

THE BALANCE OF POWER BETWEEN CITIZENS AND THE STATE: DEMOCRATIZATION AND THE RESOURCE CURSE*

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We present a model in which we reformulate and extend Albert Hirschman's *Exit, Voice, and Loyalty* (EVL) argument to examine the role of power in the relationship between states and their citizens. Our basic model and its various extensions reaffirm some of the ideas found in Hirschman's original analysis, but contradict several others. They also highlight several points that have been previously overlooked or underemphasized by scholars employing the EVL framework to substantive areas in political science. After presenting the model and discussing its general implications, we apply it to the empirical case of democratic transitions. By explaining the observed relationship between (i) economic development and democracy and (ii) the abundance of natural resources and authoritarianism, our model is able to combine the results from two largely distinct literatures within the same theoretical framework. Our model also provides important insights for the literatures addressing the role of foreign aid, inequality, and economic performance in the democratization process.

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1 Introduction

When will citizens take direct action against the state? When will states respond positively to the demands of their citizenry? Under what conditions will states limit their predatory behavior? How can citizens strengthen their position vis-à-vis the state? All of these questions force us to think about the role of power in politics - who has it, where does it come from, how and when is it used? Although scholars have defined ‘politics’ in many different ways over the years, most definitions tend to share the intuition that politics is the subset of human behavior that involves the use of power or influence. Broadly-speaking, power is involved whenever individuals cannot accomplish their goals without either trying to influence the behavior of others or trying to wrestle free from the influence exerted by others. In this paper, we introduce a game-theoretic model that captures what we think are the key elements of many political situations. Our model represents a reformulation and extension of Albert Hirschman’s (1970) famous *Exit, Voice, and Loyalty* (EVL) argument.

While Hirschman’s 1970 book sparked an enormous interest among political scientists in areas as diverse as political parties, revolutions, identity formation, theories of the state etc. (Barry 1974, Birch 1975, Laver 1976, Sharp 1984, O’Donnell 1986, Ross 1988, Hirschman 1986, Brubaker 1990, Hirschman 1992, Vanberg & Congleton 1992, Hirschman 1993, Eubank, Gangopadahay & Weinberg 1996, Dowding & John 1996, Kato 1998, Laitin 1998, Dowding et al. 2000, Lake & Baum 2001, Kurrild-Klitgaard 2002), our analysis is unusual in that it explicitly reformulates his argument in game-theoretic terms.¹ As Gehlbach (2006) notes, “Hirschman’s framework is probably unique among major contributions by neoclassical economists to modern political theory . . . in not having been subsequently expressed more precisely in game-theoretic terms.”² Arguably, the failure to precisely formalize his argument has contributed to confusion and conflicting empirical evidence regarding Hirschman’s claims. Noting this, Dowding et al. (2000) argue that “a more rigorous methodology is required to test” Hirschman’s argument.

Our EVL model and its various extensions offer a number of general insights for scholars interested in the balance of power between citizens and states. Among other things, our analysis (i) illustrates when

¹Hirschman’s *Exit, Voice, and Loyalty* also generated a huge literature in economics, psychology, management studies, public administration, and other fields. For a good introduction to this literature, see Dowding et al. (2000).

²Laver (1976) examines aspects of Hirschman’s argument but only in a decision-theoretic setting. Although Vanberg and Congleton (1992), as well as Kurrild-Klitgaard (2002), study the role of exit options in game-theoretic settings, they ignore the concepts of ‘voice’ and ‘loyalty’ found in Hirschman’s argument. Gehlbach (2006) has recently provided the only other game-theoretic analysis of Hirschman’s argument that we are aware of. Unlike us, though, Gehlbach seeks only to “elucidate the relationship between exit and voice”; he does not explicitly formalize the role of loyalty in his model. Our models differ in a number of other ways as well, including the fact that we incorporate incomplete information into some of our extensions.

citizens can expect to successfully influence state policy, (ii) provides the conditions under which states might endogenously choose to limit their own predatory behavior, (iii) highlights the importance of sample selection effects in comparative politics and the difficulty of inferring who has power from real world observations, and (iv) suggests that incomplete information can help tip the balance of power more in favor of citizens than states. While our analysis reaffirms some of the ideas found in Hirschman's original analysis, it contradicts several others. It also draws attention to several points that have previously been overlooked or underemphasized by scholars employing the EVL framework in various substantive areas of political science.³

After presenting our model and discussing some of its general implications, we apply it to the empirical case of democratic transitions. By explaining the observed relationship between (i) economic development and democracy and (ii) the abundance of natural resources and authoritarianism, our model is able to combine the results from two largely distinct literatures within the same theoretical framework. Our analysis also provides important insights for the political science literatures addressing the role of foreign aid, inequality, and economic performance in the democratization process. Specifically, it offers a potential explanation for why foreign aid might be detrimental to democratization efforts (Easterly 2002, Bueno de Mesquita & Smith 2004), why inequality might not necessarily be harmful to the emergence and survival of democracy (Reenock, Bernhard & Sobek 2007, Boix 2003), and why economic performance in dictatorships tends to be much more heterogeneous than in democracies (Przeworski et al. 2000, Bueno de Mesquita et al. 2003).

2 Basic Exit, Voice, and Loyalty Game

Hirschman asks how an individual or group will react to a deleterious change in their environment. While he conceived of this deterioration as “accidental” or “random” (1970, 1,4), we choose to think of it as resulting from a deliberate choice by some actor. In what follows, we will think of it as specifically resulting from a deliberate policy choice made by the state. For example, one could think that the state increased taxation, that it imposed a handgun ban, that it ruled prayer in public schools to be unconstitutional, or that it devalued the national currency. Of course, not everyone will experience these policy changes as deleterious. For

³A casual search of Google Scholar reveals about 2,500 citations to Hirschman's original book. The fact that our reformulation of his argument produces a different set of inferences suggests that at least some of those studies employing the EVL framework may have incorrectly stated their hypotheses and conducted misspecified tests.

example, while exporters are likely to benefit when the state devalues the currency because this makes their goods more competitive, consumers are likely to suffer because imports are now more expensive. Indeed, almost all political situations result in some individuals and groups benefiting at the expense of others. The question here, though, is how a citizen would respond if a state policy negatively affects her welfare.

Broadly speaking, there are three possible responses - the citizen can EXIT, use VOICE, or demonstrate LOYALTY.⁴ Choosing to EXIT means that she accepts the deleterious change in her environment and she alters her behavior to optimize in the new situation. For example, if the citizen does not like the fact that her state has introduced a handgun ban, she could accept the situation and simply move to another state where handguns are allowed. Choosing to use VOICE means complaining, protesting, lobbying, or taking other forms of direct action to try and change the environment back to its original condition. For example, if the state increases the citizen's tax rate, she might join an anti-tax protest to pressure the state to reverse its tax hike. Choosing to demonstrate LOYALTY means that she accepts the deleterious change in her environment but makes no other change to her behavior. For example, if the state rules that prayer in public schools is unconstitutional, she could accept the situation and keep her children in the public school system. In Table 1, we illustrate what it means to use EXIT, VOICE, or LOYALTY in response to several potentially deleterious changes to the citizen's environment.

As we noted earlier, behavior is political whenever individuals or groups attempt to influence, or escape the influence of, others. It is easy to see that the use of voice is inherently political because you are trying to change the behavior of others. For example, a citizen might participate in a tax revolt because she wants to change the state's tax policy. Indeed, Hirschman (1970, 16) refers to voice as "political action par excellence." However, behavior is also political whenever individuals or groups simply think about using voice even if they do not actually choose to use it in the end. This is because the decision to use (or not use) voice is intrinsically a decision about whether to exit or remain loyal as well. Thus, the decision to respond to deleterious changes in one's environment with exit, voice, or loyalty is always a political decision.⁵ In

⁴Despite the title of his original book, Hirschman really only allows for two possible responses – EXIT and VOICE. This is clear from the fact that he refers to "voice as a residual of exit" and states that "[t]he voice option is the only way in which dissatisfied customers or members can react whenever the exit option is unavailable" (1970, 33). To a large extent, Hirschman (1992, 1993) ignores the role of LOYALTY altogether in his later work. For Hirschman (1970, 77-78), loyalty is not a potential response but rather a characteristic that influences whether the individual or group who suffers the deleterious change is more likely to choose voice or exit and the speed with which this choice is made. We differ from Hirschman (and Gehlbach's (2006) formalization of Hirschman) in that our model explicitly allows for the citizen to respond by remaining loyal (Rusbult, Zembrodt & Gunn 1982, Rusbult, Johnson & Morrow 1986, Rusbult, Farrell & Mainous 1988).

⁵Hirschman (1970, 19) differs on this point - he refers to exit and voice respectively as "economic and political mechanisms". Our reasoning would suggest that exit is just as political as voice.

Table 1: Exit, Voice, and Loyalty Options

<i>Stimulus</i>	EXIT	VOICE	LOYALTY
State increases taxes	Reallocate portfolio to avoid tax increase	Organize or join tax revolt	Pay taxes and keep your mouth shut
State rules that prayer in public school is unconstitutional	Home school your children	Lobby the government to change the constitution	Keep your children in the public school system and keep your mouth shut
State bans handguns	Move to a different state	Join the NRA or a militia group to pressure the state to reverse the policy	Turn in your handguns and keep your mouth shut
State devalues currency	Buy goods that are not imported	Lobby the government to change its policy	Continue to buy imports and keep your mouth shut

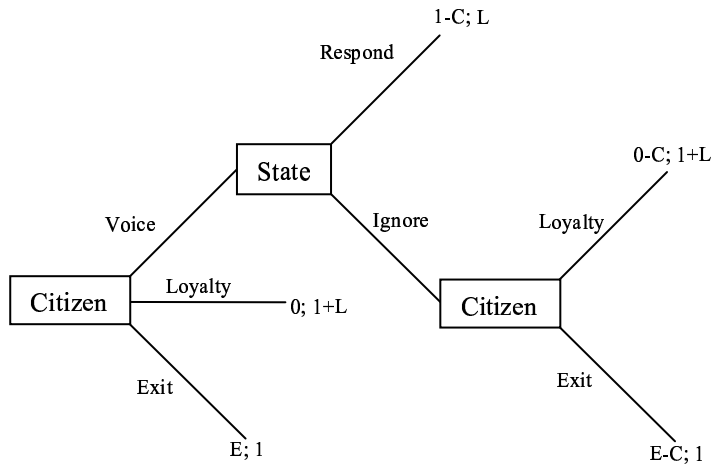
other words, politics does not just begin when voice is chosen; it begins when voice is considered. In fact, one could argue that politics is even more pervasive than this. For example, people sometimes choose to exit or remain loyal without even thinking about voice as an option simply because it would not occur to them that they could successfully change the behavior of others. This type of situation might be referred to as ‘hegemony’ (Gramsci 1971).

2.1 Structure and Payoffs

Consider the situation where the state introduces a policy that deleteriously affects the environment of one of its citizens. How should the citizen respond? When should the citizen choose to exit, use voice, or demonstrate loyalty? The citizen’s choice will depend on what she expects to happen when she chooses one of these options. In order for the citizen to know what to do, she needs to know what the state would do if she used voice. On the one hand, the fact that the citizen complains or protests might cause the state to respond by returning the citizen’s environment back to its original condition. On the other hand, though, the state might simply ignore the citizen’s use of voice. If the state did ignore her, the citizen would have to decide what to do next. After all, even though the citizen’s use of voice failed, she would still have the

choice of exiting or remaining loyal. This situation is modeled as an extensive form game in Figure 1 going from left to right.

Figure 1: Basic Exit, Voice, and Loyalty (EVL) Game



Legend Parameters:

- E Citizen's exit payoff
- 1 Value of benefit taken from the citizen by the state
- L State's value from having a loyal citizen who does not exit.
- C Cost of using voice for the citizen

Assumptions:

- $C, L > 0$

The pre-history of the game is that the state has caused a deleterious change in the environment of the citizen that results in a transfer of some benefit from the citizen to the state. For simplicity, and without loss of generality, this benefit is arbitrarily set at 1. The game begins at the left-most decision node with the citizen deciding whether to exit, use voice, or remain loyal. If the citizen decides to exit, then she receives her exit payoff (E) and the state gets to keep the benefit (1) that it seized in the game's pre-history. If the citizen decides to remain loyal, then she accepts the loss of her benefit and gets her status quo payoff, which we normalize as 0. In these circumstances, the state gets to keep the benefit (1) that it took but also obtains an additional payoff ($L > 0$) for retaining a loyal citizen who does not exit. This additional 'loyalty' payoff captures the notion that states value having a loyal citizenry and can be thought of in at least a couple of ways. One is that having loyal citizens can make life easier for state officials by providing what could be thought of as 'legitimacy' or simply by offering their support to help state officials stay in power. For example, the citizen's decision to remain loyal might mean continuing to vote for governmental

or state-sponsored parties. The other is that having loyal citizens means that they continue to invest in the economy or other activities that provide meaningful resources and support to the state. For example, one could think of the loyalty payoff in this regard as capturing the present discounted value of the future stream of benefits that come from having a citizen who continues to invest in the economy. Whatever the precise source of this additional 'loyalty' payoff (L), its size will obviously vary across states and citizens. Not only do some states desire or require more support from their citizenry than others, but some citizens are also more important to state officials than others.

If the citizen decides to use voice, then she pays a cost ($C > 0$). Like Hirschman (1970, 39), we assume that voice is costly for the citizen because protesting, complaining, lobbying etc. all require effort that could be put to alternative use. Depending on the state, voice might be costly in other respects as well. For example, one's involvement in a protest might be met by imprisonment, loss of employment, or even death. In other words, the degree of state repression will also affect the citizen's cost of using voice. It is reasonable to think that the citizen's use of voice will impose a cost on the state and that the size of this cost will vary with the particular type of voice used i.e. letter writing campaign, voting, protesting etc. However, we choose not to incorporate this imposed cost into the basic exit, voice, and loyalty game shown in Figure 1 since the fact that it would be added to all of the terminal nodes associated with the only sub-game where the state gets to move means that it would not affect the state's decisions.

If the citizen does use voice, then the state must decide whether to respond to or ignore the citizen's demands.⁶ If the state responds, it returns to the citizen the benefit that it took. In this situation, the citizen gets the value of the benefit (1) minus the cost of having used voice (C) and the state gets a loyal citizen who does not exit (L). If the state ignores the citizen, then the citizen still has the option of exiting or remaining loyal. We could allow the citizen to use her voice again, but this would add nothing substantively new to the game and our inferences would be unaffected. If the citizen decides to exit at this final decision node, then she gets her exit payoff (E) minus the cost of having used voice (C) and the state gets to keep the benefit (1). If she decides to remain loyal, then the citizen accepts the loss of her benefit (0) but has to pay the cost of having used voice (C), while the state gets to keep both the benefit (1) and a loyal citizen (L). In Figure 1, the citizen's payoffs are listed first and the state's payoffs second.

⁶One might think that the citizen's cost of using voice against the state will be higher in those situations where the state ignores the citizen's demands than in those situations where the state responds positively to them. However, varying the citizen's cost of using voice in this way makes no difference to the dynamics or outcomes of the game.

2.2 Equilibria and Interpretation

We solve the game for pure strategy sub-game perfect Nash equilibria (SPNE). There are four unique SPNE depending on the specific conditions. The equilibria are listed in Table 2 along with their required conditions and associated outcomes.

Table 2: Sub-Game Perfect Nash Equilibria from the EVL Game

#	Equilibrium	Required Conditions	Outcome
E1	(Loyalty, Loyalty; Ignore)	$E \leq 0$	Citizen remains loyal, State keeps benefit
E2	(Exit, Exit; Ignore)	$L \leq 1, E > 0$	Citizen exits, State keeps benefit
E3	(Voice, Exit; Respond)	$L > 1, 0 < E \leq 1 - C$	Citizen uses voice, State responds and returns benefit
E4	(Exit, Exit; Respond)	$L > 1, E > 0, E > 1 - C$	Citizen exits, State keeps benefit

Notes: Equilibria are written in the following form: (Citizen's first action, Citizen's second action; State's action). All equilibria assume $C, L > 0$. We make three additional assumptions in order to simplify knife-edge scenarios where $E = 0, L = 1$, or $E = 1 - C$. Specifically, we assume that the citizen will exit only if $E > 0$, the state will respond only if $L > 1$, and the citizen will not use voice if $E > 1 - C$. Proofs are shown in the online appendix.

How can we interpret the three required conditions shown in Table 2? Whether L is greater than 1 or not distinguishes states into two types – those that are ‘dependent’ and those that are ‘autonomous’. If $L > 1$, then the state is ‘dependent’ in the sense that the state values the loyalty of the citizen more than the benefit that it took from her. If $L \leq 1$, then the state is ‘autonomous’ because it values what it took from the citizen at least as much as the citizen’s loyalty. In terms of our economic example from earlier, a dependent state is one that values the continued investment of the citizen in the economy more than what it can take from the citizen today. Whether E is greater than 0 or not distinguishes citizens into two types - those with ‘credible exit threats’ and those without. If $E \leq 0$, then the citizen has no credible exit threat in the sense that she will never choose to exit because she can always do at least as well by remaining loyal. If $E > 0$, then the citizen’s exit payoff is larger than her loyalty payoff. The fact that she might realistically choose to exit under this condition means that the citizen has a ‘credible’ exit threat. Whether E is greater than $1 - C$ or not distinguishes two types of scenarios – those in which voice is a realistic response and those in which it is not. If $E > 1 - C$, then the citizen’s exit payoff is so great that she would never use voice even if she were certain that it would be effective. If $E \leq 1 - C$, then the citizen might use voice since the value

associated with the successful use of voice is at least as great as that from exiting. In Table 3, we present information about the the four equilibria in a more intuitive manner.

Several important insights can be gathered from our game-theoretic reformulation of Hirschman's argument so far. First, the state will only be willing to respond positively to the citizen when two conditions are met: (i) the citizen must have a credible exit threat ($E > 0$) and (ii) the state must be dependent on the citizen ($L > 1$).⁷ While one might think that a citizen is significantly advantaged vis-à-vis the state whenever she has a credible exit threat, this is only true if the state depends on her.⁸ Put differently, an autonomous state will never respond even if the citizen has a credible exit threat. Hirschman argues that “the exit option is widely held to be uniquely powerful; by inflicting revenue losses on delinquent management, exit is expected to induce that ‘wonderful concentration of mind’ akin to the one Samuel Johnson attributed to the prospect of being hanged” (1970, 21).⁹ A reader might infer from this that firms will always respond when faced with customers who can exit. As our model shows, though, this inference implicitly assumes that firms always depend on their customers. While we believe that this is debatable in the economic sphere, our model relaxes this implicit assumption by allowing for the possibility that the state will depend more on some citizens than others because we believe the potential for unequal influence is central to the study of politics.

It is the citizen's credible exit threat that makes the effective use of voice possible – since the state knows that the citizen will exit if it ignores the citizen's use of voice, it will choose to respond. To some extent, Hirschman seems to have this particular causal logic backwards when he writes that “the decision whether to exit will often be taken in the light of the prospects for the effective use of voice” (1970, 37). Our model would suggest that the effectiveness of voice depends on the prospects for a credible exit, not the other way around. As Lake and Baum (2001, 595) put it, “Without the possibility of exit, voice carries little

⁷One might wonder how a single citizen could ever make a state agree to respond positively through the use of voice. While we have framed our model as capturing the interaction between a single citizen and the state for illustrative purposes, it is just as easy to think of it as describing the power relationship between a group of citizens and a state. Of course, doing this raises the specter of collective action issues (Olson 1965). Indeed, Barry (1974) criticizes Hirschman's original analysis for ignoring or downplaying these issues. While we do not wish to underestimate the difficulties that citizens have in overcoming collective action problems, we should emphasize that our primary focus is on the power relationship between citizens and states when the collective action problem does not exist or when it has already been solved. We point to a large empirical literature, surveyed by Moore (1995), showing that individuals can overcome collective action problems (if only fleetingly in some cases) using a variety of techniques.

⁸A citizen with a credible exit threat is advantaged when compared to one without such a threat. This is because the citizen with a credible exit threat has the realistic option of exiting whereas the other citizen does not. Our point here, though, is that having a credible exit option is not sufficient in and of itself for the citizen to be able to influence the state.

⁹Other scholars make similar claims about the importance of exit options for changing the calculations of actors in strategic settings (Vanberg & Congleton 1992, Kurrild-Klitgaard 2002).

Table 3: Equilibria in the Basic Exit, Voice, and Loyalty Game

	<i>Benefit is greater than cost of voice</i> $1 > C$	<i>Benefit is less than or equal to the cost of voice</i> $1 \leq C$
	<p><i>The State is:</i></p> <p>Autonomous $L \leq 1$</p> <p>Dependent $L > 1$</p>	<p><i>The State is:</i></p> <p>Autonomous $L \leq 1$</p> <p>Dependent $L > 1$</p>
<i>The Citizen has:</i> A Credible Exit Threat $E > 0$	<p>E2: (Exit, Exit; Ignore)</p> <p>E3: (Voice, Exit; Respond)</p>	<p>E2: (Exit, Exit; Ignore)</p> <p>E4: (Exit, Exit; Respond)</p>
No Credible Exit Threat $E \leq 0$	<p>E1: (Loyalty, Loyalty; Ignore)</p>	<p>E1: (Loyalty, Loyalty; Ignore)</p> <p>E1: (Loyalty, Loyalty; Ignore)</p>

weight.”¹⁰ Note, though, that a citizen may not force the state to respond even if she is in a position to do so. For example, if the cost of using voice or the citizen’s exit payoff is sufficiently large ($C > 1$ or $E > 1 - C$), then the citizen will prefer to exit rather than use her voice to force the state to respond (see equilibrium E4). This may help to explain why wealthy or well-educated individuals living under a repressive regime might choose to leave rather than go through the effort of using their voice to force the regime to back down.

Second, our model reveals that in the absence of a credible exit option ($E \leq 0$), the citizen is, in some sense, a sitting duck. Under these conditions, the state can take away the citizen’s benefits and there is nothing that the citizen can do about it but accept the new state of affairs. Note that we can think of the ‘benefits’ that the state takes away in the game’s pre-history in a number of ways. It could be that the state has denied the citizen some of her civil rights or civil liberties. Alternatively, it could be that the state has taken property away from the citizen - either through taxation or appropriation. In our discussion to this point, it has implicitly been assumed that the state has taken something away from the citizen that in some sense rightfully belonged to her. However, this need not be the case for this model to be useful in understanding the role of power in the relationship between the citizen and the state. For example, it could be the case that the state has taken away the citizen’s ability to seize an unfair advantage over other citizens - say, through a licensing agreement that grants the holder of the license a market advantage. Thus, there is nothing inherently good about the state being responsive to the citizen’s use of voice; nor is it necessarily loathsome for the state to turn a deaf ear to citizen demands.

Third, our model highlights some of the significant limitations that we face when trying to draw inferences from real-world political situations. It is always possible to infer whether a citizen has a credible exit threat from observing her action. This is because the decision to exit or use voice requires a credible exit threat, whereas the decision to demonstrate loyalty implies the lack of such a threat. In contrast, it is not so easy to infer whether a state is dependent based on what we observe. For example, it is difficult to learn whether the state is dependent or autonomous when we observe the citizen exit. On the one hand, the citizen might exit because she knows that the state is autonomous and would, therefore, ignore her use of

¹⁰Hirschman (1992, 80) came to recognize this point in later work where he writes that “The availability and threat of exit on the part of an important customer or group of members may powerfully reinforce their voice.” He concludes that “such a positive relationship between increased availability of exit and increased willingness to voice rests on a structure that is more complex than the one underlying the seesaw pattern” that he had originally foreseen (Hirschman 1993, 14). Our reformulation of his argument clearly illustrates the “structure” that he is referring to.

voice. On the other hand, the citizen might exit even if the state is dependent because her exit payoff or the cost of using voice is very large.

It is also difficult to learn whether the state is dependent or autonomous when the citizen has no credible exit threat because both types of state would respond to the use of voice by such a citizen in exactly the same way - they would simply ignore her. It is precisely because she would be ignored in these circumstances that the citizen always chooses to remain loyal in the first place. This implies that we should not infer that states where the use of voice and public opposition are rare, such as contemporary Iran, China, Burma, or North Korea, are autonomous or that they do not rely on the support of their citizenry. These regimes may be very dependent, yet feel entirely free to ignore their citizens because they lack credible exit threats. The history of the collapse of the communist regime in East Germany bears this logic out. For example, one can argue that, with the exception of the Berlin Uprising in 1953, the East German population was very loyal prior to 1989 because it lacked a credible exit threat. To many outsiders (and insiders), it appeared that the communist regime was very stable and relatively autonomous from its citizens (Kuran 1991). However, the opening of the Hungarian border to Austria in May 1989 provided East Germans with a credible exit option for the first time since the construction of the Berlin Wall in 1961.¹¹ It was this change that transformed the seemingly 'loyal' and rather docile East German population into enthusiastic protesters who used voice in such large numbers on the streets of Leipzig and East Berlin (Garton Ash 1999). One can argue that it was precisely because the East German Communist Party did rely on its citizens, despite all evidence to the contrary for over three decades, that the communist regime eventually responded by opening the Berlin Wall. This particular historical example should make us very wary of inferring that a state is autonomous when its citizens have no credible exit threat - it might be, but it also might not be.

Similarly, it is inappropriate to use political mobilization (voting, lobbying, campaign contributions etc.), or the lack thereof, as a straightforward revelation of citizen preferences. Citizens may remain silent on particular issues either because they are satisfied with the status quo, or because they are dissatisfied but do not expect the use of voice to be effective. As our analysis has shown, the citizen will sometimes choose to demonstrate loyalty in her interaction with the state. Hirschman (1970, 38, 77) claims that the decision to remain loyal is "less rational" than the decision to use voice or exit, and that those who choose loyalty and

¹¹By 1961, the East German state had come to recognize that it relied on its citizens to keep the economy afloat and itself in power. By building the Berlin Wall and removing the one credible exit option available to its citizens, the communist regime was able to deprive its citizens of any influence that they might have had over it.

“suffer in silence” do so either because they “are confident that things will soon get better” or because they have a “special attachment to an organization”. Neither of these claims are true in how we have reformulated Hirschman’s argument. As our model illustrates, it is entirely rational for the citizen to demonstrate loyalty whenever she does not have a credible exit threat. Moreover, the citizen does not choose loyalty due to a special attachment to the state or because she thinks that the state will (or might) eventually respond; she chooses loyalty because she is powerless to do otherwise. The reason for the difference between the inferences from our model and those from Hirschman’s analysis has to do with the cause of the deleterious change in the citizen’s environment. While we assume that the deleterious change is the deliberate choice of the state, Hirschman conceives of it as “accidental” or “random” and something that the state would like to resolve if only it knew about it. Given that the citizen could simply use voice or exit to inform the state of the deleterious change, it is easy to see why Hirschman might refer to loyalty as something “less than rational”.¹²

3 Extended Exit, Voice, and Loyalty Game: The Pre-History

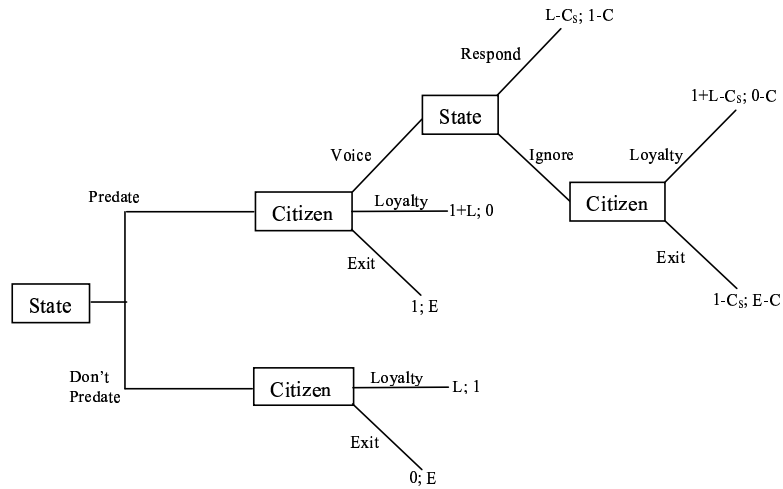
The fact that the deleterious change in the citizen’s environment results from a deliberate policy choice by the state in our model raises an important question that does not arise in Hirschman’s original analysis. Namely, if the state will be responsive to those citizens on whom it depends for loyalty whenever those citizens possess credible exit threats as our basic EVL game suggests, why would it ever take a benefit away from these citizens in the first place?

This question cannot be answered without incorporating the pre-history of Hirschman’s argument into the game itself. In other words, we must add a move at the beginning of the game in which the state decides whether or not to take the benefit away from the citizen. We can think of this as a decision by the state about whether to predate or not. If the state chooses to predate, then the basic EVL game that we have just examined begins with one small modification – we now explicitly recognize the aforementioned cost ($C_S > 0$) that is imposed on the state whenever the citizen uses voice. If the state chooses not to predate, then the citizen still has the choice of whether to exit or remain loyal. This extended EVL game is shown

¹²The same reasoning helps to explain why Hirschman (1992, 79) writes that voice “is, or should be, paramount in situations where exit either is not possible or is difficult, costly, and traumatic”, whereas our reformulation of his argument shows that voice is entirely ineffective without the presence of a credible exit threat (and a dependent state).

in Figure 2. Since the state is now the first-mover, we list the state's payoffs first and the citizen's payoffs second.

Figure 2: Extended Exit, Voice, and Loyalty Game



Legend Parameters:

- E Citizen's exit payoff
- 1 Value of benefit taken from the citizen by the state
- L State's value from having a loyal citizen who does not exit.
- C Cost of using voice for the citizen
- C_S Cost to the state of having the citizen use voice

Assumptions:

- $C, C_S, L > 0; 1 > E$

We again solve the game for pure strategy sub-game perfect Nash equilibria (SPNE). However, we now make the new assumption that $1 > E$. This restriction is necessary to make sure that there is a citizen present to play the game in the first place. If $1 < E$, then the citizen simply exits irrespective of whether the state predate or not. There are four unique SPNE depending on the specific conditions. The equilibria are listed in Table 4 along with their required conditions and associated outcome. We present the same information in a more intuitive manner in Table 5.

As Table 5 indicates, an autonomous state will always choose to predate irrespective of whether the citizen has a credible exit threat or not. The citizen will respond to predation by an autonomous state by remaining loyal if she has no credible exit threat and by exiting if she does have such a threat. In contrast, a dependent state will only predate if the citizen has no credible exit threat. The dependent state predate under these conditions because it knows it can take the citizen's benefits safe in the knowledge that she

Table 4: Sub-Game Perfect Nash Equilibria from the Extended EVL Game

#	Equilibrium	Required Conditions	Outcome
E5	(Predate, Ignore; Loyalty, Loyalty, Loyalty)	$E \leq 0$	State predates and keeps benefit, Citizen demonstrates loyalty
E6	(Predate, Ignore; Exit, Exit, Loyalty)	$L \leq 1, E > 0$	State predates and keeps benefit, Citizen exits
E7	(Don't Predate, Respond; Voice, Exit, Loyalty)	$L > 1, 0 < E \leq 1 - C$	State does not predate, Citizen demonstrates loyalty and keeps benefit
E8	(Don't Predate, Respond; Exit, Exit, Loyalty)	$L > 1, E > 0, E > 1 - C$	State does not predate, Citizen demonstrates loyalty and keeps benefit

Notes: Equilibria are written in the following form: (State's first action, State's second action; Citizen's first action at the top, Citizen's second action at the top, Citizen's action at the bottom). All equilibria assume $C, C_S, L > 0$ and $1 > E$. We make four additional assumptions in order to simplify knife-edge scenarios where $E = 0$, $L = 1$, or $E = 1 - C$. Specifically, we assume that citizen will exit only if $E > 0$, the state will respond only if $L > 1$, the state will predate only if $L > 1$, and the citizen will not use voice if $E > 1 - C$. Proofs are shown in the online appendix.

cannot do anything about it – she will always remain loyal in this situation. However, a dependent state will choose not to predate when the citizen has a credible exit threat in order to either prevent the citizen from exiting (equilibrium E8) or to avoid having to respond to the citizen's use of voice (equilibrium E7). Thus, the answer to the question with which we began this section is that a state would *not* predate or take a benefit away from citizens upon whom it depends if they have a credible exit threat.

Note that the extended EVL game essentially provides the conditions under which a state will endogenously limit its own power. As such, it alleviates *some* of the long-standing concerns that many political theorists have had with Hobbes' solution to the state of nature. Hobbes (1994 [1651], XIII: 8-9) saw the creation of a powerful state that would hold its citizens in "awe" as the solution to the "war of all against all" and the "solitary, poor, nasty, brutish, and short" life that characterizes the state of nature. While theorists such as Locke (1980 [1690]) recognized that the creation of the state might solve the political problem that citizens have with each other, they thought that it created a potential new problem between the citizens and the state. By surrendering control over the means of violence to the state, what was to prevent the state from using its power against its citizens? As some put it, "Who will guard the guardian?"¹³ The argument that we have just presented from the extended EVL game illustrates that there are *some* conditions under

¹³The original quotation, "Quis custodiet ipsos custodes?" is from Juvenal, Satire IV ("On Women").

Table 5: Equilibria in the Extended Exit, Voice, and Loyalty Game

	<i>Benefit is greater than cost of voice</i> $1 > C$	<i>Benefit is less than or equal to the cost of voice</i> $1 \leq C$
	<p><i>The State is:</i></p> <p>Autonomous $L \leq 1$</p> <p>Dependent $L > 1$</p>	<p><i>The State is:</i></p> <p>Autonomous $L \leq 1$</p> <p>Dependent $L > 1$</p>
<p><i>The Citizen has:</i></p> <p>A Credible Exit Threat $E > 0$</p>	<p>E6: PREDATION (Predate, Ignore; Exit, Exit, Loyalty)</p> <p>E7: NO PREDATION (Don't Predate, Respond; Voice, Exit, Loyalty)</p>	<p>PREDATION (Predate, Ignore; Exit, Exit, Loyalty)</p> <p>E8: NO PREDATION (Don't Predate, Respond; Exit, Exit, Loyalty)</p>
<p>No Credible Exit Threat $E \leq 0$</p>	<p>E5: PREDATION (Predate, Ignore; Loyalty, Loyalty, Loyalty)</p> <p>E5: PREDATION (Predate, Ignore; Loyalty, Loyalty, Loyalty)</p>	<p>E5: PREDATION (Predate, Ignore; Loyalty, Loyalty, Loyalty)</p> <p>E5: PREDATION (Predate, Ignore; Loyalty, Loyalty, Loyalty)</p>

which the state will voluntarily agree to limit its predatory behavior i.e. when the state depends on citizens with credible exit threats. At least under these conditions, no one needs to guard the guardian since the guardian will guard itself.

As the extended EVL game makes clear, citizens who have credible exit options wield considerable influence whenever the state depends on them. More significantly, they wield this power without ever needing to open their mouths or take any action. Former British Prime Minister, Margaret Thatcher once said that “Being powerful is like being a lady. If you have to tell people you are, you aren’t.” Her major insight that sufficiently powerful citizens never need to use their voice because they are already getting the state to do what they want is clearly demonstrated in our model. What remains somewhat questionable is her implication that the use of voice can be taken as a sign that the citizen lacks power. This is because the citizen who lacks power in our model knows that the state will ignore her and, therefore, chooses to remain loyal rather than use voice. In effect, it is the decision to demonstrate loyalty, rather than the use of voice, that signals a lack of power when the state deleteriously affects the citizen’s environment. Notice the problem that this insight creates for political scientists and other scholars who wish to identify and empirically evaluate who has power in a given society. In effect, the extended EVL game indicates that the most powerful actors will be precisely those citizens who are least likely to take action or use their voice - in other words, the political scientist will find it difficult to observe the powerful ever using their power!

As a result, the current discussion has implications for the study of comparative politics that run parallel to the insights gleaned from game-theoretic models of crisis bargaining in the international relations literatures. The insight that international crises only occur after a deterrence failure (Achen & Snidal 1989, Downs 1989) has sensitized IR empirical scholars to the difficulty of making valid inferences about the effectiveness of deterrence from a sample that only includes general deterrence failures (Huth & Russett 1993). This insight has already rippled through much of international relations (see the work of Smith (1996) on alliances, Downs, Rocke, and Barsoom (1996) on compliance with international agreements, and Przeworski and Vreeland (2000) on the effectiveness of IMF programs). In addition, it has spawned a proliferation of methodological innovations in the study of international politics (Signorino 1999, Smith 1999). Our extended EVL model suggests that a similar logic is also fundamental to the study of comparative politics. Conflicts between citizens and the state occur only if the citizens in question are not powerful or because the state has failed to anticipate the citizens’ preferred outcome. This suggests that studies that

attempt to examine the influence of citizens that do not account for this logic will yield potentially biased estimates. This obviously has important implications for the study of a whole host of issues in comparative politics such as lobbying, military insurrections, and coups. For example, the implications from our model would suggest that equating the intensity of protectionist policy preferences with the intensity of lobbying behavior (Hiscox 2002) may be problematic.

It will be obvious to some that there are striking similarities between the argument just presented and the so-called structural Marxist view of the state (Althusser 1969, Poulantzas 1975, Poulantzas 1980). According to this view, capitalists exercise tremendous power over the state despite speaking in a very soft voice because they possess credible exit threats and the state is dependent on them for the deployment of investment that fosters job creation, economic growth, and tax revenues (Miliband 1969, Block 1977, Przeworski & Wallerstein 1988). It is precisely because capital is generally more mobile than labor (has more credible exit options) that capitalists typically have significantly more influence over the state than workers. This is the case even if the state depends on both labor and capital.

4 Basic Exit, Voice, and Loyalty Game: Incomplete Information

In some sense, the basic EVL game that we first examined is as noteworthy for what it does not explain as for what it does. Note that citizens only use voice when they expect it to be effective. In other words, they only use voice when they expect the state to respond. As a result, the model cannot explain why states are sometimes observed to be unresponsive to the public demands being made by their citizens. However, it only requires incomplete information on the part of the citizen to obtain an equilibrium in which the citizen's use of voice is ignored by the state (see the online appendix for the basic EVL game with incomplete information). In such an equilibrium, a citizen with a credible exit threat uses voice under the belief that the state is dependent; however, this belief is mistaken and the autonomous state ignores the citizen's voice.¹⁴

It turns out that incomplete information has an asymmetric effect on the relative power of citizens and the state – it can help citizens but it does not help states. When the state is unsure as to whether the citizen

¹⁴As Table 4 indicates, voice is never used in equilibrium in the extended EVL game. If the citizen knows that the state will not respond, then she does not use voice. And if the state knows that it will respond, then it chooses not to predate, thereby giving the citizen no reason to use voice. As a result, the extended EVL game with complete information cannot explain why we ever observe citizens using voice. Again, it only takes some incomplete information on the part of the citizen to sustain an equilibrium in which the citizen uses voice. In such an equilibrium, both dependent and autonomous states choose to predate. If a citizen with a credible exit threat believes that the state is dependent with a sufficiently high probability, she will use voice. If the state is dependent, it responds; if it is autonomous, it ignores the citizen's use of voice and the citizen exits.

has a credible exit threat or not, there is a pooling equilibrium in which both types of citizen use voice. If the state believes that the citizen has a credible exit threat with a sufficiently high probability, it responds. The inability of the state to distinguish between the different types of citizen clearly enhances the power of those citizens who lack credible exit threats. Recall that under complete information, these citizens are sitting ducks in that all states will always ignore any demands that they make. This is no longer the case when they face a dependent state that is unsure about what type of citizen it is dealing with. In effect, incomplete information can give power to otherwise powerless citizens. This suggests that citizens who do not have credible exit threats should be very careful not to take actions or make statements that might reveal their ‘type’ to the state.

While citizens who lack power (no credible exit threat) under complete information can sometimes exert influence and get the state to respond if the state is unsure of the citizen’s type, dependent states are no better off (and may actually be worse off) if the citizen is unsure about what type of state she is facing than they are under complete information. Under complete information, a citizen with a credible exit threat will either exit or use voice when faced with a dependent state. By assumption, a dependent state will always prefer responding to the citizen’s use of voice to having the citizen simply exit because its payoff would be L rather than 1. Under incomplete information, a citizen with a credible exit threat will again either exit or use voice. However, the difference is that some citizens who would have used voice if they knew for sure that they faced a dependent state now choose to exit because they are not sufficiently confident that the state is dependent. Thus, citizens with a credible exit threat are relatively more likely to exit when they have incomplete information than they are when they have complete information. As a result, a dependent state will be no better off (and may actually be worse off) in this situation. Overall, it appears that incomplete information is, if anything, more likely to help tip the balance of power more in favor of citizens than states.

5 Democratic Transitions and the Exit, Voice, and Loyalty Game

5.1 Economic Development and Natural Resources

Ultimately, we believe that our exit, voice, and loyalty game and its various extensions provide a useful analytical framework for examining the power relationship between actors in a wide variety of political settings. In what follows, we use our EVL framework to analyze the power relationship between states and

their citizens in the specific context of democratic transitions. According to classic modernization theory, countries are more likely to become democratic and stay democratic as they become wealthier (Lipset 1959, Lipset 1977).¹⁵ We take as our starting point a variant of modernization theory, which says that it is not wealth *per se* that encourages democracy but rather the changes in socio-economic structure that accompany economic development and wealth in the modernization process.¹⁶ A key structural change that occurs during the modernization process has to do with the relative size of the “sectors” in the economy. According to this variant of modernization theory, all economies can be divided into the same set of sectors - agricultural (sometimes referred to as the ‘traditional’ sector), and manufacturing and services (sometimes referred to as the ‘modern’ sector). Specifically, countries tend to have large agricultural sectors but relatively small manufacturing and service sectors in the early stages of development. As the modernization process brings about efficiencies in the agricultural sector, resources are freed up for use in manufacturing and service sectors. Over time, and as countries continue to develop, the manufacturing and service sectors become larger and larger relative to the agricultural sector.

Many scholars have argued that this is precisely what happened in early modern Europe. As agriculture became more efficient, fewer peasants were needed to work the land and traditional feudal bonds that tied peasants to the land were torn asunder. This - eventually - led to a population shift from rural areas to urban ones. This shift occurred both at the top and bottom of the social spectrum. Peasants found themselves dispossessed of lands that they had traditional claims to and members of the gentry found themselves drawn into the commercial activities of the towns. A key feature of the commercialization of the agricultural gentry in England was the shift from grain production to the grazing of sheep to feed the growing demand of wool producers (Moore 1966). As Bates and Lien (1985) have argued, this change in the composition of the economy played a crucial role in the creation of representative government in England.

By the 17th century, the modernization process in England had brought about a shift in economic power from a relatively small number of traditional agricultural elites who controlled large domains producing easily quantifiable agricultural products to a rising class of wool producers, merchants, and financial

¹⁵Evidence in support of these theoretical predictions has been provided by a whole host of empirical analyses in recent years (Londregan & Poole 1996, Barro 1999, Ross 2001, Boix 2003, Boix & Stokes 2003, Inglehart & Welzel 2005, Epstein et al. 2006). While evidence to the contrary would seem to come from Przeworski et al. (2000), their famous claim that wealth does not increase the probability of democratic transitions seems to be contradicted by results from their own fully-specified model (p. 124).

¹⁶One of the common criticisms of classic modernization theory is that it lacks a strong causal mechanism and relies simply on an empirical correlation between wealth and democracy (Rueschemeyer, Stephens & Stephens 1992, 29). Acemoglu and Robinson (2006, 318) go so far as to say that “there is as yet no theoretical explanation for this empirical fact.” The variant of modernization theory that we outline below provides a clear causal mechanism linking economic development and democracy.

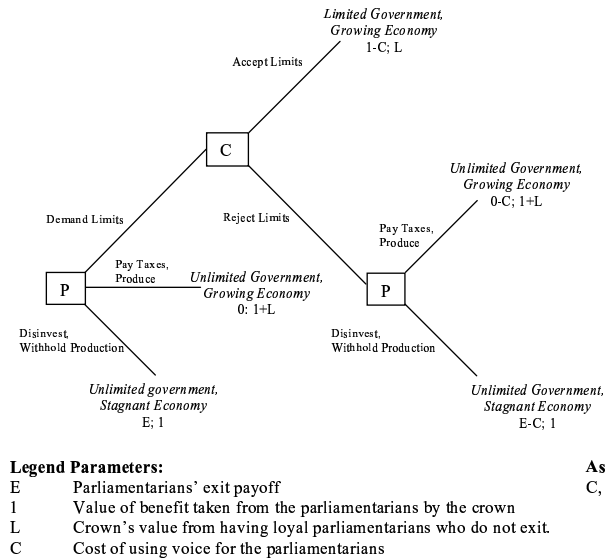
intermediaries who controlled assets that were much more difficult for the state to count – and, hence, more difficult for the state to tax. In contrast to the traditional agricultural elites who were unable to hide their fields from the crown’s tax collectors, wool producers and the new commercialized gentry could better hide their sheep (by moving them around) and their business profits. According to Bates and Lien (1985), the ability of the gentry to hide their assets from state predation changed the balance of power between modernizing social groups and the traditional seats of power - specifically, the Crown. Suddenly, the Kings and Queens of England, who needed money to keep hold of power at home and to wage their wars abroad found themselves in a position where predation no longer worked and, instead, they had to negotiate with economic elites in order to extract revenues. Since the growth of towns and the rise of the wool trade had also led to an increase in the number of economic decision makers whose actions determined the share of revenues available to the crown, it was, perhaps, natural for these actors to use their new-found bargaining power to increase the strength of institutions such as the parliament, which helped aggregate their interests. The result was the supremacy of parliament and the withering away of old avenues of representation such as the Star Chamber that had formerly served the traditional elites. Note that the increased mobility of assets - the ability to move and hide sheep or the ability to invest money in the Netherlands rather than in England for example - can be thought of as equivalent to an increase in the value of the ‘exit option’ possessed by economic elites.

Bates and Lien (1985) argue that the introduction of this more limited state occurred earlier and more definitively in England than it did in France because of the unique structure of the economy that early modernization had produced in England. To see why this is the case, it is useful to turn to our EVL game.¹⁷ In the pre-history of the game, the Crown, under the exigencies of war, has confiscated the assets of a segment of the economic elite represented by parliament. We shall refer to this segment of the elite as the Parliamentarians. At this point, the Crown is still behaving in its usual predatory fashion as though the economic development sweeping through English society did not concern it directly. However, the Parliamentarians are operating from a new-found position of strength vis-à-vis the Crown. They are faced with three options. The first option is to take what assets remain and do everything they can to shield them from further confiscation - in part by taking their assets out of production and/or consuming them (EXIT). If

¹⁷It is particularly noteworthy that Bates and Lien (1985, 60-61) explicitly state that their argument is different from Hirschman’s EVL framework. This is because the informal inferences that Hirschman (1970) presents in his book do not match the inferences that Bates and Lien develop from their formal model. In what follows, we demonstrate that the argument proposed by Bates and Lien is entirely consistent with our game-theoretic reformulation of Hirschman’s argument.

the Parliamentarians no longer invest their assets, the economy is likely to stagnate and there will be less for the Crown to tax or confiscate in the future. The second option is to petition the Crown for protections against future confiscations in exchange for a promise to continue investing their assets in the economy (VOICE). We will assume that the petition calls for the Crown to accept limits on future predatory behavior, say, by granting parliament the right to veto all future increases in taxation and/or by constructing an independent judiciary capable of policing the Crown's behavior. The third option is for the Parliamentarians to continue investing their assets as they had before the confiscation (LOYALTY).

Figure 3: Exit, Voice, and Loyalty Game between the Parliamentarians (P) and the Crown (C)



If the Parliamentarians decide to use voice and petition the Crown, the Crown can respond in one of two ways. First, it can accept the new limits on its power to tax (ACCEPT). In this case, we assume that the Parliamentarians will happily continue to invest their assets and the economy will grow. Second, it can reject the new limits (REJECT). If the Crown rejects the limits, then the Parliamentarians must choose whether to continue investing as before (LOYALTY) or to withdraw substantial portions of their assets from the market (EXIT). Depending on whether the Parliamentarians choose to continue investing their assets, the economy will either stagnate or grow. This strategic interaction between the Parliamentarians and the Crown is shown in Figure 3 going from left to right. In what follows, we address only those situations where voice is a realistic option ($E \leq 1 - C$) since the scenario in which the use of voice is unrealistic is not particularly

interesting given our substantive concern here. Information about the pure strategy sub-game perfect Nash equilibria and their associated outcomes are shown in Table 6.

Table 6: Equilibria and Outcomes in the Exit, Voice, and Loyalty Game between the Parliamentarians and Crown

	<i>The Crown is:</i>	
	Autonomous $L \leq 1$	Dependent $L > 1$
<i>The Parliamentarians have:</i>		
A Credible Exit Threat $E > 0$	POOR DICTATORSHIP Unlimited Government, Stagnant Economy (Disinvest, Disinvest; Reject)	RICH DEMOCRACY Limited Government, Growing Economy) (Demand Limits, Disinvest; Accept Limits)
No Credible Exit Threat $E \leq 0$	RICH DICTATORSHIP Unlimited Government, Growing Economy (Pay Taxes, Pay Taxes; Reject Limits)	RICH DICTATORSHIP Unlimited Government, Growing Economy (Pay Taxes, Pay Taxes; Reject Limits)

Notes: Equilibria are written in the following form: (Parliamentarian's first action, Parliamentarian's second action; Crown's action). All equilibria assume $C, L > 0$.

According to the argument made by Bates and Lien (1985), the Crown was dependent on the Parliamentarians for the funds to wage war in both England and France. In effect, we are on the right-hand side of Table 6. In England, economic development had brought about a situation where the Parliamentarians had mobile assets and, hence, credible exit threats i.e. the value they received from their assets when they hid them from the Crown was higher than it would have been had they obediently paid their taxes in a confiscatory environment. This scenario (top right) helps to explain why the English Crown agreed to accept the limits on its future predatory behavior demanded by the economic elites in parliament.¹⁸ In contrast to England, the agricultural sector in France had undergone considerably less modernization and, as a result, the engine of the economy - such as it was - continued to be a traditional oligarchy that derived its wealth

¹⁸North and Weingast (1989) present a similar argument in which they claim that the development of economic actors who could hide their assets led the king to look for ways to credibly commit to honoring his obligations to the emerging financial class from whom he wished to borrow money to fund his external wars. While the king might have simply predated upon his citizens in the past, the fact that the new gentry could now hide their assets meant that this was no longer an option. Instead, the king had to borrow the money he needed from the gentry and promise to pay it back with interest. The problem was that the private capital holders could never be sure that the king would not default on his debts once the wars were over. As North and Weingast suggest, one solution to this commitment problem was to make the crown's potential financial backers more powerful by strengthening the role and importance of the parliament (and judiciary) vis-à-vis the king. If the king reneged on his debts now, he would suffer punishment at the hands of parliament. This is precisely the explanation proposed by many scholars to explain the institutional reforms that led to the establishment of modern parliamentary democracy in Britain during the Glorious Revolution of 1688. For similar stories about how sovereigns might establish representative or democratic institutions to overcome credible commitment problems, see Acemoglu and Robinson (2000, 2006) and Stasavage (2002).

from agricultural production based on quasi-feudal processes that were easy to observe and, therefore, easy to tax. In effect, the relevant elites in France did not possess credible exit threats ($E \leq 0$). This scenario (bottom right) helps to explain why the French state remained absolutist at a time when the English monarchy was accepting limits on its predatory behavior. The Estates General, the chief French representative body at the time, did not meet between 1614 and May 1789. Thus, for nearly two centuries, French elites had little choice but to try and influence the Crown's behavior through the intricacies of court politics rather than through parliament.

The EVL game predicts that democracy (limited government) will only emerge and survive when the state (Crown) depends on economic elites (Parliamentarians) who have a credible exit option (mobile assets). This central argument can be stated more broadly: representative government (of which democracy is an example) is more likely to emerge and survive when the rulers of a country depend on a segment of society consisting of a relatively large number of people holding mobile assets. Barrington Moore Jr. (1966, 418) essentially stated the same argument quite succinctly in his magisterial analysis of the social origins of democracy and dictatorship - "No Bourgeois, No Democracy."

Note, though, that our EVL framework allows us to generalize this argument still further. Our discussion of the emergence of limited government in England makes it clear that it is not just a large group of actors with an interest in restricting the Crown's arbitrary behavior that produces parliamentary supremacy; the key is that this group has plausible exit options. A concept central to the viability of exit options is that of 'quasi-rents' – the difference between an asset's value and its short-run opportunity cost. All societies contain some actors who derive their wealth from the control of assets that produce huge quasi-rents. These actors – the owners of oil wells, copper mines, and other hard-to-redeploy assets – suffer great losses when the price of their commodity produced in the first best use of their asset plunges. However, all societies also contain some actors who derive their wealth from the control of assets that can be relatively easily redeployed in response to price changes. These actors derive their wealth from their assets' flexibility, not from quasi-rents. Members of the first group (fixed asset holders) that control assets producing large quasi-rents are not likely to possess credible exit options - it is hard for a copper mine owner or an oil company to profitably redeploy their assets (the mine, the oil rig etc.) if the state decides to predate upon them. However, members of the second group who control relatively liquid assets do possess credible exit options - if the state decides to predate upon them, they simply redeploy their assets elsewhere out of the state's reach. Our

analysis of the EVL game illustrates that the state will tend to be attentive to the needs of liquid asset holders and relatively unresponsive to fixed asset holders even if the state depends equally upon both groups. This suggests that when states depend on liquid asset holders for investment and resources, they are more likely to accept limits on their predatory behavior.¹⁹

This inference is supported by numerous empirical studies showing that democracy is unlikely to emerge or survive in states where fixed asset holders and natural resources are prevalent. For example, many scholars have shown that democracy is less likely to emerge and survive in countries where oil production (perhaps the quintessential quasi-rent generating fixed asset) is central to the economy (Barro 1999, Ross 2001). In fact, scholars speak of the ‘rentier state’ to describe the pervasive and negative effects of oil (Mahdavy 1970, Beblawi 1987). Other scholars have also shown that democracy is less common and less stable in countries that rely on other primary resources such as minerals, diamonds, and copper (Jensen & Wantchekon 2004) or whose economy is dominated by large landowners (Rueschemeyer, Stephens & Stephens 1992). These empirical results have led some to speak of a ‘resource curse’ (Ross 1999).²⁰ In contrast, Bates (1991) and Rogowski (1998) have both argued that when human capital (the quintessential liquid asset) becomes the engine of economic growth in an economy, states are forced to bargain with the holders of these assets in such a way that democracy is unavoidable.²¹ To the extent that globalization leads to increased asset mobility and an increased reliance on human capital, the argument that we propose would suggest that it should aid democratization efforts around the world. Suggestive evidence that this might be the case comes from the fact that both Huntington’s (1991) first and third waves of democracy coincide with periods of increased economic globalization and financial integration.

In sum, by explaining the observed relationship between (i) economic development and democracy and (ii) the abundance of natural resources and authoritarianism, our EVL model is able to combine the results from two largely distinct literatures within the same theoretical framework.

¹⁹The existence of wealthy dictatorships around the world has often been taken as evidence against modernization theory since it seems to contradict the prediction that countries will become democratic as they get wealthier (Przeworski & Limongi 1997). While the existence of a few wealthy dictatorships might appear anomalous in the context of classic modernization theory, these observations are entirely compatible with our variant of modernization theory since these countries tend to rely for their wealth on fixed assets such as oil, gas, minerals etc..

²⁰A large literature also shows that states that rely primarily on fixed assets such as oil are also prone to poor governance, low levels of economic development, and civil war (Ross 1999, Karl 1997, Shafer 1994, Fearon 2005, Humphreys 2005, Collier & Hoeffler 2000, Collier & Hoeffler 2005).

²¹Haber, Razo and Mauer (2003) have recently argued that states are likely to be less predatory and more limited when the technology of production is sophisticated. In the terminology of our argument, one reason for this is that sophisticated technologies of production make states ‘dependent’ on actors with high levels of human capital and ‘credible exit threats’.

5.2 Foreign Aid, Inequality, and Economic Performance

Our EVL model also has important insights about the role of foreign aid, inequality, and economic performance in the democratization process.

5.2.1 Foreign Aid

As the equilibria in Table 6 illustrate, democracy is unlikely to emerge when the state is autonomous i.e. when the state does not depend in any way on economic elites or its citizens more generally. This suggests that anything that reduces the dependence of a state on its citizens will harm the prospects for democracy. This raises an interesting issue regarding the use of foreign aid. By giving foreign aid to a dictatorial state, one is arguably reducing the dependence of that state on its citizens. In many cases, one is also reducing the incentive for the dictatorial state to produce good economic performance, thereby making the life of the average citizen more miserable and making future donations of foreign aid more necessary. Thus, an implication of our EVL model is that providing foreign aid to dictatorships – at least when the aid reduces their dependence on citizens – may actually inhibit the emergence of democracy.²² While seeing citizens live in destitution under harsh dictatorial rule may be hard to stomach, easing their pain by providing foreign aid to their governments may, under some circumstances, simply result in the prolonging of their suffering. This implication is consistent with a number of recent empirical studies showing that foreign aid to dictatorships harms the welfare of the average citizen in these countries and helps dictators stay in office through corruption and exploitation rather than through the production of effective public policy (Morgenthau 1962, Burnside & Dollar 2000, Van de Walle 2001, Easterly 2002, Bueno de Mesquita et al. 2003, Bueno de Mesquita & Smith 2004, Clark, Dozes & Woodbery 2006).

5.2.2 Inequality

A number of studies have recently argued that economic inequality undermines democracy (Huntington 1991, Rueschemeyer, Stephens & Stephens 1992, Acemoglu & Robinson 2000, Rosendorff 2001, Boix

²²Foreign aid is just one example of a policy that potentially undermines democracy by reducing the dependence of the state on its citizens. A similar story can be told about the policy of decolonization in Africa (Herbst 2000). By directly handing over power to particular elites and supporting their rule, European colonial powers essentially reduced the dependence of these new elites on their own citizens. A result was that these elites never felt particularly obliged to offer democratic concessions in return for the ability and right to rule.

2003, Reenock, Bernhard & Sobek 2007).²³ The claim that inequality is bad for democracy actually goes back at least as far as Tocqueville (1835 [1988], 49-55, 128-136), who argued that economic equality was important for both the introduction and persistence of democratic institutions. The basic argument in virtually all of these studies is that the emergence of democracy in unequal societies is likely to produce political cleavages based on divisions of wealth/income (class) and to significant pressures for economic redistribution from the rich to the poor. The possibility that the poor would attempt to expropriate the rich through the ballot box is thought to make democracy appear quite costly to elites. In effect, economic elites are expected to step in to block attempts at democratization or to conduct coups to reverse democratization in highly unequal societies (O'Donnell 1973, Stepan 1985, Drake 1996).

At present, the existing empirical evidence in support of these arguments is not particularly consistent or compelling (Reenock, Bernhard & Sobek 2007, Acemoglu & Robinson 2006, 61-62). For example, Boix (2003, 79-82) finds that economic inequality actually promotes democratic survival instead of hurting it when controlling for wealth as measured by GDP per capita. Only when he ignores a country's wealth – probably the single best predictor of democratic survival – does he find any evidence that inequality negatively affects the survival of democracy. The findings of Przeworski et al. (2000, 120-121) regarding inequality and democracy are mixed and they conclude that inequality has “no clear effect on the stability of regimes”. Similar null findings come from Barro (1997), as well as Bollen and Jackman (1985, 1995). The fact that the spread of universal suffrage in the 20th century has not historically led to the expropriation of the rich by the poor would also seem to call these arguments into question (Przeworski 1985, Roemer 1998).

We believe that the logic inherent in our EVL game can help to explain these inconsistent results since it offers a reason for why the poor do not always expropriate the rich and, hence, why economic inequality need not necessarily be bad for democracy.²⁴ We showed earlier how economic elites who had credible exit options could force a dependent state to accept limits on its predatory behavior. The fact that these economic elites have credible exit options and can realistically withdraw their much-needed investment in the economy (perhaps by consuming it or simply investing it beyond the reaches of a predatory state) also helps to explain

²³In contrast to most of these studies, Acemoglu and Robinson (2001, 2006) have argued that there is a non-monotonic relationship between inequality and the prospects for democracy. Specifically, they claim that democracy is more likely at moderate levels of inequality, where citizens are not totally satisfied with the existing system and where the elites are not so averse to democracy that they resort to repression to prevent it, and less likely when inequality is either low or high.

²⁴Others, such as Barro (1997, 69) and Przeworski et al. (2000, 117), have blamed the null or mixed results in the literature on the paucity or poor quality of the available inequality data. For example, the results from Boix's (2003, 76) recent empirical analyses are based on only 587 country-year observations of Gini coefficients out of about 5,000 possible country-year observations in his data set.

why the poor will not vote to expropriate them.²⁵ In effect, the poor ‘depend’ on the economic elites for the economy to grow. Our argument here fits squarely within the larger literature looking at the structural dependence of the state on capital (Miliband 1969, Block 1977, Przeworski & Wallerstein 1988, McGuire & Olson 1996, Rosendorff 2001). If our argument is correct, then existing empirical studies examining the link between economic inequality and democracy need to be modified. This is because economic inequality should only be bad for democracy in countries where the economic elites do not have credible exit options; where they have credible exit options, the elites should be willing to accept democracy knowing that the poor will have incentives to limit any pressures for redistribution. The failure to take account of this conditionality may explain the inconsistent findings in the literature.²⁶

5.2.3 Economic Performance

Finally, the results presented in Table 7 illustrate that our EVL game also offers insights into the conditions under which we expect to observe growing or stagnant economies. While democracies should be characterized by good economic performance on the whole, there should be considerable variation in the economic performance of dictatorships. Specifically, dictatorships where citizens have no credible exit threat should perform relatively well since citizens have little option but to continue investing, making the best of what they have and hoping that the state does not predate too much. In contrast, dictatorships where citizens have credible exit threats will perform poorly since the citizens will redeploy their assets elsewhere to avoid state predation. The prediction that dictatorships should exhibit more variation in economic performance than democracies is consistent with the theoretical claims and empirical findings associated with the selectorate theory of politics (Bueno de Mesquita et al. 2001, Bueno de Mesquita et al. 2003).²⁷ It is also supported by evidence from Przeworski et al. (2000, 176), who find that the standard deviation in economic growth rates between 1950 and 1990 is 7.04 for dictatorships and just 4.85 for democracies. These authors go on to write

²⁵This inference follows from our earlier analysis of the extended EVL game – we simply replace the state’s decision whether to predate or not in that game with the poor’s decision whether to expropriate (redistribute) or not.

²⁶To some extent, the theoretical arguments proposed by Boix (2003) and Acemoglu and Robinson (2006) recognize that the effect of inequality on democracy is likely to be conditioned by what we are calling credible exit options. However, none of Boix’s statistical models ever test this hypothesis; Acemoglu and Robinson do not conduct any statistical tests of their theory.

²⁷In many ways, the selectorate theory’s emphasis on ‘loyalty norms’ is equivalent to our argument about exit options. The selectorate theory predicts good economic performance when loyalty norms are weak (when the size of the winning coalition is large relative to the size of the selectorate) because under these circumstances members of the winning coalition can credibly threaten to defect to the challenger’s coalition. It is the credibility of such ‘exit’ threats that makes support for the incumbent costly to purchase and that, as a result, forces the leader to raise more revenue. The need to raise more revenue in order to stay in power, in turn, induces a concern on the incumbent’s part for national welfare and good economic performance.

that the “list of [economic] miracles and disasters are . . . populated almost exclusively by dictatorships” (p. 178). The fact that some dictatorships are expected to have growing economies may help to explain why so many economists and political scientists have failed to find compelling evidence that democracies routinely produce better economic performance than dictatorships (Przeworski & Limongi 1993, Sirowy & Inkeles 1991). Our argument suggests that it is inappropriate to simply compare the economic performance of democracies and dictatorships since economic performance across these regimes should be conditional on the presence or absence of credible exit options.

6 Conclusion

Human interactions are considered political whenever actors cannot accomplish their goals without considering the behavior of other actors. Under such circumstances, the attempt to influence - or to avoid the influence of - others becomes relevant. It is here that power can, and will, be exercised. Attempts to influence, or break free of the influence of others, involve three basic strategies. Like the primordial response of ‘fight or flight’, political actors can attempt to change their environment by using voice or change their ‘location’ by using exit. ‘Voice’ and ‘exit’ are to be understood metaphorically here. A citizen’s use of exit in response to a government policy need not involve emigration. Instead a citizen might change industries, production processes, or political parties. Similarly, a citizen’s use of voice might come in the form of a host of behaviors ranging from a ballot to a bullet. Finally, a citizen’s best response to government policy might be to ‘keep on, keepin’ on’. That is, throughout most of human history, the vast majority of humanity has often found itself between a rock and a hard place. Under such circumstances, it is possible that neither voice nor exit is a feasible option. It should be clear that here too, the term ‘loyalty’ is being used metaphorically - indeed, euphemistically.

Our game-theoretic reformulation and extension of Hirschman’s (1970) famous argument helps to throw new light on when and why actors choose to exit, use voice, and demonstrate loyalty. As we demonstrated, our basic EVL game reaffirms some of Hirschman’s original results but contradicts several others. It also highlights several points that have been previously overlooked or underemphasized by scholars employing the EVL framework to substantive areas of political science. We illustrated the usefulness and widespread applicability of our EVL model by investigating the conditions under which we expect to see democratic transitions. We demonstrated that the EVL model could explain both the observed relationship

between (i) economic development and democracy and (ii) the abundance of natural resources and authoritarianism. In doing so, we showed how the results from two largely distinct literatures can be combined within the same theoretical framework. We also indicated how our results could provide insights for the literatures addressing the role of foreign aid, inequality, and economic performance in the democratization process. Although we have applied our EVL model to the particular case of democratic transitions here, we believe that it offers a fruitful analytical framework for examining the power relationship between actors such as citizens and states in a wide variety of other political settings as well.

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7 Online Appendix

7.1 The Basic EVL Game

In Table 2, we claim that there are four pure strategy sub-game perfect Nash equilibria (SPNE) for the basic EVL game depicted in Figure 1. Here we provide a proof for each equilibrium. All equilibria assume that $C, L > 0$. We make three additional assumptions in order to simplify knife-edge scenarios where $E = 0$, $L = 1$, or $E = 1 - C$. These assumptions are:

1. The citizen will only exit if $E > 0$.
2. The state will only respond if $L > 1$.
3. The citizen will not use voice if $E > 1 - C$.

We will refer to these as Assumptions 1, 2, and 3. Equilibria are written in the following form: (Citizen's first action, Citizen's second action; State's action).

Equilibrium E1: (Loyalty, Loyalty; Ignore) if $E \leq 0$.

Proof: By Assumption 1, the citizen will choose to remain loyal ($0 - C$) at the last decision node rather than exit ($E - C$) if $E \leq 0$. The state will always prefer to ignore the citizen's use of voice ($1 + L$) rather than respond (L) since $L > 0$. At the initial decision node, the citizen must choose whether to exit (E), use voice ($0 - C$), or remain loyal (0). Since $E \leq 0$ and $C > 0$, the citizen will choose to remain loyal.

Q.E.D.

Equilibrium E2: (Exit, Exit; Ignore) if $L \leq 1$ and $E > 0$.

Proof: The citizen will choose to exit ($E - C$) at the last decision node rather than remain loyal ($0 - C$) if $E > 0$. By Assumption 2, the state will ignore the citizen's use of voice (1) rather than respond (L) if $L \leq 1$. At the initial decision node, the citizen must choose whether to exit (E), use voice ($0 - C$), or remain loyal (0). Since $E, C > 0$, the citizen will choose to exit.

Q.E.D.

Equilibrium E3: (Voice, Exit; Respond) if $L > 1$ and $0 < E \leq 1 - C$.

Proof: The citizen will choose to exit ($E - C$) at the last decision node rather than remain loyal ($0 - C$) if $E > 0$. The state will respond to the citizen's use of voice (L) rather than ignore her (1) if $L > 1$. At the initial decision node, the citizen must choose whether to exit (E), use voice ($1 - C$), or remain loyal (0). By Assumption 3, the citizen will choose to use voice if $0 < E \leq 1 - C$.

Q.E.D.

Equilibrium E4: (Exit, Exit; Respond) if $L > 1$, $E > 0$ and $E > 1 - C$.

Proof: The only difference with equilibrium E3 is that the citizen chooses to exit at the initial decision node. The citizen will choose to exit there if $E > 1 - C$.

Q.E.D.

7.2 The Extended EVL Game

In Table 4, we claim that there are four pure strategy sub-game perfect Nash equilibria (SPNE) for the extended EVL game depicted in Figure 2. Here we provide a proof for each equilibrium. All equilibria assume that $C, C_S, L > 0$ and that $1 > E$. We make four additional assumptions to deal with knife-edge scenarios where $E = 0$, $L = 1$, or $E = 1 - C$. These assumptions are:

1. The citizen will only exit if $E > 0$.
2. The state will only respond if $L > 1$.
3. The citizen will not use voice if $E > 1 - C$.
4. The state will not predate if $L > 1$.

We will refer to these as Assumptions 1, 2, 3, and 4. Equilibria are written in the following form: (State's first action, State's second action; Citizen's first action at the top, Citizen's second action at the top, Citizen's action at the bottom).

Equilibrium E5: (Predate, Ignore; Loyalty, Loyalty, Loyalty) if $E \leq 0$.

Proof: By Assumption 1, the citizen will choose to remain loyal ($0 - C$) at the last decision node at the top rather than exit ($E - C$) if $E \leq 0$. The state will always prefer to ignore the citizen's use of voice ($1 + L - C_S$) rather than respond ($L - C_S$) since $L > 0$. At the citizen's first decision node at the top, she must choose whether to exit (E), use voice ($0 - C$), or remain loyal (0). By Assumption 1 and the fact that $C > 0$, the citizen will choose to remain loyal. At the citizen's decision node at the bottom, the citizen will choose to remain loyal (1) rather than exit (E) since $1 > E$. Finally, the state will choose to predate ($1 + L$) at the initial decision node rather than not predate (L) since $L > 0$.

Q.E.D.

Equilibrium E6: (Predate, Ignore; Exit, Exit, Loyalty) if $L \leq 1$ and $E > 0$.

Proof: The citizen will choose to exit ($E - C$) at the last decision node at the top rather than remain loyal ($0 - C$) if $E > 0$. By Assumption 2, the state will ignore the citizen's use of voice ($1 - C_S$) rather than respond ($L - C_S$) if $L \leq 1$. At the citizen's first decision node at the top, she must choose whether to exit (E), use voice ($0 - C$), or remain loyal (0). Since $E > 0$ and $C > 0$, the citizen will choose to exit. At the citizen's decision node at the bottom, the citizen will choose to remain loyal (1) rather than exit (E) since $1 > E$. By Assumption 4, the state will choose to predate (1) at the initial decision node rather than not predate (L) since $L \leq 1$.

Q.E.D.

Equilibrium E7: (Don't Predate, Respond; Voice, Exit, Loyalty) if $L > 1$ and $0 < E \leq 1 - C$.

Proof: The citizen will choose to exit ($E - C$) at the last decision node at the top rather than remain loyal ($0 - C$) if $E > 0$. The state will respond to the citizen's use of voice ($L - C_S$) rather than ignore her ($1 - C_S$) if $L > 1$. At the citizen's first decision node at the top, she must choose whether to exit (E), use voice ($1 - C$), or remain loyal (0). By Assumption 3, the citizen will choose to use voice if $0 < E \leq 1 - C$. At the citizen's decision node at the bottom, the citizen will choose to remain loyal (1) rather than exit (E) since $1 > E$. Finally, the state will choose not to predate (L) at the initial decision node rather than predate ($L - C_S$) since $C_S > 0$.

Q.E.D.

Equilibrium E8: (Don't Predate, Respond; Exit, Exit, Loyalty) if $L > 1$, $E > 0$ and $E > 1 - C$.

Proof: The citizen will choose to exit ($E - C$) at the last decision node at the top rather than remain loyal ($0 - C$) if $E > 0$. The state will respond to the citizen's use of voice ($L - C_S$) rather than ignore her ($1 - C_S$) if $L > 1$. At the citizen's first decision node at the top, she must choose whether to exit (E), use voice ($1 - C$), or remain loyal (0). By Assumption 3, the citizen will choose to exit if $E > 1 - C$. At the citizen's decision node at the bottom, the citizen will choose to remain loyal (1) rather than exit (E) since $1 > E$. Finally, the state will choose not to predate (L) at the initial decision node rather than predate (1) since $L > 1$.

Q.E.D.

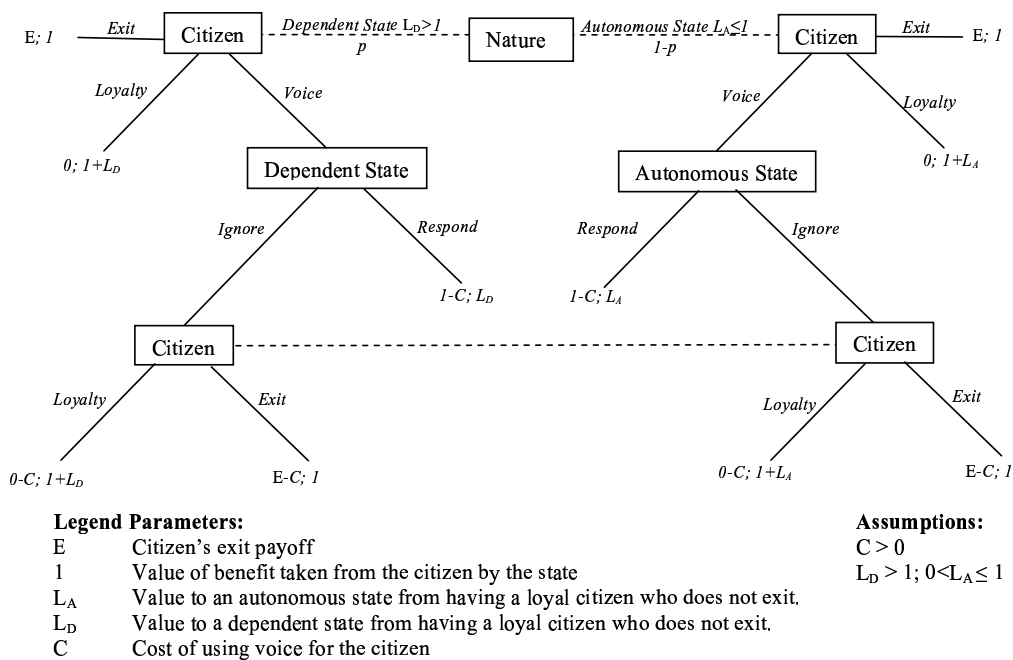
7.3 The Basic EVL Game: Incomplete Information

In section 4, we discuss how incomplete information affects the power relationship between citizens and the state. We now present versions of the basic EVL game (i) where the citizen lacks information about whether the state is dependent or autonomous and (ii) where the state lacks information about whether the citizen has a credible exit threat or not.

7.3.1 Incomplete Information on the Part of the Citizen

The basic EVL game where the citizen is unsure whether the state is dependent ($L_D > 1$) or autonomous ($0 < L_A \leq 1$) is shown in Figure 4. While the state knows whether it is dependent or autonomous, the

Figure 4: Basic Exit, Voice, and Loyalty Game when the Citizen has Incomplete Information



citizen does not. However, the citizen has beliefs about the state's type. Specifically, the citizen believes that the state is dependent with probability p and autonomous with probability $1 - p$. We solve the game for pure strategy perfect Bayesian equilibria (PBE). There are three unique PBE depending on the specific conditions. The equilibria are listed in Table 7. Equilibria are written in the following form: ((Citizen's first action, Citizen's second action), (Dependent State's action, Autonomous State's action), probability Citizen assigns to history (Dependent State)). All equilibria assume $C > 0$, $L_D > 1$, and $0 < L_A \leq 1$. We make two additional assumptions in order to simplify knife-edge scenarios where $E = 0$ or $p = \frac{C}{1-E}$. Specifically, we assume that the citizen will exit only if $E > 0$ and that she will use voice only if she believes that $p > \frac{C}{1-E}$.

Table 7: PBE from the Basic EVL Game when the Citizen has Incomplete Information

#	Equilibrium	Equilibrium Type	Outcome
E9	((Loyalty, Loyalty), (Ignore, Ignore), p) if $E \leq 0$ and for all p	Pooling	Citizen chooses loyalty
E10	((Exit, Exit), (Respond, Ignore), p) if $E > 0$ and for $p \leq \frac{C}{1-E}$	Separating	Citizen exits
E11	((Voice, Exit), (Respond, Ignore), p) if $E > 0$ and for $p > \frac{C}{1-E}$	Separating	Dependent states respond to voice. Autonomous states ignore voice. If voice is ignored, the citizen exits.

Notes: Equilibria are written in the following form: ((Citizen's first action, Citizen's second action), (Dependent State's action, Autonomous State's action), probability Citizen assigns to history (Dependent State)). All equilibria assume $C > 0$, $L_D > 1$, and $0 < L_A \leq 1$. We make two additional assumptions in order to simplify knife-edge scenarios where $E = 0$ or $p = \frac{C}{1-E}$. Specifically, we assume that the citizen will exit only if $E > 0$ and that she will use voice only if she believes that $p > \frac{C}{1-E}$.

We now prove that these are the only three pure strategy perfect Bayesian equilibria. Note that the citizen has six possible strategies given that she has three possible actions at her first decision node and two at her second. However, we know by assumption that a citizen who chooses exit at her last decision node will not choose loyalty at her first decision node. We also know by assumption that a citizen who chooses loyalty at his last decision node will not choose exit at her first decision node. Thus, we can eliminate all but four strategies for the citizen.

- (Exit, Exit)
- (Loyalty, Loyalty)
- (Voice, Exit)
- (Voice, Loyalty)

The state has four possible strategies given that each type of state has two possible actions at their decision nodes.

- (Respond, Respond)

- (Respond, Ignore)
- (Ignore, Respond)
- (Ignore, Ignore)

Thus, we have sixteen possible strategy profiles. However, we know by assumption that an autonomous state will always ignore voice. We also know that a dependent state will always respond if it expects the citizen to exit at her last decision node and to ignore if it expects the citizen to remain loyal. As a result, we can eliminate all but four strategy profiles.

- (Loyalty, Loyalty), (Ignore, Ignore)
- (Exit, Exit), (Respond, Ignore)
- (Voice, Exit), (Respond, Ignore)
- (Voice, Loyalty), (Ignore, Ignore)

In Table 7, we claim that the first three of these strategy profiles can be combined with a belief system to form a perfect Bayesian equilibrium. The proofs are shown below.

Equilibrium E9: ((Loyalty, Loyalty), (Ignore, Ignore), p) if $E \leq 0$ and for all p

Proof: By Assumption 1, the citizen will choose to remain loyal ($0 - C$) at the last decision node rather than exit ($E - C$) if $E \leq 0$. If either type of state expects the citizen to remain loyal at the end of the game, then they will ignore voice ($1 + L_i$) rather than respond (L_i) since $L_i > 0$ for $i = A, D$. By Assumption 1, the citizen will always choose to remain loyal at the beginning of the game irrespective of the type of state if $E \leq 0$.

Q.E.D.

Equilibrium E10: ((Exit, Exit), (Respond, Ignore), p) if $E > 0$ and for $p \leq \frac{C}{1-E}$

Proof: The citizen will choose to exit ($E - C$) at the last decision node rather than remain loyal ($0 - C$) if $E > 0$. If the citizen exits at the end of the game, then an autonomous state will ignore since $L_A \leq 1$ and a dependent state will respond since $L_D > 1$ by Assumption 2. If $E > 0$, then the citizen will never remain loyal at the beginning of the game; she will exit (E) rather than use voice ($p(1 - C) + (1 - p)(E - C)$) so long as $p \leq \frac{C}{1-E}$.

Q.E.D.

Equilibrium E11: ((Voice, Exit), Respond, Ignore), p) if $E > 0$ and for $p > \frac{C}{1-E}$

Proof: The only difference with equilibrium E10 is that the citizen chooses to use voice rather than exit at the beginning of the game. The citizen will use voice if $p > \frac{C}{1-E}$.

Q.E.D.

The remaining strategy profile (Voice, Loyalty), (Ignore, Ignore) cannot be combined with a belief system to form a PBE.

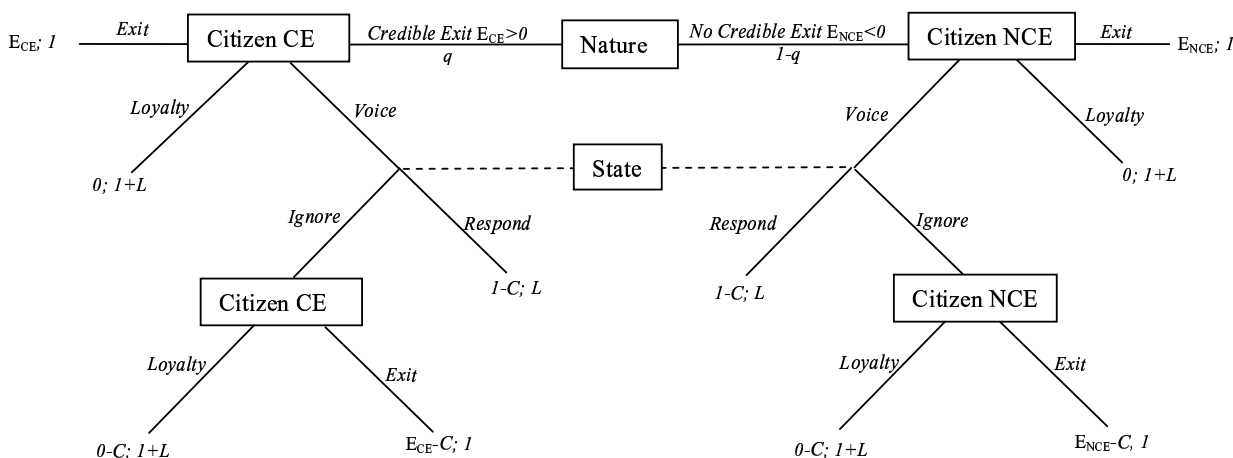
Proof: The only difference with equilibrium E9 is that the citizen chooses to use voice rather than remain loyal at the beginning of the game. For the citizen to use voice ($p(0 - C) + (1 - p)(0 - C)$) rather than remain loyal (0), it would have to be the case that $0 < -C$. However, this can never be the case since $C > 0$.

Q.E.D.

7.3.2 Incomplete Information on the Part of the State

The basic EVL game where the state is unsure whether the citizen has a credible exit threat ($E_{CE} > 0$) or not ($E_{NCE} \leq 0$) is shown in Figure 5. While the citizen knows her type, the state does not. However, the

Figure 5: Basic Exit, Voice, and Loyalty Game when the State has Incomplete Information



Legend Parameters:

- E_{CE} Type CE citizen's exit payoff
- E_{NCE} Type NCE citizen's exit payoff
- 1 Value of benefit taken from the citizen by the state
- L State's value from having a loyal citizen who does not exit.
- C Cost of using voice for the citizen

Assumptions:

- $C, L, > 0$
- $E_{CE} > 0; E_{NCE} \leq 0$

state has beliefs about the citizen's type. Specifically, the state believes that the citizen has a credible exit threat with probability q and does not have a credible exit threat with probability $1 - q$. We solve the game for pure strategy perfect Bayesian equilibria (PBE). There are three unique PBE depending on the specific conditions. The equilibria are listed in Table 8. Equilibria are written in the following form: ((Type CE's first action, Type CE's second action; Type NCE's first action, Type NCE's second action), (State's action), probability State assigns to history (Type CE, Voice)). All equilibria assume $C > 0$, $L > 0$, $E_{NCE} \leq 0$ and $E_{CE} > 0$. We make three additional assumptions in order to simplify knife-edge scenarios where $C = 1$, $E_{CE} = 1 - C$, or $q = \frac{1}{L}$. Specifically, we assume that a Type NCE citizen will use voice only if $C < 1$, a Type CE citizen will exit only if $E_{CE} > 1 - C$, and that the state will respond only if it believes that $q > \frac{1}{L}$.

Table 8: PBE from the Basic EVL Game when the State has Incomplete Information

#	Equilibrium	Equilibrium Type	Outcome
E12	((Exit, Exit; Loyalty, Loyalty), (Ignore), q) if $q \leq \frac{1}{L}$	Separating	Type CE citizen exits, Type NCE citizen remains loyal
E13	((Exit, Exit; Loyalty, Loyalty), (Respond), q) if $C > 1$ for the Type NCE citizen and $E_{CE} > 1 - C$ for the type CE citizen and for $q > \frac{1}{L}$	Separating	Type CE citizen exits, Type NCE citizen remains loyal
E14	((Voice, Exit; Voice, Loyalty), (Respond), q) if $C < 1$ for the Type NCE citizen, $E_{CE} < 1 - C$ for the Type CE citizen and for $q > \frac{1}{L}$	Pooling	Type CE citizen uses voice, Type NCE citizen uses voice, state responds.

Notes: Equilibria are written in the following form: ((Type CE's first action, Type CE's second action; Type NCE's first action, Type NCE's second action), (State's action), probability State assigns to history (Type CE, Voice)). All equilibria assume $C > 0$, $L > 0$, $E_{NCE} \leq 0$ and $E_{CE} > 0$. We make three additional assumptions in order to simplify knife-edge scenarios where $C = 1$, $E_{CE} = 1 - C$, or $q = \frac{1}{L}$. Specifically, we assume that a Type NCE citizen will use voice only if $C < 1$, a Type CE citizen will exit only if $E_{CE} > 1 - C$, and that the state will respond only if it believes that $q > \frac{1}{L}$.

We now prove that these are the only three pure strategy perfect Bayesian equilibria. Note that the citizen has 36 possible strategies given that each citizen type has three possible actions at their first decision node and two at their second. However, we know by assumption that Type CE citizens will always prefer to exit rather than remain loyal and that Type NCE citizens always prefer to remain loyal than exit. As a result, we can eliminate all but four possible strategies for the citizen.

- (Exit, Exit; Loyalty, Loyalty)
- (Voice, Exit; Loyalty, Loyalty)
- (Voice, Exit; Voice, Loyalty)
- (Exit, Exit; Voice, Loyalty)

The state has two strategies given that it has two possible actions at its information set:

- (Respond)
- (Ignore)

Thus, we have eight possible strategy profiles. However, we know that a Type CE and a Type NCE citizen will never use voice if the state is expected to ignore them. As a result, we can eliminate all but five strategy profiles:

- (Exit, Exit; Loyalty, Loyalty), (Ignore)
- (Exit, Exit; Loyalty, Loyalty), (Respond)

- (Voice, Exit; Voice, Loyalty), (Respond)
- (Voice, Exit; Loyalty, Loyalty), (Respond)
- (Exit, Exit; Voice, Loyalty), (Respond)

In Table 8, we claim that the first three of these strategy profiles can be combined with a belief system to form a perfect Bayesian equilibrium. The proofs are shown below.

Equilibrium E12: ((Exit, Exit; Loyalty, Loyalty), (Ignore), q) if $q \leq \frac{1}{L}$

Proof: By Assumption 1, we know that a Type CE citizen will exit ($E_{CE} - C$) rather than remain loyal ($0 - C$) and that a Type NCE citizen will remain loyal ($0 - C$) rather than exit ($E_{NCE} - C$) at their last decision nodes. Since the state's information set is never reached in this equilibrium, the state's beliefs need only be consistent with its choice to ignore voice. The state will ignore voice ($q(1) + (1 - q)(1 + L)$) rather than respond (L) whenever $q \leq \frac{1}{L}$. If the state is expected to ignore voice, then a Type CE citizen will exit (E_{CE}) rather than remain loyal (0) or use voice ($E_{CE} - C$) at her first decision node; a Type NCE citizen will remain loyal (0) rather than exit (E_{NCE}) or use voice ($0 - C$) at her first decision node.

Q.E.D.

Equilibrium E13: ((Exit, Exit; Loyalty, Loyalty), (Respond), q) if $C > 1$ for the Type NCE citizen and $E_{CE} > 1 - C$ for the type CE citizen and for $q > \frac{1}{L}$

Proof: The only difference with equilibrium E12 is that the state responds to voice. The state will respond if $q > \frac{1}{L}$. If the state is expected to respond, then a Type NCE citizen will remain loyal (0) rather than use voice ($1 - C$) or exit (E_{NCE}) at her first decision node if $C \geq 1$; a Type CE citizen will exit (E_{CE}) rather than use voice ($1 - C$) or remain loyal (0) at her first decision node if $E_{CE} > 1 - C$.

Q.E.D.

Equilibrium E14:((Voice, Exit; Voice, Loyalty), (Respond), q) if $C \leq 1$ for the Type NCE citizen, $E_{CE} \leq 1 - C$ for the Type CE citizen and for $q > \frac{1}{L}$

Proof: By Assumption 1, we know that a Type CE citizen will exit ($E_{CE} - C$) rather than remain loyal ($0 - C$) and that a Type NCE citizen will remain loyal ($0 - C$) rather than exit ($E_{NCE} - C$) at their last decision nodes. The state's information set is reached in equilibrium. By Bayes' rule and the strategy of the Type CE citizen to use voice and the Type NCE citizen to use voice at their first decision nodes, the state assigns probability q to the history (CE, Voice). Given this belief, it is optimal for the state to respond if $q > \frac{1}{L}$. If the state is expected to respond, then a Type NCE citizen will use voice ($1 - C$) rather than remain loyal ($0 - C$) or exit (E_{NCE}) at her first decision node if $C < 1$; a Type CE citizen will use voice ($1 - C$) rather than exit (E_{CE}) or remain loyal (0) at her first decision node if $E_{CE} \leq 1 - C$.

Q.E.D.

We now demonstrate that the remaining two strategy profiles cannot be combined with a belief system to form a PBE.

The strategy profile (Voice, Exit; Loyalty, Loyalty), (Respond) cannot be combined with a belief system to form a PBE.

Proof: By Assumption 1, we know that a Type CE citizen will exit ($E_{CE} - C$) rather than remain loyal ($0 - C$) and that a Type NCE citizen will remain loyal ($0 - C$) rather than exit ($E_{NCE} - C$) at their last decision nodes. The state's information set is reached in this potential equilibrium. By Bayes' rule and the strategy of the Type CE citizen to use voice and the Type NCE citizen to remain loyal at the beginning of the game, the state assigns probability $q = 1$ to the history (CE, Voice). Given this belief, it is optimal for the state to respond if $L > 1$. If the state is expected to respond, then it is optimal for a Type CE citizen to use voice if $E_{CE} \leq 1 - C$ and for a Type NCE citizen to choose loyalty if $C \geq 1$ at the beginning of the game. However, these two conditions are incompatible since $E_{CE} \leq 1 - C$ requires that $1 \geq C$. Thus, this is not a PBE.

Q.E.D.

The strategy profile (Exit, Exit; Voice, Loyalty), (Respond) cannot be combined with a belief system to form a PBE.

Proof: By Assumption 1, we know that a Type CE citizen will exit ($E_{CE} - C$) rather than remain loyal ($0 - C$) and that a Type NCE citizen will remain loyal ($0 - C$) rather than exit ($E_{NCE} - C$) at their last decision nodes. The state's information set is reached in this potential equilibrium. By Bayes' rule and the strategy of the Type CE citizen to exit and the Type NCE citizen to use voice at the beginning of the game, the state assigns probability $q = 0$ to the history (CE, Voice). Given this belief, it is never optimal for the state to respond since it obtains L if it backs down and $1 + L$ if it ignores voice. Thus, this is not a PBE.

Q.E.D.