ISSN 1045-6333

CORPORATE OWNERSHIIP STRUCTURES: PRIVATE VERSUS SOCIAL OPTIMALITY

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Discussion Paper No. 181

2/96

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The Center for Law, Economics, and Business is supported by a grant from the John M. Olin Foundation.

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ABSTRACT

This paper analyzes the inefficiencies that might arise in the ownership structure chosen at the initial public offering stage. We show that, contrary to what is commonly believed, the desire of initial owners to maximize their proceeds leads them to choices that, although privately optimal, may be socially inefficient. This distortion tends to be in the direction of excessive incidence of controlling shareholder structures and excessive divestment of cash flow rights. Our analysis has far-reaching policy implications for dual class stock, stock pyramiding, sale of control rules, and public offerings of minority shares. Among its positive implications, our analysis suggests reasons for the substantial differences in the incidence of control blocks across different countries.

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Corporate Ownership Structures: Private versus Social Optimality

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First Draft: July, 1994
Current Draft: February, 1996

Abstract

This paper analyzes the inefficiencies that might arise in the ownership structure chosen at the initial public offering stage. We show that, contrary to what is commonly believed, the desire of initial owners to maximize their proceeds leads them to choices that, although privately optimal, may be socially inefficient. This distortion tends to be in the direction of excessive incidence of controlling shareholder structures and excessive divestment of cash flow rights. Our analysis has far-reaching policy implications for dual class stock, stock pyramiding, sale of control rules, and public offerings of minority shares. Among its positive implications, our analysis suggests reasons for the substantial differences in the incidence of control blocks across different countries.

*We wish to thank Reuven Avi-Yona, Victor Brudney, Francesca Cornelli, Oliver Hart, Louis Kaplow, and participants in workshops at the Harvard Economic Department, Harvard Law School, and Tel Aviv University. Bebchuk benefited from the financial support of the National Science Foundation and the Harvard Law School John M. Olin Center for Law, Economics, and Business, Zingales of the Center for Research in Security Prices.

Since the work of Berle and Means (1932), much research has focused on the forces shaping the ownership structure of the modern corporation. It is now well recognized that each ownership structure has its efficiency costs. A natural question that arises is whether the market will tend to produce those structures that minimize the sum of the various types of efficiency costs and are thus most efficient.

A popular and powerful view in modern economics and finance suggests that the market would indeed tend to produce the most efficient organizational structures. A forceful presentation of this view can be found in Demsetz (1983) who argues that "[the] structure of ownership that emerges is an endogenous outcome of competitive selection in which various cost advantages and disadvantages are balanced to arrive at an equilibrium organization of the firm." (p. 384). According to this view, only government regulation would lead to an inefficient structure of ownership. Thus, for example, Roe (1990) argues that because the legal rules of the U.S. (unlike those of Japan or Germany) discourage the creation of control blocks, the low incidence of such blocks in the U.S. may be suboptimal.

The view that the market produces efficient ownership structures has the widest support in the context of firms emerging out of an initial public offering (IPO). The conventional view is that the entrepreneurs taking a company public will have a powerful incentive to choose the most efficient structure. As long as public investors are rational – the argument goes – all the costs and benefits of the chosen ownership structure will be reflected in the offering price and, thus, will be internalized by the entrepreneur who decides the initial ownership structure (Jensen-Meckling, 1976). This conventional view has important policy consequences, since it implies that all private choices made at the IPO stage are socially efficient, and thus that any regulation of these choices can only reduce social welfare.

In this paper we question the conventional view concerning the ownership structures chosen by firms going public. Like the conventional view, we assume that markets are rational and that the initial owners choose the ownership structure in order to maximize their firms' value. Yet we show that the ownership structures that are chosen at the IPO stage might be inefficient.[1]

[1]The idea that private choices made by those who set up a company might differ from the socially optimal ones was first introduced by Grossman and Hart (1980). Grossman and Hart, however, took as given the choice of ownership structure (dispersed ownership in their case), and they focused on the choice of the dilution factor

The source of the divergence between private and social optimality can be briefly described as follows. When choosing the distribution of ownership after the IPO, the initial owner will recognize the possibility that a potential buyer of the company will emerge in the future. Should such a scenario arise, the initial choice of ownership structure will have important effects on both the initial shareholders and the future potential buyer. Since the IPO price will reflect the effects that the ownership choice has on initial shareholders, the owner will fully internalize these effects. But, since future buyers of control are not "at the table" at the time of the IPO, the initial owner will not take into account the effect of the ownership structure on the expected value that such future buyers will capture.

Specifically, our model includes three ways in which the initial choice of the ownership structure will affect potential future buyers of control. First, this choice will influence whether a transfer of control will take place, affecting both the likelihood of a control transfer as well as the circumstances under which it will occur. This change, in turn, affects the expected surplus that potential future buyers can be expected to capture.

Second, in those control transfers that will take place, the initial distribution of ownership will influence the division of surplus between the initial shareholders and the control buyer. This, again, will affect the expected surplus of potential future buyers.

Third, should a control transfer take place, the initial distribution of ownership might affect the value of the company under the control buyer. For example, if the initial ownership is dispersed and the control buyer wants to move to a more concentrated ownership (because that would be a more efficient structure), such a change might be difficult to accomplish. This, yet again, might affect the surplus that a potential control buyer can expect to capture.

To demonstrate our thesis, we focus on one important choice that initial owners make. Specifically, we analyze the initial owner's choice between (1) a complete ownership (CO) structure, in which the company remains private and the initial owner retains complete ownership of the firm's cash flow rights and (2) a controlling shareholder (CS) structure, in which the

in takeovers. Subsequent work on the divergence between private and social optimality in the setting up of a company also took the ownership structure as given and focused on choices concerning the rules governing control transfers. (See, e.g., Bebchuk and Kahan (1990) and Bebchuk (1994).) In contrast to this work, we endogenize the choice of the level of ownership, and we analyze the divergence between private and social optimality in making this basic choice.

initial owner retains control of the firm but sells to public investors some of the firm's cash flow rights. This is the relevant choice that an owner faces in deciding whether to go public and how much to sell in the IPO. In fact, there is hardly any case in which the initial owner disperses his controlling stake at the IPO (e.g. Mikkelson, Partch and Shah (1995)).

Because of the three general effects noted above, the privately optimal choice between a CO and CS structure generally differs from the socially optimal one. We not only demonstrate the existence of such distortion, but also seek to shed some light on its direction and magnitude. We show that, under certain plausible conditions, this divergence generates a socially excessive incidence of CS structures. We also examine our theoretical results through the lens of the existing empirical evidence. The evidence is consistent with the results of the theoretical analysis concerning the direction of the distortion and also indicates that its magnitude could be significant.

We also show that the identified distortion might be larger when it is possible to sell cash flow rights separately from voting rights. This may occur when an initial owner can issue shares with inferior voting rights, or can set up a multi-layer pyramid of holding companies, each of which issues some shares to the public, enabling the initial owner to retain a majority of the voting rights while selling a majority of the cash flow rights to public investors. We demonstrate that such schemes worsen the distortion in favor of CS structures, and that private incentives to adopt such schemes create outcomes which diverge from the socially optimal ones.

Concerns that private incentives to adopt a differential voting scheme might be excessive have been raised in the literature (see for instance, Grossman and Hart (1988) and Ruback (1988)) and have led the SEC to issue Regulation 19c-4 to restrict companies' moves to such schemes. These concerns, however, have focussed on those recapitalizations that have created dual-class structures in mid-stream and allegedly have worsened the situation of existing shareholders. Consequently, Regulation 19c-4 does not restrict the introduction of shares with inferior voting rights at the IPO stage. By contrast, we shall show that even at the IPO stage there might be a divergence between private and social optimality causing an excessive use of dual-class structures and multi-layer stock pyramids. This distortion might justify a ban on the introduction of inferior voting shares even at the IPO stage.

Our analysis sheds also some light on the reasons why countries vary greatly in the incidence of CS structures. While CS is the prevailing ownership structure in continental Europe (see Franks and Mayer, 1994 for Germany or Zingales, 1994, for Italy), it is far less pervasive in the United States.[2] Explaining these differences is one of the important questions that Shleifer and Vishny (1995) identify in their recent survey on corporate governance. Our model suggests that CS structures tend to be more pervasive when the market for corporate control is less competitive, when dual-class structures and stock pyramids are not restricted or discouraged by regulations or tax rules, and when minority shareholders have a legal right to participate in sale-of-control transactions on the same terms as the holder of the control block. We then argue that the existing institutional differences between continental Europe and the U.S. can explain the observed differences in the ownership structure.

Our analysis also has some original normative implications. First, it suggests that it might be desirable to discourage the creation of multi-layer corporate structures in which subsidiaries of publicly traded companies sell shares to the public. In particular, the various provisions of the current U.S. tax law which penalize such pyramidal structures might be serving a useful role. Second, the analysis suggests that it might be desirable to restrict or discourage the use of differential voting structures, even at the IPO stage. Third, and more generally, the analysis introduces the possibility that the optimal policy toward IPOs might be to discourage the use of CS structures. Finally, the analysis has important implications for the optimal legal regulation of sale-of-control transactions.

There is a large literature on the costs and benefits of a CS structure as compared with a CO structure (see, e.g., Jensen & Meckling (1976), Shleifer and Vishny (1986), Holmstrom & Tirole (1993), Zingales (1995), Bolton and von Thadden (1995), Pagano and Roell (1995)). The focus of much of this research has been positive, in that it tries to understand the actual choices of owners.[3] In contrast, our model focuses on the welfare consequences of the choice

[2] Holderness and Sheehan (1988) found that in a large sample of 5,240 U.S. publicly traded firms only 13% had a shareholder with a majority interest. Similarly, Barclay and Holderness have estimated that 20% of U.S. publicly traded firms have a block exceeding 35% equity. By contrast, Zingales (1994) documents that in Italy more than half of the public companies have a majority shareholder.

[3] A notable exception is Pagano (1993). He argues that the number of public companies may be excessively low from a social point of view because an initial owner bears all the cost of listing, but reaps only part of the gains of increased diversification opportunities he provides to other owners.

of different structures of ownership. In constructing the model we build on elements from our previous work. Bebchuk (1994) analyzes how a move from a CO to a CS structure affects the circumstances under which control will be transferred. Zingales (1995) analyzes how such a move affects the division of surplus when control is transferred. In the present paper we show that these two elements, as well as a third one, work to drive a wedge between private and social optimality.

Section 1 of the paper describes the framework of analysis, and section 2 presents uses a simple model to show the divergence between private and social incentives. Section 3 demonstrates this divergence in a more general context. Section 4 extends the analysis by, among other things, introducing dual-class stock and stock pyramiding. Section 5 discusses the empirical evidence that bears on the validity and practical significance of the results. Section 6 points out the positive implications of the model, and Section 7 considers its normative implications. Section 8 concludes.

1 The Framework

We consider an initial owner I, who owns all the shares of a firm and decides whether he should maintain complete ownership (CO) of his company or sell a fraction α of his shares. In the latter case we assume that he always retains a majority control of the company, and we designate this case as a controlling shareholder structure (CS).[4] This does not preclude the possibility that the incumbent might want to sell his controlling block to another large investor.

The problem is interesting only if there is a difference between the value that an individual investor attributes to a company's shares and the value of a controlling block. Let Y_I be the value of the verifiable cash flow produced by the company, that is, the value that a risk-neutral outside investor will pay for the company's cash flow. Let B_I be the difference between the value of the company for the incumbent (V_I) and the value of the verifiable cash flow (Y_I): $B_I = V_I - Y_I$.[5]

[4] In future work we plan to address the separate question of when it is optimal, from an initial owner's point of view, to sell a majority of voting rights to dispersed shareholders. In this paper we restrict our analysis to what seems to be empirically the relevant choice faced by initial owners.

[5] Note that this definition is more general than the one commonly used in this type of literature. B_I includes

We make the conventional assumption that the values of V_I, Y_I, B_I are affected by the fraction α of the company's shares that the initial owner sells to outside shareholders. The total value of a company (V_I) will be affected by the fraction α for various reasons. On the one hand, going public may reduce value because of the transaction costs involved in the process (Ritter, 1987) and, more importantly, because of the agency costs it creates (Jensen and Meckling, 1976).[6] On the other hand, going public may increase the value of a company by spreading risk, increasing the amount of information to compensate employees (Holmstrom & Tirole, 1993), or by preventing a large shareholder from interfering with the company's management (Burkart, Gromb, and Panunzi, 1994).

We make no assumptions on the value of α that maximizes $V_I(\alpha)$. In other words, consistent with Demsetz (1983) we do not assume that the efficient level of ownership is necessarily 100%, and we allow for the optimal α to vary from case to case. We also make no assumptions on the shape of the function $V_I(\alpha)$. We do not even assume that $V_I(\alpha)$ is a continuous function. In particular, we want to allow for the possibility of a discontinuity at $\alpha = 0$. In fact, there are some fixed costs associated with the decision to go public, which will be borne independent of the fraction α sold to outside investors, provided that $\alpha > 0$.

While our main results do not depend on making assumptions about the shape of $V_I(\alpha)$, it is worthwhile to consider some restrictions that come to mind as plausible. First, consistent with the literature on the effects of a separation of ownership and control (e.g., Jensen and Meckling, 1976), the verifiable component Y_I should be positively related to the ownership retained by the initial owner, and thus negatively related to the fraction α sold to outside investors: $\frac{dY_I}{d\alpha} < 0$. In contrast, $B_I(\alpha)$ is likely to be a positive function of the amount sold to outside shareholders. As long as the initial owner retains control, the opportunities to extract private benefits are largely the same, independent of α, but the bigger α is, the less I is concerned about the inefficiencies produced by his extracting private benefits. As a consequence, a larger

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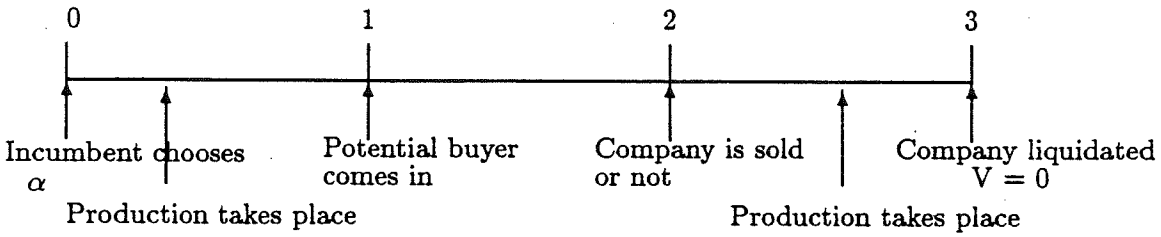
both the private benefits of control and the costs associated to control. For instance, B_I can be negative if the initial owner is very risk averse.

[6] In principle, the initial owner could design incentive contracts that would reproduce the effects of ownership, eliminating the agency costs associated to an increase in α. In practice, though, such a contract would succeed in eliminating the agency costs only by undoing the sale through a contract. Therefore, if the incumbent owner wants to dispose of a fraction of cash flow rights he will have to bear the costs of increased agency costs.

α will generally be associated with a larger B_I. Alternatively, one of the possible sources of B_I (i.e., of the difference between small shareholders' valuation of a company and that of a large shareholder) is that a large shareholder has to bear a lot of idiosyncratic risk. By divesting a larger fraction of the wealth he has invested in his company, the incumbent owner would reduce the premium required to hold an undiversified portfolio, implying that $B_I(\alpha)$ should be increasing in α.

The timing of the events is summarized in Figure 1. At time 0, an initial owner I makes a choice between maintaining complete ownership or moving to a controlling shareholder structure by selling a fraction α of his shares to the public.

Figure 1:



Between 0 and 1, the company operates and produces value. At time 1, a potential buyer of control N emerges and can purchase the company. At time 2 control is transferred. Between 2 and 3, there are again value producing operations. At time 3, the company is dissolved.

The potential buyer has a different valuation of the company $V_N = B_N + Y_N$.[7] The buyer's valuation may differ from that of the incumbent for many reasons. Different owners may have different managerial ability, and thus produce different levels of cash flow. They might also have different synergies with the company, or be more or less risk averse. Therefore, they might not only differ in their total valuation V_N, but in its components as well.

Note that the initial owner is not able to change his ownership level just after the first production period. This assumption is meant to capture the fact that the timing of the arrival

[7]For simplicity, we assume that if I or B are risk averse, this affects only the function B. Otherwise, we treat them as risk neutral.

of the potential buyer is uncertain and, thus, if the initial owner wants to preposition the ownership structure he has to face the risk of having a suboptimal ownership structure in at least one production period.

While the market for minority shares is perfectly competitive, the market for controlling blocks is not. Therefore, when the owner sells a fraction α of his shares to dispersed shareholders he will receive the expected value of those shares. By contrast, when he trades his large block with another party interested in control he will not be able to appropriate all the surplus from trade. This assumption of an imperfectly competitive market for corporate control seems to be a realistic one. Suppose, for example, that private benefits derive from a synergy with another company owned by the acquiring party. This is something very specific to a particular buyer, and in this situation it seems unlikely that a seller could extract all of the surplus.[8] We assume that the incumbent will get a fraction 1 - θ of the surplus. This can be formalized as the outcome of a bargaining game in which, with probability $0 < \theta < 1$, N has the right to make a take-it-or-leave-it offer, and with probability 1 - θ the opportunity will belong to I. So long as there is some buyer's surplus which is not captured by the incumbent (i.e., $\theta \neq 0$), the model exposed in this paper is relevant.

We also assume that the discount rate is equal to zero and that the buyer is not liquidity constrained.[9] Finally, we assume that all of the parameters are common knowledge.

2 A Model with Only Superior Buyers

We begin by making two simplifying assumptions, which will be relaxed in later sections. First, we assume that the buyer is always more efficient than the incumbent in both dimensions (i.e., $Y_N(\alpha) > Y_I(\alpha)$ and $B_N(\alpha) > B_I(\alpha)$ for any α). As will be clear later, this assumption guarantees that all efficient transfers (and only those) will take place independent of the amount of shares sold at the IPO.

[8] An alternative rationale might be that the acquisition of a company requires the availability of large financial resources, availability generally limited to only a few wealthy individuals. Therefore, the sale of a company cannot always be conducted as a competitive auction.

[9] Implicitly, we also assume that the incumbent is not liquidity constrained, in the sense that he can finance all positive net present value projects with internal funds or riskless debt. We do that to avoid the additional complication associated with the capital structure decision (see Israel, 1992).

Second, we assume that whoever is in control of the company in period 2 will move to the optimal α. In particular, if $\alpha = 0$ and $\alpha^\star > 0$, then the controller will sell additional shares, and if $\alpha > 0$ and $\alpha^\star = 0$, we assume that the controller will freeze out minority shareholders paying $\alpha Y(\alpha)$.

These assumptions eliminate the first and the third source of externality mentioned in the introduction, and allows us to focus on just the second one.

2.1 The Efficient Solution

A benevolent social planner would choose the fraction of shares α_I that the initial owner should divest at time 0. He will maximize the total welfare, which is the sum of the value produced in the two periods. The social planner will solve

$$\begin{aligned} \max_{\alpha_I} W &= V_I(\alpha_I) + EV_N \\ & s.t.\ \alpha_I \in [0,1] \end{aligned} \tag{1}$$

where $V_I(\alpha_I)$ is the expected value produced by the incumbent in the first period, and EV_N is the value produced by the (superior) buyer in the second period.

Since we have assumed that the more efficient buyer will always take control, and that that buyer's choice of ownership will be socially efficient, the social planner will choose the optimal level of ownership so as to maximize the first period value of the company. Therefore, the social planner's choice of α_I is simply

$$\alpha_I^* = argmax\{V_I(\alpha_I)\}. \tag{2}$$

Consequently, we define

$$CS^\star = \{I : \alpha_I^* > 0\}, \tag{3}$$

as the set of incumbents for which it is socially optimal to have a controlling shareholder structure rather than complete ownership.

2.2 The Initial Owner's Objective

The initial owner chooses α_I to maximize his profits (Π), irregardless of the social welfare (W). The crucial point is that the incumbent's profits (Π) differ from the social welfare. The incumbent's profits are the sum of three elements: the value he enjoys by running the company in the first period, the proceeds from the initial sale of a fraction α of shares to dispersed shareholders, and the price at which he transfers his control block in the second period.

Suppose that the incumbent sells $\alpha_I \in [0,1]$ to outside shareholders. By running the company in the first period he gets

$$B_I(\alpha_I) + (1-\alpha_I)Y_I(\alpha_I), \tag{4}$$

that is, the whole value of his net private benefits (B_I) plus the fraction of cash flow $(1-\alpha_I)$ he did not sell to outside shareholders.[10]

Outside shareholders are prepared to pay up to the discounted value of the future cash flow. The amount of cash flow received by minority shareholders is influenced by what they are entitled to in case of a change of control, and this is affected by the rules regulating these transactions. Consistent with the rule prevailing in the U.S., we assume that the buyer of a control block is under no obligation to buy out minority shareholders.[11] Outside shareholders are entitled to receive only their fraction of cash flow rights. Therefore, the ex ante value of a fraction α sold to outside shareholders is the sum of their cash flow rights in the first period (when the incumbent manages the company) and the cash flow rights in the second period, when the buyer will manage the company, that is

$$P = Y_I(\alpha_I) + EY_N(\alpha_I). \tag{5}$$

In the second period, I's proceeds from selling his control block to N are the outcome of a bargaining with the buyer. The threat point of the two contenders is determined by what they do

[10] Without loss of generality in what follows we assume that I's risk aversion is subsumed in $B_I(\alpha_I)$ and, thus, we can treat I as risk neutral.

[11] For a discussion of the main rules used and their efficiency consequences see Caprio (1992), Bebchuk (1994) and Bergström and Högfeldt (1994).

once they have acquired (retained) control. Since we assume that whoever is in control will move to the efficient ownership level, by buying out minority shareholders at $Y(\alpha_I)$, the buyer's payoff if he purchases the controlling stake is $[V_N^\star - \alpha_I Y_N(\alpha_I)]$. Similarly, in the out-of-equilibrium event where the incumbent will retains his control block, his payoff is $[V_I^\star - \alpha_I Y_I(\alpha_I)]$. As a result, his second period proceeds are

$$\theta[V_I^\star - \alpha_I Y_I(\alpha_I)] + (1-\theta)E[V_N^\star - \alpha_I Y_N(\alpha_I)] \tag{6}$$

Therefore, the net profit of the incumbent is

$$\Pi = [B_I + (1-\alpha_I)Y_I(\alpha_I)] + [\theta V_I^\star + (1-\theta)EV_N^\star] - \alpha_I[\theta Y_I(\alpha_I) + (1-\theta)Y_N(\alpha_I)] + \alpha_I P \tag{7}$$

where P is the price paid by outside shareholders at the IPO stage.

By plugging (5) into (7) and rearranging we obtain

$$\Pi = W(\alpha_I) - \theta[EV_N^\star - V_I^\star] + \alpha_I\theta[EY_N(\alpha_I) - Y_I(\alpha_I)] \tag{8}$$

By comparing equations (1) and (8) we can see that the initial owner's objective function differs from the social welfare function by the last two terms of equation (8). The second one is the expected gain enjoyed by N if α_I equals 0. The last one is the amount of N's surplus that I succeeds in extracting by selling a fraction α_I at the IPO.

2.3 The Incidence of CS

Let $\bar{\alpha}_I$ be the fraction of shares sold at the IPO stage that maximizes the incumbent's profit Π, and CS to be

$$CS = \{I : \bar{\alpha}_I > 0\}, \tag{9}$$

as the set of incumbents for whom it is privately optimal to have a controlling shareholder structure, rather than complete ownership.

Proposition 1 *There is an excessive incidence of CS structures with respect to what would be socially optimal, that is,* $CS^{\star} \subset CS$.

Proof: It is sufficient to prove that $\alpha_I^{\star} > 0$ implies $\bar{\alpha}_I > 0$, but that the converse is not true. Notice that the second term on the r.h.s. of (8) is independent of the choice of α_I, while the last one is zero for $\alpha_I = 0$ and positive for $\alpha_I > 0$.

Now assume that $\alpha_I^{\star} > 0$. By definition of $\alpha_I^{\star}$, we have $V(\alpha_I^{\star}) > V(0)$. But this implies that

$$\Pi(\alpha_I^{\star}) = V_I(\alpha_I^{\star}) + (1-\theta)EV_N^{\star} + \theta V_I^{\star} + \theta\alpha_I^{\star}[EY_N(\alpha_I^{\star}) - Y_I(\alpha_I^{\star})] > V_I(0) + (1-\theta)EV_N^{\star} + \theta V_I^{\star} = \Pi(0),$$

and this proves the first half of the statement. Now suppose $\alpha_I^{\star} = 0$, we want to show that this does not necessarily imply $\bar{\alpha}_I = 0$. A simple inspection of the above equation suggests that this is not the case provided that

$$\theta\bar{\alpha}_I[EY_N(\bar{\alpha}_I) - Y_I(\bar{\alpha}_I)] > V_I(0) - V_I(\bar{\alpha}_I).$$

Since it is possible to imagine an EY_N large enough to satisfy this inequality. There are circumstances in which $\alpha_I^{\star} = 0$ but $\bar{\alpha}_I > 0$.

□

The intuition for Proposition 1 is simply that N can capture less surplus when I chooses a CS structure. As the last term in equation (8) shows, under the maintained assumption that $EY_N > Y_I$, a CS increases I's surplus and, consequently, reduces the amount retained by N. In fact, even if N can make a take-it-or-leave-it offer, the dispersed shareholders can capture the difference $EY_N - Y_I$ because they can free ride. In other words, the creation of a CS structure imposes a negative externality on N. I will strategically exploit this externality to his own advantage even when this reduces the overall efficiency.[12] Even if CS creates a smaller pie, I may prefer it because its share is bigger.

[12]This mechanism, first presented in Zingales (1995), is at the origin of the divergence between private and social incentives: the incumbent may prefer a larger α_I because this helps him extract more surplus, even if this might be socially costly. In other words, the incumbent trades off a private gain against a social loss.

2.4 The Size of Control Blocks

A separate, but equally interesting, question is how the owner's choice of α_I compares with the socially optimal one, when $\alpha_I^* > 0$. The answer to this question is provided by the following proposition:

Proposition 2 *i) When an owner chooses to go public, the amount of shares he will sell is socially excessive if*

$$\alpha_I[EY_N(\alpha_I) - Y_I(\alpha_I)]$$

is increasing in α_I at α_I^*.

ii) In particular, if $Y_I(\alpha_I)$ is differentiable this condition corresponds to

$$EY_N'(\alpha_I) - Y_I'(\alpha_I) > -\frac{EY_N(\alpha_I) - Y_I(\alpha_I)}{\alpha_I}. \tag{10}$$

Proof: From equation (8) it follows that the source of the divergence between private and social incentives is given by the term $\alpha_I[EY_N(\alpha_I) - Y_I(\alpha_I)]$. If this term is increasing in α_I at the social optimum, then the initial owner will have the incentive to increase α_I beyond α_I^*. If $Y_I(\alpha_I)$ is differentiable then this corresponds to the condition $EY_N'(\alpha_I) - Y_I'(\alpha_I) > -\frac{EY_N(\alpha_I) - Y_I(\alpha_I)}{\alpha_I}$. □

Proposition 2 gives the condition under which there is a deviation from the social optimum in the direction of an excessive divestiture of cash flow rights (too large an α_I). The intuition follows directly from equation (8). The divergence between private and social incentives derives from the desire of the initial owner to extract more surplus from the buyer. This objective can be better accomplished by increasing α. However, an increase in α_I has two effects. The direct effect is to increase the amount of surplus extracted from the buyer by $[EY_N(\alpha_I) - Y_I(\alpha_I)]$. The second effect is to change the size of the difference between $EY_N(\alpha_I)$ and $Y_I(\alpha_I)$. To the extent both effects are positive or the first effect (which is always positive) prevails over the second, the marginal private incentives are distorted toward a larger α_I.

It is illustrative to examine condition (10) for alternative characterizations of the differences between the value of cash flow rights under the incumbent and under the potential buyer. Consider first the constant improvement case – where, $Y_N = Y_I + x$ with $x > 0$ for any α. In this case, the condition certainly holds. Consider instead the proportional improvement case – where, $Y_N = \theta Y_I$ with $\theta > 1$ for any α. Then, condition (10) simplifies to

$$\frac{Y_I'(\alpha_I)}{Y_I} > -\frac{1}{\alpha_I}.$$

This condition simply requires that the value of cash flow rights does not decline too fast when α_I increases.

2.5 Minority Shares as a Commitment Device

The idea of using a contract with a third party as a commitment goes back to Diamond and Maskin (1979). In this particular case the contract used is an equity claim that promises a fixed proportion of the cash flow rights produced by the company to the holder. This contract commits the incumbent to ignore a fraction of the cash flow in bargaining with a potential buyer. As a result, the total amount of surplus extracted by the incumbent increases. The idea is similar to the one used by Aghion and Bolton (1987) in the industrial organization literature.[13]

We do not claim that selling cash flow rights to minority shareholders is necessarily the best possible mechanism to extract more surplus from a buyer.[14] Nevertheless, cash flow rights are sold to disperse shareholders for other reasons other than cash flow as well (for instance, risk sharing). Therefore, we find it interesting to examine how a standard financial contract, like equity, determines the allocation of surplus in corporate control transactions. In particular, we are interested in identifying the extent to which private incentives are misaligned from social ones in the use of this instrument.

This mechanism has one particular advantage over other third-party contracts used as commitments: it is extremely difficult to renegotiate. The large number of parties involved prevents

[13] Aghion and Bolton show how stipulated damage contracts can increase a firm's profitability by extracting more surplus from a possible entrant.

[14] An analysis of the optimality of this mechanism is contained in Zingales (1995).

any renegotiation from taking place. Dispersed minority shareholders cannot coordinate common action. At the same time, neither the buyer nor the seller can profitably reacquire the stock held by dispersed investors. In fact, minority shareholders will have an incentive not to tender their shares at a price below $\alpha Y_N(\alpha)$, which is the value they expect to receive if they do not tender. But at this price, neither B nor I can make any profit.[15]

This conclusion might appear to contradict our previous assumption that at time 2 the controller can effect a freeze-out at αY. Indeed, one might wonder why this is not done before the transfer of control, avoiding the problems we have highlighted. For instance, N could ask I to effect this freeze-out as precondition for transferring control. However, such a possibility does not exist under the current status of U.S. law.[16] In fact, a controller who buys out minority shareholders anticipating that he will turn over control has to disclose this information at the time of the buy back. Otherwise, he becomes liable for the difference between the price he received and the price he paid. But, if the controller discloses his intention to sell, minority shareholders will not tender at any price below Y_N. In section 4, we shall ask whether this norm is optimal.

3 A More General Model

In this section we will analyze a more general version of the model in which no restrictions are placed on the characteristics of the potential buyer. In particular, N might have either a higher or a lower V with respect to I and the value of his cash flow rights (Y_N) can be either larger or smaller than I's.

3.1 Condition for a Transfer

In section 2 the characteristics of the potential buyer were such that control always changed hands. When the buyer's characteristics are not restricted, two additional outcomes are possible: some efficient transactions will not take place and some inefficient transactions will take place.

[15] This free rider problem was first identified by Grossman and Hart (1980). It was subsequently examined by Bebchuk (1988) and Holmstrom and Nalebuff (1992).

[16] See Cary and Eisenberg (1988), p. 687-688.

Bebchuk (1994) provides an exact characterization of this problem which we summarize here.

At time 2 the value of the control block to N is $V_N - \alpha Y_N$, whereas the value of the control block to I is $V_I - \alpha Y_I$. Thus, a transfer will take place if and only if

$$V_N - V_I > \alpha(Y_N(\alpha) - Y_I(\alpha)). \tag{11}$$

The left hand side is the change in the size of the pie as a result of a transfer. The right-hand side is the effect of the transfer on minority shareholders. The transfer will take place if the effect on the value captured by $I + N$ is positive.

From the expression above it follows that for any $\alpha > 0$, an efficient transfer will not take place if and only if

$$0 < V_N - V_I < \alpha(Y_N(\alpha) - Y_I(\alpha)), \tag{12}$$

and an inefficient transfer will take place if and only if

$$0 < -[V_N - V_I] < -\alpha[Y_N(\alpha) - Y_I(\alpha)]. \tag{13}$$

Note that if $\alpha[Y_N(\alpha) - Y_I(\alpha)]$ is increasing in α, then there are two effects. On the one hand, an increase in α increases the set of efficient transfers that cannot take place, and on the other hand, it increases the set of inefficient transfers that will take place.

3.2 The Socially Optimal Incidence of CS

The social planner internalizes all of the costs associated with possible inefficient transfers and impossible efficient transfers. Therefore, the social planner's objective function becomes

$$\begin{aligned} \max_{\alpha} W \quad & = V_I(\alpha) + Emax\{V_N^\star, V_I^\star\} \\ & -Prob\{0 < V_N^\star - V_I^\star < \alpha(Y_N - Y_I)\}E[V_N^\star - V_I^\star | 0 < V_N^\star - V_I^\star < \alpha(Y_N - Y_I)\} \\ & -Prob\{0 < -[V_N^\star - V_I^\star] < -\alpha[Y_N - Y_I]\}E[-[V_N^\star - V_I^\star] | 0 < -[V_N^\star - V_I^\star] < -\alpha[Y_N - Y_I]\} \end{aligned} \tag{14}$$

where $V_I(\alpha_I)$ is the value produced by the incumbent in the first period, $V_N^\star$ ($V_I^\star$) is the value produced by the buyer (incumbent) in the second period, and the last two terms are respectively the expected surplus lost because some efficient transactions will not take place and the expected surplus lost because some inefficient transactions will take place. The program (14) makes clear that the social planner's choice of α will not coincide with the level of α that maximizes $V(\alpha)$, due to the presence of the last two terms. These last two terms capture the social cost of having a level of ownership that prevents efficient transfers or allows inefficient transfers. Provided that $\alpha[Y_N(\alpha) - Y_I(\alpha)]$ is increasing in α, the last two terms of (14) are also increasing in α. As a consequence, we have the following result:

Lemma 1 *If $\alpha[Y_N(\alpha) - Y_I(\alpha)]$ is increasing in α, then $CS^{\star\star} \subset CS^\star$, where $CS^{\star\star}$ is defined as the set of incumbents for which the solution to equation (14) is strictly positive. In other words, accounting for the possible inefficiencies in the corporate control transfer reduces the set of cases in which the social planner wants to take a company public.*

Proof:

Equation (14) differs from equation (1) for the last two terms, which are decreasing in α, provided that $\alpha[Y_N(\alpha) - Y_I(\alpha)]$ is increasing in α. Therefore, when $\alpha^\star = 0$, then $\alpha^{\star\star} = 0$. But, when $\alpha^\star > 0$, it is possible that company will fall into the hands of an inefficient buyer. In such a case $\alpha^{\star\star} = 0$ is socially preferable.

□

Note that the necessary condition of Lemma 1 holds in both the constant and proportional improvement case.

3.3 The Initial Owner's Choice

The initial owner chooses α_I to maximize his profits (Π), not the social welfare (W):

$$\Pi = W - G_N \tag{15}$$

where G_N is N's expected gain from the transfer. As before, the potential divergence between social and private optimization comes from the fact that the social value includes N's expected

gain whereas the initial owner does not give any weight to this gain. N's expected gain can be written as

$$G_N = Prob[transfer] \cdot E[expected\ gains\ to\ N|transfer] \tag{16}$$

A transfer will take place if and only if

$$V_N - V_I > \alpha(Y_N - Y_I).$$

The expected gain to N if there is a transfer is, as in section 2,

$$\theta[EV_N^\star - V_I^\star] + \alpha_I \theta[EY_N(\alpha_I) - Y_I(\alpha_I)].$$

Thus, the initial owner's program becomes:

$$\Pi = W - Prob[V_N - V_I > \alpha(Y_N - Y_I)]\ \mathrm{E}\{\theta[EV_N^\star - V_I^\star] + \alpha_I \theta[EY_N(\alpha_I) - Y_I(\alpha_I)] | V_N - V_I > \alpha(Y_N - Y_I)\}. \tag{17}$$

3.4 The Incidence of CS Structures

As in section 2, the divergence between private and social optimality results from the fact that I does not take into account N's expected gain G_N and, in particular, the effect of α_I on this expected gain. But determining the direction of the distortion is now more complicated. It is no longer the case that the effect of a marginal increase in α on G_N is bound to be negative. Consider first the effect of the increase on those scenarios in which a transfer would take place independent of the increase. Here, the marginal increase in α will reduce N's gain if $Y_N > Y_I$, but it will increase N's gain if $Y_N < Y_I$.

Furthermore, unlike in section 2, the increase in α now has an effect on the set of scenarios in which a transfer is expected to take place. The increase will eliminate some (efficient) transfers and will in this way reduce N's expected gain. Note that, with respect to the efficient transfers blocked by the increase in α, N will internalize only a fraction of the resulting efficiency costs.

But the increase in α will also enable some (inefficient) transfers and will in this way increase N's expected gain. In this case, I's loss will be larger than the social loss and I will overweight the costs associated with this choice.

Thus, in theory the direction of the distortion could go either way. However, by introducing some assumptions on the distribution of the differences between the private benefits and the cash flow value of the incumbent and of the potential buyer, then following result is clear:

Proposition 3 *If $[Y_N - Y_I]$ and $[B_N - B_I]$ are invariant with respect to α and independently and symmetrically distributed around zero, then $CS^{**} \subset CS^{*}$. In other words, there is an excessive incidence of a CS structure from a social point of view.*

Proof:

Let $X = [Y_N - Y_I]$ and $Z = [B_N - B_I]$. Then, N's expected surplus can be written as

$$G = Prob[(1-\alpha)X + Z > 0] \cdot E[(1-\alpha)X + Z | (1-\alpha)X + Z > 0].$$

If X and Z are distributed independently and symmetrically around zero, then $Prob[(1-\alpha)X + Z > 0] = \frac{1}{2}$, independent of α. $E[(1-\alpha)X + Z|(1-\alpha)X + Z > 0]$ can be written as $\int_{-\infty}^{\infty}\int_{-x(1-\alpha)}^{\infty}[(1-\alpha)x + z]dF_Z dF_X$, where $F_Z(\cdot)$ and $F_X(\cdot)$ are respectively the c.d.f. of Z and X. Subtracting $G(\alpha > 0)$ from $G(\alpha = 0)$ yields

$$G(\alpha=0) - G(\alpha>0) = \int_0^{\infty}\int_{-x}^{-x(1-\alpha)}(x+z)dF_Z dF_X - \int_{-\infty}^{0}\int_{-x}^{-x(1-\alpha)}(x+z)dF_Z dF_X + \int_{-\infty}^{\infty}\int_{-x(1-\alpha)}^{\infty}\alpha x dF_Z dF_X.$$

All three terms are positive; the first two because the integrand is always positive, while the last one because of the assumption that $\int_{-\infty}^{\infty}\int_{-\infty}^{\infty} x dF_Z dF_X = 0$. Therefore, G decreases when α becomes positive. As a result, the privately optimal incidence of CS will be excessive.

□

When Y and B are independent, buyers will tend to have higher Ys (as well as higher Bs) than initial owners. In fact, although sometimes $Y_N < Y_I$, on average the buyer's cash flow rights will be higher. This implies that in those cases where the transfer will take place anyway, raising α will on average benefit the minority shareholders and thereby reduce N's gain. For

the reasons discussed in Bebchuk (1994, p. 979), one could tell plausible stories for either a positive or a negative correlation between Y and B. For this reason, the independent case is a natural benchmark to consider. In general, we might think that the two aspects are somehow linked. As long as $[Y_N - Y_I]$ and $[B_N - B_I]$ are symmetrically distributed around zero, however, the results still hold in a variety of cases. For example, if the two differences are positively correlated, then G still decreases in α. In fact, in this case an increase in α clearly reduces $(1-\alpha)[Y_N - Y_I] + [B_N - B_I]$, reducing N's expected gain. Therefore, α will be excessive even if these two differences are positively correlated.

If $[Y_N - Y_I]$ and $[B_N - B_I]$ are negatively correlated, then the result of excessive α will still hold if

$$|(1-\alpha)[Y_N - Y_I]| > |[B_N - B_I]|,$$

that is, if the absolute value of $(1-\alpha)[Y_N - Y_I]$ is always greater than the absolute value of $[B_N - B_I]$.

Finally, it is useful to point out that the existing empirical evidence (e.g., Barclay and Holderness , 1991) suggests that $E(Y_N - Y_I|\text{transfer})$ is positive. In fact, $E(Y_N - Y_I|\text{transfer})$ represents the additional value attached to minority shares as a result of the expectation of a change in control. Although it is difficult to measure $E(Y_N - Y_I|\text{transfer})$ directly, it is possible to observe changes in the expectations when the probability of a control sale increases (for example at the announcement of a transfer of control). Barclay and Holderness (1991) document that this effect is on average positive and statistically significant.

3.5 The Size of Control Blocks

The same distortion in the decision of whether to go public applies to the decision of how many shares should be sold to minority shareholders.

Proposition 4 *If $[Y_N - Y_I]$ and $[B_N - B_I]$ are invariant with respect to α and independently and symmetrically distributed around zero, then when an owner chooses to go public, the amount of shares he will sell is socially excessive.*

Proof:

Define $X = [Y_N - Y_I]$ and $Z = [B_N - B_I]$. Then, N's expected surplus can be written as

$$G = Prob[(1-\alpha)X + Z > 0] \cdot E[(1-\alpha)X + Z | (1-\alpha)X + Z > 0].$$

If X and Z are distributed independently and symmetrically around zero, then $Prob[(1-\alpha)X + Z > 0] = \frac{1}{2}$, independent of α. On the other hand, $E[(1-\alpha)X + Z|(1-\alpha)X + Z > 0]$ can be written as $\int_{-\infty}^{\infty}\int_{-x(1-\alpha)}^{\infty}[(1-\alpha)x + z]dF_Z dF_X$, where $F_Z(\cdot)$ and $F_X(\cdot)$ are respectively the c.d.f. of Z and X. Differentiating this expression using Leibnitz's rule yields

$$\frac{dG}{d\alpha} = -\int_{-\infty}^{\infty}\int_{-x(1-\alpha)}^{\infty} x dF_Z dF_X < 0,$$

given that by assumption $\int_{-\infty}^{\infty}\int_{-\infty}^{\infty} x dF_Z dF_X = 0$. Therefore, G is decreasing in α and the privately optimal incidence of CS will be excessive.

□

4 Extensions

4.1 Difficulties in Implementing a Freeze-Out in the Last Period

Thus far we have assumed that whoever ends up in control at time 2 will be able to move to the optimal ownership level at no additional cost. In particular, we assumed that if $\alpha > 0$, he would be able to buy out all minority shares at $\alpha Y(\alpha)$ rather than at $\alpha Y(1)$. However, as Burkart, Gromb and Panunzi (1995) point out, dispersed shareholders will require a takeover premium that is proportional to the expected level of insider ownership after a takeover. Even if we introduce the possibility of a freeze-out, it likely that a premium above $\alpha Y(\alpha)$ might be needed. It is thus important to consider what happens when whoever is in control faces a cost in moving toward the optimal ownership level.

To examine the implications of such difficulties, consider the extreme case in which a freeze-out at time 2 is impossible. In this case, going public at time 1 is irreversible, whereas remaining private is reversible. In other terms, if at time 2 we have $\alpha_I = 0$ and $\alpha^\star > 0$, then the controller

can easily sell α^* shares to the public, but if at time 2 we have $\alpha_I > 0$ and $\alpha^* = 0$, then the controller is trapped at a suboptimal ownership level.

Under this assumption, an initial CS structure, but not an initial CO structure, may impose a cost on whoever is in control at t=2, by impeding a move to the optimal α. This cost is going to be borne at least partially by N, and therefore it will not be fully internalized by I in his initial decision. Therefore, introducing this consideration can only strengthen the identified distortion in the direction of an excessive incidence of CS structures.

4.2 Surplus-Increasing Actions by I or N

The previous analysis was based on the assumption that the trade surplus arising as a result of the control sale is purely a rent, and is unaffected by any previous action by I or N. But, in many cases it may be reasonable to assume that this surplus is the result of past sunk effort by I or N (or both). For instance, the expected surplus might increase as a result of investments made or effort exerted by I in building his company, or it might depend on how much N invested in searching for acquisition targets.[17]

If either of these two scenarios is appropriate, then the allocation of surplus might also have ex ante consequences. If I gets only part of the surplus, then I will under-invest in his surplus-creating activity. Similarly, if N gets only part of the surplus, he will under-invest in searching for good targets.

These considerations are very important when thinking about policy implications. Any rule that might bias the division of surplus in one direction or the other may have important ex ante efficiency consequences, and these consequences should be carefully weighed before implementing such a rule. The current state of empirical knowledge does not provide reasons to believe with any confidence that it is more important to encourage I's surplus-creating activities than N's surplus-creating activities. What is clear is that introducing these issues does not undermine our thesis concerning the divergence between private and social optimality. Only by a stroke of luck would the division of surplus determined by I's choice of α produce the socially best

[17]For acquisitions of companies with dispersed ownership (i.e., no controlling shareholder), the effects of the division of surplus on ex ante search for investments in potential targets have been examined by Grossman and Hart (1980), Easterbook and Fischel (1981), and Bebchuk (1982) and (1985).

balance between encouraging I's and N's surplus-creating activities.

4.3 Dual Class Structure

Thus far we have assumed that there is only one class of equity that I can issue: a one share–one vote stock. In this context, if I wants to retain majority – as we have assumed – he must retain at least 50% of the cash flow rights. However, this is not a realistic view of the problem. Although in many countries the law restricts the extent to which voting rights can be separated from cash flow rights, the initial owner generally has some discretion in combining the voting rights and cash flow rights.

For instance, if the incumbent can create an inferior voting stock, he can maintain a majority control by retaining whatever proportion of cash flow rights he desires. This would simply strengthen the results obtained in the two previous sections. Because he can maintain control over the firm while selling more than 50% of the cash flow rights, control considerations no longer limit the incumbent, and there is no limit to his ability to disperse cash flow rights so as to extract more surplus from the incumbent.

Reconsider the simple model in section 2. Suppose that I could increase α beyond $\frac{1}{2}$ and thereby extract more surplus. Two things might happen. First, owners who before went public with an $\alpha \leq \frac{1}{2}$ can now increase the fraction of divested cash flow in order to extract more surplus. Second, owners who before did not find it profitable to go public may now choose to do so, given that going public offers them enhanced surplus-extracting opportunities.

In both cases, the choice of an $\alpha > \frac{1}{2}$ may be partly driven by the desire to extract surplus from the buyer – that is, by distributional rather than efficiency considerations. As a result, we can establish the following corollary:

Corollary 1 *The ability to deviate from a one share – one vote rule will increase the excessive use of CS structures and will further increase the amount of shares sold to the public, exacerbating the distortion with respect to the social optimum.*

This corollary highlights two new points. First, in an IPO, private optimality does not necessarily coincide with social optimality as far as the choice of the type of shares to issue is concerned. In this context, mandatory restrictions on the use of differential voting shares might

be justified even at the IPO stage. The second related point is that while most of the existing debate has focused on the effects of dual class structures on existing public companies, it is also important to understand the effects of dual class structure on the choice between a CO and a CS structure.

4.4 Pyramids

Even when a dual class structure is not allowed, it is possible to achieve a similar separation between cash flow rights and control rights by using a pyramid structure (see Nicodano, 1995). Instead of directly selling 75% of the cash flow rights in his company, the initial owner can create a holding company, which holds 50% of his original company. By selling 50% of the shares in both companies to the public, the incumbent will retain a majority control and achieve the same objective of selling 75% of the cash flow rights of his initial company to outside investors. With an arbitrary number of layers a stock pyramid can achieve any separation between cash flow rights and voting rights.

The same considerations we raised for dual class stock apply to stock pyramids. Private incentives will induce an excessive use of stock pyramids. The use of stock pyramids will in turn exacerbate the problem of excessive incidence of CS structures. This suggests, as we will discuss later on, that a policy discouraging stock pyramids may be warranted.

4.5 The Equal Opportunity Rule

In many countries other than the U.S. there exists a law requiring that the acquirer of a control block extend an offer at the same price to all shareholders (the so-called equal opportunity rule (EOR)). Even in the U.S., where such a law does not exist, many companies insert a similar requirement in their corporate charter. Therefore, it is of practical relevance to understand the effects of an EOR on the choice of a CS structure. Such an analysis is separately developed by Bebchuk (1996). The results can be summarized as follows. The EOR tends to exacerbate the divergence between private and social optimality and strengthen the result that this divergence is in the direction of an excessive use of CS. In particular, under the EOR, the incidence of CS is always excessive.

This result can be easily understood by noticing that under EOR the minority shareholders will always benefit from any transfer to N (and not only when $Y_N > Y_I$). In fact, they always get at least as much as I (per share) and I is always made no worse off by the transfer (otherwise he will not agree to it). Therefore, there is always a positive externality that I will try to exploit ex ante by choosing a CS structure.

5 Relevant Empirical Evidence

So far, this paper has identified a possible divergence between social and private incentives. Now we will examine the magnitude of this distortion. In this section we assess the empirical relevance of the problem on the basis of the existing evidence.

5.1 The effect of control transfers on minority shares

One way to identify the direction of the distortion and its importance in practice is to look at the average impact of control block sales on minority shareholders. Barclay and Holderness (1991) find that block trades that lead to a change in control generate an abnormal return of 18% for minority shareholders.[18] This figure represents only the unanticipated component of this externality. Nevertheless, it suggests that on average this is positive. This leads us to conclude that at least in the U.S., the direction of the distortion is in favor of excessive CS structure and excessive divestment of cash flow rights.[19]

The same study also suggests that the size of the externality imposed on minority shareholders by control transfers is far from trivial. The blocks analyzed by Barclay and Holderness represented about 30% of the stock. Therefore, just the unanticipated component of this externality represents about 13% of the value of a firm. A similar study conducted by Caprio, Floreani, and Radaelli (1994) for the Italian market gives similar conclusions.

[18] This figure is obtained by averaging the 19% return obtained by the 41 firms who were subsequently taken private and the 8.1% return of the 45 firms that experienced a change in control while remaining publicly traded.

[19] It should be noticed that if initial owners choose optimally, then publicly traded companies are more likely to be companies with a positive externality in case of control transfers. Therefore, the evidence on abnormal returns should be joined by an analysis of the proportion of firms that are publicly traded in a certain country. Given the large number of publicly traded firms in the U.S, the conclusion for this country should not change.

5.2 Frequency of control transfers

Our model is based on the premise that in choosing the initial α, I will take into account what will happen in the event of a control transfer. How important this consideration will be in I's decisions will depend on the likelihood of such control transfer in general, and in particular on its likelihood shortly after an IPO. The empirical evidence indicates that companies with CS structure frequently experience control transfers. For example, Holderness and Sheehan (1988) find that in a group of 114 NYSE and AMEX companies that had a shareholder owning a majority interest, there were 21 sale-of-control transaction in the four year period of 1978-1982. Similarly, Caprio, Floreani, and Radaelli (1994) look at the frequency of transfer of control blocks on the Milan stock exchange, where a CS structure is pervasive (Zingales, 1994). They report that in the 1970s 35% of the companies experienced a control block transfer; during the 1980s the same figure was 33%.

The frequency of control sales after IPOs is also an indication that the desire to maximize the proceeds from an eventual sale of control is an important motivation underlying IPOs. For instance, Rydqvist and Högholm (1994) report that control changes hands in 36% of IPOs within 5 years after the initial offerings in Sweden. They also report that 34% of U.K. IPOs are taken over within 5 years of listing. Although these figures suggest a high turnover in control, they do not prove that control turnover is abnormally high after an IPO. Evidence of this kind is provided by Pagano, Panetta and Zingales (1994). They compare control turnover after an IPO with the normal turnover in control occurring in the same years among privately held Italian firms. They find that the former is twice as large as the latter and that the difference is statistically significant at the 1% level.

6 Positive Implications

6.1 Factors That Determine the Diffusion of CS Structures

Our analysis has some clear predictions about the relative frequency of CS structures. First of all, such structures will tend to be more common when the market for control sales is less competitive. In fact, in a perfectly competitive market for corporate control the incumbent

does not need to take any action to increase his proceeds: he will always be able to extract the buyer's entire surplus. As a result, the externality we described would disappear. Second, the diffusion of CS structures will be affected by the legal tolerance for the use of differential voting shares. As Corollary 1 indicates, the ability to deviate from a one share–one vote rule will increase the excessive use of CS structures. Third, we identified a benefit of CS structure, but their effective incidence will also be influenced by the tax burden imposed on these structures. For instance, the extent of stock pyramiding should be influenced by the tax treatment of inter-company dividends: the less inter-company dividends are penalized, the more widespread stock-pyramiding should be. Finally, the diffusion of CS structures will also be affected by the rule regulating control sales. It is possible to show that the bias toward CS structure is even higher when, in case of control transfer, the buyer is obliged to make an offer to purchase all the minority shares at the price he paid for the controlling block (the so-called equal opportunity rule). Therefore, CS structure should be more prevalent in those countries in which control sales are regulated by an equal opportunity rule.

These predictions can be tested by considering the presence of CS structures in different periods or in different countries. While we leave a rigorous test for future work, a casual analysis suggests that these predictions appear to hold. We mentioned that previous studies have found a pervasive effect of stock pyramiding in Germany and Italy. Both of these countries allow the issuance of differential voting shares, which are very heavily used (see Zingales, 1995). Furthermore, in both countries dividends are not subject to double taxation (see for instance, Rajan and Zingales, 1995) and, as a result, inter-company dividends are not penalized. Finally, their market for corporate control is much less competitive than in the U.S. Therefore, in at least three dimensions the evidence from these countries is consistent with our theory.[20]

6.2 Going public by subsidiaries of public companies

In some cases, subsidiaries of public companies, including companies with dispersed ownership, go public and issue shares; that is, the initial owner moves the subsidiary from CO to CS.

[20] A form of equal opportunity rule was introduced in Italy only in 1992 and should be introduced soon in Germany as a result of an EU directive.

Depending on whether the subsidiary's shares are distributed to the existing shareholders or sold to new ones, these transactions are defined as a spin-offs or as equity carve-outs. Recent empirical evidence has cast doubt on whether such moves of subsidiaries from CO to CS are efficient. Michaely and Shaw (1985) find that there is no support for the hypothesis that carve-outs are done for financing purposes, nor do they find evidence of improvements in operating performance. Notwithstanding the above findings, Michaely and Shaw (and before them Schipper and Smith (1986) and numerous other studies) find an increase in the market value of the parent company at the announcement of this transaction. Their result in this respect confirms an earlier finding by Cusatis, Miles, and Woolridge (1993).

These results, thus, raise the question of how it is possible to reconcile the increase in stock prices observed at the announcement of a carve-out with the reduction in firm's performance following a carve-out. Our model suggests that, even if carve-outs and spin-offs do not increase efficiency, they may be value enhancing strategies because they enable the parent company to extract more surplus in a future sale of the subsidiary. This is consistent with the fact that carve-outs are often followed by a sale of the parent's block in the subsidiary (Schipper and Smith, 1986, and Klein et al., 1990). It is also consistent with Cusatis, Miles, and Woolridge's (1993) finding of an abnormal return in spun-off companies only when the subsidiary is eventually acquired by another company.

7 Normative Implications

7.1 Stock Pyramiding

We have seen that the creation of stock pyramids - that is, the creation of CS structures in subsidiaries of companies that are themselves public companies - exacerbates the identified divergence between private and social optimality. Furthermore, when the owner of a company is itself a public company, two important benefits of going public - cheaper financing and a reduction in risk bearing costs - will not be present. The optimal regulatory policy toward stock pyramids might therefore be one that discourages the use of such pyramids.

7.2 Dual Class Stock

We have seen that allowing differential voting stock may exacerbate the identified distortion. In particular, it worsens the excessive incidence of CS structures and exacerbates an inefficient separation between cash flow rights and control rights in publicly traded companies. This conclusion provides a reason for considering policies that discourage or restrict the use of dual class stock, even at the IPO stage.

The existing literature has focused on the effects of introducing a dual class structure on the existing minority shareholders (Ruback, 1988), or on the private optimality of a dual class structure (Grossman and Hart, 1988 and Harris and Raviv, 1988 and 1989). The main conclusion in that literature was that there are some justifications for restricting the issuance of differential voting shares by publicly traded companies. These writers have suggested that, at the IPO stage, companies should not face regulatory restrictions in their design of voting structure (see, e.g., Grossman and Hart, 1988) and Gilson (1987).[21] This view was adopted by the SEC when it promulgated Rule 19c-4.

In contrast to the conventional academic view, we suggest that there are reasons to consider discouraging or restricting the use of dual-class stock, even at the IPO stage. Such policies do exist in other countries. For example, in Italy differential voting stock could not be issued before 1974 and was then restricted to 50% of the book value of capital. Restrictions on the quantity of differential voting shares a company can use are present in most other European countries as well.

By contrast, in the U.S. these restrictions were present only in the Stock Exchange rules. Note that a Stock Exchange will not have the proper incentives to introduce a rule that curbs the excessive use of CS structure. Not surprisingly, a more intense competition from the less regulated NASDAQ forced the NYSE to remove its ban on differential voting stock in 1986.

[21] For example, Grossman and Hart (1988) asserts: "We thus see no reason to interfere with the ability of a new company to choose a corporate charter and a security structure that gives it the lowest cost of raising capital".

7.3 Public offering of Minority Shares in General

Thus far we have examined stock pyramiding and dual class stock - two ways of creating a CS structure with the controller retaining only a minority of the cash flow rights. But the model has established that even if we look at CS structures in general, there is a problem of excessive use. This raises the question of whether the government should be neutral in its policy towards the creation of CS structure and, in particular, toward public offering of minority shares in general.

Our model has established that the case for neutrality and non-intervention with respect to the IPO is not conclusive. When an owner sells minority shares to the public, this imposes an externality on future control buyers. The presence of externalities may justify a non-neutral policy. In theory, one possible solution would be to impose a tax on the sale of minority shares equal to the expected externality produced by such a sale. It is not our intention to advocate such a tax or any particular form of regulation. For one thing, an obvious problem is that estimating the size of the externality might be difficult. All we want at this stage is to establish a caveat for future researchers and policy makers that the social optimality of CS structures cannot always be taken for granted.

7.4 Sale-of-Control Transactions

The source of the divergence, we have seen, is that the choice of an initial ownership structure is influenced by the prospect of a future sale-of-control transaction. It is natural to wonder whether it is possible to regulate sale-of-control transactions in a way that would eliminate the distortion in the choice of initial structure.

Such a regulatory approach can be identified but might be hard to implement. As we saw, the divergence between private and social optimality results from the fact that, under the existing rules for sale-of-control transactions, a transfer of control from I to N may confer a positive or a negative externality on minority shareholders. This problem would disappear if we had an arrangement which ensured that, in the event of a control transfer, minority shareholders would end up with exactly Y_I. Bebchuk (1994) demonstrated that such an arrangement would ensure ex post efficiency – that is, that control blocks will be transferred if and only if the transfer is efficient. Our analysis points out that such an arrangement would also lead to an ex ante

efficient choice of ownership structure (and, in particular, to an efficient incidence of control blocks).

As Bebchuk (1994) shows, there are two arrangements which would ensure that minority shareholders always end up with a value of Y_I. Unfortunately, they both require that courts and minority shareholders have sufficient information. First, if courts have the same information concerning Y_I as I and N are assumed to have, then a combination of appraisal rights and freezeouts rights would produce this result. Under this arrangement, minority shareholders will have an appraisal right to redeem their shares for a value of Y_I as estimated by a court, and I will also have a freezeout right to buy out the minority shareholders prior to the transaction for a value of Y_I as estimated by a court. If courts can observe Y_I accurately, this arrangement would ensure that minority shareholders always get Y_I. But if courts might err in estimating Y_I (and in a direction that can be anticipated by I and N), then this arrangement would not ensure that minority shareholders will get an expected value of Y_I in sale-of- control transactions.

Second, if minority shareholders had the same information concerning Y_I and Y_N as I and N are assumed to have, then a specialized voting arrangement voting could be used. Under this arrangement, a control transfer would require a vote of approval by a majority of the minority shareholders; furthermore, a majority of the minority shareholders would be able to approve a transaction in which they end up with less than Y_N by, say, approving a payment from the company to I or N. Under this arrangement, if minority shareholders know Y_I and Y_N as I and N are assumed to do, then all of the transactions which are brought to shareholders for approval and obtain such approval will be ones that provide the minority shareholders with a value equal to Y_I. Once again, it can be shown that, if minority shareholders might err in estimating either Y_I or Y_N (and in a direction that can be anticipated by I and N), the sale-of-control transactions will still involve an expected externality with respect to minority shareholders.

8 Conclusions

This paper shows that the ownership structure chosen at the initial public offering is not necessarily efficient. The desire of initial owners to maximize the proceeds from selling their companies leads them to make choices that, although privately optimal, are socially inefficient. We show

that the distortion tends to be in the direction of excessive incidence of controlling shareholder structures and excessive divestment of cash flow rights. Our analysis has far-reaching policy implications with respect to dual class stock, stock pyramiding, public offering of minority shares, and sales-of-control transactions. Our analysis can also shed light on the reasons why the incidence of CS structures varies greatly among countries.

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