A FORMAL MODEL OF EXIT AND VOICE

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ABSTRACT

I re-examine Hirschman's classic text *Exit, Voice, and Loyalty* through a game-theoretic interpretation of the relationship between exit and voice. The model, which is general and applicable to diverse environments, treats exit as a costly decision, which may be prevented through an appropriate choice of policy by the leadership of an organization. Voice – the capacity of an organization's members to participate in the setting of policy – is similarly costly, but provides a share of the surplus from avoiding exit. The formalization sheds light on the static and dynamic effects of exit, the conditions for the development of voice, the impact of loyalty, and the decision of organizational leaders to suppress voice and exit. I illustrate the model by revisiting Hirschman's analysis of exit and voice in the collapse of East German communism.

KEY WORDS exit • formal theory • game theory • voice

1. Introduction

Thirty-six years have elapsed since the publication of *Exit, Voice, and Loyalty: Responses to Decline in Firms, Organizations, and States* (Hirschman 1970). In that work, Albert O. Hirschman suggested that individuals dissatisfied with the performance of an organization they belong to or do business with may try to improve their lot either by 'exiting' from the organization and thus forgoing the goods or services it provides, or by remaining with the organization but attempting to improve its performance by 'voicing' their discontent. In principle, both forms of response may motivate organizational leaders to be more responsive to their members. However, the existence of one response may stunt the growth of the other: the more discontent is dissipated through exit from the organization, the less likely it is to manifest itself in voice within the organization.

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The enduring popularity of Hirschman's book can be attributed to the ability of this simple model to seemingly explain an array of political, economic, and social phenomena. While *Exit, Voice, and Loyalty* focused primarily on discontent with the performance of a firm, subsequent work has addressed the role of exit and voice in applications as diverse as the theory of the state (Hirschman 1978; Rogowski 1998), revolution (Hirschman 1993; Pfaff and Kim 2003), household behavior (Katz 1997; Gershuny et al. 2005), identity (Laitin 1998), trade protection (Aggarwal et al. 1987), political parties (Kato 1998; Schlesinger 1975), globalization (Schoppa 2006), labor organization (Freeman and Medoff 1984) and education (Chubb and Moe 1988; Witte, 2001).[1]

Despite this wide application of the exit/voice dichotomy, and notwithstanding many important contributions to the theory of exit and voice in these works and others, there has arguably been no *general* reconceptualization of Hirschman's argument since his seminal work. In particular, while not limited in its scope to political behavior, Hirschman's framework is probably unique among major contributions by neoclassical economists to modern political theory – besides Hirschman (1970), a short list would include Downs (1957) and Olson (1965) – in not having been subsequently expressed more precisely in game-theoretic terms.[2] The failure to formally develop the microfoundations of the relationship between exit and voice has led to confusion on such basic questions as when exit and voice function as substitutes, and when as complements (Hirschman, 1993). Reviewing three decades of literature based on Hirschman's work, Dowding et al. (2000: 491) express disappointment in the empirical support for Hirschman's arguments, and argue that 'a more rigorous methodology is required to test the precise relationships between exit and voice'.

This article presents a simple game-theoretic model to elucidate the relationship between exit and voice, and thus to facilitate further empirical examination of that relationship. The model is incomplete, in that it abstracts from many important arguments made by Hirschman and others. It is, nonetheless, to my knowledge the first general formalization of Hirschman's argument since *Exit, Voice, and Loyalty*, in which Hirschman offered a largely graphical model expressed in terms of the consumer-demand theory then hegemonic within economics (Hirschman 1970: Appendixes A–D). The widespread adoption of game theory as a modeling tool since that time allows a reformulation of Hirschman's ideas in a form that should be more familiar and useful to many social scientists.

In particular, the model below assumes a conflict of interest between the leadership of an organization and its members. As in Hirschman's formulation, members may express their discontent either through exit from the organization or through voice. Exercise of the exit option is assumed to be costly, in that the joint payoff to members and their leadership is greater when exit is avoided. Thus, there is a surplus to be divided between the organization's leadership and its members. The incentive for members to develop their voice, which I interpret primarily as organizing to bargain with the leadership, is to gain a share of this surplus.

A first key contribution of the model is to differentiate between static and dynamic effects of exit. Voice having been established, exit can increase the *effectiveness* of voice by increasing individuals' bargaining power. But viewed from the perspective of the decision to establish voice to begin with, exit can reduce voice by increasing the relative attractiveness of silence.

Beyond illuminating this distinction, the model suggests a relationship between exit and voice not emphasized in Hirschman's work. When the exit of individuals is more costly to the *leadership*, voice may increase, as individuals understand that their exit option has increased their potential bargaining power vis-à-vis the leadership.

In addition, the model addresses a long-running debate over Hirschman's treatment of the concept of 'loyalty'. As in Hirschman's original account, loyalty to an organization may be sufficient to encourage voice. However, whether loyalty results in greater welfare for an organization's members depends on its nature. When, as Hirschman argued, loyalty is reflected in a greater cost of exit, then increased loyalty implies reduced welfare, as the leadership will be forced to concede less. In contrast, when loyalty is associated with less costly exercise of voice, then an organization's members may be better off if they are more loyal.

Finally, the model provides a framework for thinking about the decision of organizational leaders to suppress voice or exit. Leaders typically have an incentive to suppress voice, I argue, as by doing so they can reduce the probability that they have to bargain with individuals over policy. However, they may or may not want to suppress exit: doing so reduces what must be surrendered to individuals within the organization, but increases the probability that individuals find their common voice.

In developing this framework, I have abstracted from much of what we already know about exit on the one hand, and voice on the other, in order to provide insight into the *relationship* between the two. For example, those scholars familiar with work inspired by Tiebout (1956) (e.g. Brennan and Buchanan 1980; Rubinfeld 1987; Hoyt 1990; Montinola et al. 1995) may find the characterization of exit in this model too sparse. Further, readers knowledgeable of the literature on organizational cascades (e.g. Kuran 1991; Lohmann 1993) may be uncomfortable with the implications for voice of the assumptions of preference homogeneity and complete information.

I agree with these criticisms, and would add others. However, to start with the most general model runs the risk of obscuring what is new. For example, one could easily draw on the cascade literature to develop a microfoundation for the assumption (below, in the discussion of the manipulation of exit and voice) that the leader is uncertain if citizens will organize, but that the probability of organization is determined by factors within the leader's control. It was my judgment that doing so here would distract from the main point of that discussion: that leaders always have an incentive to suppress voice, but may or may not want to suppress exit. I have thus chosen to simplify in ways that I felt would highlight the basic relationship between exit and voice, while maintaining flexibility for future work to incorporate earlier insights. My belief is that something has been learned from the exercise, and my hope is that readers will not assume that this short article represents the last word on the topic.

I illustrate the model by revisiting Hirschman's (1993) analysis of the collapse of communism in the German Democratic Republic (GDR). This exercise highlights the additional insights gained from formalization, but also underscores the important features of political reality absent from the model. The article concludes by suggesting ways in which the model might be generalized to incorporate those features.

2. Model

Consider a population of identical individuals who belong to some organization.[3] For concreteness, I refer to the organization to which individuals belong as the 'state', and to individuals as 'citizens'. However, the model is meant to apply to any organization whose members have an exit option. I denote any generic citizen as C, and the leadership of the state as L.

At issue is some policy over which the state leadership has control, and over which there is a conflict of interest between leadership and citizens. I model this conflict in a reduced-form way, assuming that policy can take any value x between 0 and 1, where citizens receive payoff x and the leadership payoff $(1 - x)$ from the policy. Application of the model to specific policy contexts might involve a different policy space and utility functions.

The freedom of the leadership to set policy is limited by citizens' ability to exit: whatever policy x has been proposed by the leadership can be implemented only if citizens remain in the state. In the event that they exit, the leadership receives payoff q_L and citizens q_C, where $(q_L + q_C) < 1$.[4] Thus, there are gains from trade: there is always some policy x such that citizens and the leadership are both better off when citizens remain than when they exit the state.[5] In the absence of this assumption, voice would make little sense, as the welfare of both citizens and their leadership could be improved through exit.

Figure 1 illustrates the timing of events. At the beginning of the game, citizens may choose to bear some cost w of organizing collectively. I abstract from the process by which this occurs, simply assuming that individuals manage to coordinate their actions if they would be better off organized than not. (This is the key analytical assumption of this – and one may argue, Hirschman's – model. In the conclusion I discuss how the model might be generalized to better incorporate collective-action problems.) The model thus follows Hardin (1982: 73) in assuming that '[i]n collective action,

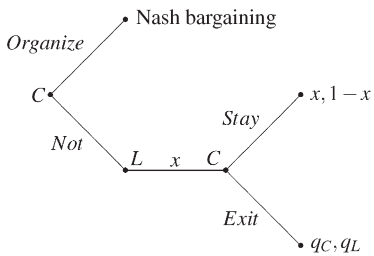

Figure 1. Sequence of play

whether an acceptable substitute is available will be important in determining whether intense demanders organize a collective effort or opt for a private solution of their problem'.[6]

Should citizens organize, then they and the state leadership bargain over x, where citizens retain the ability to exit if negotiations break down.[7] For simplicity, I assume that the outcome of this bargaining process is the Nash bargaining solution, which implies that gains from trade are split 50–50 between the two parties. However, *any* division of bargaining power that guarantees citizens some positive fraction of the surplus will produce the same qualitative results. In contrast, if citizens do not organize, then the leadership makes a take-it-or-leave-it offer of x, in response to which citizens decide whether to remain in the state or exit.

My solution concept is subgame-perfect Nash equilibrium. The following two subsections walk through the backward induction by which I find the equilibrium.

2.1. Exit (and Policy Choice)

If citizens have organized, then they and the leadership bargain over the surplus, which is $1 - (q_L + q_C)$. Given the assumption that the Nash bargaining solution is agreed to, this implies policy $x_N \equiv (1 + q_C - q_L)/2$. (To see this, note that the surplus received by the leadership $(1 - (1 + q_C - q_L)/2 - q_L)$ equals that received by the citizens $((1 + q_C - q_L)/2 - q_C)$.) Thus, 'the *effectiveness* of the voice mechanism is strengthened by the possibility of exit' (Hirschman 1970: 83; emphasis in original). The possibility of exit (more precisely, the payoff q_C from exit) increases the power of citizens once they are at the bargaining table, since the leadership must leave them with more to keep them from exiting. Conditional on citizens' having already organized, voice and exit are complements.

However, exit can bring policy more in line with citizens' preferences even when they are not organized. When citizens have not overcome their collective-action problems, then the leadership makes the take-it-or-leave-it offer which leaves citizens with exactly their utility from exiting, i.e. $x_T \equiv q_C$. Here, as when citizens are organized, an increase in the value of exit forces the leadership to be more accommodating.

Comparing the outcome of the policy-making process when citizens are organized and when they are not, we see:

1. $x_N > x_T$. Citizens receive more when they are organized than when they are disorganized, as they are able to demand a share of the surplus.
2. Citizens benefit more from a marginal increase in their exit payoff q_C in the take-it-or-leave-it environment than in the bargaining environment. Intuitively, citizens capture the full value of an increase in q_C when they are disorganized, as in that case the leadership leaves them with exactly what they would receive by exiting. In contrast, when citizens bargain with the leadership, then any increase in the value of citizens' exit option is partially offset by the fact that the surplus – now smaller – must be divided with the leadership. With less to divide, citizens are unable to take full advantage of the increase in q_C. As we will see, this has implications for the relationship between q_C and the decision to organize or not.
3. Exit never takes place in equilibrium. Rather, regardless of whether citizens are organized or not, the leadership always provides what is necessary to avoid exit. 'Silence' – often regarded as the missing element of Hirschman's equation – thus emerges endogenously in this model. While this theoretical result hinges critically on the assumptions that players have complete information about each other's preferences (so that policy choice is efficient) and that there is no heterogeneity among individuals (otherwise the leadership might choose to let some citizens go), it does illustrate that the threat of exit need not be exercised to be important. Indeed, simply looking at the incidence of exit and voice tells us little about their interaction. Ultimately, it is the outcome – not just whether exit or voice have taken place, but the policy that has been chosen by the leadership – that is important.

2.2. Voice

Anticipating policy choice under these two scenarios, citizens choose to organize if their payoff from the collective bargaining process x_N, less their cost of organizing w, is greater than their payoff from the leadership's take-it-or-leave-it offer x_T, i.e.

$$\frac{1 + (q_C - q_L)}{2} - w > q_C, \tag{1}$$

or

$$w < \frac{1 - (q_C + q_L)}{2}. \tag{2}$$

This condition can be interpreted as follows: Most trivially, organization takes place when collective-action problems are easy to overcome (w is low). More interesting, and consistent with Hirschman's original argument, exit reduces voice in the sense that citizens are less likely to organize when their exit option q_C is large. To see why this is the case, recall that the marginal benefit to citizens from an increase in q_C is greater when they are disorganized than when they are organized (point 2 above). Thus, an increase in the value of citizens' exit option makes voice relatively less attractive, even though it increases the effectiveness of voice, conditional on citizens' having organized. Voice and exit are complements once voice has been established, but are substitutes when seen from the perspective of the decision to exercise voice to begin with.

The model thus helps to resolve conflict between those like Hirschman who fear that mobility may result in less representation, and those who note that increased representation has often been afforded to those who are most mobile. In a statement representative of the latter tradition, Milner and Keohane (1996: 19) argue that if 'capital is less costly to move from country to country, then those owners of capital who can "exit" can use the threat of exit to magnify their political influence, or "voice"'.[8] As the model demonstrates, it is not voice per se but influence (i.e. favorable policy treatment) that may benefit from the availability of exit. At best, the impact of exit on voice is neutral. Nonetheless, the possibility of exit may result in more favorable policy treatment, *conditional* on the presence or absence of collective organization.

In addition, we see a relationship not directly implied by the basic exit/voice distinction: an increase in the value of exit to the leadership makes voice less likely. When citizens are organized, an increase in q_L increases the leadership's bargaining power in negotiations, as when q_L is high the leadership may walk away from the bargaining table at little cost. In contrast, when citizens are disorganized, an increase in q_L has no impact on the outcome: the leadership has all the bargaining power in any event, so citizens only receive their value from exit (q_C). Consequently, when exit does little to hurt the leadership (q_L is high), collective action is relatively less attractive to individuals, reducing the incentive for them to organize.[9]

2.3. Loyalty

In one of the more controversial chapters of *Exit, Voice, and Loyalty*, Hirschman (1970) suggested that 'loyalty' to an organization could keep individuals from exiting an organization, and thus increase their incentive to voice their discontent and bring about change from within. The model here shows in a transparent way why this might be the case, but also demonstrates that loyalty among an organization's members does not necessarily improve their welfare. In particular, whether loyalty increases or decreases members' welfare depends on its nature: an increase in loyalty leaves members unambiguously worse off when defined as an *exit tax*, while members may benefit from greater loyalty if it instead takes the form of a *voice subsidy*.

Consider first Hirschman's original formulation, where there is a 'cost of disloyalty' (Hirschman 1970: 136) that reduces the payoff to exit. In terms of the model, loyalty of this sort – an 'exit tax' – reduces q_C, which as shown above has the effect of increasing the incentive to express discontent through voice. When the reduction in q_C is sufficiently great, policy shifts from $x_T \equiv q_C$ to $x_N \equiv (1 + q_C - q_L)/2$, thus redistributing surplus from the leadership to citizens. But this shift does not leave citizens any better off, since they must bear the cost of organizing w, which is exactly equal to $(x_N - x_T)$ when citizens overcome their collective-action problems. At the same time, an increase in loyalty – a decrease in q_C – allows the leadership to take advantage of citizens' reticence to exit by offering a less favorable policy, whether they have organized or not. Figure 2 illustrates the overall impact; the kink in the graph occurs when loyalty pushes citizens into incurring the cost w of exercising voice.

Alternatively, one may observe that 'loyalty does not normally mean a mere reluctance to leave a collectivity but rather a positive commitment to further its welfare by . . . seeking to change it' (Barry 1974: 98). In this sense, loyalty is a 'voice subsidy' that reduces the cost of organization w. In contrast to the exit-tax formulation, loyalty now has the effect of increasing welfare, but only when w is sufficiently low that citizens bear the cost of collective action. In contrast, a small change in w when citizens would not otherwise organize has no effect, as the cost is not borne in any event. Figure 3 summarizes the effect.

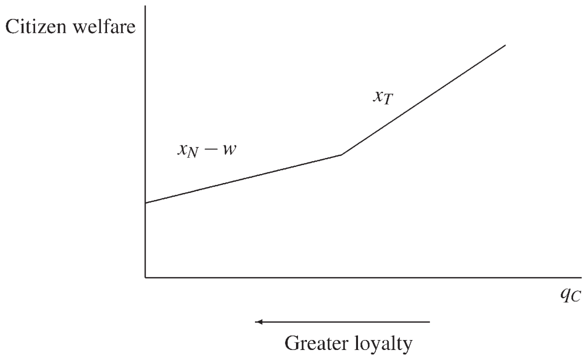

Figure 2. Impact of loyalty on citizen welfare – loyalty as exit tax

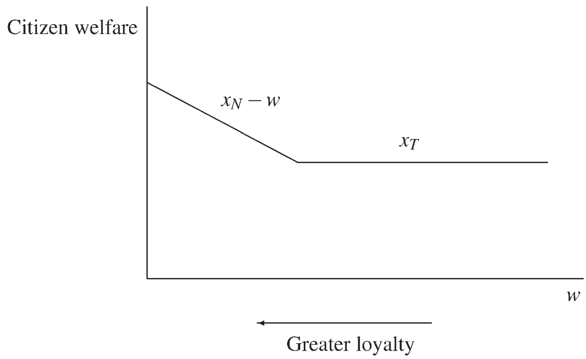

Figure 3. Impact of loyalty on citizen welfare – loyalty as voice subsidy

The model thus helps to reconcile Hirschman's account with the arguments of scholars who have criticized his use of the concept of loyalty (see, e.g. Barry 1974; Birch 1975; Boroff and Lewin 1997): loyalty may impel an organization's members to agitate on behalf of change, but it can also simply increase their capacity to 'suffer in silence' (Barry 1974: 97).[10] Whether the impact on members' welfare is positive or negative thus depends on the nature of loyalty. Loyalty expressed as 'my country right or wrong' typically leaves citizens at the mercy of their leaders, and even when it does prod citizens into organizing on behalf of their interests, they must suffer the unpleasant cost of overcoming their collective-action problems. In contrast, loyalty experienced as a responsibility to fight for one's rights may not only encourage citizens to organize when they otherwise would not, but may make the cost of organization more bearable. Empirically, it seems possible in principle to distinguish between these conceptions of loyalty by observing what members of an organization get from their leaders: feelings of loyalty associated with poor treatment imply an 'exit tax', while those associated only with the incidence of voice suggest a 'voice subsidy'.[11]

2.4. Manipulation of Exit and Voice

In the discussion so far I have treated the cost of organizing and the value of exit as exogenous. However, many organizations have some control over these variables. Hirschman (1986: 79), for example, suggests that as 'two basic, complementary ingredients of democratic freedom, the right to exit and the right to voice have on the whole been enlarged or restricted jointly'. However, reflection suggests that there are times when exit and voice move in opposite directions. Dictators often open up the 'safety valve', allowing emigration abroad, at the same time as they crack down on dissent at home. Huntington, for example, notes that for revolutionary leaders, the 'goal of the revolution is a new homogeneous community, and forcing dissident or unassimilable elements into exile is one means of producing that community' (Huntington 1968: 310).

To explore the incentives of leaders to discourage voice and exit, I modify the model above so that, prior to citizens' decision to organize or not, the leadership may (at some cost $g(w, q_C)$) increase w and decrease q_C from their starting values.'[12] (For simplicity, I assume that q_L is fixed.) Further, I assume that the cost of organization has a random component δ, realized after the leadership has chosen w and q_C, but before citizens choose whether or not to organize.[13] (This technical assumption assures continuity of the leadership's objective function.) Thus, citizens choose to organize if

$$w + \delta < \frac{1 - (q_C + q_L)}{2}. \tag{3}$$

From the perspective of the leadership choosing w and qc, the probability that citizens choose to organize in defense of their interests is then $\Pr(\delta < (1 - (q_C + q_L))/2 - w)$. The leadership therefore chooses w and q_C to solve

$$\max_{w,q_C} \Pr\left(\delta < \frac{1-(q_C+q_L)}{2} - w\right)\left(\frac{1+(q_L-q_C)}{2}\right)+$$

$$\Pr\left(\delta \geq \frac{1-(q_C+q_L)}{2} - w\right)(1-q_C) - g(w, q_C). \tag{4}$$

where the first term is the leadership's payoff from the Nash bargaining solution, weighted by the probability that citizens organize, and the second term is the leadership's payoff from a take-it-or-leave-it offer, weighted by the probability that citizens do not organize.

Examining this expression, we observe that:

1. A change in w affects only the probability that citizens organize. As the leadership is better off when citizens do not organize, it always prefers to increase w.
2. A decrease in q_C (an increase in citizens' cost of exit) increases the leadership's policy payoff conditional on whether citizens are organized or not, but simultaneously increases the probability that citizens organize, thus making the leadership's less-preferred outcome more likely.

The model thus suggests that leaders – at least those leaders whose preferences are not aligned with those of their citizens, as here – will always have an incentive to crack down on voice, but may or may not want to restrict exit. In contrast to voice, exit plays both a positive and negative role for the leadership: it makes voice less likely, but requires that the leadership provide more to citizens, whether they have voice or not.

3. Exit and Voice in the German Democratic Republic

Voice and exit played a spectacular role in the collapse of communism in Eastern Europe and the former Soviet Union. The role of the latter was especially prominent in the GDR, where exit – for decades more possible than in other countries of the Soviet bloc due to the proximity of West Germany (the Federal Republic of Germany [FRG]) – accelerated dramatically in the regime's last days, culminating in the fall of the Berlin Wall and the free movement of individuals from East to West. Writing in the immediate aftermath of these events, and noting the strong complementary role played by exit and voice in their unfolding, Hirschman (1993: 202) wondered how it could be that 'exit and voice now worked hand in glove after having undermined each other for four decades'. In this section, I briefly revisit the development of exit and voice in the period between the founding and collapse of communist rule in the GDR, using the model above to organize discussion. In doing so I do not aim for a full retelling of the story of the collapse of East German communism, a task that has been admirably accomplished by other scholars.[14] Rather, my intention is to show how the model maps onto a case of interest to Hirschman and others, and thus to demonstrate both the contributions and limits of this initial formalization of the exit/voice framework.

In making the case for exit as a substitute for voice, Hirschman suggests (Hirschman 1993: 179–80; see also Mueller 1999) that exit was relatively more attractive for East Germans than it was for other citizens of the Soviet bloc. Indeed, even after the Berlin Wall was erected emigration to the FRG never dropped below 10,000 per year, and of these a substantial number were always unauthorized migrants (Hirschman 1993: Table 1). On the other side of the Wall was another German state, where East Germans automatically became West German citizens, and where (unlike most immigrants) they were able to retain their language and culture. In terms of the model above, q_C may therefore have been comparatively large relative to that elsewhere in Eastern Europe. Examination of Condition 2, the condition for citizens to want to organize collectively, shows that to the extent this was the case the likelihood of vocal discontent would have been diminished.

That said, there were substantial risks in emigrating to the West, as testified by the significant number of individuals who died trying. In this context, it is important that the costliness of voice (w in the model) was also comparatively high for East German citizens. The presence of the GDR on the front line of the Cold War meant that the GDR's Soviet overseers were less inclined to tolerate dissent, a fact that was driven home during the violent suppression of the 1953 uprising. Further, the absence of supportive institutions like the Catholic Church in Poland meant that potential dissidents had greater obstacles to surmount in organizing action against the regime (Hirschman 1993: 182–3). Together with any relative attractiveness of exit, this implied that after 1953 opposition would remain dormant in the GDR, even as discontent periodically exploded in neighboring communist states.

This tendency was reinforced by the policy of the regime to encourage some of its most vociferous opponents to emigrate to the West. The practice of 'forced exit to reduce voice' (Hirschman 1993: 184) essentially raised the payoff from exit (q_C) for a segment of the population, even as the cost of voice was maintained at a high level (Thompson 1996). Consistent with the model above, exit was thus encouraged even as voice was discouraged. However, in contrast to what is suggested by the model, some of those encouraged to leave actually did so, as the regime took advantage of heterogeneity in individuals' willingness to organize to rid itself of unwelcome citizens even while avoiding mass emigration. Below, I discuss generalization of the model to account for such heterogeneity.

The quiescence of East German discontent ended abruptly in 1989. Spurred by an opening of Hungary's borders with the West, tens of thousands of East Germans responded to the increased possibility of exit by leaving the country through the back door. However, many stayed behind and took to the streets to demand political change, and 'it was they, not the ones who left, who toppled the Berlin Wall' (Stokes 1993: 138). Contemporaneous with these public demonstrations, a nascent and fragmented opposition formed to negotiate with the government. On December 7 the government and opposition sat down to 'Central Round Table' discussions. With the Wall gone the bargaining power of the communist leadership was greatly diminished, and free elections were negotiated in short order. Over time, however, the effectiveness of the Round Table as a negotiating mechanism was weakened by the fact that the preferences of opposition members often diverged from those of the mass of the East German public: many of those in the former group were dissidents who still hoped for a 'Third Way' between communism and capitalism, whereas those in the latter yearned for the material success of the West (see, e.g. Jarausch 1994: 92–3). As I discuss below, accounting for such agency problems is an essential part of extending the model to incorporate heterogeneity among members of an organization.

What accounted for the sudden reversal of four decades of acquiescence to the regime and its policies? The most obvious explanation is that the cost of voice was suddenly perceived to be lower than it was before: as shown in Condition 2, a drop in w sufficiently large will trigger collective action. The failure of the Soviet Union to intervene in Poland and Hungary earlier in the year, coupled with Soviet leader Mikhail Gorbachev's public support for reform of communist regimes in Eastern Europe (most notably during celebrations of the 40th anniversary of the GDR; see Pfaff and Yang [2001]), may have been sufficient to convince the East German public that collective action now carried fewer risks.

The dilemma posed by Hirschman, which is reinforced by Condition 2, is that the cost of exit for East German citizens was declining (q_C was increasing) together with the cost of voice. Thus, the overall effect of changes in the political environment on the likelihood of voice is ambiguous. One response is simply to conclude that the drop in the cost of voice outweighed that of the cost of exit: in the model, that would be enough to trigger collective action. Another possibility suggested by Condition 2 is that the value of exit to the East German leadership (q_L) fell as 1989 wore on and the hard-line Honecker regime was replaced with individuals concerned about the 'tormenting' (*quälend*) exodus of East German citizens to the West.[15] Understanding that their potential bargaining position vis-à-vis the communist leadership had improved, individuals would have had more incentive to organize.

A more subtle argument is that the 'toughness' of the regime – its willingness to accept emigration and its tolerance of dissent – was not known with certainty to the general public (Tietzel and Weber 1994). Thus

> [t]he inability of the GDR, starting in the spring 1989, to prevent a large-scale flight of its citizens to West Germany, via Hungary, Poland, or Czechoslovakia, signaled a novel, serious, and *general* decline in state authority. (Hirschman 1993: 187; emphasis in original)

Alternatively, there may have been asymmetric information among the East German public. 'Horizontal voice' (O'Donnell 1986) was discouraged under communism, so that the level of discontent with the regime was not common knowledge (Kuran 1991; Lohmann 1994; Pfaff and Kim 2003; Völker and Flap 2001).[16] In either case exit may have been interpreted as a signal of the attractiveness of voice, either because individuals were subsequently less convinced of the willingness of the regime to crack down, or because they became more convinced of the dissatisfaction of their neighbors and hence of the likelihood that they would not be protesting alone. The consequence is that exit and voice could develop simultaneously, at least until exit became so overwhelming that the capacity for voice disappeared (Pfaff and Kim 2003).[17] In the model in this article there is, of course, no private information. In the conclusion I discuss the possibility of extending the model to incorporate information asymmetry.

This concurrence of voice and exit was encouraged by the division of the population into two groups, those with more and less loyalty towards eastern Germany, if not the GDR per se. The less loyal were inclined to exit, and as the exodus gained pace, those with greater sentiments of loyalty felt increasingly compelled to exercise voice. While the division of the population into groups with starkly different feelings of loyalty is beyond the scope of my model and Hirschman's original formulation (Hirschman 1993: 197–8), the discussion in the previous section does help us to interpret the flow of events. The very fact that those who did finally speak out initially chose inert silence when their compatriots were fleeing the country suggests that loyalty acted as an exit tax rather than voice subsidy. That some of these same individuals could have left – indeed, were encouraged to leave – during the communist era but instead chose to stay behind underscores the point. At the same time, some of those who refused to leave in 1989 and desired change did join the vocal opposition. Those who did so may have felt a greater obligation to organize collectively, i.e. may have been more loyal in the sense of a voice subsidy.

Perhaps the best way of assessing the balance of these two forces is to engage in the following thought exercise: what would have happened if the communist leadership had been able to 'price discriminate' among those more and less loyal to eastern Germany? Would they have taken advantage of those with greater feelings of attachment to the peoples and lands of the GDR? If so, then loyalty acted primarily as an exit tax rather than a voice subsidy. However, in 1989 the leadership had no such flexibility, and entered into negotiations over the fundamental shape of the political system with individuals representing at least the more loyal segment of the general population. The fact that others, less loyal, retained their exit option may have made the negotiating position of civic representatives more credible. The result was an extraordinary shift in policy away from the leadership's preferences, facilitated both by the exercise of voice and its complement (voice having been established), exit.

4. Conclusion

In *Development, Geography, and Economic Theory*, Paul Krugman (1995) discusses the history of economic theory by appealing to the formalization of another of Albert Hirschman's concerns: the idea that the government might, through a 'big push' in investment, overcome the coordination problem that keeps economies in a permanent state of underdevelopment.[18] Formalization, writes Krugman, promises various benefits, not least of which is the additional insight gained by making explicit the link between assumption and claim. However, in the short run the modeling enterprise carries the risk that scholars will forget what was known before, much as the Western world 'forgot' what was in the interior of Africa once maps of the continent were subjected to the rigor of modern cartography.

Such is the case with the model in this article. While the formalization presented above of the relationship between exit and voice may provide additional insights – the distinction between static and dynamic effects of exit; the relationship between the policy outcome and the decision to organize on the one hand, and the value of exit to leadership and citizens on the other; the ambiguous impact of loyalty; and the conclusion that the leadership will typically want to suppress voice, but may or may not want to suppress exit – much would be lost if the formalization were to stop here. As illustrated by the discussion of the collapse of communism in East Germany, certain key features of the interplay between exit and voice stressed by Hirschman and many others are absent from this model. These include:

- Heterogeneity among members of an organization: Individuals differ both in the value they attach to exit (including, perhaps, in their loyalty to the organization) and in the share of the cost of collective action (net of any private benefits from such action, including those that arise from loyalty) that they bear in the development of voice. Accounting for such heterogeneity is key to reconciling this model with the logic of collective action. Further, when the leadership of an organization cannot set policy separately for each type of member, heterogeneity may lead to a decision to allow some members to exit – perhaps those who would otherwise be most likely to voice their discontent. Formalization of this idea must address at least five issues, none of which are trivial and all of which are beyond the scope of this article: the distribution of types within the organization, the dependence of the benefits of membership on the number of those who remain with the organization (as when mass emigration from East Germany threatened the provision of public goods for those who remained; see, e.g. Goldstone [1994]), the dependence of the cost of organizing on the number of individuals who do organize, the nature of collective representation once diverse members have found their voice (a situation with its own internal exit/voice dynamics; see Bourdieu [1986]), and the ability of an organization's leadership to 'price discriminate' by offering different policies to different members (or groups of members).

- Private information held by the leadership: Members of an organization may not know with certainty the preferences of their leadership. As discussed in the context of the East German case, this may result in the unexpected phenomenon of the simultaneous development of exit and voice, as the leadership's response to exit may provide information about its willingness to crack down on voice.
- Private information held by the membership: Exit and voice may convey information about the state of an organization which, if acted upon by the leadership, is beneficial to the organization's members. Formalization of this idea would move the model beyond the simple conflict of interest represented here, though it seems some conflict must remain – else, as Ed Koch was wont to do, the leadership could simply ask the membership to tell it (in cheap-talk fashion) how it is doing. Alternatively, as discussed above, members may be uncertain as to the level of dissatisfaction among other members of the organization, a reality that can also lead (within limits) to a positive relationship between exit and voice.
- Organizational design: Some organizations, such as firms, are better equipped to respond to exit. Others, such as democratic states, more effectively respond to voice. Such considerations might be captured in the costs imposed on the leadership from exit and the share of the surplus received by the leadership in negotiations.

Future work should address these and other omissions. The result, one hopes, will be a deeper understanding of the relationship between exit and voice, and a richer set of hypotheses for empirical exploration.

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NOTES

1. This list of applications is clearly incomplete. For a more complete review, see Hirschman (1986) and Dowding et al. (2000).
2. One partial exception is the literature on cooperation in repeated games with an exit option; see, e.g., Orbell et al. (1984), Schuessler (1989) and Vanberg and Congleton (1992). While important work, the focus in that literature on the incentives for cooperation among members of an organization ignores the interaction between those members and the organization's leadership that is my concern. Further, Laver (1976) formalizes the exit/voice decision, but does so in decision-theoretic terms that similarly abstract from the strategic considerations central to this article.
3. Formally, I assume a continuum of individuals of mass one, which together with the assumption of homogeneity implies that the payoff to any individual equals the total payoff for the population.
4. More precisely, the payoff to the leadership is $\alpha(1-x)+(1-\alpha)q_L$, with α the proportion of citizens who have remained in the state. Given the homogeneity of the population, however, all citizens either exit or stay.
5. Put differently, despite the conflict of interest over policy the game is not zero-sum, as citizens and the leadership have a common interest in avoiding exit.
6. In focusing on collective action, I neglect the possibility that members of an organization may also act through 'individual voice' (Dowding et al. 2000), such as complaining to a store manager about the quality of a product. Hirschman's own formalization (Hirschman 1970: Appendixes A–D) seems to correspond more to this alternative case, constrained as it was by its reliance on the tools of consumer-demand theory.

7. Note that the model can alternatively be viewed as involving a group of individuals who have already overcome their collective-action problems, but who must bear some cost to initiate negotiations with the leadership.
8. Bates and Lien (1985) provide a formalization of this argument, focusing on the widely noted relationship between representation and taxation in the development of European states. They too equate voice with influence, and suggest a 'divergence between Hirschman's conclusions and [their] own' (1985: 61).
9. The following example may be instructive: In Russia in the 1990s, workers often quietly accepted long delays in wage payments, rather than organizing to strike or otherwise pressure employers to clear wage arrears. This failure of voice seems to be related in part to the fact that wage arrears were concentrated among Russian employers with dominant positions on the local labor market who had little to fear from the exit of workers from the firm (Earle and Sabirianova 2002; Guriev and Friebel forthcoming). Anticipating this, workers would have expected to receive little in collective bargaining with employers, thus reducing the incentive to organize.
10. In many contexts the absence of organized voice will not be associated with literal silence, but rather with vocal expressions of allegiance to the organization; see Havel (1992 [1978]) and Kuran (1997).
11. The particular form that loyalty takes may depend on the nature of the organization, and hence on individuals' *attitudes* (Ajzen and Fishbein 1980; Ajzen 1988) toward behavioral identification with it. See, e.g. Finkel and Opp (1991) and Blank (2003) for studies of party identification and national identity, respectively, using this framework.
12. More precisely, assume that $w = \bar{w} + y$ and $q_C = \bar{q}_C - z$, where $\bar{w}$ and $\bar{q}_C$ are exogenous. Then we may define the analogous cost function $h(y, z)$, where $h(. , .)$ is convex in y and z and satisfies standard boundary conditions.
13. I assume that δ is distributed on some interval of the real number line according to a continuous and increasing distribution function, with a mean and variance such that corner solutions may be ruled out.
14. See, e.g. Darnton (1991), Keithly (1992), Naimark (1992), Philipsen (1992), Garton Ash (1993), Jarausch (1994), Joppke (1995), Opp et al. (1995), Maier (1997) and Grix (2000).
15. Hirschman (1993: 196). The East German leader expressing this sentiment is Politburo member Günter Schabowski.
16. On the importance of common knowledge in collective action, see, e.g. Chwe (1999).
17. Pfaff and Kim (2003) provide empirical evidence that such an inverted U-curve characterizes the relationship between exit and voice in East Germany: at the county or municipal level, voice (protest) and exit (migration) are positively correlated for low levels of exit, and negatively correlated for high levels. In contrast, Schoppa (2006) argues in the context of Japanese policy change that the probability of reform (not voice) follows a (non-inverted) U-curve relationship, as organizations respond to pressure only when exit is small (so that voice is large) or exit is large (though voice is small). As with the discussion of voice above, these conflicting accounts can be partially reconciled by noting the nonequivalence of voice and influence.
18. The idea originates with Rosenstein-Rodan (1943). The formalization of which Krugman writes is by Murphy et al. (1989). Hirschman (1958) argued in particu-

lar that coordinated investment could concentrate on a few key sectors, and so need not entail a ‘big push’ across all of industry.

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