No. 1868

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FINANCIAL ECONOMICS

Centre for Economic Policy Research

ISSN 0265-8003

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Discussion Paper No. 1868
June 1998

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CEPR Discussion Paper No. 1868

June 1998

ABSTRACT

Block Premia in Transfers of Corporate Control*

This paper studies block trades and tender offers as alternative means for transferring corporate control in firms with a dominant minority blockholder and an otherwise dispersed ownership structure. Incumbent and new controlling parties strictly prefer to trade the controlling block. From a social point of view, however, this method is inferior to tender offers, because it preserves a low level of ownership concentration which induces more inefficient extraction of private control benefits. This discrepancy is caused by the free-riding behaviour of small shareholders. Moreover, the controlling block trades at a premium which reflects, in part, the surplus that the incumbent and the acquirer realize by avoiding a tender offer and the consequent transfer to small shareholders. Therefore, factors that alter the pay-offs of small shareholders in a tender offer (e.g. supermajority rules, disclosure rules and non-voting shares) also alter the block premium. Finally, the paper argues that greenmail, like block trading, enables the controlling parties to preserve low levels of ownership concentration and large private control benefits.

JEL Classification: G32
Keywords: block premia, tender offers, takeover regulation, greenmail

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*The authors would like to thank Philippe Aghion, Arnoud Boot, Jean Tirole, David Webb, Luigi Zingales and seminar participants at the CEPR workshop on Corporate Finance, Lisbon, 21 March 1997, the European Corporate Governance Network conference in Milan, the European Finance Association meeting in Oslo, Harvard, Lausanne, London (London Business School, London School of Economics, University College London), Madrid (Carlos III), Oxford and Toulouse (IDEI). This project was initiated while Burkart and Panunzi were visiting IDEI. Financial support from the Human Capital and Mobility Programme (Panunzi) and Jan Wallender Stiftelse (Burkart) is gratefully acknowledged. All remaining errors are those of the authors.

Submitted 13 March 1998

NON-TECHNICAL SUMMARY

This paper develops a framework for analysing the transfers of corporate control in firms with a leading shareholder owning a minority block and otherwise dispersed ownership. The starting point is that trading the block is a choice not only over the absence of such an exchange but also over alternative means of transferring corporate control, such as a public tender offer. It is shown that there is a discrepancy between the socially and privately optimal method of exchanging control. From a social perspective, tender offers are preferable, because they increase the new controlling party's ownership stake, which leads to less inefficient extraction of private benefits and higher firm value. In contrast, incumbent and new controlling party prefer to trade only the controlling block, thereby maintaining a lower ownership concentration and consequent large private benefits of control.

This result hinges crucially on two features; the free-riding behaviour of small shareholders and the moral hazard of the controlling blockholder, modelled as inefficient transformation of security benefits into private benefits.

Consistent with the empirical findings, our model predicts that the block is traded at a premium with respect to its post-trade market value. The premium partly reflects the gain that the incumbent and the acquirer realize in avoiding a tender offer and the consequent transfer to the small shareholders. As a result, factors that alter the pay-off of small shareholders in a tender offer (e.g. supermajority rules, disclosure rules, and introduction of non-voting shares) alter also the block premium. The insight that the institutional and regulatory settings which govern alternative modes of transferring corporate control affect block trades is specific to our theory. It suggests that empirical research on block trades and premia should include these factors as explanatory variables.

The discrepancy between the socially and privately optimal ways of exchanging control within our model has also an immediate regulatory implication. The prohibition of partial bids (Equal Opportunity Rule (EOR)), such as the UK City Code on takeovers, improves social welfare. By imposing a larger final holding on the new controlling party, it induces less inefficient extraction of private benefits and therefore increases total firm value. Finally, we apply our theory to greenmail (an offer by the incumbent management or target firm to buy back shareholdings accumulated by an unwanted acquirer at a substantial premium on condition that the takeover attempt be suspended) and uncover its similarities to block trading.

1 Introduction

The ownership of a large block of shares bestows upon the owner a controlling influence. Such influence does not require a majority stake. It can also accrue to owners of large minority blocks, especially in firms with otherwise dispersed ownership. Indeed, small investors lack the incentives to take part in decisions or monitor those taking them on their behalf. Furthermore, a blockholder's voting power makes it more likely that conflicts be resolved in his favor. Consequently, blockholders are left with considerable discretion to pursue their own goals and thus derive private benefits of control that do not accrue to other shareholders and are, at least partly, produced at their expense.[1] Hence, trades of large minority blocks are not mere transfers of cash flow claims but events in which control and associated private benefits change hands.[2]

These considerations suggest that in a firm with a leading minority shareholder, control can be transferred either through a private sale of the controlling block or through a public acquisition in which the other shareholders also have the option to participate. Analyzing this choice, the present paper points out that there is a discrepancy between the socially and privately optimal means of transferring control. The mode of transaction matters because it affects the new controlling party's ownership stake and as a result the post-transaction moral hazard and associated inefficiencies. In particular, a public acquisition results in a larger stake being held by the new controlling party, which implies less extraction of private benefits and higher firm value. In contrast, a private block trade maintains a low ownership concentration which leads to large private benefits of control but to relatively low firm value. Because of the dispersed shareholders' free-riding behavior, incumbent and new controlling party prefer to trade the block. Thus, the paper illustrates how the transfer of control itself may be subject to agency problems.

We consider a firm with a leading shareholder holding a minority block and with an otherwise dispersed ownership. There are neither agency problems between management and leading shareholder nor any opposition from the small shareholders. Hence, the blockholder enjoys unimpaired private benefits of control, which are extracted at a dead-weight loss. A potential buyer appears under whose control the block has a higher value. That is, the sum of private

[1] Both these features are well documented in the empirical literature. See e.g., Shleifer and Vishny (1997) and the discussion in Section 2.

[2] In support of this view, empirical work documents that block trades are rarely prologues to full acquisitions (Barclay and Holderness 1989, 1991, 1992) and that they involve substantial premia relative to post-trade stock prices.

benefits plus the block's fraction of security benefits is larger. Within this setting, we analyze whether and how control will change hands, allowing two alternative methods of transfer: a public tender offer and a private block transaction which excludes all other shareholders.

A controlling party with a larger stake internalizes more of the inefficiency of extracting private benefits, and thus extracts less such gains. As a result, tender offers are the socially preferable mode of transferring control. They increase ownership concentration and therefore total firm value. The coalition of incumbent and buyer, however, opts against the transfer mode which would lead to a higher total firm value. Since small shareholders free-ride in tender offers, they appropriate the bulk of the value improvement brought about by an increase in the ownership concentration. Hence, the coalition of incumbent and buyer is not sufficiently compensated ex-ante, through the bid price, for the reduction in private gains that its ex-post enlarged stake will induce. From the coalition's viewpoint, acquiring dispersed shares is detrimental. Because bargaining between the coalition's members yields a coalition-efficient outcome, only the block will be traded.

A regulatory implication is that the Equal Opportunity Rule (EOR) which grants all shareholders the right to participate on the same terms in the control transaction improves social welfare. By imposing a public tender offer, the EOR mitigates the underconcentration of return claims and consequent inefficient extraction of private benefits.

We argue further that the discrepancy between private and socially optimal way of transferring control accounts for part of the block premia. By avoiding a public tender offer, the coalition of incumbent and buyer secures larger private benefits. This translates into a larger value difference between controlling stake and equal amount of security benefits. The terms of trade reflect the incumbent's share of this additional surplus from the block trade. Consequently, factors which alter the small shareholders' payoff in a tender offer also change the coalition's surplus from block trading and hence the block premium. We illustrate this point with the impact of supermajority rules, non-voting shares, and disclosure rules.

While the above results are primarily theoretical, they are relevant for empirical work. We propose that variables which affect the tender offer outcome also influence the price of the block. For instance, our theory predicts that factors which increase the bid price in tender offers should have a positive impact on block premia. In addition, the size of the block is itself an important determinant of private benefits. Consequently, estimates of block premia should include such factors as explanatory variables.

In addition, our theory implies that block trading should hardly affect the firm's ownership concentration when markets are transparent. A reduction in the ownership stake of the controlling party leads to efficiency losses. Since bargaining is efficient, incumbent and new controlling party avoid such losses. Instead, they maintain full concentration of the block ownership. That is, they trade the entire block. The new controlling party also refrains from increasing the block for the same reason that the coalition prefers to only trade the block. The small shareholders demand a price equal to the post-trade share value. Furthermore, the premium per share and the acquirer's surplus are found to decrease with the block size.

Finally, we interpret greenmail and block trade as two sides of the same coin. In both cases the coalition of incumbent and buyer prefers to maintain a low concentration level to preserve larger private benefits. Block premium and greenmail payments are the share of private benefits that goes to the coalition partner who does not have control in the end: the incumbent in the case of block trading and the potential acquirer in that of greenmail.

Within the extensive literature on ownership and control, only few papers address the issue of leading shareholders having control without majority ownership. Zwiebel (1995) derives equilibrium ownership structures within and across firms, where investors attempt to gain a share of the divisible control benefits. The model predicts that the emergence of single large minority blockholders in firms with otherwise dispersed ownership. We focus on the transfer of control in firms with such leading shareholders. Dewatripont's (1993) analysis of the leading shareholder strategy as a way to gain control without having to acquire 50% of the firm extends to an incumbent blockholder who wants to protect himself against a rival. In his model, the incumbent and the rival are assumed to compete in a takeover contest. In contrast, the present paper shows that, given the choice, both parties strictly prefer to trade the block.

Most of the literature on alternative means of gaining control concentrates on the choice of the structure of a takeover bid; hostile versus friendly takeovers, payment in cash versus securities, or the mode of financing a takeover bid.[3] In contrast, the transfer of corporate control through block trades has received relatively little attention in the theoretical literature. Notable exceptions are the papers by Bebchuk (1994) and Bebchuk and Zingales (1996). Bebchuk analyzes the inefficiencies involved in the process by which control is transferred in firms with a majority blockholder and the impact of the EOR.[4] Because of externalities on the minority shareholders, some inefficient transfers of control may occur, and some efficient transfers may

[3] A selected review of these issues is provided by Hirshleifer (1995).

[4] See also Kahan (1993).

be frustrated. The EOR succeeds in preventing all socially inefficient transfers of control, but discourages more value-increasing control transactions than in a regime without EOR.[5] Building on these results and those of Zingales (1995), Bebchuk and Zingales show that at the IPO stage the firm's founders may choose an ownership structure which is not socially optimal in order to extract more surplus in future control transfers. In contrast, the present paper assumes minority blocks and focuses on the parties' deliberate choice between two alternative modes of transferring control. Moreover, our framework explicitly links the level of private benefits to the ownership structure. This provides a new rationale for the EOR: it imposes a higher ownership concentration, thereby reducing agency costs.

The paper is organized as follows. Section 2 presents the model and provides empirical evidence to motivate the chosen framework. Section 3 shows that incumbent and new controlling party prefer block trading to a tender offer. Section 4 derives the model's implications for determinants of block premia. Section 5 addresses some robustness issues. Section 6 applies our theory to greenmail. Section 7 concludes. Mathematical proofs are in the appendix.

2 Modelling block trading

2.1 The model

Consider a firm in which a fraction $(1-\alpha)$ of shares is dispersed among small shareholders while the remaining minority stake α is held by a leading shareholder (henceforth the incumbent, I). We assume initially the size of the minority block as exogenously determined. Endogeneity of the block size is discussed in section 5. The incumbent faces a potential acquirer (henceforth the rival, R) who owns no shares (except for section 4). The firm's stylized governance rules are such that R can gain control by becoming its largest shareholder. He can achieve this either by acquiring shares from I, or by making a public tender offer, or both. Neither private trades between I and R nor tender offers involve any transaction costs and all shares carry the same number of votes. For public tender offers, we impose the additional restriction that the successful bidder has to have a final holding of at least 50% of the shares. The sole purpose of this assumption - which will be relaxed in Section 5 - is to limit the number of cases. Furthermore, trading on the open market by either I or R is initially ruled out. The sequence of events unfolds as follows.

In stage 1, I and R can trade privately. This is modelled as Nash bargaining with respective

[5] This result is related to Grossman and Hart's (1988) analysis of the one share - one vote rule.

bargaining powers ψ and $1-\psi$, where $\psi \in [0,1]$. I and R bargain over the fraction of the block $\eta \leq \alpha$ that R acquires and the transfer price P. In addition, they can negotiate a standstill agreement, where I pledges not to acquire further shares in the future. That is, they can agree to skip stages 2 and 3, and move directly to stage 4. If bargaining breaks down or does not result in a standstill agreement, the game continues with stage 2.

In stage 2, a takeover contest takes places. First, R makes an offer and I may then counter-bid. Offers are unrestricted and conditional, requiring the winning bidder to acquire all tendered shares provided that his final stake is at least 50%. Neither I nor R face any wealth constraints.

In stage 3, the shareholders face the tendering decision. We assume that tendering is sequential. First, I and R decides how many shares (if any) they want to tender. Having observed these choices, the dispersed shareholders non-cooperatively decide whether and to which party to tender. They are homogeneous and atomistic and hence each of them does not perceive himself as pivotal for the tender offer outcome. In order to select amongst multiple equilibrium outcomes, the Pareto dominance criterion is used.[6] Assuming sequential rather than simultaneous tendering keeps the analysis synoptical, without affecting the qualitative outcome of the tender offer. We will discuss this point further in Section 3.

In stage 4, the firm's largest shareholder, $X \in \{I, R\}$, exercises corporate control and allocates the firm's resources. They may either be used to generate private benefits for X or security benefits which accrue to all shareholders. The degree of control by X and thus his ability to extract private benefits is assumed to be independent of the block size. This point is discussed in Section 5.

The resource allocation decision is modelled as the choice of $\phi \in [0,1]$ such that security benefits are $(1-\phi)v_X$ while private benefits are $d(\phi)v_X$. The controlling party X, holding a fraction β of shares, will choose a level of extraction, ϕ_X^β. We assume that extracting private benefits is inefficient.

Assumption 1 *For $X = I, R$, the function d_X is strictly increasing and concave on $[0,1]$, with $d_X(0) = 0$, $d'_X(0) = 1$ and $d'_X(1) = 0$.*

The transformation of security benefits into private benefits has two crucial features: inefficiency and uniformity. The controlling party's utility gains from extracting private benefits,

[6]Shareholder coordination on the Pareto-dominating equilibrium is furthered by control share acquisition laws. Adopted by more than 15 states in the US, they require that the acquirer gains the approval of all outstanding shares and by a majority of disinterested shares (Karpoff and Malatesta (1989)).

measured in monetary terms, are on the margin less than the aggregated loss in security benefits. The extraction of private benefits affects the value of all shares equally. That is, the controlling party cannot discriminate among shares when choosing ϕ. It should be noted that our results carry over to any standard moral hazard model.

I and R differ in their abilities to extract private gains and generate security benefits.[7] The next two assumptions capture these differences.

Assumption 2 *R can generate higher security benefits than I, i.e. $v_R > v_I$.*

Assumption 3 *R values the block more than I, i.e.$[\alpha(1 - \phi_R^\alpha) + d_R(\phi_R^\alpha)]v_R > [\alpha(1 - \phi_I^\alpha) + d_I(\phi_I^\alpha)]v_I$.*

Assumptions 2 and 3 define our main case where there are gains from trade, irrespective of the mode of transferring control. As will become clear later, block trading also occurs when Assumption 2 does not hold. Within our framework, the violation of Assumption 3 leads to greenmail (section 6). Finally, all agents are risk-neutral and the functions d_I and d_R as well the parameters α, v_I and v_R are common knowledge.

2.2 Empirical evidence to the model

The model is based on the notions that large minority shareholders exist, exert control over firms, and that block trades constitute control events. Moreover, it assumes that private benefits of control are at least partly extracted at the expense of security benefits and inversely related to the controlling party's ownership stake. The following paragraphs present briefly some evidence to support the empirical relevance of these notions.

Although in the United States and the United Kingdom the rule is dispersed ownership, large share stakes and dominant shareholders exist in considerable numbers.[8] For instance, Zwiebel (1995) reports that for the 456 firms included in the *1981 CDE Stock Ownership Directory: Fortune 500* there are 123 shareholders holding blocks in excess of 20% of a firm's equity. Moreover, such leading shareholders are usually the single large investor in the firm. In their study of 106 negotiated block trades in the United States, Barclay and Holderness

[7] The heterogeneity of the blockholders' incentives and expertise has been documented in several studies. Morck *et al.* (1988) find that firm value tends to be lower when the firm is run by a member of the founder's family. The view is perhaps best supported by the very fact that stock prices react (positively) to a change in the identity of the blockowner which leaves the ownership structure unaffected (Barclay and Holderness (1991)).

[8] Large blockholdings are even more pervasive in other countries, e.g., Continental Europe and Japan. The lack of a takeover market, however, suggests that the choice to transfer control by either a block trade or a tender offer does not exist. Thus, evidence from these economies can offer only limited support for our theory.

(1991) document that minority shareholders have indeed substantial control and that block sales are control events. The average block size is 27% of the firm's equity, and most trades (90%) represent a change in the firm's largest blockholder, rather than an increase in ownership concentration. In most cases the block trade is also not a mere prologue to full acquisition but the final outcome, with control passing from the seller to the purchaser. Moreover, negotiated block trades are a relatively common method for transferring control. For instance, while there were 10 hostile tender offers a year during the 1978-1982 period in the United States, there were approximately 20 registered block trades. The occurrence of a control transfer through block trading is supported by the observed aftermath; typically acquirers or their representative become directors or officers, while sellers resign from their corporate positions. The overall turnover among CEOs following block trades is similar to the turnover following other control transactions and these changes are typically initiated by block purchasers.

We are not aware of any corresponding study for the United Kingdom. Nevertheless, Franks *et al.* (1995) document that block trades are an important way in which corporate control is exercised. They find that active new shareholders acquire blocks from incumbent corporate investors and directors in poorly performing companies and that such trades are associated with significant board turnovers. Finally, the view that minority blockholders enjoy substantial control and can use their influence for self-serving purposes is also reflected in some legislations. For example, the UK City Code on takeovers requires all parties owning more than 30% of the votes to make an offer to the other shareholders.

As regards the source of private benefits, there are various ways in which a controlling party can employ corporate resources in a manner which primarily serves its own interest. Prominent examples are the excessive retention of free cash flow and acquisitions motivated by empire building ambitions. A more extreme example is the straight expropriation of minority shareholders by the controlling party, e.g., through transactions at preferential terms.

Nonetheless direct evidence on private benefits is hard to find. As Zingales (1994) notes, "[i]n fact, some corporate benefits are enjoyed exclusively by the management precisely because they cannot be easily measured (and thus claimed) by minority shareholders."[9] The most compelling evidence comes from the price at which blocks change hands. Barclay and Holderness (1989) find that in the United States blocks are priced at an average premium of 20% relative to the post-trade share value which, they conclude, reflects private benefits that

[9] Shleifer and Vishny (1997) survey numerous studies that document self-serving actions by controlling parties.

accrue exclusively to the blockholder. Evidence with the same interpretation is the observed premium that voting shares command relative to non-voting shares.[10]

Some related evidence of self-serving behavior and its mitigation through equity ownership comes from the MBO literature. Jensen (1989) argues that increased managerial ownership in LBOs provide strong incentives for managers to abstain from wasteful investments and self-serving actions. Empirical studies, e.g. Kaplan (1989), document post-buyout operating improvement and value increases and attribute them to improved incentives rather than wealth transfers. Further evidence stems from the considerable discounts on closed-end funds, which could be easily eliminated by liquidating or opening the fund. Barclay *et al.* (1993) report that the funds' large shareholders veto any open-ending proposals in order to preserve their private benefits, such as management fees, employment of relatives, or giving the fund the family name.

3 Block trades: Social *versus* private optimality

This section presents the main theoretical insight of the paper. It is shown that within our model tender offers are the socially preferable method of transferring control. In contrast, I and R have a common interest to avoid a tender offer. The game is solved by backward induction.

In stage 4, the party in control, $X \in \{I, R\}$, chooses ϕ_X^β to maximize

$$\beta(1-\phi)v_X + d_X(\phi)v_X$$

Lemma 1 *The level of private benefits extraction chosen by the party in control is strictly decreasing in his shareholding, i.e.* $\partial\phi_X^\beta/\partial\beta < 0$.

On the margin, diverting corporate resources is inefficient. As the controlling party's shareholding increases, he internalizes more of this dead-weight loss. Consequently, the extent of private benefit extraction is decreasing in the size of his final stake. This implies a positive relationship between share value $(1-\phi_X^\beta)v_X$ and β.

In stages 2 and 3, R makes a tender offer, I has the option to counter, and all shareholders (including I and R) then decide whether and to which party to tender. Tendering is sequential: first, I and R decide how many shares they want to tender. Then, the small shareholders decide, taking into account the choices of I and R. Stages 2 and 3 are reached only if a standstill agreement has not been negotiated in the stage 1 bargaining. Nonetheless, R may still have acquired some of I's shares at stage 1.

[10]The average voting premium is 10% in the United States and 13% in the United Kingdom. Both are well below the values found for Canada 23%, Switzerland 27%, Israel 45%, and Italy 81% (Zingales (1994)).

Lemma 2 *In all Pareto-dominant equilibria of the tendering game, the highest bidder gains control. If party X with a pre-offer stake γ gains control with the highest bid $b \leq v_X$, his final payoff is equal to $\gamma b + d_X\left(1 - \frac{b}{v_X}\right)v_X$, which is strictly decreasing in b.*

Suppose that small shareholders anticipate X's success and expect him to hold a final stake $\hat{\beta} \geq 50\%$. Because they do not perceive themselves as pivotal for the outcome, each of them considers tendering if and only if retaining the shares does not yield a higher expected return. Conversely, each of them considers retaining if and only if tendering does not yield a higher expected return. Hence, dispersed shareholders must be ex-ante indifferent between tendering and retaining their shares. In the rational expectations equilibrium, shareholders anticipate X's final stake β correctly, and so $b = (1 - \phi_X^\beta)v_X$. Thus, the dispersed shareholders free-rider behavior implies that the winning bidder's final holding β is such that the bid price equals the post-takeover security benefits. This holds irrespective of the fact that either I or R loses the bidding contest and may want to tender shares himself.

The dispersed shareholders' free-rider behavior has two further consequences. First, the supply of shares and thus the winning bidder's final stake increase with the bid price. An increase in b must be matched by a corresponding increase in the post-takeover security benefits which in turn necessitates a larger final stake. Second, the winning bidder does not make any profit on the tendered shares. As in Grossman and Hart (1980) and Shleifer and Vishny (1986), he gains only from the value increase of his pre-offer stake, $\gamma(1 - \phi_X^\beta)v_X$, and from his private benefits, $d_X(\phi_X^\beta)v_X$.

The winner's net payoff $\gamma(1 - \phi)v_X + d_X(\phi)v_X$ would be maximized for $\phi = \phi_X^\gamma$. However, the level of private benefit extraction that he will choose ex-post is determined by the size of his final holding, $\beta > \gamma$. The larger final stake induces the winning bidder to choose a level of ϕ that increasingly differs from the level which is optimal for an initial stake of γ (Lemma 1). Hence, as bid price and final stake increase, the winning bidder's profits decrease. He forgoes more private benefits without making any profit on the tendered shares. The outcome of the takeover contest can be summarized as follows.[11]

Lemma 3 *In all Pareto-dominant equilibria of the bidding contest, R wins control. More precisely,*

- *If $(1 - \phi_R^{\frac{1}{2}})v_R > v_I$ (non-effective competition), R bids $b^* = (1 - \phi_R^{\frac{1}{2}})v_R$ and his final holding is $\beta^* = \frac{1}{2}$.*

[11] For further details see Burkart, Gromb and Panunzi (1998).

- *If* $(1-\phi_R^{\frac{1}{2}})v_R < v_I$ *(effective competition), R bids* $b^* = v_I$ *and his final holding is* β^* *such that* $b^* = (1-\phi_R^{\beta^*})v_R$.
- *In both cases, I tenders some fraction* $\nu \in [\max\{0, (\beta^* - \eta - 1 + \alpha)\}, (\alpha - \eta)]$ *and the dispersed shareholders tender the remaining fraction* $\beta^* - \eta - \nu$.

For R to gain control, his bid must attract 50% of the shares and prevent I from successfully countering. Because R's net payoff is decreasing in his bid, he will bid the lowest price satisfying these two constraints. Suppose that R has just bid b. By not counter-bidding, I would receive a payoff of $(\alpha - \eta)b$. By bidding (marginally above) b, I would receive $(\alpha-\eta)b + d_I(1-\frac{b}{v_I})v_I$ (Lemma 2). Hence, $b = v_I$ is the lowest price for which I refrains from counter-bidding. In the absence of effective competition, R has to bid $(1-\phi_R^{\frac{1}{2}})v_R$ in order to attract 50% of the shares. Consequently, to win the contest, R will bid $b = \max[v_I,\ (1-\phi_R^{\frac{1}{2}})v_R]$. Since $b < v_R$, R makes strictly positive gains, and indeed wins the contest. The gains of R are lower in the case of effective competition. The final stake in excess of 50% induces R to extract less private benefits while the resulting improvement in share value is appropriated by the target shareholders.[12]

As stated in Lemma 3, the equilibrium share supply may originate from a multiplicity of tendering strategies. As regards I, he has an impact on the equilibrium outcome only in his role as the potential competitor. That is, his ability to counter-bid determines R's bid and his final stake β^*. In contrast, his tendering decision merely affects the equilibrium strategies, not the outcome.

The irrelevance of I's tendering strategy for the outcome depends on the assumption that tendering decisions are sequential. With simultaneous moves, intricacies arise which are tangential to the focus of the paper. In particular, R's bid may fail for $b \in [(1-\phi_R^{50\%})v_R,$ $(1-\phi_R^{50\%+(\alpha-\eta)})v_R]$. Given that R's bid succeeds, I has an incentive to tender some additional shares when $b = (1-\phi_R^{\beta})v_R$ and $\beta \geq 50\%$. By increasing R's final holding β, he raises the value of the shares which he retains. Because this incentive to "overtender" persists for any b, an equilibrium requires that I tenders all his shares. However, I may be pivotal for the outcome of the tender offer and prefer R's bid to fail. More precisely, for bids $b < (1-\phi_R^{50\%+(\alpha-\eta)})v_R$ the equilibrium condition $b = (1-\phi_R^{\beta})v_R$ requires that less than $50\% + (\alpha-\eta)$ of the shares are tendered. Given that I tenders all his shares in the equilibrium where R's bid succeeds,

[12] Because of the simple formalization of the bidding contest, I and R's optimal bids are independent of the initial stakes. In a framework with several or simultaneous bids, parties owning toeholds would overbid (Burkart (1995)). This, however, would not alter the qualitative features of our results.

small shareholders tender less than 50% and I is pivotal. If I accepts the offer each share has a value equal to b. In contrast, if he retains his shares and keeps control, each of his shares is worth $[\frac{d(\phi_I^{\alpha-\eta})}{\alpha-\eta}v_I + (1-\phi_I^{\alpha-\eta})v_I]$. Hence, for $(\alpha-\eta)b < \alpha(1-\phi_I^{\alpha-\eta})v_I + d_I(\phi_I^{\alpha-\eta})v_I$ and $b < (1-\phi_R^{50\%+(\alpha-\eta)})v_R$, the only equilibrium outcome in the tendering stage is failure of R's bid. Anticipating this outcome, R increases his stage 2 offer such that at least $50\% + (\alpha-\eta)$ of the shares are tendered. Thus, the difference between sequential and simultaneous tendering decisions is that for some parameter constellations the lower bound for R's optimal bid increases from $(1-\phi_R^{50\%})v_R$ to $(1-\phi_R^{50\%+(\alpha-\eta)})v_R$ which tends to increase the negotiated price P in the block trade.

In stage 1, R and I bargain over the transfer price, the fraction η of shares transferred, and a standstill agreement, in which they agree to skip the tender offer stages.

Lemma 4 *In the bargaining, I and R trade the entire block, i.e. $\eta = \alpha$, and enter a standstill agreement.*

Assumptions 2 and 3 imply that R gains control, irrespective of the transfer mode. Because the tender offer results in a higher ownership concentration, both I and R strictly prefer private trading. The intuition for this result is to consider I and R as a coalition. If they increase their joint ownership, their incentives to extract private benefits will be reduced. However, the coalition has to acquire the shares in the tender offer at their post-acquisition value because dispersed shareholders free-ride. Thus, the bid price does not compensate the coalition ex-ante for the reduction in private benefits that its ex-post enlarged stake will induce. Hence, from the coalition's viewpoint, acquiring dispersed shares in a tender offer is detrimental. Instead I and R agree to trade privately and to skip the tender offer stages.

The joint surplus from the control transfer is maximized when R internalizes ex-post the full dead-weight loss that the extraction of private benefits imposes on the value of the block. This is achieved only when R owns the entire block (Lemma 1). Since bargaining between I and R yields a coalition-efficient outcome, they will trade the entire block.

Efficient bargaining and symmetric information imply that I and R will, in equilibrium, always agree to avoid the takeover contest. This is not meant to suggest that firms with a dominant minority shareholder are never subject to tender offers. Note also that without a standstill agreement R would continue to be subject to the threat that I may start a bidding contest. That is, after having traded the block, I could threaten to trigger a bidding contest in order to extract a further payment from R. Anticipating this threat R will demand such an agreement in the stage 1 bargaining.

Proposition 1 summarizes the conclusions of the above analysis and points at the welfare implication.

Proposition 1 *I and R find it optimal to trade privately and to avoid the takeover. From a social efficiency viewpoint, however, a public tender offer is superior as a mechanism for transferring control.*

Transfer of corporate control through a block trade preserves the low concentration of ownership and the corresponding high level of inefficient extraction of private benefits. In contrast, in a bidding contest, R acquires a larger fraction of the return rights, $\beta^* > \alpha$, and diverts corporate resources to a lesser extent. Hence, social surplus is greater when control is transferred through a tender offer than through a block trade.

In our model, the discrepancy between socially and privately optimal means of transferring control in firms with a leading minority shareholder is caused by two factors: the free-rider behavior of dispersed shareholders and the inefficient extraction of private benefits. Without the free-rider behavior, the increase in share value following a tender offer would compensate the coalition of I and R for the reduction in private benefits. Hence, there would be no reason why a transfer of control would not be associated with a socially superior increase in ownership concentration.

Without the inefficient extraction, security benefits and private benefits are independent. This is the standard assumption in the control transfer literature, e.g. Grossman and Hart (1988), Bebchuk (1994), Zingales (1995). In such a framework, total firm value does neither depend on the ownership structure nor on the method of transferring control, provided that control is transferred. Moreover, the coalition of I and R does not always strictly prefer block trading within the standard framework: in the case of non-effective competition, they are indifferent between block trading and a tender offer. Similarly, I and R do not gain from keeping the block intact (Lemma 4) when share value and private benefits are independent. Trading the entire block or merely part of it is a matter of indifference, (unless the controlling position is lost). Because of the ex-post moral hazard problem created by the inefficient transformation of security benefits into private benefits, our model's implications differ. In particular, I and R always strictly prefer to trade privately and never want to break up the block.[13]

[13] Barclay and Holderness (1991) report that blocks are usually kept together after a trade.

Some further implications of our model are worth pointing out. First, the inefficiency of a block trade relative to a tender offer does not depend on the stock price reaction, i.e., the sign of $[(1-\phi_R^\alpha)v_R - (1-\phi_I^\alpha)v_I]$. An increase in the stock price merely implies that small shareholders also benefit from the control transfer. It does, however, not preclude that they would gain even more in a tender offer.

Second, our model predicts block trading whenever the block is worth more under R than under I (Assumption 3). This holds irrespective of whether Assumption 2 holds. When $v_I > v_R$, the coalition of I and R still prefers to trade the block. Due to the small shareholders' free-rider behavior, the coalition loses in a tender offer relative to maintaining a low ownership concentration. Moreover, because bargaining is coalition-efficient, I and R realize the gains from trade and transfer control. Indeed Assumption 3 and a revealed preferences argument imply

$$[\alpha(1-\phi_I^\beta)+d_I(\phi_I^\beta)]v_I < [\alpha(1-\phi_I^\alpha)+d_I(\phi_I^\alpha)]v_I < [\alpha(1-\phi_R^\alpha)+d_R(\phi_R^\alpha)]v_R$$

The difference between constellation $v_R > v_I$ and $v_I > v_R$ regards which party can threaten to trigger a bidding contest and thereby reduce the other party's surplus. For $v_R > v_I$, I can threaten R to trigger a contest in the bargaining, unless he gets appropriately compensated for handing over control. For $v_I > v_R$, R can threaten to increase I's stake through a bidding contest, in order to induce him to trade the block.[14] In this latter constellation, the threat may lack some credibility because R has by assumption no initial shares and would thus not benefit from a takeover contest. As will be shown in section 4, R actually has an incentive to acquire an initial stake in order to strengthen his bargaining position.

Third, our model implies that block trades leave the ownership structure unchanged. Once R has acquired the entire block α from I, he will not alter his stake through open market transactions. Indeed, the following can be proved.

Corollary 1 *In a fully transparent market, R does not retrade after acquiring the block.*

When the identity of traders and the traded quantities are publicly observable, R will not find it optimal to reduce his stake after the block trade. Forward looking buyers anticipate that a smaller block will induce R to extract more private benefits, thus lowering share value.

[14] For $v_I > v_R$, our model yields the same predictions only under the additional assumption that R is an effective competitior. That is, $v_R \geq (1-\phi_I^{50\%})v_I$, or $v_R \geq (1-\phi_I^\alpha)v_I$ once the assumption is relaxed that the successful bidder has to own at least 50% after the tender offer (see section 5). Without this restriction, I can refuse to sell the block and maintain the status quo, i.e., being in control with his initial block α.

That is, R would bear the dead-weight loss on the entire original block α that a reduction of his stake generates. As a result, he has no incentive to increase the extent of private benefit extraction by selling some shares in the open market. R has equally no incentive to acquire additional shares. Indeed, dispersed shareholders free-ride and their supply of shares is such that the bid price equals the post-trade share value. Hence, R would not be compensated for the reduction in private benefits. Corollary 1 is in accordance with the findings of Barclay and Holderness (1991) who report that ownership concentration typically does not change following a block trade. It is no obvious result though. Its key is the ex-post moral hazard problem that is created by the inefficient extraction of private benefits.

Finally, the fact that social optimality does not emerge from private contracting suggests that there is scope for regulation.

Corollary 2 *Social welfare is improved by a mandatory bid requirement with the prohibition of exclusive block trading, i.e., the Equal Opportunity Rule.*

The Equal Opportunity Rule (EOR) entitles the dispersed shareholders to participate in the transaction on the same terms as I.[15] Under such a regulatory regime, the acquisition of the block at a premium is never optimal for R. It would force R to offer all other shareholders to purchase their shares at the same price. Instead, R and I go directly to the tender offer stage. The winning bid is $b^* = \max\{v_I, (1 - \phi^{\frac{1}{2}})v_R\}$ and the rival's final holding is $\beta^* \geq 50\% > \alpha$, resulting in less private benefits and less dead-weight loss. Thus, the EOR is socially beneficial because it prevents that the underconcentration of return claims can be preserved in control transfers.

The present analysis provides a rationale for the EOR which differs from Bebchuk's (1994) argument. Analyzing the transfer of majority blocks, Bebchuk shows that the EOR succeeds in preventing all socially inefficient transfers but discourages more value-increasing control transactions than in a regime without EOR.[16] Provided that a value-increasing control transfer occurs, the EOR is irrelevant. In our model, the EOR has an impact also on value-increasing

[15] The U.K. City Code includes an EOR whereas the Williams Act, the federal takeover legislation in the United States, does not contain such a provision.

[16] Within the framework of Grossman and Hart (1988), a majority blockowner is equivalent to a security-voting structure which deviates from one share - one vote. Hence, the question analysed by Bebchuk (1994) may be rephrased as whether a compulsory conversion to the one share - one vote rule, i.e., the EOR, or the preservation of concentrated security-voting structure leads to a more efficient allocation of control. On the one hand, the conversion to one share - one vote in the control transfer process performs well in terms of discouraging value-decreasing acquisitions. On the other hand, a conversion makes it more likely that efficient control transfers are infeasible. A value-increasing rival may be unable to offer all shareholders the same terms as to the incumbent blockholder who needs to be compensated for his forgone control benefits.

transfers. By imposing a larger final holding, it reduces the inefficient extraction of private benefits and therefore increases total firm value. This difference stems from the different frameworks. In Bebchuk's model, total firm value is independent of the ownership structure and the problem is to discriminate between value-increasing and value-decreasing bidders. In our framework, total firm value does not only depend on the identity of the controlling party but also on the fraction of shares that R is required to buy in order to gain control.

Our conclusion needs to be qualified as it implicitly relies on negligible takeover costs and risk neutrality. Takeovers, however, involve usually substantial costs such as financing costs and fees which must be taken into account in any welfare analysis. Indeed, it may be possible that these costs exceed profits, in which case banning block trades prevents a transfer of control. In contrast, bargaining over the block price has both lower costs and higher gains for the R. Provided that $[(1-\phi_R^\alpha)+d_R(\phi_R^\alpha)]v_R > [(1-\phi_I^\alpha)+d_I(\phi_I^\alpha)]v_I$, a transfer of control is socially desirable,[17] and the EOR trades off the frequency of control transfers against their inefficiency.

The result that higher ownership concentration is socially beneficial hinges upon the assumption that all the parties are risk neutral. If the large blockholders were risk averse, there would be a countervailing effect. In this case, implementing the EOR could prove suboptimal. The policy conclusion we have reached is therefore not very robust, since our model is biased towards increased ownership concentration.

4 Determinants of block premia

We have shown that I and R agree to avoid a public tender offer because dispersed shareholders would appropriate the bulk of the gains from the control transfer. Instead I and R trade the block and thereby maintain large private benefits which they do not have to share with the other shareholders. We now examine the transfer price of control and its determinants in more detail. Within our theory, blocks trade at a premium and part of this premium reflects I and R's surplus from avoiding the tender offer. More importantly, the environment in which tender offers take place affects the terms of block trades. This is the section's core result and an implication of our general point that the acquisition of a controlling minority block is a deliberate choice among alternative means of transferring control.

Two introductory remarks are in order. First, most of the subsequent results - as well as some of the previous ones - hinge on the chosen bargaining model. That is, they require that

[17] Note that $[\alpha(1-\phi_R^\alpha)+d_R(\phi_R^\alpha)]v_R > [\alpha(1-\phi_I^\alpha)+d_I(\phi_I^\alpha)]v_I$ (Assumption 3) does not ensure that a transfer of control is socially efficient, i.e., $[(1-\phi_R^\alpha)+d_R(\phi_R^\alpha)]v_R > [(1-\phi_I^\alpha)+d_I(\phi_I^\alpha)]v_I$.

the bargaining outcome depends to some extent on the parties' outside options.[18] Second, our model predicts block trading irrespective of whether $v_R > v_I$ (Assumption 2) or the reverse holds. We restrict the analysis to the main case ($v_R > v_I$) as the qualitative results do not differ.

4.1 Block premium

In the stage 1 bargaining, R acquires the entire block from I at a price P. The transfer price P is determined by the parties' relative bargaining powers and threat points and is given by

$$P = \alpha b^* + \psi \left[(\alpha(1-\phi_R^\alpha) + d_R(\phi_R^\alpha))\, v_R - \left(\alpha b^* + d_R(\phi_R^{\beta^*}) v_R\right)\right]$$

where $b^* = \max[v_I, (1-\phi_R^{\frac{1}{2}})v_R]$ and $\phi_R^{\beta^*} = 1 - \frac{b^*}{v_R}$. Let Π denote the difference between the transfer price and the post-transfer value of α shares. That is, $\Pi = P - \alpha(1-\phi_R^\alpha)v_R$. It can easily be shown that I benefits more from the transfer of control than the small shareholders.

Corollary 3 *The block trades at a premium with respect to the post-trade share value, i.e.* $\Pi > 0$. *The premium per share,* Π/α, *is decreasing in the block size.*

The block premium can be split into two components.

$$\Pi = \alpha\,[b^* - (1-\phi_R^\alpha)v_R] + \psi \left[(\alpha(1-\phi_R^\alpha) + d_R(\phi_R^\alpha))\, v_R - \left(\alpha b^* + d_R(\phi_R^{\beta^*}) v_R\right)\right]$$

The threat point of I is to force R into a tender offer contest in which he receives αb^*. I can thus secure $\alpha[b^* - (1-\phi_R^\alpha)v_R]$, the first term in the expression of Π. This is a purely redistributive transfer from R to I. Second, I also receives a share ψ of the surplus that I and R derive from avoiding a takeover contest. By transferring control through a block trade, they prevent the value of the block to fall from $[\alpha(1-\phi_R^\alpha) + d_R(\phi_R^\alpha)v_R]$ to $[\alpha b^* + d_R(\phi_R^{\beta^*})v_R]$, the second term of Π. This second component is specific to our theory as it relies on the post-takeover moral hazard on part of R.

The premium per share can similarly be decomposed into two terms.

$$\frac{\Pi}{\alpha} = [b^* - (1-\phi_R^\alpha)v_R] + \psi \left[\left((1-\phi_R^\alpha) + \frac{d_R(\phi_R^\alpha)}{\alpha} \right) v_R - \left(b^* + \frac{d_R(\phi_R^{\beta^*})}{\alpha} v_R \right) \right]$$

[18] These results would not obtain in Rubinstein's (1982) alternating offers bargaining model. There is, however, an alternative version of the alternating offer game where players are indifferent about the timing of an agreement and there is a given probability of a breakdown after each bargaining round. In this latter framework, all our results hold because the parties' bargaining payoffs depend on their outside options (see e.g. Osborne and Rubinstein (1990)).

As α increases, I's threat point per share, b^*, remains unchanged while the post-transfer value of each share increases. Hence, the first term decreases. The coalition's per share surplus from a block trade, the second term, is also decreasing in α. The direct effect of an increase in α is to reduce the surplus per share, i.e. $-\frac{d_R(\phi_R^\alpha)-d_R(\phi_R^\beta)}{\alpha^2}v_R$. A change in α also affects the surplus through the level of dilution ϕ_R^α but this effect is second order. Indeed, ϕ_R^α being chosen optimally, the envelope theorem applies. Moreover, the second term in the surplus remains unchanged because the controlling stake emerging from a tender offer is unaffected by a change in α.

Consider now the rival's profit which is equal to

$$d_R(\phi_R^{\beta^*})v_R + (1-\psi)\left[(\alpha(1-\phi_R^\alpha) + d_R(\phi_R^\alpha))\, v_R - \left(\alpha b^* + d_R(\phi_R^{\beta^*})v_R\right)\right]$$

Corollary 4 *The rival's profit is decreasing in the block size.*

The rival's outside option, $d_R(\phi_R^{\beta^*})v_R$, is independent of α, while an increase in α puts more weight on the security benefits. This reduces the surplus that I and R derive from avoiding a tender offer. An increase in α also affects the extraction of private benefits but this is again a second order effect. As a result, the surplus to be shared is reduced and so the rival's payoff decreases. This result is in line with the findings of Barclay and Holderness (1992) who observe a lower frequency of large block trades than of smaller block trades.

While Corollaries 3 and 4 are supported by empirical findings (Barclay and Holderness 1989, 1991, 1992) they are not unique to our theory. That is, these results do not rely on the moral hazard on part of R once he is in control. A framework with independent private benefits and security benefits can also generate a positive block premium and a negative relationship between block size and premium per share or rival's profit. Relative to such models (e.g., Zingales (1995)), the distinguishing feature of our model is the surplus that the coalition of I and R obtain from avoiding the tender offer. This is the mechanism behind Proposition 1. It also accounts for our unique prediction that factors which increase the dispersed shareholders' payoff in a tender offer lead to a higher block premium. We develop this implication in the next section.

4.2 Institutional environment and block premia

Our theory considers block trading as an alternative to a tender offer. This implies that factors which affect the outcome of tender offers also impact on the terms of block trades.

Proposition 2 *For a given block size α, factors that increase the bid price and the ownership concentration in a tender offer lead to a higher block premium.*

As the bid price increases, so does the ownership concentration emerging from a takeover contest. Both factors benefit the dispersed shareholders, while reducing the private benefits for R. Therefore the coalition's surplus from avoiding the tender offer is increased. Because I gets part of this larger surplus, the block premium increases. The main insight of Proposition 2 is that an understanding of block trades and premia requires to explicitly include factors that influence the outcome of tender offers (or of other alternative means of transferring control). In what follows we provide three examples of such factors: supermajority rules, non-voting shares, and disclosure thresholds.

4.2.1 Supermajority rules

A firm's majority rule influences the amount of return rights that a bidder needs acquire to gain control. Under the simple majority rule, the rival needs to acquire a fraction $\kappa \geq 50\%$ in order to succeed in the tender offer.

Corollary 5 *For a given block size α, the block premium weakly increases with the control majority.*

As the control majority marginally increases, the ownership concentration emerging from a takeover contest strictly increases under non-effective competition and remains unchanged under effective competition. In addition, the likelihood of non-effective competition increases in the control majority. A higher ownership concentration subsequent to the tender offer implies a larger surplus from block trading and hence a larger block premium.

Note that Corollary 5 is a prediction specific to our theory. If private benefits and security benefits were independent of the ownership concentration, the majority rule would have no impact on the block premium. In fact, the supply of share in the tender offer would be flat, making the buyer indifferent between buying 50% of the shares or $\kappa > 50\%$.

4.2.2 Non-voting shares

Consider next a firm's security-voting structure. In combination with the majority rule, the security-voting structure determines the amount of return rights that the bidder has to acquire in a takeover contest. Without loss of generality, the analysis is restricted to two classes of shares; voting shares with a fraction s of return rights, and non-voting shares with a fraction $1 - s$ of return rights. The impact of a dual-class share system is similar to, though more complex than, changes in the control majority.

Corollary 6 *If there is effective competition under one share - one vote, i.e., $s = 1$, the introduction of some non-voting shares increases the block premium for a given block size α.*

Introducing some non-voting shares intensifies the competition. In a contest, both bidders will only attempt to buy voting shares. Acquiring non-voting shares is of no use in gaining control, while it reduces the winning bidder's private benefits because of the increased final holding. A reduction in the fraction of voting shares increases the winner's private benefits because he has to hold less shares. In addition, he spreads these benefits across fewer shares. Hence, the losing bidder's highest bid, i.e. the winning bid price, $b^*(s)$, increases as the number of non-voting shares increases. For s close to 1, introducing more non-voting shares leads to a larger total number of voting shares being tendered. As a result, I's payoff in a tender offer increases, while R's payoff decreases, which implies a larger block premium. This effect, however, prevails only if there are some voting shares left that are not tendered. Once the winning bidder attracts all voting shares, introducing further non-voting shares actually reduces R's final stake. The effect on R's payoff is ambiguous; he pays a higher price but receives more private benefits ex-post. Similarly, the block premium may increase or decrease following a further increase in the fraction of non-voting shares. A sufficient condition for a positive effect on the block premium is that the control transfer leads to an increase in the share value. Finally, the case of non-effective competition is isomorphic to the situation of effective competition where all voting shares are tendered.

4.2.3 Disclosure rules on shareholding

Finally, suppose that R can acquire shares in the open market prior to the stage 1 bargaining.[19] Assume further that purchases below the disclosure threshold ω can be executed secretly.[20] That is, R can buy any quantity up to ω at a price equal to the share value under I's control. Once R has reached the disclosure threshold, the free-rider problem is effective and additional shares have to be purchased at their final value.

[19] Barclay and Holderness (1991) find that in 75% of block trades in their sample, the block purchasers did not own any stock prior to the trade. In the other trades, their pre-trade holdings were 14% (median 9%).

[20] In the United States, parties who acquire 5% or more are required to disclose their holdings within 10 days. The U.K. regulation requires a first disclosure at 3%, prior to December 1988 the threshold was at 5%. The first disclosure threshold in the EU legislation is 10% (Burkart 1995).

Corollary 7 *For a given block size α, a reduction in the disclosure threshold ω weakly increases the block premium.*

Let $\triangle$ denote the fraction of shares that R acquires before the bargaining stage. To decompose the different effects, we analyze first the situation where $\omega = 0$ and R has to buy all shares at a price equal to their final value $(1 - \phi_R^{\alpha+\triangle})v_R$. The acquisition of shares at this price involves the following trade-off. On the one hand, additional shares improve R's bargaining position in stage 1, because his payoff in the takeover contest is larger. On the other hand, they increase the coalition's ownership stake and thereby reduce the amount of private benefits. For a small number of shares, the gain from an improved bargaining position dominates the loss in private benefits. As the number of shares increases, the relative magnitude of the two effects might be reversed, and acquiring a larger initial stake might be detrimental for R. Hence, given the option to buy shares at their final value, R will choose to do so to a certain extent.

Consider now a positive disclosure threshold $\omega > 0$. Secret purchases are executed at the current share value $(1 - \phi_I^\alpha)v_I$. R can circumvent the free-rider problem and the change in value of these secretly purchased shares is captured by the coalition of I and R. Obviously, secret purchases are only attractive if the current share price $(1 - \phi_I^\alpha)v_I$ is not too high relative to the final share value. Denote by $\bar{p}$ the price above which secret purchases are not profitable.

Provided that $(1 - \phi_I^\alpha)v_I \leq \bar{p}$, R will always acquire a fraction $\triangle > \omega$. First, the gain from increasing the coalition's joint equity stake at a relatively low current share value $(1 - \phi_I^\alpha)v_I$ always dominates the loss in private benefits because the latter are extracted inefficiently. As a result, R will acquire secretly as many shares as possible. Second, as explained above, R initially gains from buying shares at their final value $(1 - \phi_R^{\alpha+\triangle})v_R$, and hence $\triangle > \omega$. In this constellation a lower disclosure threshold increases the costs of acquiring an initial stake and R will buy fewer shares. This reduces R's payoff in the tender offer and the joint shareholding of R and I. The former effect strengthens I's bargaining power, the latter makes it more attractive for the coalition to avoid the tender offer. Both effects increase the block premium.

In the reversed case where $(1 - \phi_I^\alpha)v_I > \bar{p}$, R has no incentives to acquire any shares secretly. Under the assumption that R can always credibly convey his intention to gain control, he will do so immediately. He voluntarily imposes a zero disclosure threshold and has to pay the final value for any shares that he purchases on the open market. Because this improves R's bargaining position, he will still acquire some shares. The legal threshold or changes thereof have, however, no impact.

5 Robustness

In this section we discuss how variations of the basic model affect our results and point at some limitations of our model. More specifically, we address four issues. First, we examine the model's implications for the transfer of majority blocks. Second, we discuss the assumption that the blockowner has full control, irrespective of the block size. Third, we consider the robustness of our results with respect to the chosen bid form and to alternative means of acquiring shares. Finally, we explore how controlling minority blocks may arise.

5.1 Majority blocks

If I owns a majority block $\alpha > 50\%$, a tender offer is no longer an option. Control can only be transferred through a block trade and the incumbent remains in control if bargaining breaks down. Under Assumptions 1 to 3, it still holds that block trades leave the ownership structure unchanged. Moreover, social efficiency would be greater if the rival were forced to acquire further shares.

As regards trading patterns, we cannot predict whether majority blocks trade at a premium or a discount. Since I cannot use the threat of triggering a takeover, the outside option in the bargaining is the status quo, and I and R simply split the gains from a control transfer. Whether a majority block trades at a premium or a discount depends on the bargaining powers and the source of gains. Suppose that R values the block more than I because of higher security benefits rather than larger private benefits. In this case dispersed shareholders free-ride on the value improvement, while I has to bribe R to take control. That is, he has to accept a discount. If the gains from a control transfer mainly stem from R's higher ability to extract private benefits, the majority block trades at a premium. Thus, our model predicts that the majority block premium can be either positive or negative. In contrast, in the case of a minority block where control is potentially at stake, blocks are always traded at a premium.

5.2 Minority block and control

We have assumed that the blockholder has full control, irrespective of the block size. One may object that the blockholder's ability to impose his agenda depends positively on his stake, at least in some range. This seems especially plausible when there are other smaller blockholders in the firm. Introducing a positive relationship between control and stake gives rise to a countervailing effect: private benefits need no longer be decreasing in the block size. As a result, the relationship between total firm value and block size may also be non monotonic. In this modified framework, R might not always prefer a low concentration of ownership because a small block might constrain his ability to extract private benefits. This makes the tenders offer a less costly alternative and therefore reduces the block premium.

This modified specification of minority control exhibits a limitation of our model. Our analysis applies to large blockholders who do not face any serious challenge by other shareholders. A fitting example is a firm in which one party holds $20 - 25\%$ of the shares but no other shareholder owns a significant stake. In contrast, our model does not cover the case where two or more blockholders compete for the control. Similarly, our model cannot account for the possibility that monitoring by other shareholders constrains the leading minority shareholder in his behavior.

While defining control as a zero-one variable is surely restrictive, it is an appropriate approximation of the balance of power within firms with a dominant minority shareholder. Indeed, there is empirical support indicating that such shareholders deter other block investors, and hence their controlling positions are largely unchallenged. For instance, Zwiebel (1995) reports that firms with multiple large blockholders are rare.

5.3 Bid form and alternatives acquisition modes

We have imposed that the successful bidder has to have at least a final holding of 50% of the shares. Our results do, however, not depend on this simplifying restriction. Suppose instead that R gains full control after a tender offer if he owns ε more shares than I. In this modified setting, three rather than two cases must be distinguished. First, under effective competition, the 50% threshold is not binding and the restriction is irrelevant. Second, for $(1 - \phi_R^{\frac{1}{2}})v_R \geq v_I \geq (1 - \phi_R^{\alpha+\varepsilon})v_R$, R's winning bid $b^* = v_I$ attracts a fraction β^* defined by $(1 - \phi_R^{\beta^*})v_R = v_I$. Since $\beta^* > \alpha$, both parties still prefer to trade the block and all the results carry through. Third, for $(1 - \phi_R^{\alpha+\varepsilon})v_R > v_I$, R's optimal bid attracts $\alpha + \varepsilon$ shares. In this case, there are no gains from block trading, because acquiring the block or buying an equivalent amount of shares on the open market have the same cost for R. Hence, there is no block premium.[21]

Another assumption is that bids are unrestricted. If offers restricted to 50% were admissible, I may remain in control because owning α shares gives him a larger advantage in the bidding

[21] Even in this case, the rival may have an incentive to pay a premium for the block. By buying out the incumbent, he prevents potential future conflicts which are bound to reduce the returns from owning a block.

contest. Indeed with restricted bids I might win the contest, although $v_R > v_I$. Nonetheless, our conclusions do not change. Under Assumption 3, I and R still strictly prefer to trade the block and to skip the tender offer stages. That is, the coalition's payoff from the block trade exceeds the payoff from a takeover contest with restricted bids.[22]

Finally, we have excluded the possibility that R can gain control other than through block trading or a tender offer. An alternative would be to acquire sufficient shares on the open market. Our results, do, however, not depend on whether open market purchases are feasible, as long as either party can launch a tender offer. Moreover, open market acquisitions are equivalent to tender offers when markets are fully transparent. Dispersed shareholders anticipate the control transfer and set an ask-price equal to the final share value. Therefore, R does not gain by acquiring shares on the market rather than through a tender offer. In practice, neither the identity of the traders nor the traded quantities are always publicly observed. Nonetheless, R is most unlikely to even come close to gain control through secret purchases. If the market fails to infer from his purchases the pending control transfer, the disclosure threshold ensures that R's intentions become public information.

5.4 Endogenous minority blocks

Throughout the analysis, we have assumed a minority block of exogenous size. One may question whether the model is compatible with the existence of minority blocks. In particular, the inefficient extraction of private benefits implies that total firm value is maximized under full ownership. Nonetheless, minority blocks may emerge as privately optimal choice, despite being socially inefficient. Zingales (1995) shows how the initial owner's choice of the ownership structure solves a trade-off with respect to a future control transfer. On the one hand, a dispersed structure allows the initial owner to extract all the improvement in security benefits brought about by the future controlling party. In contrast, by bargaining he has to share the improvement in security benefits with the future controlling party. On the other hand, dispersed shareholders cannot extract any private benefits from the future controlling party, whereas, by having control, the initial owner can extract some of it in a direct negotiation. The

[22] Consider the case of effective competition, (otherwise the bid form is irrelevant). Assume that I owns α shares at the beginning of the takeover contest, and that tendered shares are accepted on a pro-rata basis if the offer is oversubscribed. When I wins the contest I and R realizes a total payoff equal to $\alpha(1-\phi_I^{\frac{1}{2}})v_I + d_I(\phi_I^{\frac{1}{2}})v_I - (\frac{1}{2}-\alpha)[b^* - (1-\phi_I^{\frac{1}{2}})v_I]$. When R wins the takeover contest the total payoff to I and R is $[\alpha(1-\phi_R^{\frac{1}{2}}) + d_R(\phi_R^{\frac{1}{2}})]v_R + \frac{1}{2}[1-\alpha][(1-\phi_R^{\frac{1}{2}})v_R - b^*]$. Either payoff is less than I and R's joint payoff from the block trade because of effective competition and Assumption 3.

optimal fraction retained by the initial owner may well be a minority block.[23]

6 Greenmail

Many large companies have adopted anti-takeover measures during the late 1980s. A particularly controversial practice is the targeted repurchase of the firm's shares, usually referred to as *greenmail*. Typically, a potential raider acquires a stake in the target company and begins to make his presence known by e.g., demanding Board representation or threatening a takeover. The incumbent management reacts to the presence of the potential raider by offering to repurchase his shares at a premium, excluding other shareholders from this offer.[24] In return, the potential bidder signs a standstill agreement.

We analyze greenmail in the same model save for two modifications. First, both R and I own a fraction of the company's shares. Denote by δ the fraction of shares held by R (α still denotes the fraction held by I). Second, I values the total block $(\alpha+\delta)$ more than R.

Assumption 4 $[(\alpha+\delta)(1-\phi_R^{\alpha+\delta})+d_R(\phi_R^{\alpha+\delta})]v_R < [(\alpha+\delta)(1-\phi_I^{\alpha+\delta})+d_I(\phi_I^{\alpha+\delta})v_I]$

We maintain that $v_R > v_I$ (Assumption 2). This implies that R can extract a payment from I because he can threaten to gain control in a takeover contest.[25] Finally, to highlight the analogy to block trading, we assume that I acquires R's shares out of his own wealth. In most cases, repurchases are, however, made using the firm's cash-flow and the repurchased shares are liquidated. These modifications would not overturn our results, provided that I continues to own some shares. Moreover, the incentives to reach a greenmail agreement are even higher in such a modified setting since I pays only a fraction α of the total repurchase expenses.

The analysis of stages 2, 3 and 4 remains unchanged. R wins the takeover contests at a bid price $b^* = \max\{v_I, (1-\phi_R^{\frac{1}{2}})v_R\}$, and holds a final fraction $\beta^* \geq \frac{1}{2}$ of shares. Hence, the outside options in the bargaining are αb^* for I and $\delta b^* + d_R(\phi_R^{\beta^*})$ for R. The total payoff to I and R

[23] The inefficient extraction of private benefits gives rise to third effect which is not present in Zingales' model: a larger block implies a higher share value but less private benefits. Therefore, a more dispersed ownership structure proves useful in extracting a larger fraction of security benefits, but lowers the level of security benefits. Conversely, a larger block allows to capture a higher fraction of the private benefits, but reduces the size of private benefits. Due to this additional effect, highly dispersed or very concentrated ownership structures are less likely to emerge in our framework than in Zingales' model.

[24] Bailey (1991, page 77) writes "Greenmail was a [...] popular device. That it sounded like blackmail was no accident, since only a question of legality distinguished blackmail from greenmail which was basically an offer to buy back a raider's stock at a premium price. Because this was offered only to the raider as opposed to the other ordinary shareholders, it was basically a bribe."

[25] Like block trading, greenmail could also arise when the incumbent would win the takeover contest, i.e., $v_I > v_R$. The threat of R would then be to increase the ownership stake of I. We abstract from this case since it yields qualitatively the same results.

from greenmail is equal to $(\alpha+\delta)(1-\phi_I^{\alpha+\delta})v_I + d_I(\phi_I^{\alpha+\delta})v_I$ which is larger than their returns from a takeover. Indeed, a revealed preferences and Assumption 4 imply

$$[(\alpha+\delta)(1-\phi_I^{\alpha+\delta})+d_I(\phi_I^{\alpha+\delta})]v_I > [(\alpha+\delta)(1-\phi_I^{\alpha+\delta})+d_I(\phi_I^{\alpha+\delta})]v_R > [(\alpha+\delta)(1-\phi_I^{\beta^*})+d_I(\phi_I^{\beta^*})]v_R$$

In stage 1, R and I bargain over a payment in exchange for (a fraction of) the δ shares and the standstill agreement. In contrast to block trading, the block $(\alpha+\delta)$ is now worth more under I's control than under R's control. Replacing Assumption 3 with Assumption 4 switches the identity of the block's buyer and seller but leads to no further changes. Hence, Lemma 4 applies and we have the following result.

Proposition 3 *I and R find it optimal that I keeps control and repurchases all of R's shares.*

Like block trading, greenmail enables the controlling party to preserve a low concentration of ownership and consequent large private benefits. For the coalition of I and R, it is inefficient to acquire additional shares due to the free-rider behavior of the dispersed shareholders. Since the block $(\alpha+\delta)$ is worth more under I's control and bargaining is efficient, they agree on greenmail rather than on transferring control to R. Moreover, since their joint surplus is maximized when I takes the dead-weight loss of dilution on the total block $(\alpha+\delta)$ into account, he repurchases the entire block δ.

Denote by G the total payment for the δ shares plus the standstill agreement. Following the same reasoning as in the derivation of the block premium, we obtain

$$G = \psi\left[\delta b^* + d_R(\phi_R^{\beta})v_R\right] + (1-\psi)\left[(\alpha+\delta)(1-\phi_I^{\alpha+\delta})v_I + d_I(\phi_I^{\alpha+\delta})v_I - \alpha b^*\right]$$

The total payment is decreasing in the incumbent's block size and increasing in the rival's block size. In fact, by the envelope theorem,

$$\frac{\partial G}{\partial \alpha} = -(1-\psi)[b^* - (1-\phi_I^{\alpha+\delta})v_I] < 0 \qquad \text{and} \qquad \frac{\partial G}{\partial \delta} = \psi b^* + (1-\psi)(1-\phi_I^{\alpha+\delta})v_I > 0$$

The reservation payoff of R is independent of α, while I's reservation payoff is increasing in α. Hence, as α increases I has to pay less to R. Similarly, as δ becomes larger, I has to offer more to R. Define the greenmail payment Γ as the difference between the total payment G and the post-repurchase value of δ shares. That is, $\Gamma = G - \delta(1-\phi_I^{\alpha+\delta})v_I$ which can be rewritten as

$$\Gamma = \delta[(b^* - (1-\phi_I^{\alpha+\delta})v_I] + \psi d_R(\phi_R^{\beta})v_R + (1-\psi)\left[(\alpha+\delta)[(1-\phi_I^{\alpha+\delta})v_I - b^*] + d_I(\phi_I^{\alpha+\delta})v_I\right]$$

Corollary 8 *R's shares are repurchased at a premium relative to the post-repurchase share value, i.e.* $\Gamma > 0$. *The premium* Γ *is decreasing in I's block* α.

Like the block premium, the greenmail payment represents a bribe. I pays it to R in order to maintain control and avoid an increase in the ownership concentration. As the size of the incumbent's block increases, the advantages of greenmail decrease and so does the premium that the rival earns (for a given δ). Hence, an incumbent with a small block is more likely to fall victim to greenmail. This result reinforces the idea that greenmail is caused by underconcentration of ownership.

So far it has been assumed that the rival buys a stake $\delta > 0$ before bargaining with the incumbent. Within our model, a positive δ emerges endogenously. Consider a perfectly transparent capital market, the least favorable case for the purchase of δ. In this case, R has to buy shares at their final value $(1 - \phi_I^{\alpha+\delta})v_I$. Hence, Γ is also the rival's net profit from the greenmail operation. The first-order condition with respect to the stake size δ yields

$$\frac{\partial \Gamma}{\partial \delta} = \left[\psi[b^* - (1 - \phi_I^{\alpha+\delta})v_I] + \delta \frac{\partial \phi_I^{\alpha+\delta}}{\partial \delta} v_I\right] = 0.$$

Since $\frac{\partial \Gamma}{\partial \delta} = \psi[b^* - (1 - \phi_I^{\alpha+\delta})v_I] > 0$ as δ goes to 0, the rival has an incentive to acquire a strictly positive stake δ.

The repurchase of R's block brings an end to the takeover threat and prevents shareholders from earning a substantial takeover premium. Indeed, empirical studies, e.g., Holderness and Sheenan (1985) and Mikkelson and Ruback (1986), document a significative stock price drop following the announcement of greenmail agreements. Our model does not yield this prediction because greenmail is a certain outcome, anticipated by all parties. Introducing inefficient bargaining would, however, make our model consistent with this observed price drop.[26] Instead our model predicts a different effect of greenmail agreements on stock prices.

Corollary 9 *Over the entire period from the original purchase to the repurchase, greenmail leads to a stock price increase.*

Before R acquires his stake, the stock price is $(1 - \phi_I^{\alpha})v_I$. After the greenmail agreement, the incumbent owns a larger stake $(\alpha + \delta)$ and extracts less private benefits. As a result, the

[26] When bargaining is inefficient, I and R sometimes enter a takeover contest. Before the bargaining outcome is known, the stock price will lie between post-takeover share value and post-repurchase share value. Since $b^* > (1 - \phi^{\alpha+\delta})v_I$, the announcement of a tender offer (i.e., failed negotiations) will lead to a positive price reaction and the announcement of a repurchase to a negative price reaction

share value increases from $(1-\phi_I^{\alpha})v_I$ to $(1-\phi_I^{\alpha+\delta})v_I$. Therefore, shareholders are not harmed, but benefit from the whole greenmail operation. Corollary 9 is supported by the empirical evidence. It indicates that the stock price of target firms rises, when measured from the initial purchase by the rival to the final repurchase. Mikkelson and Ruback (1986) examine 39 cases of greenmail during 1978-80. They report an average gain of 1.7 percent over the entire period of the greenmail operation. Holderness and Sheenan (1985) study 12 cases of greenmail and they find a pattern of returns consistent with the evidence of Mikkelson and Ruback.

The fact that shareholders seem to be gaining from greenmail does not render greenmail agreements socially desirable.

Corollary 10 *Social surplus is greater when R takes control through a tender offer than when I retains control through a targeted share repurchase.*

While the stock price increase due to the share repurchase clearly benefits the company's shareholders, they would benefit even more from a takeover by R. If R were to challenge I in a takeover contest, ownership concentration would increase and the deadweight loss would be reduced. As in the case of block trades, a caveat applies to this result. Because our model abstracts from transaction costs, it would be premature to conclude from the Corollary 10 that banning greenmail is unambiguously beneficial.

7 Conclusion

The paper develops a framework for analyzing the transfers of corporate control in firms with a leading shareholder owning a minority block and otherwise dispersed ownership. The starting point is that trading the block is a choice not only over the absence of such an exchange but also over alternative means of transferring corporate control, such as a public tender offer. It is shown that there is a discrepancy between the socially and privately optimal method of exchanging control. From a social perspective, tender offers are preferable because they increase the new controlling party's ownership stake which leads to less inefficient extraction of private benefits and higher firm value. In contrast, incumbent and new controlling party prefer to trade only the controlling block, thereby maintaining a lower ownership concentration and consequent large private benefits of control.

This result hinges crucially on two features; the free-riding behavior of small shareholders and the moral hazard by the controlling blockholder, modelled as inefficient transformation of security benefits into private benefits. Indeed, as the coalition of incumbent and buyer increases its stake, it internalizes more of the inefficiency and thus extracts less private benefits. However, the coalition has to buy shares at their post-tender offer value because dispersed shareholders free-ride. Hence, the coalition is not compensated ex-ante, through the bid price, for the reduction in private gains that its ex-post enlarged stake will induce. Since bargaining between incumbent and buyer is efficient, the block will be traded but no further shares will be acquired.

Consistent with the empirical findings, our model predicts that the block is traded at a premium with respect to its post-trade market value. The premium reflects in part the gain that the incumbent and the acquirer realize in avoiding a tender offer and the consequent transfer to the small shareholders. As a result, factors that alter the payoff of small shareholders in a tender offer (e.g., supermajority rules, disclosure rules, and introduction of non-voting shares) alter also the block premium. The insight that the institutional and regulatory settings which govern alternative modes of transferring corporate control affect block trades is specific to our theory. It suggests that empirical research on block trades and premia should include these factors as explanatory variables.

The discrepancy between the socially and privately optimal ways of exchanging control within our model has also an immediate regulatory implication. The prohibition of partial bids (EOR), e.g., as by the U.K. City Code on takeovers, improves social welfare. By imposing a larger final holding on the new controlling party, it induces less inefficient extraction of private benefits and therefore increases total firm value. Finally, we apply our theory to greenmail and uncover its similarities to block trading. In either case the coalition of incumbent and rival benefit from maintaining a low level of ownership concentration. Like the block premium, the greenmail payment represents the "bribe" to secure large private benefits of control. Whether incumbent and rival opt for a block trade or greenmail depends under whose control the block is worth more.

APPENDIX

A Proof of Lemma 1

The first and second derivatives of X's profit with respect to ϕ are $-\beta v_X + d'_X(\phi)v_X$ and $d''_X(\phi)$. The problem is concave as $d''_X(\phi) < 0$. $d'_X(0) = 1$ and $d'_X(1) = 0$ ensure that an interior solution is obtained.

B Proof of Lemma 2

Suppose X bids b which is the highest bid. Dispersed shareholders consider tendering iff $b \geq (1 - \phi_X^{\hat{\beta}})v_X$ and consider retaining iff $(1 - \phi_X^{\hat{\beta}})v_X \geq b$, where $(1 - \phi_X^{\hat{\beta}})v_X$ are the expected post-takeover security benefits. In the rational expectations equilibrium, $\hat{\beta} = \beta$ and hence $b = (1 - \phi_X^{\beta})v_X$. By Lemma 1, this equation has a unique solution. X's final payoff is $[\beta(1-\phi_X^{\beta}) + d_X(\phi_X^{\beta})]v_X - (\beta - \gamma)b$ which may be rewritten as $\gamma b + d_X(1 - \frac{b}{v_X})v_X$. Differentiating with respect to b yields $\gamma - d'_X(1 - \frac{b}{v_X}) < 0$ as $d'_X(\phi_X^{\beta}) = \beta > \gamma$.

C Proof of Lemma 3

R wins the contest if (1) his bid discourages I from countering and (2) attracts at least 50% of the shares.

$$\begin{cases} \max & \eta b + d_R(1 - b/v_R)\, v_R \\ (1) & (\alpha - \eta)b \geq (\alpha - \eta)b + d_I(1 - b/v_I)\, v_I \\ (2) & b \geq (1 - \phi_R^{\frac{1}{2}})v_R \end{cases}$$

From Lemma 2 follows that maximizing $\eta b + d_R(1 - b/v_R)\, v_R$ is equivalent to minimizing b. Moreover, (1) is rewritten $0 \geq d_I(1 - b/v_I)$ which holds iff $b \geq v_I$.

$$\begin{cases} \min & b \\ (1) & b \geq v_I \\ (2) & b \geq (1 - \phi_R^{\frac{1}{2}})v_R \end{cases}$$

Since $b^* = \max[(1 - \phi_R^{\frac{1}{2}})v_R, v_I] > (1 - \phi_I^{\alpha})v_I$ (pre-tender offer stock price), R winning the contest is indeed the Pareto-dominant outcome.

Consider now the tendering strategies in the case of effective competition. (The same reasoning applies for the case of non-effective competition.) Having observed I tendering ν shares, dispersed shareholders simply tender $(\beta^* - \nu - \eta)$ so $b^* = (1 - \phi_X^{\beta^*})v_X$ (Lemma 2). If $\beta^* \leq 1 - (\alpha - \eta)$, I is indifferent about the number of shares that he tenders. The subsequent tendering decision by the dispersed shareholders ensures that $b^* = (1 - \phi_X^{\beta^*})v_X$, and I realizes a return equal to $(\alpha - \eta)b^*$. If instead $\beta^* \geq 1 - (\alpha - \eta)$ this does no longer hold. Hence, $b^* = (1 - \phi_X^{\beta^*})v_X$ iff I tenders $\nu \geq (\alpha - \eta) + \beta^* - 1$ shares. Tendering fewer shares is, however, dominated, because it would result in a return smaller than $(\alpha - \eta)b^*$.

D Proof of Lemma 4

In a tender offer, R's payoff is $\eta b^* + d_R(\phi_R^{\beta^*})v_R$, and I's payoff is $(\alpha - \eta)b^*$. Hence, the coalition's joint payoff in a tender offer is $\alpha b^* + d_R(\phi_R^{\beta^*})v_R$ which may be rewritten as $\alpha(1 - \phi_R^{\beta^*})v_R +$

$d_R(\phi_R^{\beta^*})v_R$. Similarly, the coalition's joint payoff from a trading privately is $\alpha(1-\phi_R^\alpha)v_R + d_R(\phi_R^\alpha)v_R$. Trading privately dominates the tender offer if and only if

$$\alpha(1-\phi_R^\alpha)v_R + d_R(\phi_R^\alpha)v_R > \alpha(1-\phi_R^{\beta^*})v_R + d_R(\phi_R^{\beta^*})v_R.$$

which is true by revealed preferences.

By definition, $\phi_R^\alpha = \arg\max \alpha(1-\phi_R^\alpha)v_R + d_R(\phi_R^\alpha)v_R$. After trading with I, R maximizes $\eta(1-\phi_R^\alpha)v_R + d_R(\phi_R^\alpha)v_R$. Hence, he will set $\phi = \phi_R^\alpha$, iff $\eta = \alpha$.

E Proof of Corollary 1

Suppose that R trades a fraction Δ (with $\Delta > 0$ or $\Delta < 0$) at price p per share. His new payoff is

$$(\alpha - \Delta)(1-\phi_R^{\alpha-\Delta})v_R + d_R(\phi_R^{\alpha-\Delta})v_R + \Delta \cdot p$$

If R reduces his holding ($\Delta > 0$), rational traders will anticipate the (lower) post-trade share value, so that $p = (1-\phi_R^{\alpha-\Delta})v_R$. If instead, R is increasing its holding ($\Delta < 0$), atomistic shareholders will free ride and not sell below the increased post-trade share value, so that again $p = (1-\phi_R^{\alpha-\Delta})v_R$. As a result, R will trade to maximize

$$\alpha(1-\phi_R^{\alpha-\Delta})v_R + d_R(\phi_R^{\alpha-\Delta})v_R$$

which, given the inefficiency of dilution, is achieved at $\Delta = 0$.

F Proof of Corollary 3

$$\Pi = \alpha\left[b^* - (1-\phi_R^\alpha)v_R\right] + \psi\left[\left(\alpha(1-\phi_R^\alpha) + d_R(\phi_R^\alpha)\right)v_R - \left(\alpha b^* + d_R(\phi_R^{\beta^*})v_R\right)\right]$$

The first term is positive because $b^* = (1-\phi_R^{\beta^*})v_R \geq (1-\phi_R^{\frac{1}{2}})v_R > (1-\phi_R^\alpha)v_R$. The second term is positive by a revealed preference argument. Hence, $\Pi > 0$. The premium per share is

$$\frac{\Pi}{\alpha} = \left[b^* - (1-\phi_R^\alpha)v_R\right] + \psi\left[\left((1-\phi_R^\alpha) + \frac{d_R(\phi_R^\alpha)}{\alpha}\right)v_R - \left(b^* + \frac{d_R(\phi_R^{\beta^*})v_R}{\alpha}\right)\right]$$

Computing the derivative with respect to α yields

$$\frac{\partial(\Pi/\alpha)}{\partial\alpha} = \frac{\partial\phi_R^\alpha}{\partial\alpha}v_R + \psi\left[0 - \frac{d_R(\phi_R^\alpha) - d_R(\phi_R^{\beta^*})}{\alpha^2}\right]v_R$$

Both terms being negative, we have proved $\frac{\partial(\Pi/\alpha)}{\partial\alpha} < 0$.

G Proof of Corollary 4

The rival's profit is

$$d_R(1-\frac{b^*}{v_R})v_R + (1-\psi)\left[\left(\alpha\left(1-\phi_R^\alpha\right)v_R + d_R\left(\phi_R^\alpha\right)\right) - \left(\alpha b^* + d_R(1-\frac{b^*}{v_R})\right)\right]$$

Computing the derivative with respect to α yields (using the envelope theorem)

$$0 + (1-\psi)[(1-\phi_R^\alpha)v_R - b^*] < 0.$$

H Proof of Proposition 2

Once $\phi_R^{\beta^*}$ is substituted by $(1-\frac{b^*}{v_R})$ in the expression for Π, it is immediate to check that

$$\frac{\partial \Pi}{\partial b^*} = \alpha - \psi(\alpha - d_R'(1-\frac{b^*}{v_R})) = \alpha + \psi(\beta - \alpha) > 0$$

I Proof of Corollary 5

R's winning bid price $b^* = \max[v_I, (1-\phi_R^{\kappa})v_R]$ is weakly increasing in κ. The block premium is given by

$$\Pi = \alpha\,[b^* - (1-\phi_R^{\alpha})v_R] + \psi\left[(\alpha(1-\phi_R^{\alpha}) + d_R(\phi_R^{\alpha}))\,v_R - \left(b^* + d_R(\phi_R^{\beta^*})v_R\right)\right]$$

or, using the equality $b^* = \left(1-\phi_R^{\beta^*}\right)v_R$

$$\Pi = \alpha\,[b^* - (1-\phi_R^{\alpha})v_R] + \psi\left[(\alpha(1-\phi_R^{\alpha}) + d_R(\phi_R^{\alpha}))\,v_R - \left(b^* + d_R(1-\frac{b^*}{v_R})v_R\right)\right]$$

so that

$$\frac{\partial \Pi}{\partial b^*} = (1-\psi)\alpha + \psi \cdot d_R'(\phi_R^{\beta^*}) > 0$$

J Proof of Corollary 6

Given a fraction s of voting shares, the lowest price that I does not counter, i.e., R's winning bid price, is $b^*(s) = b_I(s) = \left[(1-\phi_I^s) + \frac{d_I(\phi_I^s)}{s}\right]v_I$. Since ϕ_I^s is strictly decreasing in s, $\frac{\partial b_I}{\partial s}$ has the opposite sign of $\frac{\partial b_I^s}{\partial \phi_I^s}$. Substituting $d_I'(\phi_I^s)$ for s in b_I^s and differentiating yields $\frac{\partial b_I^s}{\partial \phi_I^s} = -d_I(\phi_I)d_I''(\phi_I)/[d_I'(\phi_I)]^2 > 0$. Hence, $b_I(s)$ is decreasing in s.

Effective competition under $s=1$ implies $v_R > v_I > (1-\phi_2^{50\%})v_R$. Because $(1-\phi_2^s)v_R$ increases with s, and $b_I(s)$ decreases with s, there exists a unique s^* such that $b^*(s^*) = (1-\phi_R^{s^*})v_R$. Two cases have to be distinguished. If $s > s^*$, R's winning bid $b^*(s)$ determines his final holding. That is, the equality $b^* = \left(1-\phi_R^{\beta^*}\right)v_R$ holds. If $s < s^*$, the winning bidder's final holding is determined by the fraction of voting shares s. (Note that Assumptions 2 and 3 do not exclude the possibility that I may win the bidding contest for $s < s^*$. That is, $b_I(s) > b_R(s) = [(1-\phi_R^s) + \frac{d_R(\phi_R^s)}{s}]v_R$ is not ruled out.)

For $s \geq s^*$, $\beta^* < s^*$, $\phi_R^{\beta^*} = (1-\frac{b^*}{v_R})$, and the block premium is given by

$$\Pi = \alpha\,[b^* - (1-\phi_R^{\alpha})v_R] + \psi\left[(\alpha(1-\phi_R^{\alpha}) + d_R(\phi_R^{\alpha}))\,v_R - \left(\alpha b^* + d_R(1-\frac{b^*}{v_R})v_R\right)\right]$$

which is increasing in b^* hence decreasing in s.

For $s < s^*$, $\beta^* = s^*$ and $\phi^{\beta^*} = \phi^{s^*}$. Given that R continues to win the takeover contest, the block premium is equal to

$$\begin{aligned}\Pi &= \alpha\,[b^* - (1-\phi_R^{\alpha})v_R] \\ &\quad + \psi\left[(\alpha(1-\phi_R^{\alpha}) + d_R(\phi_R^{\alpha}))\,v_R - (\alpha b^* - s b^* + s\,(1-\phi_R^s)\,v_R + d_R(\phi_R^s)v_R)\right]\end{aligned}$$

and

$$\frac{\partial \Pi}{\partial s} = \alpha(1-\psi)\frac{\partial b^*}{\partial s} + \psi\frac{\partial\,[s b^* - (s\,(1-\phi_R^s)\,v_R + d_R(\phi_R^s)v_R)]}{\partial s}$$

The sign of $\frac{\partial \Pi}{\partial s}$ is determined by that of either the first or the second term depending on ψ. The first term is strictly negative. Let us examine the second term. Using the envelope theorem we get

$$\begin{aligned}\frac{\partial\left[sb^* - \left(s\left(1-\phi_R^s\right)v_R + d_R(\phi_R^s)v_R\right)\right]}{\partial s} &= \frac{\partial}{\partial s}\left(s\left(1-\phi_I^s\right) + d_I(\phi_I^s)\right)v_I \\ &\quad -\frac{\partial}{\partial s}\left(s\left(1-\phi_R^s\right) + d_R(\phi_R^s)\right)v_R\end{aligned}$$

Using the envelope theorem twice yields

$$\frac{\partial\left[sb^* - \left(s\left(1-\phi_R^s\right)v_R + d_R(\phi_R^s)v_R\right)\right]}{\partial s} = \left(1-\phi_I^s\right)v_I - \left(1-\phi_R^s\right)v_R$$

We have made no assumption on the sign of this quantity. However, a sufficient condition for it to be negative is $\left(1-\phi_R^\beta\right)v_R \geq \left(1-\phi_I^\beta\right)v_I$, $\forall\beta \in [0,1]$.

K Proof of Corollary 7

Let Δ be the fraction of shares acquired by R before the bargaining stage. From previous arguments follow that the winning bid in a takeover contest is $b^* = v_R(1-\phi_R^{\beta^*})$ and $\beta^* - \Delta$ shares are tendered, where $b^* = \max\{v_I, v_R(1-\phi_R^{\frac{1}{2}})\}$. I's payoff is $\alpha(1-\phi_R^{\beta^*})v_R$ and R's payoff is $\Delta(1-\phi_R^\beta)v_R + d_R(\phi_R^\beta)v_R$. This implies a block price equal to

$$P = \psi[(\alpha+\Delta)(1-\phi_R^{\alpha+\Delta}) + d_R(\phi_R^{\alpha+\Delta}) - \Delta(1-\phi_R^{\beta^*}) - d_R(\phi_R^{\beta^*})]v_R + (1-\psi)\alpha(1-\phi_R^{\beta^*})v_R.$$

Denote R's total profits by Q_R. In the presence of a disclosure threshold ω, the first ω can be purchased at the current stock price p, while the remaining $\Delta-\omega$ shares are bought at their post-transfer value, i.e. $(1-\phi_R^{\alpha+\Delta})v_R$. Depending on p, the optimal Δ may be smaller or larger than ω.

For $\Delta \geq \omega$, R's total profits are

$$Q_R = (\alpha+\Delta)(1-\phi_R^{\alpha+\Delta})v_R + d_R(\phi_R^{\alpha+\Delta})v_R - P - p\omega - (\Delta-\omega)(1-\phi_R^{\alpha+\Delta})v_R$$

which can be rewritten as

$$\begin{aligned}Q_R &= (1-\psi)[\alpha(1-\phi_R^{\alpha+\Delta}) + d_R(\phi_R^{\alpha+\Delta})]v_R + \psi[\alpha(1-\phi_R^{\beta^*}) + d_R(\phi_R^{\beta^*})]v_R \\ &\quad +\psi\Delta[\phi_R^{\alpha+\Delta} - \phi_R^\beta]v_R - \alpha(1-\phi_R^{\beta^*})v_R - \omega[p-(1-\phi_R^{\alpha+\Delta})v_R]\end{aligned}$$

Determining the optimal initial stake requires to compute $\frac{dQ_R}{d\Delta}$. Some manipulations yield

$$\frac{dQ_R}{d\Delta} = [(\Delta-\omega)\frac{d\phi_R^{\alpha+\Delta}}{d\Delta} + \psi(\phi_R^{\alpha+\Delta} - \phi_R^\beta)]v_R = 0.$$

Since by assumption $\Delta \geq \omega$ and $\frac{dQ_R}{d\Delta}|_{\Delta=\omega} = \psi(\phi_R^\alpha - \phi_R^\beta) > 0$, the initial stake will be strictly larger than ω. The second order condition for a maximum requires $\frac{d^2Q_R}{d\Delta^2} < 0$. Therefore

$$\frac{\partial\Delta^*}{\partial\omega} \propto -\frac{d\phi_R^{\alpha+\Delta}}{d\Delta} > 0$$

Tighter disclosure rules (i.e., low ω) will therefore reduce the initial stake Δ purchased by the rival. The block premium is $P - \alpha(1-\phi_R^{\alpha+\Delta})v_R$, and can be written as

$$\Pi = (1-\psi)\alpha[(1-\phi_R^{\beta^*}) - (1-\phi_R^{\alpha+\Delta})]v_R + \psi[(\alpha+\Delta)(1-\phi_R^{\alpha+\Delta}) + d_R(\phi_R^{\alpha+\Delta})]v_R$$
$$-\psi[(\alpha+\Delta)(1-\phi_R^{\beta^*}) + d_R(\phi_R^{\beta^*})]v_R$$

Therefore,

$$\frac{\partial \Pi}{\partial \Delta} = \alpha \frac{d\phi_R^{\alpha+\Delta}}{d\Delta} + \psi[(1-\phi_R^{\alpha+\Delta}) - (1-\phi_R^{\beta^*})]v_R < 0$$

Since Π is decreasing in Δ, and Δ is increasing in threshold ω, a lower disclosure threshold increases the block premium.

For $\Delta \leq \omega$, R's objective function is

$$Q_R = (\alpha+\Delta)(1-\phi_R^{\alpha+\Delta})v_R + d_R(\phi_R^{\alpha+\Delta})v_R - P - \Delta p$$

which can be written as

$$Q_R = (1-\psi)[(\alpha+\Delta)(1-\phi_R^{\alpha+\Delta}) + d_R(\phi_R^{\alpha+\Delta})]v_R + \psi[\Delta(1-\phi_R^{\beta^*}) + d_R(\phi_R^{\beta^*})]v_R$$
$$-(1-\psi)\alpha(1-\phi_R^{\beta^*})v_R - \Delta p$$

Some manipulations yield

$$\frac{dQ_R}{d\Delta} = (1-\psi)(1-\phi_R^{\alpha+\Delta})v_R + \psi(1-\phi_R^{\beta^*})v_R - p$$

Because $\frac{d^2Q_R}{d\Delta^2} = -(1-\psi)\frac{d\phi_R^{\alpha+\Delta}}{d\Delta}v_R > 0$, Q_R is a convex function in the range $\Delta \leq \omega$. Therefore, the optimal Δ is either 0 or ω. $\Delta = \omega$ yields larger total profits Q_R iff

$$p \leq \bar{p} = (1-\phi_R^{\alpha+\Delta})v_R + \psi[(1-\phi_R^{\beta^*}) - (1-\phi_R^{\alpha+\Delta})]v_R$$
$$-\frac{1-\psi}{\Delta}[(\alpha+\Delta)(1-\phi_R^{\alpha+\Delta}) + d_R(\phi_R^{\alpha+\Delta}) - (\alpha+\Delta)(1-\phi_R^{\beta^*}) + d_R(\phi_R^{\beta^*})]v_R$$

Moreover, being a convex function, Q_R is either *i)* always decreasing in Δ, *ii)* always increasing in Δ, or *iii)* initially decreasing and then increasing in Δ. In the first two cases, the solution remains unchanged, i.e., either $\Delta = 0$ or $\Delta = \omega$, as ω increases. In the third case, the solution may jump from 0 to ω. Therefore, as ω increases, the amount of shares purchased secretly increases weakly.

Hence, for $\bar{p} \geq (1-\phi_I^{\alpha})v_I$, R buys $\Delta > \omega$ shares and changes in the legal threshold have the claimed effect on the block premium. In the reversed, R imposes a zero disclosure threshold as buys some shares since for $\omega = 0$, $\frac{dQ_R}{d\Delta} = [\Delta\frac{d\phi_R^{\alpha+\Delta}}{d\Delta} + \psi(\phi_R^{\alpha+\Delta} - \phi_R^{\beta})]v_R$.

L Proof of Corollary 8

The greenmail payment Γ is equal to

$$\Gamma = \psi d_R(\phi_R^{\beta})v_R + \delta[(b^* - (1-\phi_I^{\alpha+\delta})v_I] + (1-\psi)\left[(\alpha+\delta)[(1-\phi_I^{\alpha+\delta})v_I - b^*] + d_I(\phi_I^{\alpha+\delta})v_I\right]$$

The first term is obviously positive. $b^* = \max[v_I, v_R(1-\phi_R^{\frac{1}{2}})]$ ensures the second term is positive. From Assumption 4 and revealed preferences follows

$$[(\alpha+\delta)(1-\phi_I^{\alpha+\delta})+d_I(\phi_I^{\alpha+\delta})]v_I > [(\alpha+\delta)(1-\phi_R^{\alpha+\delta})+d_R(\phi_R^{\alpha+\delta})]v_R > [(\alpha+\delta)(1-\phi_R^{\beta'})+d_R(\phi_R^{\beta^*})]v_R$$

This implies that $[(\alpha+\delta)(1-\phi_I^{\alpha+\delta})+d_I(\phi_I^{\alpha+\delta})]v_I > (\alpha+\delta)(1-\phi_R^{\beta^*})v_R$. Hence, the third term is also positive and $\Gamma > 0$.

To prove the second part of the Corollary it is sufficient to observe that

$$\frac{\partial \Gamma}{\partial \alpha} = \delta \frac{\partial \phi_I^{\alpha+\delta}}{\partial \alpha} v_I - (1-\psi)[b^* - (1-\phi_I^{\alpha+\delta})v_I] < 0$$

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