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Goal and Strategies of an Insurgent Group: Violent and Non-violent Actions

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Abstract:

We model the strategy of an insurgent group that follows a pattern of prolonged popular war but negotiates with the government. The main results of the model are the following: (i) If the marginal probability of signing a peace treaty is significantly low when the guerrilla invests little on non-violent strategies, then they will continue to fight and allocate all its resources on military power. (ii) *Ceteris paribus*, the future stock of military power of a guerrilla is increasing in their current military power and its budget. (iii) The greater the government's military power, the lower the share of resources guerrillas allocate to violent strategies. We also provide two examples of negotiation processes between the Colombian government and FARC, and relate it to our theoretical results.

Keywords: Economic conflict, negotiation strategies, guerrilla, utility functions

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1 Introduction

Negotiation processes can be the way out of prolonged and painful domestic conflicts. However, sometimes the negotiation is part of a strategy designed to regain military force and, consequently, it is also the prelude of an upsurge of the war. For this reason, during peace talks, skeptic voices are strong and almost any event generates new doubts about the feasibility of a negotiated peace.

We consider a negotiation process between the government and an insurgent group defined as a band of irregular soldiers that uses guerrilla warfare, harassing the government by surprise raids, sabotaging communication and supply lines. We also assume that the main objective of the insurgent group is to change the economic and political order of the country. Finally, we define guerrilla as a member of an insurgent group.¹ Given the main goal of the insurgent group and its tactics, for many people it is difficult to believe in the peace will of guerrillas. Indeed, a negotiation process can be a way to protect the leaders of the group, gain some air and even obtain concessions that may be helpful for the purpose of a revolution. In this context a number of questions arise: How is the budget of an insurgent group devoted between violent actions and non-violent actions? Is it possible to know the real goal of an armed group? Do the actions outside the table reflect the intentions of an armed group?

In this article we answer the first question.² To do so, we provide a simple model where the insurgent group behaves in a rational way and chooses its actions in order to maximize its expected utility. For each period there are three possible scenarios: (i) revolution is achieved, (ii) a peace treaty is signed, (iii) the conflict continues and the same situation is faced in the next period.

Revolution is considered the scenario where the guerrilla obtains its highest outcome. In this case the government would be defeated and the guerrilla would have no need to invest more resources on conflict. Hence, there would not be diversion of resources from productive activities.

The second scenario results from a bargaining process between the government and the guerrilla which outcome depends on the stock of military power of each agent. In particular, it depends negatively on the stock of military power of the government and positively on the guerrilla military power. Its value is bounded below by the case where the guerrilla is defeated and above by revolution. A peace agreement would also imply the cease of military activities and the use of such resources on productive activities. However, such returns would have to be split with the government and thus the guerrilla outcome will be lower than the one obtained with revolution.

The first two scenarios happen with an endogenous probability that depends on the actions of the guerrilla and the government. Each period, guerrillas allocate resources to violent and non-violent strategies. Investments in non-violent strategies include campaigns, advertisement and political organizations. These investments increase the probability of signing the peace treaty. On the other hand, expenditure on military operations, ammunition, terrorist attacks and logistics; increases the stock of military power and the probability of a complete revolution. The government can also affect the probability of a revolution by changing its military power: more government power decreases this probability. If none of the first two scenarios happen, the conflict continues and thus its value is bounded by these two outcomes.

Although both investments in both violent and non-violent strategies divert resources from productive activities and thus are inefficient, achieving the efficient scenarios require them in a stochastic sense. The investment in non-violent strategies is tightly connected with Fearon (1995) explanation of private information as a source of inefficient conflict. Since the government has some uncertainty on the guerrilla's real military power, the guerrilla might have to incur in costly signals to achieve a "fair" bargaining outcome. If they are too costly, inefficient conflict could continue. On the other hand, investment in violent strategies will be optimal for the guerrilla since it increases its bargaining power for future peace agreements and increases the chances of achieving revolution.

In this setting we find three main results. First, if the guerrillas perceive that investing in non-violent strategies does not increase significantly the probability of signing a peace treaty, then they will continue fighting and no budget is allocated to non-violent strategies. Second, the guerrilla invests more in violent strategies the higher is their current military power and their budget. Third, the higher the military strength of the government the lower the share of resources guerrillas allocate to violent strategies.

The paper at hand is related to Skaperdas (2006) who models the utility function of an insurgent group and identifies relevant variables in order to explore the conditions under which a truce can be reached. However, he does not investigate the incentives or effects of violent and non-violent strategies. Likewise, Bueno de Mesquita (2011) considers the case of a conflict between two individuals in a game theoretical framework. However, in his frame the identification of the parties with guerrillas and government is problematic.³

The rest of the paper is organized as follows: In Section 2 we present the model, in Section 3 we briefly present two examples of negotiation processes which help illustrate the relevance of the theoretical model, and Section 4 concludes.

2 Model

We propose a model where the guerrilla wants to maximize its intertemporal utility, where each period the utility is given by an expected value of three scenarios. In the first scenario a revolution is achieved and the guerrilla obtains complete control over the country. In the second one a peace treaty is signed, violence ceases and the guerrilla participates democratically. Finally, in the third scenario, the conflict continues and the same situation is faced in the next period. In such a scenario the guerrilla has to allocate a budget between expenditure on non-violent and violent strategies. While the former increases the probability of signing the peace treaty, the second one increases their military stock, which in turn increases the probability of revolution and the utility derived from the peace agreement.

The lifetime utility from successful revolution is denoted by W , the highest discounted utility the guerrilla can obtain. The utility derived by the guerrilla from the peace treaty arises from a bargaining process between the guerrilla and the government. Its outcome depends on their bargaining power that we associate with their military power. Therefore, we can think on a reduced form utility $U(M, S)$ that depends positively on the guerrilla military stock M and negatively on the government military stock S .⁴ We also assume it is a concave function of M and that the cross derivative is negative, that is, the marginal utility of the guerrilla from increasing military power is decreasing in the government military power. The utility $U(M, S)$ is bounded below by 0, which is the normalized utility of a defeated guerrilla, and bounded above by W .⁵

In the third scenario when the parties are in conflict, the problem of the guerrilla is to allocate its budget B between expenditure on non-violent strategies n and expenditure on violent strategies m . We assume for simplicity that the budget is constant over time. However, all the results derived in the paper hold when the budget changes over time and those changes are perfectly foreseen by the guerrilla, although in this case we cannot use recursive tools to solve it.

The share n could be interpreted as expenditure on campaigns, advertisement and political parties and it increases the probability of signing the peace treaty $\pi(n)$, which we assume it is a differentiable convex function. On the other hand, we identify the share m with expenditure on military operations, ammunition, terrorist attacks and logistics; it is assumed that it increases the stock of military power M , which depreciates at a rate δ . Formally, the law of motion for M is given by $M' = (1 - \delta)M + m$, where M' is next period stock of guerrilla military

power. In other words, the future guerrilla military stock depends of its current stock and on the investment on violent strategies.

The stock M increases the probability of revolution $\theta(M, S)$, which also depends negatively on the government military power S . We assume the following conditions over this function:

$$\theta_M(M, S) > 0, \lim_{M \rightarrow 0} \theta_M(M, S) = \infty, \theta_{MM}(M, S) < 0,$$

$$\theta_S(M, S) < 0, \theta_{MS}(M, S) < 0, \text{ for all } M, S$$

In words, greater military stock of the guerrilla increases such probability, although at a decreasing rate; such increase is also decreasing on the government military power. Moreover, we impose the Inada condition stating that the marginal probability of revolution becomes very large when M tends to 0. The latter implies that the probability of continuing the conflict is less than 1 and has the role of a discount factor. We further assume that changes in both military powers have a greater effect (in absolute value) on the expected value of not signing the peace treaty than in the value of signing it. Denote by $V(M)$ the utility derived by the guerrilla during conflict as a function of its military stock M . Formally, we assume $0 < U_M \leq \theta_M(W - V(M'))$ and $\theta_S(W - V(M')) \leq U_S < 0$ for all M' .

The problem to be solved by the guerrilla can be expressed recursively as:

$$V(M) = \max_{M'} \pi(n)U(M, S) + (1 - \pi(n))[\theta(M, S)W + (1 - \theta(M, S))V(M')]$$

$$\text{subject to } M' = (1 - \delta)M + m, m + n = B.$$

The value function can also be thought as a reduced form utility arising from a complete information dynamic game with the government. Consider the case where the guerrilla moves first by choosing M , then the government observes this choice and chooses S' to maximize its utility function. Using backward induction, the optimal strategy of the government can be written as $S'(M', S)$. Then, in order to obtain the unique subgame perfect equilibrium, the guerrilla would solve:

$$\hat{V}(M, S) = \max_{M'} \pi(n)U(M, S) + (1 - \pi(n))[\theta(M, S)W + (1 - \theta(M, S))\hat{V}(M', S'(M', S))]$$

$$\text{subject to } M' = (1 - \delta)M + m, m + n = B$$

However, note that we can define $V(M', S) = \hat{V}(M', S'(M', S))$ to obtain the previous formulation. In other words, the guerrilla understands how the government will react with its decision and chooses its military power accordingly, and S is interpreted as the (initial) government power that remains constant through time.⁶

The value function satisfies standard conditions, such as existence and uniqueness of the solution, and is bounded as it is shown in the next proposition.

Proposition 1: The value function $V(M)$ exists, is unique and is bounded below by $U(M, S)$ and above by W .

Proof: Let $C(X)$ be the space of bounded continuous functions $f: X \rightarrow \mathbb{R}$ such that $U(M, S) \leq f(M) \leq W$ for all $M \in X$. Now define the operator T on $C(X)$ as

$$Tf(M) = \max_{M'} \pi((1 - \delta)M + B - M')U(M, S) \\ + (1 - \pi((1 - \delta)M + B - M'))[\theta(M, S)W + (1 - \theta(M, S))f(M')]$$

Therefore the problem to be solved is continuous over a compact restriction set, and thus a maximum exists. Since π and θ are bounded and continuous, and the restriction set is compact and continuous, the Theorem of Maximum applies and implies that Tf is also continuous. Finally, note that since $U(M, S) \leq f(M') \leq W$ then $U(M, S) \leq Tf(M) \leq W$ since $Tf(M)$ results from a convex combination of $U(M, S)$, W and $f(M')$. Hence $T: C(X) \rightarrow C(X)$. Since the problem is monotone in $V(\cdot)$ and is discounted by $(1 - (\pi(n))(1 - \theta(M, S))) < 1$ given the Inada condition on θ , then it is a contraction and its solution is unique. ■

The proposition states that the maximum outcome a guerrilla can obtain is complete revolution and the minimum is a peace treaty. However, note that a peace treaty includes the case where the guerrilla gets nothing from the agreement since they have been defeated, in which case their utility is 0. Although the result is very intuitive, it is a key step to obtain the following results. The first derivative with respect to the future stock M' is then given by:

$$\frac{\partial V}{\partial M'} = -\pi_n(n)[U(M, S) - \theta(M, S)W - (1 - \theta(M, S))V(M')]$$

$$+ (1 - \pi(n)) \left((1 - \theta(M, S)) \frac{\partial V(M')}{\partial M'} \right)$$

$$\text{where } \frac{\partial V(M)}{\partial M} = \pi_n(n)(1 - \delta)[U(M, S) - \theta(M, S)W - (1 - \theta(M, S))V(M')]$$

$$+ (1 - \pi(n))(\theta_M(M, S)(W - V(M'))) + \pi(n)U_M(M, S)$$

Therefore, increasing the stock of military power decreases the chances of a current peace treaty and increases the current expected value function, while also changing the value of continuing the conflict next period. However, note that the future value of continuing the conflict is not necessarily monotone increasing in M' . On one hand, it increases the probability of a revolution next period and the value of a future peace treaty (the terms in the second line of the equation). On the other hand, it decreases the need for investing in more

military power, thus increasing the probability of having a future peace treaty, which has a lower value. Nevertheless, although we cannot assure the monotonicity of the value function, the value function is concave in M given our assumptions:

$$\begin{aligned} \frac{\partial^2 V(M)}{\partial M^2} &= \pi_{nn}(n)(1-\delta)^2[U(M, S) - \theta(M, S)W - (1-\theta(M, S))V(M')] \\ &\quad + 2(1-\delta)\pi_n(U_M(M, S) - \theta_M(W - V(M'))) + \pi(n)U_{MM}(M, S) \\ &\quad + (1-\pi(n))(\theta_{MM}(M, S)(W - V(M'))) < 0 \end{aligned}$$

Therefore we know that the sign of the first derivative will change at most one time. If it were to be positive for all M or slightly negative for large M , then the first derivative (first order condition) will be positive for all M' and thus the guerrilla will invest all its budget in military power. This will happen if $\pi_n(n)$ approaches to 0 as n gets closer to 0. In words, the guerrilla will invest its entire budget in military power whenever investing a small amount in non-violent strategies does not increase the probability of signing a peace treaty significantly.

Lemma 1: If $\lim_{n \rightarrow 0} \pi_n(n) = 0$ then $m(M)=B$ for all M .

Proof: It follows directly from the first order conditions.

Now consider an interior solution where $0 < m < B$. In this case the solution is obtained when the first derivative is equal to zero and therefore it is necessary that $\frac{\partial V(M')}{\partial M'} < 0$. In words, an interior solution is obtained whenever increasing the stock of military power decreases the future guerrilla utility since it leaves more room to spend the future budget in non-violent strategies to increase the likelihood of signing a peace treaty. Such condition leads to a maximum since the problem is concave in M' :

$$\begin{aligned} \frac{\partial^2 V}{\partial M'^2} &= \pi_{nn}(n)[U(M, S) - \theta(M, S)W - (1-\theta(M, S))V(M')] \\ &\quad + 2\pi_n(n)(1-\theta(M, S))\frac{\partial V(M')}{\partial M'} + (1-\pi(n))(1-\theta(M', S))\frac{\partial^2 V(M')}{\partial M'^2} < 0 \end{aligned}$$

Proposition 2: In an interior solution the chosen military power M' is strictly decreasing in the government power S , and increasing in previous power M and the budget B .

Proof: The cross derivatives of the value function are given by

$$\frac{\partial^2 V}{\partial M' \partial S} = \pi_n(n)[\theta_S(M, S)(W - V(M')) - U_S(M, S)] - (1-\pi(n))\theta_S(M, S)\frac{\partial^2 V(M')}{\partial M' \partial S} < 0$$

where

$$\begin{aligned} \frac{\partial^2 V(M)}{\partial M \partial S} &= \pi_n(n)(1-\delta)[U_S(M, S) - \theta_S(M, S)(W - V(M'))] \\ &\quad + (1-\pi(n))(\theta_{MS}(M, S)(W - V(M'))) + \pi(n)U_{MS}(M, S) < 0 \end{aligned}$$

$$\begin{aligned} \frac{\partial^2 V}{\partial M' \partial M} &= -\pi_{nn}(1-\delta)[U(M, S) - \theta(M, S)W - (1-\theta(M, S))V(M')] \\ &\quad + \pi_n(n)[\theta_M(M, S)[W - V(M')] - U_M(M, S)] - [\pi_n(1-\delta)(1-\theta(M, S)) \\ &\quad + (1-\pi(n))\theta_M(M, S)]\frac{\partial V(M')}{\partial M'} > 0 \end{aligned} \quad \blacksquare$$

$$\begin{aligned} \frac{\partial^2 V}{\partial M' \partial B} &= -\pi_{nn}[U(M, S) - \theta(M, S)W - (1-\theta(M, S))V(M')] \\ &\quad - [\pi_n(1-\theta(M, S))]\frac{\partial V(M')}{\partial M'} > 0 \end{aligned}$$

Hence, the greater the government power, the less the guerrilla will invest in their military power since it decreases the probability of having a complete revolution. It is also easy to show that the value function is decreasing in S , thus a greater government power decreases its incentives for military confrontation and increases the chances of a peace treaty. On the other hand, the guerrilla will invest more on military power the more military power they had before, until it reaches the point where all budget is allocated to military power. The proposition also states, as expected, that a greater budget induce a greater investment in military power.

3 Guerrillas in Colombia: a tale of two processes⁷

In Colombia, the first guerrilla groups appeared in the decades of 1940 and 1950. However, these groups didn't become a serious threat until the decade of 1970 given the support of part of the public opinion sympathetic with nationalism and opposition to imperialist oppression (Boot, 2013). The Cuban revolution and the political changes in other countries of Latin-America served as inspiration and support for the Colombian rebels.

Different groups with different ideological identities became part of the violent national environment: the pro-Cuban movement ELN (National Liberation Army), the FARC (revolutionary armed forces of Colombia)

pro-USSR and the EPL (Popular Liberation Army) pro-Mao and the pro-cuban movement M-19 (Beckett, 1999). In the early 1970s, the guerrilla violence had become endemic, and in an effort to put an end to these groups, the Government tripled the size of the army, achieving only the guerrillas to return to emerge more forcefully (Castro, 2006).

Given the increasing size of the guerrilla, the Colombian government has gone through several negotiation processes with different results. However, two processes help illustrate the relevance of our theoretical model: Caguan and La Habana.⁸

In 1998 a negotiation process between the Colombian government and FARC began in Caguan. The guerrillas imposed the demilitarization of 42 thousand square kilometers as a condition to begin the peace talks. The negotiations were held while military offensives and operations were carried out by both sides, wearing out the process and bringing it to an end four years later in 2002.

In Caguan, the FARC recognized the State as an actor and accepted the principle of negotiation. The problem this time was the distance between what the government was willing to give and what the FARC were demanding. The guerrilla did not accept the terms of the agreement and asked to be at least 50% of the Government. In terms of our model, they demanded a value of the agreement to be equal to the value of the revolution. The unattainable conditions demanded by the FARC led to the paralysis of the dialogues and the strategy of FARC outside the table was to increase the military power, the number of guerrillas and the territorial control.

In terms of our model, The FARC were in an interior point where they were increasing their military power M' to continue their goal of achieving a complete revolution. This suggests they were not truly interested in their peace negotiations. Under such circumstances, if talks are held, they are part of a war strategy and not a plausible formula for finishing the conflict.

The perception of FARC was that their relative strength M/S was so big that the probability of a revolution $\theta(M, S)$ was close to one and, for this reason, their utility in the case of a peace agreement $U(M, S)$ has to be close to their utility in the case of a complete revolution. Since this was not what the government was offering, the strategy of the FARC was investing more on military power m and less in political support n .

After the failure of Caguan, Alvaro Uribe, a right wing politician, was elected president. Uribe's Government strategy was to promote an increase in the strength of the State. It ruled out the option of negotiations and many of the members of the Secretariat, chiefs and important figures of the guerrillas of the FARC, were killed or captured. There was a pronounced increase in the military power of the State and a debilitation of the military power of FARC, as the model suggests.

Uribe ruled for two consecutive periods and after 8 years. Then, Juan Manuel Santos, Minister of Defense of Uribe administration, was elected President. In August 2012 President Santos announced an existing secret dialogue with the FARC in order to initiate peace talks.

In terms of our model the strategy of Uribe was a big increase in military strength S that reduced substantially the probability of a revolution $\theta(M, S)$ and allowed him to reduce the utility derived by FARC in the case of a peace treaty $U(M, S)$. Admittedly, part of the strategy of Uribe administration which is not captured in our model was a reduction of the military strength of guerrillas M which reinforced the effects on $\theta(M, S)$ and $U(M, S)$.

Since then until the 26th of September of 2016, the FARC guerrillas and the Colombian government negotiated. The main goal of the process was, of course, putting an end to the armed conflict. However, for this goal to be achieved the parts had to agree on how to address specific problems: Rural Development, Political Participation, Illicit Drugs and Victims. They also had to agree on the conditions for the demobilization of guerrillas and the mechanism to democratically endorse the agreements. In terms of our model they had to agree on $U(M, S)$.

During this process, the FARC had been involved in political activities, supporting civic movements like *Marcha Patriótica*, communicating their views and goals and telling what they call their truth. Additionally, they had collaborated with the army in order to remove antipersonnel mines and reduced their military activity. In terms of our model, the FARC chose to invest a big part of their resources on n .

We claim that, with these actions the FARC "revealed their actual goal". If the final goal of the FARC were an armed revolution then they would have continued fighting and allocating resources on military power m , or asking for too much in a peace negotiation. The decision to invest in political activities suggests that the FARC expects to see the return of such investment in the democratic contend. On the one hand, actions like the decision to collaborate with the army in order to remove antipersonnel mines, the so-called infiltration of civil protests and the support to *Marcha Patriótica* are non-violent strategies. On the other hand, the unilateral truce (even if it is not fully complied) suggests that military power and territorial control were less important than before.

4 Conclusions

For some armed groups the only acceptable outcome is the complete revolution. If this is the case, negotiations may be part of a strategy designed to gain military force. For this reason, peace talks can be surrounded by skepticism.

The guerrillas are more likely to engage in an honest negotiation process when the terms of the negotiation are appealing to the insurgent group. If the guerrillas value political participation, as they are willing to accept the outcome of a negotiation process, then their optimal strategy is to avoid military confrontation and devote the resources to gain political strength and sign a peace treaty. Similarly, the willingness to negotiate and accept a peace deal increases with the military strength of the government. If the insurgent group is not willing to accept anything but a complete revolution then the probability of signing a peace treaty is significantly low and the guerrilla allocates all its resources on military power.

We further claim that the strategy of the guerrillas depends on their budget constraint, their own military power and the military power of the government. In particular, (i) the greater the government power, the less the guerrillas will invest in their military power and thus the chances of a peace treaty increases, and (ii) the greater their own military power and their budget, the higher the investment in increasing its own military power.

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Notes

¹Guerrilla Warfare is the use of hit-and-run tactics by small, mobile groups of irregular forces operating in territory controlled by a hostile, regular force.

²In order to answer all these questions, we would need a complete dynamic game theoretical model with incomplete information where government and guerrillas observe the actions of the other party and then decide their own actions. This analysis is left for future research.

³Other contributions in the area of negotiations are Chang (2008) and Zuleta, Villaveces, and Andonova (2013).

⁴Skaperdas (2006) shows that a peace settlement depends directly on the probability of winning of each side. In our model, the variables M and S determine these probabilities and therefore, in equilibrium, the result of the peace agreement depends on the probability of winning of each side.

⁵In general, the utility derived by the guerrilla group once a settlement is reached depends also on the interactions of insurgents and the government. Although extremely important, our interest is not on the bargaining process inside the table but on the strategies outside the table. Other authors have studied the bargaining process in detail: see Fearon (1994), Powell (1996, 2004, and 2012) and Slantchev (2003).

⁶For a deep and complete discussion about dynamic conflicts see chapter 8 of Konrad (2009).

⁷A complete analysis of the Colombia conflict can be found in a Special Issue of Peace Economics, Peace Science and Public Policy on Conflict, Crime and Violence in Colombia edited by Raul Caruso and Juan F. Vargas. In this issue Arias, Ibáñez, and Querubin (2014), Blanco and Vargas (2014), Lemus (2014), and Vargas and Caruso (2014) provide profound studies about the economic causes and consequences of the Colombian conflict.

⁸The efforts made by the government in order to achieve a peace agreement can be perfectly justified by the costs of the Colombian conflict. See Rubio (1995), Trujillo and Badel (1998), Mejía and Posada (2003), Zuleta (2004), Zuleta and Andonova (2009), and Vargas and Riascos (2011), among others.

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