INTERVENTIONS AGAINST A DICTATOR

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The Arab Spring, a wave of revolutions in nondemocratic countries in North Africa and the Middle East, forced some dictators to flee from their countries while others stayed and one faced intervention by an international coalition. Using a stylized game-theoretic model, this article analyzes the decision-making process of a dictator and explains the different outcomes. A rational dictator only leaves the country if the expected costs from punishment outweigh the benefits of staying. For the international coalition, the model identifies a trade-off between the cost of the intervention and the potential for economic benefit from a successful intervention. A higher number of participants in the coalition increases the probability of the intervention's success. However, if the intervention fails, coalition participants lose all economic benefits. Therefore, an intervening country benefits from the participation of other countries because it lowers the risk of failure. If the intervention succeeds, the economic benefits are shared among all intervening countries. Thus, an intervening country has the most to gain if it acts alone. Furthermore, a country can deliberately abstain from an intervention to benefit from higher shares of economic profit if the intervention fails and coalition members lose all economic benefits. The model can help explain the rarity of unanimous votes for an intervention and the complex and tedious bargaining process surrounding decisions to intervene.

In early 2011, the world observed a wave of revolutions in nondemocratic countries in North Africa and the Middle East that became known as the Arab Spring. The revolution in Tunisia swept away the longstanding president, Zine el-Abidine Ben Ali. After another successful revolution in Egypt, protests in Libya, Syria and Yemen intensified. The leaders of all three countries countered the

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The Global Public Policy Network Essay features the finest work received by the Journal *from students at GPPN partner schools, including Sciences Po Paris, the London School of Economics and Political Science, the Lee Kuan Yew School of Public Policy, and Columbia University. The essay prize was inaugurated in 2011.*

uprisings with military force. After Muammar al-Qaddafi ordered his air force to attack demonstrators, the United Nations authorized an international coalition to intervene in Libya.[1] Although the Syrian regime was committing similar violence against its citizens, the international community chose not to intervene militarily. A game-theoretic framework based on a stylized model sheds light on the decision-making process underlying these choices at the international level.

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A dictator seeks to maximize his rents.[2] One can distinguish between two extreme types of dictators who seek high rents.[3] The first type exercises force and control, coercing citizens to work. Since this coercion impedes the growth of the country—at least in the long run—leaders increase coercion and atrocities over time, resulting in a totalitarian regime (e.g., Mao Zedong in China, Pol Pot in Cambodia, Muammar al-Qaddafi in Libya, etc.). Other dictators try to maximize rents by stimulating growth (e.g., Park Chung Hee in South Korea and Lee Kuan Yew in Singapore).[4] Often, a regime's party is founded for the recruitment and distribution of patronage.[5] The incorporation of opposition groups into the system (such as the Muslim Brotherhood in Jordan) can reduce the chance of rebellion.[6] The model focuses on totalitarian leaders, but the analysis also discusses a rationale for the existence of the second type of leader.

The model assumes a hypothetical country where an insurgency of citizens, rebels or revolutionaries is endangering the rule of a well-established, exploitative dictator. [7] In line with recent events in Libya, the model assumes that the rebels cannot overthrow the current regime without military support from the international community. For this reason, the rebels are not modeled as active decision makers. Only the dictator and the international coalition of intervening countries are players in the model. The dictator can decide to leave the country to avoid punishment or stay and face a possible intervention from the international coalition. The game is thus structured in such a way that the dictator first decides whether he wants to stay; in the event that he does not leave, the international coalition then decides whether or not it will intervene.

The model assumes that each player is only interested in maximizing his utility.[8] Although utilities can also contain moral considerations, the analysis is restricted to economic benefits. As dictators have the opportunity to extract high rents while they rule, the model assigns a high utility to the dictator for staying in power and remaining in the country. However, a dictator might decide to forego the opportunity to extract rents in order to avoid punishment after a successful

intervention. Yet, by deciding to leave the country, the dictator might also miss out on possibilities for further rent seeking if the intervention is not executed or if it fails.

The coalition of countries decides whether or not to intervene only after the dictator has decided to stay. In an extended version of the framework, the decision-making process of countries within the coalition is modeled as follows: The intervening countries obtain a baseline economic utility from the country with the dictator. Trade and access to natural resources are examples of benefits that countries obtain from cooperation with the dictator's country. An intervention generally inflicts damage on the dictator's country, reducing economic benefits for the coalition. In addition, the intervening countries must share costs of the intervention. If the coalition successfully intervenes and manages to remove the dictator, the model assumes that the coalition can use its influence to extend its access to natural resources. Additionally, it is assumed that trade with the autocratic country will be more efficient after the removal of the dictator, since the negative effects of patronage are likely to be reduced. The utility of coalition countries therefore increases if the dictator either leaves or is defeated.

Although the coalition profits from the removal of the dictator, countries participating in the intervention face a risk by doing so. If the intervention fails, the dictator will deny further access to natural resources and close off trade to the intervening countries. Conversely, countries that did not participate in the intervention will receive a higher share of the total economic benefits that are obtained from trade with the autocratic country. However, if the intervention succeeds, nonparticipating countries will lose their entire share of benefits since the intervening countries can use their influence to secure complete and exclusive access to all natural resources and other trade opportunities. In addition, the model assumes that a successful intervention will increase the total benefits of interaction with the country because the dictator can no longer have a negative impact on the economy.

Based on the developed framework, the conditions for Nash equilibria can be derived from the underlying structure of the game. The model identifies a trade-off between the costs and resulting damage of any intervention and the higher economic benefits of a successful intervention. A higher success probability for the intervention increases the chances of higher economic benefits. Since the success probability increases when more countries decide to intervene, the coalition has an interest in maximizing the number of participants. For an individual country, the decision is more complex because participation can result in a loss of all economic benefits if the intervention fails. From this perspective, an intervening country needs the assistance of other countries to increase the success probability of the

intervention. If the intervention succeeds, the economic benefits have to be shared among all intervening countries. Therefore, an intervening country maximizes profits if it intervenes alone. Although actual results depend on the dynamics of the success probability, the model can derive these trade-offs based on a few intuitive assumptions. It can explain the rarity of unanimous votes for interventions and the complex and tedious bargaining process leading up to interventions. The bargaining process is highly dynamic because the number of intervening countries influences the success probability, which in turn is a crucial determinant because it changes expected economic benefits. The model explains variation in countries' decisions to intervene without taking into account any idiosyncratic preferences or characteristics of coalition countries or their relationship to the dictatorship.

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In the next section, the framework is developed as a sequential game in the spirit of political economy. In the first stage, the dictator decides whether to stay in power or leave the country. If he stays, the coalition reacts in the second stage and decides whether to intervene. In the basic version of the game, it is initially assumed that the intervention is always successful. The expanded version includes a probabilistic factor for the success of the intervention. Later the coalition is disassembled, leading to a simultaneous multi-player game for the second stage with individual countries as the players. After analyzing the outcomes of the complete model, this article concludes with a discussion of the model, its empirical impact, potential extensions and notes a few caveats.

Sequential Analysis

The basic game has two players: the dictator and the coalition. The coalition receives E in baseline economic benefits from the dictator's country through mechanisms such as trade and the import of natural resources like oil. As discussed above, the economy under an exploitative dictatorship is unlikely to flourish. Therefore, the removal of a dictator reduces economic inefficiencies and leads to increased economic benefits for the coalition of $E + e^0$ with $e^0 > 0$. If an intervention is successful, the coalition has a stronger negotiation position such that the economic benefits are $E + e$ with $e > e^0$.[9] The dictator receives benefits of $R > 0$ by staying in power because of the extensive opportunities for rent seeking.

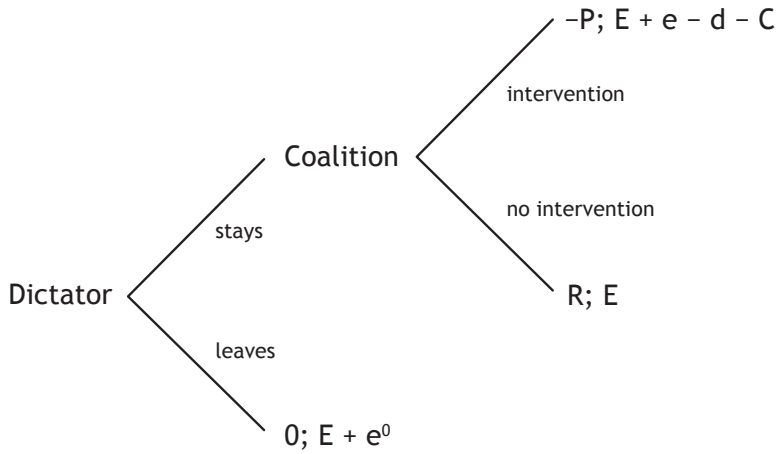
Intervention with Certain Success

The two-level sequential game has three different outcomes, as depicted in

Figure 1. For now, the game assumes that an intervention always succeeds. This assumption is relaxed in the next section. In the first stage of the game, the dictator can decide whether he stays or leaves. If he leaves, he will lose his rent R and receive a utility of zero. In addition, the coalition will receive higher economic benefits $E + e^0$. If the dictator stays, the coalition has to decide whether to intervene. If it decides against an intervention, the dictator can remain in power and continue receiving rents R. Since the country does not yield higher economic returns, the coalition will continue receiving economic benefits E. In case of an intervention, which is assumed to be successful, the dictator is punished with $-P$. The coalition has increased bargaining power, which leads to increased economic benefits $E + e$, but also entails reduced benefits from the damage to the attacked economy d and the costs of the intervention C. This leads to an overall utility of $E + e - d - C$ for the coalition.

The model . . . can explain the rarity of unanimous votes for interventions.

Figure 1: Extensive form of the two-level game



Players are denoted at the inner nodes, actions are annotated on the branches and utilities are given at the leaves. The first value corresponds to the dictator's utility, while the second value indicates the utility for the coalition.

Based on backward induction, the coalition will decide to intervene in the second stage of the game if the additional benefits e are greater than the damage and costs $d + C$ of the intervention, where $e > d + C$. Hence, the dictator faces punishment $-P$ because of an intervention if $e > d + C$. In the case of no intervention, he will collect rents R. He can also leave the country, which yields a utility of zero. As $R > 0 \geq -P$, the dictator will stay in the country when $e \leq d + C$, assuming that the coalition decides against an intervention if it is

indifferent. In the event of an intervention ($e > d + C$), the dictator will leave the country to avoid punishment if $P > 0$ (or if $P = 0$, in which case he is indifferent). Note that the decision making is independent of the economic benefits e^0.

In expectation of such a decision, a dictator can try to influence the values of these parameters. In the model, these parameters are exogenous, but an avenue of future research would be to model them endogenously. One could then analyze the choices dictators make regarding whether to invest in military equipment or economic development. A dictator could decrease the chances of an intervention by increasing the costs C of an intervention, maximizing the inflicted damage d or both. Marshaling a powerful army would increase costs C, while fighting until the bitter end leads to high damage d. Here, the parallels to Qaddafi's strategy are striking. Another option would be to decrease additional economic benefits e. This could be achieved by implementing far-reaching reforms to open the country but risks decreasing rents R for the dictator. As noted above, this scenario provides one explanation for the reasoning of dictators who focus on stimulating economic growth in their countries.

Expected Utilities

In the last section the intervention was assumed to succeed with certainty. Now this assumption is relaxed through the introduction of a success probability of the intervention p where $0 < p < 1$. The utilities of an intervention therefore need to be adjusted in accordance with the success probability p.[10] The dictator only receives rent-seeking benefits if the intervention fails but is punished with $-P$ if the intervention succeeds. Thus, the dictator's expected utility for facing an intervention is $(1 - p)R + p(-P)$. The coalition does not obtain the additional economic benefits e, but it does face costs C and damage d from the intervention if the intervention fails. This yields economic benefits of $E - d - C$.[11] This utility is increased by e if the intervention succeeds. Hence, the coalition has the following expected utility for an intervention:

$$p(E + e - d - C) + (1 - p)(E - d - C) = E - d - C + pe\,.$$

If the coalition decides against an intervention, the dictator stays, obtaining a utility of R, and the coalition yields a utility of E as in the status quo. Concordantly, if the dictator leaves without an intervention and receives a utility of 0, the coalition has a utility of $E + e^0$.

Coalition-Level Utilities

Applying backward induction to the analysis of the sub-game of the coalition

yields the following condition:

$$\begin{aligned} E - d - C + pe &> E \\ p &> \frac{d + C}{e}. \end{aligned} \tag{1}$$

Given that the dictator decides to stay, the coalition will decide to intervene if the expected utility of the intervention is higher than the expected utility of no intervention. Hence, the coalition will always decide against an intervention if the intervention costs $d + C$ exceed or equal the additional benefits e as $0 < p < 1$. The more the additional benefits e exceed the intervention costs $d + C$, the greater the chance that the coalition will risk an intervention. In addition, if intervention costs $d + C$ are equal to zero, the coalition will always attack or be indifferent. Since this model contains the model from the last section, assuming a successful intervention as a special case with $p = 1$, it produces the same result—i.e., that benefits have to exceed costs and damage $e > d + C$ for an intervention.

Dictator-Level Utilities

The next step is to analyze the first step of the game: the dictator's choice. If condition (1) is fulfilled, the coalition will intervene and the dictator receives an expected utility of $(1 - p)R + p(-P)$ if he decides to stay. Since his expected utility is zero if he leaves, the model yields a second condition: the dictator will decide to stay if his expected utility of staying is greater than zero. Therefore,

$$\begin{aligned} (1 - p)R + p(-P) &> 0 \\ p &< \frac{R}{R + P}. \end{aligned} \tag{2}$$

The more benefits the dictator receives from rent seeking (R) and the smaller his punishment if he is expelled after a successful intervention (P), the more he is willing to risk an intervention, even one with a high probability of success. Only if he does not receive any punishment ($P = 0$) will he definitely stay, independent of the success probability p.[12] Conditions (1) and (2) can be used to relate punishment $-P$ and rent seeking R to intervention costs $d + C$ and additional benefits e. The dictator will decide to stay despite a predictable intervention under the following condition:

$$\frac{R}{R + P} > p > \frac{d + C}{e}.$$

If condition (1) is not fulfilled, the coalition will not intervene; hence, the

dictator will always stay because $R > 0$. This can be a suboptimal outcome for the coalition, which could threaten to intervene against the dictator in retaliation, but this would not be credible since the coalition is still better off if it does not intervene. Since the dictator can predict this decision, he would ignore the noncredible threat and stay in power while the coalition would not rationally intervene.

The result can be generalized for a repeated game with $K > 1$ rounds and with constant parameters (since different parameters could change the characteristics of the game).[13] The coalition can only negatively affect the dictator's utility by intervening. Hence, the coalition's strategy for greatest retaliation is permanent intervention. In each round, the dictator will obtain either $(1 - p)R - pP$ if he stays or zero if he leaves. As the utilities are round-invariant—that is, they do not change from round to round—it is sufficient to count the number of rounds k when the dictator stays. Thus, he has a total utility of $k[(1 - p)R - pP]$. The dictator will choose to stay for the number of rounds k that maximizes this outcome. Since $(1 - p)R - pP > 0$ if condition (2) is fulfilled, the total utility is maximized for $k = K$ if the condition holds. Hence, the dictator stays in all rounds if it is better for him to stay in one round. Thus, the permanent intervention strategy does not change the behavior of the dictator.[14]

Coalition Forming

So far, it has been assumed that the coalition decides whether to attack without considering which countries are members of the coalition. In this section the second stage of the game is extended and each country is allowed to decide on intervention separately. Given M countries in the coalition, the number of intervening countries is denoted as n and the number of nonintervening countries as $m = M - n$. The intervention costs C are shared by n countries, which decide to attack. In addition, it is assumed that attacking countries will obtain better market access and hence a higher share of the economic benefits $E + e - d$ if the intervention succeeds. If the attack fails, the dictator will terminate relations with the attacking countries, and the m nonattacking countries will benefit from a higher share of $E - d$. The success probability $p = p(n)$ is also assumed to be a monotonically, or continuously, increasing function of the number of attacking countries n.[15]

For simplicity, all countries are assumed to have an equal share of the economic benefits of E/M in the status quo. In the event of a successful intervention, attacking countries increase their share by δ:

$$\frac{1 + \delta}{M} (E + e - d) .$$

The parameter $0 < \delta \leq M/n - 1$ regulates the gain in economic benefits that result from better access and higher influence after the intervention. For example, the intervention in Iraq in 2003 was opposed by France, Germany and Russia, which were later excluded from lucrative business contracts to rebuild Iraq. For simplicity, the model assumes the most extreme value for $\delta = M/n - 1$ such that nonattacking countries lose all their benefits. This simplifies the economic benefits to the following:

$$\frac{1}{n}(E + e - d) .$$

If the attack fails, incorporating the costs of the intervention C and the loss of all economic benefits results in the following expected utility for the attacking countries:

$$\frac{p(n)}{n}(E + e - d) - \frac{C}{n} = u(n) .$$

The nonattacking countries have the following expected utility:

$$[1 - p(n)]\frac{E - d}{m} = v(n) .$$

The nonattacking countries gain additional economic benefits e in the case of a successful intervention but otherwise lose everything. If the intervention fails, the total economic benefits are reduced by the damage d, but the share of the nonattacking countries is increased by the shares of the excluded attacking countries.

Nash Equilibria

This simultaneous M-player game for the decision of an intervention can be analyzed for Nash equilibria. A Nash equilibrium is a strategy where no player can improve his utility by deviating.[16] In this case, there is no Nash-equilibrium outcome for intervention if countries cannot improve their utilities by attacking (i.e., deviating from the status quo). Each country will receive a utility of E/m if the dictator stays and nobody attacks, but attacking alone would result in a utility of $u(1)$. An attack is only reasonable under the following condition:

$$p(1)(E + e - d) - C > E/m .$$

The inequality holds if

$$p(1) > \frac{E/m + C}{E + e - d} .$$

Above, $p(1)$ is constrained to be in the interval [0, 1], but the inequality cannot hold for $E/m + C > E + e - d$. Hence, a Nash equilibrium exists for no intervention if the current share of economic benefits is greater than the total economic benefits after damage d and intervention costs C are subtracted, given that the dictator decided to stay. In turn, high economic opportunities E with low damage d can motivate an intervention to obtain exclusive access to resources if intervention costs and success probability are moderate.

Applying the definition of Nash equilibria yields further conditions for Nash equilibria. No country can increase its utility by deviating if all attacking countries receive a higher utility from attacking than from dropping out, while all nonattacking countries are better off if they abstain from attacking:

$$v(n) > u(n + 1) \quad \text{and} \quad v(n - 1) < u(n) .$$

This depends on the marginal success probability, $dp(n)/dn$. For moderate success probabilities and levels of participation in the intervention, it can be rational for a country to abstain from attacking in the hope that a failed intervention will increase its share of economic benefits. One can see this mechanism at work by looking for a Nash equilibrium if all countries intervene, arriving at the following condition:

$$v(M - 1) < u(M)$$
$$[1 - p(M - 1)]\, M\, (E - d) < E + e - d - C .$$

Even if an intervention is certain so that $p(M) = 1$, it can be better for a country to deviate if doing so decreases the success probability sufficiently, such that the expected utility for the nonintervening country is higher than if it joins the intervention. If the marginal contribution of a single country has no influence on the success probability, the intervention of all countries is a Nash equilibrium if $p(M) = 1$.

Discussion

This framework elucidates the decision-making process regarding military interventions in support of rebels who are trying to overthrow an exploitative dictator. A dictator has to balance the rent-seeking benefits of staying in power with the punishment costs from a successful intervention. When the intervention has a higher probability of success, the dictator's decision shifts toward leaving the

country since punishment is more likely. The coalition's decision is determined by the costs and damage resulting from an intervention as well as the additional economic benefits that can be obtained if the dictator leaves. The situation is more complex if the decision-making process for the individual countries within the coalition is also considered. In this case, some countries might decide to abstain from an intervention, hoping that they will profit from the coalition's failure. This is one reason why unanimous decisions in multiple-country coalitions are rarely observed. Other motivations, such as moral and domestic political concerns—particularly during national election campaigns—also play an important role here.

A dictator has to balance the rent-seeking benefits of staying in power with the punishment costs from a successful intervention.

Because of its simplicity, this model can be extended in various ways. The current model assumes homogenous benefit shares within the coalition; in reality, countries might have different shares in the status quo. Their costs of intervention and contribution to the success probability of the intervention might also differ. For example, participation of the United States would significantly increase the success probability, while the involvement of smaller countries would have a less profound impact on success. As noted earlier, parameters for economic benefit, damage and success probabilities could also be modeled endogenously.

This model rationalizes the decision of Muammar al-Qaddafi to stay in power. In previous decades he awarded lucrative oil contracts to many Western countries, which reduced the additional economic benefits these countries would receive after an intervention. In addition, Qaddafi's relatively well-equipped military lowered the success probability for the coalition and increased the likelihood of damage to the economy during an intervention, which lowered utilities for the intervening countries. The fact that an international coalition still chose to intervene can, however, be explained if damage and costs were small relative to additional economic benefits, and if the probability of success for the coalition was sufficiently high. Qaddafi's decision not to leave the country can be explained by his calculation that the opportunity for rent seeking was sufficiently higher than his prospective punishment. Some countries in the coalition, such as China and Russia, might have abstained from the intervention in the hope that they would benefit from a failed attempt by the coalition. The model also helps to shed light on the situation in Syria, where the success probability of an intervention appears to be rather low.

The proposed model can serve as a framework to understand the decision

of a dictator to stay or leave the country and of a coalition on whether or not to intervene. The simplicity of the model emphasizes principal mechanisms of decision making in this context but naturally limits its applicability to the real world. Empirical studies would be essential to show how real-world data fit the input variables of the model, including success probabilities, costs of intervention, economic benefits and rents and punishment for the dictator. The framework illustrates the trade-offs for the players involved and their influence on the outcomes and strategies of the game. ♔

NOTES

1 Chris McGreal et al., "Allied strikes sweep Libya as west intervenes in conflict," *Guardian*, 19 March 2011. For a historical perspective on interventions in developing countries, see Odd Arne Westad, *The Global Cold War: Third World Interventions and the Making of Our Times* (New York: Cambridge University Press, 2007).

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7 Daron Acemoglu, James Robinson and Thierry Verdier, "Kleptocracy and Divide-and-Rule: A Model of Personal Rule," *Journal of the European Economic Association* 2, no. 2-3 (April-May 2004): 162–92. Padró i Miquel proposes fear of a worse successor, especially in ethnically diverse countries. Gerard Padró i Miquel, "The Control of Politicians in Divided Societies: The Politics of Fear," *Review of Economic Studies* 74, no. 4 (October 2007): 1259–74.

8 Anthony Downs, *An Economic Theory of Democracy* (New York: Harper, 1957).

9 A discrepancy in the economic benefits when the dictator leaves voluntarily or is defeated by a successful intervention is not crucial for the model, owing to the sequential character of the game.

10 All players are assumed to be risk neutral.

11 The model can be adapted such that all relations between the coalition and the dictator are eliminated by setting the utility equal to $-C$. Since this is equivalent to $d = E$, the model contains this option.

12 This model assumes that the dictator stays if he is indifferent between leaving and staying.

13 Robert M. Axelrod, *The Evolution of Cooperation* (New York: Basic Books, 1984).

14 Note that the permanent intervention strategy is also a noncredible threat in a repeated game.

[15] For example, $p(n) = n - 1(n - 1)$.

[16] John Nash, "Equilibrium Points in *n*-Person Games," *Proceedings of the National Academy of Sciences* 36, no. 1 (January 1950): 48–49.