MANAGERIAL CONTROL OF VOTING RIGHTS
Financing Policies and the Market for Corporate Control

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This paper analyzes how managerial control of voting rights affects firm value and financing policies. It shows that an increase in the fraction of voting rights controlled by management decreases the probability of a successful tender offer and increases the premium offered if a tender offer is made. Depending on whether managerial control of voting rights is small or large, shareholders' wealth increases or falls when management strengthens its control of voting rights. Management can change the fraction of the votes it controls through capital structure changes, corporate charter amendments, and the acquisition of shareholder clienteles.

1. Introduction

Many papers analyze the role of managerial equity ownership in governing the conflict of interest between managers and outside shareholders. This literature takes the view that the value of the firm increases as the managers' stake in the firm's future cash flows increases. In Jensen and Meckling (1976), larger managerial equity ownership helps to align the incentives of managers with those of outside shareholders, as managers bear direct wealth consequences from their decisions. Further, Leland and Pyle (1977) show that managerial equity ownership conveys information to outside shareholders about managers' private valuation of the firm.

In this paper, we emphasize that the fraction \( \alpha \) of the voting rights controlled by management is an important element of the ownership structure of publicly traded firms. We show that the value of the firm is positively related to \( \alpha \) for low values of \( \alpha \) and negatively related to \( \alpha \) as \( \alpha \) becomes large.

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Although managers can change $\alpha$ by buying or selling shares, we show that they can also do so through a variety of capital structure changes, through changes in the corporate charter, and through the acquisition of shareholder clienteles favorable to management. An important result from our analysis is that capital structure changes affect the value of the firm through their effect on $\alpha$.

To demonstrate the importance of managers' control of voting rights, we consider a model in which the conflict of interest between management and outside shareholders arises solely from the fact that a successful tender offer affects the welfare of outside shareholders and managers differently. Although this assumption seems reasonable for corporations for which the threat of a hostile takeover attempt is significant, it is important to understand that the threat of a battle for corporate control is always present and hence always affects managers' actions. However, to keep our analysis tractable, we ignore the disciplining effects of the market for corporate control. In our model, managers control voting rights only because, by doing so, they affect the behavior of potential bidders and hence the probability of losing control. We show that the premium offered in a tender offer is an increasing function of the fraction of voting rights of the target controlled by management, while the probability of a hostile takeover falls with that fraction. Since $\alpha$ plays a crucial role in both the probability and the outcome of a hostile takeover attempt, one expects managers who value control to increase $\alpha$ when they learn that their firm has become a more attractive target. This is because the benefits managers derive from a large $\alpha$ increase with the probability of a takeover attempt, whereas the costs (for instance, the lack of diversification of their portfolio) remain the same.

In this paper, an increase in the fraction $\alpha$ of the voting rights controlled by managers has an ambiguous effect on the value of a potential target. On the one hand, a higher $\alpha$ adversely affects the value of the target as it decreases the probability of a hostile takeover attempt. On the other hand, the premium offered if such an attempt is made increases with $\alpha$. If managers control a sufficiently large fraction of the votes and always oppose hostile takeover attempts, the value of the outside shares is lowest because no tender offers are ever made. However, if managers control no votes a tender offer with a small premium can succeed even though, in general, the bidding firm would have been willing to offer a higher premium to acquire control. Hence, if $\alpha = 0$, an increase in $\alpha$ enables the target to get a larger fraction of the benefits from the takeover. This paper implies, therefore, that the value of the firm increases or falls when $\alpha$ increases depending on whether $\alpha$ is small or large, so that there is a unique value of $\alpha$ that maximizes the value of the firm. Morck, Shleifer and Vishny (1988) independently formulate and test this hypothesis, assuming

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1 Bradley and Kim (1985) show that tender offers for firms in which $\alpha$ exceeds 20% are rare.
that the fraction of the voting rights held by management is equal to the fraction of the firm’s equity owned by management. They argue that when $\alpha$ is small, an increase in $\alpha$ makes the interests of management closer to those of shareholders, but that when $\alpha$ is large, an increase in $\alpha$ makes management more entrenched and less subjected to the discipline of the market for corporate control. Their empirical evidence shows that, after controlling for industry effects, Tobin’s $Q$ falls as $\alpha$ becomes large.

When managers control votes only through ownership of shares, it is likely that for a large all-equity firm managers control fewer votes than would be required to maximize the value of the firm. While a large investment in their company’s shares makes it more likely that managers will keep control, it also forces them to bear a large amount of risk. We show that various contractual arrangements have the same benefits for managers as an increase in $\alpha$ brought about by a purchase of shares but different costs. Other types of contractual arrangements that increase management’s bargaining power are available, such as those that decrease the value of control of the target for the bidder (poison pills, etc.), but they differ from those we focus on in this study. Because takeover defenses that consolidate management’s control of voting rights have effects similar to an outright purchase of shares by management, we are able to explain why outside shareholders sometimes vote for such defenses. It may also happen, however, that management controls too many voting rights, in the sense that the value of the outside shares would increase with a fall in $\alpha$. In such cases, it becomes profitable for outside shareholders to make a takeover less costly for management, for instance through a golden parachute.

Whether management controls too few or too many votes, the firm’s capital structure decision is relevant because of its effect on the distribution of voting rights. For instance, for fixed investment policy and fixed holdings of shares by management, an increase in leverage increases $\alpha$ and brings about an increase in the value of the outside shares if, previously, $\alpha$ was small. Hence, as in the Harris and Raviv (1988) model of proxy contests, managers may wish to change a firm’s capital structure for the sole purpose of controlling a larger fraction of the voting rights with a given investment in their firm. In our model, an increase in leverage with fixed investment policy does not necessarily decrease the probability that management will be replaced by a competing management team. The reason is that an increase in debt increases $\alpha$ but also decreases the total value of equity, so that it becomes cheaper for a bidder who faces increasing marginal costs of borrowing (for instance, because existing debt has restrictive covenants) to acquire control. On the other hand, the covenants attached to new debt can substantially strengthen management’s bargaining position and make a hostile takeover less likely.

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2 See Dann and DeAngelo (1988) for an analysis of various takeover defenses available to a corporation and of their effect on the value of the target.
The paper proceeds as follows. We derive the optimal behavior of the bidder in section 2. In section 3, we show how the value of the firm depends on $a$. Section 4 presents the determinants of the managers' choice of $a$. The next section derives the implications of our analysis for financing decisions and discusses some takeover defenses that have the same effect as an increase in $a$. We also compare the valuation effects of the announcement of financing decisions and takeover defenses in our analysis with the empirical evidence. We provide concluding remarks in section 6.

2. Managerial control of voting rights and tender offers

Consider an economy in which there are two relevant dates, dates 1 and 2, and in which all parties have the same information at date 1. At date 1, it is assumed that management controls the voting rights of a fraction $a$ of the shares of an all-equity firm. We call those shareholders whose voting rights are not controlled by management outside shareholders. There is a continuum of atomistic outside shareholders who own shares at date 1. At date 1, some firm, called the bidder, decides whether to acquire information about the management's firm. If the bidder invests in information acquisition, it pays $I$ at date 1 and receives information at date 2 describing the gain that would accrue to the bidder from control of the target. Given its information at date 2, the bidder decides whether to make a bid. To focus more readily on the key results of this paper, we assume that if the bidder's first attempt to acquire control of the target is not successful, its potential gain from control disappears. With this assumption, we do not have to analyze the gaming that often takes place once a bidder sets out to acquire control of a target. We will discuss where appropriate how relaxing this assumption would change our results. Furthermore, to focus the analysis, we assume until section 4 that the bidder's gain from control is too small to enable it to offer a premium large enough to induce management to tender the shares whose voting rights it controls. Although the objective function of management is discussed in section 4, for the moment it suffices to say that management values control and loses it if the takeover attempt succeeds.

We consider the case in which control of the target is guaranteed by possession of a simple majority of the shares. The bidder must therefore acquire half the shares for the takeover to be successful. To simplify the analysis, we consider only offers of the following kind: the bidder offers to buy exactly half the shares at a total price of $\frac{1}{2}y + P$, where (i) $y$ is the date 2 value of the firm if no takeover attempt succeeds and is common knowledge when the bid is made, and (ii) $P$ is the total premium offered by the bidder to acquire half the shares. If fewer than half the shares are tendered, the bidder buys no shares. We also assume that the total value of the shares not
purchased by the bidder if the bid succeeds is equal to $\frac{1}{2}y$. This assumption implies that all the benefits from control accrue to the bidder who pays for these benefits the premium $P$. If the value of the shares not acquired with a successful bid is equal to $\frac{1}{2}y + \delta$ instead, where $\delta$ could be a function of the premium that accrue to the bidder from control, the premium relevant for the shareholder tendering decision is $P - \delta$, rather than $P$. It is necessary that $\delta < P$ for a takeover to have a positive probability of success. We will discuss when appropriate how our results are affected when $\delta$ is positive but smaller than the premium.

Since the outside shareholders are atomistic, they cannot collude to force the bidder to offer a high premium, but instead compete among themselves for the premium. While all shareholders would be better off if they did not tender for a low premium, i.e., one that is small compared with the bidder's potential gain from control, an individual shareholder has no private incentives not to tender when the fraction of the premium he expects to receive exceeds his opportunity cost from tendering. In the following, we assume that some shareholders have a positive opportunity cost of tendering and that not all of these shareholders face the same cost. An individual shareholder's opportunity cost of tendering is not common information and hence is not known by the bidder. Differing opportunity costs of tendering among shareholders imply that the supply curve of shares tendered increases with the premium offered by the bidder, as those shareholders with the lowest opportunity costs tender first. We assume that there is enough uncertainty about the distribution across shareholders of the opportunity costs of tendering that neither the bidder nor the target's managers know the true supply curve of shares tendered. The distribution of this curve is assumed to be such that, for most possible gains from control, it would not be profitable for the bidder to offer a premium which guarantees success of the tender offer. Further, we do not want the opportunity costs of tendering to eliminate competition among shareholders for the premium. To insure that competition among shareholders is economically significant, we assume that small bids have a nontrivial probability of success.

Assumptions implying that the expected fraction of the shares tendered is an increasing function of the premium offered by the bidder and that the bidder is uncertain about the fraction of the shares that will be tendered can be motivated by both empirical evidence and informal theoretical arguments. Empirically, there is evidence of bids that initially fail, but then succeed as the premium over the pre-offer price is increased, and there is evidence of bids

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3See Bradley (1979) and Grossman and Hart (1980).
4This competition is discussed extensively in DeAngelo and Rice (1983). See also Bebchuk (1985), Bradley and Kim (1985), and the references in the previous footnote.
that are oversubscribed. It has been shown that for share repurchases the number of shares purchased increases with the premium offered. There is also direct evidence that the probability of success of a tender offer increases with the premium offered.

Theoretical arguments that motivate an upward-sloping expected supply curve of shares can proceed along many routes. Although we do not want our analysis to be too intimately tied to a particular motivation for the upward-sloping expected supply curve, it is useful to derive one particular motivation that has implications consistent with our assumptions. Suppose all outside shareholders have the same information but face different capital gains tax rates. A shareholder who tends for cash must pay taxes on his capital gains, which represent his opportunity cost of tendering, whereas a shareholder who does not tender can keep postponing these taxes unless a successful tender offer is followed by a clean-up tender offer which involves an exchange of shares for cash. Consider the case in which a nontendering shareholder can postpone paying capital gains taxes indefinitely. This case does not preclude a clean-up tender offer, as the bidder can undertake a nontaxable exchange of shares. Let $T_i$ be the fraction of his proceeds from tendering that shareholder $i$ must pay in capital gains taxes. $T_i$ depends both on the price the shareholder paid for his stake initially and on his personal tax rate. Shareholder $i$ is better off if he tenders, and his share is accepted if $(1 - T_i)(y + 2P) > y$. Consequently, shareholder $i$ tenders only if

$$T_i \leq \frac{P}{\frac{1}{2}y + P}.$$  

In this setting, a bidder who does not know how shareholders are distributed across tax rates is uncertain about the supply curve of shares tendered.

To facilitate our analysis, we make the following assumptions about the supply curve of shares tendered. If, once the bid is made, one samples among outside shareholders, each randomly chosen outside shareholder is assumed to tender with the same probability $s(P)$. We assume, for simplicity, that $s(P)$

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3See, for instance, Bradley, Desai, and Kim (1983). Note, however, that the definition of the premium used here differs from the one commonly used in empirical analysis. The definition used in empirical work compares the price offered by the bidder with some pre-offer price. In this model, the pre-offer price depends on the expected premium and the probability of a tender offer. Nevertheless, if a tender offer takes place, the empirical measure of the premium is positively related to the measure used here.


7See, for instance, Walkling (1985).

8Behchuk (1985) provides a model in which an upward-sloping expected supply curve of shares arises from the fact that shareholders are heterogeneously informed about the value of the firm if it is not acquired.
does not depend on \( \alpha \). This implies that a firm does not attract different types of shareholders for different values of \( \alpha \). If the opportunity cost of tendering results from capital gains taxation, \( s(P) \) is equal to the probability that a shareholder’s tax rate is low enough to make it advantageous to tender. As there is uncertainty about the distribution of the opportunity costs of tendering, \( s(P) \) is not known before a bid is made. We assume, however, that \( s(P) \) is known to be distributed uniformly between \( u(P) \) and \( d(P) \) for \( P \leq \bar{P} \) and that the bidder never finds it profitable to offer a premium larger than \( \bar{P} \). \( u(P) \) and \( d(P) \) are assumed to be increasing linear functions of \( P \) with equal slopes. So that the expected number of shares tendered at a premium \( P \), \((1 - \alpha)E(s(P))\), is a linear function of \( P \), and \( u(P) - d(P) \) is a constant. To insure that there is enough competition among shareholders, we assume that \( u(P) > \frac{1}{2} + \gamma \) as \( P \to 0 \), where \( \gamma \) is a constant greater than zero. This assumption implies that a small bid has a nontrivial positive probability of success. While the assumption that a supply curve is linear is often made in economic analyses, the appendix shows that it could be substantially relaxed without affecting our results.

At date 2, target shareholders, the management, and the bidder first learn \( y \), the value of the firm if no bid is made. \( y \) is drawn from a continuous distribution with density function \( h(y) \). Once \( y \) is known, the bidder learns \( G \) if an investment in information is made at date 1, where \( G \) is the gain that accrues directly to the bidder from control of the target. We assume that \( G \) is drawn with probability \( p \) from a uniform distribution between 0 and \( \bar{G} \) and is equal to some negative number \( G \) with probability \( (1 - p) \). If \( G \) is low enough, the bidder never makes a bid without having acquired information. To simplify the discussion, we assume from now on that this is the case. \( G \) can take a negative value for many reasons. For instance, a bid may have a fixed cost which, in some states of the world, exceeds the benefits which accrue from control of the target.

The bidding firm chooses the premium given its perception of the probability of success of the bid as a function of the premium. Given a premium \( P \), it follows from the central limit theorem that a fraction \((1 - \alpha)s(P)\) of the shareholders tender, i.e., with a continuum of outside shareholders, there is no uncertainty about the fraction of outside shareholders who tender if the probability that an individual shareholder tenders is known. Since the tender offer is successful if \((1 - \alpha)s(P)\) exceeds one half, it can succeed only if \( s(P) \) is greater than \( 1/2(1 - \alpha) \). Let \( z(\alpha) \) be equal to the fraction of the outside shareholders that must tender for the offer to be successful. Since the bidder does not know \( s(P) \), the probability of success of the offer is the probability that \( s(P) \) exceeds \( z(\alpha) \). With our assumptions, this probability is given by

\[
N(P, \alpha) = \frac{u(P) - z(\alpha)}{u(P) - d(P)},
\]
as long as the probability of success of the bid is less than one and greater than zero. The probability of success does not depend on the shareholders' perception of the value of the bidder's gain from control. This is because even if $G$ is large compared to the payment offered by the bidder, shareholders cannot collude to make the bid fail to force the bidder to offer a higher payment. For an individual shareholder, the bidder's gain from control is irrelevant to his tendering decision because there is nothing he can do to appropriate a larger fraction of that gain.

Although the managers of the bidding firm maximize their own expected utility subject to constraints imposed by the shareholders, we assume for simplicity that they choose the optimal premium by maximizing the expected value of the bid. With this assumption, the bidding firm chooses $P$ to maximize

$$[G - P]N\Omega,$$

where $\Omega$ is equal to zero if no bid is made and one otherwise. We will call the maximized value of (3) the expected value of the bid. Note that the bidder's actions when $G$ is known do not depend on $\Omega$, which is the sunk cost of acquiring information about the target. The expected value of the bid is shown in the appendix to be a concave function of the premium and it falls when $P$ gets large. Hence, if a bid is made, there is a unique optimal premium. Further, the optimal premium increases with $G$, which is the bidder's gain from control.

In the absence of managerial holdings of shares, the bidder has to persuade half of the outside shareholders to tender to be successful. However, if $\alpha$ is positive, a larger fraction $\alpha = \frac{1}{2}(1 - \alpha) > \frac{1}{2}$ of the outside shareholders must tender for the bidder to gain control. To keep the probability of success constant as $\alpha$ increases, the bidder must therefore increase the premium with $\alpha$. As $\alpha$ increases, the probability of success falls for each premium because a larger fraction of the outside shareholders has to tender for the bid to succeed. It immediately follows that:

**Result 1.** An increase in the fraction $\alpha$ of the voting rights controlled by management decreases the expected value of the bid to the bidder.

**Proof.** See appendix.

For a given value of the gain from control $G$, the bidder increases the probability of success and decreases the expected value of the bid if it increases the premium offered. The bidder does not choose to offer a premium that insures success, but instead trades off the probability of success against the gain obtained if the bid is successful. For a given premium, an increase in
3. Expected marginal cost and marginal gain of the bid

Fig. 1. Effect of an increase in $\alpha$ on the premium offered by the bidder. The bidder chooses a premium such that the expected marginal cost of increasing the premium equals the expected marginal gain. An increase in $\alpha$ leaves the expected marginal gain of increasing the premium unchanged but decreases the expected marginal cost, since it makes it less likely that the premium will have to be paid. This implies that an increase in $\alpha$ moves the expected marginal cost curve to the right, so that it intersects the expected marginal gain curve at a higher premium. Consequently, an increase in $\alpha$ increases the premium offered.

$\alpha$ does not affect the gain made by the bidder if the bid is successful, but it decreases the probability of success. Consequently, a higher $\alpha$ induces the bidder to offer a higher premium to make the tradeoff between the probability of success and the gain associated with a successful bid optimal. This explains the following result:

**Result 2.** From the bidder's perspective, the optimal premium is an increasing function of the fraction $\alpha$ of the voting rights of the target controlled by management as long as $\alpha$ is not so high that a bid is a negative net present value project.

**Proof.** See appendix.

Fig. 1 illustrates this result. The expected value of the bid for the bidder is equal to an expected gain, $GN$, minus an expected cost, $C$. The expected gain is the bidder's gain from control times the probability of success, and the expected cost is equal to the total premium offered times the probability of success, $PN$. The bidder chooses the premium offered to be such that the expected marginal gain from an increase in the premium equals the expected marginal cost. With our assumptions, the expected marginal gain is not affected by a change in $\alpha$, since the effect of an increase in the premium
offered on the probability of success does not depend on $\alpha$. However, an increase in $\alpha$ decreases the marginal expected cost by lowering the probability of success. With a higher $\alpha$, an increase in the premium offered has a smaller cost because it is less likely that the premium will actually be paid. Fig. 1 shows how, with an increase in $\alpha$, the marginal expected gain curve stays unchanged while the marginal expected cost curve moves to the right and intersects the marginal expected gain curve at a higher premium. Hence, the premium must increase with $\alpha$ as long as a bid is a positive net present value project. If outside shareholders can collude, they can make the bid a zero net present value project for the bidder irrespective of $\alpha$. In that case, an increase in $\alpha$ cannot increase the premium.

3. The value of the firm and $\alpha$

In this section, we address the question of how the date 1 value of the firm, $V(\alpha, 1)$, depends on the fraction of the firm's voting rights controlled by management. In the presence of capital gains taxes, shareholders have an opportunity cost of selling their shares and they may not all be made better off if managers take actions that maximize the market value of the firm. To avoid the unchartered territory where value maximization breaks down, we arbitrarily define $V(\alpha, 1)$ as the present value of the cash flows which accrue to shareholders and assume that they want $V(\alpha, 1)$ to be maximized. Taxes are ignored in the following analysis, so that $V(\alpha, 1)$ corresponds to the value of the firm from the perspective of an investor who pays no taxes. Furthermore, we assume that all cash flows are discounted at the rate of interest $R$. Using the analysis of section 2, it follows that

$$V(\alpha, 1) = \left( \frac{1}{1 + R} \right) \left[ \mathbb{E} + \int_0^G p'(G, \alpha) N(P(G, \alpha), \alpha) \frac{dG}{G} \right],$$

where $i$ is an indicator variable that takes value zero if the bidder makes no investment in information about the target and one otherwise. As all parties know $\alpha$, $I$, and the distribution of the bidder's gain $G$ (characterized by $a$)

\footnote{Without our assumptions about the distribution of the fraction of shares held by outside investors that are tendered, the premium may fall with an increase in $\alpha$. In particular Result 2 does not hold if the marginal contribution of an increase in the premium to the probability of success of the bid falls too much when $\alpha$ increases (formally, if $N_{pa}$ is negative and $N_{pa} - (G - P) N_{pa} > 0$). The intuition for this condition is that, if $N_{pa}$ is small, an increase in the premium has only a small impact on the probability of success of the bid, so that an increase in the premium increases the expected gain ($GN$) less than it increases the expected cost ($PN$) of the bid. In this case, the bidder is better off decreasing the premium offered if $\alpha$ increases. However, if $N_{pa}$ is small enough to invalidate Result 2, there generally is no interior solution for the premium, as the second-order condition of the bidder's maximization problem [eq. (A.3) in the appendix] is unlikely to hold.}
probability \( p \) that the gain is positive and distributed uniformly between zero and \( G \) before the shares are sold, they can infer \( i \) at date 1. Eq. (4) states that the value of the target is equal to the sum of two terms. The first term is the expected value of the firm in the absence of a takeover attempt, and the second is the expected value of the payment to target shareholders by a successful bidder times the probability that a successful bid will be made. For the bidder to invest in information, the net present value of doing so must be positive:

\[
\left( \frac{1}{1 + R} \right) p \int_{\alpha}^{G} (G - P(\alpha, G)) N(P(G, \alpha), \varepsilon) \frac{dG}{G} \leq i. \tag{5}
\]

It immediately follows from this that:

**Result 3.** If the target’s value at date 1 is expressed as a function of the fraction of the voting rights controlled by managers, it reaches a maximum for some positive amount of that fraction and a minimum when management controls half or more of the shares.

**Proof.** See appendix.

The intuition behind Result 3 can be explained as follows. The value of the target would be maximized if the target’s shareholders could find a way to appropriate for themselves the benefits that otherwise would accrue to the bidder in the event of a successful bid. However, there is no action that an outside shareholder can take independently to insure that only bids having zero value for the bidder are successful. By increasing \( \alpha \), managers reduce the probability that a bid will succeed and make it more likely that a successful bid is a high bid. On the one hand, the probability of a successful bid falls as \( \alpha \) increases and reaches zero when \( \alpha \) equals one-half. On the other hand, the expected premium if a bid is successful is bounded by the gain from control for the bidder. This means that, as \( \alpha \) becomes large, the product of the probability of a successful bid times the expected premium if such a bid takes place becomes small. Eventually, as \( \alpha \) reaches one-half, no bid ever succeeds, so that the date 2 value of the firm is equal to its stand-alone date 2 value, \( y \). However, Result 3 and this discussion rest on the assumption that management does not tender its shares at the highest premium that the bidder is willing to offer. This assumption is relaxed in the next section. It is interesting to note that, in this model, an increase in \( \alpha \) is similar to establishing a minimum bid in an auction.\(^{10}\) The benefit of establishing a minimum bid is

\(^{10}\)Note that Shleifer and Vishny (1986b) provide an analysis in which the target implements a minimum bid once the bidder has already purchased shares by buying back those shares and entering a standstill agreement. See Riley and Samuelson (1981) for a discussion of the usefulness of establishing a minimum bid.
that it raises the expected value of the successful bid; the cost is that it decreases the probability of a successful bid.

If, contrary to our assumption, there is a second potential bidder, an increase in $\alpha$ will have less effect on the value of the target, because the first bidder takes into account that unless the premium offered is high enough, the second bidder will find it profitable to bid. Or, pursuing the auction analogy, the usefulness to the seller of establishing a minimum bid falls as the number of bidders becomes large. Hence, in this model, as the number of bidders increases, the benefit to shareholders of an increase in $\alpha$ when $\alpha$ is small falls while the cost is unchanged.\footnote{Previous papers focus on the benefits for the target of having multiple bidders. See Fishman (1985), Khanna (1985), Png (1985), and Suniti and Vishny (1986). In Riley and Samuelson (1980) the level of the minimum bid is not affected by the number of bidders, but the expected revenue from establishing a minimum bid is.} Note also that if nontendering shareholders receive more than $\frac{1}{2}v$ if the bid is successful, because the bidding firm faces constraints in its ability to appropriate the gains from the takeover, their opportunity cost of tendering is increased. This forces the bidder to offer a larger premium and hence has the same effect as an increase in the number of bidders.

Although our analysis shows that shareholders can benefit from an increase in $\alpha$, such an increase has a cost for society as a whole. In our model any increase in the value of the target takes place at the expense of the bidder. However, an increase in $\alpha$ decreases the combined value of the target and the bidder because it makes unprofitable some bids that are profitable for $\alpha = 0$. Hence, a positive $\alpha$ leads to a waste of some opportunities for the bidder and the target to increase their combined value. Although a large $\alpha$ reduces the agency cost of equity financing, as discussed by Jensen and Meckling (1976) and others, and hence benefits society as a whole, this gain comes about because managers have a stake in future cash flows and not because they control voting rights. An analysis of the social costs and benefits of legislation that would restrict managerial control of voting rights is beyond the scope of this paper.

4. The choice of $\alpha$ by management

In this section, we study the determinants of $\alpha$ when management controls voting rights only by holding shares and the firm is an all-equity firm. Whereas our earlier analysis explicitly assumes that the premium offered is too small for managers to tender their shares, we now also consider the case in which the premium is high enough to persuade managers to tender and show that our previous results are not altered in this more general setting. For simplicity, we assume that managers act to maximize the following collective objective
function:
\[
\max E[U(W(2)) + Q(1 - N)],
\]
where \(W(2)\) is the managers' wealth at the beginning of trading at date 2, i.e., when the outcome of the takeover attempt is known. \(Q\) is the managers' expected utility gain if a successful takeover does not occur and is independent of the change in the value of their holdings of their firm's shares. The probability that managers will get \(Q\) is one minus the probability of a successful takeover. It is assumed that \(U\) is a concave function of date 2 wealth and that it exhibits decreasing absolute risk aversion. In this simple approach, a positive \(Q\) means that the target's managers would be worse off if they lost their jobs. It may be that managers like to manage the target. However, in general, one would expect \(Q\) to be high whenever managers have skills that are unlikely to be highly valued by a potential bidder and are not very useful outside the target. An obvious example would be a situation in which the target is attractive because it owns stores in buildings that would be useful to the bidder. Presumably, the bidder, if successful, would close the stores and use the buildings for other purposes. Hence, managers who have become expert in managing the stores would lose a large part of their firm-specific human capital. One would also expect \(Q\) to be high whenever managers' compensation includes implicit promises of future payments. It is not always to the bidder's advantage to honor such commitments. For instance, suppose that compensation contracts are structured so that effort increases the probability of being rewarded by a big prize — for instance, the job of chief executive, which has a salary chosen to make the prize attractive. In such a situation, the management of the target may lose substantially if the top prize is taken away by the bidder, and \(Q\) is a measure of its loss in expected utility if a successful takeover changes the probability of obtaining this prize.

To determine managers' optimal holdings of shares in their firm, we first derive an expression for their wealth at date 2. We assume that at date 1 managers have wealth \(W(1)\) and a stake in their firm worth \(\alpha W(1)\). Managers' compensation from the firm is neglected in the following discussion. The compensation for the next period can be viewed as part of their wealth, while part of \(Q\) may reflect their compensation in subsequent periods. A useful extension of the present analysis would take into account the interaction between management's compensation and the probability of a change in control. It is assumed, for simplicity, that no asset can be used by managers to hedge their investment in their firm. In such a setting, there is no great loss of generality if one assumes that the investment opportunity set of managers

\[12\] Knoeber (1985) uses this argument to explain golden parachutes.

consists of only a risk-free bond with return $R$ and the common stock of the firm. In this section, we also assume that there are no restrictions on short sales, so that managers can borrow at the rate $R$. Since capital gains taxes make it less likely that managers will tender, we assume that managers pay no taxes and discuss later how our results are changed when this assumption does not hold. At date 2, managers' wealth depends on the value of their shares. If no tender offer is made or if managers do not tender, the total value of their shares is $\alpha y$. If managers tender, they also receive a fraction $f$ of the premium. This fraction depends both on $\alpha$ and on the fraction of the shares tendered by outside shareholders. It follows from this that management's wealth at date 2 is

$$W(2) = [W(1) - \alpha V(\alpha, 1)](1 + R) + \alpha y + fP. \quad (7)$$

Managers' return from investing in their firm comes in two forms. First, managers get a pecuniary return from their investment that depends on their tendering policy. When managers tender less readily than other shareholders, their expected pecuniary rate of return is smaller than $R$ as they may end up not tendering in the event of a successful bid. However, managers also benefit from the fact that their holdings of shares make it more likely that they will remain in control. At date 2, management tenders if its utility is maximized by doing so:

$$U([W(1) - \alpha V(\alpha, 1)](1 + R) + \alpha y + fP)N^* \geq U([W(1) - \alpha V(\alpha, 1)](1 + R) + \alpha y)N + Q(1 - N), \quad (8)$$

where $N^*$ is the probability of success given that management tenders and $N$ is the probability of success derived in section 2. To compute $N^*$, note that if management tenders, the offer is successful if a fraction $(1 - \alpha)/(1 - \alpha)$ of the outside shareholders tenders. Hence, $N^*$ can be computed by substituting this fraction in eq (2). Inspection of eq. (8) reveals that, for a small enough premium, the left-hand side of the equation is smaller than the right-hand side, which means that it does not pay for management to tender when the premium is small. However, there is always a premium large enough that it pays for management to tender, as utility increases with date 2 wealth. Consequently, there is a premium $P^*$ such that management tenders for all premia that exceed $P^*$. It immediately follows from eq. (8) that $P^*$ is an increasing function of the benefit that management derives from control. However, for management not to tender, it must also be the case that the probability of success is higher when management tenders than when it does not, which means that management generally tenders in offers that are highly likely to succeed. If, contrary to our assumption in this section, management pays capital gains taxes, it may choose not to tender even when an offer is highly likely to succeed.
At this point, it is interesting to note that if the bidder can make repeated offers, it can learn about the true supply curve of shares. Hence, the bidder could, after having made repeated unsuccessful offers, offer a premium $P'$ such that $s(P') = z(\alpha)$. If the bidder offers $P'$, the offer succeeds with probability one, so that management tenders unless its opportunity cost of tendering exceeds the premium. However, as the offer is oversubscribed for that premium, management might be better off to tender at a lower premium $P''$. This is because the tender offer will succeed anyway, so that management wants to maximize its revenue from tendering. For a fixed supply curve of shares from outside shareholders, if management tenders at $P''$, a larger fraction of its shares will be accepted. In this case, it is not necessarily true that the premium for an offer that succeeds increases with $\alpha$, since management might tender at a premium that induces less than half of the outside shareholders to tender. However, the probability that an offer will be made is still negatively related to $\alpha$, since the bid cannot succeed unless it is profitable for the bidder even if it has to pay $P'$, because otherwise management benefits from holding out. If it is costly to make a bid, a bidder does not generally find it profitable to make multiple offers that it expects to fail, so our assumption of no repeated bids leads to more plausible results. This discussion suggests, however, that this assumption could be relaxed, since our results obtain as long as there is substantial uncertainty about the supply curve of shares, so that management tenders only for a high premium.

We can now turn to the determinants of $\alpha$. As it is risky for management to own shares, $\alpha$ is negatively related to managers' degree of relative risk aversion. Furthermore, because managers exhibit decreasing absolute risk aversion, $\alpha$ is an increasing function of managerial wealth. Moreover, however, $\alpha$ is positively related to the benefits that managers get from control and to the absolute value of the change in the probability of success of a bid brought about by an increase in $\alpha$. It follows therefore that a decrease in the managers' benefits from control decreases $\alpha$. Shareholders can engineer such a decrease by granting management a golden parachute, which suggests that the value of the firm should increase when a golden parachute is introduced in a firm with a large $\alpha$. However, a golden parachute could also be introduced to reduce the value of the bid for a potential bidder, which would decrease the value of the firm irrespective of $\alpha$. Although empirical researchers find that introducing a golden parachute can increase the value of a firm, such golden parachutes are likely to be introduced when the probability of a takeover attempt has increased, so that the positive abnormal returns associated with their introduction may just reflect the change in expectations about a successful takeover.14

We are now in a position to show that the results of sections 2 and 3 are not affected when management tenders for premia in excess of $P^*$. Note first that our results would no longer hold if it turns out that an increase in $\alpha$ decreases $P^*$. This is because, in this case, some bids would have a higher probability of success with higher values of $\alpha$. It has been argued, for instance by Walking and Long (1984), that an increase in $\alpha$, by increasing the pecuniary loss to managers who refuse to tender, decreases $P^*$. However, in our present analysis, $\alpha$ is high when the benefits of control to management are high. Hence, a higher $\alpha$ is associated with a higher value of $Q(1 - N)$ and a smaller probability that management will tender for some, but not necessarily all, premia that the bidder might offer. This implies that our results of sections 2 and 3 still hold when management chooses to tender for some premia, at least for values of $\alpha$ smaller or equal to half the votes plus one. In the setting of this paper, there is no reason for managers to hold votes in excess of half the votes plus one. Hence, to explain such holdings of votes, one has to introduce considerations (for instance, incentive or asymmetric information effects) affecting managerial holdings of votes that are not captured in our model and may lead the value of the firm to increase with $\alpha$ when $\alpha$ exceeds one half.

It is important to understand that the results of sections 2 and 3 hold because managers' holdings of shares affect their probability of keeping the benefits from control. If there are no benefits from control, managers do not behave differently from other shareholders and they tender when doing so maximizes the value of their shares net of taxes. In this case, the relation between the value of the firm and $\alpha$ depends on the managers' tax status and on how their large shareholdings enable them to affect the outcome of the bid. It is interesting to note that our model implies that the value of the shares sold to the public in an initial public offering increases with $\alpha$ over some range of $\alpha$ if the potential shareholders believe that management is less likely to tender than outside shareholders. However, there is no apparent mechanism whereby managers can commit not to tender, so that if managers get no benefits from control, the value of the firm could be lower for a small positive $\alpha$ than for $\alpha = 0$. This is because managers might tender for a lower premium than the premium for which half the outside shareholders would tender when $\alpha = 0$.

5. Financing policies and management control of voting rights

Because of risk aversion and limited wealth, management is likely to own only a relatively small fraction of the shares of an all-equity corporation. Often, therefore, the value of an all-equity firm could be increased if management found ways to increase its control of voting rights. In this section, we show that all financing decisions affect management's control of voting rights for a given dollar investment by management in its corporation. Because the value of the firm was shown in earlier sections to depend on the distribution of
voting rights, it follows that financing decisions affect the value of the firm. In particular, for low values of $\alpha$, increases in leverage in general increase the value of the firm while decreases have the opposite effect. However, to highlight the valuation effects of changes in management's control of voting rights, we neglect the other determinants of the firm's capital structure that have traditionally been studied. Introducing these determinants would probably change the degree of leverage that maximizes the value of the firm, but not the result that the firm's value is not everywhere increasing in $\alpha$. We conclude the section by discussing contractual arrangements that allow management to increase its control of voting rights while leaving other aspects of the firm's capital structure unchanged.

5.1. Leverage and management's control of voting rights

The analysis in section 4 assumes that managers can borrow to buy shares and face perfect capital markets. With such an assumption, it does not matter whether the firm or the managers borrow, so the value of the firm is independent of its capital structure but not of management's control of voting rights. However, this argument depends critically on the ability of managers to borrow on personal account at the same terms as the corporation.\(^\text{15}\) In particular, managers must be able to enter into nonrecourse loans to purchase shares. If they cannot or if there is any other reason why managers cannot borrow at the same rate as the corporation, one would expect the firm to have debt outstanding. This is because with a debt issue managers can purchase a constant fraction of the shares at a lower cost and hence can achieve at more favorable terms what they would otherwise accomplish on personal account. While our model focuses on the possibility that managers will lose control through a hostile takeover, as more corporate debt is sold, the risk to managers of losing their position through bankruptcy increases and hence additional corporate debt becomes less advantageous.\(^\text{16}\) Furthermore, as the firm issues more debt, the shares become more risky so that managers bear more risk for a given investment in the firm. As the debt-equity ratio increases, it is likely that at some point a further substitution of debt for equity leads managers to reduce their investment in the firm so that $\alpha$ falls. It follows that there are costs to increasing debt and that managers try to balance the marginal costs and benefits of debt when they choose the firm's debt-equity ratio. An

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\(^{15}\) Note that if outside shareholders cannot borrow and lend at the same terms as the corporation, they are not indifferent with respect to the capital structure of the firm. Although this result implies that there will be leverage-induced clienteles, it does not have useful implications for the capital structure of individual firms.

\(^{16}\) Harris and Raviv (1988) have a model in which the advantage of debt is that it makes a change in control through a proxy contest less likely, while its cost is that it makes it more likely that managers will lose control to the creditors.
increase in the gain from control for a potential bidder increases the benefit to management of a high $\alpha$, but does not change the costs associated with a high debt–equity ratio if no takeover attempt succeeds. This leads to the following result:

**Result 4.** If we hold constant the managers' investment in their own firm and if a change in the debt–equity ratio affects the potential bidder only because it changes management's control of voting rights, (a) there is a positive debt–equity ratio that maximizes the date 1 value of the firm, (b) the probability of a hostile takeover attempt is negatively related to the target's debt–equity ratio, and (c) an unexpected increase in the probability of a hostile takeover attempt increases the target's debt–equity ratio.

Paepe (1986) provides evidence to support this result. He studies a sample of 163 firms that were acquired during the period 1971–1979 and a random sample of 256 firms that had not been acquired as of 1979. He estimates a logistic multiple regression model in which the explanatory variables are firm characteristics hypothesized to affect a firm's probability of being taken over while the binary dependent variable takes the value one for acquired firms and zero otherwise. The estimate of the regression coefficient for leverage is negative and significant at the 0.05 level, so that a highly levered firm is less likely to be acquired than an unlevered firm.

One should note, however, that an increase in the debt–equity ratio can make a takeover less likely because it decreases the bidder's gain from control in addition to its effect on $\alpha$. This may occur for at least three reasons. First, as suggested by Jensen (1986a, b), the issuance of new debt can be a way for management to bond itself to higher payout and reduced investment expenditures that raise the value of the firm and make acquisition of the target less valuable for a potential bidder. Second, the target's debt may include covenants which restrict the bidder's ability to use these assets in the way it wants to. For instance, the bidder may not be able to sell some of the target’s assets without repurchasing the debt at a premium. Such covenants may be included in the bond indenture only because they make the target less attractive to a potential bidder. Hence, bond covenants themselves are a way for a target to use the probability of a successful bid, but such covenants decrease the value of the firm because they decrease the bidder's gain from control and hence decrease the premium offered. Third, an increase in the debt–equity ratio can make a takeover attempt less likely because the bidder may have included in its computation of the gain from the acquisition an increase in the debt of the target. Since an increase in the debt–equity ratio of the target reduces the target’s ability to issue additional debt, the gain from the acquisition would fall as the debt–equity ratio increases.
Result 4 implies that an increase in leverage increases the value of the firm for low values of α. The empirical evidence on announcement effects of financing decisions shows that exchange offers that increase leverage increase the value of the firm, whereas exchange offers that decrease leverage decrease the value of the firm. Our analysis implies that, for a firm with a low α, the unexpected announcement of a leverage-increasing exchange offer has a positive effect on the value of the firm through its effect on α. This is because for low values of α an increase in leverage consolidates voting rights in the hands of management and hence enables it to force a bidder to pay a higher premium to acquire control. It should be emphasized, however, that the consolidation of voting rights is not the only possible positive effect on the value of the firm of an increase in α. Other favorable effects of an increase in leverage discussed in the literature include tax effects, information effects, and incentive effects.¹⁷

Interestingly, our model suggests a well-defined information effect of an unexpected change in leverage. Suppose that management has superior information about the probability that the firm will become a target given the existing value of α. Depending on whether it believes that probability has increased or decreased, management will choose to increase or decrease leverage. For low values of α, an increase in leverage would lead outside shareholders to believe the firm is moving toward the new, higher value of α that maximizes the value of the firm. However, if α becomes large as a result of the increase in leverage, the value of the firm would fall as a successful takeover becomes unlikely. Hence, whether the change in leverage conveys information about the probability of a takeover attempt or not, one would expect that the announcement effect of leverage-increasing exchange offers is related to α and can be negative when α is large, if the concentration of voting rights effect is economically significant. Dann and DeAngelo (1988) document negative average announcement effects for leverage-increasing transactions for a sample of firms involved in corporate control contests.

A final note of caution is required. Result 4 may not hold when the debt–equity ratio of the target affects the bidder’s cost of borrowing. To see this, suppose the bidder faces increasing marginal costs of borrowing. For instance, issuing more debt could force the bidder to renegotiate with its bondholders to change some bond covenants. This would be costly and could induce the bidder to avoid making a bid that has to be financed with debt unless the gain from control for the bid is high. As the target increases its debt, the total value of its equity and the bidder’s borrowing costs to acquire control fall. In this case, a bid may become more likely as the debt–equity ratio

¹⁷Smith (1986) reviews the empirical evidence and the hypotheses offered to explain it. Jensen (1986a, b) offers a new explanation of the empirical evidence which relies on the fact that, for firms with free cash flow, a leverage increase bonds management to new payout and investment policies more favorable to shareholders’ interests.
increases. Because the total premium paid by the bidder increases with \( \alpha \), the value of the target is still increased by the change in the debt-equity ratio when \( \alpha \) is small. However, in this case, an increase in the debt-equity ratio could mean that managers are more likely to lose control. One would not expect such cases to be frequent, because bidders are usually firms for which bond covenants are unlikely to become binding in the short run. Further, newly issued bonds could incorporate covenants that decrease a bidder’s possible gain from control (for instance, by restricting the sale of the target’s assets) and hence make a bid less likely even though a bidder would have to issue less debt to acquire the target. Nevertheless, this case is important because it shows that, sometimes, it will pay for a firm to decrease its debt-equity ratio to obtain a better bargaining position with a bidder.

5.2. Stock repurchases

Although many papers have been devoted to the study of stock repurchases, most do not address why takeover targets find such repurchases desirable. In the standard corporate finance literature, stock repurchases are generally viewed as a way for managers to signal greater earning opportunities. This literature does not explain, however, why greater earning opportunities should come up just when a bidder makes a bid or why, if management already knew these opportunities, it waited to act until a bidder made himself known. Jensen (1986a, b) argues that such stock repurchases decrease the resources available to management and hence prevent the management of firms with limited growth opportunities from investing these resources in negative net present value projects. His analysis implies that stock repurchases are more likely when the increased likelihood of a takeover contest puts management under pressure to make the target less attractive to a hostile bidder.

Although a share repurchase can decrease the bidder’s gain from acquiring control of the target, it also follows from our analysis that a share repurchase can make it harder for a bidder to acquire control because it increases managers’ control of voting rights. For low values of \( \alpha \), a share repurchase increases the value of the target even in the absence of its effects on the management’s actions discussed in Jensen (1986a, b). However, for large values of \( \alpha \), our analysis implies that share repurchases can decrease the value of the firm. Dann and DeAngelo (1988) provide empirical evidence on share repurchases during takeover contests. Interestingly, they find that the average announcement effect of the repurchases in their sample is negative. Some of the repurchases they discuss seem to be strongly motivated by managers’

\(^{18}\text{Stiglitz (1972) argues that b. cause of this phenomenon the probability of a takeover increases with the debt-equity ratio.}

\(^{19}\text{See, for instance, Dann (1981), Vermaelen (1981), Masulis (1980), and Rosenfeld (1982).}
intention to consolidate their voting power as they are associated with private placements of shares to management, investors allied with management, or pension funds under the control of management. The other repurchases they discuss as well as those discussed in Jensen (1986a,b) are better explained as ways for management to bond itself to new investment and payout policies. The motivation for repurchases discussed in Jensen and the motivation emphasized here are not mutually exclusive and each can contribute, in varying degrees, to explaining particular stock repurchases.

The concentration of the vote effect of an increase in $\alpha$ increases the value of the firm for low values of $\alpha$ and decreases it for high values of $\alpha$. Vermaelen (1981) regresses the announcement effect on the fraction of insider holdings. For one subperiod in his sample, he finds that in a multivariate regression the coefficient of the announcement effect on the fraction of insider holdings is significantly different from zero at the 0.05 level. This evidence could mean that the positive signalling, tax, or leverage-increasing incentive effects of stock repurchases dominate the concentration of the vote effect for high values of $\alpha$. However, Vermaelen’s result does not hold for other subperiods in his sample. As more recent repurchases seem to be taking place around takeover contests it would be interesting to study the relation between announcement effects of stock repurchases and $\alpha$ in a sample that includes the more recent experience.

5.3. Convertible debt and delayed conversion

Ingersoll (1977a) and Brennan and Schwartz (1977) show that in perfect markets a convertible security should be called as soon as the value of the asset to be exchanged for the security equals the call value plus the accrued interest. Yet Ingersoll (1977b) documents that most firms do not follow this policy. In his sample, corporations waited, on average, until the value of the common stock to be exchanged for the debt was 83.5% in excess of the call value plus the accrued interest of bonds convertible into stock, while the value of the preferred stock was 63.3% in excess. In the context of the present paper, forcing conversion of debt into common stock decreases $\alpha$. If the holders of convertible debt are less likely to convert and tender than holders of common stock, forced conversion has a cost created by the redistribution of voting rights that has been neglected in the literature. As holders of a convertible security who tender lose either a put option in the case of convertible debt or, possibly, the right to higher dividends with convertible preferred stock, it seems likely that holders of convertible securities face a higher opportunity cost of tendering than holders of common stock. Further, holders of convertible securities may not be able to convert in time to participate in the tendering.

20See Ingersoll (1977b), Harris and Raviv (1985), and Constantinides and Grundy (1986) for analyses which offer hypotheses as to why convertibles are called late.
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offer. Mikkelsen (1981) documents that the announcement of forced conversion of debt convertible into common stock significantly decreases the value of the firm, while the decrease in the value of the firm resulting from the announcement of forced conversion of preferred stock into common stock is not statistically different from zero. Since, on average, preferred stock seems to have less valuable voting rights than common stock, forced conversion of debt into common stock would be more likely to signal a decreased probability of a tender offer than forced conversion of preferred stock into common stock. This could help explain the stronger adverse impact on the value of the firm of the forced conversion of debt convertible into common stock. Note, however, that in the case in which the bidder faces increasing marginal costs of borrowing, forced conversion of a convertible would make it more difficult for the bidder to acquire control as more borrowing would be required.

5.4. Supermajority rules and differential voting rights

Instead of increasing their control of voting rights directly, managers can decrease the importance of voting rights held by other shareholders. One way to do this is through a supermajority rule. A supermajority rule is viewed here, for simplicity, as one according to which the bidder gains effective control of the target only if some fraction \( \gamma > \frac{1}{2} \) of the shares has been acquired. The introduction of a supermajority rule is equivalent to an increase in \( \alpha \) as it implies that, even if \( \alpha = 0 \), the marginal shareholder who tenders requires a higher premium than if \( \gamma = \frac{1}{2} \). In our model, therefore, an increase in \( \gamma \) from \( \gamma = \frac{1}{2} \) increases the value of the firm if \( \alpha \) is smaller than the value of \( \alpha \) that would maximize the value of the firm and decreases it otherwise. DeAngelo and Rice (1983), Linn and McConnell (1983), and Jarrell and Poulsen (1987) study the change in the value of the firm associated with the announcement of the introduction of antitakeover amendments. On average, the introduction of supermajority amendments does appear to reduce the value of a firm, but the announcement effect seems to vary considerably in both sign and magnitude among firms. It would therefore be useful to re-examine these announcement effects to see whether \( \alpha \) can provide some explanation for their cross-sectional distribution. Our model implies that negative announcement effects are more likely to be associated with firms in which \( \alpha \) is large than with other firms. Alexander (1986), regressing the announcement effects of antitakeover amendments on a constant and the fraction of the shares held by members of the board of directors, finds that the announcement effect is negatively related to the fraction of the shares held by members of the board. Jarrell and Poulsen (1987) obtain a similar result.

In some cases, supermajority rules can achieve an increase in the value of the firm that cannot be accomplished through an increase in \( \alpha \). To see this, consider the case in which management is not made worse off by a takeover.
attempt. In this case, the value of the firm would increase with an increase in \( \alpha \) provided that managers could commit not to tender, because a bid would succeed only with the support of shareholders with higher opportunity costs of tendering. As argued in the previous section, however, there is no mechanism whereby managers can commit not to tender. Hence, in this case, the value of the firm may not depend on \( \alpha \). However, management can achieve the same effect as an increase in \( \alpha \) associated with a credible commitment not to tender by introducing a supermajority rule. The disadvantage of a supermajority rule is that it is not easy to remove when shareholders might be better off without it.

By introducing differential voting rights, management can also decrease the importance of voting rights held by other shareholders. Consider a firm with two classes of common stock that differ only in their voting rights. For instance, both types of shares receive identical payouts, but shares of one type have two votes, whereas shares of the other type have only one vote each. If management holds the shares with the higher voting rights, it holds a larger fraction of the voting rights for a given investment than it would without the existence of two classes of common stock. Hence, the existence of differential voting rights brings about an increase in \( \alpha \) when managers hold a disproportionate fraction of the shares with superior voting rights. The analysis in this paper implies that one would expect shares with higher voting rights to be held mainly by managers. DeAngelo and DeAngelo (1985) and Partch (1987) document that this is indeed the case. Our analysis also indicates that the value of the firm falls when managers introduce shares with higher voting rights to acquire a veto right on future proposed control changes.

If some shares with higher voting rights are traded, one would expect those shares to trade at a premium as long as the probability of a takeover is not zero and to receive a higher premium if a successful tender offer is made. Several papers document that, usually, shares with higher voting rights trade at a premium over other shares issued by the same firm. Further, DeAngelo and DeAngelo (1985) study cases in which firms with more than one type of shares were acquired by other firms and show that shares with higher voting rights received a higher premium. Partch (1987) studies a sample of firms that issued shares with limited voting rights and finds that, on average, the creation of such shares increased shareholder wealth. However, as two-thirds of the shares with limited voting rights in her sample also receive a preferential dividend, she is unable to distinguish between the effect of a change in payout policy and the effect of a change in the distribution of voting rights at conventional significance levels. Pinegar and Lease (1986) study the announcement effect on a firm's common stock of an offer to exchange common stock

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\(^{21}\)See, for instance, DeAngelo and DeAngelo (1985) and Lease, McConnell, and Mikkelsen (1983, 1984).
for preferred stock. They find that the announcement effect of such an offer is negatively related to the voting rights of the preferred stock. In other words, shareholders benefit more from an offer to exchange common stock for preferred stock when the preferred stock has no voting rights than otherwise, which would be consistent with our analysis if these firms have low \( \alpha \)'s. This suggests that announcement effects of a capital structure change are related to the changes in the distribution of voting rights they bring about.

5.5. Shareholder clientele

Management can increase \( \alpha \) through contractual arrangements that give it the right to vote shares it does not own or enable it to influence how such shares are voted. These contractual arrangements are likely to be costly for management, as they can force it to relinquish some decision rights. Our analysis suggests that, for low values of \( \alpha \), the announcement effect of new contractual arrangements that increase \( \alpha \) should be positive as they move \( \alpha \) closer to the value that maximizes the value of the firm. A discussion of the main empirical implications of our analysis for such contractual arrangements follows.

5.5.1. ESOP's and pension funds

Management generally acts as a trustee of the firm's pension fund and of the firm's stock ownership plan, and hence it can significantly influence how the firm's shares held by the pension fund or the stock ownership plan are voted. One would therefore expect that the introduction of an ESOP and purchases of the firm's shares by its pension fund or the ESOP would have a positive concentration of the voting rights effect on the value of the firm when \( \alpha \) is small. One should not forget, however, that purchases of shares by the firm's ESOP or pension fund can also affect the value of the firm for other reasons (for instance, they can have tax effects).

5.5.2. Voting trusts

DeAngelo and DeAngelo (1985) document instances in which management has the right to vote shares that it does not own that are held in trust. The establishment of such a trust could have a positive effect on the value of the firm as it increases \( \alpha \). However, when the establishment of such a trust leads to a large value of \( \alpha \), i.e., one that is close to or exceeds one half, one would expect the value of the firm to fall. The value of the firm's equity can also increase or fall when shares are acquired by investors friendly to management
depending on whether \( \alpha \) is small or large. Dann and DeAngelo (1988) document instances during takeover contests in which management places shares with friendly investors and show that, on average, such placements decrease the value of equity even when they do not decrease the firm's leverage.

5.5.3. Standstill agreements

Typically, a standstill agreement that limits ownership of target shares by an investor also stipulates that the investor will vote with management in a corporate control contest. This suggests that, in some cases, a standstill agreement could increase the value of the firm's equity because it concentrates control of the votes in management's hands. Dann and DeAngelo (1983) find that standstill agreements typically decrease the value of the target's equity. This could mean that standstill agreements are used more often by firms with large \( \alpha \)'s. A more plausible explanation however, is that besides concentrating voting rights in the hands of management, a standstill agreement effectively eliminates a bidder. This would decrease the value of the firm in our analysis.

5.5.4. Financial restructurings

So far, we have assumed that financial transactions leave an individual shareholder's probability of tendering unchanged for a given premium. However, a financial restructuring can change this probability. For instance, a share repurchase buys back shares from those shareholders who have the lowest opportunity costs of tendering, so that a subsequent bidder has to buy shares from shareholders who have higher opportunity costs of tendering. In our model, such a share repurchase decreases the probability of success of a bid for a low premium and leads the bidder to offer a higher premium. This effect of a share repurchase can take place even if \( \alpha = 0 \) and hence is not directly related to the main theme of this paper. However, it follows from this discussion that the effect of a given \( \alpha \) on the premium offered can be affected.

22In this model a large shareholder plays a different role than in the model of Shleifer and Vishny (1986a). In their model, some takeovers cannot take place in the absence of a large shareholder, even though they would make the target's shareholders better off, because the bidder cannot exclude the target's nontendering shareholders from the gains created by its improvements in the target's management. The large shareholder can facilitate a takeover by giving up some of the gains and hence make the takeover a positive net present value project for the bidder. In the Shleifer and Vishny (1986a) model, the premium offered in a takeover attempt falls with the proportion of shares held by the large shareholder, while the value of the target increases. Following an increase in the large shareholder's holdings, a takeover becomes more likely because takeovers which generate lower gains can take place.
by changes in the distribution of shareholders' opportunity costs of tendering through financial restructurings.

6. Conclusion

This paper shows how the value of a firm that is a potential takeover target depends on the fraction of the voting stock held by management. The result that the value of the firm depends critically on the distribution of the votes between management and outside shareholders is shown to have implications for how one views various takeover defenses and for the firm's financial policies.

Some interesting extensions of the previous analysis are the following. First, we assume that the conflict of interest between shareholders and managers arises only from the fact that a successful takeover always benefits shareholders but may hurt managers. Thus our analysis ignores the positive incentive effects of a large \( \alpha \), stressed by Jensen and Meckling (1976), and of the market for corporate control discussed in Jensen and Ruback (1983). It is possible that an analysis that includes the incentive effects of \( \alpha \) would show that, in some cases, the value of the firm increases monotonically with \( \alpha \) because these effects dominate the distribution of the vote effect studied in this paper.

Second, we assume the target's management cannot increase its bargaining power other than through an increase in \( \alpha \). It would be interesting to see how our analysis extends to the case in which management can increase its bargaining power in other ways, for instance by introducing a poison pill, and how the distribution of voting rights affects management's ability to bargain with a bidder.

Finally, we ignore informational asymmetries. In general, one would expect management to know more about the target than either outside shareholders or the bidder. This introduces a new reason for management to resist, in that it may have information that leads it to believe the firm is undervalued. In such a situation, the managers' ability to block a low bid would increase the value of the firm. Hence, this type of informational asymmetry could bring about a higher optimal value for \( \alpha \). Although constructing a model that incorporates distribution-of-votes effects, incentive effects, and informational asymmetries is a challenging task well beyond the scope of this paper, the results presented here indicate that research along these lines would be helpful.

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23 See Scharfstein (1985) for a model that deals with the incentive effects of the market for corporate control.
24 See Parsons (1985) for a bargaining model of tender offers.
25 See Baron (1983) for a model that deals with these informational asymmetries.
to understand better how the market for corporate control works and how corporate capital structures are selected.

Appendix

Let \( N_\alpha \) and \( N_p \) be, respectively, the partial derivatives of \( N \) with respect to \( \alpha \) and \( P \). It is easy to verify that \( N_\alpha < 0 \) and \( N_p > 0 \).

**Result 1.** If a bid is made, let \( Y = (G - P)N \). Using the envelope theorem, it immediately follows that

\[
\frac{dY}{d\alpha} = (G - P)N_\alpha < 0. \tag{A.1}
\]

**Result 2.** The optimal premium satisfies:

\[
(G - P)N_p = N, \tag{A.2}
\]

\[
(G - P)N_{pp} - 2N_p < 0, \tag{A.3}
\]

\[
(G - P)N \geq 0. \tag{A.4}
\]

(A.2) is the first-order condition, (A.3) the second-order condition, and (A.4) represents the constraint that a bid has to be a positive NPV project. With our assumptions, \( N_p \) is a constant, so that \( N_{pp} = 0 \) and the second-order condition (A.3) is always satisfied.

Differentiating (A.2) using the envelope theorem yields

\[
\frac{dP}{d\alpha} = \frac{-[G - P]N_{pa} + N_\alpha}{[G - P]N_{pp} - 2N_p} = \frac{-N_\alpha}{2N_p} > 0, \tag{A.5}
\]

where the second equality follows from the fact that \( N_p \) is a constant.

\( dV/d\alpha \). Differentiating \( V(\alpha,1) \) with respect to \( \alpha \) yields

\[
\frac{dV}{d\alpha} = P \int_0^\bar{\alpha} \left( \frac{1}{1 + R} \right) \left( P_\alpha N + PN_p P_\alpha + PN_\alpha \right) \frac{dG}{G}. \tag{A.6}
\]

To evaluate the term in square brackets, we can use eq. (A.5) to rewrite this term as follows:

\[
P_\alpha \bar{N} + PN_p P_\alpha + PN_\alpha = \frac{1}{2} (PN_p - N)(N_\alpha/N_p). \tag{A.7}
\]
Note now that eq. (A.2) implies that $N = [G - P]N_p$. Using (A.2) to eliminate $N$ in (A.7) yields
\[
\frac{1}{2} [PN_p - N](N_a/N_p) = \frac{1}{2} [2P - G]N_p. \tag{A.8}
\]
Consequently, the term in square brackets in eq. (A.6) is positive whenever $G$ is large in comparison with $P$. As $u(P)$ and $d(P)$ are assumed to be linear functions of $P$ with identical slopes, we can rewrite them as $u(P) = a + \beta P$ and $d(P) = A + \beta P$. Using eq. (A.2), we get the following solution for the premium:
\[
P = \frac{1}{2\beta} [G\beta - a + z(a)]. \tag{A.9}
\]
Eq. (A.9) implies that if the premium is optimally chosen, $G$ exceeds $2P$ for $\alpha = 0$, as $-a + z(0)$ is negative by assumption. Hence, $dV/d\alpha$ is positive when $\alpha = 0$.

**Different supply functions.** Our results still hold if $N_{pp}$ and $N_{pa}$ differ from zero provided that (a) there is a unique interior solution for the premium, (b) $N_a + (P - G)N_{pa} < 0$, and (c) $G > 2P$ over a sufficient range of values for $G$ for $\alpha = 0$. Condition (b) is likely to hold whenever there is a unique interior solution for the premium. This follows from the fact that an increase in $\alpha$ has the opposite effect on $N$ of a fall in the premium. By this argument, one would expect $N_{pa}$ to have the opposite sign from $N_{pp}$. However, if $N_{pp}$ is positive and $G - P$ is large, the second-order condition (A.3) does not hold. Hence, one would expect $N_{pa}$ to be positive, which implies that condition (b) holds. Condition (c) holds whenever competition among shareholders for the premium is strong, so that the premium offered when $\alpha = 0$ is small compared with the gain to the bidder.

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