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Should I Stay or should I Go? Bandwagons in the lab☆

Tom-Reiel Heggedal[a], Leif Helland[b,*], Knut-Eric Neset Joslin[c]

[a] BI Norwegian Business School and Centref or Experimental Studies and Research (CESAR), Norway
[b] BI Norwegian Business School and CESAR,Norway
[c] Uppsala University and CESAR, Norway

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ABSTRACT

We experimentally investigate the impact of strategic uncertainty and complementarity on leader and follower behavior using the model of Farrell and Saloner (1985). At the core of the model are endogenous timing, irreversible actions and private valuations. We find that strategic complementarity strongly determines follower behavior. Once a subject decides to abandon the status quo the probability that other players jump on the bandwagon increases sharply. However, there is a reluctance to lead when leading is a conditional best response. We explain this deviation from the neo-classical equilibrium by injecting some noise in the equilibrium concept. We also find that cheap talk improves efficiency.

1. Introduction

Many economic environments are characterized by the presence of asymmetric information and strategic complementarity. Examples include bank runs (Garratt and Keister, 2009; Goldstein and Pauzner, 2005); speculative currency attacks (Morris and Shin, 1998); setting of industry standards (Farrell and Klemperer, 2007; Farrell and Saloner, 1985); technology adoption (Katz and Shapiro, 1985; 1986); political revolts (Edmond, 2013; Egorov and Sonin, 2011); and foreign direct investment (Goldberg and Kolstad, 1995; Rodrik, 1991). In such environments, there is a potential for joint welfare improvements through coordination of actions. When players' moves are endogenous, the timing of moves may in itself serve as an important coordinating device. For players with conditional best responses, strategic uncertainty enters the picture and may impact on the ability to coordinate actions.[1]

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* Corresponding author.
E-mail address: leif.helland@bi.no (L. Helland).

[1] We follow Morris and Shin (2002) in defining strategic uncertainty as "uncertainty concerning the actions and beliefs (and beliefs about the beliefs) of others." Strategic uncertainty need not be important for behavior. In neo-classical theory, strategic uncertainty should have no bearing on a player's choice of action if the player has a dominant best reply.

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We investigate the seminal model of Farrell and Saloner (1985) (FS) in a controlled laboratory experiment.[2] In the model, players have incomplete information about types and endogenously time their actions in the presence of strategic complementarity. In stage one, players simultaneously decide whether to Stay with the status quo or Go to the alternative, where Go is an irreversible action.[3] In stage two, players that are not committed to Go again choose between Stay or Go. If no player committed in the first stage, second stage decisions are again simultaneous. All payoffs are obtained after the second stage. The key decision in the model is whether to Lead or Follow. A leader is defined as a player that chooses to Go in the first stage. A follower is defined as a player that Stays in the first stage and matches the first stage decision of her co-player in the second stage. Due to strategic complementarity, when a player leads, this may create incentives for the co-player to "jump on the bandwagon." The strength of the incentive depends on the private valuations of the co-player with respect to the status quo and its alternative. Thus, a player may regret the decision to Lead if the co-player fails to Follow.

In FS, the combination of a specific information structure and the endogeneity of moves produces a unique equilibrium.[4] This provides an unequivocal benchmark for our analysis and facilitates separate assessment of the role of strategic uncertainty and complementarity. Our two main treatments explore how variations in strategic uncertainty affect leadership decisions. This treatment variation is also consequential for follower decisions because of strategic complementarity.

We present two main results. Foremost, we find that subjects often fail to Lead when the optimality of this action depends on beliefs about their match. This effect of strategic uncertainty is unaccounted for by the model. Leading carries the risk of failure: The leader might end up alone. We find that it is the variation in the cost of failed leadership, rather than the sharp cut-off between dominant and non-dominant equilibrium strategies, that appears to cause the reluctance to Lead. We clarify this argument by introducing some noise in the decision making process. Such noise makes beliefs relevant everywhere, eroding the sharp divide between dominant and non-dominant equilibrium strategies. In particular, we show that an agent quantal response equilibrium (AQRE) organizes our data well.

Second, we find that the effect of strategic complementarity is strong. If a subject takes the Lead, all strategic uncertainty is resolved, and types who should Follow in equilibrium do so with high probability. This contrasts with recent findings in a similar environment in which subjects have incomplete information about fundamentals rather than types. We comment further on this below.

In addition, we investigate an extension of the model which permits cheap talk. We find that cheap talk improves subjects' ability to coordinate on mutually beneficial actions and increases efficiency.

To the best of our knowledge, ours is the first experiment to address the FS-model. The paper closest to ours is Brindisi et al. (2014).[5] While they use the same sequence of moves as we do, type uncertainty is replaced by uncertainty about fundamentals. Agents get a private signal about the true state of fundamentals, resembling a global games set-up. In contrast to us, they find that strategic complementarity does not strongly determine outcomes, as it should do in equilibrium. This indicates that the information structure is crucial in determining the strength of bandwagon behavior in the presence of complementarities and irreversible choices. While strategic complementarity is a strong force in environments with private information about types, it appears not to be so under private information about fundamentals.

More generally, most, if not all, economic situations of interest embody a mix of type uncertainty and uncertainty about fundamentals. Usually, it is not evident what the crucial source of uncertainty is in a particular situation. Accordingly, the choice of information structure should be determined with a view to the context.[6] For these reasons, we believe that models such as the one analyzed in this paper have the potential to shed further light on situations in which the current practice is to rely on a global games approach.

There is an experimental literature on leadership effects in weak-link games. In contrast to our setting, multiple Pareto ranked equilibria coexist in these games. However, as in our setting, strategic complementarities are strong in weak-link games. Several instruments of leadership have been found to increase efficiency in this class of games. These include leadership by example (Cartwright et al., 2013), leadership by communication (Brandts and Cooper, 2007; Brandts et al., 2015; Chaudhuri and Paichayontvijit, 2010), and commitment by leaders to help (low ability) followers (Brandts et al., 2016). There is also an experimental literature on leadership in public goods provision in which there are no strategic complementarities (see Helland et al., 2017 for a review).

The remainder of the paper is organized as follows. In the next section, we describe the model. For concreteness, we present the model using the parameters of the experiment. Thereafter, in the third section, we review our design and the experimental procedures. In section four, we present the experimental results. The fifth section considers how noisy behavior impacts the equilibrium. The final section concludes.

[2] For textbook treatments, see Shy (2001) and Belleflamme and Peitz (2015).

[3] E.g. the action Go could–depending on the application–be "switch to the new technology platform", "rise against the ruler", or "make an investment." The action Stay would have the prefix "do not" attached.

[4] Coordination problems are defined by the presence of multiple, Pareto-ranked equilibria. Coordination failure results if players beliefs lead them to play a payoff dominated equilibrium. Thus, in a strict sense, there are no coordination problems in the game we use.

[5] Brindisi et al. (2009) provides a thorough exposition of the theory.

[6] This is also the view taken in the seminal work on global games. See the discussion in Carlsson and Van Damme (1993), pp. 251–2.