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# Start-ups, incumbents, and the effects of takeover competition

Jan U. Becker [a], Michel Clement [b,*], Markus Nöth [c]

[a] Marketing and Service Management, Kuehne Logistics University, Großer Grasbrook 17, 20457 Hamburg, Germany
[b] Marketing and Media, University of Hamburg, Moorweidenstr. 18, 20148 Hamburg, Germany
[c] Banking and Behavioral Finance, University of Hamburg, Moorweidenstr. 18, 20148 Hamburg, Germany

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ABSTRACT

Recent acquisitions involving *Tumblr* and *Instagram* have demonstrated that the takeover of an unlisted start-up company can offer enormous financial benefits to its (former) stakeholders. Considering the multimillion-dollar amounts paid for start-ups with no existing and highly uncertain future revenues, we investigate the process and outcome of negotiation dynamics in the context of takeovers. In a series of experiments, we show that even with a low level of uncertainty about a start-up's value and its financial resources, start-ups can influence bidders' behavior and consequently the start-ups' valuation. The results indicate that incumbents' bidding behavior is driven by the perceived threat level with respect to the start-up's business activities as well as by the uncertainty with respect to other incumbents' bidding behavior—drivers that are subject to activities by the start-ups' management. Interestingly, the effect even exists if incumbents clearly know that initiating a bidding process will very likely lead to losses.



## 1. Introduction

Especially in times of technological advancement (e.g., the rise of the Internet), a multitude of start-up companies are founded and enter the market every year (e.g., amounting to $48 billion in venture capital investments in 2014; National Venture Capital Association, 2015). Previous research has shown that in times of such technological discontinuities entire industries may collectively fail to adequately adapt resulting in "collective inertia" (e.g., Abrahamson & Fombrun, 1994). Collective inertia is a potential result of different behavioral patterns in the face of discontinuous business models changes initiated by a new entrant. Surviving in competitive markets forces established companies to evaluate strategies to fight off companies entering their market (Homburg, Fürst, Ehrmann, & Scheinker, 2013). To protect or recapture its market share, an incumbent's natural reaction is to take over an entrant as particularly successful players are bound to incumbent inertia (Chandy & Tellis, 2000).

Since the 1990s, there has been substantial merger and acquisition (M&A) activity despite up- and downturns in the economic cycle. In the U.S. alone, for example, in 2013, there were nearly 10,000 M&As, with a total value of over $950 billion (FactSet Research, 2014). In addition to M&As between large established firms, acquisitions of Internet start-ups have also involved tremendous sums. *Facebook*'s $1 billion deal to take over *Instagram* and *Yahoo*'s $1.1 billion investment in *Tumblr* shows that firms are willing to pay extremely high prices for start-ups that are losing money and which face a high uncertainty with respect to their future revenues and profits.

In the existing literature, the dynamics of competition in corporate takeovers have received special attention. Despite the existing literature on M&As involving competing bidders (Betton, Eckbo, & Thorburn, 2008; Boone & Mulherin, 2007), alternative takeover strategies (e.g. Berkovitch & Khanna, 1991; Boone & Mulherin, 2009; Giammarino & Heinkel, 1986), and the outcomes of competitive bids (e.g. Aktas, de Bodt, & Roll, 2010; Giliberto & Varaiya, 1989), little is known about why and how negotiation dynamics influence takeover outcomes, particularly because merger negotiations always carry the risk that multiple incumbents enter an auction process for the target company (Aktas et al., 2010; Betton et al., 2008; Eckbo, 2009). Thus, it is unclear what effects "overshadowing" auctions' behavioral and market dynamics have on the evaluation of the target company, the competitive situation, the actual bidding behavior, and, ultimately, on the target company's price.

More recently, the determinants of takeover prices and the distribution of synergy gains between targets and bidders have been analyzed mostly based on available data of listed companies. It is often observed in the M&A market that targets with internal growth potential initiate acquisitions to address their financial constraints (Masulis & Simsir, 2013). Targets also prefer to set up an auction to maximize their premium through greater competition, however the gains distribution

* Corresponding author.
*E-mail addresses:* jan.becker@the-klu.org (J.U. Becker), michel.clement@uni-hamburg.de (M. Clement), markus.noeth@uni-hamburg.de (M. Nöth).

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between targets and bidders depends on target size (Schlingemann & Wu, 2014). This result may depend on the entry decision of invited bidders.

With high uncertainty, targets should prefer auctions compared to negotiations (Gentry & Stroup, 2014). Even different bidder types, e.g., strategic or financial bidders (Gorbenko & Malenko, 2014) or private equity (Roosenboom, Fidrmuc, & Teunissen, 2009) lead to different valuations of targets. Summing up, auctions offered by targets with (severe) financial constraints are common among listed companies and may be even more common among unlisted start-ups due to a high valuation uncertainty. Unfortunately, this empirical data is not available because there are no disclosure requirements of unsuccessful bidders.

Considering that *Facebook*, *Google*, and *Yahoo* have all tried to acquire *Tumblr* in 2013, our study focuses on how unprofitable, unlisted start-ups can benefit from competition among incumbents. We address the question whether start-ups can implement a business model which deliberately forgoes sustainable profits in order to threaten incumbents' revenues by providing a disruptive service for free (or at very low cost).[1] The ultimate goal of this "born-to-be-sold strategy" is that the incumbent acquires the disruptive start-up.[2] We focus on the sustainability of this strategy and address two research questions: (i) How likely is it that a bidding process is initiated by one or more incumbents even though it is clearly irrational to bid for the start-up? (ii) If a bidding process for the start-up is initiated, we ask how bids evolve in the bidding process, if the number of actual bidders and the level of their bids are unknown?

Our research questions are embedded in a conceptual framework that is based on a two-stage takeover model that captures the process and the outcomes of negotiation dynamics in takeovers (Betton, Eckbo, & Thorburn, 2009). In order to rule out rational economic or strategic explanations for a corporate takeover, we designed a series of experiments with managers and MBA students that focus solely on the incumbents' competitive behavior. The results indicate that even in case start-ups (or their venture capitalists) do not interfere, uncertainty with respect to other incumbents' bidding behavior leads to suboptimal actions by bidders, resulting in higher prices.

Our findings contribute to the management and entrepreneurship literature because actual or assumed takeover competition has important ramifications. We show how market dynamics and assumptions about competitors' reactions influence incumbents' behavior in favor of corporate takeovers and provide an argument as to why even those companies that appear to lack a business model are being taken over. Considering that the mere competition between incumbents sufficiently explains takeovers indicates the potential for investors to manipulate the M&A process. In case a start-up additionally fuels the diffusion of noisy signals about its value, it mostly increases the likelihood of bidding as well as the levels of bids as other firms are lured into the auction. This herding behavior may lead to even greater competition and therefore increases the perceived threat level of the disruptive start-up. Hence, start-ups are likely to successfully execute their born-to-be-sold strategy.

## 2. Conceptual framework

Similar to the approach of Betton et al. (2009), we base our conceptual framework on a two-stage takeover model in which the first stage involves private negotiations of incumbents with a start-up, which might lead to an auction during the second stage. The conceptual framework outlines incumbent companies' options for reacting to the market entry of a disruptive start-up. The framework provides a guideline for our experimental design, as described in the next section.

Our primary assumptions are (i) a start-up with limited resources enters a market that has multiple incumbents; (ii) the start-up increases its customer base due to a superior value proposition (for example, a free service such as the one offered by *Instagram*); and (iii) it therefore attracts the attention of incumbents as they lose market share.

Such a simplified scenario captures the main features of many markets, particularly online markets. Given the effective and cost-efficient way for companies to innovate is to participate from user innovations (von Hippel, 1976), the optimal strategy for an entrant would be to take an intermediate position in the value chain between supply and demand, and to internalize network externalities which, in the digital business, are attached to small marginal costs. A perfect environment for such user-generated value is provided in the *Napster* example, where the start-up used peer-to-peer communities of interest: Those community-based innovations can be found "off-line" (Franke & Shah, 2003), but especially online (Lerner & Tirole, 2002; von Hippel & von Krogh, 2003). Hence, creating strong (online) communities does not only lead to ever new and inexpensive products, but also to cohesive in-group identification and a clear demarcation to other products brands (Armstrong & Hagel, 1996; Muniz & O'Guinn, 2001). Consequently, offering attractive user-generated content that is provided within a community of peers for free ultimately induces a self-accelerating growth process, often leading to oligopolistic or 'winner takes all' market structures (due to positive externalities, e.g., Katz & Shapiro, 1986; Farrell & Saloner, 1986; Westland, 1992). In this case, the entrant reaches strategic relevance as the incumbents lose market share and revenues.

When faced with this scenario, an incumbent has two options: first, it can attempt to take over the start-up's business and add the start-up's users to its own customer base (analog to Homburg et al., 2013). An incumbent would benefit by increasing its customer base but would still cannibalize its core business. In fact, changing the business model (e.g., by charging user fees; Pauwels & Weiss, 2008) might reduce losses but also carries the risk of shrinking the customer base. Second, an incumbent can ignore the start-up and thus lose business, at least in the short run. However, due to limited resources and a lack of substantial revenues, the start-up cannot survive in the long run without an investor, and the *status quo ante* will be restored. Even if it is obvious that the start-up will eventually go bankrupt as a stand-alone company without additional funds, it requires cooperative behavior by all incumbents to "bleed out" the start-up, which is at best difficult to coordinate and at worst illegal.

Because their decisions are interdependent, all incumbents would be better off by ignoring the start-up and eventually restoring the *status quo* instead of taking over the start-up's business (resembling a *N*-person dilemma game situation; see Dawes, 1980). Ignoring a start-up also reduces the incentive for others to imitate it; once a start-up has been sold, many imitators will try to repeat the success (Economist, 2011). Thus, universal cooperation among traditional

[1] While the ultimate goal of viable start-ups is to generate profits, sales growth or more generally a growing customer base have seemed to be more desirable for many start-ups over the last ten years. In the end, however, the subsequent repeated losses will affect the valuation of a company. For example, the stock price of *Rocket Internet* declined by about 50% in 2015 due to "skepticism about the ability of its many subsidiaries to turn sales growth into profit" (McCrum, Jackson, & Vasagar, 2015).

[2] An anecdotal example of a start-up following a born-to-be-sold strategy is *Napster*. In 1999, music majors were hit hard by *Napster*, a small US-based company that enabled its users to globally exchange music files. *Napster* did not charge a fee for the service, or provide any advertising space. Thus, they operated without any obvious business model. Within weeks, millions of users adopted the free service and up- and downloaded hundreds of millions of (copyrighted) music files (RIAA 2000). The major music labels (including the *Bertelsmann Music Group*, BMG) identified the massive illegal file swapping as one of the main reasons for the sharp decline in music sales (Bhattacharjee et al., 2007) and, consequently, sued *Napster* in 2000. At the same time, BMG's mother company *Bertelsmann* displayed a vivid interest in acquiring *Napster*, the company that had produced only losses so far and had no viable business model. In interviews with managers of *Napster* and *Bertelsmann* (who wish to remain anonymous) about the business model, we were told that *Napster* and its investors never had the goal to establish a profitable business—they knew about the potential disruptive strategic relevance of the service (and its user base) to the music industry and expected the labels to buy the company off the market to protect their traditional business. Thus, *Napster*'s investors followed a born-to-be-sold strategy.

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players should lead to a higher payoff than individual or universal defection.

However, ignoring a start-up is only a viable option as long as it is likely that the start-up will eventually run out of resources. Because incumbents themselves differ in size and resources, a start-up's growth affects them differently as well—putting smaller incumbents in particular under an increasing financial strain. Additionally, the start-up's success might even attract industry outsiders who only benefit from the user base and brand and do not fear cannibalization. For example, we know from interviews with executives from *Deutsche Telekom* that *Skype* was considered to be a prime acquisition target by several telecommunication companies before eventually taken over by *eBay*. Thus, if one incumbent starts to show interest in a start-up, the payoff function changes and leads to a situation in which bidding for the start-up's business becomes the dominating strategy (Dawes, 1980). The (dilemma) situation cannot be resolved unless each incumbent has reason to believe that the others will not defect and start bidding. Consequently, an incumbent's first-stage considerations already take place in the shadow of an auction (Eckbo, 2009). Due to uncertainty about a start-up's resources and the behavior of other incumbents, rational incumbents anticipate the potential for competition (Aktas et al., 2010) and pursue the dominating strategy—namely, bidding on the start-up. The first publicly expressed interest to take over the start-up, however, initiates the second stage, the *auction phase*. If there is at least one bidder, then the dominating strategy for all incumbents is to compete in the auction. We are interested in studying whether uncertainty about competitors' behavior can cause incumbents to start bidding even in the light of resulting expected losses. This leads to:

Research question 1. How likely is it that a bidding process is initiated by one or more incumbents even though it is irrational to bid for the start-up?

Considering that bid amounts increase with the number of bidders (Aktas et al., 2010; Flanagan & O'Shaughnessy, 2003), the chances are high not only that a takeover will occur but also that the start-up will be sold for a considerable price. Because uncertainty leads to failures in judgment (Thaler, 1988), even bids that exceed an unlisted start-up's value are not surprising. In this case, the failure in judgment, or winner's curse, is the result of the highest bidder's systematic overestimation of a start-up's value (Kagel & Levin, 1986). Because this effect increases with the number of bidders (Thaler, 1985) and the level of uncertainty (Goeree & Offerman, 2002), the whole process gives some of a start-up's stakeholders, such as its investors, an opportunity to influence the outcome of an M&A process in their favor—which creates an open playing field for ethically questionable opportunistic behavior. Indeed, because investors are interested in quick and profitable exits (Zider, 1998), they may provide (potential) bidders with noisy signals about a start-up's value to ultimately increase bids.[3] The bids increase as other firms are lured into the auction through their fear of potentially negative external effects that may be brought on by ignoring ongoing talks with the start-up. This herding behavior may lead to even greater competition (and higher prices)—especially when uncertainty about the value of the firm is observed (Drehmann, Oechssler, & Roider, 2005; Giammarino & Heinkel, 1986). Thus, we are interested in studying the behavior of bidders in the auction which results in:

Research question 2. How do bids evolve in case of an auction if the number of actual bidders and the level of their bids are unknown?

[3] The authors were told in interviews with managers that investors may leak the existence of new, interested parties to systematically increase the uncertainty about competitors' bidding behavior. Fassin (1993) has described the problems of inside information and confidentiality as major ethical issues for venture capitalists.

## 3. Experimental study

### 3.1. Experimental framework

To analyze how uncertainty regarding competitors' *actions* influences incumbents' behavior, we simplify this complex decision problem in a series of experiments. Our experimental study is designed to evaluate a simple situation in which a fixed number of equally sized incumbents face a start-up that threatens the established business model—a situation which has been observed in the case of *Napster*. The Napster case shows that incumbents must decide whether to acquire the start-up, or not. In reality, all sorts of *ex ante* explanations exist as to why such deals may be rational. Because these factors are dependent on each incumbent's situation and are therefore almost impossible to measure in the real world, we use an experimental design in which these parameters are fixed and public knowledge. Thus, the valuation and procedural risks as well as the expected pay-offs are common knowledge in our experiment. Further, the experiment's design allows us to focus on (very limited) interactions among incumbents without any verbal communication in a simplified bidding process. By limiting the reasons why participants initiate auctions, the design enables us to study the effect of uncertainty regarding incumbents' behavior. The results may help to assess start-ups' potential to pursue a successful born-to-be-sold strategy.

### 3.2. Study design

In each session, four incumbents, each represented by one participant in the experiment, are confronted with an emerging start-up company. Because we are interested in incumbents' behavior, the start-up's value distributions over time, its effect on incumbents' values, and the start-up's reaction to incumbents' bids are exogenously given and are public knowledge (see the instructions in Appendix A). Because the start-up cannot reject any bids, the experimental setting ensures that the start-up will sell to the highest bidder. Moreover, it is also known that the start-up will go bankrupt and leave the market unless it is bought within the three periods comprising the experiment. This information is also public information, and all of the incumbents are identical *ex ante*. No additional public or private information on the start-up's value or the incumbents' bids is distributed after the original information has been released. Thus, we remove uncertainties about (*i*) market development, (*ii*) outside bids, and (*iii*) heterogeneous information about the start-up's value.

As described in the conceptual framework, the experiment consists of up to two stages as shown in Fig. 1. In *Stage 1*, all incumbents are asked (in a maximum of) three periods whether they would like to request an auction to determine the start-up's selling price or whether they want to ignore the start-up.[4] If at least one incumbent calls for an auction, then all incumbents move to *Stage 2* and participate in the auction,[5] otherwise the next period begins. As long as no incumbent requests an auction, incumbents' values are certain but decreasing (see Table 1).[6]

As shown in Table 1, each subject's budget $w_t$ is reduced in every period to reflect the start-up's steady growth and the incumbents' subsequent losses of market share. Simultaneously, the economic value of the start-up is increasing but uncertain. This accounts for the start-up's growing user base and the uncertain sustainability of its business model. Thus, the start-up's value $x_t$ is randomly drawn from the uniformly distributed interval $[\underline{X}_t; \overline{X}_t]$ and represents its common

[4] When incumbents enter *Stage 2*, they do not receive any additional information. It is only revealed that at least one incumbent requested an auction.

[5] We allowed all incumbents to participate in the auction for two reasons: first, this is common practice in the market and, second, this design element removes potential first-mover advantages from the bidding process.

[6] Because all incumbents initially have the same value, their value changes in the same way, i.e., all incumbents have the same value during a specific period.

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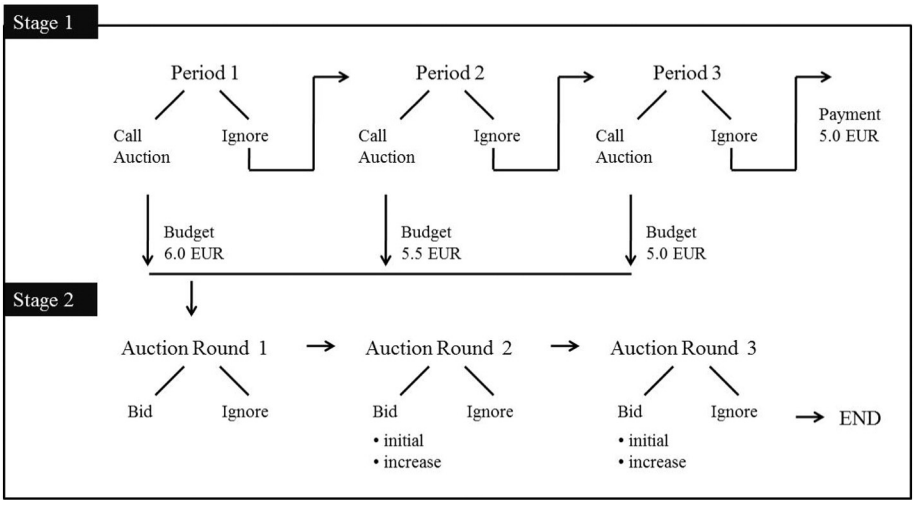


**Fig. 1.** Structure of the experiment.

value (Goeree & Offerman, 2002; Kagel & Levin, 1986). This information is public knowledge, too.

If no incumbent requests an auction in three periods, every incumbent receives $w_3$, i.e., € 5 (€ 50) for every student (manager). If an auction is requested in period *i*, a first-price auction (*Stage 2*) begins and all subjects are asked to simultaneously submit sealed offers. Note that there is no incentive (such as a first-mover advantage) to request an auction because all participants face the same situation at the start of an auction regardless of whether they requested it or not.[7] The minimum bid is € 1 (approx. US$ 1.30) for students and € 10 for managers.[8] The maximum bid is limited to the remaining budget and is equal for all subjects. There is no obligation to submit a bid. However, if an auction has been initiated, it is rational to submit at least the minimum bid because winning the auction with the minimum bid always yields an equal or higher value than abstaining from the auction ($w_i - 1 + \underline{X}_t \geq d_i$). After each bidding round, only the existence of one or more (binding) bids is publicly announced: to reflect the usual non-disclosure agreements between negotiating parties, neither the number of bids nor the highest bid are publicly revealed. The auction ends when no new bids are made (Abbink et al., 2005) or after a maximum of three auction rounds. In the event that two or more bids are tied, the winner is chosen randomly. The winner of the auction receives $P = w_t - bid + x_t$ ($t = 1, 2, 3$). Note that $w_t$ is always larger than $w_t - 1 + E(x_t)$, even when comparing $w_3$ to requesting an auction and submitting the minimum bid in *Period 1*: $w_1 - 1 + E(x_1)$. The three incumbents who do not acquire the start-up receive $d_i$; e.g., an auction requested in *Period 3* yields $d_3 = €\ 2$ for student participants (all payments are multiplied by a factor of 10 for managers). Because the expected value when winning the auction with the minimum bid ($E(P) = w_t - 1 + E(x_t)$) is always less than the certain value after waiting three periods ($w_3 = €\ 5.00$) and decreasing over time (periods), it is rational to not request an auction but to wait until the start-up goes bankrupt after *Period 3* instead, assuming that all incumbents are not risk-seeking. Moreover, all incumbents can participate in the auction regardless of whether they requested it.

By design, the only reasons that a subject should request an auction are the behavioral uncertainty generated by fellow incumbents and/or a desire for competition. To control the level of threat that evolves from non-cooperative behavior, we asked the subjects to report their subjective *threat levels* in each period (on a 5 point Likert scale; "not threatening" – "existence-threatening") before their decision to request an auction. Based on these threat levels, we identify participants whose behavior was influenced by the anticipated actions of fellow incumbents. Because all of the subjects have access to the same resources and information, the only threat results from not trusting competitors to cooperate in the long run and rescue the start-up from bankruptcy by investing. Because participants realize the highest (expected) values if they request the auction in *Period 1*, it is rational to do so right away (a preemptive behavior of sorts; Fishman, 1989; Levin & Peck, 2003). In this case, the (seemingly risk-seeking) subjects start the auction just to see whether they can obtain the start-up for a bargain, but they would not place any bids above the start-up's real value. Subjects with this strategy can be identified because they would request an auction in *Period 1* without wanting to win the auction at all costs. However, subjects with a desire for competition would definitely try to win the resulting auction.

Overall, our research questions cannot be tested using real-world data because (*i*) the necessary data are not available; (*ii*) the bidding process is usually not sufficiently structured to test the propositions; and (*iii*) uncertainties exist with respect to the (decreasing) value of incumbents and the start-up. In contrast, our experiment allows us to track all of the incumbents' actions (i.e., auction requests and bids).

### 3.3. Participants

To answer the research questions experimentally, we recruited 108 MBA students from two German universities via advertisements asking for volunteers to participate in a decision-making experiment, with payoffs contingent upon performance. To assure the outside validity of

**Table 1**
Payoff values (in €).

| Period | $w_t$ | $d_t$ | $\underline{X}_t$ | $\overline{X}_t$ | $E(x_t)$ | $w_t - 1 + E(x_t)$ |
|---|---|---|---|---|---|---|
| 1 | 6.00 | 3.00 | −2.00 | 1.50 | −0.25 | 4.75 |
| 2 | 5.50 | 2.50 | −2.00 | 2.00 | 0.00 | 4.50 |
| 3 | 5.00 | 2.00 | −2.00 | 2.50 | 0.25 | 4.25 |

*Note*: $w_t$ is the current value of the incumbent if no auction is requested, i.e. without any auction request, incumbents receive € 5 at the end of a session. If an auction is requested in period *t*, all incumbents not winning the auction have a reduced value of $d_t$ that is also their *ex ante* budget constraint for the auction. The start-up has a value in period *t* that is uniformly distributed between $\underline{X}_t$ and $\overline{X}_t$. The minimum bid is € 1 (×10 for managers). Payoff values for managers have to be multiplied by 10.

[7] We introduced a time limit for the auction request to limit the duration of a session. This time limit was rarely reached and resulted in inactivity by default. This default helped incumbents to sit out the game changer's threat.

[8] The minimal bid increment is € 0.10 (€1.00) for students (managers).

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the experiment, we recruited 40 managers who work in the M&A departments of five international companies in the telecommunications ($n = 8$), media ($n = 12$) and E-Commerce retail industries ($n = 12$), along with managers who work for a leading strategy consulting firm ($n = 8$). All of the manager sessions were conducted on the premises of their respective companies. Experiments were conducted with either only students or only managers. With respect to the demographics of the experimental subjects, 53% (80%) of the students (managers) are male, with an average age of 25 (32) years (sd: 2.8 (6.5)).

We provided each subject with hard copies of the experiment instructions, which explain the scenario and the incentive scheme in detail (see Appendix A). Furthermore, the instructions were read aloud to students or managers to assure identical information levels for all subjects. To verify whether they understood the structure of the game and the payment consequences, the subjects were asked to rate their understanding of the experiment (1–5 point scale "*I don't understand anything*" to "*I understand every aspect*") and to calculate the expected values for two different scenarios (see Appendix B). Subjects were only allowed to participate in the experiment if they formulated correct answers and solutions to questions 2, 3, and 4. The mean self-assessed level of understanding is 4.42 (4.08) with a standard deviation of .60 (.66), implying that the subjects' decisions did not result from confusion.

Four subjects, who were not allowed to communicate with each other, participated in each 45-min session. After the experiment, subjects received an individual payoff in addition to a show-up fee (€ 2 for students and € 20 for managers). Even in the worst-case bidding scenario, the participant's overall payoff could not be negative—the winning bid was constrained by the available funds $w_i$; the minimum value of the start-up was € −2 (€ −20) and thus could be paid using the show-up fee.

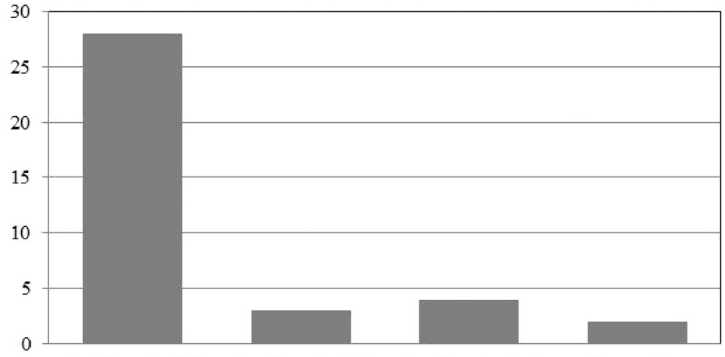
### 3.4. Results

In line with Drehmann et al. (2005), we find that students and managers do not significantly differ in their behavior: Managers show a slightly more aggressive behavior with respect to how often they request auctions (1.8 vs. 1.4 requests (sd: 0.88; 0.57)), how early they do (in *Period* 1.20 vs. 1.36 (sd: 0.61; 0.69)), and how high they bid (2.41 vs. 2.20 mean highest individual bid (sd: 0.96; 1.01)). However, their actual payment is not significantly different after taking the payment factor of 10 into account; it is only slightly higher for managers because they almost always request an auction during *Period 1* (see Fig. 2). Because both groups show no significant differences, we continue by reporting the combined results.

To address RQ1 where we ask about the likelihood of incumbents initiating an auction, we need to analyze auction requests by period. As mentioned above, it is rational to cooperate and not request an auction since doing so reduces the welfare of all participants and does not exclude other incumbents from bidding. More specifically, requesting an auction never increases the expected payoff—either for the auction initiator or for the other incumbents. As shown in Fig. 2, all incumbents decided to cooperate and ignore the start-up over all 3 periods in only 2 out of the 37 sessions (5.2%). In the vast majority of sessions, subjects requested an auction and reduced their welfare: The mean payoff was € 2.86 (minimum: € −1.50, maximum: € 5.50, sd: 0.99; managers' payoffs: ×10; excluding the show-up fee), as opposed to a possible € 5.00 if no auction was requested. Despite the obvious experimental setting, the subjects did not cooperate by ignoring the start-up.

However, not all subjects behaved alike. A detailed analysis of individual auction requests shows that approximately 60% of all of the auctions were only initiated by one incumbent (see first column in Fig. 3). On average, 2.5 incumbents were willing to cooperate, but they were lured to compete in the auction (*Stage 2*). Subjects requesting an auction preferred to do so in *Period 1* (28 out of 35 sessions). Both results lead to the preliminary conclusion that (on average) incumbents do not behave irrationally, but may fear to be lured to compete in an auction in a later period. To test how much the participants trust their competitors to cooperate, we analyzed the individual threat levels. Although all participants received the same information, their individual interpretations and subjective threat levels varied. The results show that threat levels in *Period 1* ($r = .22$, $p < 0.01$; $n = 148$), *Period 2* ($r = 0.37$, $p < 0.05$; $n = 36$), and *Period 3* ($r = 0.43$, $p < 0.05$; $n = 24$) are significantly correlated with auction requests. Hence, we find that higher subjective threat level indeed increase the likelihood of an auction request and decrease the likelihood of cooperation.

To distinguish between two possible reasons for requesting an auction, we analyze the relationship between auction requests and subsequent bids. If the main reason for requesting an auction is to preempt




| | Auction started in Period 1 | Auction started in Period 2 | Auction started in Period 3 | No auction started | Total |
|---|---|---|---|---|---|
| Students | 19 | 3 | 3 | 2 | 27 |
| Managers | 9 | 0 | 1 | 0 | 10 |

*Note:* An auction is started if at least one incumbent requested the auction. If an auction is started in *Period 3* this implies that no requests had been submitted in P*eriods 1* and *2* and at least one incumbent requested an auction in *Period 3*.

**Fig. 2.** Number of auctions started. *Note*: An auction is started if at least one incumbent requested the auction. If an auction is started in *Period 3* this implies that no requests had been submitted in P*eriods 1* and *2* and at least one incumbent requested an auction in *Period 3*.

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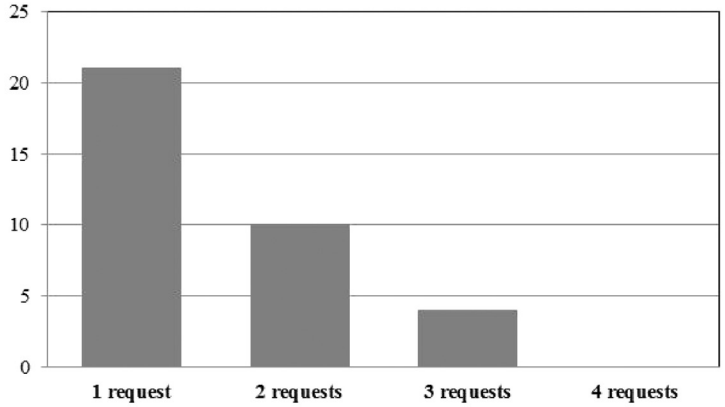



| | 1 request | 2 requests | 3 requests | 4 requests | Total |
|---|---|---|---|---|---|
| Students | 16 | 8 | 1 | 0 | 25 |
| Managers | 5 | 2 | 3 | 0 | 10 |

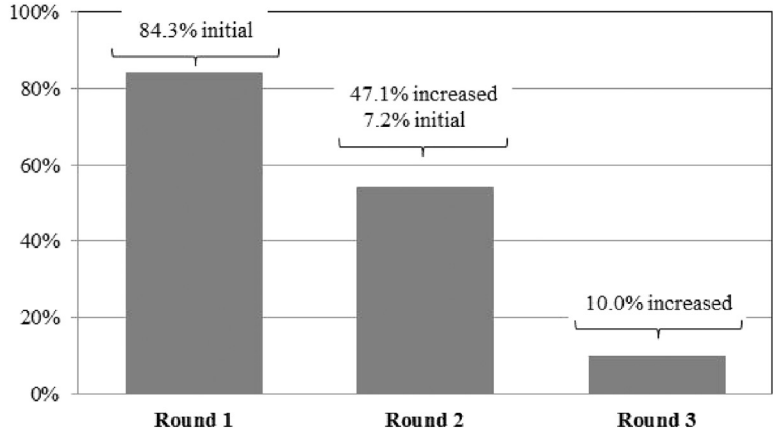
*Note:* In two sessions, no auction was requested and thus we observe bids only in n=35 sessions.

**Fig. 3.** Number of auctions requested by number of incumbents. *Note*: In two sessions, no auction was requested and thus we observe bids only in $n = 35$ sessions.

other incumbents' auction requests, we assume that the requesting incumbent does not want to win the auction under all circumstances. However, the desire for competition should motivate an incumbent to make the highest bid in an auction regardless of its economic consequences; i.e., we would observe a winner's-curse type of behavior. In addition, subjects are more likely to increase their bids in subsequent auction rounds if they have a desire for competition. Thus, auction requests and winning bids should be positively related and bid revisions are more frequent.

However, we find mixed results for the relationship between auction requests and bidding behavior. Only 13 of the 53 subjects (approx. 25%) aggressively requested an auction, i.e., their highest bids exhibit risk-seeking. Because 14 of the remaining 95 subjects were risk-seeking in the auction (even though they did not request it), a desire for competition is not the only reason to request an auction. Regarding preemptive behavior, it is obvious that subjects substantially overestimated the propensity of their competitors to call an auction; withholding their own auction requests would have reduced the probability of an auction to less than 50% (on average, only 1.5 subjects per session requested to start an auction).

In RQ2, we ask about how incumbents' bids evolve during the auction rounds if the number of actual bidders and the level of their submitted bids are unknown to each bidder. If an auction has been requested, incumbents should submit their bids in the first round. As shown in Fig. 4, 84.3% of the participants submit a bid in the first round. Although competitive behavior may determine the decision of whether to bid in an auction, it should not influence the size of the bid. Increasing a bid in subsequent rounds is however not rational given that no additional relevant information is released—neither information regarding the highest bid (or any other bid) nor the number of participating bidders.




| | Round 1 | Round 2 | Round 3 |
|---|---|---|---|
| Students | 85.0% | 58.0% | 4.0% |
| Managers | 82.5% | 45.0% | 25.0% |

*Note:* Values indicate the percentage of participants that placed a bid in the three rounds of the 35 auctions; n=140 ($n_{students}$=100; $n_{managers}$=40).

**Fig. 4.** Percentage of bidding participants. *Note*: Values indicate the percentage of participants that placed a bid in the three rounds of the 35 auctions; $n = 140$ ($n_{students} = 100$; $n_{managers} = 40$).

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As a result, incumbents cannot update their expectations, which may lead to a higher bid only on the basis of changing preferences over time, not because there is any additional information.[9] However, 47.1% of the first round bids increased in *Round 2* (10.0% increase in *Round 3*), even though subjects had not received additional information. On average, bids increased by 30% from *Round 1* to *2* ($n = 66$, sd: 0.38) and by 8% from *Round 2* to *3* ($n = 7$, sd: 0.06). The increases in bids resulted from competition among the subjects (the same applies to the 7.2% of the subjects who started bidding only in *Round 2*).

To analyze whether the monetary value of incumbents' bids is related to the perceived level of threat, we estimated an OLS regression model. Here, we used each person's maximum bid as the dependent variable. As independent variables, we used (*i*) the individual perceived threat level of the last period; (*ii*) a dummy variable indicating whether the person had requested the auction or not; and (*iii*) a dummy variable indicating a student vs. manager participant. We find that the monetary value of a bid is significantly influenced by the individual threat level (regression coefficient of 0.20, standard error = 0.10, $p < 0.05$). The two other variables show no significant impact. The results show that the level of perceived threat does not only influence the likelihood of auction requests, it also induces higher bids.

By controlling for other explanations in our experimental design, our findings show that although individual incumbents know that a start-up has limited resources and will eventually vanish, an auction is initiated in the majority of sessions in the experiment. As shown by the high threat levels, the subjects feared that their competitors would not cooperate and, thus, would ultimately keep the start-up alive. Anticipating competitors' sub-optimal behavior, incumbents' best response is to request an auction in *Period 1*. Threat levels not only lead incumbents to initiate auctions but also influence bidding behavior—bid values increase with increased threat levels.

## 4. Discussion

This study contributes to the existing literature on M&As by providing insights into the role of competition in dynamic takeover behavior of start-ups. In a series of experiments that address our two research questions, we show that despite an obvious lack of reasons for taking over an unprofitable start-up company, uncertainty about competitors' reactions leads to auctions and, subsequently, to takeovers. This effect can be observed even if incumbents are aware that initiating a bidding process for the start-up will very likely lead to individual losses. Consequently, we find support for the fact that unprofitable start-ups may well pursue a successful "born-to-be-sold" strategy and achieve a profitable exit.

Relying on a conceptual framework that we apply to an online market setting, we find substantial opportunities for strategic behavior by start-ups' investors that may lead to severe outcomes for incumbents. Specifically, the targeted diffusion of noisy signals about a start-up's value increases the likelihood of bidding as well as the levels of bids as other firms are lured into the auction. The resulting behavior may lead to even greater competition and therefore increases the perceived threat level of the start-up. The uncertainty with respect to a start-up's value, its financial resources, and, of course, potential competitors' reactions suffices as catalyst for a takeover. This implies that a start-up's stakeholders, such as venture capitalists, may strategically influence the M&A process in their favor (Kesner, Shapiro, & Sharma, 1994). Specifically, such investors may use information asymmetry to systematically leak information about competitors and their intentions (for example, via blogs such as *techcrunch.com*) to actually increase incumbents' uncertainty (Fassin, 1993). Understandably, investors would use such hidden actions based on the asymmetrically distributed information to maximize their self-interest (namely, a quick and profitable exit; Zider, 1998) to the disadvantage of the incumbents (Schnebel & Bienert, 2004).

It is not new for a founding company to operate solely under a strategy of being taken over. In the 1800s, *Standard Oil* built its monopoly on acquiring competing refineries that were intentionally founded for that purpose (McGee, 1958). However, online environments make it easier to execute this strategy as the economics of network externalities play a major role in the online business by increasing the likelihood for entrants to grow on a fast scale threatening current market leaders by simply destroying their business model. In recent years, a considerable number of technology-based start-ups such as *Instagram*, *Skype*, and *Tumblr* have successfully entered the market with free services that have attracted millions of users. Given their free superior service, their success is not surprising (Blodget, 2013; Carlson, 2012). Moreover, despite the fact that these companies had few tangible assets, marginal revenues, little or no profits, and no business model that might promise future profits, they were taken over by incumbents after negotiations that included competitive bids, such as *NewsCorp's* $580 million investment in *MySpace*, *Facebook*'s $1 billion deal to take over *Instagram*, *Yahoo*'s $1.1 billion investment in *Tumblr*, *Google*'s $1.65 billion investment in *Youtube*, *and eBay*'s $2.6 billion investment in *Skype*. The anecdotal evidence not only supports this study's conclusion that competition and uncertainty stimulate M&As but also indicates that a start-up does not even need a sustainable business model to be taken over by incumbents.

Although the results of our experiment with students and managers provide evidence that behavior uncertainty among incumbents might lead to high payoffs for investors in start-ups, there are some limitations of our study that present opportunities for further research. First, we tested our conceptual framework in an experimental setting designed to eliminate alternative influences besides competitive behavior. While this approach helped our contribution by revealing the effect of competition alone, it certainly neglects further important factors that might influence the bidding behavior, e.g., competition for a start-up share in a new valuation round. Further research could extend this study's finding by investigating the implications further real-life attributes. Second, since we observed the incumbents' behavior without verbal communication, it would be interesting to investigate the outcome in a case of intentional strategic bidding behavior by incumbents (for example, bidding intended to systematically harm competitors). Third, knowing that the born-to-be-sold strategy promises a viable option even for unprofitable start-ups to realize an exit, future studies could extend research regarding the entrepreneurs' motivations.

Despite these limitations, this study has provided initial insights about *why and how* negotiation dynamics influence takeover outcomes. We find that start-ups can successfully follow a "born-to-be-sold" strategy by initiating a bidding process among incumbents. However, we hope that the results of this study will help incumbents to act thoughtfully before they are being lured into the bidding process by start-ups.

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## Appendix A. Experiment instructions (managers)

Thank you for participating in this experiment. You will make a series of decisions that directly affect the financial compensation you will receive at the end of the experiment in cash. Please read the experiment description completely and thoroughly before you begin making your decisions.

[9] Note that in case of an auction, it is rational to submit at least the minimum bid given the payoff structure $w_i - 1 + \underline{X}_t = d_i$. Higher bids depend on incumbents' risk perceptions.

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**Note:** Each participant will receive € 20 regardless of the outcome of the experiment. This is not part of the actual experiment and can be seen as reward for showing up today.

*A.1. Initial situation*

You are the manager of a large film studio and get wind of a start-up business (that is, a business new to the market) that provides free downloads of movies off the internet. Their offer is well-received and the customer base is growing rapidly. The main goal of the start-up is to be purchased. You must decide if you want to purchase the start-up, and if so, how much you are willing to pay for it. The purchase holds risks as well as opportunities. You also know that the start-up cannot stay afloat for long without financial input (i.e., buy-out). You have a total of 3 competitors.

*A.2. Phase 1: Make your decision*

The decision phase will last for at most 3 periods. After Period 3, the start-up will disappear from the market if no auction has taken place for its purchase. The experiment will then end. In each period, you must decide if:

1) you ignore the start-up and refuse to initiate an auction for its purchase, or
2) you are interested in its purchase and initiate the auction.

You have 2 min to make your decision. If you fail to submit a choice, it will be assumed that you wish to ignore the start-up. If none of the 4 competitors choose to initiate an auction, the next period begins. (E.g.: All participants ignore the start-up in Period 1; Period 2 begins. All ignore it in Period 2; Period 3 begins...). Your balance is reduced by € 5 after each period.

If no auction has taken place by the end of Period 3, the experiment ends. Each competitor/participant receives € 50 cash—their balance after Period 3. This is in addition to the € 20 show-up compensation.

| | Balance (in €) |
|---|---|
| Period 1 | 60 |
| Period 2 | 55 |
| Period 3 | 50 |

*A.3. Phase 2: Auction*

If at least one participant chooses to initiate an auction, an auction begins. (E.g. all participants ignore the start-up in Period 1; Period 2 begins. A participant chooses to initiate an auction in Period 2, an auction begins.) All 4 competitors can participate in the auction for the start-up once it has been initiated. The minimum bid is € 10. All bids must be placed in (multiples of) € 1 increments and are not to exceed the respective balance (not including the € 20 start-up fee). The balance depends on the period in which the auction is initiated. For example, if the auction begins in Period 1, € 60 is available. Should the auction begin in Period 2, € 55 is available. You have two choices:

1) do not place a bid, or
2) place a bid for the start-up purchase.

You have 2 min to make this decision. If you fail to make a choice, it is assumed that you do not wish to place a bid. **Remember that each bid is binding!!** After the first auction, you will be informed if a highest bid has been placed. However, you will not receive any further information about the highest bid. Then, you have two choices:

1) do not place a further bid (the first bid remains valid), or
2) place a higher bid in an attempt to purchase the start-up.

If the highest bidder is not outbid, s/he purchased the start-up (price = bid). If the highest bidder is outbid, participants are informed once again and a second auction round begins. The procedure is repeated until no new bids arrive with a maximum of three bidding rounds. If there are a number of identical highest bids, a lottery takes place. The participant who purchases the start-up receives the following payoff:

$$Payoff = (BankaccountBalanceoftheperiod - bid\ for\ thestart - up) + chancegainorloss.$$

The start-up's revenues are uncertain; a chance to gain or to lose exists. The revenue is drawn from an equally distributed interval of whole numbers. The following table shows the smallest and largest possible values (minimum and maximum) for this factor "chance."

| | | Uncertain value of start-up for buyer | |
|---|---|---|---|
| Auction started: | Balance (in €) | Minimum (in €) | Maximum (in €) |
| Period 1 | 60 | −20 | 15 |
| Period 2 | 55 | −20 | 20 |
| Period 3 | 50 | −20 | 25 |

**Note:** A negative win (balance less that € 0) will be offset by the show-up compensation.

If an auction takes place and you are not the winner, your account balance is reduced to the values presented in the following table. You will then receive this payout in addition to the € 20 start-up fee. The experiment ends with the purchase of the start-up.

| Auction started: | Balance for non-buyers (in €) |
|---|---|
| Period 1 | 30 |
| Period 2 | 25 |
| Period 3 | 20 |

## Appendix B. Questions before start of the experiment (managers)

1. Do you understand the structure and timing of this experiment? Please use a scale from 1 ("I don't understand anything") to 5 ("I understand every aspect").
2. Is the following statement correct, or not? "There are three decision periods regardless of auction requests." [correct/incorrect]
3. Is the following statement correct, or not? "At the end of each period, an auction is started automatically." [correct/incorrect]
4. In an auction that starts at the end of *Period 1* the highest bid is € 30 and the start-up is bought. What are the minimum and the maximum payment to the buyer of the start-up excluding the show-up fee? [min: € 10/max: € 45]

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