The Effects of Interfirm Mobility and Individual versus Group Decision Making on Managerial Time Horizons

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We conducted an experimental simulation to examine the impact of interfirm mobility and individual versus group decision making on managerial time horizons. Subjects played the role of firm members in a market consisting of several firms between which there existed the possibility of mobility. Within each firm, over several rounds of play, subjects decided how much to withdraw from a limited fund. Funds not withdrawn received a positive expected return. We manipulated two variables: the rate of interfirm mobility and whether firm decision makers consisted of groups of five or of individual decision makers. Both factors significantly influenced withdrawals. High interfirm mobility led to high rates of withdrawal. In addition, individual decision makers withdrew more money than groups.

In recent years intertemporal choice—decisions involving consequences that extend over time—has joined decision making under uncertainty as an important topic of research. Empirical studies have measured individuals' rates of time discounting in a variety of settings such as consumer purchases, occupational choice, health-related decisions, and stylized choices presented in surveys and experiments. One of the most important applications of the work on time preference is to managerial decision making. When managers decide what projects to invest in, or how much to spend on R&D or training employees, their decisions implicitly reflect trade-offs between costs and benefits occurring at different points in time. The weight that a manager gives to costs and benefits that
are remote in time is commonly referred to as the manager's "time horizon."

The problem of managerial time horizons is especially important to U.S. researchers because the time horizons of American managers are widely believed to be short relative to their foreign competitors. This view is commonly expressed by media analysts, but is not exclusive to them. For example, Richard Darman, ex-President Bush's budget director, characterized the U.S. manager as having contracted the disease of "now-now-ism," with symptoms such as "collective short-sightedness," an "obsession with the here and now," and a "reluctance to adequately address the future" (New York Times, 7/21/89). Managers themselves, moreover, seem to share this perspective. In a 1990 survey of members of the Financial Executives Institute—an organization consisting of top U.S. financial executives—respondents ranked short-sighted investors and short-sighted corporate managers as the two most important factors responsible for domestic competitiveness problems (Jacobs, 1991). Short-time horizons are evident in low rates of capital investment and investment in R&D, lack of concern for customer loyalty or market share, reduced investments in human development, and a variety of other commonly observed firm-level behaviors. One recent study estimated that Japanese and European employers spend three to five times as much on job training as U.S. companies (Business Week, 1990).

Many explanations for the short-time horizons of American managers, some of which we review in the following section, have been proposed. In a recent paper (Mannix and Loewenstein, 1993), we examined the effect of one particular factor: high rates of interfirm mobility. Our main theoretical focus was on how interfirm mobility influences time horizons through its impact on group processes and group decisions. Since in most firms crucial decisions regarding investment, employment, production, and a variety of other issues are made at the group level (Goodman, 1986; Ancona, 1990; Walton & Hackman, 1986; Ancona, Friedman, & Kolb, 1991), any effect of mobility on group interactions is likely to influence managerial time horizons. At the same time, however, we acknowledged that mobility can also influence time horizons for reasons of individual-level objective expected utility maximization.

In an earlier paper, we conducted an experimental simulation in which subjects acted as stakeholders in firms between which there existed the possibility of mobility. Within each firm, members decided how much of a limited resource to withdraw over several rounds of play. As in a social dilemma situation, if the resource was withdrawn from the firm quickly, the resource pool was depleted and the opportunity to receive added investment income was forfeited; however, individual firm members risked losing their claim on firm resources that were not withdrawn early
if they were transferred out of the firm. We found that higher rates of
mobility led to shorter time horizons, but that time horizons were in-
creased when people had prior knowledge of their own mobility.

Although we speculated about the mediating effect of group processes
on both of these relationships, we were unable to examine their effect
explicitly since the experiment did not include a comparison condition in
which group interactions were precluded, i.e., in which subjects made
decisions as individuals. The study we report here addresses this limita-
tion by comparing the effect of different rates of interfirm mobility on the
behavior of group and individual decision makers. Our main questions are
first, whether there is a main effect of group versus individual decision
making on time horizons. That is, do individuals or groups placed in a
similar situation tend to have similar time horizons? Second, we test for
an interaction effect between individual versus group decision making and
the rate of mobility; does a change in mobility have a greater impact on
time horizons when either individuals or groups are responsible for deci-
dion making? A third and subsidiary goal is to test for a main effect of
mobility on time horizons, thus replicating one of the main results from
our early study. After a brief review of the academic literature on man-
gerial time horizons, we discuss in greater detail the potential impact of
interfirm mobility on intra- and intergroup processes.

Managerial Time Horizons

As noted earlier, diverse explanations for the problem of short execu-
tive time horizons have been proposed. Perhaps the most common of
these cites the high cost of capital in the United States (DeTertouzos, 1989).
A high cost of capital effectively forces managers, no matter how far-
sighted, to adopt a short-term perspective. While there is considerable
(though by no means unanimous) consensus that the U.S. cost of capital
is high relative to its most prominent competitors, there is much less
agreement on the cause of the problem or its importance as a cause of
short-time horizons.

According to Jacobs (1991), American companies avoid financing in-
vestment with debt, which is cheaper than equity, because they fear that
the commoditized American debt market will be unforgiving in the event
of transitory downturns. Stein (1988, 1989), on the other hand, views as
excessive the same levels of debt financing that Jacobs believes are in-
adequate. Stein argues that high levels of corporate debt incurred during
the takeovers of the 1980s require large immediate cash outlays that
detract from long-term investment. Thus, despite their disagreements, both
argue that the inflexibility of debt financing is responsible for shorter time
horizons. On the other hand, Shleifer and Vishny (1990) point to the
equity side of the market as the cause of the problem. They argue that the
focus of investors on short-term stock returns causes share prices to fluctuate with the short-term performance of companies, preventing managers from making investments with delayed payoffs.

Individual-level myopia is also sometimes blamed on business school training and specifically on capital budgeting techniques commonly taught in accounting classes. According to Myers (1984), these methods tend to undervalue intangible assets with long-term payoffs such as workers' skills and to overvalue direct monetary benefits. Executive reward systems that tie bonuses to year-to-year performance have also been linked to short managerial time horizons. According to Merchant (1989), most management incentive schemes base compensation in part on accounting measures that ignore such long-term factors as market share and employee morale and which, worse still, often reflect short-term, i.e., annual or even quarterly, results.

Finally, and most relevant to the present endeavor, the short-time horizons of managers has been attributed to high rates of mobility in the United States. Managerial mobility rates are higher in the United States than in most other countries and also high compared to historical levels (Harvard Business Review, 1988). Interfirm mobility can affect managerial time horizons for a variety of reasons, both economic and psychological. From an economic vantage point, it is rational for managers to shorten their time horizons as mobility rates increase. High levels of mobility uncouple managers' personal gains from the long-term performance of the company for which they are employed at a particular point in time. As the level of mobility increases, it becomes less likely that a manager will benefit from investments made in the firm. As Rumelt (1987) comments, "Given mobility, the manager must temper his view of how a project’s future influences his reputation or income with the possibility that he will no longer be in the organization." But mobility can also influence time horizons for psychological reasons, for example, through its influence on group cohesiveness and identification with the firm.

**Individual versus Group Decision Making**

It is well established that group decisions do not arise from a simple aggregation of individual preferences. Several early studies revealed a performance advantage of group versus individual decision making (cf. Stroop, 1932; Watson, 1928; Thorndike, 1938; Barnlund, 1959). However, other studies have found that groups are seldom able to outperform their most proficient members (Steiner, 1972) and are somewhat more subject to decision making biases than individuals (Bazerman, Giuliano, & Appelman, 1984; Argote, Seabright, & Dyer, 1986). As the research comparing individual and group decision makers has evolved, it has become apparent that there are important differences between individual and
group decision making, but the nature of these differences remains incompletely understood.

One body of work with particular relevance to the effect of interfirm mobility on individual versus group decision making is the research on social dilemmas (Hardin, 1968; Schelling, 1978; Dawes, 1988). Social dilemmas can be characterized as N-person prisoner's dilemmas in which each individual receives a higher payoff for a socially defecting choice than for a cooperative choice yet the group as a whole receives a higher payoff if all cooperate than if all defect. Typically, the social dilemma paradigm has been used to understand behavior in natural and environmental situations (e.g., Hardin, 1968). Increasingly, however, researchers are coming to see important applications of the dilemma structure to the behavior of individuals within firms (Mannix, 1991, 1993; Kramer, 1990). When individual and firm-level goals are not neatly aligned, firm members may choose actions that benefit themselves but harm the organization as a whole.

The element of time introduces an additional complexity. In "temporal traps," (Platt, 1973; Messick & McClelland, 1983) the negative consequences of defection are not only spread out over large number of people, but also delayed in time. If individuals or groups discount the future they will care even less about the negative consequences of their own noncooperative behavior. In organizations, shirking, padding expense accounts, and using company property for personal ends are just some examples. Shirking may improve an individual's immediate outcomes by making his or her workday easier, but if practiced by several firm members, the firm as a whole will suffer. This effect is cumulative. Over time, each individual in the firm will be subject to the long-term negative consequences of a poorly motivated workforce and may experience pay cuts or even layoffs because the firm itself has become less productive.

Social dilemmas exist not only within firms, but also between them. In an international context, for example, coordination of R&D and investment between firms in the same domestic market can lead to an increase in market share at the expense of foreign competitors. Taking domestic firms as the focal group, all can potentially benefit by cooperating, but any one firm would maximize its profit by free-riding off the efforts of other domestic firms. Reasoning of this kind, supported by government encouragement, has contributed to the recent emergence of industry-wide cooperative ventures in semiconductor and software technology. A similar phenomenon occurs in the marketing of new products, when advertising can attract new consumers rather than simply drawing consumers from one brand to another. The benefits of such advertising accrue, not only to the company doing the advertising, but also to its competitors. Companies might advertise less than they do if they realized all of the
benefits of doing so. As in a classic dilemma, each firm maximizes its own profit at a low level of advertising, but each firm would benefit if it and all other firms were to increase their advertising outlays.

In the current study, the existence of interfirm mobility produces an analogous between-firm social dilemma. With mobility rates greater than the average return on investment, profit maximization involves maximum withdrawals from the firm in every period. However, all firms would be better off if no firms withdrew their resources; everyone in the market would then benefit from the positive return on investment and firm members would not suffer losses by changing firms. In this type of situation, how will the time horizons of individual and group decision makers differ, and how will they respond to varying levels of mobility?

One answer to this question can be found in social psychological literature. One of the most prominent findings in small group research suggests that in many situations groups make more competitive decisions than individuals (Insko, Schopler, Hoyle, Dardis & Graetz, 1990; Insko et al., 1987). Many explanations for this effect have been offered. As the size of the group increases, feeling of responsibility for the competitive choice may decrease and may be further justified by the benefit a competitive stance may bring to the group. Groups can provide social support for self-serving competitive behavior which is not available to the individual decision maker (Insko & Schopler, 1987). In addition, interacting with other groups brings into play negative stereotypes and expectations, which may include the belief that the outgroup is likely to compete. It is well known that decision making entities, whether groups or individuals, tend to respond in kind to an actual or anticipated competitive stance on the part of other parties (Sherif, 1951; Brewer & Campbell, 1976). In a multifirm context with mobility between firms, competitive behavior between firms is likely to entail withdrawing resources from the firm to prevent nonmembers who move into the firm from benefiting. Thus, we might expect firms composed of group decision makers to have shorter time horizons, resulting in larger firm withdrawals, than firms consisting of individuals.

There is, however, a countering psychological factor that could induce group decision makers to behave more cooperatively than individual decision makers. In the real world, communication between firms is generally limited. This is due, in part, to competitive considerations such as a concern about sharing technology, revealing strategy, etc. and partly due to antitrust regulations which constrain the amount and nature of such interactions. Similarly, in the typical social dilemma (as in our experiment), players have no opportunity to communicate at the interfirm level, whether the firms consist of individual or of group decision makers. However, group firms are able to communicate at the intradecision maker
level. Such intradecision maker communication may focus the group inward, reinforcing a sense of group identity and producing behavior that will benefit the group in the long run. Cooperative behavior, in the form of lower withdrawals, accomplishes this end, although it may be at the expense of some individual group members who, given the potential for mobility, may be forced to leave the group (Messick & Brewer, 1983; Dawes, Van De Kragt, & Orbell, 1988).

Individual decision makers, on the other hand, are isolated and must make decisions to cooperate or compete without any type of verbal interaction. Such individually based firms are more likely to focus outward—heightening their awareness of the potential for competitive behavior from the other individuals in the market. Thus, individual decision makers might be expected to behave competitively (Dawes, McTavish, & Shaklee, 1977; Edney & Harper, 1978; Dawes et al., 1988).

In sum, it is possible that group decision makers will transform the situation into a cooperative, intragroup decision making task through an increased sense of group identity, whereas individual decision makers will arrive at a more competitive, interindividual transformation (Kelley, 1983). Based on these arguments we would predict that firms composed of individual decision makers will have shorter time horizons and larger firm withdrawals than firms composed of group decision makers.

In addition to producing a main effect of individual versus group decision making on time horizons, the psychological mechanism of group identification could also produce an interaction between mobility and group versus individual decision making. It seems likely that high mobility will have a negative impact on group identification. Under high mobility, the firm is likely to be perceived by its members as a fluid, ever-changing collection of people rather than a cohesive entity. Several studies have shown that group identification increases cooperative behavior (Tajfel, 1982; Kramer & Brewer, 1984; Komorita & Lapworth, 1982). Thus, we expect groups to exhibit lower levels of cooperation, and thus higher levels of withdrawals, when faced with high mobility. Since this group-solidarity-mediated effect is not present for individuals, we expected groups to decrease their time horizons more than individuals in response to an increase in mobility.

These considerations leave us with several predictions. First, we expect to replicate the finding from our earlier experiment that high mobility will decrease the time horizons of both individual and group decision makers, increasing withdrawals from the firm. Second, there are competing reasons to expect firms consisting of groups to have (a) shorter or (b) longer time horizons than firms consisting of individuals. Third, we look for a possible interaction effect between individual versus group decision making and the rate of mobility. Specifically, we speculate that the in-
crease in withdrawals associated with high rates of mobility will be
greater for group-based than for individual-based firms.

METHOD

Subjects, Task, and Procedure

One hundred fifty-three Masters of Business Administration students in
four classes at two business schools participated in the study. Subjects
had an average of 4 years of work experience included 69 females and 84
males. The study was conducted as a class exercise, and students’ grades
depended in part on their performance in the exercise.

The 2 × 2 experimental design manipulated interfirm mobility—the
probability that movement between firms would occur on each round (low
vs high)—and manipulated whether firms consisted of individuals or
groups. Both were between-subjects variables. The firms were grouped
into “markets” of three to five firms each, for a total of 16 markets. Two
of the markets consisted of five firms, 6 of the markets consisted of four
firms, and the remaining 8 markets each included three firms. There was
no relationship between number of firms in a market and the treatment
variables. Subjects moved between firms, as described below, but always
stayed within the same market.

At the beginning of the experimental session, subjects were given back-
ground and role playing instructions. After reading the instructions, they
were permitted to ask clarifying questions. They were then randomly
assigned to a market and to a firm within that market. Each market was
located in a separate room, and participants in markets were completely
isolated from one another and were not aware of the differences between
markets (e.g., in mobility rates).

Subjects were told that they would play the role of a stakeholding
partner in a small, hi-tech computer firm. This task was developed by
the authors and similar versions have been used in previous research and as
a classroom exercise (Mannix and Loewenstein, 1993). During each of the
eight rounds, firms decided how much money to take out of the firm as
individual profit (or salary) and how much to leave in and reinvest.

Firm composition. In the group firm condition, firms began with a pool
of $80,000. During each round the group firms, as a whole, were permitted
to withdraw from $0 to $15,000, which they were required to divide
equally between the five members. In the individual firm condition, firms
began with a pool of $16,000 (one-fifth of the group pool size), and with-
drawals between $0 and $3,000 were permitted in each round. In both
conditions, once money was removed from the firm, it could not be re-
invested in a later round. Subjects were provided with a sheet to keep
track of their individual withdrawal amounts.
Money that was left in the firm was subject to a variable rate of return. Subjects were told that as participants in a very competitive market the rate of return was uncertain and might take any value from 3 to 12%. The actual value was determined each round by random drawing. Each firm had a bag of 10 balls labeled from 3 to 12. At the end of each round, after the withdrawal decision had been made and recorded, each firm drew a ball from the bag, which determined the rate of return for that round. The money remaining in the firm was compounded by the rate of return to determine the resource pool size for the following round. After the drawing, the ball was returned to the bag.

Subjects were told that each round would last 10 min and that the entire experiment would be completed during the class period of 1 hr 40 min. In the group condition, firms were instructed that they had to reach a consensus on how much to withdraw by the end of each round. If and only if a firm could not agree on how much money to withdraw at the end of the 10-min time period, they were instructed to hold a majority vote on one of two options: (1) withdraw nothing or (2) withdraw the full amount possible, $15,000. At the end of the eighth round, all firms liquidated remaining assets, which were distributed equally among the firm members. Thus, if money was withdrawn from the firm quickly, the resource pool was depleted and the opportunity to receive added investment income was forfeited. However, if funds were not withdrawn, individual firm members risked losing their claim on the firm’s resources if they were transferred out of the firm. The rate and pattern of resource depletion were used as the measures of the firms’ time horizons.

Interfirm mobility. If any mobility occurred during a round, it happened at the very beginning of that particular round, including round 1. The level of interfirm mobility was manipulated between the markets as low or high. Subjects were told that their firm was one of three, four, or five comparable firms in a competitive market. For the group firms in the low mobility condition subjects were told that on each round there would be a 25% chance that one person in their firm would move to another firm in the same market and be replaced by a member of an outside firm. In the high mobility condition, group firm subjects were told that there was a 75% chance that a person in their firm would move.

Mobility was determined separately for each market by drawing poker chips out of an opaque bag. In the low mobility condition one of the chips was white and three of the chips were blue; in the high mobility condition three chips were white and one was blue. In either case, if the chip drawn was blue there was no mobility and the round proceeded with the nego-

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1 No group ever had to use this option. All groups were able to reach consensus before the end of each round.
tiation. If a white chip was drawn one person from each firm was transferred to a new firm. Who moved from each firm, and which firm they moved to, was also determined by a random drawing within each firm. For example, in the three firm markets, if movement occurred, either a person from firm A would move to B, B would move to C, and C would move to A, or A would move to C, C to B, and B to A. This pattern was adapted for the four- and five-firm markets.

Since there were five persons in each firm, on any given round there was a .05 chance (.2 × .25) that any one person would move in the 25% condition and a .15 chance (.2 × .75) that any one person would move in the 75% mobility condition. These figures parallel the mobility rates in the individual decision groups. Subjects in the individual decision firms in the low mobility condition were told that on each round there would be a 5% chance that they would move to another firm in the same market and be replaced by a member of an outside firm. In the high mobility group firms conditions subjects were told that the probability was 15%. As in the group condition, actual movement was determined at the beginning of each round by a draw of different colored poker chips. Thus, in both group and individual firms the likelihood of any individual switching firms at some point during the seven rounds when investment decisions were made was .68 in the high mobility condition and .30 in the low mobility condition. Neither of these figures incorporates the small likelihood that an individual will move out of a firm but move back on a subsequent round.

RESULTS

Our dependent variable was firm withdrawal on different rounds. We ran a repeated measures ANOVA across the 57 firms in which withdrawal at rounds 1–7 was the repeated measure.2 We did not include the eighth round because withdrawals in the eighth round were always equal to the accumulation of wealth over the prior seven. Between-subject independent variables were the likelihood of interfirm movement (low versus high) and firm composition (individual versus group). Withdrawals in the group condition were divided by 5 to make them comparable to withdrawal in the individual condition.

In part due to the difference in cell sizes, the sphericity assumptions do not hold in the repeated measures test that pools the orthogonal polynomials. Therefore, we report F tests associated with each individual orthogonal polynomial, as each test is valid regardless of whether the sphe-

2 Due to the different subjects demands required for the individual and the group conditions the cell sizes vary as follows: Individual/Low = 16, Individual/High = 17, Group/Low = 12, Group/High = 12
ricity condition is satisfied. Our main findings are presented in Fig. 1, which plots average withdrawals per round for the four conditions defined by the probability of interfirm movement and firm composition. The average withdrawal for all firms, regardless of experimental condition, was $1450.38. Consistent with Hypothesis 1, the rate of interfirm mobility had a substantial effect on withdrawals \( F (1,53) = 47.01, p < .01 \). The mean withdrawal over the first seven periods was $656.85 for low mobility firms and $2,131.07 for high mobility firms.

Firm composition also affected withdrawals \( F (1,53) = 6.17, p < .05 \). Firms composed of individual decision makers withdrew an average of $1,661.07, whereas firms composed of group decision makers withdrew an average of $1,126.84 over the seven rounds. The between-factors interaction between mobility rate and group composition was not significant \( F < 1 \).

The orthogonal polynomial tests on the within factors reveal a significant effect for round on both the quadratic \( F (1,53) = 3.93, p < .05 \) and the cubic \( F (1,53) = 4.28, p < .05 \) component tests. Figure 2, which shows the mean withdrawal across collapsed all experimental conditions clearly shows both these functions.

Also informative, although to be cautiously interpreted, is the marginally significant three-way interaction on the linear component between round, mobility rate, and group composition \( F (1,53) = 2.93, p < .10 \).

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![Figure 1](image-url)  
**Fig 1.** Mean withdrawals per round as a function of probability of interfirm mobility and individual versus group firm composition.
Both the high mobility individual firms and the low mobility group firms show relatively flat rates of withdrawals through round 5, at which point the withdrawals for the high mobility individual firms spike up for one round, while the withdrawals for the low mobility group firms drop down. A different pattern for the low mobility individual firms is evident showing an increase in withdrawals through round 4, followed by a decline through round 7. Finally, the high mobility group firms show an increase in withdrawals that peaks at round 6 (with the expect of a drop at round 2), sloping off slightly in round 7. These effects may be seen in Fig. 1.

However, it is possible that because some groups with high withdrawals actually ran out of funds in round 7, the drop in withdrawals for that round is not the result of a decision made in that round but, instead, the result of decisions made in earlier rounds. An additional repeated measures analysis omitting groups that had run out of funds by round 7 was conducted. This resulted in the elimination of 11 groups, 9 of which were in the individual condition, and all but 1 in the high mobility condition. In this analysis both mobility ($F (1,42) = 34.13, p < .01$) and firm composition ($F (1,42) = 5.08, p < .05$) remained significant; however, the linear, quadratic, and cubic effects were eliminated ($Fs < 1$).

It is also interesting to note the rate at which decision makers in the different conditions took an "all or nothing" approach. All withdrawal decisions were coded as (1) no withdrawal, (2) highest withdrawal possi-
ble, or (3) in-between, resulting in a 2 (mobility) × 2 (firm composition) × 3 (withdrawal decision) table (see Table 1). On average, 77% of all the withdrawal decisions made were all or nothing decisions. A log linear analysis revealed a significant effect for the Mobility × Withdrawal Decision interaction ($\chi^2 (N = 399) = 137.86, p < .01$), as well as the Firm Composition × Withdrawal Decision interaction ($\chi^2 (N = 399) = 37.66, p < .01$). As shown in Table 1, 57% of the decisions in high mobility groups resulted in the highest withdrawal possible, compared to only 13% of the decisions in low mobility groups. Thirty percent of the decisions made by individuals resulted in no withdrawal, compared to 56% of the decisions made by groups.

A further analysis tests two additional questions. First, did the experience of mobility encourage high withdrawals? Second, did people respond in the short-term to past fluctuations in the rate of return on the resource pool? That is, when they experienced a low rate of return, did it discourage firm members from making further investments?

To answer these questions we ran a hierarchical regression analysis in which each round was a unit of analysis at the first level and each firm was a unit of analysis at the second level. In other words, we fit a regression model with random coefficients for each firm in which round, rate of return on the prior round, and mobility on the prior round were the predictor variables. The predictor variables were centered around their mean in order to estimate the effect of initial conditions, which is the intercept term, independently from the other variables in the model. The variability in the coefficients among the firms was then modeled by the basic features of firms—that is, firm composition and the rate of interfirm mobility.

The results of this analysis are presented in Table 2. As can be seen from the table, the initial conditions have a strong effect on withdrawal rate, and this effect differs as a function of firm composition and interfirm mobility. The positive slope for discount rate suggests that subjects in the high mobility condition withdrew higher amounts than the subjects in low

<table>
<thead>
<tr>
<th>Mobility rate</th>
<th>Firm composition</th>
<th>Withdrawal decision</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Nothing</td>
</tr>
<tr>
<td>Low</td>
<td>Individual</td>
<td>55.30</td>
</tr>
<tr>
<td></td>
<td>Group</td>
<td>82.14</td>
</tr>
<tr>
<td>High</td>
<td>Individual</td>
<td>5.88</td>
</tr>
<tr>
<td></td>
<td>Group</td>
<td>29.76</td>
</tr>
</tbody>
</table>
TABLE 2
RESULTS OF HIERARCHICAL REGRESSION ANALYSIS FOR FIRM WITHDRAWALS

<table>
<thead>
<tr>
<th></th>
<th>γ</th>
<th>Standard error</th>
<th>t statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Base coefficient</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Base</td>
<td>1394.35</td>
<td>106.67</td>
<td>13.07**</td>
</tr>
<tr>
<td>Mobility</td>
<td>755.43</td>
<td>105.34</td>
<td>7.17**</td>
</tr>
<tr>
<td>Firm composition</td>
<td>274.65</td>
<td>106.67</td>
<td>2.57*</td>
</tr>
<tr>
<td><strong>Round slope</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Base</td>
<td>-10.97</td>
<td>31.72</td>
<td>-35</td>
</tr>
<tr>
<td>Mobility</td>
<td>3.12</td>
<td>31.32</td>
<td>.10</td>
</tr>
<tr>
<td>Firm composition</td>
<td>-40.70</td>
<td>31.73</td>
<td>-1.28</td>
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<td><strong>Rate of return slope</strong></td>
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<tr>
<td>Base</td>
<td>35.83</td>
<td>14.80</td>
<td>2.42*</td>
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<tr>
<td>Mobility</td>
<td>-5.79</td>
<td>14.78</td>
<td>-.39</td>
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<tr>
<td>Firm composition</td>
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<td>14.84</td>
<td>.51</td>
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<tr>
<td>Mobility on prior round slope</td>
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</tr>
<tr>
<td>Base</td>
<td>18.34</td>
<td>79.28</td>
<td>23</td>
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<tr>
<td>Mobility</td>
<td>45.66</td>
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<tr>
<td>Firm composition</td>
<td>76.54</td>
<td>79.18</td>
<td>97</td>
</tr>
</tbody>
</table>

* Firms that had no variation in withdrawals over time were eliminated from this analysis.
Thus, this analysis is based on 42 of the 57 firms.

*p < .05
**p < .01

Mobility condition. Similarly, the positive slope for firm composition points to a higher amount of withdrawal for firms composed of individuals compared to firms composed of groups. Furthermore, rate of return had significant effect on withdrawal rate. The higher the return in the previous period was, the more subjects withdrew in the following periods. However, this relationship does not differ depending on firm composition or on the rate of intramobility.

One pitfall of this analysis is that there is no variation in the amount of withdrawal for some firms over different rounds because of the strong effect of initial conditions. Therefore, these firms had to be eliminated from the analysis. As a result, the analysis is based on only 42 of 57 firms, which reduces the power of the analysis considerably. Therefore, to look for converging evidence for the results obtained from the hierarchical regression analysis, we also conducted a stepwise regression analysis on these data. In the stepwise analysis, each firm at each round was treated as the unit of observation. Withdrawal per round was the dependent variable, and the rate of intramobility, firm composition, and round were independent variables. In addition, we included as independent variables the rate of return and whether there was mobility in the prior round.

Table 3 presents the results of the stepwise regression, detailing the
changes in $R^2$ for each step. As in the hierarchical analysis, the mobility rate accounted for the majority of the predicted variance in withdrawal rates. In addition, the firm composition contributed significantly to firm withdrawals, as did the rate of return in the previous round. Thus, it seems that despite being informed of the random nature of the mechanism for determination of the rate of return, subjects were influenced by their own past experience with the rate of return. Perhaps, subjects expected mean-reversion to occur, such that a high rate of return on one round would be followed by a low rate on the next. Alternately, they may have withdrawn funds following an unusually large rate of return so as to lock in their profit. Again, neither round itself nor mobility on the previous round significantly influenced withdrawals.

Finally, we examined individual outcomes as a function of mobility and firm composition. An analysis of variance that examined the effects of mobility rate and firm composition on total individual outcome was conducted. The overall average level of individual outcome, regardless of experimental condition was $23,453.6$. Mobility significantly affected the total individual outcome, such that subjects in the low mobility conditions achieved higher outcomes ($M = 26,487.4, SD = 4,017.00$) than subjects in the high mobility conditions ($M = 21,233.0, SD = 8,147.80$), $F(1,73) = 7.88, p < .01$. The effect of firm composition was only marginally significant, such that subjects who were members of group firms achieved somewhat higher outcomes ($M = 24,558.5, SD = 7,558.57$) than subjects who were members of individual firms ($M = 21,465.5, SD = 2,517.14$), $F(1,73) = 7.23, p < .1$. The interaction was not significant, $F < 1$.

**DISCUSSION**

In addition to replicating the original finding of a negative relationship between mobility and time horizons, the current results reinforce the widely accepted view that individual preferences cannot be readily ex-
trapulated into group decisions. Groups exhibited longer time horizons than individuals, disinvesting from their firms at lower rates at both high and low levels of mobility. One explanation for this effect is that subjects felt more jealously possessive of their firms when they were the sole shareholder, making them more reluctant to see the fruits of their investments appropriated by another person. In other words, because subjects in the individual decision-making condition were isolated decision makers, they may have been more likely to focus outward, viewing the other individuals in their market as salient competitors. These subjects may have preferred to dissolve their firms rather than let another market member, a competitor, take it over. Subjects in the group condition, however, may have been more likely to focus inward. Aided by intragroup communication, perhaps they developed a group identity and a concern for the welfare of their firm and the firm members. The finding of greater cooperation and longer time horizons for groups than for individuals does not contradict the well-documented finding that the behavior of groups toward one another is more competitive than that between individuals but, it seems, the group solidarity effect was stronger in this particular context.

Perhaps subjects in the group condition construed the exercise differently and were more likely to make cooperative transformations of the payoff structure than individuals were, especially under low mobility. Although high mobility increased the competitive orientation of groups as well as individuals, group decision makers were still more cooperative and had longer time horizons than individuals. Perhaps for groups under high mobility, the prospect of leaving the firm may have somewhat diluted the solidarity between firm members, reducing the member's allegiance to the firm and reducing the concern for the long-term health of the firm. Why, then, would groups still be less competitive than individuals under high mobility? It may be that in the group condition, competition between firms was less intense because group members realized that they might become a member of one of these other firms (Sherif, 1951). Individuals, on the other hand, would not ever have to "join" other firm members, but would simply leave their individually held firm for another individually held firm, thus leaving intact their isolation and preserving their competitive orientation.

In this experiment, profit maximization entailed maximum withdrawals in the high mobility condition and zero withdrawals in the low mobility condition. The logic is straightforward: in the high mobility condition, the probability of switching firms (and thus losing one's investment) on any round exceeds the expected value of earnings if funds are retained in the firm. In the low mobility condition, expected earnings on each round exceed the probability of losing them by switching firms. Referring back
to Table 1, in the mobility condition, a larger fraction of firms consisting of groups made withdrawals of $0. Thus, under low mobility, groups tended to behave "more rationally." However, it is clear that individuals came closer to profit maximization in the high mobility condition in the sense that a larger number of firms consisting of individuals made maximum withdrawals. Therefore, using this definition of rationality, individual decision makers were "more rational" than groups, on average, under high mobility. However, this rationality "switch-over" between low and high mobility conditions reflects the change in the definition of rationality (from minimal to maximal withdrawals) rather than a change in the comparative behavior of individuals and groups.

Despite their lower level of "rationality" in the high mobility condition, group decision makers slightly outperformed individuals under both low and high mobility. This was because all firms composed of group decision makers tended to withdraw less money and thus benefited from the return on reinvestment. In the same way that players who "irrationally" cooperate in a repeated prisoner's dilemma game tend to outperform those who defect, group-based firms in our market benefited from their own collective irrationality in the high mobility condition.

Another possible interpretation of the findings is that firms composed of individuals may have believed that they had a higher probability of moving and losing their firm, despite the fact that the objective chance of movement was the same in both conditions and was explicitly stated to all participants. Subjects in the group condition may have perceived a lower probability of being moved because they were only one of five persons that might be chosen to move. In the group condition, mobility was a two-stage process: a chance that someone in the group would move, and contingent upon someone moving, a chance that a particular individual would be the one to do so. In the individual condition, these two stages were collapsed into one. Although the objective probabilities of mobility were matched between the individual and group conditions, possibly individuals in groups perceived the likelihood of mobility as being lower. However, we find this explanation implausible since earlier research (Bar-Hillel, 1973) found that people tend to overestimate rather than underestimate the likelihood of compound events.

The major new finding of this paper is that groups made decisions consistent with a longer time horizon than did individuals in an otherwise identical situation. The effect is statistically significant and consistent at two different rates of interfirm mobility. Thus it adds, at once, a new factor worthy of attention in the literature on intertemporal choice and a new type of decision at which groups appear to make systematically different decisions than the individuals who compose them. At the same time, however, the effect and its determinants clearly merit further atten-
tion. It would be informative, for example, to examine other types of intertemporal choices by individuals and groups—for example, choices between payoffs occurring at different points in time. And, as in the literature on group polarization, it would be interesting to attempt to pinpoint the causes of the group/individual difference, for example, by limiting communications between group members. Finally, it would also be interesting to examine whether the effect is robust across different types of groups. Perhaps, for example, there is a tendency toward longer time horizons in groups in which decision making tends to be more collective rather than hierarchical. As in the effect of mobility on time horizons, such an effect is consistent with the common observation that decision making in American firms tends to be more hierarchical than many of their foreign competitors.

These findings should be interpreted cautiously. As noted in the introduction, there are many possible causes of short managerial time horizons. Although our results support the idea that interfirm mobility does, in fact, influence time horizons, they provide no information about the importance of mobility relative to other factors. Furthermore, there may be benefits to mobility that are not captured in our experiment. Mobility may facilitate transfer of human capital to where it can be used most efficiently and it may enhance the transfer of knowledge and expertise between firms. Our results suggest, however, that one consequence of mobility, and thus of any public policy measures that promotes it, is likely to be a shortening of time horizons. It is also tempting to extrapolate this finding to other domains, such as the political arena. As James Madison wrote of legislator term limits: “By rendering a periodical change of men necessary, it discourages beneficial undertakings which require perseverance” (from Wills, 1992; p. 29).

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