Available online at www.sciencedirect.com
ScienceDirect
Electronic Commerce Research and Applications 7 (2008) 44–54
Electronic Commerce Research and Applications
www.elsevier.com/locate/ecra

Rational fads in investor reactions to electronic commerce announcements: An explanation of the Internet bubble

Eric Walden *, Glenn J. Browne

ISQS, Texas Tech University, Box 42101, Lubbock, TX 79409, United States

Received 7 April 2006; received in revised form 29 September 2006; accepted 29 September 2006
Available online 30 October 2006

Abstract

This work proposes that information cascade theory can help to explain the formation of the Internet bubble. We propose that the bubble existed because a lack of good information about the potential value of electronic commerce led investors to rely on other investors' private valuations of electronic commerce. We use the event study methodology to estimate returns to company announcements of electronic commerce initiatives in 1999 and 2000. We find that after controlling for network externalities and time trends, investors' valuations of the returns to electronic commerce initiatives were significantly influenced by the market return from prior periods. Moreover, the relative weight placed on prior periods' returns decreased as the variance of the prior periods' returns increased. Both of the results are consistent with the behavior predicted by information cascade theory.

Keywords: DotCom bubble; Electronic commerce; Empirical research; Event study; Information cascade theory; Investor psychology; Rational fads; Stock market

1. Introduction

Technology is subject to fads – situations in which many agents adopt a technology with exaggerated zeal [1–3]. Recently, we witnessed an impressive technology fad – the Internet bubble. From 1998 to 2000 the popular press hailed the beginning of a *new economy*, and investments in electronic commerce activities were believed to be the best use of one's money. Then, by 2002, we returned to the old economy and electronic commerce investment was no longer seen as being particularly better or worse than any other kind of business investment. Businesses certainly needed the electronic channel, but they also needed many other things. During this time the chosen vehicle for investing in electronic commerce was the stock market. For example, in the 24 months from January 1998 to January 2000, the AMEX Internet stock index increased nearly 600%. However, by January 2002 it had returned almost to its 1998 level. Even today, in 2006, it is only about 50% higher than its 1998 level.

Why did investors believe that the returns on electronic commerce initiatives should be so large? Mills [4] cites four key reasons given to explain the Internet bubble: It was an accident, it was engineered by the incentive structures of financial services firms, it was due to inexperienced investors entering the market, and it was an example of "the madness of crowds". To this list we add another reason. This work proposes that investors' estimates of electronic commerce returns were the best guess of rationally-motivated individuals making decisions with great uncertainty. Specifically, we argue that each individual was very uncertain about how large returns on e-commerce investments should have been, and therefore supplemented his or her own information by relying on information contained in the investment behavior of others. Although there were clearly other causes of the bubble, our data suggest that as much as 25% of the value investors placed in an electronic commerce investment was based on the value others placed on prior electronic commerce investments.

* Corresponding author. Tel.: +1 806 742 1925; fax: +1 806 742 3193.
E-mail address: eric.walden@ttu.edu (E. Walden).

1567-4223/$ - see front matter © 2006 Elsevier B.V. All rights reserved.
doi:10.1016/j.elerap.2006.09.001

In this paper, we investigate empirically the idea that technology fads are a consequence of agents inferring information about the benefits of a technology from the observable actions of other agents. We use stock return data from the "DotCom" era to investigate this question. In particular, we investigate agents' willingness to pay for technology based on other agents' willingness to pay for similar technologies.

The paper proceeds as follows. In the next section we review literature explaining technology fads. We then develop a theoretical explanation of fads as information processes. We then describe the data and conduct our analyses. We conclude with implications of our findings for research and practice.

2. Background literature and relevant theory

In the present research we develop an explanation of the development of the DotCom bubble using a rational explanation of fad-like behavior. The most popular rational explanation of fad-like behavior is network externality theory [5–8]. Communication networks often have the characteristic that their value increases as the number of agents on the network increases. Thus, as more agents join a network, the value of the network increases, causing more agents to want to join the network. This positive feedback loop leads to rapid growth. However, this theory also suffers from three shortcomings in the present context. First, not all technologies are characterized by network effects [9–11]. Thus, network externality theory is not general enough to explain the full range of technology decisions. Second, network externality theory does not consider the information available to decision makers' and thus misses an important aspect of the decision makers, environment. Third, network externality theory does not offer a good explanation of failed or mistaken fads. Agents always choose the most popular technology, even though it may not be the most advanced, because the size of the network outweighs the benefits of advanced features.

To overcome these difficulties, we take the perspective of information cascade theory [12,13]. Information cascade theory is based on sequential decisions in an information-poor environment. In this context, decision makers are faced with several courses of action and must make the best choice. Unfortunately, no single decision maker has complete information; rather, each has some imperfect private information. Decision makers can observe the actions, but not the private information, of prior decision makers. Observing the actions allows them to make inferences about the prior decision makers' private information. A rational decision maker then incorporates those inferences with his or her own private information to increase the likelihood of making a correct decision, which is a reasonable response to an information-poor environment. However, because decisions occur in a sequence, a mistake made by a particular decision maker propagates to all future decision makers. If a decision maker has poor information that leads him to make an inappropriate decision, then all future decision makers will incorporate that poor information into their information set. It is rational for each individual decision maker to make use of the information implicit in the actions of others. However, as more individuals make the same decision, there is increasing pressure for other decision makers to make the same decision, regardless of their private information. Thus, we experience a situation in which everyone begins making similar decisions and a fad for a poor product or service is begun. Information cascades have been validated in laboratory experiments [14–16], and behaviors consistent with information cascades have been observed in natural phenomena [13].

Past research has studied this type of sequential decision making in strings of individual decision makers. In the present research, we extend this idea to explain how individuals infer group-level information in prior periods. We posit that the members of a group of decision makers individually infer information about the group by examining other group members' prior decisions. Specifically, we propose that stock markets react simultaneously to events, but that when another similar event occurs, individual investors infer information about the value of the event by the market's cumulative reaction to prior, similar events.

The context for our investigation is firms' adoption of electronic commerce technologies during the Internet stock bubble. We argue that the Internet stock bubble was, to some degree, a rational response by investors to the early success of Internet firms. However, this response was made in an environment with poor information about the true costs and benefits of electronic commerce. A few early apparent successes (e.g., Amazon, eBay, Dell) caused informed investors to value electronic commerce very highly, which drove up the returns of electronic commerce initiatives [17]. Because the market responded well to these early events, investors inferred high values for similar events, which they incorporated into their own private valuations. This caused investors to value the events higher than if they had relied solely on their own private information. The cumulative effect thereby drove valuations even higher, and the abnormal valuations of early events propagated through future events.

It could be argued that the observed behavior indicating the rise of DotCom stocks is just a variation on the "hot-hand phenomenon" (we thank an anonymous reviewer for this excellent point; see also [18]). The "hot hand" refers to the belief among many people that "streaks" that occur (such as a basketball player who has made many baskets consecutively) are likely to continue (and thus other players should pass the basketball to him so he can take additional shots). Although most associated with sports activities, the belief applies to many superstitious behaviors (such as people saying to a person who has had several good outcomes recently that he should take a trip to Las Vegas). (See [19] for a detailed explanation of this phenomenon.)