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EFFICIENT AND INEFFICIENT
SALES OF CORPORATE CONTROL

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ABSTRACT

This paper develops a framework for analyzing transactions that transfer a company's controlling block from an existing controller to a new controller. This framework is used to compare the market rule, which is followed in the United States, with the equal opportunity rule, which prevails in some other countries. The market rule is superior to the equal opportunity rule in facilitating efficient transfers of control but inferior to it in discouraging inefficient transfers. Conditions under which one of the two rules is overall superior are identified; for example, the market rule is superior if existing and new controllers draw their characteristics from the same distributions. Finally, the rules' effects on surplus division are analyzed and this examination reveals a rationale for mandatory rules.

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I. INTRODUCTION

The economic significance of transactions that transfer corporate control is now widely recognized. This paper focuses on an important set of control-shifting transactions — those in which a controlling interest in a corporation is sold from one party to another. These "sale-of-control" transactions are different from the tender offer acquisitions which have attracted much attention in the last decade. Tender offers or takeover bids are used when ownership of the target company is dispersed, with no shareholder holding a controlling interest. However, in many publicly traded corporations — both in the United States and (even more so) in other countries — a significant number of shares are concentrated in the hands of a controlling shareholder.[1] In such cases, a buyer generally cannot obtain control unless the existing controller agrees to sell some or all of its shares to the buyer in a sale-of-control transaction.[2]

Whether or not a sale-of-control transaction will take place may depend on whether, and to what extent, the law provides minority shareholders with rights to participate in (or otherwise benefit from) the transaction. In the United States, the general rule has been that minority shareholders do not have a right to participate in sale-of-control transactions. In some other countries, however, there are rules that provide minority shareholders with certain rights with respect to such transactions. The desirability of such rules has been the subject of long-standing debate among legal scholars and regulators.[3]

In the last fifteen years, economists have devoted much attention to modelling the

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[1] While the legal rules of the United States seem to discourage the creation of control blocks (see Roe [1990]), the incidence of such blocks is substantial even in the United States. Barclay and Sheehan [1988] found that, in a large set of 5,240 publicly traded companies in the United States in 1984, approximately 13 percent had a shareholder with a majority interest. In another study, Barclay and Holderness [1989] report that, in a randomly chosen sample of 394 publicly traded companies in 1986, 20 percent of the companies had a shareholder with a block exceeding 35 percent of equity. Finally, while publicly traded companies with a control block tend to be smaller, the NYSE and AMEX (which tend to have the larger publicly traded companies) listed 114 companies with a majority interest in 1984 (approximately 5 percent of the total listed) with average assets value of 1.1 billion dollars (see Barclay and Holderness [1988]).

[2] Such transactions seem to be common for companies with a controlling block. Barclay and Sheehan [1988] found that, in a group of 114 NYSE and AMEX companies that had a shareholder owning a majority interest, there were 21 sale-of-control transactions in the four-year period of 1978-82.

[3] See, e.g., Andrews [1965], Easterbrook and Fischel [1982], Clark [1986], and Elhauge [1992].

1

inefficiencies involved in the outcome of tender offers. The free-rider problem may prevent a takeover from taking place even if it would be efficient (see Grossman and Hart [1980]). And the pressure-to-tender problem might enable some inefficient takeovers to occur (see, e.g., Bagnoli and Lipman [1988]).

Economists have devoted little attention, however, to modelling the efficiency problems involved in transactions in which an existing controlling shareholder sells its control block to an acquirer.[4] This feature of the literature might be due in part to the recognition that, in such transactions, the seller's decision about whether to sell does not involve the free-rider or pressure-to-tender problems that characterize the tender decisions of dispersed shareholders. As this paper demonstrates, however, the lack of free-rider and pressure-to-tender problems on the seller side does not imply that there are no efficiency problems with sale-of-control transactions. To the contrary, efficiency problems do arise because such transactions may well have externality effects on minority shareholders. As a result of such externalities, inefficient transfers of control may occur and efficient transfers of control may be frustrated.

This paper develops a framework for analyzing sale-of-control transactions. This framework enables us to identify the circumstances under which a given rule may fail to facilitate all efficient transfers or to discourage all inefficient transfers. The paper applies this framework to analyze and compare the market rule and the equal opportunity rule — the two rules that have been most used in various countries and debated in policy discussions. The framework, however, can also be used to analyze alternative arrangements, and the paper discusses several such arrangements. Bebchuk [1993] uses the framework to develop a full analysis of alternatives to the market and equal opportunity rules.

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[4] There is an important body of literature that models other aspects of the presence of large shareholders. Thus, for example, Shleifer and Vishny [1986] present a model in which large shareholders with significant but non-controlling interests monitor the performance of their company and occasionally acquire control through tender offers. Holmstrom and Tirole [1993], to take another example, analyze the optimal size of a controlling block, given the benefits and costs of market monitoring. Zingales [1993] includes sales of control block as an important element in his model but, under the assumptions adopted by him, transfers of such blocks cannot create efficiency problems. The only attempt to model the efficiency problems involved in sales of control blocks is in the recent independent work by Kahan [1993]. Kahan also models the market rule and the equal opportunity rule but does not develop the full efficiency comparison of these rules that is provided in this paper.

The paper is organized as follows. Part II presents the framework of analysis. A central feature of the model is that controllers might differ from each other in two respects — first, in their ability to manage and produce value, and second, in their ability to capture private benefits of control. A control transfer from an existing controller to a new controller will be efficient if and only if the new controller can better manage the company's assets.

Part III analyzes when control transfers will take place under the market rule (MR). Under the MR, which has generally been followed in the United States, minority shareholders enjoy no rights in connection with a sale-of-control transaction. Under this rule, a control block will be sold by the existing controller to an acquirer whenever the value of the control block (including the private benefits of control captured by the controller) is greater to the acquirer than to the existing controller. The analysis shows that the MR enables inefficient transfers to take place. The reason is that the control block may have a higher value to the new controller than to the existing controller not because the new controller has greater managerial ability, but rather because the new controller has a greater ability to extract private benefits of control. The analysis also shows that the MR fails to facilitate all efficient transfers; in this regard, however, the MR turns out to perform better than the equal opportunity rule.

Part IV analyzes the equal opportunity rule (EOR). Under the EOR, minority shareholders are entitled to participate in the transaction on the same terms as the control seller. As will be noted, the equal opportunity approach is found in the City Code of the U.K. and in the rules of some other jurisdictions, is included in a recently proposed EEC directive on company law, and has been advocated in the United States by some legal scholars. The analysis shows that, compared with the MR, the advantage of the EOR is that it prevents all inefficient transfers. Under the EOR, transfers that make minority shareholders worse off cannot take place, and consequently inefficient transfers will never occur. At the same time, however, the EOR is inferior to the MR in terms of facilitating efficient transfers: the former prevents a wider range of such transfers than the latter.

Thus, neither of the two basic rules analyzed in parts III and IV dominates the other by performing better in all cases. The question which naturally arises is whether one of the two rules performs better on the whole, that is, on an expected value basis. Part V seeks to shed

3

light on this question. In particular, it identifies certain conditions — concerning the distribution of managerial ability and private benefits of control among existing and new controllers — under which one of the two considered rules is overall superior to the other.

The analysis of part V identifies a certain structural differences between the performance of the MR and the EOR that works in favor of the MR. The severity of the efficiency problems under the EOR depends on the magnitude of the absolute levels of controllers' private benefits, whereas the severity of the efficiency problems under the MR depends on the magnitude of the differences among controllers' levels of private benefits. The analysis also identifies several conditions under which this factor is sufficient to ensure the superiority of the MR. To start with, it is shown that the MR is overall superior to the EOR if the differences among controllers in private benefits of control are sufficiently small. More importantly, a surprisingly strong and clear result is established under the assumption that the characteristics of existing and new controllers are drawn from the same distribution: this assumption is sufficient to ensure the superiority of the MR. Furthermore, even if new controllers are assumed to differ systematically from existing controllers, it is still possible to identify conditions under which the MR is superior.

While the analysis of part V reveals a structural factor that works in favor of the MR, it also identifies conditions, which cannot be ruled out a priori as implausible, under which the EOR is superior. Thus, completely resolving the question of which rule is superior still requires empirical evidence concerning the distributions of controllers' characteristics; the results of the analysis indicate which evidence is needed for such resolution.

Part VI considers the use of other arrangements — in particular, voting, appraisal rights, and freezeouts. It examines the extent to which such arrangements can be used to address the identified efficiency problems.

While most of the analysis focusses on the perspective of efficiency (social optimality), part VII compares the MR and the EOR from the private optimality perspective of the company's initial shareholders (or,equivalently, those who design the corporate charter). It is shown that, compared with the MR, the EOR reduces the expected profits captured by outside buyers. Consequently, superiority of the MR over the EOR from the perspective of private optimality is a sufficient but not a necessary condition for superiority of the MR from an efficiency perspective.

4

The identified divergence between private and social optimality indicates that mandatory rules — that is, regulation by fiat — may be desirable for sale-of-control transactions.

Finally, part VIII remarks on the effects that the identified inefficiency in the control transfer process has on the ex ante choice of corporate ownership structures with controlling shareholders. A full analysis of this ex ante question is developed in Bebchuk [1994].

II. FRAMEWORK OF ANALYSIS

Consider a publicly traded company that, in period 0, has an existing controlling shareholder, which we shall refer to as E. In period 1, a potential new controller, which we shall refer to as N, emerges: N may or may not acquire control from E. In period 2, the company operates under the management of either E or N, whichever one ends up with control in period 1. At the end of period 2, the company is liquidated, and its value is divided among its shareholders.

The company has n shares outstanding throughout these periods. The initial controller, E, owns a block of k shares — which is assumed to give E effective control — with the remaining $(n - k)$ shares dispersed among public investors. The control block may consist of a majority of the company's shares ($k \geq n/2$) but also may not; in publicly traded companies a block that falls short of a majority interest may frequently be sufficient to provide control. We shall refer to the public shareholders of the company as "minority shareholders," even though k may take on values less than $n/2$.

The controller's identity is important because it may influence the value of two parameters, W and B. Let $W > 0$ denote the per share total value that will flow to the company's shareholders in period 2 as a result of the company's operations. (Without loss of generality, one can assume that no value will flow to the shareholders until then.)

Of the total value that will flow to shareholders, a fraction will flow directly to the controller as private benefits of control. Specifically, the value that will flow to the controller as private benefits is B per share, and the value that will flow to the shareholders qua shareholders is thus $W - B$ per share. The importance of private benefits of control in modelling corporate control questions has been emphasized in the literature (see Grossman and Hart [1988] and

5

Harris and Raviv [1988a, 1988b]). Controllers can capture private benefits through using control to divert value by, for example, engaging in self-dealing, taking corporate opportunities, or obtaining excessive salaries and other benefits. (Although legal rules somewhat constrain such diversion, they do not prevent it altogether.) Private benefits of control may also include such elements as the psychic benefits resulting from control or the direct benefits that other businesses of the controller may get as a result of increased synergies or market power.[5]

To highlight the generality of the used framework, it should be emphasized that no assumption is made as to whether the extraction of private benefits dissipates total value or enhances it. That is, if the controller were to choose to forego extracting private benefits of control, total value may be higher or lower than W. But taking as given that the controller is expected to capture some private benefits, W and B are assumed to be the parameters that take this into account.

N and E may well differ in either W or B or both. To start with, there are likely to be differences among controllers in W; for one thing, controllers are likely to differ in their relative abilities to manage (or monitor the management of) the company. Similarly, controllers may differ in their ability to capture private benefits of control (see Grossman and Hart [1988] and Harris and Raviv [1988a, 1988b]). For example, a controller that owns other entities that are engaged in lines of business complementary to those of the controlled company has a greater ability to extract value by engaging in self-dealing or the taking of corporate opportunities than a controller that does not own such entities. Thus, it is reasonable to assume that controllers may well differ in B, though the analysis will also consider the special case in which controllers do not differ, or hardly differ, in B.

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[5] There is empirical evidence that private benefits of control are significant. Barclay and Holderness [1989] found that the average premium over market price in sales of blocks exceeding 5 percent of equity was on average 4 percent of the value of the company's equity. The size of the block premium increased, and at an increasing rate, with the size of traded block. Thus, since many of the traded blocks in this study were not controlling blocks (the median block size was 17 percent of equity), 4 percent of equity may well be a substantial underestimate of average private benefits of control in the United States.

Evidence also exists about the significant size of private benefits of control in other countries. The average premium that voting shares have (relative to shares without votes) was estimated to be 13 percent in England (Megginson [1990]), 20 percent in Switzerland (Horner [1980]), 23 percent in Canada (Robinson and White [1990]), 45 percent in Israel (Levy [1982]), and 82 percent in Italy (Zingales [1994]).

6

Let W_e and B_e denote the values of W and B respectively if the existing controller E retains control through period 2. And let W_n and B_n denote the values of W and B respectively if N acquires control. It is assumed that W_n may be higher or lower than W_e, and similarly that B_n may be higher or lower than B_e. Finally, let ΔW denote $(W_n - W_e)$, and let ΔB denote $(B_n - B_e)$.

A transfer of control will be efficient if and only if $W_n > W_e$, that is, if and only if $\Delta W > 0$. In other words, the transaction will be efficient if and only if N can produce a greater total value.[6] While greater managerial ability is just one important factor that influences the amount of total value that a controller can produce, for simplicity I will refer to a controller that would create a higher (lower) total value as one that is a better (worse) manager.

Under all of the prevailing and proposed rules for sale-of-control transactions, a transfer cannot be forced on E but rather requires E's agreement to transfer some or all of the shares in E's control block to N. It will be assumed that N and E will agree to a transaction transferring control if and only if there is a transaction that will make both of them better off.[7] Whether E and N will agree to a transaction may thus depend on the rights that the minority shareholders have in connection with the transaction. In evaluating the effects of a transaction, E and N are assumed to know the values of W_e, W_n, B_e, and B_n.

The operation of the MR does not depend on the extent to which minority shareholders (or other third parties) are also informed about W_n, W_e, B_n, and B_e. But the operation of the EOR, and the additional arrangements considered in part VI, may depend on what is known by others than E and N. The analysis here will focus on the case in which W_n, W_e, B_n, and B_e are known to the market, but the consequences of imperfect information will also be considered.

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[6] We assume that the transfer of control does not impose negative externalities or confer positive externalities on groups other than the minority shareholders. This assumption seems reasonable for an analysis that focuses on the consequences of certain basic corporate law rules. To the extent that the transfer of control may impose or confer externalities on other groups (such as debtholders, workers, competitors, and so forth), such externalities would be better addressed by other legal rules or contractual arrangements.

[7] If W_n, W_e, B_e, and B_n are common knowledge among N and E, then bargaining theory would indeed suggest that the parties will agree to a transaction if there are gains to be shared between them. If there is some informational asymmetry concerning these values, however, the parties may fail to agree to a mutually beneficial transaction and may fail to capture the potential gains from trade.

III. The Market Rule

Under the MR, the seller is free to sell its control block at any price that the acquirer is willing to pay, and minority shareholders enjoy no rights in connection with the transaction. This is the rule that essentially governs sale-of-control transactions in the United States.[8]

A. The Outcome Under the Market Rule

A control block of k shares provides a controller with private benefits worth nB and value qua shareholder of $k(W - B)$. Adding up, the total value of the k-share block to the controller is $kW + (n-k)B$: the first term represents the controller's claim on its pro rata fraction of the total value that is produced; and the second term represents the extent to which the controller receives more — and the minority shareholders receive less — than their proportionate share of the value produced. Thus, whereas the per share value of minority shares is $(W - B)$, the control block has a higher per share value of $W + [(n-k)/k]B$.

Under the MR, there will be a transaction transferring a control block from E to N if and only if E and N can find a price for the block that will make both of them better off. This will be the case if and only if the value of the control block to N is higher than the value of this block to E. Thus we have the following proposition:

PROPOSITION 1. Under the MR, a transfer of control will occur if and only if:

$$(1) \qquad W_n + \left(\frac{n-k}{k}\right) B_n > W_e + \left(\frac{n-k}{k}\right) B_e.$$

B. The Efficiency Costs of the Market Rule

From proposition 1, it is possible to derive the following two corollaries.

COROLLARY 1 (inefficient transfers). Under the MR, an inefficient transfer of control will take place if and only if:

$$(2) \qquad W_n - W_e = \Delta W < 0 \quad and \quad \left(\frac{n-k}{k}\right)(B_n - B_e) = \left(\frac{n-k}{k}\right)\Delta B > -\Delta W;$$

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[8] For a good account of the use of the MR in the United States, and the exceptions to it, see Elhauge [1992].

or, equivalently, if and only if

(3)
$$-\left(\frac{n-k}{k}\right)\Delta B < \Delta W < 0 \ .$$

REMARKS. (1) Even if N is a worse manager than E, N nevertheless will place a higher value on the control block if N expects to extract enough additional private benefits of control. In the case of such an inefficient transfer, the value of minority shares will decrease both because the total value produced will fall under N and because a higher fraction of this total value will flow to N as private benefits. The inefficient transaction will occur because E and N will not internalize the negative externality imposed by the transaction on minority shareholders.

(2) *The Evidence.* The evidence does not rule out the possibility that inefficient transfers do take place under the prevailing MR. To be sure, studies indicate that, on average, the market price of minority shares rises following a transfer of a control block.[9] In many cases, however, transfers of control lead to a decline in the market price of minority shares.[10] Thus, it is possible that, under the existing state of the law, inefficient transfers do take place in situations in which the acquirer has a greater ability to extract private benefits of control.

COROLLARY 2 (efficient transfers). Under the MR, an efficient transfer of control will not take place if and only if:

(4)
$$W_n - W_e = \Delta W > 0 \quad and \quad \Delta W < \left(\frac{n-k}{k}\right)(B_e - B_n) = -\left(\frac{n-k}{k}\right)\Delta B \ ;$$

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[9] See, e.g., Holderness and Sheehan [1988] (reporting that in 21 transfers of majority share blocks not involving simultaneous offers to minority shareholders, there were average announcement-period abnormal increases in stock prices of 9.41 percent).

[10] Holderness and Sheehan [1988] report that in the 31 cases of sales of majority blocks examined by them, 19 percent of the announcement-day and 35 percent of the announcement-period abnormal returns were negative. These figures are likely to understate the degree to which sale-of-control transactions lead to a decrease in the value of minority shares. First, the 31 cases include 10 in which a simultaneous offer was made to minority shareholders. In these 10 cases, abnormal returns to stock prices were significantly higher than for the sample as a whole. Second, the trades studied involved the acquisition of share blocks larger than necessary to achieve control. The purchase of such blocks is more likely to be motivated by expectations of an increase in the value of the company than by anticipated private benefits of control.

9

or, equivalently, if and only if

(5)
$$0 < \Delta W < -\left(\frac{n-k}{k}\right)\Delta B \ .$$

REMARKS. (1) Even when N is a better manager than E, N will place a lower value on the control block if N's private benefits of control are sufficiently smaller. Note that when N has a higher W and a lower B, a transfer of control would benefit minority shareholders in two ways — by increasing the total value produced and by reducing the fraction of total value that flows to the controller as private benefits. But E and N will ignore this positive externality, and for this reason an efficient transfer may not take place.

(2) *Free-rider Problem.* It might be suggested that, even if (5) is satisfied, an efficient transfer of control will not be blocked because E will first purchase the minority shares for a per share price slightly above $(W_e - B_e)$ and then will proceed with the control transfer to N. But if E were to make a tender offer for minority shares at a price slightly above $(W_e - B_e)$, the offer may fail to attract enough minority shares due to a free-rider problem. Each minority shareholder may have an incentive to hold out in the hope of ending up with minority shares in the N-controlled company.[11] Thus, unless controllers have a legal right to effect a freezeout of minority shares at $W_e - B_e$ (see section VI.C), E's ability to try to purchase minority shares cannot ensure that all efficient transfers occur under the MR.

COROLLARY 3 (efficiency costs). The expected efficiency costs of the MR are (per share)

(6)
$$C_{MR} = Prob\left(-\left(\frac{n-k}{k}\right)\Delta B < \Delta W < 0\right)E\left[-\Delta W \mid -\left(\frac{n-k}{k}\right)\Delta B < \Delta W < 0\right] +$$
$$Prob\left(0 < \Delta W < -\left(\frac{n-k}{k}\right)\Delta B\right)E\left[\Delta W \mid 0 < \Delta W < -\left(\frac{n-k}{k}\right)\Delta B\right].$$

REMARKS. (1) The first term of (6) represents the expected costs resulting from the possibility of inefficient transfers taking place under the rule. The second term of the equation represents the expected costs resulting from the MR failing to facilitate all efficient transfers.

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[11] For models of the free-rider problem in tender offers, see Grossman and Hart [1980] (atomistic shareholders) and Bebchuk [1989] (non-atomistic shareholders).

(2) Both types of efficiency costs under the MR result from the possible differences among controllers in their B. To see that this is the case, consider the situation in which all controllers have the same B, that is, B_n always equals B_e. In this case, one can see from proposition 1 that a transfer will take place under the MR if and only if the transfer is efficient $(W_n > W_e)$. For if E and N have the same ability to extract private benefits of control, the control block will be more valuable to N than to E if and only if N has greater managerial ability. More generally, holding other things equal, the expected efficiency costs of the MR decrease as the difference among controllers in B decreases, an issue to which we will return in part V.

(3) The expected efficiency costs of the MR decrease as k — the number of shares held by the controller — increases. For the smaller the number of minority shares, the smaller the magnitude of the externality (negative or positive) that a transfer may create with respect to the minority shareholders.

IV. THE EQUAL OPPORTUNITY RULE

Under the EOR, minority shareholders are entitled to participate in the sale on the same terms as the seller. This part will analyze two versions of the EOR. One version — which we shall refer to as the complete acquisition version — requires the buyer that is buying control to offer to buy the shares of all minority shareholders at the price paid to the control seller. This version of the rule can be found in the City Code of the United Kingdom, in the rules of some other countries (such as Spain and Australia), and in a proposed EEC directive (see Elhauge [1993] and Lüttmann [1992]). Under this version of the rule, partial acquisitions are not possible unless the minority shareholders choose not to tender all of their shares to the buyer.

A second version of the rule — which is seemingly less "demanding" — will be referred to as the proration version. Under this version of the rule, a potential purchaser of control is not required to purchase all shares but only to extend an equal offer to all shareholders and to accept tendered shares on a pro rata basis. As a result, minority shareholders have the right to sell, for the same price, the same percentage of their shares as the control seller. The proration version of the EOR was proposed in a classic article by Andrews [1965] and has since become the subject of vigorous debate among legal scholars in the United States (see, e.g., Andrews [1965],

11

Javares [1965], and Easterbrook and Fischel [1982]). But even though the proration version of the rule seems less demanding at first glance, the analysis below will show that its consequences are largely the same as those of the complete acquisition version.

A. The Outcome Under the Complete Acquisition Version

PROPOSITION 2. Under the complete acquisition version of the EOR, a transfer of control will occur if and only if:

(7)
$$W_n > W_e + \left(\frac{n-k}{k}\right)B_e , \qquad or$$

(8)
$$\Delta W > \left(\frac{n-k}{k}\right)B_e .$$

REMARK. This result, which is proved in the Appendix, can be explained intuitively as follows. The right-hand side of (7) — being the per share value that E has in the absence of a sale — represents the minimum price at which N's offer must be made in order that the transaction not impose a loss on E.

The left-hand side of (8) represents the maximum price at which the offer can be made for the transaction not to impose a loss on N. Since W will have a value of W_n under N's management, any price below W_n will leave N with a profit on each share acquired. And any offer at any price above W_n will impose a loss on N: such an offer will be accepted not only by E but also by all the minority shareholders, N will end up with all of the shares and will have paid for them a per share price exceeding their per share value W_n.

B. The Outcome Under the Proration Version

Consider now the situation in which N is permitted to buy a controlling block without offering to buy all of the minority shares. In particular, suppose that N is allowed to purchase only $q < n$ shares (q shares are assumed to be sufficient for control), and that N is only required to extend the same offer to all shareholders and, in the event of oversubscription, to take up tendered shares on a pro-rata basis. Thus, if N offers to pay a price P for each of the q shares that it buys, the existing shareholders of the company (E and the minority shareholders) will end

12

up with qP in cash plus $(n-q)$ minority shares worth $(W_n - B_n)$ each — that is, a total value of $qP + (n-q)(W_n - B_n)$ in payments and minority shares.

PROPOSITION 3. Under the proration version of the EOR, a transfer of control will occur if and only if (8) — or, equivalently, (7) — is satisfied.

REMARKS. (1) The intuition for this result, which is proven in the Appendix, is as follows. As before, if the transaction is not to impose a loss on E, the minimum per share value that E must get from it is the per share no-transaction value that E has, which is the right-hand side of (8).

Also, as before, the maximum per share value that the transaction can give E and still not impose a loss on N is W_n, which is the left-hand side of (8). If the transaction is not to impose a loss on N, the total value with which the existing shareholders will end up following the transaction cannot exceed nW_n; for if the existing shareholders will end up with more than nW_n — the total value produced following the transaction — some of the existing shareholders' value will have to come at the expense of N's loss. Given that the proration version gives the minority shareholders the right to participate on the same terms as E, E will not be able to capture more than its prorata fraction of the total value obtained by the existing shareholders. Thus, since this total value cannot exceed nW_n without the transaction imposing a loss on N, the per share value that the transaction gives E cannot exceed W_n.[12]

(2) *Equivalence between Versions.* Propositions 2 and 3 indicate that control transfers will take place in exactly the same circumstances under both versions of the EOR. The reason for this equivalence is that, under both versions of the rule, the minority shareholders' option to participate will ensure that the maximum per share value which the transaction can provide E without imposing a loss on N is the same, W_n.

(3) *Liquidity Constraints.* The above analysis has assumed that N has funds to finance a complete acquisition of all the company's shares (if such an acquisition would be profitable). But would the complete acquisition version impede a transaction if N has funds that are

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[12] Another way to understand the intuition behind Proposition 3 is by understanding why B_n does not appear in the transfer condition: to the extent that N is expected to extract private benefits of control, N must compensate E (and participating minority shareholders as well) by an offsetting amount. Thus, B_n does not represent a net source of value to N from owning the control block.

sufficient to purchase only $q < n$ shares? It may well not. For one thing, in such a case, N would be able to buy the company's shares not directly but through a "shell" subsidiary. N would form a wholly-owned subsidiary and provide it with the funds that N has. The subsidiary would offer to buy all of the company's shares for a total consideration equal to the funds that the subsidiary has and a fraction $[(n-q)/n]$ of the shares of the subsidiary. Thus, the company's existing shareholders would end up with the funds paid by the subsidiary and a fraction $[(n-q)/n]$ of the shares of a company (the subsidiary) that has all of the company's assets and is controlled by N. In this way, N would convert the complete acquisition version to the proration version.[13]

C. The Efficiency Costs of the Equal Opportunity Rule

From propositions 2 and 3, it is possible to derive the following two corollaries.

COROLLARY 4 (inefficient transfers). Under (the two versions of) the EOR, inefficient transfers will not occur. Thus, in terms of preventing inefficient transfers, the EOR is superior to the MR.

REMARK. Inefficient transactions may take place under the MR because, under this rule, a transaction may impose a negative externality on the minority shareholders and E and N will disregard this negative externality when considering a transfer. In contrast, transfers under the EOR cannot leave minority shareholders worse off. Indeed, under the EOR, if a transaction takes place, minority shareholders will be always made better off by it: they will end up with at least the per share value that E will have following the transaction, which in turn is higher than E's per share value in the absence of a sale, which is in turn higher than the no-sale per share value of minority shares. Thus, under the EOR, all of the transactions that occur must make all parties, including minority shareholders, better off. Consequently, all transfers that take place under this rule must be efficient.

COROLLARY 5 (efficient transfers). Under (the two versions of) the EOR, an efficient transfer will

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[13] Even if the above way were for some reason not possible, N could still purchase all n shares of the company and then resell $(n-q)$ shares to the market for their per share value of $(W_a - B_a)$. Assuming that there are no transaction costs involved in reselling minority shares to the market, this combination of transactions would leave N in exactly the same position as if it had purchased q shares at the start. Thus, even in this case, the performance of the complete acquisition will differ from that of the proration version only to the extent of the transaction costs involved in reselling shares.

not take place if and only if:

(9)
$$0 < \Delta W < \left(\frac{n-k}{k}\right) B_e .$$

Thus, in terms of facilitating efficient transfers, the EOR is inferior to the MR; the former prevents more efficient transfers than the latter.

REMARKS. (1) The EOR impedes efficient transfers because it requires E to forego any advantage over the minority shareholders in the event of a control transfer even though E has an advantage over the minority shareholders in the absence of a transfer. In the absence of a transfer, E enjoys a disproportionately large share of the value produced by the company because of E's private benefits. In the event of a transfer, however, because N must extend the same offer to all shareholders, E can capture no more than its proportionate fraction of the total value received by the existing shareholders. Even if the total value produced by the N-run company is greater than the total value of the company under E, the value of E's disproportionate share of the lower-valued company may be greater than E's proportionate share of the higher-valued company. When this occurs, E cannot be induced to sell the control block to N.

(2) *Free-rider Problem.* It might be suggested that, when (9) is satisfied, the efficient transfer would still take place because E would be able to purchase first all the minority shares at $(W_e - B_e)$ and then proceed with the control transfer. But, for the reasons explained in the remarks following corollary 2, such an offer by E to purchase the minority shares would be impeded by a free-rider problem.

COROLLARY 6 (efficiency costs). The expected efficiency costs under (either version of) the EOR are (per share)

(10)
$$C_{EOR} = Prob\left(0 < \Delta W < \left(\frac{n-k}{k}\right) B_e\right) E\left[\Delta W \mid 0 < \Delta W < \left(\frac{n-k}{k}\right) B_e\right].$$

REMARKS. (1) In contrast to the case under the MR, the efficiency costs of the EOR would not disappear if controllers were assumed not to differ in their private benefits of control, that is, if B_n were assumed to always equal B_e. Even if controllers had the same B, there would be some meaningful efficiency costs as long as this uniform level of private benefits was not trivial.

15

(2) The expected efficiency costs of the EOR decrease as k — the number of shares held by the controller — increases. For the smaller the number of minority shares, the smaller the relative magnitude of the advantage that E has over minority shareholders in the absence of a sale relative to E's prorata share of the company's total value.

D. *The Minority Shareholders' Option Not to Tender*

Under the EOR, minority shareholders have an option — but are not required — to participate in the transaction. If the minority shareholders exercise their option, they will emerge from the transaction with the same per share value as E will have. But the minority shareholders may decline to exercise their option. If the share price negotiated by E and N is less than $(W_a - B_a)$, the minority shareholders will be better off holding to their shares. In this case, they will end up with a higher per share value than E — and thus with more than their pro rata fraction of the total value received by the company's existing shareholders.

By eliminating the option element, the EOR could be modified to create what may be called the "equal sharing" rule. Under such a rule, whenever E and N negotiate a sale, minority shareholders would be required (rather than given an option) to participate on the same terms as E.[14] For our purposes, the choice between the EOR and the equal sharing rule is not all that significant. The analysis contained in the proofs of propositions 2 and 3 implies that both rules will produce control transfers under the same set of circumstances: the rules will differ only in the division among the shareholders of the surplus from the transfers that take place.

Finally, it should be noted that while the possibility that minority shareholders have less information about $(W_a - B_a)$ than E and N is irrelevant to an analysis of the equal sharing rule (under which minority shareholders do not make any decisions), it is relevant to an analysis of the EOR. Under the EOR, minority shareholders have to decide whether to exercise their option. To be sure, the minority shareholders can, by tendering their shares, always ensure that they

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[14] If the EOR were to be adopted in the U.S. without any change in existing merger law, then the result would in many cases be wholly equivalent to that of an equal sharing rule. For under existing merger law, a controller with a majority interest can sell the company for a price it negotiates with the buyer and then distribute the proceeds to all shareholders on a pro rata basis. Thus, a controller with a majority interest would be able to design a sale of its interest in the company in such a way that minority shareholders get no more than their pro rata fraction of the total value obtained by the existing shareholders.

16

get the same per share value as E. But the minority shareholders may choose not to sell their shares to N if, based on the information available to them, they believe that $(W_n - B_n)$ is higher than the negotiated share price.[15]

V. Aggregate Comparison of the Market and Equal Opportunity Rules

As was shown in parts III and IV, neither the MR nor the EOR dominates the other: each will perform worse than the other in some cases. The question thus naturally arises as to which rule performs better over the aggregate of cases, that is, which rule is characterized by lower expected efficiency costs. This part seeks to shed some light on this question.

In examining this question, the analysis below identifies a certain structural difference between the two rules' performance that works in favor of the MR in an overall comparison. The severity of the efficiency problems under the MR depends on the distribution of $|B_n\text{-}B_e|$. In contrast, the severity of the efficiency problems under the EOR depends on the distribution of B_e. Under various plausible scenarios, the distribution of $|B_n\text{-}B_e|$ is closer to zero than that of B_e. The analysis identifies certain conditions under which this factor is sufficient to ensure the overall superiority of the MR. It should be emphasized, however, that the analysis also identifies a condition under which, in spite of the identified factor, the EOR is superior.

A. Similarity in Private Benefits of Control

Let us begin with the condition that is easiest to identify. We saw in part III that, as ΔB goes to zero, so do the expected efficiency costs of the MR. And we saw in part IV that, for any given B_e, sending ΔB to zero will not affect the expected efficiency costs of the EOR. These observations lead to the following proposition, which is proved in the Appendix.

Proposition 4. The expected efficiency costs of the MR are smaller than those of the EOR if the maximal difference between controllers in their private benefits of control, $max|\Delta B|$, is

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[15] Thus, overestimates of $(W_n - B_n)$ by minority shareholders may lead them to hold out in a case in which this will lead to their ending up with a per share value lower than that which E will get. Consequently, it can be shown that shareholders' having less information about $(W_n - B_n)$ than E and N have could lead to (i) occurrence of some inefficient transfers under the EOR and (ii) occurrence of some efficient transfers which would otherwise be blocked by the rule.

sufficiently small.

While this proposition highlights the importance of differences in B, one cannot derive from it a confident conclusion that the MR is superior to the EOR. Even if one believes that the range of differences in B is not large (or at least not large relative to the range of differences in W), one cannot be confident that the range is sufficiently small to ensure that the condition in proposition 4 is satisfied. For the very sources from which B often arises suggest that controllers may differ significantly in their ability to extract private benefits of control.

B. *Symmetry Between Buyers and Existing Controllers*

A natural benchmark case to consider is the one in which ΔW and ΔB are symmetrically and independently distributed around zero. That is, while new controllers may have higher or lower values for W or B, new controllers have neither a systematic advantage nor a systematic disadvantage relative to existing controllers.

One assumption that would give rise to such a scenario is that, in every case, W_n is symmetrically distributed around W_e and B_n is symmetrically distributed around B_e. As a result, in every case both ΔW and ΔB will be symmetrically distributed around zero.

Alternatively, one could assume that W_n and W_e are drawn from the same distribution, and similarly that B_n and B_e are drawn from the same distribution. Here, in the aggregate of cases, both ΔW and ΔB are symmetrically distributed around zero.

Surprisingly, in the case of symmetry, it is possible to establish a strong and clear result about the relative performance of the MR and the EOR.[16]

PROPOSITION 5. Assuming that ΔW and ΔB are both symmetrically and independently distributed around zero, the MR is characterized by lower expected efficiency costs than the EOR.

REMARKS. (1) The intuition behind this result, which is proved in the Appendix, may be explained as follows. Under the MR, there may be an efficiency problem both when $\Delta B > 0$ (an inefficient transfer will occur if $0 < -\Delta W < \Delta B$) and when $\Delta B < 0$ (an efficient transfer will be

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[16] I am grateful to Jesse Fried for the proof of this proposition.

18

prevented if $0 < -\Delta W < -\Delta B$). Under the assumed conditions of symmetry, the expected efficiency costs resulting from a given positive ΔB are the same as those resulting from a negative ΔB with the same absolute value. Consequently, the size of the total expected efficiency costs depends on the distribution of $|\Delta B|$. The further away from zero $|\Delta B|$ is distributed, the greater the total expected efficiency losses.

In contrast, under the EOR, the magnitude of the efficiency problem depends on the distribution of B_e. The further from zero B_e is distributed, the greater the expected efficiency costs of the rule (from efficient transfers blocked when $0 < \Delta W < B_e$).

The assumption that ΔB is symmetrically distributed around zero implies that the distribution of $|\Delta B|$ is stochastically dominated by the distribution of B_e. This ensures that the expected efficiency costs of the MR are smaller than those of the EOR.

(2) Indeed, under the assumed conditions of symmetry, the expected efficiency costs of the MR may be substantially lower than those of the EOR. Consider the following example, which assumes that W_n is symmetrically and uniformly distributed around W_e and that B_n is symmetrically and uniformly distributed around B_e. In this case, assuming that
$max\ (\Delta W) > [(n-k)/k]\ max\ (\Delta B)$, computation indicates that the expected efficiency costs of the MR are less than 1/3 of the expected efficiency costs of the EOR.

C. Asymmetry Between Buyers and Existing Controllers

While the symmetric case is a natural benchmark case to consider, it is possible to argue that potential buyers may systematically differ in their characteristics from existing controllers. Indeed, one can think of reasons for systematic differences in two opposite directions. On the one hand, it may be argued that existing controllers are the product of a selection process that put them in control in the first place, and that, as a result, their W and B may be systematically (though not always) higher than those of potential buyers.[17] On the other hand, it may be argued that existing controllers may have already exhausted some of the modes available to them in creating or diverting value, and that, as a result, new controllers may have

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[17] See Bebchuk and Kahan [1990] for a consideration of a similar argument in the context of proxy contests.

systematically (though not always) higher W and B. We therefore explore below the implications of systematic difference in characteristics. The analysis shows that the structural factor working in favor of the MR in the symmetric case continues to operate in the asymmetric case. The analysis also shows, however, that there are distributional assumptions under which the EOR is nonetheless superior to the MR.

1. Asymmetry only in B. It turns out that symmetry in W alone is sufficient to ensure the superiority of the MR, even if buyers have systematically higher B, as long as the increases in B brought about by new controllers are not too large relative to the existing level of B.

PROPOSITION 6. Assuming that ΔW and ΔB are independently distributed, and that ΔW is symmetrically distributed around zero, a sufficient condition for the MR to be superior to the EOR is that (i) B_n does not exceed $2B_e$, or, more generally, (ii) the distribution of $|B_n - B_e|$ is stochastically dominated by the distribution of B_e.

REMARK. The intuition behind the result, which is proved in the Appendix, is as follows. As noted earlier, when ΔW is symmetrically distributed around zero, the expected efficiency costs of the MR depend on how far the distribution of $|B_n - B_e|$ is from zero, whereas the expected costs of the EOR depend on how far the distribution of B_e is from zero. Consequently, when the distribution of $|B_n - B_e|$ is closer to zero than the distribution of B_e, the efficiency costs of the MR are smaller than those of the EOR.

2. Same asymmetry in both W and B. Let us denote $Prob(W_n > W_e)$ by θ_W and $Prob(B_n > B_e)$ by θ_B. Our interest now is in examining the case in which both $\theta_W \neq 1/2$ and $\theta_B \neq 1/2$. To explore this case, we make the following simplifying assumptions. We assume that, in every given case, ΔW is distributed as follows: conditional on $\Delta W > 0$, ΔW is distributed uniformly on $(0,w)$, and conditional on $\Delta W < 0$, ΔW is distributed uniformly on $(-w,0)$. Thus, the density function of ΔW is $(1-\theta_W)/w$ on $(-w,0)$ and θ_W/w on $(0,w)$. Similarly, we assume that, conditional on $\Delta B > 0$, ΔB is distributed uniformly on $(0,b)$ and that, conditional on $\Delta B < 0$, ΔB is distributed uniformly on $(-b,0)$. (Given that $B_n > 0$, it follows that b must be less than B_e.) Thus, the density function of ΔB is $(1-\theta_B)/b$ on $(-b,0)$ and θ_B/b on $(0,b)$. Finally, we assume that $B_e < max(\Delta W)$ and, as before, that ΔW and ΔB are independently distributed.

20

For this uniform distribution example, one can establish a surprisingly strong and clear result, which is proved in the Appendix, concerning how the MR compares with the EOR.

PROPOSITION 7. In the uniform distribution case described above, if $\theta_W = \theta_B$ (that is, N is equally likely to have a higher W as it is to have a higher B), then the MR is superior to the EOR. Furthermore, a sufficient condition for the MR to be superior to the EOR is that $\theta_W > \dfrac{\theta_B}{2(1+\theta_B)}$.

REMARKS. (1) From the analysis in the proof of proposition 7, it follows that when $\theta_W = \theta_B$, then C_{MR}, the expected efficiency cost of the MR, is less than $(2/3)(1-\theta_W)$ of C_{EOR}, the expected efficiency cost of the EOR. Thus, C_{MR} is always less than $2/3$ of C_{EOR} and, for $\theta_W > (1/2)$, C_{MR} is less than $1/3$ of C_{EOR}.

(2) Proposition 7 implies that $\theta_W > (1/2)\theta_B$ is always a sufficient condition for the MR to be superior. Furthermore, for $\theta_B < (1/2)$, $\theta_W > (1/6)\theta_B$ is also a sufficient condition for the MR's superiority.

Thus, in the considered uniform case, even if potential buyers have a systematic disadvantage in W relative to the existing controllers, the MR will still be superior to the EOR as long as potential buyers have a similar systematic disadvantage in B. The EOR will be superior only if the standing of potential buyers (relative to existing controllers) in terms of W is substantially worse than their relative standing in terms of B.

3. Conditions under which the Equal Opportunity Rule is Superior. The analysis thus far has shown that, even when new and existing controllers draw their characteristics from different distributions, the identified factor continues to work in favor of the MR. Still, while the analysis has identified certain conditions of asymmetry under which the MR is superior, it should be emphasized that one cannot draw from them a confident conclusion about the MR's superiority. The reason is that it is also possible to identify conditions under which the EOR is superior. Suppose, for example, that new controllers have neither a systematic advantage nor disadvantage in terms of B, but that they have a systematic disadvantage in terms of W. If this disadvantage in W is sufficiently large, the EOR will be superior. Our current knowledge does not enable us to rule out this scenario concerning the distributions of B and W as an implausible

21

description of the world.

To see that the considered scenario may be plausible, one may suggest the following story. Before a company goes public, its ownership may move hands until it gets into the hands of the owner that will sell to the public a minority of the company's shares and become the initial controlling shareholder. This process will tend to produce initial controllers with a high W. But because a high B will not make the company more valuable to an owner (a high B will be fully reflected in the price the public will be willing to pay for shares), the process will not result in initial controllers with a systematically high B. Consequently, compared with the initial controllers, emerging potential buyers will have a systematic disadvantage in W but not in B.

Thus, more empirical evidence on the distributions of B_o, ΔW and ΔB than is currently available is needed to enable us to determine confidently which rule is superior. The analysis in this part, however, indicates which evidence is needed and how it could be used to resolve the considered question.

D. Correlation Between ΔW and ΔB

Thus far we have assumed that W and B are independently distributed. But it could be suggested that W and B may have either a positive or a negative correlation. To suggest the possible presence of positive correlation, it may be argued that, when the total value produced is larger, the opportunities to extract private benefits increase. Also, it may be argued that in some instances the extraction of private benefits may be surplus producing — that is, the private benefits may not come, at least not fully, at the expense of the values flowing to shareholders qua shareholders.[18] To suggest the possible presence of a negative correlation, one may argue that in some cases the extraction of private benefits dissipates value. One reason for this is that some actions taken to divert value from minority shareholders (e.g., self-dealing) may be inefficient, that is, they may produce a smaller increase in private benefits than the decrease they bring about in the value flowing to shareholders.

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[18] For example, consider a controller that derives psychic benefits from managing the family's long-standing business or that owns other businesses that can benefit from the network of relationships to which the control position gives access; such benefits need not come, at least not fully, at the expense of values flowing to shareholders.

22

Since theory cannot enable us to determine whether a negative or positive correlation is more likely to occur, the assumption of independent distributions that has been used thus far provides a good starting point. But in the hope that future empirical work may identify whether correlation exists and in which direction, let us consider briefly the implications of correlation.

The presence of correlation between ΔW and ΔB will have no effect on the expected efficiency costs of the EOR. For these costs do not depend on the distribution of ΔB but only on the distribution of B_a. The presence of correlation, however, will affect the expected efficiency costs of the MR.

Introducing a positive correlation between ΔW and ΔB will decrease the expected costs of the MR and thus further strengthen the rule's advantage over the EOR. Such correlation implies that, when ΔW is positive and a transfer is thus efficient, ΔB will be more likely to be positive as well; accordingly, there will be fewer efficient transfers that will be blocked. Such correlation also implies that, when ΔW is negative and a transfer is inefficient, ΔB will be more likely to be negative as well; thus, the problem of inefficient transfers will also recede in severity.

In contrast, introducing a negative correlation between ΔW and ΔB will increase the expected costs of the MR and thus erode or even eliminate the rule's advantage. A similar reasoning to the one just noted indicates that negative correlation will increase both the expected costs of blocked efficient transfers and the expected costs of inefficient transfers taking place.

E. Multiple Rounds of Potential New Controllers

The analysis has assumed just one round in which a potential new controller may emerge. A more general setup would of course allow for many rounds. In each round, a new potential controller would emerge; whichever controller ends up in control at the end of a given round will face the new controller that emerges in the following round, and so on. While the analysis of such a general setup is beyond the scope of the present paper, it is possible to identify in the many-rounds case a factor that works in favor of the MR: under the MR total value will converge eventually toward its maximum potential value, whereas under the EOR total value might get "stuck" below that level.

Suppose that there is an infinite number of rounds. Suppose also that the characteristics

23

of all potential controllers that emerge in those rounds are drawn from the same distribution. Specifically, suppose that W and B of all potential controllers with positive probability are distributed in $[\underline{W}, \overline{W}]$ and $[\underline{B}, \overline{B}]$ respectively. In this case, under the MR, there is a sufficiently large number of rounds after which W will reach a level arbitrarily close to $\overline{W}$ with any given high probability. After such a large number of rounds, a potential controller with both W and B close to $\overline{W}$ and $\overline{B}$ will emerge with the required high probability. And when such a controller emerges, the MR will facilitate a transfer to this controller.

In contrast, under the EOR, we cannot rely on such a convergence of W to the upper bound of $\overline{W}$. It is possible that W will get "stuck" at a level significantly below $\overline{W}$ and will not climb above it regardless of how many rounds follow. To see this, suppose that, after one or more rounds, the controller is one with B_e and $W_e = \overline{W} - [(n-k)/k]B_e$. Under the EOR, even if in later rounds controllers with W's between W_e and $\overline{W}$ emerge, a transfer will still not occur.

VI. OTHER LEGAL ARRANGEMENTS

The framework developed in this paper can be used not only to analyze the MR and the EOR but also other arrangements that are or may be applied to sale-of-control transactions. Below I discuss three arrangements -- voting, appraisal rights, and freezeouts -- that one may consider as possible improvements over the MR and the EOR. A full analysis of the arrangements considered below (and some additional possible arrangements) can be found in my earlier discussion paper (Bebchuk [1993]).

A. Voting

Consider an arrangement that supplements the MR with a voting requirement. Under the arrangement, a control transfer would require a vote of approval by the company's minority shareholders. Of course, to obtain the needed approval, E and N may choose to induce the minority shareholders to approve the transfer by offering them some payments (from E or N) or opportunities to participate in the transaction in some way.

Suppose first that minority shareholders know $(W_e - B_e)$ and $(W_n - B_n)$ as E and N are assumed to do. In this case, the vote requirement would eliminate the problem of inefficient

24

transfers and ensure that no such transfers take place. For the approval requirement will ensure that no negative externalities are imposed on minority shareholders, and, in the absence of such externalities, all transfers that take place will be efficient ones.

Note that, while the considered voting arrangement would eliminate the problems of inefficient transfers, it would not address the problem of blocked efficient transfers. Recall that, when B_e exceeds B_n, some efficient transfers may not take place, because E and N will not internalize the positive externality that the transfer will confer on minority shareholders. To facilitate all efficient transfers, the voting arrangement would have to be strengthened to allow the minority shareholders also to approve a concession — that is, the minority shareholders will be able to approve a transaction in which they end up with less than $(W_n - B_n)$ by, say, approving a payment from the company to E or to N equal to $(B_e - B_n)$. Under this strengthened arrangement, and assuming that minority shareholders know $(W_e - B_e)$ and $(W_n - B_n)$ as E and N are assumed to do, the first-best would be attained.

Suppose, however, that minority shareholders have less information about $(W_e - B_e)$ and $(W_n - B_n)$ than E and N do, either because E and N have some private information or because voting shareholders may not have much incentive to acquire information. In such a case, the voting requirement may not prevent all inefficient transfers (for the minority shareholders may approve an inefficient transfer that would actually hurt them) and also may prevent some efficient transfers that would otherwise take place (for the minority shareholders may erroneously block a transfer that would actually benefit them). Furthermore, if the voting arrangement is strengthened to enable the minority shareholders to approve their getting less than $(W_n - B_n)$, then the shareholders may approve concessions leading to the occurrence of some inefficient transactions that would not take under the MR alone.

B. Appraisal Rights

Consider an arrangement that would supplement the MR with appraisal rights. State corporation statutes typically provide shareholders with appraisal rights in connection with certain "fundamental" corporate transactions (such as mergers). When a transaction triggers appraisal rights, shareholders have the option of redeeming their shares for the estimated value

25

that their shares would have in the absence of the transaction (as determined by a court). Although current law does not offer shareholders appraisal rights in the context of sale-of-control transactions, one may consider providing such rights in these transactions.

Let us suppose first that the appraisal process is accurate -- that is, that courts know $(W_a - B_a)$ as E and N are assumed to do, and that minority shareholders exercising their appraisal rights will thus get this value. In this case, and assuming that shareholders will exercise appraisal rights whenever it is beneficial to do so, adding appraisal rights to the MR would eliminate the problem of inefficient transfers. For under these assumptions, minority shareholders will never be hurt by a transaction. Since no transaction will impose a negative externality on the minority shareholders, it follows that all occurring transfers will be efficient.

Indeed, under the considered assumptions, the MR with appraisal rights would not only dominate the performance of the MR alone but also that of the EOR. Because the appraisal rights would eliminate all inefficient transfers, they would eliminate the advantage in this regard that the EOR has over the MR alone. And the addition of appraisal rights would not erode the MR's advantage over the EOR in terms of facilitating efficient transfers. (Because accurate appraisal rights would never enable minority shareholders to get more than they would have in the absence of a sale, adding such rights would not increase the incidence of blocked efficient transfers under the MR.)

Suppose, however, that courts have less information about $(W_a - B_a)$ than E and N because E and N have some private information. In this case, appraisal rights may provide minority shareholders exercising them with inaccurate compensation for the no-sale value of their shares (see Bebchuk [1993] for a model of the inaccuracies of the appraisal process). In instances in which E and N expect the court estimate to lead to under-compensation, the presence of appraisal rights would not ensure that inefficient transfers will not take place. And in instances in which E and N expect the court estimate to lead to over-compensation, the appraisal rights may lead to more efficient transfers being prevented than the MR alone.[19]

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[19] Finally, the discussion above assumed that minority shareholders will exercise their appraisal rights whenever this will be beneficial. Suppose, however, that minority shareholders have less information about $(W_a - B_a)$ than E and N do. In this case, the minority shareholders may not exercise

C. Freezeouts

In analyzing the problem of blocked efficient transfers under both the MR and the EOR, it was observed that all efficient transfers would take place if E were always able to purchase the minority shares for $(W_a - B_a)$ per share. It was noted, however, that, in the case of some efficient transfers, an offer to purchase the minority shares for $(W_a - B_a)$ may well fail due to a free-rider problem. Freezeouts may be considered as a way of addressing this free-rider problem. When freezeouts are allowed, a controller may impose on minority shareholders a sale of their shares to the controller for the shares' no-transaction per share value of $(W_a - B_a)$ as estimated by a court.

Suppose first that courts know $(W_a - B_a)$ as E and N are assumed to do — and thus that the required freezeout consideration would provide minority shareholders with the precise no-transaction value of their shares. In this case, allowing controllers to effect a freezeout prior to a sale of the company would eliminate the problem of blocked efficient transfers under both the MR and the EOR. With the freezeout option, E and N will always be able to deprive the minority shareholders from any benefit produced by the transaction. Since no positive externality will be ever conferred on minority shares, E and N will be always able to benefit from a transaction that is efficient and could increase total value.

Thus, under the assumption of accurate freezeout compensation, adding freezeouts to either the MR or the EOR will be beneficial. Indeed, under this assumption, the EOR with freezeouts will indeed attain the first-best. Adding the freezeout option will ensure that all efficient transactions take place even under the EOR. As to inefficient transactions, recall that the EOR will prevent all such transactions, and note that adding the freezeout option will not change this. For while this option will enable E to prevent minority shareholders from benefitting from a control transaction, it will not enable E to impose a negative externality on such shareholders.

Suppose, however, that courts have less information about $(W_a - B_a)$ than E and N and

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their appraisal rights even if $(W_a - B_a)$ is lower than the appraisal consideration. Consequently, in this case, even if the appraisal consideration is accurate, the presence of appraisal rights may not prevent all inefficient transfers.

that, consequently, the required freezeout consideration may over- or under-compensate minority shareholders for the no-transaction value of their shares (see Bebchuk and Fried [1993] for a model of the inaccuracies of freezeout compensation). In this case, adding the freezeout benefits may produce smaller benefits or may even be overall costly. When E and N expect the court estimate to lead to overcompensation, the freezeout option cannot be relied on to ensure that all efficient transfers take place. And when E and N expect the court estimate to produce an under-compensation, the freezeout option may lead to inefficient transfers (as well as unnecessary freezeouts).

VII. PRIVATE VS. SOCIAL OPTIMALITY

Before closing, it is important to consider the difference in our context between the perspectives of social and private optimality. The analysis has thus far focussed on the perspective of efficiency, that is, social optimality. From this perspective, a transfer of control is judged solely by its effect on the expected total value including whatever fraction of this total value that is captured by the outside buyer; the division of surplus between the buyer and the initial shareholders is irrelevant. But it is also possible to examine a control transfer from the perspective of the company's initial shareholders — or, equivalently, from the perspective of those who design the corporate charter (whose interests generally lie in maximizing the expected value to be obtained by the company's initial shareholders). From this private optimality perspective, the division of surplus in sale-of-control transactions does count. A control transfer is judged by how it affects the expected total value obtained by the company's initial shareholders; value captured by the outside buyer does not count.[20]

To compare the two considered rules from the perspective of private optimality, we need to model explicitly the bargaining process between E and N. Suppose that, when there is a potential gain for E and N from a transaction, the transaction price (and thus the division of surplus) will be fixed following one round of bargaining. In this round, either E or N will make

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[20] The distinction between corporate arrangements that are socially optimal and those that are privately optimal was first highlighted by Grossman and Hart [1980] in the takeover context. Bebchuk and Kahan [1990] examine this distinction in the context of proxy contests.

a take-it-or-leave-it offer to the other party. The identity of the side making the offer will be chosen randomly, with N making the offer with a probability θ and E making the offer with probability $1-\theta$. With these fairly weak assumptions, the following sharp result can be established.

PROPOSITION 8. The expected value captured by outside buyers is smaller under the EOR than under the MR.

REMARK. This result, which is proved in the Appendix, can be intuitively explained as follows. Recall that, under the EOR, there will be transactions — and outside buyers will capture some profits — in fewer instances than under the MR. Furthermore, it can be shown that, in those instances in which transactions take place under both rules, the expected profits to outside buyers will be smaller under the EOR. To see this, consider the situation in which N is the one making the take-it-or-leave-it offer and can hope to capture some surplus. Under both rules, N will have to set the transaction price so as to provide E with the per share value that E has in the absence of a sale. Under the EOR, however, N may also have to provide the minority shareholders with a greater value than under the MR, thus leaving a smaller fraction of the surplus for the outside buyer.

Thus, the MR is better for outside buyers than the EOR. It follows that if the MR is privately optimal — that is, if it provides a greater expected value for the initial shareholders — it will also be socially optimal. If the MR is socially optimal, however, it may not be privately optimal. That is, superiority of the MR over the EOR from a private optimality perspective is sufficient — but not necessary — for superiority of the MR from an efficiency perspective.

While exploring fully the normative implications of the identified divergence between social and private optimality is beyond the scope of this paper, the following should be noted. First, the identified divergence implies that this is an area in which it may be desirable to adopt mandatory rules — that is, to regulate by fiat and disallow opt-out charter provisions. Second, the identified divergence implies that it may not be possible to make straightforward inferences concerning the socially optimal arrangement from companies' privately adopted choices.

VIII. CONCLUDING REMARKS ON EX ANTE EFFECTS

The analysis of this paper has taken as given the existence of corporations that have an ownership structure with a controlling shareholder. Taking the incidence of controlling shareholder structures as given, I have focussed on analyzing the inefficiencies involved in the process by which control may be transferred in such corporations. The identified inefficiencies, however, have important implications for the ex ante choice of controlling shareholder structures, and three such implications should be noted.

First, the analysis has identified a cost that is associated with creating a controlling shareholder structure. There is a substantial literature on the benefits and costs of a controlling shareholder structure compared with, say, the complete ownership structure of a closely held corporation (see e.g., Jensen and Meckling [1976], Holmstrom and Tirole [1993]). To the costs and benefits already identified in the literature, it is necessary to add the cost of the identified inefficiencies of the control transfer process. As the analysis has shown, this cost decreases under both the MR and the EOR when the fraction of the shares held in the control block increases. In a complete ownership structure $(k=n)$, this cost does not exist.

Second, the inefficiency costs of the control transfer process are not accurately translated into private costs for the initial shareholders. With respect to blocked efficient transfers, some of the expected social costs from this possibility are borne by outside buyers rather than by the initial shareholders. With respect to inefficient transfers taking place, the expected private costs to the initial shareholders from this possibility exceed the social costs (as outside buyers still make profits from such transfers). Thus, the choices that private agents make between a controlling shareholder structure and complete ownership may be distorted.

Third, whether the prevailing rule is the MR or the EOR affects both the privately optimal and the socially optimal incidence of controlling shareholder structures. From a social point of view, the choice of rule affects the optimal incidence because it affects the expected efficiency costs of the control transfer process. From a private point of view, the choice matters also for an additional reason — that, under the EOR, the expected profits of outside buyers are smaller. Thus, compared with the MR, the EOR may lead to an increase in the incidence of

30

controlling shareholder structures even if the EOR raises the expected efficiency costs of the control transfer process.[21]

<center>APPENDIX</center>

Proof of Proposition 2. Let us first show that (7) is a sufficient condition for a transfer. If (7) is satisfied, then it is possible to set the offer at a price P that exceeds $W_e + [(n-k)/k]B_e$ and falls below W_n. A transaction at this price will make E better off, because the price will exceed the control block's per share value to E. The transaction will also make N better off because purchased shares will have a value to N of at least W_n (W_n if minority shareholders tender, more than W_n if minority shareholders choose to keep their shares).

To show that (7) is also a necessary condition, suppose that (7) is not satisfied, and let us show that there exists no transaction price P that will make both E and N better off. If (7) is not satisfied, then any chosen price cannot be both above $W_e + [(n-k)/k]B_e$ and below W_n. If P is not above $W_e + [(n-k)/k]B_e$, then the transaction will not make E better off. And if P does not fall below W_n, N will not be made better off.   QED

Proof of Proposition 3. Let us first note that, if N purchases q shares at a per share price P, the average per share value with which the company's shareholders will end up is
$V(P) = (q/n)P + [(n-q)/n] (W_n - B_n)$. For N to be made better off by the transaction, P must be below the per share value of the q-share block to N, which is $W_n + [(n-q)/q]B_n$. Algebraic rearrangement yields that this condition is equivalent to the condition that $V(P)$ is below W_n.

Let us now show that (7) is a sufficient condition for a transfer to occur. If (7) is satisfied, it is possible to choose a price P such that $V(P)$ will be just slightly below W_n and above $(W_n - B_n)$ and $W_e + [(n-k)/k]B_e$. This transaction will make N better off because $V(P) < W_n$. Furthermore,

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[21] There are two additional ex ante issues that may be worthwhile mentioning. First, as noted, the identified inefficiency costs increase as the size of the control block decreases. Thus, the analysis has implications also for the privately optimal choice, and the socially optimal choice, of a control block's size. Second, the discussion in this section has taken the incidence of companies as given and focussed on the choice of companies' ownership structure. But, if decisions to set up companies are sensitive to the entrepreneur's expected returns, then, given that the choice between MR and EOR affects these returns, the analysis may also have implications for the incidence of entrepreneurs' setting up companies.

<center>31</center>

because $V(P) > W_n - B_n$, the minority shareholders will tender, and E will end up with $V(P)$. Thus, since $V(P)$ exceeds $W_e + [(n-k)/k]B_e$, the transaction will also make N better off.

Finally, to show that (7) is also necessary for a transfer to occur, suppose that (7) is not satisfied, and let us show that no transaction price P can make both E and N better off. Recall that, for N to be made better off, $V(P)$ must be below W_n. If (7) is not satisfied, this implies that $V(P)$ must be also below $W_e + [(n-q)/q]B_e$. Note now that the per share value with which N will end up will not exceed $V(P)$. (If the minority shareholders tender, N will get $V(P)$; if minority shareholders do not tender — which will happen when $P < W_n - B_n$ and thus $P < V(P)$ — then N will end up with a per share value of $P < V(P)$.) Thus, if $V(P)$ is such that N will be made better off, E will not benefit from the transaction.   QED

Proof of Proposition 4. Recall from (6) that the efficiency costs of the MR, C_{MR}, are given by

$$Prob\ (-[(n-k)/k]\Delta B < \Delta W < 0)\ E\ [-\Delta W|-[(n-k)/k]\Delta B < \Delta W < 0] +$$

$$Prob\ (0 < \Delta W < -[(n-k)/k]\Delta B)\ E\ [\Delta W|0 < \Delta W < -[(n-k)/k]\Delta B].$$

As $max|\Delta B|$ approaches 0 (that is, B_n approaches B_e), the values of both terms in this expression — and hence C_{MR} — all approach 0.   QED

Proof of Proposition 5. The proof is in two steps. First, it will be shown that, given the assumption of symmetry, the efficiency costs from efficient transfers blocked under the MR are less than half of the efficiency costs of the EOR.

Recall from (6) that the efficiency costs from efficient transfers blocked under the MR, which we denote below by $C_{MR}(eff)$, are given by

$$Prob\ (0 < \Delta W < [(n-k)/k](B_e - B_n)\ E\ [\Delta W|0 < \Delta W < [(n-k)/k](B_e - B_n)].$$

Recall from (11) that the efficiency costs of the EOR, C_{EOR}, are given by

$$Prob\ (0 < \Delta W < [(n-k)/k]B_n)\ E\ [\Delta W|0 < \Delta W < [(n-k)/k]B_n].$$

The assumption of symmetry implies that $Prob\ (B_e > B_n) = 1/2$ and that $Prob\ (0 \le \Delta W \le [(n-k)/k](B_e-B_n)) = Prob\ (B_e > B_n)\ Prob\ (0 \le \Delta W \le [(n-k)/k](B_e-B_n)|B_e > B_n)$. From this it follows that

$$(A1) \qquad Prob\left(0 \le \Delta W < \left(\frac{n-k}{k}\right)(B_e - B_n)\right) = \frac{1}{2} Prob\left(0 \le \Delta W \le \left(\frac{n-k}{k}\right)(B_e - B_n) \mid (B_e > B_n)\right).$$

32

Since $Prob\ (0 < \Delta W < [(n\text{-}k)/k](B_e\text{-}B_w)|(B_e > B_w)) < Prob\ (0 < \Delta W < [(n\text{-}k)/k]B_e)$, and $E\ [\Delta W|0 < \Delta W < [(n\text{-}k)/k](B_e\text{-}B_w)] < E\ [\Delta W|0 < \Delta W < [(n\text{-}k)/k]B_e]$, it follows from (A1) that

(A2) $$C_{MR}(\mathit{eff}) < \frac{1}{2}\ C_{EOR}\ .$$

The second step in the proof is to show that the efficiency costs from inefficient transfers taking place under the MR, which we denote by $C_{MR}(\mathit{ineff})$, equal $C_{MR}(\mathit{eff})$. From (6), recall that $C_{MR}(\mathit{ineff}) = Prob\ (\text{-}[(n\text{-}k)/k]\Delta B < \Delta W < 0)\ E\ [\text{-}\Delta W|\text{-}[(n\text{-}k)/k]\Delta B < \Delta W < 0]$.

The assumed conditions of symmetry of ΔB and ΔW imply that $Prob\ (\text{-}[(n\text{-}k)/k]\Delta B < \Delta W < 0) = Prob\ (0 < \Delta W < \text{-}[(n\text{-}k)/k]\Delta B)$, and that $E\ [\text{-}\Delta W|\text{-}(n\text{-}k)/k]\Delta B < \Delta W < 0] = E\ [\Delta W|0 < \Delta W < \text{-}\ [(n\text{-}k)/k]\Delta B]$. From this it follows that

(A3) $$C_{MR}(\mathit{ineff}) = Prob\left(0 < \Delta W < -\left(\frac{n-k}{k}\right)\Delta B\right)E\left[\Delta W\,|\,0 \le \Delta W < -\left(\frac{n-k}{k}\right)\Delta B\right] = C_{MR}(\mathit{eff}).$$

From (A2) and (A3), it follows that $C_{MR} = C_{MR}(\mathit{eff}) + C_{MR}(\mathit{ineff}) < C_{EOR}.$ QED

Proof of Proposition 6. Let us use the same notation as in the proof of proposition 5. Given that ΔW is distributed symmetrically around zero, we have

(A4)
$$C_{MR}(\mathit{ineff}) = Prob\left(0 < -\Delta W < \left(\frac{n-k}{k}\right)\Delta B\right)E\left(-\Delta W\,|\,0 < -\Delta W < \left(\frac{n-k}{k}\right)\Delta B\right) =$$
$$= Prob\left(0 < \Delta W < \left(\frac{n-k}{k}\right)\Delta B\right)E\left(\Delta W\,|\,0 < \Delta W < \left(\frac{n-k}{k}\right)\Delta B\right).$$

(A5) $$C_{MR}(\mathit{eff}) + C_{MR}(\mathit{ineff}) = Prob\left(0 < \Delta W < \left|\left(\frac{n-k}{k}\right)\Delta B\right|\right)E\left(\Delta W\,|\,0 < \Delta W < \left|\left(\frac{n-k}{k}\right)\Delta B\right|\right).$$

Therefore, assuming that the distribution of $|\Delta B|$ is stochastically dominated by the distribution of B_e, comparing (A5) with C_{EOR} (as given by (11)) indicates that $C_{MR}(\mathit{eff}) + C_{MR}(\mathit{ineff}) < C_{EOR}.$ QED

Proof of Proposition 7. In the uniform distribution case described in the text, using the same notation as in the proofs of propositions 4 and 5, it can be calculated that

(A6) $$C_{EOR} = \int_0^{\left(\frac{n-k}{k}B_e\right)} \Delta W\left(\frac{\theta_w}{w}\right)d\,\Delta W = \left(\frac{\theta_w}{2w}\right)\left(\frac{n-k}{k}\right)^2 B_e^2.$$

33

$$\text{(A7)} \qquad C_{MR}(\textit{eff}) = \int_{-b}^{0} \int_{0}^{\left(\frac{n-k}{k}\right)\Delta B} \Delta W \left(\frac{\theta_W}{w}\right) \left(\frac{1-\theta_B}{b}\right) d\Delta W d\Delta B = \left(\frac{(1-\theta_B)\theta_W}{6w}\right) \left(\frac{n-k}{k}\right)^2 b^2$$

$$\text{(A8)} \qquad C_{MR}(\textit{ineff}) = \int_{0}^{b} \int_{\left(\frac{n-k}{k}\right)\Delta B}^{0} (-\Delta W) \left(\frac{1-\theta_W}{w}\right) \left(\frac{\theta_B}{b}\right) d\Delta W d\Delta B = \left(\frac{(1-\theta_W)\theta_B}{6w}\right) \left(\frac{n-k}{k}\right)^2 b^2.$$

Since, by assumption, $b < B_a$, it follows that a sufficient condition for $C_{MR} < C_{EOR}$ is that

If $\theta_W = \theta_B$, (A11) is satisfied. Indeed, if $\theta_W = \theta_B$, then $C_{MR} < (2/3)(1-\theta_W)C_{EOR}$.   QED

$$\text{(A9)} \qquad C_{MR} = C_{MR}(\textit{eff}) + C_{MR}(\textit{ineff}) = \left[(1-\theta_B)\theta_W + (1-\theta_W)\theta_B\right] \left(\frac{n-k}{k}\right)^2 \left(\frac{b^2}{6w}\right).$$

$$\text{(A10)} \qquad (1-\theta_B)\theta_W + (1-\theta_W)\theta_B < 3\theta_W , \quad or$$

$$\text{(A11)} \qquad \theta_W > \left(\frac{\theta_B}{2(1+\theta_B)}\right).$$

Proof of Proposition 8. From propositions 1, 2, and 3, it follows that the circumstances in which transfers occur under the EOR constitute a subset of the circumstances in which transfers occur under the MR. Thus, to prove the proposition, it is sufficient to show that, in those cases in which transfers occur under both rules, N's expected profit is smaller under the EOR. To examine this expected profit, we need to focus on N's profit when N is the side making the take-it-or-leave-it offer (which will happen with probability θ). Under the MR, when N is the one making the offer, N will offer E slightly above $W_a + [(n-k)/k]B_a$, and the minority shareholders will get a per share value of $(W_a - B_a)$. Thus, under the MR, N's expected profit will be

$$\text{(A13)} \qquad \theta E \left\{ n W_a - k \left(W_a + [(n-k)/k]B_a \right) - (n-k)(W_a - B_a) \right\}.$$

Under the EOR, when N is the one making the offer, N will set the price so that E will get slightly above $W_a + [(n-k)/k]B_a$, and the minority shareholders will be able to choose between getting the same per share value as E and getting $(W_a - B_a)$. Thus, N's expected profit will be

(A14)
$$\theta E\left\{ nW_n - k\left(W_\bullet + [(n-k)/k]B_\bullet\right) - (n-k)\max\left(W_\bullet + [(n-k)/k]B_\bullet, W_n - B_n\right)\right\}.$$

Given that transactions transferring control to a buyer with characteristics such that $W_n - B_n < W_\bullet + [(n-k)/k]B_\bullet$ are possible, (A14) is greater than (A13). QED

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