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Title: Transfers of Corporate Control under Asymmetric Information: Hostile versus Friendly Takeovers

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Abstract

The paper presents a model which derives the outcome of a takeover as an equilibrium of a dynamic takeover game with asymmetric information. The target company's value under the incumbent's control is the private information of the incumbent manager. The idea behind the model is that the incumbent manager's response to the initial takeover proposal reveals some of her information to the raider and the target shareholders and influences the parties' decisions and the deal outcome. In equilibrium, depending on the values of parameters, a friendly takeover, a hostile takeover or a takeover failure can occur. According to the model, the outcomes of takeovers depend on the incumbent manager's share of stock in the target company and her private benefits. The model explains the empirical fact that in hostile tender offers the premia are higher than in friendly deals. The results also generate empirical predictions on the target company's market price reaction to the failure and provide a rationale why, after a takeover failure, the target's stock price often remains above its pre-takeover level. This prediction is consistent with some empirical observations.

1 Introduction

The economic importance of transfers of corporate control is widely recognized and receives a great deal of attention from academic researchers. According to considerable empirical evidence on takeovers, friendly and hostile deals are different in frequency, target company and acquirer's characteristics, price reactions during the deal(Barclay, Holderness, 1991; Holmen and Nivorozhkin, 2007; Schwert, 2000). Although the acquirer always offers a premium over the existing market price of the target company (Bruner, 1994), a great number of deals fail (Straub, 2007) due to various reasons.

The objective of this paper is to endogenize the outcomes that are observed in reality and explain why some transfers of control occur through friendly takeovers, some through hostile tender offers, yet others fail. The interests of both - the raider and the incumbent manager- influence the outcome of the takeover. On the one hand, the raider can try to persuade the manager to convince the shareholders to sell control in a friendly deal by offering a suitable price or can attempt to acquire the company despite manager's resistance. On the other hand, incumbent manager's attitudes towards the

takeover can be different. The incumbent manager has security benefits and private benefits from running the company and, thus, has incentives to protect them by fighting against the takeover. Management's resistance against the acquirer's initial offer may also occur as an attempt to increase the initial bid if the incumbent expects to sell her stake at a higher price during the hostile takeover. Nevertheless, some managers will welcome the opportunity to sell the company if the raider's offer is generous enough. In this work the model will address these trade-offs.

The paper is aimed to contribute to the theoretical literature on the outcomes of hostile and friendly takeovers. In the existing theoretical studies the researchers usually concentrate on the particular type of takeover and examine its properties. For instance, Grossman and Hart (1980), Shleifer and Vishny (1986) papers present a classical framework for hostile takeovers and examine the free-riding problem among the minority shareholders of the target company and ways to overcome it. The shareholders do not act cooperatively, therefore, each of them thinks she can retain her shares during the takeover and obtain the value under the raider's control. As the result, the shareholders are willing to sell their shares during the takeover only if the bid is not less than the post-takeover value under the raider's control. Hirshleifer and Titman (1990) examine hostile takeovers and show why observed hostile takeovers sometimes fail. The authors introduce two-sided asymmetric information in their model: the raider has private information about the post-takeover value under her control and the shareholders - about personal costs and benefits of tendering. Each shareholder's minimum acceptable bid depends on her expectations on the post-takeover value and her private costs and benefits of tendering that are not known to the raider. The raider makes a conditional offer to the shareholders, so that the takeover succeeds only if the required fraction of shares is sold to the raider by the dispersed shareholders. In equiibrium the probability of the takeover success is determined endogenously. Bebchuck (1994) develops a framework for examining only negotiated block trades by controlling shareholders and does not analyze hostile takeovers in his model. There are very few papers looking at both possible methods of acquiring control. Burkart et al. (2000) investigate control transfers in companies with a dominant blockholder and otherwise dispersed owners and examine the choice between a negotiated deal and a tender offer. The paper reaches the conclusion that in equilibrium the incumbent manager and the raider will prefer to trade privately and obtain

higher utility at the expense of the minority shareholders. Therefore, hostile tender offers never occur in their model. Berkovitch and Khanna (1991) build up a model with symmetric information in which the acquirer has a choice between mergers and tender offers. The raider can choose between a secret merger and a hostile tender offer that will lead to the competition among potential bidders. At any stage of negotiation of the merger the acquirer can stop and make a tender offer. In equilibrium a merger or a hostile tender offer occurs depending on the the level of synergy gains from the takeover. However, tender offers occur only when the target shareholders provide their managers with golden parachutes that give them higher payoffs in tender offers than in mergers.

This paper allows for both possibilities for the raider: she may try to obtain the incumbent's approval to take over the company or if she faces the incumbent's opposition, try to acquire control in a hostile bidding or withdraw the deal. The main focus is made on the role of incumbent manager's private information about the fair value of the target company under her control and public communication that normally occurs between the target's management, the shareholders, and the potential acquirer during the takeover process. The framework in the paper is similar to Schnitzer (1994), who analyzes the choice of an uniformed raider between a hostile tender offer and a friendly takeover under the incumbent manager's private information. Unlike Schntzer, I assume that the manager affirmation does not necessarily result in the shareholders' approval of the takeover and, therefore, a friendly deal can fail. I also relax the assumption of the fixed exogenous probability of the failure of hostile tender offers. In the model the failure will occur endogenously and will be directly affected by the raider and the manager's equilibrium actions.

I assume that incumbent managers differ in their abilities to generate value for the shareholders (for simplicity, I introduce two types of managers: a high and a low type - that correspond to high and low value of the company under their control). Before the takeover attempt the manager's skills and the correspondent true value of the company under the incumbent manager's control are not observed by the shareholders and the raider. The key idea behind the model is that the incumbent manager's response to the initial takeover proposal of the raider may reveal some of her information to the raider and the target shareholders and influence their decisions and the outcomes of the deal. The raider can either try to acquire both types of companies using the

same method or make the managers choose different actions and, thus, force them to reveal their private information. Separation can be beneficial to the raider, if she manages to friendly negotiate a lower price with the shareholders and manager of the low type company. However, a more efficient, high-type, incumbent manager will also benefit from this information revelation: she can credibly signal to shareholders the higher fair value of the company under her control, so that they will demand a high price from the raider that in some cases can be too expensive for the raider to launch a takeover. Moreover, the information revelation affects the credibility of the raider's threats: if the shareholders understand that the incumbent manager is more efficient, the raider might lose the possibility to acquire the company in hostile bidding. Her hostile attempt will not be successful, and the failure will occur. Therefore, the raider faces the trade-off between acquiring companies from both, more and less efficient managers, in case the managers' actions are the same and their signals are not informative to the shareholders and negotiating a lower price from less efficient managers when the private information is revealed.

The model generates friendly and hostile takeovers and takeover failures as equilibrium outcomes depending on the values of several parameters. I show that even if the raider cannot acquire the high type at its fair value under the incumbent manager's control, she may prefer separating the managers and taking over only low-type companies if she manages to negotiate a lower price than the post-takeover value. The possibility to negotiate a lower price with the low-type incumbent manager appears only if the low-type managers security and private benefits are small, so that the low-type manager will accept the offer under the treat of the deal withdrawal. In separating equilibria failures of the hostile takeovers of the high-type companies occur. Thus, in such equilibria hostile takeovers do not happen, and the raider creates a credible threat of withdrawing the deal for the low-type manager that forces her to accept a friendly deal at a lower price than will be demanded in a hostile takeover.

The model offers several empirical predictions on the influence of different companies' characteristics (including possibility to extract private benefits of the incumbent manager and her ownership) on takeover outcomes. Also, there are several predictions on the price reactions during the takeover process. The model predicts a lower price reaction to the announcement of friendly deals than of hostile takeovers. In the model takeover failures occur only with high-

type companies. Thus, the failure is associated with positive news about the incumbent manager's higher efficiency and is expected to increase market price of the company. These price reaction facts are consistent with some empirical findings (Schwert, 2000; Martynova, Renneboog, 2006).

The rest of the paper is organized as follows. Section 2 describes a model set up. In section 3 the solution of the tender offer stage. In section 4 the solution under symmetric information case is discussed. Section 5 examines the framework with asymmetric information. Section 6 summarizes the main results, presents comparative statics and empirical predictions. Directions for future research and conclusion are presented in Section 7.

2 Model

I consider a company in the market that is run by a manager with $\alpha < \frac{1}{2}$ fraction of shares, the rest $1 - \alpha$ being hold by dispersed shareholders. The manager extracts private benefits Z.

There are two types of managers: a high-type manager generating value X^H for the company and a low-type manager generating value X^L; $X^L \leq X^H$. The true value of the company under the incumbent manager's operation is her private information and is not observed by the shareholders and the raider. For instance, this value can reflect the quality of company's corporate governance or the value of a long-term project currently run by the manager the outcome of which is not observed by the market during its development, but will be known in future and bring the value to the company in the long-run perspective. I assume additionally, the incumbent manager cannot sell her stake immediately in the market. Thus, it is possible to state that even if the market agents overvalue the company, the incumbent manager still regards the true value of the company under her control as the part of her utility.

The fraction of high-type managers is θ, that is a common knowledge.

Definition : Define $\overline{X}$ as the expected value under the incumbent manager's control:

$$\overline{X} = \theta X^H + (1 - \theta) X^L$$

Potentially, another company (a raider) can run a company. The value under the raider's management is X^R. We assume that the raider makes a offer and wants to get some $\beta \geq \underline{\beta}$ of shares to obtain control over the company. Following Grossman and Hart's (1980) version of solving the free-rider problem

of the dispersed shareholders I additionally assume that the raider plans to make exogenous dilution of the value under her control after the takeover. This dilution allows the raider to extract φ fraction of the post-takeover value as her private benefits, leaving the dispersed shareholders with the post-takeover value of $(1-\varphi)X^R$.

Assumption 1: The raider's management is efficient for the shareholders of the low-type companies:

$$X^L \leq (1-\varphi)X^R$$

Assumption 2:[1] The company under the raider's control has a higher value than the expected value under the incumbent manager's control:

$$\overline{X} < X^R < X^H$$

The game proceeds in the following way.

t=1. The raider makes a take-it-or-leave-it offer to the company at price P for the stake β. The raider's communication is public, so her offer is observed by the shareholders.

t=2. The incumbent manager accepts or rejects the offer. Her actions are also observed by the dispersed shareholders. If the manager accepts the offer the deal proceeds to the shareholders' voting at the shareholders' meeting, where the shareholders jointly decide whether to approve the offer or reject it. If the meeting accepts the offer, the raider buys the shares from the shareholders on the pro rate principle (buys β fraction of each shareholder's share of stock). Hence, each shareholder gets β share of the raider's initial price and $1-\beta$ fraction of the post-takeover value per each of her shares:
$\beta P + (1-\beta)(1-\varphi)X^R$. Each shareholder is forced to sell the required fraction of her shares and cannot retain it. If the shareholders' meeting votes against the raider's initial offer, the raider goes away.

t=3. If the manager rejects the offer the raider decides whether to make an unconditional unrestricted hostile tender offer at price P_{HT}[2]. The shareholders non-cooperatively decide whether to sell or retain their shares. Following Tirole (2006), panic equilibria where the shareholders sell their shares at the

[1]The case $X^R \geq X^H$ does not generate new results to the results obtained in the paper.

[2]This assumption is used for simplicity. If an unconditional tender offer for β share of stock in the company is assumed instead, the results of the model will not change qualitatively.

price under the expected value under the incumbent manager's control are ruled out.

The timing of the game is illustrated on Figure 1.

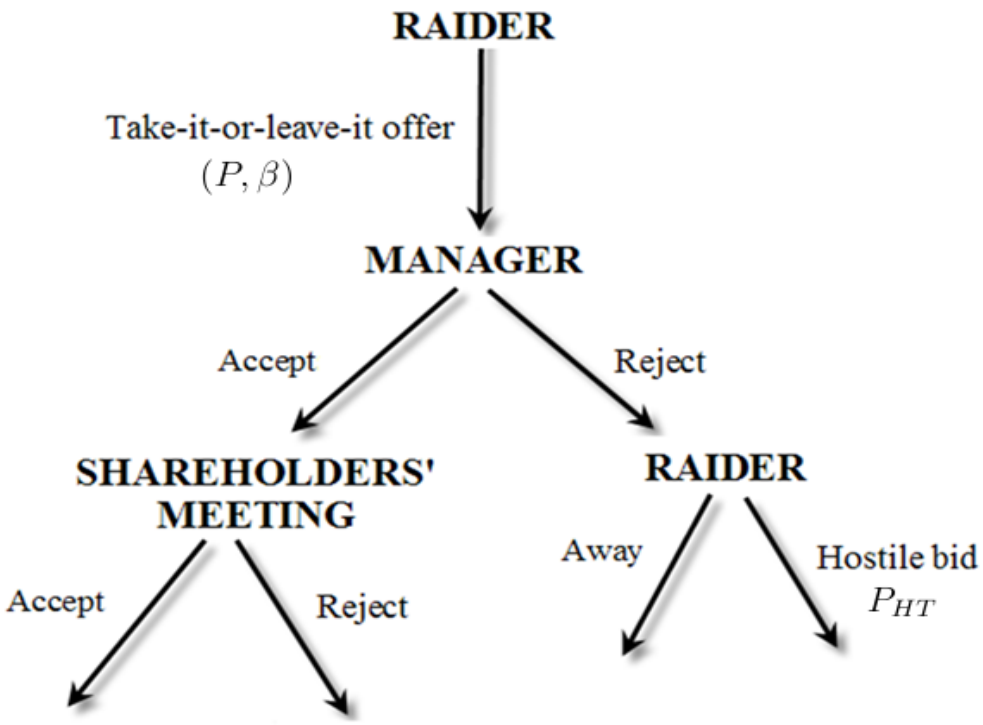


Figure 1. The game tree

Therefore, in a friendly deal the raider avoids the shareholders' free-riding problem because the shareholders are coordinated by the shareholders' meeting so that they do not have an option to retain their shares during the takeover as in the hostile takeover framework. Their alternative payoff refers to the value under the incumbent manager's control if they reject the raider's offer. Hence, the shareholders' meeting will approve the takeover, if the raider's offer brings each shareholder a higher value per share than the value under the incumbent's management. In contrast with the friendly takeover, in case of a hostile takeover the shareholders are not coordinated and make their decisions independently regarding the decisions of the other shareholders as given. Hence, the free-riding problem of the shareholders occur.

3 Preliminaries: Tender offer stage solution

Let's first analyze the case when the incumbent manager rejects the initial offer, and the raider decides whether to make a tender offer or withdraw the takeover. The raider's choice depends on the price she has to offer to the shareholders in order to persuade them to sell their shares. The shareholders' decision to retain or sell shares depends on their beliefs about the company's type.

Definition : Let $\kappa \in [0,1]$ be the raider and the dispersed shareholders' belief that the company is of high type. The corresponding expected value under the incumbent manager's control is $\widetilde{X}(\kappa) \in [X^L, X^H]$:

$$\widetilde{X}(\kappa) = \kappa X^H + (1-\kappa)X^L$$

The shareholders' individual rationality constraint for selling the shares in a hostile tender offer depends on the relationship between the post-takeover value and the expected value under the incumbent manager's control. When the post-takeover value is higher than the expected value under the incumbent manager's control $(1-\varphi)X^R \geq \widetilde{X}(\kappa)$ free-riding of the minority shareholders occur. Each shareholder regards the decision of the other shareholders as given and compares the bid and the post-takeover value, assuming that other shareholders will sell their shares to the raider in the latter case. As the result, each shareholder will sell the shares if and only if the price exceeds the post-takeover value: $P_{HT} \geq (1-\varphi)X^R$.

If the value under the raider's control is lower than the expected value under the incumbent manager's control $(1-\varphi)X^R < \widetilde{X}(\kappa)$ under the assumptions of no panic equilibria the shareholders sell their shares to the raider when the price (weakly exceeds the expected value under the incumbent manager's control: $P_{HT} \geq \widetilde{X}(\kappa)$.

If the price in a tender offer satisfies the shareholders' individual rationality, they sell their shares to the raider, who obtains a profit $\pi = (X^R - P_{HT})$. The raider initiates a tender offer after the incumbent manager' rejection of the initial bid if this profit is non-negative $(X^R - P_{HT}) \geq 0$ or $X^R \geq P_{HT}$. In this case she chooses the minimum price satisfying the shareholders' individual rationality constraint to obtain the highest payoff. If the raider's profit given the minimum acceptable price is negative, the raider does not launch a tender offer.

The above argument leads to the following lemma summarizing the raider's choice and the outcome of the deal after the incumbent manager's rejection.

Lemma .1. *Consider a subgame where the raider decides whether to initiate a tender offer at price P_{HT} after the manager's rejection. Assume the expected value under the incumbent manager's control corresponding to the raider and the dispersed shareholders' belief κ is $\widetilde{X}(\kappa)$. Then*

1) if $(1-\varphi)X^R \geq \widetilde{X}(\kappa)$ the raider acquires the company in the tender offer at $P_{HT} = (1-\varphi)X^R$ and gets a profit $\pi = \varphi X^R$,

2) if $X^R \geq \widetilde{X}(\kappa) > (1-\varphi)X^R$ the raider acquires the company in the tender offer at $P_{HT} = \widetilde{X}(\kappa)$ and gets a profit $\pi = (X^R - \widetilde{X}(\kappa))$,

3) if $\widetilde{X}(\kappa) > X^R$ the raider does not make a tender offer.

I will refer to this results later to analyze the outcomes of the game given different shareholders' equilibrium beliefs on the manager's type in this subgame.

4 Symmetric information

In this section I will examine the outcomes of the game in case of symmetric information when both the raider and the dispersed shareholders know the true type of the manager and the company's value under her control. The game is solved using backward induction. First, let's consider the subgame after the incumbent manager's approval of the initial offer. In the subgame the shareholders' meeting votes for or against the initial offer.

Lemma .2. *Consider the symmetric information case. Assume the incumbent manager accepts the raider's initial offer (P, β). Then*

1) the shareholders' meeting of the low-type company approves the takeover if the initial offer satisfies:

$$\beta P + (1-\beta)(1-\varphi)X^R \geq X^L,$$

2) the shareholders' meeting of the high-type company approves the takeover if the initial offer satisfies:

$$\beta P + (1-\beta)(1-\varphi)X^R \geq X^H.$$

Proof. The proof is straightforward. If the shareholders' meeting approves the offer, each shareholder sells β fraction of her shares at P and retains $1-\beta$ fraction of her stake in the new company. Therefore, the takeover brings each shareholder the payoff $\beta P + (1-\beta)(1-\varphi)X^R$. In case of rejection, the raider withdraws the deal, and each shareholder obtains the value under the incumbent manager's control: X^H and X^L correspondingly for the shareholder of the high-type and low-type company. Therefore, the approval is preferable if it does not bring a lower payoff than the value under the incumbent manager's control. □

If the incumbent manager rejects the initial offer, the raider decides whether to initiate a tender offer. The following lemma summarizes the results in this subgame:

Lemma .3. *Consider the symmetric information case. Assume the incumbent manager rejects the raider's initial offer* (P, β)*. Then*

1) The raider acquires the low-type company in a tender offer at $P_{HT} = (1-\varphi)X^R$ *and gets a profit* $\pi = \varphi X^R$*.*

2) The raider does not make a tender offer to the high-type shareholders.

Proof. First, note that according to assumption 2: $X^R \geq \overline{X} \geq X^L$. The rest follows from Lemma 1. □

The incumbent manager rationally anticipates the outcomes of the game that will follow her approval or rejection of the initial offer and chooses the action that will bring her a higher payoff. Therefore, if the raider makes an offer that brings the incumbent manager a lower payoff than in case of rejection, the manager will reject. Making a offer associated with a higher payoff to the incumbent is not optimal to the raider, since she can acquire the company in the hostile bidding. The raider's offer can also make the incumbent indifferent between accepting and rejecting the initial offer. The following proposition summarizes the outcomes of the game under symmetric information:

Proposition .1. *Consider the symmetric information case.*

1) The low-type companies are always sold at post-takeover value $P = (1-\varphi)X^R$ *in either hostile or friendly takeovers.*

2) The high-type companies are not acquired.

Proof.

1)The raider (weakly) prefers to make an offer that will be suitable for the shareholders' meeting. Otherwise, the incumbent manager can accept this offer (if her payoff from staying in control is high) and the raider will lose the possibility to acquire the company and get a positive profit after the shareholders' meeting votes against the takeover. Therefore, the initial offer satisfies the shareholders' meeting participation constraint and will be accepted if the incumbent manager approves it. Thus, the low-type incumbent manager cannot prevent the takeover, so she has to compare the price she will obtain on her share of stock α in case of a friendly deal and a hostile takeover. She will choose to accept the offer if $\beta P + (1-\beta)(1-\varphi)X^R \geq (1-\varphi)X^R$. So if the raider wants to acquire the company in a friendly deal she will offer the minimum suitable $P = (1-\varphi)X^R = P_{HT}$. The raider and the incumbent manager are irrelevant between the two methods of takeover.

2) According to lemma 3, the raider will not initiate the hostile takeover after the manager's rejection. The high-type companies will not be acquired in friendly deals either, since the initial offer satisfying the individual rationality constraint of the shareholders' meeting of the high-type company (lemma 2):

$$\beta P + (1-\beta)(1-\varphi)X^R \geq X^H$$

also leads to the negative profit for the raider $\pi = (X^R - X^H) < 0$. Therefore, the high-type companies are not acquired if $X^H > X^R$. □

5 Asymmetric information

In case of asymmetric information the raider and the shareholders do not know the true type of the incumbent manager and the value under her control. According to lemma 3, the raider will not make a tender offer to the high-type shareholders if they know the true type of their company and realize that it's fair value is X^H. Therefore, if the manager's private information is revealed to the market, the raider will not initiate a hostile tender offer against the high-type company. The incumbent manager will stay in control. However, when both types of managers behave the same way and pool their actions, the market cannot learn the true type of the company. Then the high-type companies can be acquired by the raider since the shareholders stay uninformed about the fair

value of the company under the incumbent manager's control. Thus, even the shareholders of the high-type companies will accept a lower price than X^H.

I will look for pure strategy Perfect Bayesian equilibrium in this game.

First, let's consider a subgame in which the raider has made an offer (P, β) to the incumbent manager. Let's look at all pure strategy equilibria in this subgame, including:

- *separating equilibria*: the low-type manager accepts the offer, the high-type manager rejects;
  - the shareholders' meeting approves the takeover
  - the shareholders' meeting votes against the takeover
- *separating equilibria*:the low-type manager rejects the offer, the high-type manager accepts;
  - the shareholders' meeting approves the takeover
  - the shareholders' meeting votes against the takeover
- *pooling equilibria*: both managers accept the offer;
  - the shareholders' meeting approves the takeover
  - the shareholders' meeting votes against the takeover
- *pooling equilibria*: both managers reject the offer
  - the shareholders' meeting approves the takeover (on the out-of-equilibrium path)
  - the shareholders' meeting votes against the takeover

Then I'll point out the preferable situations from the view point of the raider's expected payoff.

5.1 Separating: Low-type manager accepts, high-type manager rejects; the shareholders' meeting approves the takeover

In this equilibrium, the incumbent manager's action reveals information to the raider and dispersed shareholders. The raider can acquire only low-type companies via a friendly deal. If she makes initial offer to the high-type

company, the incumbent manager rejects it. After the rejection the raider does not initiate the hostile bid by offering directly to the shareholders, since the information about high type of the company is revealed to the raider and the dispersed shareholders, so that the raider will have to offer at least X^H, that is unprofitable to her by assumption.

The high-type manager will choose to reject the initial offer in case the friendly deal brings her a lower payoff than her payoff from the control over the company normilized by her share:

$$\alpha(\beta P + (1-\beta)(1-\varphi)X^R) \leq \alpha X^H + Z \qquad (IC^H)$$

$$\beta P + (1-\beta)(1-\varphi)X^R \leq X^H + \frac{Z}{\alpha} \qquad (IC^H)$$

If the low-type manager deviates and rejects the offer, the raider will not launch a hostile tender offer. In separating equilibrium, deviation leaves the low-type manager in control over the company. According to the assumption of the model, the incumbent manager cannot sell her stake immediately in the market at the price of the high-type company in case of deviation. Hence, the incentive compatibility constraint for the low-type manager will be

$$\beta P + (1-\beta)(1-\varphi)X^R \geq X^L + \frac{Z}{\alpha} \qquad (IC^L)$$

Additionally, the raider's offer should persuade the shareholders' meeting to accept the raider's offer:

$$\beta P + (1-\beta)(1-\varphi)X^R \geq X^L \qquad (IR)$$

The incentive compatibility constraint of the low-type manager is stronger than the individual rationality constraint of the shareholders' meeting.

Proposition .2. *Consider the subgame following the raider's initial offer (P, β). A separating equilibrium of this subgame in which the low-type manager accepts, the high-type manager rejects the initial offer, the shareholders' meeting approves the takeover exists if and only if (P, β) satisfies*

$$\beta P + (1-\beta)(1-\varphi)X^R \leq X^H + \frac{Z}{\alpha} \qquad (IC^H)$$

$$\beta P + (1-\beta)(1-\varphi)X^R \geq X^L + \frac{Z}{\alpha} \qquad (IC^L)$$

The best offer (P, β) in terms of the raider's expected profit that induces such separating equilibrium is any offer satisfying $\beta P + (1-\beta)(1-\varphi)X^R = X^L + \frac{Z}{\alpha}$. The raider's profit is $\pi = (1-\theta)(X^R - X^L - \frac{Z}{\alpha})$.

Remark. Formally, two types of managers also separate themselves in the subgame where the raider offers price $\beta P + (1-\beta)(1-\varphi)X^R < X^L$ that is not acceptable for the shareholders of the low-type companies. The shareholders' meeting will vote against the takeover. The incumbents are indifferent between accepting and rejecting the offer, since in both cases the deals fail. Therefore, there is no profitable deviation for both of them. However, the raider will get zero profit in this case and will not choose this price in equilibrium, if there is an opportunity to obtain a positive profit. As we will see later, this equilibrium will be never realized in the whole game.

5.2 Separating: High-type accepts, low-type rejects, shareholders' meeting votes against the takeover

If the raider offers the price, that is not acceptable for the shareholders' meeting of the high-type company, the high-type manager can find it profitable to accept the offer of the raider and stay in control, whereas the low-type manager will reject the offer in order to proceed to the hostile takeover.[3] In this equilibrium the incumbent managers rationally anticipate that the shareholders' meeting will reject the raider's offer and the takeover will fail. Thus, the incumbent manager stay in control if they accept the initial offer. Therefore, the incumbent manager's payoff in case of acceptance is her security benefits and private benefits. Rejection proceeds to the hostile tender offer stage, where the raider acquires the company at the post-takeover value. Incentive compatibility constraint for the high-type manager implies that her security and private benefits when she stays in control are higher than the post-takeover value of her share of stock, whereas the low-type manager obtains a higher payoff in the hostile takeover, when she sell her shares to the raider. This argument leads to the following proposition:

[3] This type of equilibrium with the shareholders meeting of the high-type company accepting the offer does not exist since the low-type manager will deviate and accept the offer to obtain a higher payoff in a friendly takeover: in this case the initial offer would have to satisfy the individual rationality constraint of the shareholders of the high-type company at the shareholders' meeting: $\beta P + (1-\beta)(1-\varphi)X^R \geq X^H > (1-\varphi)X^R$ because $X^H > X^R \geq (1-\varphi)X^R$ so that the low-type manager would prefer to deviate and accept the offer.

Proposition .3. *Consider the subgame following the raider's initial offer* (P, β)*. A separating equilibrium of this subgame in which the low-type manager rejects, the high-type manager accepts the initial offer, the shareholders' meeting votes against the takeover exists if and only if* (P, β) *satisfies*

$$X^H + \frac{Z}{\alpha} \geq (1-\varphi)X^R \qquad (IC^H)$$

$$X^L + \frac{Z}{\alpha} \leq (1-\varphi)X^R \qquad (IC^L)$$

$$\beta P + (1-\beta)(1-\varphi)X^R \leq X^H \qquad (IR)$$

In this equilibrium the raider acquires only low-type companies in hostile tender offers. Her profit is $\pi = (1-\theta)\varphi X^R$ in any such separating equilibria.

The equilibrium appears to be quite unusual. In fact, the motivation behind the manager's actions in this situation is opposed to her actions: the high-type manager approves a friendly deal and negotiations in order to make the shareholders' meeting reject the offer and prevent the takeover. The low-type manager understands that she can benefit from the acquisition and rejects the initial offer to compel the raider to bid in a hostile tender offer. Nevertheless, this outcome can be realized in a more realistic situation. Assume the modified game such that the raider can additionally make a tender offer to the shareholders at $t = 1$ bypassing the manager. The manager can make a cheap-talk message of approval or rejection after the offer is made. Assume the raider offers the price at the post-takeover value to the shareholders $P = (1-\varphi)X^R$. If $X^L + \frac{Z}{\alpha} \leq (1-\varphi)X^R$ the low-type manager benefits from the takeover and there is an equilibrium in which the managers send different cheap-talk messages to the shareholders and separate themselves. Therefore, the shareholders of the low-type company will sell their their shares, whereas the shareholders of the high-type company will realize that the offer is inappropriate to them and retain their shares: $X^H > (1-\varphi)X^R$. The outcome will coincide with the above discussed equilibrium: low-type companies are acquired at the post-takeover value and the high-type companies stay under the incumbent manager's control.

5.3 Pooling: Both types of managers accept

There is an equilibrium in the subgame, such that both types of managers accept the offer. In order to persuade the shareholders and managers to accept the offer, the raider should offer a high enough price. Shareholders' meeting

will vote for the takeover if they obtain the value not less than under the incumbent's control. In pooling equilibria, managers' actions provide no additional information about the manager's true type. As the result, the dispersed shareholders consider the expected value of the company under the incumbent manager's control when they vote on the shareholders' meeting and accept the offer if the initial offer satisfies:

$$\beta P + (1-\beta)(1-\varphi)X^R \geq \overline{X} \qquad (IR)$$

The manager accepts the offer if rejection is not associated with a higher payoff. The raider's payoff from rejection dependents on the raider's and shareholders' out-of-equilibrium beliefs about the company's type.

Definition :

1) Let $\kappa \in [0,1]$ be an out-of-equilibrium belief of the raider and dispersed shareholders. $\widetilde{X}(\kappa) \in [X^L, X^H]$ is the corresponding expected value value of the company under the incumbent manager's control:

$$\widetilde{X}(\kappa) = \kappa X^H + (1-\kappa)X^L$$

2) Let θ_1 be a belief such that expected value under this belief equals the post-takeover value:

$$\widetilde{X}(\theta_1) = \theta_1 X^H + (1-\theta_1)X^L = (1-\varphi)X^R$$

3) Let θ_2 is be a belief such that that expected value under this belief equals the value of the company under the raider's control and, hence, leaves the raider with zero profit:

$$\widetilde{X}(\theta_2) = X^R$$

Lemma .4.

1) Assume $0 \leq \kappa < \theta_1$. In case of rejection the raider will acquire a company in a tender offer at $P = (1-\varphi)X^R$. The managers obtain a payoff $\Pi_H = \Pi_L = (1-\varphi)X^R$.

2) Assume $\theta_1 < \kappa \leq \theta_2$. In case of rejection the raider will acquire a company in a tender offer at $P = \widetilde{X}(\kappa)$. The managers obtain a payoff $\Pi_H = \Pi_L = \widetilde{X}(\kappa)$.

3) Assume $\theta_2 < \kappa \leq 1$. In case of rejection the raider will not bid and the incumbent managers stay in control. The high-type manager's payoff is $\Pi_H = X^H + \frac{Z}{\alpha}$, the low-type manager's payoff is $\Pi_L = X^L + \frac{Z}{\alpha}$.

Proof. The results follow from lemma 1. □

Therefore, under different out-of-equilibrium beliefs the shareholders will demand different minimum acceptable prices to sell their shares to the raider. If they expect that the raider will bring them a higher value than under the incumbent's control, they will accept a post-takeover value of the share as a minimum acceptable bid due to free-riding problem . If their beliefs are biased towards the high-type company, they may treat the raider as a value-decreasing acquirer who creates a lower value than the expected value under the incumbent manager's control. Therefore, the raider will take over the company at the correspondent expected value under the incumbent manager's control unless takeover brings her a non-negative profit.

Proposition .4. *Consider the subgame following the raider's initial offer* (P, β)*. A pooling equilibrium of this subgame in which the both types of managers accept the initial offer, the shareholders' meeting approves the takeover exists if and only if* (P, β) *satisfies*

$$\beta P + (1-\beta)(1-\varphi)X^R \geq \Pi_H \qquad (IR^H)$$

$$\beta P + (1-\beta)(1-\varphi)X^R \geq \Pi_L \qquad (IR^L)$$

$$\beta P + (1-\beta)(1-\varphi)X^R \geq \overline{X} \qquad (IR)$$

where Π_H *and* Π_L *are the alternative payoffs for the high-type and the low-type managers correspondingly in case of deviation.*

Proof. In pooling equilibrium the shareholders stay uninformed about the true type of their company. Thus, the shareholders' meeting approves the takeover if the raider's offer bring a higher payoff that the expected value under the incumbent manager's control:

$$\beta P + (1-\beta)(1-\varphi)X^R \geq \overline{X} \qquad (IR)$$

In the equilibrium the initial payoff satisfies the individual rationality constraints of the managers. The incumbent manager accepts the offer if there is no profitable deviation. If the manger accepts the offer she will obtain the same payoff per share as the other shareholders since she will be forced to sell β fraction of her shares. The payoff in case of rejection (Π_H or Π_L) depends on the out-of-equilibrium beliefs of the raider and shareholders (see lemma 4).

The initial offer must bring the incumbent manager the same or the higher payoff than in case of rejection:

$$\beta P + (1-\beta)(1-\varphi)X^R \geq \Pi_H \qquad (IR^H)$$

$$\beta P + (1-\beta)(1-\varphi)X^R \geq \Pi_L \qquad (IR^L)$$

□

In this equilibrium the raider acquires both companies in friendly takeovers. Her profit depends on the out-of-equilibrium payoffs of the incumbent managers under the raider and shareholders' beliefs:

- $\pi \in [0, \varphi X^R]$, in case $(1-\varphi)X^R > \overline{X}$
- $\pi \in [0, X^R - \overline{X}]$, in case $(1-\varphi)X^R \leq \overline{X}$

Remark. If $X^L + \frac{Z}{\alpha} \geq (1-\varphi)X^R$ the outcome with both managers accepting can exist if the initial price is too low for the shareholders' meeting to accept it.

$$\beta P + (1-\beta)(1-\varphi)X^R \leq \overline{X}$$

So, the managers will approve the offer in order to eliminate the hostile takeover and stay in control. Nevertheless, this outcome is not acceptable for the raider, who gets a zero profit if there is an opportunity to obtain a positive profit via making another initial offer. As we will see later, this equilibrium will be never realized in the whole game.

5.4 Pooling: Both types of managers reject

If both types of managers reject the initial offer, the game proceeds to the tender offer stage where the raider decides whether to initiate a tender offer or withdraw the deal. According to lemma 1, the raider launches a tender offer and offers the price $P_{HT} = max((1-\varphi)X^R, \overline{X})$. She can take over companies of the both types since the dispersed shareholders do not have information about the true type of the company.

Definition Let $\kappa \in [0,1]$ be an out-of-equilibrium belief of the raider and dispersed shareholders. $\widetilde{X}(\kappa) \in [X^L, X^H]$ is the corresponding expected value value of the company under the incumbent manager's control:

$$\widetilde{X}(\kappa) = \kappa X^H + (1-\kappa)X^L$$

Proposition .5. *Consider the subgame following the raider's initial offer* (P, β).

1) Assume $(1-\varphi)X^R \geq \overline{X}$. *A pooling equilibrium of this subgame in which the both types of managers reject the initial offer, the shareholders' meeting approves the takeover, exists if and only if* (P, β) *satisfies the following system:*

$$\beta P + (1-\beta)(1-\varphi)X^R \leq (1-\varphi)X^R \qquad (IR^H)$$

$$\beta P + (1-\beta)(1-\varphi)X^R \leq (1-\varphi)X^R \qquad (IR^L)$$

$$\beta P + (1-\beta)(1-\varphi)X^R \geq \widetilde{X}(\kappa) \qquad (IR)$$

2) Assume $(1-\varphi)X^R$. *A pooling equilibrium of this subgame in which the both types reject the initial offer, the shareholders' meeting approves the takeover exists if and only if* (P, β) *satisfies the following system:*

$$\beta P + (1-\beta)(1-\varphi)X^R \leq \overline{X} \qquad (IR^H)$$

$$\beta P + (1-\beta)(1-\varphi)X^R \leq \overline{X} \qquad (IR^L)$$

$$\beta P + (1-\beta)(1-\varphi)X^R \geq \widetilde{X}(\kappa) \qquad (IR)$$

3) A pooling equilibrium of this subgame in which the both types reject the initial offer, the shareholders' meeting votes against the takeover does not exist.

Proof. 1,2.) Proof is straightforward. The incumbent managers understand they will stay in control, but fear that the shareholders' meeting will sell the company according to the out-or-equilibrium beliefs $\widetilde{X}(\kappa)$ at a lower price than in a hostile tender offer. The managers reject the offer to proceed the deal to the hostile takeover, where the companies are sold either at the post-takeover value or at the expected value under the incumbent manager's control. Therefore, the initial bid satisfies the individual rationality constraints of the incumbent managers and the shareholders' meeting on the out-of-equilibrium path.

3.) If the initial bid does not satisfy the shareholders' meeting individual rationality constraint, on the out-of-equilibrium path the takeover fails and the incumbent manager stays in control. In this case the high-type manager will benefit from deviation because $X^H + \frac{z}{\alpha} > X^R \geq (1-\varphi)X^R$. Therefore, this equilibrium does not exist. □

The raider's profit is this subgame in any of such equilibria is

- $\pi = \varphi X^R$, in case $(1-\varphi)X^R > \overline{X}$;
- $\pi = X^R - \overline{X}$, in case $(1-\varphi)X^R \leq \overline{X}$

5.5 Raider's choice

This section examines the raider's expected payoffs resulted from different incumbent manager's equilibrium behavior and her optimal choice of the initial offer.

The raider can get the following expected profits depending on the incumbent manager's equilibrium actions:

1. **separating** : the low-type manager accepts the offer, the high-type manager rejects; the shareholders' meeting approves the takeover

   $\pi \in [(1-\theta)(X^R - X^H - \frac{z}{\alpha}); (1-\theta)(X^R - X^L - \frac{z}{\alpha})]$

2. **separating** : the low-type manager accepts the offer, the high-type manager rejects; the shareholders' meeting votes against the takeover

   $\pi = 0$

3. **separating** : the low-type manager accepts the offer, the high-type manager rejects; the shareholders' meeting votes against the takeover

   $\pi = (1-\theta)\varphi X^R$

4. **pooling** : both managers accept the offer; the shareholders' meeting approves the takeover

   - $\pi \in [0, \varphi X^R]$, in case $(1-\varphi)X^R > \overline{X}$
   - $\pi \in [0, X^R - \overline{X}]$, in case $(1-\varphi)X^R \leq \overline{X}$

5. **pooling equilibrium** : both managers accept the offer; the shareholders' meeting rejects the takeover

   $\pi = 0$

6. **pooling** : both managers reject the offer;the shareholders' meeting approves the takeover

   - $\pi = \varphi X^R$, in case $(1-\varphi)X^R > \overline{X}$;
   - $\pi = X^R - \overline{X}$, in case $(1-\varphi)X^R \leq \overline{X}$

The following proposition points out the most preferable equilibrium outcomes for the raider.

Proposition .6. *Assume* $(1-\varphi)X^R > \overline{X}$.[4]

1) Consider $X^L + \frac{z}{\alpha} \geq (1-\varphi)X^R$. *Than the highest expected profit of the raider is obtained in pooling equilibria where the companies are acquired at the post-takeover value(in friendly or hostile takeovers). The raider gets profit* $\pi = \varphi X^R$.

2) Consider $X^L + \frac{z}{\alpha} < (1-\varphi)X^R$. *The raider obtains the highest expected profit in separating equlibrium, where the low-type manager accepts the offer and shareholders' meeting votes for the takeover, whereas the high-type manager rejects the initial offer if*

$$(1-\theta)(X^R - X^L - \frac{z}{\alpha}) \geq \varphi X^R$$

The raider gets profit $\pi = (1-\theta)(X^R - X^L - \frac{z}{\alpha})$

Otherwise, the raider obtains the highest expected profit in pooling equilibria, where she acquires both companies in hostile tender offers or in friendly deals at the post-takeover value. The raider gets profit $\pi = \varphi X^R$.

The proof is apparent and is based on the comparison of different expected profits the raider can get. The highest payoffs are obtained by the raider in either the case of the most preferable (associated with the the lowest payment βP) separating where the low-type manager accepts the offer, the high-type manager rejects; the shareholders' meeting approves the takeover; or the most preferable pooling equilibria.

The other outcomes generate lower payoffs to the raider. In the most preferable separating the raider makes the initial offer based on the low-type incumbent manager's incentive compatibility constraint. This offer is sufficient to overpay the low-type incumbent manager's security benefits and private benefits per share of her stock in the company $(X^L + \frac{z}{\alpha})$ and leads to the

[4]The case $(1-\varphi)X^R \leq \overline{X}$ gives the similar results:

1) If $X^L + \frac{z}{\alpha} \geq \overline{X}$ the raider prefers pooling equilibria where the companies are sold at $\overline{X}$.

2) If $X^L + \frac{z}{\alpha} < \overline{X}$ the raider can obtain the highest expected profit in separating equlibrium, where the low-type manager accepts the offer and the shareholders' meeting votes for the takeover, whereas the high-type manager rejects the initial offer if

$$(1-\theta)(X^R - X^L - \frac{z}{\alpha}) \geq X^R - \overline{X}$$

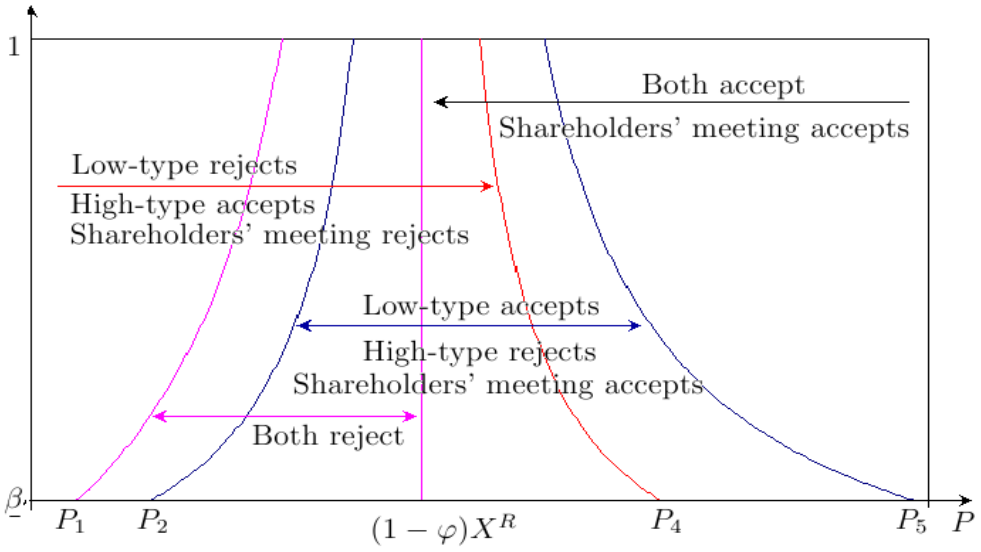
Otherwise, the raider can obtain the highest expected profit in pooling equilibria, where she acquires both companies in hostile tender offers or in friendly deals at the post-takeover value.

raider's expected profit $\pi = (1-\theta)(X^R - X^L - \frac{z}{\alpha})$. Therefore, the separating equilibrium becomes more attractive when the low-type managers' ownership in the company is higher, whereas the opportunities to extract private benefits are lower. As the low-type incumbent manager's security benefits and private benefits per share of her stock in the company $X^L + \frac{z}{\alpha}$ grow the separation becomes more expensive to the raider and, finally, the raider prefers to pool the managers' actions and acquire both companies from the uninformed dispersed shareholders. In the equilibrium, the takeovers of the high-type companies fail, since after the incumbent manager's rejection the raider does not make a tender offer and goes away.

Let's examine the initial offers that induce the incumbent manager's equilibrium actions that lead to the highest expected profit for the raider. Figure 2 represents the initial offers (P, β) that induce the incumbent managers to pool or separate in the equilibrium for the case $(1-\varphi)X^R > \overline{X}$. According to the figure, if $X^L + \frac{z}{\alpha} \geq (1-\varphi)X^R$ the raider can enforce the most preferable equilibrium, for instance, by offering $(1-\varphi)X^R$ to acquire both companies in either friendly takeovers or hostile tender offers.

However, if $X^L + \frac{z}{\alpha} < (1-\varphi)X^R$ the multiplicity of eqilibria occurs that complicates the analysis of the outcomes in the game and predictions of the model. Cho-Kreps or D1 criteria for signaling games fail to provide the refinement of these equilibria. The raider's optimal initial offer for the separating equilibrium associated with the highest expected profit for the raider can also be an equilibrium offer in the pooling equilibrium where the both managers reject the initial offer and the raider acquires the both companies in the hostile tender offer or the equilibrium offer for another separating equilibrium in which the low-type manager rejects the initial offer, the high-type manager accepts the offer, but the shareholders' meeting votes against the takeover. Despite the multiplicity of eqilibria, the model generates some general results that will be discussed below in details. For instance, if failures occur they occur only with the high-type companies. Therefore, takeover failure is associated with information revelation and signal the high-type of the company to the market.

I. $X^L + \frac{z}{\alpha} < (1-\varphi)X^R$



II. $X^L + \frac{z}{\alpha} \geq (1-\varphi)X^R$

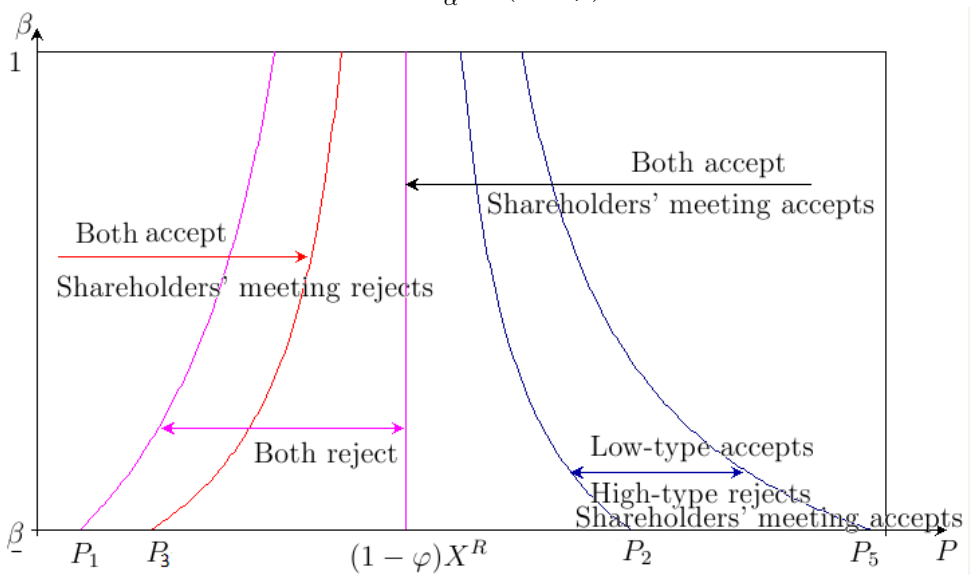


Figure 2. The equilibrium outcomes under different initial offers of the raider.

- $P_1 = \frac{1}{\underline{\beta}}(X^L - (1-\underline{\beta})(1-\varphi)X^R)$
- $P_2 = \frac{1}{\underline{\beta}}(X^L + \frac{Z}{\alpha} - (1-\underline{\beta})(1-\varphi)X^R)$
- $P_3 = \frac{1}{\underline{\beta}}(\overline{X} - (1-\underline{\beta})(1-\varphi)X^R)$
- $P_4 = \frac{1}{\underline{\beta}}(X^H - (1-\underline{\beta})(1-\varphi)X^R)$
- $P_5 = \frac{1}{\underline{\beta}}(X^H + \frac{Z}{\alpha} - (1-\underline{\beta})(1-\varphi)X^R)$

6 Empirical predictions

The model generates three observable outcomes for the takeovers attempts: friendly takeovers, hostile bids, and takeover failures. The outcomes depend on the raider's efficiency and possibility to extract private benefits, the incumbent manager's private benefits and her share of stock.

Despite the multiplicity of the equilibria in the model, some general conclusions can be drawn.

Result 1: The outcomes of takeovers depend on the incumbent manager's share of stock in the target company and her private benefits. The model generates different outcomes depending on the relationship between the incumbent manager's security benefits and private benefits normalized by her share of stock ($X^L + \frac{z}{\alpha}$) and the post-takeover value ($(1-\varphi)X^R$). If $X^L + \frac{z}{\alpha} < (1-\varphi)X^R$ the separating equilibrium, where the raider acquires only low-type companies in friendly deals exists. Thus, when the incumbent manager's share is higher and private benefits are lower, the raider is likely to acquire a company in the friendly deal. This result is consistent the viewpoint that managers with higher ownership tend to accept the takeovers more often since they can sell their shares with a premium and, thus, compensate the loss of her private benefits (Holderness, 2003).

When $X^L + \frac{z}{\alpha} \geq (1-\varphi)X^R$, in the equilibrium the raider will never choose to separate the managers and to acquire only low-type companies in friendly deals (see proposition 6). Hence, if the manager enjoys the opportunity to extract high private benefits or her share in the company is low, according to the model, it would be harder for the raider to acquire the company in a friendly deal.[5] As the result, the companies, where the management's interests diverge from the shareholders' interests, expected to be acquired in hostile takeovers more often. These results are consistent with the findings of Morck et al. (1998) that the hostile tender offers targets usually have a smaller fraction of the incumbent manager's shares. ii *Result 2: Premium paid to the target shareholders and target company's price reaction to the takeover announcement are higher in hostile takeovers than in friendly takeovers.* According to the model, in hostile tender offers the companies are acquired at $P_{HT} = (1-\varphi)X^R$.

[5]Note, that n both cases there are pooling equilibria where the both types of companies are acquired either in friendly or in hostile takeovers. But in case $X^L + \frac{z}{\alpha} < (1-\varphi)X^R$ friendly acquisitions can additionally occur for the low-type companies in separating equilibria.

Friendly transfers of control occur in either the pooling equilibria at $P = (1-\varphi)X^R$ when both types of managers accept the raider's initial offer at the post-takeover value of the company or in the separating equilibrium where the low-type manager accepts the offer and the high-type rejects the offer. The price paid by raider in this separating is lower than $(1-\varphi)X^R$. For instance, in the most preferable for the raider separating equilibria[6] the low-type company is sold at $P = \frac{1}{\beta}(X^L + \frac{Z}{\alpha} - (1-\beta)(1-\varphi)X^R)$ that brings the raider the highest expected profit. The equilibrium exists in case $X^L + \frac{z}{\alpha} < (1-\varphi)X^R$, implying that $P < (1-\varphi)X^R$. Thus, premia[7] offered in friendly takeovers in the model do not exceed premia paid in the hostile tender offers, that is observed in the data on real deals (Schwert, 2000).

Result 3: After a takeover failure the target company's market price exceeds its pre-takeover level. In separating equilibrium of the model failures can occur. High-type manager succeeds in persuading the shareholders that the company's fair value under her control is higher than the post-takeover value. The shareholders believe in the incumbent's high efficiency and demand a high bid higher that the raider cannot pay. The takeover fails, but the market learns the managers' high type and reacts positively. This prediction is consistent with empirical observation described in Martynova and Renneboog (2006). The authors actually found very intriguing results for failed takeovers - in some European countries, target price goes down but it does not fall to the pre-bid level, and in other countries price does not fall at all, it remains at the same level as during the period of bid negotiations or even goes up.

7 Conclusion and directions for future research

The paper introduces a model that endogenizes the outcomes of the takeovers and can be helpful in explaining why some transfers of control occur as friendly deals, while some occur as hostile tender offers, yet the other deals fail. The

[6] The first illustration of Figure 2 shows that the offers corresponding to the most preferable for the raider separating equilibria belong to the area of multiple equilibria, that complicates drawing strict conclusions. Nevertheless, one can state for sure that the raider will never choose initial offers satisfying $P > (1-\varphi)X^R$ since the expected payoffs given these offers are lower than she can obtain in other equilibria. Therefore, friendly deals with price exceeding $(1-\varphi)X^R$ will never occur in the model

[7] Note, that according to the model set-up, initially both types of companies have the same market value $\overline{X}$. Therefore, the higher takeover price in the model is associated with the higher premium over the existing market price.

model generates some interesting equilibria in which the raider prefers separating the managers in order to learn their true type. In this separating equilibrium the raider forces the incumbent manager to reveal the private information to the market and shareholders and acquires only less efficient companies, but pays the lower price than the bid she has to offer in a hostile tender offer. The more efficient managers enjoy the possibility to signal their high efficiency to the shareholders and persuade them not to sell their shares to the raider. Thus, the takeover attempts to acquire these companies fail, but failures will credibly signal the market the manager's high efficiency.

According to the model, the outcomes of takeovers are expected to depend on the incumbent manager's security and private benefits. If the incumbent manager extracts high private benefits or her share of stock is too small to bring her a high payoff for her shares in case of takeover, the price she would agree to accept will be too high for the raider. Hence, the raider may choose to acquire both types of companies in a hostile tender offer despite the manager's opposition.

The model generates predictions on the stock price reactions and premia paid in takeovers that are consistent with empirical observations. According to the model results, premia paid in friendly deal will never exceed the premia paid in hostile takeovers. Also, after a takeover failure the market price of the target company is predicted to exceed the pre-takeover level.

The main shortcomings of the model are associated with existence of equilibria, that appear to be counter-intuitive or inconsistent with empirical observations. Further research can be devoted to developing model modifications in which these equilibria will be ruled out.

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