods and the value of the natural resource in question have important implications for when highly local state repression occurs in intrastate conflicts.

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Introduction

The presence of natural resources is correlated with civil war onset, increased conflict duration, and high levels of conflict severity (Lujala 2010). Despite these observations, scholars have been unable to identify a causal relationship between natural resources and civil war processes. Particularly, we are unaware of *how* rebels' access to resources changes their conflict behavior. I suggest that previous work fails to consider the civilians necessary for maintaining or maximizing a group's natural resource endowments. Specifically, I consider the importance of mobile, non-landowners engaged in the production of the primary commodities that supplement either rebel or state income.

I argue that rebels compel or encourage action from the non-combatants connected to the production of certain resources, and that the character and economic decisions of these individuals will affect the survival, territorial growth and capacity of the armed group. I also argue that, under certain circumstances, the state will attempt to dissuade civilian laborers from supporting rebels by preemptively employing indiscriminate violence. The state is particularly concerned about situations where the value of a labor-driven resource is high or increasing, leading to rapid growth in rebels' funding and military capacity. However, engaging in indiscriminate violence is at minimum inefficient, and at most can negatively impact the state in the future of the conflict. My primary research question, then, is *when does the state perceive that rebels will benefit substantially enough from obtaining access to labor-based resources to merit the risk of using indiscriminate violence?*

Given this strategic interaction between state, rebels, and civilians, it is appropriate to apply a formal model to understand each actor's preferences, expected actions, and beliefs about possible outcomes. This paper proceeds in the following sections. First, I outline the motivating literature and the basis of my theory. I then discuss the setup of the formal model and include a discussion of all parameters. In the fourth section, I include an

incomplete information solution of the game, and present comparative statics for how certain variables affect the overall outcome as well as hypotheses for empirically testing these implications. The fifth section outlines the brief, illustrative case of the Peruvian state and Sendero Luminoso, and the sixth concludes.

Theory and Hypotheses

My argument builds on substantial literature about the role of natural resources in intrastate conflict, but applies a highly disaggregated level of analysis and reintroduces the state's decision calculus over contested natural resources. Initial scholarship on resources in conflict used state-level measures of oil endowments to examine if states with natural resources experience more conflict, (Collier and Hoeffler 2004; Fearon 2005; Fearon and Laitin 2003; Douma 2001; Berdal and Malone 2000) finding that, indeed, resource rich states tend to be more conflict prone. These authors propose two explanations - either resource endowments occur in weak states that are less able to contain rebellion, or the prospect of financial gain sufficiently offsets the costs of fighting for rebels. Neither argument is fully explored, and at the state level, the presence of natural resources would appear to have the same effect in either circumstance. Scholars then began to disaggregate the different types of resources accessible to non-state actors to better understand whether resource type matters for conflict duration and severity (Ross 2004; Lujala 2009, 2010). Through case studies, Ross (2004) presents the idea that rebel groups are forward thinking and able to tailor their strategies according to resource type. Lujala predominantly finds correlation between types of resources and conflict duration, which reinforces the idea that resource type matters for rebel-state dynamics. These papers hypothesize that accessibility to different resource types influences a rebel group's ability to profit from them, thus prolonging their capacity to engage in conflict, but do not present a theory of how rebels are able to gain and maintain control of certain resources.

The most recent literature disaggregates even further by looking at the micro-foundations of armed group finance (Myres 2012), levels of competition between armed groups over access to resource-based funding (Fjelde and Nilsson 2012), and the specific market con-

ditions of intrastate war economies (Arnson and Zartman 2005). The implication of these diverse arguments is that rebels' funding choices are based not only on resource type, but also on the external actors that influence their level of access to such resources. Beardsley and McQuinn (2009) most closely address this topic by proposing a helpful framework for understanding how a group's aims and access to efficient financial returns affect its relationship with supporters. They do not, however, consider how the state similarly affects rebel choices, or how the state interacts with non-combatants in relation to the conflict. In summary, scholars have identified that resources affect rebels' cost-benefit analysis of deciding to participate in conflict, that different types of resources are correlated with differing levels of severity and lengths of conflict duration, and that rebels are forward-thinking and strategic about their resource endowments. Despite the focus on rebel groups in the recent literature, it is also necessary to consider how rebel groups' actions affect the state's gains or losses of income from these primary commodities.

My theory contributes to existing research first by examining the competition for natural resources at the highly local, disaggregated level. I apply existing bargaining models of conflict to rebel/state competition over civilian economic support, thus also introducing an important third player. Pinpointing the importance of the individuals necessary to produce key natural resources allows for the consideration of two different bargaining processes: between the rebels and the civilians with whom they seek to cooperate, and between the state and the non-combatants they govern. I offer an explanation of rebel group and state strategy at the municipal level based on rebel access to labor-intensive natural resources, in particular those that allow rebels to seize additional territory by maintaining functional ownership of land.

It is important to note that these labor-based resources are distinct from 'lootable' resources traditionally considered in the civil war literature. Ongoing, sustained civilian relationships are needed to gain or maximize profits from labor-based resources, which implies a level of investment from the state or rebel group collecting these profits that is absent from lootable resources. I consider labor-intensive resources to be those that require significant amounts of labor to fully profit from controlling the resource. Thus, examples of these

laborers of include but are not limited to drug crop growers, farmers of legal agricultural commodities, or gemstone miners. Such civilians are primarily interested in the return on their investment and maintaining a form of 'job security', regardless of their support for the rebels' political or ideological goals. In order to increase their financial supply and territorial holdings, rebels must sufficiently appease or intimidate these civilians into shifting their loyalty[1] away from the state.

Rebels aim to establish and maintain this funding relationship at the lowest possible cost, using any surplus for attacks against the state. This process of allocating resources to civilians resembles Acemoglu and Robinson's (2001) formal explanation of how authoritarian state leaders maintain support over time. The authors' theory is about political transitions and redistribution of goods at the state level, but the concept of redistribution as a commitment to future action can be transformed into a general theory of how financial resources are an investment in future loyalty. Empirically, the rebels are most likely applying a mix of 'carrots and sticks' to induce laborers to participate in production. For the first steps of this paper, I simplify the rebel 'offer' to civilians as a positive inducement (explained in detail in the next section). Examining rebels use of 'carrots' rather than sticks follows Wood's (2014) argument that reliance on civilian support minimizes an insurgency's use of indiscriminate victimization. This decision also reflects the idea that participation in illicit economies with rebel protection may, in fact, be more profitable to civilians than legal, state-sanctioned economic activity. The value of maintaining loyalty to the state versus engaging with rebel forces differs in distinct districts or municipalities. In particular, a rebel 'offer' of future economic gain is profitable in areas where the state is unable or unwilling to provide public goods to maintain civilian loyalty.

The state, meanwhile, can observe the presence of natural resources and the level of local rebel attacks, but not the negotiations between rebels and civilians as rebels seek to move into a specific area. Group access to civilian support affords substantial increases in capital and military power, and when a state anticipates this increase, it will seek to

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[1] Again, this need not be support for the rebels' goals, but rather support in the form of economic participation and a willingness to allow rebel action within the civilians' home municipality.

prevent rebels from expanding their territorial and economic holdings. As Powell (2006) explains, preemptive war occurs when actors anticipate a change in the balance of power that makes them unable to commit to maintaining peace in the future. Thus, states can be expected to take strong measures, even if costly, to prevent civilians from investing in rebel groups as a guard against increasing levels of rebel attacks through the course of a conflict. States that seek to preempt or prevent a rebel/civilian relationship from forming in a given municipality are guarding not only against rebel gains but also their own losses, as rebel access to a resource inherently implies a state's loss of the same territory and commodity endowments.

It is worth noting that resources such as oil or gas deposits are unlikely to attract civilian participation and thus preemptive state violence against civilians, as initial investment in the necessary technology and skills usually requires significant and stable capital and ownership of land. Thus, these industries are often tied to state support early on, and are unlikely to be swayed in favor of the rebels, as their value for the status quo and stability is high. For other, labor-intensive resources, early and decisive state action should be especially evident when expected returns for the rebels are very high. This follows Carter's (2010) argument that key territorial gains are endogenous to the balance of military capabilities and, thus, the onset of interstate conflict. In particular, control of natural resources with sharply increasing prices would allow the rebels to rapidly alter the balance of power as their amount of capital grows exponentially. This may be particularly important for illicit crop production, where the state cannot easily anticipate rapid fluctuations in price, and also will lose taxable income as legal crops are replaced by illegal ones. The state, meanwhile, will particularly want to maintain control of legal commodities that are increasing in value. Thus, in the model, one parameter of interest reflects how expected changes in resource values (those that rebels can access vs. those that states can access) affect rebel probability of victory and the state's willingness to continue local investment to civilians to maintain access to resource taxation or extortion.

The expectation of preemptive action is also consistent with literature on state repression, which suggests that such action occurs when a state is sufficiently threatened by the prospect of political upheaval to merit coercive action as a preventative strategy (Davenport

2007; Ritter 2014). Although this paper focuses on resources in civil war, my theory also forwards our knowledge of what drives repression or civilian victimization in conflict more broadly. The role of repression in the context of an ongoing conflict is particularly under-investigated. Most extant research focuses on the circumstances under which we observe civilian victimization from either conflict actor and stresses the relationship between capacity and civilian victimization, but does not fully address how targeting civilians then affects group or state capabilities. In particular, an investigation of how resource-based economies and the profits states are able to gain from a certain region have not yet influenced studies of local-level indiscriminate violence. Fielding and Shortland (2012), for example, use the Peruvian civil war to highlight that civilian victimization is reciprocal and suggest that either side terrorizes civilians in an effort to coerce action, but do not make claims about the type of action or the effects of gaining civilian 'support.' Wood distinguishes between situations of positive feedback and negative feedback in discussing reciprocal civilian victimization. He finds that weak insurgent groups rely on civilian targeting rather than provision of security or services to compel action and are even more likely to do so following state repression, but that stronger groups attempt to distinguish themselves from a repressive state by providing 'carrots' when possible. Wood (2014) then also points to the importance of resource endowments by suggesting that the source of financial support influences levels of insurgent violence against civilians, but does not connect this finding to state response or overall insurgent success.

Davenport (2007) suggests that better investigation of state beliefs about what repression or indiscriminate violence accomplishes, as well as disaggregation within states and by shorter time periods, is a necessary step for understanding when and why states repress. This paper partially tackles both of these issues. Of course, the state's actions to prevent this civilian/rebel relationship are not necessarily violent or repressive, but for the simplicity of the current model, they are assumed to be such, as states are gambling between using indiscriminate violence as a tool to deter all possible civilian economic support and waiting to fight rebels more directly. Earl (2011) discusses the assumption in the literature that repression is most often seen in the face of action that is seen to be particularly threatening

to the state or the leadership of a state's future. It follows, then, that states would respond to opportunities for rebel groups to increase their capacity to threaten the state with violent, indiscriminate action against the broad group of actors that might allow the group to do so. This also reflects the idea that developing lucrative local economic opportunities or continuing to provide public goods (carrots rather than sticks) is both time consuming and costly, and states will likely seek quicker and cheaper methods to compel civilian activity (Fielding and Shortland 2012). Particularly for locales without lucrative primary commodities to offset the costs of maintaining civilian loyalty through public goods, the state will be more likely to choose violent or repressive tactics. The interplay between public goods provision and the value of natural resources for the state and rebels is highlighted in the next section, where I introduce the formal model.

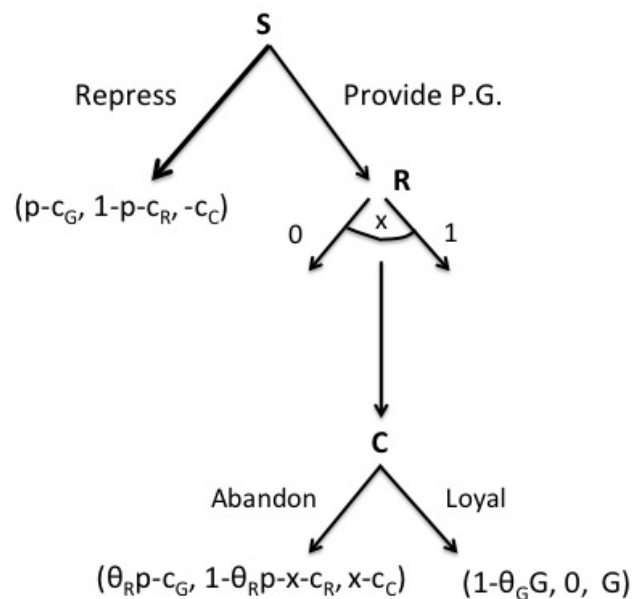**Explanation and Setup of the Game**

Fig. 1: 3 Player Sequential Game

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To better understand the interaction between the government and the civilians in particular, I evaluate the rebels' and state's beliefs about how rebels gaining certain resource endowments can be exploited in the future through a game theoretic model included in Figure 1. The state (S) moves first to capture that their decision to repress or to continue providing public goods and support to civilians is made without full knowledge of the possible deal that the rebels and local non-combatants make, whether or not this negotiation is successful. The state, then, chooses between strategies of immediate indiscriminate violence and continuing to provide public goods to certain districts or municipalities [Repress, Provide P.G]. In the future, expanding the government's decision to a 'range' of an offer similar to the rebels', which would allow the civilians to maximize their options between the repressive/rewarding offers from either actor, would be beneficial. For the purposes of this paper, I assess only the choice between two strategies.

Thus, when engaging in indiscriminate violence at the beginning of this game, the government is gambling that the risk of civilian backfire, which may decrease their popular perception and overall probability of victory, will be minimal enough to compensate for the risk of waiting to observe a rebel/civilian deal. If the government chooses not to act, the state is risking that rebels and civilians may establish a profitable relationship resulting in a significant increase in rebel capability and probability of besting the state. However, given that the establishment of this relationship is probabilistic, when the perceived risk of increased rebel capacity is low, the state may choose to avoid the consequences of indiscriminate violence by waiting to observe the rebel-civilian negotiations. Particularly in very local-level conflict scenarios where rebels and civilians are difficult to distinguish, this approach may be best for the state.

The state considers the use of repression or indiscriminate violence when the cost of providing public goods in relation to the amount the state can gain from the region is high. Empirically, I consider this to be a scenario where there are few opportunities for the state to access local, taxable resources or expropriate the value of primary commodities within the territory, meaning that the municipality and the labor within are of little value to the state. Alternatively, the state may find it too costly to provide public goods in an area where the

resource endowments are not high enough to compensate for this investment. In situations where there are few other ways for civilians to support themselves economically, however, indiscriminate violence is more likely to backfire, with the possibility of pushing economic supporters into active fighting support for the rebels should rebel groups move into the area(Wright 2015). In situations where there is a thriving legal economy and extensive state infrastructure, the rebels are unlikely to be able to extend a high enough offer to encourage deviation from the status quo, which also affects the state's belief about the probability of this deal occurring.

For the state, the decision to repress is partially based on the anticipated value of rebel gains θ_R, or how much the economic benefit of winning over civilians changes the rebels' probability of winning. This parameter θ_R is bounded between 0 and 1 ($\theta_R \in [0,1]$) and captures the idea that more valuable resources require less investment relative to their ultimate value (thus, more desirable resources θ_R take on values closer to 0).[2] This value θ_R represents gains from both legal and illegal resources by the rebel group by engaging civilian labor. On the right hand side of the final node, where civilians maintain loyalty to the government, the government investment in resources made is θ_G, where $\theta_G \in [0,1]$, and reflects *only* resources that the government can legally tax, sell, or trade. Thus, in the Colombian example, θ_R includes the possible value of coca cultivation in a particular department as well as legal agricultural products, while θ_G might encompass only coffee or palm oil production. The state also suffers costs c_G ($c_G \in [0,1]$) from fighting the rebels, as fighting is necessarily costly (Powell 2006).

Uncertainty about whether or not the civilians will shift their loyalty is the primary factor in assessing the state's initial decision of whether or not to engage in indiscriminate violence as well as the rebel's offer level. This belief is based on the costs civilians incur by partnering with rebels. The rebels and state share the same belief c_c' about whether or not the civilians will accept the costs associated with the rebels' offer. For the state, if this belief c_c' is sufficiently high, the state will take the risk of incurring these costs to avoid a

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[2] Although it may not be empirically exact, I consider this to be the proportion of a resource allocated to maintaining civilian economic support, or $\frac{Payment\,to\,civilians}{Overall\,economic\,value\,of\,the\,primary\,commodity}$.

change in rebel capacity that significantly increases the group's chances for military victory. The beliefs c'_c can be thought of as the probability that an agreement between civilians and rebels is made based on levels of c_r, G, and θ_R. These beliefs are uniformly distributed over the interval $[0, 1]$. Thus, the state's expected utility from indiscriminate violence is $p - c_G$. The state's utility from foregoing indiscriminate violence and continuing to provide public goods is $\theta_R p - c_G$ when the civilians accept, and $1 - \theta_G G$ when they do not.

If widespread indiscriminate violence does not occur,[3] The encroaching rebel group decides on a level of an 'offer' to extend to the civilians. This offer can be seen as a complete alteration of the status quo, in which rebels propose becoming dominant authority in the area, essentially replacing the state's provision of public goods and economic opportunities with their own. Rebels, like the state, have the same level of uncertainty about the costs c_c civilians incur by transferring their loyalty to the rebel group. Thus, they make an optimal offer based on their beliefs about these costs c'_c, which is derived in the appendix and described in greater detail in the next section.

This offer can be considered an opening of negotiations rather than a sunk cost. As such, the rebels only lose the offer x, and thus must follow through on their commitment to control the municipality, protect the civilians, and provide economic incentives, when the civilians agree to cooperate. Thus, x is a positive offer of cooperation, bounded between 0 and 1 ($x \in [0, 1]$) with 0 allowing the rebels to make no offer if they perceive this relationship to be too costly to maintain or to only minimally increase their probability of victory against the state. In the case where the rebels make no offer or the civilians perceive cooperation with the rebels to be too costly, the rebel payoff is 0, reflecting that they are unable to make any economic or territorial gains.

Again, for the rebels, a crucial consideration when extending this offer is how the increasing value of the resource in question or the capture of associated territory would allow for expanded group capacity. In the model, the term θ_R represents this perceived future ben-

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[3] This is a current simplification in the model in which I assume that if the state uses in a high level of preemptive indiscriminate violence, rebels will not be able to make a positive economic offer that can compensate for the state's decision to decimate and abandon the area.

efit, as it increases the rebels' probability $1 - p$ of winning the conflict, following Powell and Carter (2006; 2010).[4] As above, lower values of θ_R, are more beneficial to the rebels. When rebels expect a particularly profitable civilian relationship they are more likely to incur a high level of costs (x) to ensure that civilians accept their offer. The rebels, like the state, suffer costs from fighting c_R that are included in their payoff for continuing to fight with civilian assistance. Because this is a highly local story of rebel movement and civilian response, these costs are incurred only when rebels establish a local presence. Thus, the rebels payoff when civilians accept their offer is $1 - \theta_R p - x - c_R$, and the rebels' utility when civilians reject their offer is simply 0.

Following the rebel offer, these civilians make a choice of whether to begin cooperating with rebels in economic production of a primary commodity or to reject the rebels' attempt to attract civilian support. As mentioned above, I assume that civilians (C) are motivated only by economic gain – formally, that they agree to work with rebels when the benefits of the rebels offer x outweigh the benefit of public goods G provided by the state. As discussed in the previous section, different types of civilians will have varying evaluations of the costs of giving up legal or regulated economic participation, and thus differing levels of c_C. Civilians with few existing local economic opportunities and a lower level of public goods provision such as missing infrastructure and poor governmental services are likely to be more perceptive to working for the rebel group. Civilians in municipalities or districts with high levels of state participation or investment would require a much more lucrative 'deal' to forfeit their current economic activity and relationship with the state. As such, the civilians' payoff when they shift their loyalty to the rebels (A for abandon) is $x - c_c$, and the payoff when they maintain loyalty to the state (L for loyal) is simply G, the value of public goods provided.

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[4] For simplicity's sake, I assume that θ_R linearly increases the rebels probability of victory. An additional step in complicating the model would be to model this relationship as non-linear, either plateauing after certain values are reached, or increasing and then decreasing due to higher levels of state attention and response.

Solution and Comparative Statics

I solve this game using the Perfect Bayesian Equilibrium solution concept based on the rebel and state's beliefs about c_c*, the costs civilians face in engaging with the rebel group and abandoning their loyalty to the state.[5]   I assume that neither the state nor the rebels have complete information about the costs shareholders may incur. Thus, the rebels will make an optimal offer based on their beliefs about these costs when it is profitable for their long-term probability of victory, and the state will similarly choose to use indiscriminate violence based on their perception of how likely this offer is to be accepted.

The local labor force (civilians) will find it profitable to cooperate with rebels when the rebel offer x of economic gain and replacement of state authority and governance exceeds their existing value from state provision of public goods G, or when $x > G + c_c$. The rebels, then, offer the optimal level x, based on the probability of correctly assessing the shareholders' costs c_c and reaching a deal. When making decisions about the level of their offer, the rebels take θ_R, or the value of the available resource, into account as rebels are unwilling to offer an x greater than $1 - \theta_R p - c_R$. Thus, for higher levels of θ_R, the rebels can afford lower values of x and still turn a profit. The state, finally, will engage in indiscriminate violence based also on their beliefs c_c* about the probability that the rebels have proposed this optimal and acceptable value of x. Their decision is based on weighing the utility of immediate repression, which sacrifices some economic efficiency, and the expected utility of allowing rebels and civilians to negotiate over an offer. The state will continue to provide public goods rather than engaging in indiscriminate repression at the start of the game, when $c_c^* > c_c'$, and will choose indiscriminate violence otherwise (when $c_c^* < c_c'$).

When including all of the relevant parameters, the state chooses to continue providing public goods (plays strategy Provide P.G in the first decision node) when:

$$\frac{1 - p - \theta_G G + c_G}{1 - \theta_R p - \theta_G G + c_G} > \frac{1}{2}(1 - c_r - G - p\theta_R)$$

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[5] The full solution is in the Appendix.

And state chooses indiscriminate violence (plays strategy Repress) when:

$$\frac{1 - p - \theta_G G + c_G}{1 - \theta_R p - \theta_G G + c_G} < \frac{1}{2}(1 - c_r - G - p\theta_R)$$

Comparative Statics

Given the complexity of the above inequalities, I have included plots to show how changes in public goods G and the value of resources for the rebels and the state θ_R and θ_G affect when indiscriminate repression occurs. Figures 2 through 6 illustrate when indiscriminate violence occurs across a range of values for the state's probability of victory p and the value of the resource rebels may access θ_R. I investigated the instances of indiscriminate violence with three different values of public goods- 0.1, 0.5 and 0.8. Lower values of G are less costly for the state, but also indicate that civilians may be more willing to strike a deal with rebels as they would have little loyalty to the state. Particularly when θ_R is low, rebels are more likely to offer a high level x to lock in future economic gains. For each of these levels of G, I also show differing values of θ_G- 0.1, 0.5 and 0.8 again, to show how the state's behavior changes based on the overall value of the natural resources that they can access within the area in question. An overall implication from these graphs is that stronger states (higher levels of p) are more willing to engage in indiscriminate violence, but that the range of states willing to do so marginally increases as the expected profits from rebel investment increase or the costs of state investment increase (as θ_R decreases or θ_G and G increase).

In Figure 2, the value of public goods G are low at 0.1. This means that the state is incurring few costs by providing such goods, but also that civilians gain very little from the state's involvement. I include only the plot of $\theta_G = 0.5$ here, as there was very little change over differing values of the resource θ_G. This means that states are only slightly more willing to choose indiscriminate violence in situations where they are unable to truly profit from local natural resource production. For each value of θ_G, the state is willing to use indiscriminate violence when rebel gains are anticipated to be high (θ_R is low), meaning that the rebels are likely to offer a substantial x to counter the state's low value of public

goods provision. Thus, when a low level of public goods is provided, the state becomes concerned that rebels will reach a 'deal' with civilians when θ_R is high and the rebels are particularly anxious to establish this economic relationship.

Figures 3 and 4 show the state's propensity to use indiscriminate violence when the
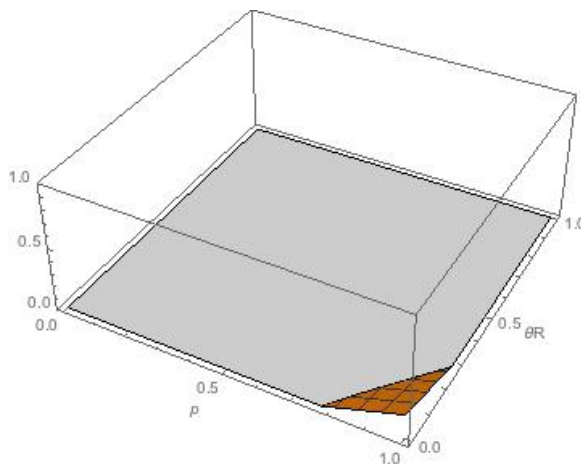
Fig. 2: Cheap Public Goods

c_G=.2, c_R=.2, G=.1, θ_G=.5

value (and therefore cost to the state) of public goods is in the middle of the range at 0.5. In this case, states are prone to repress when the value of θ_R is low, indicating substantial gains for the rebels from accessing legal or illegal commodities In fact, when θ_G is particularly low at 0.1, as in Figure 3, repression almost never occurs as the state does not want to lose their most efficient access to these lucrative resources. As the value of θ_G increases, indicating that the state's return from natural resources is decreasing, the state increasingly chooses indiscriminate violence. Because the state's return from natural resources is low here, when there is a risk of rebels making significant gains from local primary commodities θ_R, the state is often willing to forgo their access to local labor by engaging in preemptive repression. In Figure 4, states choose to repress for all but the highest values of θ_R, in which rebels are unlikely to establish a relationship with civilians.

Figures 5 and 6 demonstrate how the propensity of the state to choose repression changes with more costly public goods provision G (here, set to 0.8). In these plots, we do see that repression occurs over a broader range of state strength- and that weaker states (with a p of .5 to .6) are willing to risk indiscriminate violence even for high levels of θ_R where
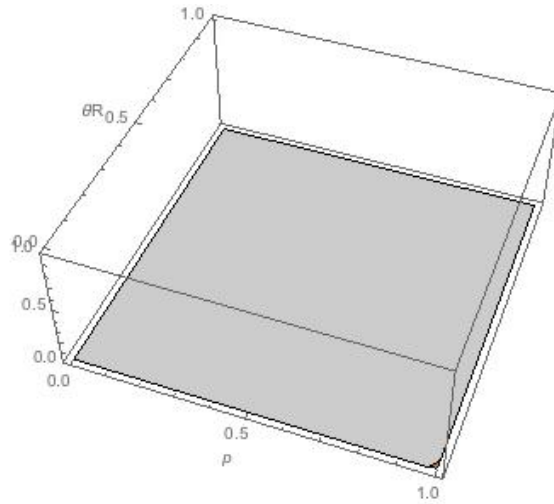
Fig. 3: Highly Profitable State Resources

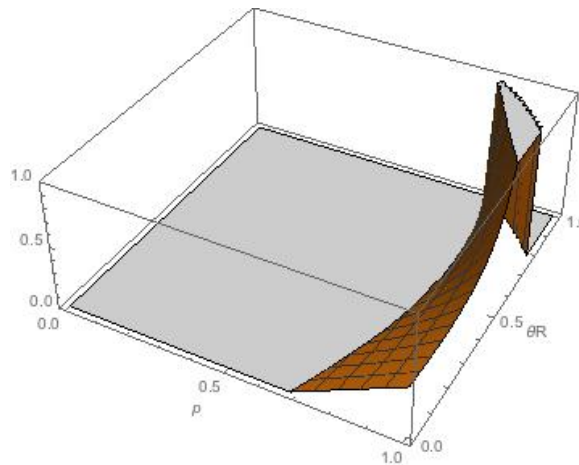c_G=.2, c_R=.2, G=.5, θ_G=.1

Fig. 4: Less Profitable State Resources

c_G=.2, c_R=.2, G=.5, θ_G=.8

rebels are unlikely to benefit significantly from the resource in question, as in 6. This is because if public goods provision is expensive *and* the state's income from certain resources is low, the state finds it cheaper to simply repress and mitigate the risk of guerilla-style war seen when rebels and civilians join forces. However, because public goods provision and thus civilian gains are already high, states are more confident in their ability to maintain civilian loyalty. Thus, when the state's value of a natural resource is high as in 5, repression never occurs. In this case, the state would rather not risk a decrease in taxable or seizable economic production resulting from repression.

States similarly do not choose repression when values of θ_R are high, however, be-

cause at a certain level, the rebels will make no offer to the civilians. In situations where $\theta_R > \frac{1-c_R+G}{p}$, the rebels recognize that civilians will not accept a shift to rebel control of the territory and economic endeavors within a profitable range of x. In this situation, the state is aware that the rebels cannot will make no offer, and thus will never choose repression. The final figure (6) illustrates the state's cost-benefit analysis of provision of public goods vs. the 'cheaper' but riskier option of using indiscriminate violence, showing that when rebels are likely to make gains with civilians in a certain area and the state's value for the area is low, repression occurs.
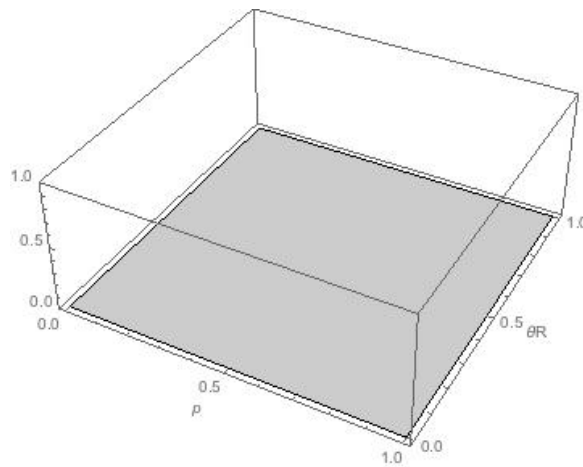

Fig. 5: Costly Public Goods, Highly Profitable State Resources

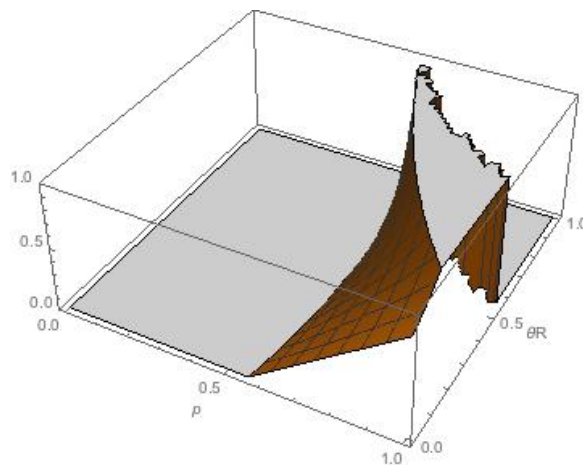c_G=.2, c_R=.2, G=.8, θ_G=.1

Fig. 6: Costly Public Goods, Less Profitable State Resources

c_G=.2, c_R=.2, G=.8, θ_G=.8

From the above plots, it is evident that the values of θ_R, θ_G and G are important for un-

derstanding when we can expect to observe indiscriminate violence at the municipal level. States should be making a cost-benefit analysis of their anticipated gains from a natural resource (θ_G) and are more likely to choose indiscriminate violence when these returns are low, indicating that this municipality or area does not hold high value for the state. Similarly, when public goods provision is costly (G is high), the state's action is dependent upon the expectation of whether or not civilians will accept rebel offers of cooperation. These expectations are partially based on the rebels' anticipated profits from the local resources, as captured in θ_R. In short, a low θ_R, high θ_G, and middle to high costs of public goods G all increase the probability of engaging indiscriminate violence. Based on the implications of the formal model, I formulate two empirically observable hypotheses about when we should see indiscriminate violence. They are as follows:

H1: States are more likely to employ indiscriminate violence against civilians in regions or locales where profits from resources are lower than the costs of providing public goods.

H2: States are more likely to employ indiscriminate violence against civilians when the price of natural resources present in areas of rebel activity are rapidly increasing.

Case Study: Peru and Sendero Luminoso

Preliminary empirical evidence for these hypotheses can be found in the case of the Peruvian conflict with the rebel group Sendero Luminoso, otherwise known as the Shining Path. This conflict between the Marxist rebel group and the Peruvian state began in the mid-to-late 1970s with students in rural universities, specifically in the areas of Ayacucho and the Huallaga valley (Arnson and Zartman 2005), (Koc-Menard 2007). Although there are varied estimates of the number of fatalities, Fielding and Shortland suggest that "almost 70,000 Peruvians died between 1980 and 2000 in the violent conflict between Peruvian security forces and [the rebel groups]" (848). Scholars generally recognize that a significant number of these deaths were civilian casualties, often inflicted by the state as the strategy of indiscriminate violence was common in certain areas and over certain times in the course of the war.

Additional municipal or township-level data collection is necessary, but scholars such as Koc-Menard (2007; 2006) and Galdo (2013) suggest that there were important regional differences as Sendero grew and spread its influence in the 1980s. Kay (1999) discusses how Sendero began in areas with high levels of economic deprivation and very little state presence. As they spread into the Huallaga valley, where the coca industry was already part of the local economy, the rebel group gradually established a relationship with civilians by "protecting coca growers from the state authorities, forcing traffickers to pay a higher price than farmers could negotiate themselves, and establishing a social order" (103). Thus, in its initial movement away from the poorest parts of Ayacucho and the surrounding areas, Sendero moved forward by extending an offer of governance and economic growth to peasants (de Wit and Gianotten 1994; Berg 1994). The rebels experienced initial success as these farmers - given the lack of other economic opportunities, security and public goods provided by the state - largely acquiesced to governance by the group.

From roughly 1980 to 1982, Sendero made minimal progress in rural areas by winning over peasant constituencies. As they began to move closer to urban areas, and in particular as they established a stronger foothold in drug-producing areas, the Peruvian state sought to respond to the encroaching threat. As Galdo (2013) states, "the initial response from the government was tardy and ineffective...Instead of using strategic force, along with rapid economic assistance, to bolster local economic conditions in the initially affected areas, police and military forces were accused of using indiscriminate violence against civilians" (793). Military abuses of peasants were widespread during this time, but scholars note regional differences in the levels of indiscriminate violence. For example, Koc-Menard suggests that in certain areas of the Upper Huallaga valley and Ayacucho, where coca production and trade was established, the state generally employed 'brutal practices' in areas on the fringe of Sendero Luminoso's strongholds in an attempt to deter peasants from engaging with or supporting rebel forces (Koc-Menard 2007). However, in Puno, where there was a higher level of legal, taxable agricultural production coupled with previous economic reforms, the Peruvian military engaged in fewer acts of indiscriminate violence.

Phrasing this in the language of the model, then, Sendero Luminoso was able to gain

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territory and make minor economic inroads in the early years and in highly remote areas. In these cases, the Peruvian state allowed the rebel groups to make an 'offer' of governance to civilians, which they accepted. As the group moved into areas that either allowed them access to a more lucrative illicit economy (as in Upper Huallaga) or encroached upon the state's taxable economic resources, the Peruvian state often took the gamble of employing indiscriminate violence rather than waiting to see if a deal was struck. In the case of areas like Puno, where the state had already established a positive relationship with peasants and was engaged in the local economy and governance, the rebels were able to make few advances towards the peasant population. Overall, as Sendero Luminoso's 'success' in gaining territory increased, the emergency zones or EMZs declared by the government increased on the edge of Sendero's activity, and these zones were often areas that witnessed high levels of indiscriminate violence (Berg 1994).

Implications and Future Direction

In this paper, I presented a new theory of why resources 'matter' for intrastate conflict. Previous work has been unable to explain strategic interaction between the state and a rebel group over resources, relying only on basic explanations of how each resource type is correlated with conflict severity or duration. The level of analysis for former work has also been too highly aggregated, rather than examining the importance of natural resources at the municipal level. Further, a more careful consideration of not only rebel gains, but also state losses was needed. I argue here that the labor necessary for production of primary commodities is a crucial third actor for understanding rebels' behavior and the state's response to the group's changes in strength. Specifically, including non-combatants as an active part of the formal model allows for changes in the government's belief about whether or not repression is an effective tactic for managing increasing rebel strength based on resource endowments. By including this third actor, I am able to gain intuition about when rebels are likely to allocate funds and time towards maintaining a relationship with local labor, as well as when states perceive that an economic relationship resulting from the rebels' offer is sufficiently dangerous to merit the costs of repression.

The formal model and comparative statics in section 4 indicate that states weigh the costs of continuing public goods and the anticipated value of local resources when considering whether to use indiscriminate violence from the outset to prevent rebels from gaining an economic foothold. When deciding where to cultivate relationships with non-combatants needed to produce primary commodities, rebels similarly consider these civilians' costs of abandoning the state and shifting their loyalty to the rebels, thus losing access to public goods. The first implication of the formal model is that indiscriminate repression occurs when the state's income from local extraction does not compensate for the cost of public goods, which we would expect to see in resource-poor areas. Secondly, when rebels may be able to achieve high-levels of economic gain from striking a bargain with civilians, the state will use indiscriminate violence unless their local profits are such that they cannot risk a reduction in production due to the inefficiency produced by choosing repression. The implications of this model are considered with a case study from Peru, in which highly local variation in the state's use of indiscriminate violence can be seen as a consequence of the different natural resource endowments in areas of possible rebel activity.

Beyond the scholarly importance of uncovering the causal process associated with rebels' local resource gains, understanding such behavior has clear implications for security policy. If this calculus over the labor needed to produce primary commodities is truly the hidden mechanism driving rebel activity and state response, then policies, defense strategies or peace agreements aimed at rebels alone may be ineffective. My theory also reveals an important time horizon: states facing conflicts financed by civilians will find it increasingly difficult and costly to cut off rebel resources as rebels' strength allows them to provide increasing offers to civilians. This research also suggests that local-level indiscriminate violence is a standard action chosen by states to avoid the costs of civil war. If, through additional data collection and testing, this argument holds true, this finding would increase the ability to anticipate and possibly prevent violent repression by encouraging alternative state responses. In short, by pointing to the non-combatant labor behind certain resource endowments as a previously unconsidered conflict mechanism, this paper highlights new ways to mitigate violent intrastate conflict.

APPENDIX

Incomplete Information Solution

The civilians accept the rebel offer when:

$$x - c_c \geq G,$$
$$x \geq G + c_c$$
$$c_c \leq x - G$$
$$\text{where } x \in [0, 1]$$
$$\text{and } c_c \in [0, 1]$$
$$\text{and } G \in [0, 1]$$

The rebels will offer the optimal level x, based on the probability of correctly assessing the shareholders' costs c_c and reaching a deal. The rebels' expected utility, then, is:

$$(x - G)(1 - \theta_R p - x - c_R) + (1 - x + G)(0)$$
$$\text{where } \theta_R \in [0, 1]$$
$$p \in [0, 1]$$
$$c_R \in [0, 1]$$

Taking the derivative of this expression with respect to x yields:

$$1 - c_R + G - 2x - p\theta_R$$

This means that the rebels will make the following offer:

$$x = \frac{1}{2}(1 - c_r + G - p\theta_R)$$

The rebel and state beliefs about shareholder costs c_c' are thus:

$$\frac{1}{2}(1 - c_r + G - p\theta_R) - G$$
$$c_c' = \frac{1}{2}(1 - c_r - G - p\theta_R)$$

The government, then, will engage in indiscriminate violence based also on their beliefs c_c' about the probability that the rebels have proposed this optimal and acceptable value of x. When these beliefs are higher than the critical probability c_c^* at which the state is indifferent between indiscriminate violence and continuing to provide public goods, the state will use indiscriminate violence. The government chooses to use indiscriminate violence when:

$$c_c^*(\theta_R p - c_G) + (1 - c_c^*)(1 - \theta_G G) \geq p - c_G$$
$$\text{where } \theta_G \in [0, 1]$$
$$c_G \in [0, 1]$$

The critical probability c_c^* at which the state is indifferent between risking the use of using indiscriminate violence and waiting to observe a rebel/civilian interaction is, then:

$$c_c^* = \frac{1 - p - \theta_G G + c_G}{1 - \theta_R p - \theta_G G + c_G}$$

The state chooses to provide public goods (Plays strategy Provide P.G.) when $c_c^* > c_c'$

$$\frac{1 - p - \theta_G G + c_G}{1 - \theta_R p - \theta_G G + c_G} > \frac{1}{2}(1 - c_r - G - p\theta_R)$$

Thus, the state chooses indiscriminate violence (plays strategy Repress) when $c_c^* < c_c'$, or:

$$\frac{1 - p - \theta_G G + c_G}{1 - \theta_R p - \theta_G G + c_G} < \frac{1}{2}(1 - c_r - G - p\theta_R)$$

Complete Information Solution

The shareholders will accept if:

$$x - c_c > G$$
$$x > G + c_c$$

Rebels propose x when:

$$1 - \theta_R p - c_R - x- > 0$$
$$x < 1 - \theta_R p - c_R$$

Looking at the civilians' costs c_c, this happens when:

$$G + c_c < x < 1 - \theta_R p - c_R$$
$$G + c_c < 1 - \theta_R p - c_R$$
$$c_c < 1 - \theta_R p - c_R - G$$

And rebels make no offer if

$$c_c > 1 - \theta_R p - c_R - G$$

The government then chooses to use indiscriminate violence when:

$$p - c_G > \theta_R p - c_G$$
$$1 > \theta_R$$

So, the government uses indiscriminate violence and the game ends (Outcome 1) when:

$$x > G + c_c$$
$$c_c < 1 - \theta_R p - c_R - G$$
$$1 > \theta_R$$

And the status quo continues with no shift in civilian loyalty or government indiscriminate violence (Outcome 3) when:

$$x < G + c_c$$
$$c_c > 1 - \theta_R p - c_R - G$$

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