Incentives to Rebel, Bargaining, and Civil War

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Abstract

To fully understand the effects of factors that encourage rebellion, we must differentiate between the way such factors influence mass decisions to join an ongoing rebellion and the way they influence the level of concessions offered by the government. We analyze a three player bargaining model that allows us to do so. Our results indicate that governments tolerate a greater risk of conflict with their chosen concessions when any conflict that does occur is likely take the form of a limited, rather than popular, rebellion. We demonstrate that rebellions are more likely to be popular when the general populace is relatively dissatisfied with the status quo and when the government is relatively incapable of putting down rebellions. Widespread poverty and low state capacity might therefore be associated with a *lower* likelihood of conflict, but a greater probability that the general populace will participate in any conflict that does occur.

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Are civil wars more likely to occur in the face of material incentives to rebel? Whether they are based on greed, grievance, or simple opportunism, many early accounts of civil war onset contended that the answer to this question is "yes."[1] But governments can readily observe whether their people are poor or their ability to effectively combat a guerilla-style insurgency is minimal. Accordingly, scholars have begun to consider the possibility of governments preempting rebellion by buying the population off.[2] Yet many questions remain. How does the government's willingness to offer concessions depend on the prevalence of popular grievances? How do incentives to rebel influence the likelihood that the government successfully buys off the rebel elites who might otherwise organize a rebellion?[3]

In this research note, we seek to answer such questions.

To do so, we analyze a bargaining model in which rebellions occur if and only if the government offers a level of concessions unacceptable to the rebel elites. Once the rebel elites' reject the government's concessions, if indeed they do so, the rebel elites then propose a division of the spoils to the general populace.[4] If the general populace accepts the rebel elites' proposal, a popular rebellion occurs. Otherwise, a limited rebellion occurs.[5] This allows us to disentangle the effects of incentives to rebel on the *form* of any conflict that occurs from effects on the *likelihood* of a conflict occurring.[6]

[1]See especially Collier and Hoeffler (1998), who develop an explicitly decision-theoretic account, as well as Collier and Hoeffler (2004) and Fearon and Laitin (2003). See also Blattman and Miguel (2010), who offer a thorough overview of the literature.

[2]See inter alia Le Billon (2003), Fjelde (2009), Fjelde and De Soysa (2009), Snyder and Bhavnani (2005) and Taydas and Peksen (2012). See also Regan and Norton (2005) and Thies (2010), who also consider the behavior of the government in addition to that of the would-be rebels.

[3]We refer to any instance of armed conflict between actors within the state and the established government thereof as a "rebellion," regardless of the form or intensity of the conflict, differentiating in an admittedly crude way between "popular rebellions" and "limited rebellions," where the former involve cooperation between the rebel elites and the general populace and the latter do not.

[4]A growing number of formal theorists have turned their attention to civil conflict, focusing on how bargaining between a government and a rebel group may be effected by factors such as uncertainty over the spoils of holding office (Dal Bó and Powell 2008) or commitment problems (Powell 2012). (See also Walter (1997) and Walter (2009).) However, most of the formal models used to analyze civil conflict ignore interactions between the rebels and the public, with a few exceptions (Bueno de Mesquita 2010, N.d.).

[5]The two bargaining processes may be implicit. We do not necessarily assume that the government invites the leaders of any would-be rebellion to join them in formal negotiations. We need only assume that the government has the opportunity to offer concessions to a group that is understood to be willing to engage in violence if at least some of its demands are not met.

[6]Throughout, we assume that failure to reach an agreement results in some form of armed conflict. That

The model yields several important results.

First, popular dissatisfaction with the status quo, as might be brought about by widespread poverty, increases the likelihood that any rebellion that occurs will take the form of a popular rebellion. One way to understand this is to view increases in dissatisfaction with the status quo as decreasing the price at which the support of the general populace can be purchased.[7]

Second, an inability of the government to put down a rebellion, as might be associated with low state capacity, also increases the likelihood that any rebellion that occurs will take the form of a popular rebellion.[8] This can be understood as an increase in the rebel elites' willingness to pay a given price in order to secure the support of the general populace.

Third, the government's willingness to risk rejection decreases with the expectation that any rebellion to occur would enjoy the support of the general public. Two critical assumptions drive this result. First, the broader populace is not expected to spontaneously organize for violence on their own.[9] Second, the rebel elites cannot gain the support of the general populace without giving something up. One way to conceive of this is that they share the spoils with those members of the public who support them, though our results apply equally if the rebels acquire the support of the population through coercion and/or bribery.

is, we ignore the obvious possibility that aggrieved populations might seek redress through the courts, engage in peaceful protest, or otherwise express dissent. We do so not because we are unaware that such strategies are available, but in order to improve our understanding of the relationship between material incentives to rebel and the the likelihood and form of civil conflict. Note that Ritter (Forthcoming) analyzes a theoretical model that is broadly similar to ours, though her focus is on dissent and repression. Her theoretical model anticipates, and her empirical analysis uncovers evidence of, relationships broadly similar to those we identify.

[7]This is consistent with some empirical observations. See in particular Buhaug et al. (2011), who present cross-national evidence that, within state, it is the relatively impoverished areas that are the most likely to experience conflict outbreaks. Note that Humphreys and Weinstein (2008) find that in Sierra Leonne's civil war, poverty was systematically associated both with participation on behalf of the rebels *and* the ousted government. This suggests that susceptibility to manipulation by elites is the driving mechanism linking poverty to participation in civil war more so than economic grievances. This is consistent with our argument. See also Justino (2009). On the other hand, Hegre, Ø stby and Raleigh (2009) finds that more conflict events were observed during Liberia's civil war in the wealthier areas.

[8]The term "state capacity" can refer to many things. See especially Hendrix (2010), who distinguishes between three different facets of state capacity. We are less concerned here with bureaucratic administrative capacity and the coherence of political institutions than we are military capacity.

[9]In other words, we assume that elites are critical to organizing collective action. Though there is some debate about how extensive the free-riding problem is in the context of ongoing civil wars (Kalyvas and Kocher 2007), the primary argument against the relevance of such an assumption hinges upon rebel elites coercing or bribing the public. See also Bueno de Mesquita (2010) and Humphreys and Weinstein (2008) on the role of elites in mobilizing mass participation in violence.

Some accounts of civil war posit that conflict is more likely when the rebel elites find conflict more attractive. Intuitively enough, in our model, the rebel elites find conflict more attractive either when the government is relatively ill-equipped to put down a rebellions or when the rebel elites can expect to secure the support of the broader populace at a relatively low cost. However, our model indicates that any factor causing the rebel elites to find conflict more attractive also increases the level of concessions offered by the government.

Depending upon the size of each effect, we might expect an increased likelihood of rebellion, a decreased likelihood of rebellion, or no effect. Critically, however, our model indicates that the level of concessions *offered by the government* increases more rapidly than does the rebels' *willingness to reject* any given level of concessions as we shift from conditions under which rebellions are unlikely to be popular to those in which they are likely to be popular. When the government believes that failure to buy off the rebel elites will result in a popular rebellion, its desire to avoid conflict increases in direct proportion to difference between the expected outcome of a popular rebellion and that of a limited one, while the rebel elites only come to view rebellion as somewhat more attractive. This is because the support of the general populace does not come freely. That is, the government is fully sensitive to the difference between the terms upon which they expect to settle a popular rebellion versus a limited rebellion, while the rebel elites are only partially so. Thus, a shift from conditions that discourage popular participation in rebellion to those favoring such will have the effect of expanding the overall bargaining space. This, in turn, will make conflict *less* likely.

We proceed first by discussing a critical difference between interstate and intrastate crisis bargaining. We then introduce and analyze our formal model. Before concluding, we offer a brief discussion of the empirical implications of our theoretical model.

Bargaining and Civil War

In crisis bargaining between two established states, if an agreement is not reached and the two resort to war, the question of how they manage to fight one another is quite trivial, since both sides have a standing army. The same cannot be said of crisis bargaining between a government and dissident groups within the state, since the latter will generally need to recruit from amongst the general populace in order to assemble an effective fighting force.[10]

Though valuable insights can be gleaned from models in which the group opposing the government is treated as a unitary actor, it is particularly important to consider the behavior of the general populace separately from that of the rebels if we are to understand the effect of factors that are thought to provide material incentives to rebel. We now turn our attention to a theoretical model that sheds light on this complicated strategic environment.

The Model

The game begins with the government of some state, G, deciding what level of concessions, if any, to offer to a group of rebel elites, who are denoted R. The government knows that the rebel elites are willing to resort to violence rather than accept the status quo, yet they also know that the rebel elites are not so committed to violence that they cannot be placated.

We are largely agnostic as to the nature of R's grievances, though we do assume that the overall bargaining space is continuously divisible.[11] While much of the literature on civil conflict stipulates a relationship between the nature of the issue in dispute and the severity of any conflict associated therewith, – distinguishing, for example, between ethnic and non-ethnic wars, those fought at the center versus the periphery – we abstract away from such differences in order to focus on key dynamics that are relevant to all civil conflicts.

[10] Of course, some civil wars pit highly organized state-like entities against one another. In such cases, the same theoretical approaches used to study interstate conflict may well suffice (Lemke 2008). However, our focus here is on a different sort of conflict.

[11] Note that even if the primary issue of contention is indivisible, the overall bargaining space can still be made divisible through issue-linkage or side payments, as Fearon (1995) notes.

Let $x \in [0, 1]$ denote G's offer. If R accepts these concessions, the game ends, and G receives $1 - x$ while R receives x. In that case, the general populace, denoted P, will simply receive its value for the status quo, $q \in [0, 1]$.

Of course, depending upon the nature of R's grievance, any concession made by G may necessarily impact P. If the government releases imprisoned members of the rebel group or cuts back on military and law enforcement operations aimed at disrupting the group's operational capacity, this will primarily serve to benefit the rebel group without much direct impact on the general populace. But if the government agrees to institute sweeping economic or political reforms, that may benefit the population as much as the rebels. A more general model would therefore allow q to depend on x, and would allow for variation in the degree to which q depends on x to vary.[12] However, allowing for such a possibility would complicate the analysis considerably without adding additional substantive insight. So long as the goals of R and P diverge to at least some degree, yet there is the possibility for R to co-opt P, the relationships we identify would still obtain.

Note that even though we have assumed that R's and P's preferences diverge more than may sometimes be the case, we nonetheless assume that P does not pose an independent threat to G. In our model, it is only R that must be bought off in order to avoid a rebellion.[13] Of course, that need not always be true. But *in most cases*, the collective action problem prevents even aggrieved populations form spontaneously rising up against the government without any elite actors to incentive participation through the provision of selective incentives.[14] Of course, P might have already overcome the collective action problem. It would no longer make sense to refer to them as the general populace at that point, though, and simultaneous bargaining with multiple groups lies outside the scope of this paper.[15]

[12] We thank an anonymous reviewer for this suggestion.

[13] We set aside the question of precisely how R forms in the first place and how they establish a credible threat to use violence.

[14] On the collective action problem, see Olson (1965). On the willingness of people to abide by the status quo even when they are sufficiently dissatisfied that they would take participate in collective action *once underway*, see Kuran (1991). On the importance of selective incentives in motivating participation in rebellion, see Humphreys and Weinstein (2008).

[15] See Best and Bapat (N.d.) for analysis of precisely such a model.

Should R reject x, we assume that a rebellion of some form ensues, and that it has the potential to broaden to include P. Specifically, at this point, R makes an offer, denoted $y \in [0, 1]$, to P, which reflects the share of the spoils that R will allocate to P once the conflict ends. However, our results our not sensitive to this formulation. If we were instead to assume that R secures P's assistance through the provision of selective incentives, and allow R to strategically choose how much effort to expend in providing such incentives, we would arrive at the same substantive results.

If P accepts the offer of y, we assume that some portion of the general populace takes up arms, and we refer to the ensuing conflict as a popular rebellion.[16] If P rejects y, then no significant cooperation between R and P takes place and we might think of the resulting conflict as a limited rebellion. We discuss this distinction in more detail below.

Let w denote the share of the disputed good that is expected to be wrested from the government's hands as a result of the rebellion. We assume that w depends upon each side's strength, broadly conceived. When P rejects R's offer of y, and R thus fights G alone, R acquires control of $\underline{w} = \dfrac{r}{r+g}$ of the good, where $r > 0$ denotes R's capacity for rebellion and $g > 0$ denotes G's ability to put down a rebellion.

If P accepts R's offer, G is expected to relinquish control of $\overline{w} = \dfrac{r+p}{r+p+g}$ of the good, where $p > 0$ denotes the relative contribution of P to the rebellion. Note that $p > 0$ ensures that $\underline{w} < \overline{w}$, indicating that G expects to relinquish control of a greater share of the contested good following a popular rebellion than a limited one.

In the event of a rebellion, G's payoff depends upon two factors: the distributive outcome, as determined by w, and the loss of utility associated with incurring the costs of fighting, denoted $c_G \in (0, 1]$.[17] Specifically, G receives $1 - \overline{w} - c_G$ from a popular rebellion and $1 - \underline{w} - c_G$ from a limited one.

[16] Though we might reasonably assume that the relative proportion of the populace that participates in the war would depend upon how much of the spoils R has promised to share with P, such an assumption is not necessary for our key results.

[17] While we might expect the cost of fighting to vary with the size of the force opposing the government, allowing c_G to vary with P's participation would not alter the substantive interpretation of our results.

R's payoff from a rebellion similarly depends on the distributive outcome and the loss of utility associated with the costs of fighting, which we denote $c_R \in (0, 1]$.[18] However, R's payoff also depends on the share of the spoils, if any, promised to P. More formally, R's payoff for a limited rebellion is $\underline{w} - c_R$, and $\overline{w}(1 - y) - c_R$ for a popular one.

Thus, though G always prefers limited rebellions to popular ones, R does not necessarily prefer the opposite. That is, the difference between $\underline{w}$ and $\overline{w}$ may or may not be sufficient to justify the cost of purchasing P's support.

Participating in the rebellion brings P some share of whatever benefits are wrested away from G but also entails some costs. The lost of utility associated with the latter is denoted $c_P \in (0, 1]$. If P does not participate in the conflict, its payoff depends on its value for the pre-conflict status quo, q, less some loss of utility representing the negative externalities generated by civil conflict, which we denote $\xi \in (0, 1]$. Formally, P receives $\overline{w}y - c_P$ if it participates and $q - \xi$ if it does not.

We assume that both the rebel elites and the public hold private information concerning their resolve, such that c_R is known only by R and c_P is known only by P, while the uninformed actors only know the probability distributions from which c_R and c_P are drawn.[19]

For the sake of simplicity, we assume that c_R takes on one of two values.[20] The uninformed players know that R is relatively low in resolve with probability ϕ_R, and thus suffers a relatively high loss of utility when incurring the costs of fighting, or $c_R = \overline{c}_R$. With probability $1 - \phi_R$, R is relatively resolved and suffers a lower loss of utility when incurring the costs of fighting, or $c_R = \underline{c}_R$, where $\underline{c}_R < \overline{c}_R$. Similarly, the uninformed players know that with probability ϕ_P, $c_P = \overline{c}_P$ and with probability $1 - \phi_P$, $c_P = \underline{c}_P$, where $\underline{c}_P < \overline{c}_P$.

[18] As with c_G, we assume that c_R does not depend on whether P participates in the rebellion or not. Alternatively, we could assume that the primary benefit to R of securing P's support is to shift the costs of fighting onto P. However, so long as R had to expend resources to acquire P's support, our substantive results would remain the same.

[19] Note that c_R and c_P reflect the loss of utility associated with incurring the costs of fighting. Since any given level of fatalities or financial costs will entail a smaller loss of utility for an actor who assigns a greater value to the issue in dispute, we can interpret lower values of c_R and c_P as indicating higher levels of resolve for R and P, respectively.

[20] Alternatively, c_R could be allowed to vary continuously. However, this would complicate the analysis without significantly altering the substantive implications.

Since P's final decision does not depend on c_R, our assumption that P does not know R's resolve is innocuous. R's uncertainty about c_P and G's simultaneous uncertainty about c_P and c_R, however, prove critical. If G could anticipate perfectly whether R would accept or reject any given level of concessions, the inefficiency of conflict would be sufficient to guarantee a peaceful outcome (Fearon 1995). Our explanation for civil conflict is therefore identical to the prevailing rationalist explanation for interstate war.[21] However, as we seek to demonstrate in the remainder of the paper, our model offers novel and valuable insights with respect to the likelihood and form of civil conflict.

Analysis

The unique perfect Bayesian equilibrium to our model contains three general cases, differentiated by the interactions between R and P. In one case, R offers terms that P always accepts.[22] In another, R offers terms that P will accept if and only if P is relatively resolved. In the third and final case, R offers nothing to P.

The three cases are separated by the size of q relative to two critical thresholds: $\underline{q}$ and $\overline{q}$. More formally, we demonstrate in the Appendix that

$$R \text{ sets } y = \begin{cases} \overline{y} & \text{iff } q \leq \underline{q} \\ \underline{y} & \text{iff } \underline{q} < q \leq \overline{q} \\ 0 & \text{iff } q > \overline{q}. \end{cases}$$

Thus, R's choice of y effectively determines the form of rebellion. Note, however, that P's value for the status quo determines R's choice of y. Intuitively, as q increases, P must be offered ever more favorable terms by R in exchange for its participation in the rebellion, and as the price of purchasing P's cooperation increases, R's willingness to pay it decreases.

[21] Namely, G and R sometimes fail to reach agreements because the incentive for R to misrepresent its private information gives rise to the familiar risk-return tradeoff (Powell 1999). Though G knows that there are agreements that both G and R would prefer to conflict, G does not know *which* terms R finds acceptable, and may find it optimal to propose terms that risk rejection in hopes of getting a better deal.

[22] See the Appendix.

Thus, even though G is uncertain about the precise value of c_P, G will sometimes know what form any potential rebellion would take. As q increases, it becomes more likely that R will not even attempt to secure P's support. At the other extreme, if q takes on sufficiently low values, G need not know the value of c_p to know that any rebellion will be popular. When q takes on relatively moderate values, however, G cannot know for certain whether failure to reach an agreement with R will result in popular rebellion or a limited one.

In each case, conflict is possible, but not certain, as G may or may not choose to offer terms that R accepts regardless of type. Generically, G always selects one of two values of x, denoted $\underline{x}$ and $\overline{x}$, where $\underline{x} < \overline{x}$. When G offers $\overline{x}$, the more generous level of concessions, peace is assured. Offering $\underline{x}$, however, risks rebellion, since R will only accept such terms if relatively low in resolve. All else equal, G offers more generous concessions the lower ϕ_R is, or as the government becomes less confident that the rebel elites are low in resolve.

Overall, then, the three cases are quite similar. In each, G risks rejection, knowing that a rebellion of some scale would then follow, if and only if G is sufficiently confident that R is the less resolved type. As G becomes more and more convinced that R is relatively resolved, and thus becomes more concerned that R would reject a low-ball offer, G becomes more willing to grant the offer the more generous set of concessions.

Critically, however, the conditions under which G risks rejection differ across the cases.

As we demonstrate in the Appendix, G need not be as confident that R is the less resolved type before choosing to offer $\underline{x}$ if G knows that R will not have the support of P as when G believes that it is possible that P will join forces with R. Similarly G need not be as confident that R is the less resolved type before choosing to offer $\underline{x}$ if there is but a possibility that R will secure the support of P as when G knows for certain that any rebellion to occur will be popular. More formally, G risks rejection under the most restrictive set of conditions when $q \leq \underline{q}$, under somewhat less restrictive conditions when $\underline{q} < q \leq \overline{q}$, and under the least restrictive conditions when $q \geq \overline{q}$. The less satisfied the populace is with the status quo, the more willing the government is to offer concession no rebel group would reject.

The intuition for this is that when R becomes more likely to solicit the assistance of P, G finds conflict less attractive due to the difference between $\overline{w}$ and $\underline{w}$. While R necessarily finds rebellion more attractive the more likely they are to elicit support from P – otherwise they wouldn't offer terms that P would accept – the difference between the payoff from a popular rebellion and that of a limited rebellion is always smaller for R than it is for G. As we move from conditions under which R is likely to fight alone to conditions where R is likely to have P's support, the terms that G is willing to offer to R change, but so do the terms that R is willing to accept. Put differently, R expects to acquire control of a larger share of the benefits following a popular rebellion than a limited rebellion, yet R must share any spoils with P in the former case and not the latter.[23] Thus, only a fraction of the additional spoils associated with turning a limited rebellion into a popular one accrues to R. If an exogenous shock were to lead both the rebel elites and the government to believe that any conflict between them would be likely to take the form of a popular rebellion, where previously they expected that the broader populace would not get involved, this will increase the government's willingness to offer concessions more so than it will increase the rebel elites' willingness to reject any given offer of concessions. The net effect of a substantial increase in the government's willingness to offer concessions and a modest increase in the rebels' willingness to reject any given level of concessions is a greater likelihood of peace.

Essentially, our model implies an inverse relationship between the likelihood of rebellion and the likelihood of popular participation in any rebellion that does occur. Mass incentives to rebel, therefore, ought to be associated with a *lower* likelihood of conflict, albeit a greater probability that any conflict to occur will enjoy popular support. Though this conclusion might seem surprising to those who focus only on the behavior of those who rebel, once we consider the differential impacts of an increase in the general populace's willingness to participate in violence on the bargaining strategies of the government and the rebel elites.

We now turn to a brief discussion of the empirical implications of our model.

[23] Or must pay some costs to provide selective incentives, whether through bribery or coercion.

Empirical Implications

Our results have important implications for the interpretation of existing results, and point to potentially fruitful avenues of future research. Much of the literature on civil conflict focuses on the effects of GDP per capita and state capacity. If we interpret low levels of GDP per capita as indicative of widespread economic grievances and low state capacity as a relative poor ability on behalf of the government to put down rebellions, our model suggests that both factors should be associated with a higher probability that any civil conflict to occur will enjoy popular support, but a lower probability of conflict in the first place.

As we demonstrate in the Appendix, increases in q not only decrease the likelihood that R will secure the assistance of P, but further narrow the conditions under which G risks rejection within the cases where R either sometimes or always secures P's assistance. Thus, we have two reasons to expect G to be more willing to risk rejection, and thus for rebellions to be more frequent, as the general populace becomes more satisfied with the status quo.

With respect to the government's ability to put down rebellions, we demonstrate in the appendix that so long as $g > r + \sqrt{rp}$, $\underline{q}$ and $\overline{q}$ are decreasing in g. That is, so long as the government is relatively strong in comparison to the rebel elites, increases in the government's ability to put down rebellions deter the rebel elites from seeking out the support of the general populace. The intuition here is that marginal increases in the size of the rebel army matter more the weaker the government is. When the government is so strong that even relatively large increases in the size of the force fighting against it will make little difference to the likely outcome, the rebel elites have little incentive to share what little spoils they can expect to gain from fighting with the general populace, since popular support will only increase the expected size of the spoils modestly. Thus, low state capacity, like widespread economic grievances, should be associated with a lower probability of conflict but a greater probability of popular participation in whatever conflicts do occur.

These implications appear to be at odds with much of the literature. However, there are several important points to be made.

First, in order to assess whether the historical record provides evidence contrary to the patterns anticipated by our model, we would need reliable measures of the extent of popular participation in violence against the state. We would also need to focus on broader measures of civil conflict. Civil conflicts are much more likely to involve 1000 or more battle fatalities if the rebels control their own territory.[24] Any rebel group that controls its own territory likely has the (willing or unwilling) assistance of the (local) population.[25] Thus, prevailing measures of civil war tend to exclude conflicts in which the rebels are likely to secure participation from the broader population. As such, our results are not necessarily inconsistent with the finding that low levels of GDP per capita increase the risk of civil war. Yet they challenge prevailing interpretations of this empirical regularity.

This brings us to our second point. The outcome we have labeled "limited rebellion" refers to any campaign of political violence carried out by non-state actors that inflicts costs on both the government and the population.[26] Put differently, our results could be interpreted as indicating that campaigns of terrorist violence will occur more often than more broad-based campaigns of violence involving mass participation,[27] and that high-capacity states whose populations are relatively satisfied with the status quo (e.g., wealthy democracies) will be somewhat more prone to political violence than low-capacity states whose populations are relatively dissatisfied with the status quo, though the form of violence experienced by the former will be fundamentally different than the latter. While many studies find that civil war is associated with low levels of GDP per capita, the same is not true of terrorism.[28]

[24]See de la Calle and Sànchez-Cuenca (2012).

[25]Again, recall that our decision to frame cooperation between the rebels and the populace as resulting from promises to share the spoils is largely semantic. Substantively identical results can be derived from a model where popular participation in violence results from elite provision of selective incentives in the form of either bribery or coercion.

[26]In the model, we assumed that even if P does not participate in the rebellion, P is made worse off by a conflict between G and P because of negative externalities such as the impacts of civil conflict on economic opportunities, civil liberties, and public health. However, without loss of generality, we could instead interpret ξ as reflecting the costs of being targeted by terrorist attacks.

[27]We are aware that terrorism is a tactic rather than outcome, and that terrorist attacks often occur in the midsts of civil wars. The distinction we are drawing here is between campaigns of violence *limited* to terrorism and those that *may include* terrorism but are primarily marked by a greater level of popular participation in violence.

[28]See especially Piazza (2006).

Third, we have thus far focused on the effects of popular dissatisfaction with the status quo and state capacity. However, one important determinant of the government's willingness to offer terms that might be rejected by the rebel elites is the loss of utility the government suffers when incurring the costs of conflict. If GDP per capita is not only associated with q but also c_G, then our model does not necessarily indicate that wealthy states are more likely to experience political violence, though it would still indicate that any political violence that does occur in wealthy states would be unlikely to involve popular participation.

Finally, we have presupposed the existence of a dissident group that is willing and able to engage in violence against the state, as we acknowledged above. However, if the population is sufficiently satisfied with the status quo that their support could not be bought at a price the rebels would be willing to pay (i.e., $q > \overline{q}$) and the only outcomes the rebels could achieve through force would be insufficient to offset the costs, regardless of their resolve (i.e., $\underline{w} < \underline{c}_R$), the government would never offer any concessions and yet no rebellion would occur. Insofar as one might argue that this is indeed the case for the highest capacity states, then our model would indicate a curvilinear relationship between state capacity and civil conflict. That is, when state capacity is low, we would expect a relatively low probability of conflict, with any conflict that occurs being likely to involve popular participation; when state capacity is moderately high, we would expect a somewhat higher probability of conflict, though any conflict that occurs would be unlikely to involve popular participation; at the highest levels of state capacity, we would expect a trivial probability of conflict and the absence of popular participation in the event that conflict did occur.

Ultimately, the empirical implications of our theoretical model depend upon the assumptions we make about how popular participation in violence against the state maps onto different measures of civil conflict and the relationship between economic development and popular satisfaction with the status quo, the government's willingness to bear the costs of war, and the ability of a rebel group to take what it wants by force.

Conclusion

We began by asking how factors that create a material incentive for rebellion influence the level of concessions offered by the government and thus the likelihood that the government succeeds in buying off the rebel elites. To that end, we analyzed a bargaining model in which the government first offers concessions to a set of rebel elites and where the rebel elites have the opportunity to secure the support of the general populace in the event that they take up arms against the government.

Our model yields some important insights concerning the relationship between material incentives to rebel and both the likelihood and nature of civil conflict. Specifically, the model suggests that in cases where the government anticipates a popular rebellion rather than a more limited one, the government will tolerate a lower risk of rejection with its choice of concessions. The more likely it is that the general populace will join any rebellion, the less likely it is that a rebellion will occur in the first place.

The intuition behind this result is that the government's value for the expected outcome of the conflict depends upon the decision of the general populace to a greater degree than does the rebel elites' value for the expected outcome. From the government's perspective, the stronger the opposition that they face, the worse off they are. That some of what they will be forced to give up will end up in the hands of the general populace is small consolation. But the rebel elites do not view things so simply, since they do not capture the full value of the increase in the spoils that comes from transforming a limited rebellion into a popular one. The assistance of the broader populace comes at a price. At times, this price will be worth paying, but the need to pay it necessarily detracts from the temptation to reject offers from the government.

We have done our best to outline the empirical implications of our analysis under various different assumptions about what existing measures actually measure and how economic development relates to various parameters of the model. We leave it to the reader to decide which assumptions are the most appropriate empirically.

We conclude by noting that many advocate for poverty alleviation and the development of state capacity in part because they hope these efforts will save lives, and that our results might, at first blush, seem to offer an indictment of such efforts. However, we do not draw such a conclusion. Though we think it important to note that alleviating poverty and building state capacity might increase the probability that *some* form of civil conflict occurs, such efforts might also decrease the expected number of lives lost due to political violence. As discussed above, those conflicts that kill the most people likely also involve some level of popular support for the rebels. If the goal is simply to decrease the probability of all forms of armed conflict, without regard for the likely form of those conflicts that nonetheless still occur, then perhaps our results can be read as indicating that policy makers should focus on spreading poverty and decreasing state capacity. However, we see no reason why anyone would adopt such strange priorities. Our goal is not to criticize efforts at alleviating poverty or building state capacity, but to improve our understanding of civil conflict.

Appendix

Generically, P accepts R's offer of y if and only if (iff) $EU_P(acc) \geq EU_P(rej)$, or

$$\overline{w}y - c_P \geq q - \xi, \tag{1}$$

which is equivalent to

$$y \geq \frac{q - \xi + c_P}{\overline{w}}. \tag{2}$$

However, the precise value of c_P depends upon P's type, and thus so too does P's willingness to accept. More formally, when $c_P = \underline{c}_P$, P accepts iff $y \geq \underline{y}$, where

$$\underline{y} \equiv \frac{q - \xi + \underline{c}_P}{\overline{w}}, \tag{3}$$

and when $c_P = \overline{c}_P$, P accepts iff $y \geq \overline{y}$, where

$$\overline{y} \equiv \frac{q - \xi + \overline{c}_P}{\overline{w}}. \tag{4}$$

Let us now turn to R's choice of y. Note that R can readily infer that

$$pr(P\ accepts) = \begin{cases} 1 & \text{if } y \geq \overline{y} \\ 1 - \phi_P & \text{if } \underline{y} \leq y < \overline{y} \\ 0 & \text{if } y < \underline{y}. \end{cases}$$

Therefore,

$$EU_R = \begin{cases} \overline{w}(1 - \overline{y}) - c_R & \text{if } y \geq \overline{y} \\ \phi_p(\underline{w} - c_R) + (1 - \phi_P)\left(\overline{w}(1 - \underline{y}) - c_R\right) & \text{if } \underline{y} \leq y < \overline{y} \\ \underline{w} - c_R & \text{if } y < \underline{y}. \end{cases}$$

Note that R never profits from setting y any larger than necessary to secure a given probability of acceptance from P. That is, $u_R(y = \overline{y})$ is strictly greater than $u_R(y > \overline{y})$ and $EU_R(y = \underline{y})$ is strictly greater than $EU_R(\underline{y} < y < \overline{y})$. What remains is to determine whether R prefers to set y exactly equal to $\overline{y}$, exactly equal to $\underline{y}$, or less than $\underline{y}$. Naturally, if R does not intend to secure P's support, then the actual value of y makes no difference. For simplicity, we will assume that R offers nothing (i.e., sets $y = 0$) in such cases.

From above, it follows that $EU_R(y = \overline{y}) \geq EU_R(y = \underline{y})$ holds iff

$$\overline{w}(1 - \overline{y}) - c_R \geq \phi_p(\underline{w} - c_R) + (1 - \phi_P)\left(\overline{w}(1 - \underline{y}) - c_R\right), \tag{5}$$

which is equivalent to

$$\overline{w}(1 - \frac{q - \xi + \overline{c}_P}{\overline{w}}) - c_R \geq \phi_p(\underline{w} - c_R) + (1 - \phi_P)\left(\overline{w}(1 - \frac{q - \xi + \underline{c}_P}{\overline{w}}) - c_R\right). \tag{6}$$

This simplifies to

$$\overline{w} - q + \xi - \overline{c}_P - c_R \geq \phi_p(\underline{w} - c_R) + (1 - \phi_P)(\overline{w} - q + \xi - \underline{c}_P - c_R), \tag{7}$$

which can be rewritten as $q \leq \underline{q}$, where

$$\underline{q} \equiv \overline{w} - \underline{w} + \xi - \underline{c}_P - \frac{\overline{c}_P - \underline{c}_P}{\phi_P}. \tag{8}$$

$EU_R(y = \underline{y}) \geq EU_R(y = 0)$ holds iff

$$\phi_p(\underline{w} - c_R) + (1 - \phi_P)\left(\overline{w}(1 - \underline{y}) - c_R\right) \geq \underline{w} - c_R \tag{9}$$

which is equivalent to

$$\phi_p(\underline{w} - c_R) + (1 - \phi_P)\left(\overline{w}(1 - \frac{q - \xi + \underline{c}_P}{\overline{w}}) - c_R\right) \geq \underline{w} - c_R. \tag{10}$$

This simplifies to

$$\phi_P \left(\underline{w} - \overline{w}(1 - \underline{y})\right) \geq \underline{w} - \overline{w}(1 - \underline{y}), \tag{11}$$

which is true iff $q \leq \overline{q}$, where

$$\overline{q} \equiv \overline{w} - \underline{w} + \xi - \underline{c}_P. \tag{12}$$

Observe that $\underline{q}$ is strictly less than $\overline{q}$, since

$$\overline{w} - \underline{w} + \xi - \underline{c}_P - \frac{\overline{c}_P - \underline{c}_P}{\phi_P} < \overline{w} - \underline{w} + \xi - \underline{c}_P \tag{13}$$

simplifies to

$$\overline{c}_P > \underline{c}_P, \tag{14}$$

which is true by assumption.

Finally, $EU_R(y = \overline{y}) \geq EU_R(y = 0)$ holds iff

$$\overline{w}(1 - \overline{y}) - c_R \geq \underline{w} - c_R, \tag{15}$$

which is equivalent to

$$\overline{w}(1 - \frac{q - \xi + \underline{c}_P}{\overline{w}}) - c_R \geq \underline{w} - c_R. \tag{16}$$

This simplifies to $q \leq \overline{q}$, which we have already defined.

Taken together, this tells us that R sets

$$y = \begin{cases} \overline{y} & \text{if } q \leq \underline{q} \\ \underline{y} & \text{if } \underline{q} < q \leq \overline{q} \\ 0 & \text{if } q > \overline{q}. \end{cases}$$

Put differently, case A, as defined in the paper, applies when $q \leq \underline{q}$, while case S applies when $\underline{q} < q \leq \overline{q}$, and case N applies when $q > \overline{q}$.

Now let us turn to G's choice of x.

Starting with case A, G can infer that, generically, R accepts iff $u_R(acc) \geq u_R(rej)$, which is equivalent to

$$x \geq \overline{w}(1 - \overline{y}) - c_R. \tag{17}$$

More specifically, R accepts iff $x \geq \overline{x}_A$ when $c_R = \underline{c}_R$, where

$$\overline{x}_A \equiv \overline{w}(1 - \overline{y}) - \underline{c}_R, \tag{18}$$

and iff $x \geq \underline{x}_A$ when $c_R = \overline{c}_R$, where

$$\underline{x}_A \equiv \overline{w}(1 - \overline{y}) - \overline{c}_R. \tag{19}$$

Observe that $\underline{c}_R < \overline{c}_R \Leftrightarrow \underline{x}_A < \overline{x}_A$.

Next, consider case S. Here, generically speaking, $u_R(acc) \geq u_R(rej)$ is equivalent to

$$x \geq \phi_P(\underline{w} - c_R) + (1 - \phi_P)\left(\overline{w}(1 - \overline{y}) - c_R\right). \tag{20}$$

More specifically, R accepts iff $x \geq \overline{x}_S$ when $c_R = \underline{c}_R$, where

$$\overline{x}_S \equiv \phi_P(\underline{w} - \underline{c}_R) + (1 - \phi_P)\left(\overline{w}(1 - \overline{y}) - \underline{c}_R\right), \tag{21}$$

and iff $x \geq \underline{x}_S$ when $c_R = \overline{c}_R$, where

$$\underline{x}_S \equiv \phi_P(\underline{w} - \overline{c}_R) + (1 - \phi_P)\left(\overline{w}(1 - \overline{y}) - \overline{c}_R\right). \tag{22}$$

Lastly, consider case N. Again, starting generically, $u_R(acc) \geq u_R(rej)$ is equivalent to

$$x \geq \underline{w} - c_R. \tag{23}$$

We can therefore say that R accepts iff $x \geq \overline{x}_N$ when $c_R = \underline{c}_R$, where

$$\overline{x}_N \equiv \underline{w} - \underline{c}_R, \tag{24}$$

and iff $x \geq \underline{x}_N$ when $c_R = \overline{c}_R$, where

$$\underline{x}_N \equiv \underline{w} - \overline{c}_R. \tag{25}$$

Letting $\underline{x}$ and $\overline{x}$ refer generically to the smaller and larger values of x_A, x_S, and x_N, we can establish that the following results hold across all three cases. First,

$$pr(R\ accepts) = \begin{cases} 1 & \text{if } x \geq \overline{x} \\ \phi_R & \text{if } \underline{x} \leq x < \overline{x} \\ 0 & \text{if } x < \underline{x}. \end{cases}$$

Second, $u_G(x = \overline{x}) > u_G(x > \overline{x})$, for the same reason that $u_R(y = \overline{y}) > u_R(y > \overline{y})$. Similarly, $EU_G(x = \underline{x})$ is strictly greater than $EU_G(\underline{x} < x < \overline{x})$. Put differently, G never offers R better terms than necessary to induce a given probability of acceptance.

Finally, unlike above, we can establish that $EU_G(x = \underline{x}) > u_G(x < \underline{x})$, since this is generically equivalent to

$$\phi_R(1 - \underline{x}) + (1 - \phi_R)(1 - w - c_G) > 1 - w - c_G, \tag{26}$$

which simplifies to

$$w + c_G > \underline{x}, \tag{27}$$

a condition that holds for relevant values of w and $\underline{x}$.

What remains is to determine whether and when G prefers setting $x = \overline{x}$, which guarantees acceptance and thus peace, to setting $x = \underline{x}$, which risks rejection and thus rebellion.

Begin with case A. Here, $u_G(x = \overline{x}_A) \geq EU_G(x = \underline{x}_A)$ iff

$$1 - \overline{x}_A \geq \phi_R(1 - \underline{x}_A) + (1 - \phi_R)(1 - \overline{w} - c_G). \tag{28}$$

This holds iff $\phi_R \leq \hat{\phi}_A$, where

$$\hat{\phi}_A \equiv \frac{\overline{wy} + c_G + \underline{c}_R}{\overline{wy} + c_G + \overline{c}_R}. \tag{29}$$

Next, consider case S. Here, $u_G(x = \overline{x}_S) \geq EU_G(x = \underline{x}_S)$ iff

$$1 - \overline{x}_S \geq \phi_R(1 - \underline{x}_S) + (1 - \phi_R)\left(\phi_P(1 - \underline{w} - c_G) + (1 - \phi_P)(1 - \overline{w} - c_G)\right), \tag{30}$$

This holds iff $\phi_R \leq \hat{\phi}_S$, where

$$\hat{\phi}_S \equiv \frac{\phi_P \overline{w}\underline{y} + c_G + \underline{c}_R}{\phi_P \overline{w}\underline{y} + c_G + \overline{c}_R}. \tag{31}$$

Finally, case N, where $u_G(x = \overline{x}_N) \geq EU_G(x = \underline{x}_N)$ iff

$$1 - \overline{x}_N \geq \phi_R(1 - \underline{x}_N) + (1 - \phi_R)(1 - \underline{w} - c_G), \tag{32}$$

This holds iff $\phi_R \leq \hat{\phi}_N$, where

$$\hat{\phi}_N \equiv \frac{c_G + \underline{c}_R}{c_G + \overline{c}_R}. \tag{33}$$

We can now fully characterize the unique perfect Bayesian equilibrium, which is comprised of the following beliefs and strategies:

$$G \text{ sets } x = \begin{cases} \overline{x}_A & \text{iff } \phi_R \leq \hat{\phi}_A \\ \overline{x}_S & \text{iff } \phi_R \leq \hat{\phi}_S \\ \overline{x}_N & \text{iff } \phi_R \leq \hat{\phi}_N, \end{cases}$$

selecting the corresponding value of $\underline{x}$ otherwise, while

$$R \text{ accepts iff} = \begin{cases} x \geq \overline{x} & \text{if } c_R = \underline{c}_R \\ x \geq \underline{x} & \text{if } c_R = \overline{c}_R, \end{cases}$$

rejecting otherwise, and

$$R \text{ sets } y = \begin{cases} \overline{y} & \text{if } q \leq \underline{q} \\ \underline{y} & \text{if } \underline{q} < q \leq \overline{q} \\ 0 & \text{if } q > \overline{q}, \end{cases}$$

and

$$P \text{ accepts iff} = \begin{cases} y \geq \underline{y} & \text{if } c_P = \underline{c}_P \\ y \geq \overline{y} & \text{if } c_P = \overline{c}_P, \end{cases}$$

rejecting otherwise.

Our key results follow from the relative ordering of $\hat{\phi}_N$, $\hat{\phi}_S$ and $\hat{\phi}_A$, the likelihood that q lies above either $\underline{q}$ and $\overline{q}$, and the impact of q on $\hat{\phi}_N$, $\hat{\phi}_S$ and $\hat{\phi}_A$.

Consider first the size of $\hat{\phi}_N$ relative to $\hat{\phi}_S$, where $\hat{\phi}_N < \hat{\phi}_S$ holds iff

$$\frac{c_G + \underline{c}_R}{c_G + \overline{c}_R} < \frac{\phi_P \overline{w}\underline{y} + c_G + \underline{c}_R}{\phi_P \overline{w}\underline{y} + c_G + \overline{c}_R}. \tag{34}$$

This holds so long as $\phi_P \overline{w}\underline{y} > 0$, since $\frac{x}{y} < \frac{x+z}{y+z}$ $\forall\ x, y, z > 0$. Intuitively, if we add some arbitrary constant (z) to both the numerator (x) and denominator (y) of a fraction, the fraction moves closer to 1. Since $\hat{\phi}_S$ is essentially $\hat{\phi}_N$ with an arbitrary constant ($\phi_P \overline{w}\underline{y} = z$) added to both the numerator ($c_G + \underline{c}_R = x$) and the denominator ($c_G + \overline{c}_R = y$), it must be true that $\hat{\phi}_N < \hat{\phi}_S$ so long as $\phi_P \overline{w}\underline{y} = z > 0$.

Intuitively, this tells us that G risks war under a more restrictive set of values of ϕ_R under case S than case N, provided that $\phi_P \overline{w}\underline{y} > 0$. Though we cannot rule out the possibility that $\phi_P \overline{w}\underline{y} = z < 0$ since it is possible that $\underline{y} < 0$, this implies that the only exception to the claim that G risks war under less permissive conditions in case S than case N is when $\underline{y}$ takes on values such that case N must apply anyway. Put differently, when the price at which R can buy the support of even the less resolved P is negative, and thus offering such terms would leave R strictly worse off than fighting G alone, the range of values of ϕ_R for which G risks war is more permissive if R adopts a strategy that R will not choose to adopt. That is why we said above that $\hat{\phi}_N < \hat{\phi}_S$ for all meaningful parameter values.

Next, consider $\hat{\phi}_S < \hat{\phi}_A$, which holds iff

$$\frac{\phi_P \overline{w}\underline{y} + c_G + \underline{c}_R}{\phi_P \overline{w}\underline{y} + c_G + \overline{c}_R} < \frac{\overline{wy} + c_G + \underline{c}_R}{\overline{wy} + c_G + \overline{c}_R}. \tag{35}$$

By the same argument as above, this must be true so long as $\phi_P \overline{w}\underline{y} < \overline{wy}$. Since ϕ_P is a probability, and is thus bounded between 0 and 1, and since $\underline{c}_P < \overline{c}_P \Leftrightarrow \underline{y} < \overline{y}$, and $\underline{c}_P < \overline{c}_P$ is true by assumption, it follows that $\phi_P \overline{w}\underline{y} < \overline{wy}$ must hold. Here, we do not even need the caveat about $\underline{y}$ needing to be positive, though it is of course still true that cases where $\underline{y} < 0$ are fundamentally uninteresting.

Having established $\hat{\phi}_N < \hat{\phi}_S$ and $\hat{\phi}_S < \hat{\phi}_A$, it follows that $\hat{\phi}_N < \hat{\phi}_A$.

This tells us that G risks war under more restrictive conditions when there is a possibility that R and P will team up than when there is no potential for a popular rebellion, and that G risks war under even more restrictive conditions when R and P are expected to work together for a certainty. Since case N exists when $q > \overline{q}$ and case A exists when $q \leq \underline{q}$, with case S arising when $\underline{q} < q \leq \overline{q}$, this indicates that the prospects for rebellion are greatest when the general populace's satisfaction with the status quo is highest and are the most difficult to satisfy when the general populace is least satisfied with the status quo.

However, if increases in q were associated with increases in any of the thresholds, the overall relationship between q and the likelihood of rebellion would be non-monotonic, since increases in q would be associated with an increased likelihood of falling under a case in which G faces a stronger incentive to risk rejection, but a weakening of the incentive to risk rejection *within* any given case. Thus, we now evaluate the effect of q on $\hat{\phi}_N$, $\hat{\phi}_S$, and $\hat{\phi}_A$.

It is straightforward to establish that $\dfrac{\partial \hat{\phi}_N}{\partial q} = 0$. This is unsurprising, since $\hat{\phi}_N$ does not contain q or any terms that themselves contain q. It is equally straightforward to demonstrate that $\dfrac{\partial \hat{\phi}_S}{\partial q} \leq 0$ and $\dfrac{\partial \hat{\phi}_A}{\partial q} \leq 0$. Note that $\underline{y}$ and $\overline{y}$ are both increasing in q. It is through these terms that increases in q act to increases $\hat{\phi}_S$ and $\hat{\phi}_A$.

Next, consider the effect of g on $\underline{q}$ and $\overline{q}$. Note that $\dfrac{\partial \underline{q}}{\partial g} = \dfrac{\partial \overline{q}}{\partial g} = \dfrac{\partial(\overline{w} - \underline{w})}{\partial g}$, since none of the other components of either $\underline{q}$ or $\overline{q}$ depend on g either directly or indirectly.

Since $\dfrac{\partial(\overline{w} - \underline{w})}{\partial g} = \dfrac{\partial \overline{w}}{\partial g} - \dfrac{\partial \underline{w}}{\partial g}$, it follows that $\underline{q}$ and $\overline{q}$ decrease in g so long as $\dfrac{\partial \overline{w}}{\partial g} < \dfrac{\partial \underline{w}}{\partial g}$. This condition holds provided

$$\frac{-r-p}{(r+p+g)^2} < \frac{-r}{(r+g)^2}. \tag{36}$$

This is equivalent to

$$-r^3 - 2r^2g - rg^2 - r^2p - 2rgp - pg^2 < -r^3 - 2r^2p - 2r^2g - 2rgp - rp^2 - rg^2, \tag{37}$$

which ultimately simplifies to $g > r + \sqrt{rp}$.

Finally, consider the effect of g on $\hat{\phi}_N$, $\hat{\phi}_S$, and $\hat{\phi}_A$. It is straightforward to establish that $\frac{\partial \hat{\phi}_N}{\partial q} = \frac{\partial \hat{\phi}_S}{\partial q} = \frac{\partial \hat{\phi}_A}{\partial q} = 0$. Observe that $\hat{\phi}_N$ does not contain g or any terms that themselves contain g. Note that $\hat{\phi}_S$ contains $\overline{w}$, but this is multiplied by $\underline{y}$, which has a denominator of $\overline{w}$. Thus, we can rewrite $\hat{\phi}_S$ as $\frac{\phi_P(q - \xi + \underline{c}_P) + c_G + \underline{c}_R}{\phi_P(q - \xi + \underline{c}_P) + c_G + \overline{c}_R}$. After doing so, it is clear that $\hat{\phi}_S$ also does not depend on g. Similarly, $\hat{\phi}_A$ contains $\overline{wy}$, where $\overline{y}$ also has a denominator of $\overline{w}$. We can therefore rewrite $\hat{\phi}_A$ as $\frac{q - \xi + \overline{c}_P + c_G + \underline{c}_R}{q - \xi + \overline{c}_P + c_G + \overline{c}_R}$, which clearly does not depend on g.

We have therefore shown that increases in q and g increase the likelihood of falling into case S relative to A, and of N relative to S, and that G risks war under more permissive conditions in case S than case S than case A, and under even more permissive conditions in case N. Moreover, increases in q decrease $\hat{\phi}_A$ and $\hat{\phi}_S$, though g has no impact on the size of $\hat{\phi}_N$, $\hat{\phi}_S$, or $\hat{\phi}_A$. This establishes that increases in q increase the likelihood that G will risk rejection, as do increases in g, at least provided $g > r + \sqrt{rp}$.

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