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A Bargaining Model of Friendly and Hostile Takeovers

GINO LOYOLA[†] AND YOLANDA PORTILLA[‡]
[†]Department of Management Control, University of Chile, Santiago, Chile, and
[‡]School of Economics and Business, Catholic University of Chile, Santiago, Chile

ABSTRACT

A bargaining model is developed that characterizes the conditions under which a takeover will either be friendly, hostile, or unsuccessful when the target management can tilt the selling procedure toward a white knight. The conditions considered mainly involve private control benefits, toehold size, and breakup fees. Also established by the model are the conditions for an efficient takeover. The proposed framework of strong management influence on takeover outcome, an alternative modeling of hostility and the adoption of a negotiation procedure, rather than an auction setup with strong shareholder influence as in most of the existing literature, delivers new insights into the US market of corporate control, which are consistent with the available evidence.

JEL classification: C72; D44; D82; G32; G34

I. INTRODUCTION

This article proposes a simple sequential bargaining model under complete information, which characterizes the determinants of the takeover premium and the conditions under which a takeover may be either friendly, hostile, or unsuccessful. A central role in these results is played by two factors: (i) the level of breakup fees and (ii) the target management's trade-off between the higher surplus it could extract from a hostile raider and the private control benefits it would retain with a white knight buyout. Our model delivers testable implications, which are consistent with the evidence from the US market for corporate control in recent decades.

Existing theoretical works differ from our setup in three crucial aspects. First, most of the received literature adopts an auction-based rather than a bargaining-based procedure to model a takeover process (Loyola 2012a; Dasgupta and Tsui 2003; Hansen 2001), which is surprising given that according to the evidence, at least half of takeovers are conducted under a negotiation format (Aktas *et al.* 2010; Boone and Mulherin 2007b). Second, whereas previous analyses classify a hostile/friendly takeover only by the target management's response to a merger

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invitation (Betton *et al.* 2009), our formulation considers the buyer's initial intentions regarding the continuation or elimination of management's private benefits.

Third, although the theoretical studies that most closely resemble our approach have developed more complex bargaining frameworks than ours, such models implicitly assume a strong corporate governance system in which either shareholders and management's interests are completely aligned (Dimopoulos and Sacchetto 2014) or shareholders play an active role in the selling procedure via an approval stage or a tender offer (Berkovitch and Khanna 1991; Calcagno and Falconieri 2014). In contrast, we assume that takeovers are conducted under a weak corporate governance environment in which the incumbent management shapes the rules of the selling procedure in favor of its interest and exerts a larger influence on the decision regarding which class of bidder (hostile or friendly) the target is ultimately assigned to.

As a result of these differences from existing analyses, our simple negotiation model is able to generate new insights and more direct implications regarding the following: (i) the role played by private control benefits in determining takeover premiums; (ii) the decline of both hostile and failed takeovers in the USA over the last few decades; and (iii) the effects of breakup fees, managerial incentives, and toeholds on these outcomes and their dynamics.

This paper proceeds as follows. Section II presents our takeover bargaining model. Section III characterizes the equilibrium target premium and conditions under which a takeover eventually either fails, is friendly or is hostile, and also examines efficiency issues. Section IV develops a comparative analysis with closely related works, stressing the main contributions of the model here proposed. Finally, Section V discusses the empirical implications of our theoretical model for the US corporate control market. All the proofs are collected in the Appendix.

II. A TAKEOVER NEGOTIATION GAME

Consider a company facing a takeover attempt from two possible risk-neutral buyers, A and B. The value of fully controlling the target to buyer i is $v_i \in (0, 1]$, $i = A, B$. Because we assume that this value is common knowledge, the setup presented here is one of complete information. We interpret v_i as the value that buyer i assigns to 'running the firm', that is, an individual synergy i obtains from taking over the target company and securing absolute control of it. Because this synergy is idiosyncratic and not available to other buyers, our setting is one of private values that fits well with strategic bidders (e.g., competitors, suppliers, and customers) competing for a target. This contrasts with a common values environment that better represents a takeover contest in which financial bidders (e.g., private equity funds) can exploit gains available to all other bidders such as cost-cutting, leverage restructuring, or selling off noncore assets. A justification for this private values assumption is related to the timing of the takeover game we adopt (detailed in the succeeding sections), in the sense that the process is initiated by a buyer (not the target). On this point, Fidrmuc *et al.* (2012) report

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evidence that whereas deals involving strategic bidders are more often buyer-initiated rather than target-initiated, takeovers involving financial bidders show an opposite pattern.

Before the takeover process begins, raider A has a toehold, that is, a minority participation in the ownership of the target and hence in the selling surplus as well. If we call the toehold $\theta \in (0, 1/2)$, the term $(1-\theta)$ then represents the fraction of the selling surplus going to nonbuying shareholders. The value shareholders and outsiders initially assign to the target company is denoted by v_0, which is common knowledge and normalized to zero.

The incumbent management enjoys private control benefits given by $\beta \in (0, 1]$. If buyer A takes over the company, she eliminates these benefits and we say that this is a takeover by a hostile raider, or in brief terms, a *hostile takeover*. If, on the other hand, buyer B acquires the company, he allows these benefits to continue and we say that this process is a *friendly takeover* by a *white knight*.

Our framework models a takeover as a sequential negotiation procedure conducted by the target management on behalf only of nonbuying shareholders. In order to align the objectives of both parties in this agency relationship, management obtains a fraction $\gamma \in (0, 1)$ of the net revenues coming from the target sale. Despite this incentive, it should be emphasized that the selling procedure to be described in the succeeding paragraphs is suitable for takeovers taking place under a weak corporate governance environment given that it assigns a primarily passive role in the process to shareholders. It thus allows the incumbent management to exert a strong influence over the class (hostile/friendly) and timing of additional offers as well as over the decision on which bidder the target is eventually sold to.

Lastly, an implicit but relevant assumption is that all shareholders (both buying and nonbuying ones) must sell their stakes to the winning buyer (who must in turn buy all of them) in accordance with the negotiation process pricing rules.

A. Timing of the game

Let p_i be the price (the takeover premium) to be paid by buyer i for all target shares. The takeover process then involves a two-stage negotiation procedure to determine this price, which yields the following dynamic game.

Stage I

I.1 Buyer A (the hostile raider) makes an unsolicited take-it-or-leave-it offer p_A to the target management. The offer also contains a termination clause if the target is acquired by buyer B in a subsequent stage. In such a case, the clause includes an (exogenous) breakup fee $t > 0$ to be paid to buyer A.

I.2 Management has two possible responses: reject or stay. If it rejects offer p_A, the target company remains under the current ownership structure and the game is over. Otherwise, management delays the decision to a next negotiation round in which it contacts a white knight who will allow its private benefits β to continue.

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Stage II

I.1 Management makes a take-it-or-leave-it offer p_B to buyer B (the white knight).
I.2 Buyer B has two possible responses: reject or accept. If he rejects, the target is sold to hostile raider A according to the terms established in Stage I and management loses its private benefits. If he accepts, the target is sold to friendly buyer B but the company must pay raider A the breakup fee t committed to in Stage I.

Two comments on the assumptions of the takeover game are in order. First, the timing of the game highlights the weak corporate governance environment in which the takeover is conducted, as there is no active shareholders' participation, and the final decision of the selling procedure rests heavily on the incumbent management. Shareholders' approval of any agreement reached by management is thus assured, as is the inability of the hostile raider to launch a successful tender offer due, for instance, to coordination problems among dispersed shareholders. This weak corporate governance also rules out the organization of an alternative auction-based procedure. Finally, it prevents the hostile raider from either overbidding ex post the offer subsequently made to the white knight or bidding with a preemptive motivation.

The second observation is that it does not seem reasonable to assume a 'no shop' provision in the negotiation round between management and buyer A. Because buyer A has launched a hostile offer, management should not be prevented from seeking another offer, particularly a friendly one. Thus, breakup fees can be seen as a suitable device for the hostile bidder to protect herself in case management reaches a final agreement with another bidder in a subsequent stage.

III. THE RESULTS

Let us first define the critical values $\overline{\beta} \equiv \gamma(v_A - v_B)$ and $\overline{t} \equiv (1-\theta)v_B$. The next statement formalizes the characteristics of the outcome of our takeover game.

Proposition 1: *The takeover negotiation game has the following possible outcomes*:

(i) If $t \leq \overline{t}$ and $\beta < \overline{\beta}$, the company is sold to the hostile raider with a takeover premium of

$$p_A^* = v_B - \frac{t}{1-\theta} + \frac{\beta}{\gamma(1-\theta)} + \varepsilon_A.$$

with $\varepsilon_A \downarrow 0$.
(ii) If $t \leq \overline{t}$ and $\beta \geq \overline{\beta}$, the company is sold to the white knight with a takeover premium of

$$p_B^* = v_B.$$

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(iii) If $t > \bar{t}$ and $\beta \leq \gamma v_A$, the company is sold to the hostile raider with a takeover premium of

$$p_A^* = \frac{\beta}{\gamma(1-\theta)}.$$

(iv) If $t > \bar{t}$ and $\beta > \gamma v_A$, the company remains under the current control and management.

A. Insights on takeovers

The equilibrium outcomes of this negotiation procedure generate several insights into different aspects of takeovers.

Takeover premium. The friendly takeover premium p_B^* is such that the target management is able to extract *all* the white knight's surplus when he accepts its price offer. This result is the consequence of a first-mover advantage management enjoys in the last negotiation round.

On the other hand, the hostile takeover premium p_A^* results from different forces that either increase or decrease the bargaining power of both management and hostile buyer A. To better understand this point, let us consider case (i) in Proposition 1. Although buyer A plays first, management can subsequently contact a friendly buyer who will pay it a maximum premium p_B equal to v_B and allow its private benefits β to continue. These phenomena are reflected in higher management bargaining power expressed by the properties $\frac{\partial p_A^*}{\partial v_B} > 0$ and $\frac{\partial p_A^*}{\partial \beta} > 0$. By contrast, when breakup fees increase, a potential agreement between management and the white knight creates a less negative scenario for hostile buyer A given that she will receive a higher indemnification if it eventually materializes. This fact is reflected in higher buyer A bargaining power expressed by the property $\frac{\partial p_A^*}{\partial t} < 0$.

Hostile versus friendly takeover. The proposed model shows that when breakup fees are sufficiently low (i.e., $t \leq \bar{t}$), two options are possible depending on the level of private benefits of control. If the target management is not strongly entrenched ($\beta < \bar{\beta}$), in equilibrium, the company will be sold to the hostile raider. On the other hand, if it is strongly entrenched ($\beta \geq \bar{\beta}$), the company will be assigned to a white knight and management's high private benefits will continue. Because $\bar{\beta}$ is increasing with the value gap $v_A - v_B$, the nature of the takeover outcome (hostile or friendly) then basically rests on the trade-off between (i) a higher surplus because of a potentially higher value (i.e., $v_A > v_B$) when selling to a hostile raider and (ii) private benefits β that are retained by management when selling to a white knight.

Our condition for a hostile/friendly takeover does not coincide with that characterized by Betton *et al.* (2009), a consequence of the differences between our respective definitions of hostility. In Betton *et al.*, what defines the nature of a takeover is the rejecting/accepting response by the target management to a merger invitation made by a first bidder. Hence, if this invitation is rejected, the bidder launches an unsolicited (hostile) tender offer to shareholders, which

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is resisted by the management. However, if this invitation is accepted, the process is classified as a friendly takeover even though the winning bidder finally eliminates management's private benefits of control. On the other hand, in our model, what defines the nature of a takeover is the initial intention a buyer has about eliminating/allowing these private benefits. Then, whenever a raider eliminates these benefits once he takes over the company, the process is always classified as a hostile takeover. Similarly, a friendly takeover is only carried out by a white knight that allows the management to retain its private benefits.

As a consequence, whereas in Betton *et al.* a hostile takeover occurs when private benefits of control are sufficiently high, our model predicts, on the contrary, that this would occur when these benefits are low enough. Although opposite at first glance, both results are indeed consistent with each other and just the consequence of a different definition of hostility. To understand this apparent contradiction, let us consider the case of a strongly entrenched target management who enjoys large private benefits. In the model of Betton *et al.*, the only way for management to retain these benefits with a positive probability is to reject the merger invitation, as in such a case a white knight may win the auction run in a subsequent stage. Under their definition, this rejection immediately transforms the process into a hostile takeover. In our model, the way for management to retain these benefits is also not to accept the raider's offer ('stay'), hoping that a white knight accepts to buy the target in a subsequent take-or-leave-it negotiation. Under our definition, unlike that of Betton *et al.*, the white knight's acceptance immediately transforms the process into a friendly takeover.

Inefficient takeovers. The model does not always yield efficient outcomes from a social viewpoint (or that of the shareholders) because there is no guarantee the target company will always end up with the ownership structure that maximizes its value. On this point, two cases in particular are of interest: (i) failed takeovers and (ii) inefficient friendly takeovers. We will discuss the latter case first.

When $v_A > v_B$, the negotiation procedure does not ensure the firm will always be assigned to the hostile raider, the efficient outcome from a social welfare perspective. This is because in the context of our framework, when $t \leq \bar{t}$, the parameters of the model may satisfy the following condition:

$$v_B < v_A \leq v_B + \frac{\beta}{\gamma}.$$

Rearranging the second inequality, we obtain $\beta \geq \bar{\beta}$, which according to Proposition 1 (case (ii)) is the equilibrium condition for a friendly takeover by the white knight.

It is worth stressing that under this inefficient takeover case, premium p_B^* can be greater or smaller than the finally rejected hostile offer p_A^*. If $p_B^* > p_A^*$, in the context of our model, the assignment of the target to the white knight would even survive a potentially subsequent stage of shareholders' approval.[1]

1 This outcome would not hold, however, if the hostile raider could make a direct tender offer to shareholders. In that case, because $v_A > v_B$, buyer A would offer a target premium $p_A^* > v_B$ so that buyer B could not match or outbid such an offer. As a result, the target would finally be sold to the hostile raider, and thus, this buyer A's offer may be interpreted as a preemptive behavior.

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Alternatively, if $p_A^* > p_B^*$, this situation resembles real-world examples in which incumbent management teams have rejected attractive offers in favor of lower but friendlier offers.[2]

Failed takeovers. Because it was assumed that $v_i > 0 = v_0$ for all $i = A, B$, it is always more efficient to sell the target than not to sell it. Nevertheless, case (iv) in Proposition 1 suggests that a failure of the takeover cannot be ruled out, and thus, the selling negotiation procedure may inefficiently end up with the target in the incumbent management's hands.

This will occur as long as both breakup fees and private benefits of control are sufficiently high. The intuition behind this result is as follows. When $t > \bar{t}$, selling the firm to the white knight is always dominated from management's viewpoint by not selling it at all as the payoff of the latter alternative is higher: $\beta > \beta + \gamma(\bar{t} - t)$. The relevant comparison for management when evaluating buyer A's offer is thus between its payoff from selling to the hostile raider and its private benefits from keeping control of the target, that is, $\gamma(1 - \theta)p_A^*$ versus β. From buyer A's standpoint, this implies that her relevant payoff comparison is between a successful hostile takeover and a failed takeover, that is, between $v_A - (1 - \theta)p_A^*$ and 0. Because buyer A wants to minimize the premium to be paid, she will then set optimally $p_A^* = \frac{\beta}{\gamma(1-\theta)}$. Hence, the takeover will eventually fail whenever her payoff from a successful hostile takeover is negative, that is, whenever the inequality $\beta > \gamma v_A$ holds.[3]

Managerial selling incentives. Another element in our framework that influences the nature of the takeover is the power of selling incentives γ. From Proposition 1, it is straightforward to see that thresholds of private benefits defining regions for hostile takeovers depend on γ. In fact, when $t > \bar{t}$, threshold γv_A always increases with γ, which implies a larger (smaller) region for values of β satisfying the condition for a hostile (failed) takeover. Similarly, when $t \leq t$, threshold $\bar{\beta}$ also increases with γ but only as long as $v_A > v_B$, implying a larger (smaller) region for values of β satisfying the condition for a hostile (friendly) takeover.[4]

Thus, more powerful selling incentives for management increase the probability of a hostile takeover. This is a quite intuitive result: the more aligned the interests of management and of shareholders, the more likely that when deciding which buyer's offer to choose, the management focuses more on the highest target valuation and less on its private benefits. Consequently, if a takeover attempt involves the target's executive compensation packages including, for instance, stocks or stock options, the likelihood of that takeover being hostile should be higher, all other things being equal.

2 A well-known case is the Paramount's rejection of an offer made by QVC in favor of a much lower offer from Viacom. A similar situation is Revlon's rejection of a Pantry Pride's offer in favor of a lower one from Forstmann Little.

3 Taken jointly, the two conditions of case (iv) together imply that a failed takeover is more likely when both buyers' potential synergies from running the firm are relatively low.

4 The case in which $v_A \leq v_B$ is not interesting, since in such case $\beta > 0 \geq \bar{\beta}$ for all β (the target management is always stongly entrenched), and thus, the takeover would always be friendly irrespective of selling incentives γ.

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Toeholds. In our model, initial hostile raider's stakes play a crucial role in three aspects of takeovers: (i) the premium; (ii) the selling process outcome; and (iii) outcome efficiency.

Regarding the takeover premium, it follows from Proposition 1 that in hostile takeovers

$$\frac{\partial p_A^*}{\partial \theta} = \begin{cases} \dfrac{\beta}{\gamma(1-\theta)^2} & \text{if } t > \bar{t} \text{ and } \beta \leq \gamma v_A \\ \dfrac{1}{(1-\theta)^2}\left(\dfrac{\beta}{\gamma} - t\right) & \text{if } t \leq \bar{t} \text{ and } \beta < \bar{\beta} \end{cases}.$$

Hence, in the first case, where $t > \bar{t}$ and $\beta \leq \gamma v_A$, management will always obtain a higher target premium from buyer A if her toehold size increases, as in that case the model's parameters ensure that $\frac{\partial p_A^*}{\partial \theta} > 0$. In the second case, this derivative is positive as long as the target premium gap is also positive, that is

$$p_A^* - p_B^* = \frac{1}{1-\theta}\left(\frac{\beta}{\gamma} - t\right) > 0,$$

which seems to be supported by empirical evidence (Betton *et al.* 2009). Therefore, we expect that in general, a toehold induces buyer A to be more aggressive in her offer, thus allowing management to extract a higher target price from the hostile acquirer than the friendly one.

Moreover, because the cut-off value $\bar{t}$ depends on θ, Proposition 1 also suggests that toeholds can affect not only the nature of the takeover (hostile or friendly) but also the success of the entire process. These properties are formalized as follows.

Corollary 1. *As hostile raider's toehold θ increases*

(i) *A hostile (*resp. *friendly) takeover is more (*resp. *less) likely.*
(ii) *A failed takeover is more likely.*

The acquisition of a previous stake in the target can then be seen as a strategy of a potential buyer to increase her chances of success in a future hostile takeover attempt. As the proof of Corollary 1 indicates, this is so because buyer A's toehold enlarges the region of private benefits from control within which management eventually prefers selling the company to a hostile raider.[5] Interestingly, this result is consistent with the evidence on previous target stakes in the US market for corporate control. Betton *et al.* (2009), for instance, find that in hostile takeovers, the presence of toeholds is much more frequent (50%) than in friendly takeovers (11%).

As for the efficiency issue, prior target stakes held by the hostile buyer play a dual role. For instance, if we suppose that $v_A > v_B$ and start from a situation in

5 This result then posits a toehold advantage for a potential buyer in the context of a negotiation-based takeover, different from that attributed to toeholds in the context of an auction-based takeover and related to either more aggressive bids (Burkart 1995; Singh 1998, Bulow *et al.* 1999; Loyola 2012b) or an informational advantage (Povel and Sertsios 2014).

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which $t < \bar{t}$, a sufficiently high increase in the toehold θ may lead to a sufficiently high decrease of $\bar{t}$ so that now $t > \bar{t}$. In that case, two countervailing effects emerge. On the one hand, because the threshold for private control benefits now increases from $\bar{\beta}$ to γv_A, the probability of an inefficient friendly takeover decreases (indeed, it is now zero!). If, on the other hand, private benefits of control are high enough (i.e., $\beta > \gamma v_A$), a failure of the takeover process cannot be ruled out, which in our model constitutes an inefficient outcome as $v_i > 0 = v_0$ for $i = A, B$.

IV. COMPARISON WITH LITERATURE ON BARGAINING AND TAKEOVERS

To highlight the main contributions of our work, in this section, we compare our results with three earlier papers that propose a similar view of takeovers as a negotiation process. In the first of the three, Berkovitch and Khanna (1991) develop a model of corporate control in which the buyer must choose between two mechanisms: an alternating-offer bargaining process or a tender offer used as a threat. As with our model, the authors' formulation also allows for an agency problem between shareholders and management. However, the conflict in their framework is less severe than in ours because (i) although management enjoys control benefits, these are assumed to be very low and always smaller than the raider's synergies; (ii) although management has the discretion to delay an agreement beneficial to shareholders, it cannot prevent such an agreement altogether nor tilt the process toward a friendly acquirer (in fact, all potential buyers are hostile); and (iii) shareholders can design optimal managerial incentives that restrict management's influence over the takeover outcome. In general, Berkovitch and Khanna differ from our approach in that it focuses on explaining when bargaining schemes or tender offers are adopted as selling mechanisms rather than on determining the conditions for a hostile, friendly, or failed takeover. Furthermore, their setting is unable to identify an explicit effect on takeover premiums of either private control benefits, breakup fees, or toeholds.

The second article, by Calcagno and Falconieri (2014), models takeover as an alternating-offer bargaining game in which the outside options for the incumbent (a large blockholder or management) and the raider are a private auction and a tender offer, respectively. Although the authors also assume that the incumbent enjoys private control benefits, their model considers that takeovers are conducted under a stronger corporate governance environment than that assumed in our setting. Two points in particular illustrate this assertion: (i) the role of shareholders in takeovers is much more active than in our work, as once an agreement has been attained, the offer is publicly announced and submitted to all shareholders and (ii) although the incumbent can, as in our model, look for a friendlier offer than that made by the hostile raider, the two potential buyers compete in a fair auction where the incumbent cannot bias the process in favor of the white knight. Overall, the main goal of Calcagno and Falconieri's work is different from ours because it is centered on the interplay between negotiation and auctions as

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well as on predictions about how takeover outcomes are determined by the degree of competition in the process. No explicit conditions for a hostile or friendly takeover are given, nor do they state any for a failed takeover because in this setting, the target always ends up being sold. Regarding the takeover premium, and contrary to our model, Calcagno and Falconieri's setup concludes that it does not depend on control benefits when the target's valuation is sufficiently high. Finally, they do not acknowledge any effect of toeholds on takeover premiums.

The last reviewed work was that of Dimopoulos and Sacchetto (2014), who model takeover as a two-stage process: first, a two-bidder auction stage with costly sequential entry, and second, a possible subsequent winning bidder's offer subject to the shareholders' approval. In contrast to our framework, this model does not explicitly consider management as an active player nor does it acknowledge the existence of private control benefits. In addition, bidders are not characterized by their prior selling intention, and as a result, no predictions on friendly or hostile takeovers are made. Moreover, although a failed takeover is a possible outcome, it is explained on the basis of entry costs and bidders' valuations of the target rather than by agency costs. Lastly, although Dimopoulos and Sacchetto's empirical section estimates some results on takeover premiums, their theoretical framework does not deliver explicit predictions regarding the impact of either private benefits, breakup fees, or toeholds on these premiums.

From this comparative analysis with the extant literature, we conclude that the main novelty of our work is modeling takeovers under a weaker corporate governance environment, allowing us to generate new insights regarding the determinants of the target premium, the occurrence (failure/success) of a takeover, and the final nature (friendly/hostile) of the takeover process, as well as the roles played by private benefits, breakup fees, managerial incentives, and toeholds in these outcomes.

V. EMPIRICAL IMPLICATIONS

The simple model we have proposed here has a number of implications that are consistent with evidence from the US market for corporate control over recent decades, but which similar works have not analyzed even though they may have developed more complex frameworks. First, our formulation suggests that hostile takeovers may have declined since the 1990s because of an increase in the level of private control benefits (the parameter β). Second, our framework also points out that the reduction in the frequency of failed takeovers in the US during the 1990s may be the consequence of either a decrease in the level of breakup fees (the parameter t) or an increase in the threshold of this class of fees (the cutoff $\bar{t}$). Because recent evidence suggests that termination fees held relatively constant during the 1990s (Boone and Mulherin 2007a), the focus should be on the cutoff $\bar{t}$. Our model predicts that an increase in this threshold is possible if the presence of toehold θ in takeovers decreases. Evidence for the US market for corporate control confirms this prediction given that the frequency of initial stakes has declined dramatically in the last few decades (Povel and Sertsios 2014).

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Finally, our analysis suggests that hostile takeovers in continental Europe may be less frequent than in the US (Burkart and Panunzi 2008) because the incentive power γ of managerial pay is usually higher in the US, as it is indeed the case for stock-based compensation (Tirole 2006, p. 21). Interestingly, evidence available for continental Europe in the 1990s shows an increase of both hostile takeovers activity and equity-based managerial compensation. Although various competing explanations may have caused this common trend, our model posits a possible theoretical link between executive compensation and likelihood of hostile takeovers that could be interesting to explore empirically.

Gino Loyola
Department of Management Control
University of Chile
Santiago
Chile
gloyola@fen.uchile.cl

REFERENCES

Aktas, N., E. de Bodt, and R. Roll (2010), 'Negotiations Under the Threat of an Auction', *Journal of Financial Economics*, 98, 241–55.

Berkovitch, E., and N. Khanna (1991), 'A Theory of Acquisition Markets: Mergers Versus Tender Offers, and Golden Parachutes', *Review of Financial Studies*, 4, 149–74.

Betton, S., B. E. Eckbo, and K. S. Thorburn (2009), 'Merger Negotiations and the Toehold Puzzle', *Journal of Financial Economics*, 91, 158–78.

Boone, A., and H. Mulherin (2007a), 'Do Termination Provisions Truncate the Takeover Bidding Process?', *Review of Financial Studies*, 20, 461–89.

Boone, A., and H. Mulherin (2007b), 'How are Firms Sold?', *Journal of Finance*, 62, 847–75.

Bulow, J., M. Huang, and P. Klemperer (1999), 'Toeholds and Takeovers', *Journal of Political Economy*, 107, 427–54.

Burkart, M. (1995), 'Initial Shareholdings and Overbidding in Takeover Contests', *Journal of Finance*, 50, 1491–515.

Burkart, M., and F. Panunzi (2008), 'Takeovers', in X. Freixas, P. Hartmann and C. Mayer (eds), *Handbook of European Financial Markets and Institutions*. Oxford: Oxford University Press, pp. 265–97.

Calcagno, R., and S. Falconieri (2014), 'Competition and Dynamics of Takeover Contests', *Journal of Corporate Finace*, 26, 36–56.

Dasgupta, S., and K. Tsui (2003), 'A 'Matching auction' for Targets with Heterogeneous Bidders', *Journal of Financial Intermediation*, 12, 331–64.

Dimopoulos, T., and S. Sacchetto (2014), 'Preemptive Bidding, Target Resistance, and Takeover Premiums', *Journal of Financial Economics*, 114, 444–70.

Fidrmuc, J. et al. (2012), 'One Size Does Not Fit All: Selling Firms to Private Equity Versus Strategic Acquirers', *Journal of Corporate Finance*, 18, 828–48.

Hansen, R. G. (2001), 'Auctions of Companies', *Economic Inquiry*, 39, 30–43.

Loyola, G. (2012a), 'Optimal and Efficient Takeover Contests with Toeholds', *Journal of Financial Intermediation*, 21, 203–16.

Loyola, G. (2012b), 'Auctions vs. Negotiations in Takeovers with Initial Stakes', *Finance Research Letters*, 9, 111–20.

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Povel, P., and G. Sertsios (2014), 'Getting to Know Each Other: The Role of Toeholds in Acquisitions', *Journal of Corporate Finance*, 26, 201–24.
Singh, R. (1998), 'Takeover Bidding with Toeholds: The Case of the Owner's Curse', *Review of Financial Studies*, 11, 679–704.
Tirole, J. (2006), *The Theory of Corporate Finance*. Princeton and Oxford: Princeton University Press.

APPENDIX

Proof of Proposition 1: This proof has two parts. We first characterize the subgame perfect equilibrium (SPE) of the takeover game, and second, we establish, based on such equilibrium, the outcomes of the negotiation process.

Part I: **Equilibrium**. In order to find the SPE, we apply backward induction as follows.

Stage II.2

As buyer B faces a take-or-leave-it offer, he has to compare payoffs coming from accepting ($v_B - p_B$) and rejecting (zero payoff). It follows then directly that the optimal decision rule for him is described by

$$\text{Buyer } B \begin{cases} \text{accepts} & \text{if } p_B \leq v_B \\ \text{rejects} & \text{otherwise} \end{cases}.$$

Stage II.1

Let U_M be the target management's payoff. Then, at this stage, the management offers a price p_B that considers the subsequent buyer B's optimal strategy so that

$$\max_{p_B} U_M = \begin{cases} \gamma\big(p_B(1-\theta) - t\big) + \beta & \text{if } p_B \leq v_B \\ \gamma p_A(1-\theta) & \text{otherwise} \end{cases}$$

from which it follows that

$$p_B^* = \begin{cases} v_B & \text{if } p_A \leq v_B - \dfrac{t}{1-\theta} + \dfrac{\beta}{\gamma(1-\theta)} \\ v_B + \varepsilon_B & \text{otherwise} \end{cases}$$

where $\varepsilon_B > 0$.

Stage I.2

At this stage, the target management decides about a take-it-or-leave-it offer made by hostile buyer A, but also taking into account the optimal offer that it itself would make to friendly buyer B in the next stage. Thus, management has to compare the payoff associated to three possible paths: (**i**) β (if the management rejects); (**ii**) $\gamma p_A(1-\theta)$ (if the management stays and B rejects); and (**iii**)

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$\gamma\left(p_B^*(1-\theta)-t\right)+\beta$ (if the management stays and B accepts). Note that in path (iii) for B to indeed accept it is required that $p_B^*=v_B$, and thereby, optimal payoff becomes in that case equal to $\gamma\left(\bar{t}-t\right)+\beta$. Thus, for stages I.2 and I.1, we have to analyze separately two cases: $t\leq\bar{t}$ and $t>\bar{t}$.

Case 1: Because $t\leq\bar{t}$, from the management's viewpoint, path (iii) dominates path (i). Thus, the target management always stays if it anticipates that B will accept its offer later on, irrespective of p_A. However, if it anticipates that B will reject its offer, management stays or rejects depending on the comparison $\gamma p_A(1-\theta)$ versus β. All this analysis is summarized by the following optimal decision rule:

$$\text{Management}\begin{cases}\text{stays} \quad \text{if}\begin{cases}p_B^*=v_B \ \text{ (i.e., } B \text{ accepts)}\\ \text{or}\\ p_B^*=v_B+\varepsilon_B \ \text{ (i.e., } B \text{ rejects) and } p_A\geq\dfrac{\beta}{\gamma(1-\theta)}\end{cases}\\ \text{rejects} \quad \text{if } p_B^*=v_B+\varepsilon_B \ \text{ (i.e., } B \text{ rejects) and } p_A<\dfrac{\beta}{\gamma(1-\theta)}\end{cases}.$$

Case 2: Because $t>\bar{t}$, from the management's standpoint, path (i) dominates path (iii). Thus, the target management always rejects if it anticipates that B will accept its offer later on, irrespective of p_A. Nevertheless, if it anticipates that B will reject its offer, management stays or rejects depending on the comparison between $\gamma p_A(1-\theta)$ and β. Thus, the management's optimal decision rule becomes

$$\text{Management}\begin{cases}\text{stays} \quad \text{if } p_B^*=v_B+\varepsilon_B \ \text{ (i.e., } B \text{ rejects) and } p_A\geq\dfrac{\beta}{\gamma(1-\theta)}\\ \text{rejects} \quad \text{if}\begin{cases}p_B^*=v_B \ \text{ (i.e., } B \text{ accepts)}\\ \text{or}\\ p_B^*=v_B+\varepsilon_B \ \text{ (i.e., } B \text{ rejects) and } p_A<\dfrac{\beta}{\gamma(1-\theta)}\end{cases}\end{cases}.$$

Stage I.1

Case 1: $t\leq\bar{t}$. At this stage, buyer A compares the payoff stemming from three possible paths: (i) 0 (if the management rejects); (ii) $v_A-p_A(1-\theta)$ (if the management stays and B rejects); and (iii) $t+\theta p_B^*$ (if management stays and B accepts). Thus, the hostile raider offers a price p_A so that

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$$\max_{p_A} U_A = \begin{cases} 0 & \text{if } p_B^* = v_B + \varepsilon_B \text{ and } p_A < \dfrac{\beta}{\gamma(1-\theta)} \\ v_A - p_A(1-\theta) & \text{if } p_B^* = v_B + \varepsilon_B \text{ and } p_A \geq \dfrac{\beta}{\gamma(1-\theta)} \\ t + \theta p_B^* & \text{if } p_B^* = v_B \end{cases}.$$

Notice that these three possible paths impose different conditions on p_A^* as we will see now. First, path (i) implies that $p_A < \frac{\beta}{\gamma(1-\theta)}$ and $p_A > v_B - \frac{t}{1-\theta} + \frac{\beta}{\gamma(1-\theta)}$ (for $p_B^* = v_B + \varepsilon_B$ so that B rejects). Nevertheless, because $t \leq \bar{t}$, both conditions are inconsistent with each other, so that this path is not feasible.

Second, path (ii) requires that $p_A \geq \frac{\beta}{\gamma(1-\theta)}$ and $p_A > v_B - \frac{t}{1-\theta} + \frac{\beta}{\gamma(1-\theta)}$ (for $p_B^* = v_B + \varepsilon_B$ so that B rejects). Because $t \leq \bar{t}$, a sufficient condition for both inequalities to hold is given by

$$p_A^* = v_B - \frac{t}{1-\theta} + \frac{\beta}{\gamma(1-\theta)} + \varepsilon_A$$

where $\varepsilon_A \downarrow 0$ (because raider A wants to minimize the target price to be paid). Substitution of p_A^* yields a buyer A's payoff in path (ii) equal to

$$v_A - \left(v_B(1-\theta) - t + \frac{\beta}{\gamma} + \varepsilon_A(1-\theta)\right).$$

Third, it suffices for path (iii) that $p_A^* = v_B - \frac{t}{1-\theta} + \frac{\beta}{\gamma(1-\theta)}$ (for $p_B^* = v_B$ so that B accepts).[6] Hence, all this analysis implies that buyer A chooses p_A^* by means of the payoff comparison[7]

$$v_A - \left(v_B(1-\theta) - t + \frac{\beta}{\gamma} + \varepsilon_A(1-\theta)\right) \text{ versus } t + \theta v_B$$

and thus, the optimal price rule at this stage is described by[8]

$$p_A^* = \begin{cases} v_B - \dfrac{t}{1-\theta} + \dfrac{\beta}{\gamma(1-\theta)} + \varepsilon_A & \text{if } \beta < \overline{\beta} \\ v_B - \dfrac{t}{1-\theta} + \dfrac{\beta}{\gamma(1-\theta)} & \text{if } \beta \geq \overline{\beta} \end{cases}.$$

6 Indeed, any p_A^* such that $p_A^* \leq v_B - \frac{t}{1-\theta} + \frac{\beta}{\gamma(1-\theta)}$ guarantees that $p_B^* = v_B$, and thereby, path (iii). Here, for simplicity, we have only chosen the maximum price; this is irrelevant because under this path, buyer A never pays such price because the target is sold to buyer B.

7 Under path (iii), $p_B^* = v_B$.

8 As footnote 6 points out, when $\beta \geq \overline{\beta}$, there is indeed an interval for the equilibrium price so that $p_A^* \in \left[0, v_B - \frac{t}{1-\theta} + \frac{\beta}{\gamma(1-\theta)}\right]$.

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The SPE of Case 1 consists then of all the equilibrium strategies characterized for stages I and II.

Case 2: $t > \bar{t}$. From the previous stage, it is clear that if the management stays, the parameters of the model are inconsistent with buyer B accepting its offer in the subsequent stage. Thus, buyer A offers a price p_A so that

$$\max_{p_A} U_A = \begin{cases} 0 & p_B^* = v_B \\ 0 & \text{if } p_A < \dfrac{\beta}{\gamma(1-\theta)} \text{ and } p_B^* = v_B + \varepsilon_B \\ v_A - p_A(1-\theta) & \text{if } p_A \geq \dfrac{\beta}{\gamma(1-\theta)} \text{ and } p_B^* = v_B + \varepsilon_B \end{cases}.$$

After studying conditions imposed by each of these three situations on p_A^* (similarly to the analysis performed with Case 1), it can be finally established that

$$p_A^* = \begin{cases} v_B - \dfrac{t}{1-\theta} + \dfrac{\beta}{\gamma(1-\theta)} & \text{if } \beta > \gamma v_A \\ \dfrac{\beta}{\gamma(1-\theta)} & \text{if } \beta \leq \gamma v_A \end{cases}.$$

Therefore, all the equilibrium strategies for stages I and II jointly constitute the SPE of case 2.

Part II: **Outcomes**. From the equilibrium established earlier, we characterize now the possible outcomes of the negotiation process. Four outcomes emerge according to the values of t and β.

Case 1.1: $t \leq \bar{t}$ and $\beta < \bar{\beta}$. In accordance with the equilibrium, both inequalities imply that $p_A^* = v_B - \frac{t}{1-\theta} + \frac{\beta}{\gamma(1-\theta)} + \varepsilon_A$, and thus

$$p_A^* > \frac{\beta}{\gamma(1-\theta)}. \tag{A1}$$

Also, it is verified that $p_A^* > v_B - \frac{t}{1-\theta} + \frac{\beta}{\gamma(1-\theta)}$, which according to the equilibrium, ensures that

$$p_B^* = v_B + \varepsilon_{B.} \tag{A2}$$

Whereas conditions (A1) and (A2) imply jointly that the management stays in the negotiation, condition (A2) leads buyer B to reject the offer made to him. The equilibrium path is then $p_A^* = v_B - \frac{t}{1-\theta} + \frac{\beta}{\gamma(1-\theta)} + \varepsilon_A$; management stays; $p_B^* = v_B + \varepsilon_B$; buyer B rejects. Hence, the company is sold to the hostile raider.

Case 1.2: $t \leq \bar{t}$ and $\beta \geq \bar{\beta}$. In the equilibrium, both inequalities imply that $p_A^* = v_B - \frac{t}{1-\theta} + \frac{\beta}{\gamma(1-\theta)}$, which in turn ensures that

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$$p_B^* = v_B. \tag{A3}$$

Notice that condition (A3) implies directly that the management stays and buyer B accepts his respective offer. Hence, the equilibrium path is $p_A^* = v_B - \frac{t}{1-\theta} + \frac{\beta}{\gamma(1-\theta)}$; management stays; $p_B^* = v_B$; buyer B accepts. The company is thus sold to the white knight.

Case 2.1: $t > \bar{t}$ and $\beta \leq \gamma v_A$. In accordance with the equilibrium, these inequalities imply that

$$p_A^* = \frac{\beta}{\gamma(1-\theta)} \tag{A4}$$

and hence $p_A^* > v_B - \frac{t}{1-\theta} + \frac{\beta}{\gamma(1-\theta)}$. In turn, the last condition ensures that

$$p_B^* = v_B + \varepsilon_{B.} \tag{A5}$$

Whereas conditions (A4) and (A5) imply jointly that the management delays the negotiation process, condition (A5) leads buyer B to reject his respective offer. We have then the following equilibrium path: $p_A^* = \frac{\beta}{\gamma(1-\theta)}$; management stays; $p_B^* = v_B + \varepsilon_B$; buyer B rejects. The company is then sold to the hostile raider.

Case 2.2: $t > \bar{t}$ and $\beta > \gamma v_A$. Hence, the equilibrium is so that $p_A^* = v_B - \frac{t}{1-\theta} + \frac{\beta}{\gamma(1-\theta)}$, which in turn ensures that

$$p_B^* = v_B. \tag{A6}$$

Note that condition (A6) is one of the sufficient conditions for the management to reject the offer made to it. The equilibrium path is thus described by $p_A^* = v_B - \frac{t}{1-\theta} + \frac{\beta}{\gamma(1-\theta)}$; management rejects. Hence, the takeover finally fails.

Proof of Corollary 1: (**i**) To perform this proof, we fix an arbitrary value $t \leq \bar{t}$, as otherwise an increase of toehold θ does not affect the relevant cut-off for a hostile takeover (i.e., this cut-off continues to be γv_A). From the definition of $\bar{t}$, it follows that $\frac{\partial \bar{t}}{\partial \theta} = -v_B < 0$ because by assumption $v_B > 0$. This means that we have to analyze the case in which, because a decrease in $\bar{t}$, it now holds that $t > \bar{t}$. In such a case, it is verified that $\bar{\beta} \equiv \gamma(v_A - v_B) < \gamma v_A$, which implies that the new cut-off of private benefits of control for a hostile takeover to occur is higher, and thus, this class of takeover is now more likely as well. Moreover, because when $t > \bar{t}$, a friendly takeover never takes place, one can also conclude that an increase of θ makes less likely to selling the target to a white knight. (**ii**) It follows directly from the fact that $\frac{\partial \bar{t}}{\partial \theta} < 0$ and the role played by $\bar{t}$ in the success of the takeover (see Proposition 1, part iv).

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