THE CONTEST OF CORPORATE CONTROL UNDER LAB

BY

JIN XU

A Thesis Presented to
The Hong Kong University of Science and Technology
In Partial Fulfillment
of the Requirements for
the Degree of Master of Philosophy
in Economics

Hong Kong, August 2000

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BY

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Department of Economics

18 August 2000
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ABSTRACT

This thesis first introduces the concept of Liquidation after Buy (LAB), then revisit some corporate issues under the LAB, which are paid little attention in the literature. Those issues include the efficiency of transfer of controls under different take-over rules such as the Market Rule and the Equal Opportunity Rule, the safe level of debt, the protection of the minority shareholders and so on. We also give an explanation why debtholders are rarely given voting rights before a firm’s default. The optimal ownership structure under LAB is also discussed.
CHAPTER 1

INTRODUCTION

Many researches have been done on take-overs, such as the efficient sales of corporate control (Bebchuk 1994), capital structure and the market for corporate control (Israel 1991), and almost all of them only consider the situation where the raider has the ability or intend to get enough cash flow such that the target firm will not be default after the take-over. This Liquidation-After-Buy (LAB) situation, however, is possible and not rare in reality. In chapter 3, we will give an example to illustrate its possibility.

Many conclusions obtained previously excluding the liquidation-after-buy (LAB) situation will be very different if we take it into account. For example, Bebchuk (1994) showed that no inefficient take-overs would happen under the Equal Opportunity Rule. But under the LAB, we will show that inefficient take-overs may occur when some conditions are met.

In this thesis, four issues under LAB will be addressed. One is the efficiency of the sales of corporate control. The second is the protection of investors, such as the safe level of lending for a creditor. The third is the optimal ownership structure under LAB. The fourth is the voting rights and debtholders.

1.1 Sales of corporate control: efficiency issues

The economic significance of transactions that transfer corporate control is now widely recognized. There are many ways to transfer corporate control, e.g., through a scheme of arrangement with the existing controller, or take-over bids (or tender offers). Many researches have been done on the efficiency of transfer of corporate controls, but little attention has been paid on the situation where
the LAB is possible. In this thesis, we first introduce the two take-over rules—the Market Rule (MR) and the Equal Opportunity Rule (EOR), then give the sufficient and necessary conditions where the transfer of controls can happen under the LAB, finally the efficiency of the transfer is researched.

1.2 Protection of investors

Many securities markets claim that to protect the minority shareholders is one of their main concerns. Under the LAB and MR, the minority shareholders will suffer losses. And due to the default, debtholders will also be painful. This raises an issue of how to protect investors and the tradeoff between the protection of investors and the social efficiency. We will show the safe level of lending for a creditor and the safe level of investments for minority shareholders under the LAB.

1.3 Debtholders and Voting Rights

Debtholders are rarely given control rights before the default of the firm. That is, bundling the voting rights and the fixed cash claims is rare. We will give an explanation of that in this thesis by showing that the probability of LAB is the highest and the social losses are also highest under this situation.

This thesis is organized as follows. Chapter 2 will briefly describe some terms and expressions that will frequently used in this thesis. In Chapter 3 we provide an example of LAB. In chapter 4, a summary and overview of our results are illustrated. This chapter is designed to give the general flavor of our analysis, using numerical examples only. It can be skipped by those who are comfortable with the more formal analysis. Chapter 4 describes the model. Chapter 5 concludes this thesis.
CHAPTER 2

DESCRIPTIONS OF KEY EXPRESSIONS

In this chapter, we will briefly describe some concepts we will frequently use in this thesis.

2.1 General aspects of take over

A take-over bid or a take-over offer is generally understood to mean an offer made to the existing shareholders of a company to acquire their shares for a consideration in cash or securities, or for a consideration involving a combination of both. Perhaps the most succinct definition of a 'take-over' is that of Weinberg & Blank who define it as a transaction or a series of transactions whereby a person (individual, group of individuals or company) acquires control over the assets of a company either directly by becoming the owner of those assets, or indirectly by obtaining control of the management of the company\(^1\). Weinberg’s definition straddles both share and asset acquisitions. As this thesis considers only acquisition of shares, a reference to a take-over should be construed as a reference to a transaction or a series of transactions whereby a person (individual, group of individuals or company) acquires control over the assets of a company indirectly by obtaining control of the management of the company.

In a closely held company, the take-over will usually be effected by a share acquisition agreement between the acquirer and the controllers of the company to be acquired (the 'target company'). In a widely held company, the take-over may be effected in three possible ways—(1) by a share acquisition agreement between the acquirer and the controllers of the target company; or (2) by market purchases

\(^1\)Weinberg & Blank, para 1-003.
if there is a market for the shares in the target company; or (3) by means of a take-over bid, which is defined as an offer to acquire shares of a company, whose shares are not closely held, addressed to the general body of shareholders with a view to obtaining at least sufficient shares to give the offeror voting control of the company. In this thesis, I mainly consider (1) and (3). That is, a take-over is effected by means of either a take-over bid or a scheme of arrangement.

The term 'tender offer' or 'exchange offer' is also widely used. A reference to a tender offer is a reference to a take-over which is effected by cash, whilst a reference to an exchange offer is a reference to a take-over effected by a share-for-share exchange which may include cash, either in combination with shares or as an alternative. In this thesis, we only consider 'tender offer'.

The term 'control' appears frequently in this thesis and therefore needs amplification. There are different types of control that may be sought by a person intending to acquire the target company through the take-over bid. Control may be classified into five categories:

1. Management control in the form of control over the process of appointing proxies. Control of the proxy machine confers certain tactical advantages on the management. In any battle, the management is in a position to strike the first blow and their solicitation of proxy votes is likely to meet with a substantial response before the opposition is able to marshall its resources.

2. Effective control which involves control exercised through holding a block of shares which, in a widely held company, enables control to be effectively maintained by a combination of the voting power conferred by the block of shares, the general apathy of shareholders and the advantage conferred by control of the instruments by which proxies are appointed.

3. Majority control which involves ownership and control of more than 50% of the voting rights exercisable at a general meeting.

4. Super majority control which involves ownership and control of 75% or more of the voting rights exercisable in a general meeting. This is sufficient
to pass special resolutions which are required for important constitutional changes.

5. complete control which involves ownership and control of the entire issued share capital of a company.

Naturally, the above classification is different in different countries. In this thesis, we refer control to 'de facto control', which is an ability in practice to control the affairs of a company. We also assume that a holding of 50% or more of the voting rights of a company is sufficient to gain de facto control.

2.2 Market rule and equal opportunity rule

In this thesis, an important issue, among other things, of take-over is given much consideration. This issue is whether the offeror should (or can) make the offer to the general body of shareholders of the target company, or to approach only the controllers of the target company with a view to acquiring their shares. The former is called unrestricted (general) offer, while the latter restricted (partial) offer.

To acquire the control of an existing company, partial offers are sometimes nearly impossible since many countries' Codes on Take-overs and Mergers have the equal opportunity rule (EOR). This rule generally states that all shareholders of the same class of an offeree company shall be treated similarly by an offeror. Thus, whenever a shareholder sells a controlling block of shares, every holder of shares of the same class is entitled to have an equal opportunity to sell his shares on substantially the same terms. Thus, when an offeror acquires a holding or aggregate holdings, of shares carrying a threshold percentage or more of the voting rights of a company, irrespective of whether that holding, or holdings, gives de facto control, she is obliged to make a general(unrestricted) offer for the shares of all the other holders of the class or classes of voting share capital owned by her. This threshold trigger is 35% in Hong Kong, 25% in Singapore, and 30% in United Kingdom. Therefore, a strict regime is often imposed for partial offers.
However, in some countries, such as the United States, the controller of the offeree company 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 rule is called *market rule*, which essentially governs sale-of-control transactions in the United States (Elhauge 1992).

Under the EOR, there are actually two versions. 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 offers are not possible unless the minority shareholders choose not to tender all of their shares to the buyer. A second version the EOR, 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), Javanes (1965), and Easterbrook and Fischel (1982)). In this thesis, we will give an analysis about both versions.

In this thesis, we will see why this equal opportunity rule is very important, especially, to protect the minority shareholders.
CHAPTER 3

THE EXISTENCE OF LAB

3.1 Introduction

There are many kinds of take-overs. When people consider the take-overs, they often only think of the situation where the existence of the target firm has the positive gain to the raider. Thus after the take-over, the raider will let the acquired firm continue to operate, then enjoy both the returns ascribed to his cash claims and the private benefits from the control. A special case, where the existence of the target firm is greatly harmful to the raider's existing firm is paid little attention but not rare in reality. When the cost of the takeover exceeds the losses due to the existence of the target firm, the raider will be very glad to acquire it and then liquidate it, thus making himself better off.

A recent example of LAB can be found in The Denver Post on November 27, 1999. The Writer Corp. was a Colorado homebuilder with a storied history, but it's stock has been stagnant in the past five years, trading in the $1 to $3 range, apparently undervalued. A business group that controlled 10 percent of the company's stock was unhappy with Writer's performance, however. They said that proposals to improve Writer Corp.'s performance, dating to 1997, had been rebuffed by company Chairman George S. Writer Jr., who controlled nearly 20 percent of the company's stock. This dissatisfied Coughlin group thus planned a hostile takeover bid at $3 per share for the control of the company. After the takeover, the Coughlin group will liquidate the firm. This is profitable since the other homebuilders who buy this firm will benefit from less competition and the book value per share of the firm was about $3. Although this transaction was finally unsuccessful but provided a potential example of LAB.

The following is an stylized example to illustrate the possibility of LAB.
3.2 An Example

Let's first describe the timeline for this model first. Suppose there is a monopoly market at date 0. The monopolist invested in a number of machines, which is used to producing products. The maintenance fees for the machines in operation are propositional to the number (suppose it's I) of machines used. And we assume that this is the only source of variable costs. There are always maintenance costs for machines, whether they are idle or in operation. Those fixed costs are denoted by C. The monopolist's production function is \( Q_m(I) = \sqrt{I} \), where I is the number of machines used and \( Q_m \) is the monopolist’s output. The demand function for the market is \( P = 1 - bQ \) (the product is a normal product, thus \( b > 0 \)), where \( P \) denotes the market price and \( Q \) denotes supply level. Now the monopolist’s problem is to maximize her profit (we ignore the fixed costs here) as follows.

\[
\max_I \pi_M = PQ_m - I = (1 - b\sqrt{I})\sqrt{I} - I
\]  \hspace{1cm} (3.1)

FOC is

\[
\frac{1}{2\sqrt{I}} - b - 1 = 0
\]  \hspace{1cm} (3.2)

Thus, we get

\[
I_M^* = \frac{1}{4(1 + b)^2}
\]  \hspace{1cm} (3.3)

The monopolist’s profit is

\[
\pi_M^* = (1 - b\sqrt{I_M^*})\sqrt{I_M^*} - I_M^* \\
= \left(1 - b\sqrt{\frac{1}{4(1 + b)^2}}\right)\sqrt{\frac{1}{4(1 + b)^2}} - \frac{1}{4(1 + b)^2} \\
= \frac{1}{4(1 + b)}
\]  \hspace{1cm} (3.4)

Now suppose at date 1 a potential entrant emerges. The controller of the entrant firm decides whether or not to enter the market. We can find later that he will
be better off if he enters. He has the same demand function $P = 1 - bQ$ and the
same form of production function $Q_e(I) = \sqrt{I}$. When setting the equilibrium of
the duopoly, we use the quantity competition equilibrium (Cournot Equilibrium).
The problem is as follows:

Given the entrant’s operation level $I_e$, the incumbent’s problem:

$$
Max_{I_i} \pi_i = (1 - b(q_i + q_e))q_i - I_i = (1 - b(\sqrt{I_i} + \sqrt{I_e}))\sqrt{I_i} - I_i \tag{3.5}
$$

FOC:

$$
\frac{2}{\sqrt{I_i}} - \frac{b\sqrt{I_i}}{2\sqrt{I_e}} - b - 1 = 0 \tag{3.6}
$$

Given the incumbent’s operation level $I_i$, the entrant has the similar problem:

$$
Max_{I_e} \pi_e = (1 - b(q_e + q_i))q_e - I_e = (1 - b(\sqrt{I_i} + \sqrt{I_e}))\sqrt{I_e} - I_e \tag{3.7}
$$

FOC:

$$
\frac{2}{\sqrt{I_i}} - \frac{b\sqrt{I_e}}{2\sqrt{I_i}} - b - 1 = 0 \tag{3.8}
$$

From (3.6) and (3.8), we can get:

$$
I_i^* = I_e^* = \frac{1}{(2 + 3b)^2} \tag{3.9}
$$

Substituting the above into either (3.5) or (3.7), we can get the profits of two
firms under the duopoly market are now

$$
\pi^*_D = \frac{1 + 2b}{(2 + 3b)^2} \tag{3.10}
$$

By comparing the above with (3.4), we can obtain the profit loss of the monopolist
as follows:

$$
\Delta \pi = \pi^*_M - \pi^*_D = \frac{b^2}{4(1 + b)(2 + 3b)^2} > 0 \tag{3.11}
$$

Suppose that the entrant firm is controlled by $E$ who has the $\alpha = 20\%$ shares of
the firm’s stocks. In order to reduce his loss caused by the entrant, the monopolist
can consider to buy the control rights of the entrant firm from E. We assume that E has no private benefits of control rights here. Then this take-over will be successful under the market rule if and only if

$$\Delta \pi > \alpha \ast \textit{the entrant firm's value}$$ \hspace{1cm} (3.12)

The entrant firm’s value is

$$V_e = P^*Q^* = (1 - b(\sqrt{I_i^*} + \sqrt{I_e^*}))\sqrt{I_e^*} = \frac{2 + b}{(2 + 3b)^2} \text{ from (3.9)}$$ \hspace{1cm} (3.13)

Then (3.12) can be

$$\frac{b^2}{4(1 + b)(2 + 3b)^2} > \frac{2 + b}{5(2 + 3b)^2}$$ \hspace{1cm} (3.14)

We solve the above equation and consider $b > 0$, we have $b > \bar{b} = 6 + 2\sqrt{11}$. Thus, when $b > \bar{b}$, the monopolist can benefit from the take-over. After the take-over, the monopolist has no incentive to keep the entrant firm still in operation since he has already owned enough machines to produce and no need to increase his machines, which will increase his fixed cost. Thus he just liquidates the entrant firm after the take-over. This is just the liquidation after buy (LAB).

In this example, after the take-over, only the monopolist and the controller E of the entrant firm will be better off, but the minority equityholders and the debtholders of the entrant firm will suffer losses. This naturally leads to a question of how to protect investors. We will discuss this issue later in this thesis.

Moreover, from (3.12), we will find that the take-over may not be successful under every situation. The ownership structure is critical on the success. For the above example, if the controller holds more than 25% shares of stocks, there will be no suitable $b$ to guarantee (3.12).

In the next chapter, we will explore a more detailed example to outline our concerns.
CHAPTER 4

NUMERICAL EXAMPLES

In the following examples, we assume that there is an entrepreneur, who later becomes the incumbent management (I), a rival for control (R), and a continuum of atomistic investors (A). And we further assume that all agents are risk neutral and that the interest rate is zero.

Initially, the entrepreneur controls the firm and has the right to undertake a profitable project that costs $C$, and this project generates a cash flow $Y_I = 220$ under current management. Suppose $C = 200$. This outlay of the investment can be financed by both equity and debt. Suppose an amount of $K$ is financed by equity and $D$ financed by debt. Suppose $K = 80$ and $D = 120$. I holds a share of 50 of $K$ and A holds 30. I assumes the control of the firm. Moreover, there are private benefits $B_i$, where $i = \{I, R\}$. Suppose $B_I = 0$ and $B_R = 80$ conditional on the firm's default\(^1\) And if default, the liquidation value $L$ of the firm is 110. R bids at the price $P = 63$ for I's shares and voting rights. Also, one-share-one-vote is assumed. The above can be summarized as the table 1.

As seen in the Table 1, the minority shareholders and the debtholders will surfer losses after the take-over, but the incumbent controller I will be better off. The social welfare pre-takeover is 20 and post-takeover is $-10$, thus this transaction is not socially efficient.

The above is carried out under the Market Rule. Now look at the Equal Opportunity Rule. Here we consider the complete acquisition version of the

\(^1\)This is reasonable under some circumstance. For example, before a firm enters a monopoly market, the monopolist has the optimal investment. Any increase in investment will leads to a decrease in profits. But when a new firm enters, the monopolist has to increase his output and decrease the price. Under some conditions, the optimal strategy is to take over the entrant and make it idle and keep its own company at its original output level. Or consider a football club acquires a main opponent club. This club will have no opponent if he just liquidate the club.
Table 1: Numerical Example 1: MR

<table>
<thead>
<tr>
<th>I</th>
<th>A</th>
<th>R</th>
<th>D</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Initial investment</td>
<td>50</td>
<td>30</td>
<td>0</td>
<td>120</td>
</tr>
<tr>
<td>2. Voting rights, no take-over (%)</td>
<td>62.5</td>
<td>37.5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3. Voting rights, take-over (%)</td>
<td>0</td>
<td>37.5</td>
<td>62.5</td>
<td>0</td>
</tr>
<tr>
<td>4. Payoff, no take-over</td>
<td>62.5</td>
<td>37.5</td>
<td>0</td>
<td>120</td>
</tr>
<tr>
<td>5. Payoff, take-over, date 0</td>
<td>63</td>
<td>0</td>
<td>-63</td>
<td>0</td>
</tr>
<tr>
<td>6. Payoff, take-over, date 1</td>
<td>0</td>
<td>0</td>
<td>80</td>
<td>110</td>
</tr>
<tr>
<td>7. Total gain, no take-over (4-1)</td>
<td>12.5</td>
<td>7.5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>8. Total gain, take-over (5+6-1)</td>
<td>13</td>
<td>-30</td>
<td>17</td>
<td>-10</td>
</tr>
</tbody>
</table>

Table 2: Numerical Example 2: EOR

<table>
<thead>
<tr>
<th>I</th>
<th>A</th>
<th>R</th>
<th>D</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Initial investment</td>
<td>50</td>
<td>30</td>
<td>0</td>
<td>120</td>
</tr>
<tr>
<td>2. Voting rights, no take-over (%)</td>
<td>62.5</td>
<td>37.5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3. Voting rights, take-over (%)</td>
<td>0</td>
<td>0</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>4. Payoff, no take-over</td>
<td>62.5</td>
<td>37.5</td>
<td>0</td>
<td>120</td>
</tr>
<tr>
<td>5. Payoff, take-over, date 0</td>
<td>63</td>
<td>38</td>
<td>-101</td>
<td>0</td>
</tr>
<tr>
<td>6. Payoff, take-over, date 1</td>
<td>0</td>
<td>0</td>
<td>80</td>
<td>110</td>
</tr>
<tr>
<td>7. Total gain, no take-over (4-1)</td>
<td>12.5</td>
<td>7.5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>8. Total gain, take-over (5+6-1)</td>
<td>13</td>
<td>8</td>
<td>-21</td>
<td>-10</td>
</tr>
</tbody>
</table>

EOR. That is, the raider must acquire all the shares of the firm. The result is shown as in the Table 2.

In this situation, the gain of the raider will be negative, thus the raider will not bid. the LAB will not happen. Thus, the results under different rules will be different. Later, We will show that under the MR, the probability of the LAB is the highest if other things being equal.

In the above examples, debtholders are always held up since the firm will be default. Debtholder may require the voting rights to protect themselves. The following example as shown in the Table 3 assumes this.

In this example, however, we can see that the raider has the highest gain. And both the incumbent controller and the minority shareholders will get losses.
Table 3: Numerical Example 3: Debtholders has control rights

<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>A</th>
<th>R</th>
<th>D</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Initial investment</td>
<td>50</td>
<td>30</td>
<td>0</td>
<td>120</td>
<td>200</td>
</tr>
<tr>
<td>2. Voting rights, no take-over (%)</td>
<td>30</td>
<td>20</td>
<td>0</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>3. Voting rights, take-over (%)</td>
<td>30</td>
<td>20</td>
<td>50</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>4. Payoff, no take-over</td>
<td>62.5</td>
<td>37.5</td>
<td>0</td>
<td>120</td>
<td>220</td>
</tr>
<tr>
<td>5. Payoff, take-over, date 0</td>
<td>0</td>
<td>0</td>
<td>-130</td>
<td>130</td>
<td>0</td>
</tr>
<tr>
<td>6. Payoff, take-over, date 1</td>
<td>0</td>
<td>0</td>
<td>190</td>
<td>0</td>
<td>190</td>
</tr>
<tr>
<td>7. Total gain, no take-over (4-1)</td>
<td>12.5</td>
<td>7.5</td>
<td>0</td>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td>8. Total gain, take-over (5+6-1)</td>
<td>-50</td>
<td>-30</td>
<td>60</td>
<td>10</td>
<td>-10</td>
</tr>
</tbody>
</table>

To make this situation never happen, they will never give the debtholders voting rights. We will discuss this issues in more details later.
CHAPTER 5

THE CONTEST OF CORPORATE CONTROL

5.1 Framework of analysis

The framework of our analysis is mainly adapted from Bebchuk (1994) and Israel (1992). Consider a publicly traded company that, in period 0, has an incumbent controlling shareholder, which we shall refer to as $I$. $I$ has the right to undertake a profitable projet that costs $C$. I can decide the firm's ownership structure and capital structure at this period. We assume that the debt level of the firm is $D$ and the interest rate is zero. In period 1 a potential new controller, which we shall refer to as $R$, emerges: $R$ may or may not acquire control from $I$. In period 2 the company operates under the management of either $I$ or $R$, whichever one ends up with control in period 1. At the end of period 2 or just after the take-over the company is liquidated, and its value is divided among its shareholders unless it is default. The proceeds from the project depend on the identity of the controlling management. At the period 2, the project returns a cash flow $Y_j$, where $j \in \{I, R\}$ is the manager's identity. We assume that the project has positive net preset value under the management of $I$—that is, $Y_I > C$. But under the management of $R$, the firm will be liquidated—that is, $Y_R = L$, which is just the LAB situation. We assume that under this situation the liqutation value of the firm is $L$ and $L < Y_I$.

The company has $n$ shares outstanding throughout these periods. The initial controller, $I$, owns a percentage $\alpha_I$ of the shares—which is assumed to give $I$ effective control—with the remaining $\alpha_A = 1 - \alpha_I$ shares dispersed among public investors (denoted as $A$). The control block may consist of a majority of the company's shares ($\alpha_I \geq 1/2$) 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". One-share-one-vote is assumed at present, and the debtholders is supposed to be unable to hold any voting rights. These assumptions will be relaxed in the next chapter. Thus when a raider acquires a firm, he will receive the same amount of dividend claims and voting rights.

Capital markets are competitive but incomplete. Competition among investors drives prices of securities to their expected value given the available information. The market is incomplete in that there are noncontractible private benefits of control, $B_j \geq 0, j \in \{I, R\}$, that accrue only to the party in control. The private benefits may include the diversion of wealth from the firm to other firms controlled by management, from ability to dilute minority rights, or as a result of increased synergies or market power. The importance of private benefits of control in modeling corporate control questions has been emphasized in the literature (see Grossman and Hart (1988), Harris and Raviv (1988b), Bebchuk (1994), Israel (1992) and so on).

To make the sequence of events more clear, we describe it again as follows. First, the entrepreneur establishes the firm and decides on the capital and ownership structures. Second, the rival arrives and considers to acquire the control of the firm. Under the Market Rule, he may make a scheme of arrangement with the existing controller $I$; under the Equal Opportunity Rule, he may make a tender offer under either the complete acquisition version or the proration version, depending on the market. Third, if a tender offer is made, the atomistic investors and the incumbent simultaneously consider whether to tender their shares to the rival. Their tendering decisions determine the winner of the contest for control. If the rival does not bid, the incumbent maintains control. Under the Market Rule, a take-over can be done by a scheme of arrangement. Fourth, production takes place, cash flows are distributed to the final holders of securities, and the firm liquidates.

Initially, the entrepreneur (the controller $I$ later) may contribute $W_0$ from his own resources to the project. The market value of equity sold to outsiders by $E_A$. 

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The entrepreneur issues debt and equity to atomistic investors in competitive capital markets. The amount raised from outsiders and the entrepreneur's own contribution finance the required investment:

\[ E_A + D + W_0 = C \]  

(5.1)

We assume that initial financing does not involve the rival. Hence, the rival has no equity in the firm. The expected cash to equityholders is defined as the expected cash flows from the project less the expected cash flows to debtholders:

\[ S_j = \begin{cases} 
Y_j - D_j & \text{if } Y_j \geq D_j \\
0 & \text{otherwise} 
\end{cases} \]  

(5.2)

Note that this is not the value of equity under management \( j \in \{I, R\} \), since equity value reflects expected premiums that may be paid by the rival to gain control. We assume that the rival acquires the firm for LAB. Since the liquidation value of the firm is less than the returned cash flow \( Y_I \) under the incumbent's management, thus \( S_R < S_I \).

Subsequent to the establishment of the firm, the rival considers submitting a tender offer or making a scheme of arrangement with the existing controller. We will discuss the details of take-overing the subsequent sections. We assume that there are no transaction costs involved in the control contest, or equivalently, these costs exist but have been subtracted from the rival's private benefits of control \( B_R \).

A transfer of control will be efficient if and only if the after-take-over social welfare \( SW^a \) is greater than the before-take-over one \( SW^b \). That is, \( SW^a > SW^b \). This is equivalent to \( V^a > V^b \), where \( V^a \) and \( V^b \) are the values of the firm after or before the take-over respectively. Thus a transfer of control will be efficiently if and only if

\[ S_R + B_R + D_R > S_I + B_I + D_I \]  

(5.3)

When analyzing the contest for control, we will use the SPNE (Subgame Perfect Nash Equilibrium). In the following sections, we will make a thorough analysis of sales of corporate control under different take-over rules, which mainly
focus on the conditions for the transfer of control and the efficiency of transfer and so on. At the end of this chapter, we will analyze the safe level of debt and the ownership structure and capital structure.

5.2 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.

5.2.1 The Outcome under the Market Rule

A control block of $\alpha_I$ shares provides the existing controller with private benefits worth $B_I$ and value qua share of $(\alpha_I S_I + B_I)/(n\alpha_I)$, while the minority shareholders $A$ have a lower per share value of $S_I/n$.

If $\alpha_I \geq 1/2$ and the bidding price per share is higher than $(\alpha_I S_I + B_I)/(n\alpha_I)$, $I$ will be glad to tender his shares. And the minority shareholders have no right to enjoy this transfer and actually they will suffer losses since $I$ will liquidate the firm after his buy. Similarly, debtholders will also get losses when the liquidation value $L$ is less than $D$.

However, if $\alpha_I < \alpha_A$, that is, $\alpha_I < 1/2$ (since $\alpha_A + \alpha_I = 1$), the situation will be different and interesting. $R$ can acquire the control either by making a scheme of arrangement with $I$ or submitting a tender offer to $A$ and $I$. The follows can illustrate why this may be feasible. Suppose the total amount $R$ should pay for the take-over is $P_R$ and the take-over is carried out at the per share price $p$. The minority shareholders $A$ would like to tender if and only if $p > (S_I/n)$. If $np < \alpha_I S_I + B_I, R$ will be better off using an unconditional tender offer than only making a scheme of arrangement with $I$. But expecting his loss, $I$ will also bid
for $I$'s shares. The following is $I$'s payoff under different situations:

$$ I \begin{cases} \text{bid at per share price } p & : & S_I + B_I - n\alpha_A p \\ \text{tender} & : & n\alpha_I p \\ \text{not tender} & : & \alpha_I S_R \end{cases} \quad (5.4) $$

When $S_I + B_I - n\alpha_A p \leq n\alpha_I p$, i.e., $p \geq (S_I + B_I)/n$, $I$ will prefer to tender; otherwise, he prefers to anti-takeover. Thus, in order to successfully acquire the firm, $R$ must bid at a higher price $p'$ than $(S_I + B_I)/n$ (from $S_I + B_I - n\alpha_A p \leq n\alpha_I p$). But at this price $p'$, $R$ would otherwise just buy $I$'s shares since his total payoff is greater by so doing than making a tender offer. That is,

$$ B_R + S_R - np' \leq B_R + S_R - (S_I + B_I) = (B_R - B_I) + (S_R - S_I) \leq (B_R - B_I) + \alpha_I (S_R - S_I) = B_R + \alpha_I S_R - (B_I + \alpha_I S_I) $$

(5.5)

where the first item in the above inequality is just the total payoff $R$ should pay if he makes a tender offer and the last item is just what he will get if he just buys $I$'s shares. Note that $\alpha_I S_R < B_I + \alpha_I S_I$, thus, if $R$ make a scheme of arrangement with $I$, $I$ will be sure to tender. Thus, no matter whether $\alpha_I$ is greater than or less $1/2$, $R$ will only buy $I$'s shares for the control of firm at the total amount larger or equal to $\alpha_I S_I + B_I$. We summarize our discussion as the following proposition.

**Proposition 1** Under the MR and LAB a transfer of control will occur if and only if

$$ B_R + \alpha_I S_R > \alpha_I S_I + B_I $$

(5.6)

*Proof of Proposition 1.* See Appendix. ■

### 5.2.2 The Efficiency Analysis

The social welfare difference after the take-over is

$$ \Delta SW = B_R + L - (S_I + B_I + D) = (B_R - (\alpha_I S_I + B_I)) + (L - (\alpha_A S_I + D)) $$

(5.7)

The above expression can be either greater than or less than zero. Thus we have the following proposition:
Proposition 2 The transfer of control under the MR and LAB can be either efficient or inefficient.

5.3 The Equal Opportunity Rule: the Complete Acquisition Version

Under the EOR, minority shareholders are entitled to participate in the sale on the same terms as the seller. This section will analyze two versions of the EOR. One version is the complete acquisition version, which 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. A second version of the EOR is 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 Andrews (1965).

5.3.1 The Outcome under the Complete Acquisition Version

Under the complete acquisition version, the raider must provide a price that everyone agrees to tender. The per share value of $I$'s stock is $(\alpha_I S_I + B_I)/(n\alpha_I)$, but for $A$, it is $S_I/n$. Considering this, we have

Proposition 3 Under the complete acquisition version of the EOR and LAB, a transfer of control will occur if and only if

$$B_R + S_R > S_I + \frac{B_I}{\alpha_I}$$

(5.8)

Proof of Proposition 3. See Appendix.
5.3.2 The Efficiency Analysis

The social welfare difference after the take-over is

\[
\Delta SW = B_R + L - (S_T + B_I + D) = (B_R - (S_T + B_I/\alpha_I)) + (L + \frac{\alpha_A B_I}{\alpha_I} - D)
\]

(5.9)

If it is not default after the take-over, then the above expression is greater than zero; otherwise, the above expression can be either greater than zero (if the liquidation value is near to the debt level) or less than zero (if the liquidation value is very low). Thus we have the following proposition:

**Proposition 4** The transfer of control under the EOR complete acquisition version and LAB can be either efficient or inefficient.

This conclusion is different from Bebchuk (1994), who claimed that under the EOR, inefficient transfers will not occur. In the above, however, we point out that inefficient transfers can occur under the EOR if we consider the LAB.

5.4 The Equal Opportunity Rule: the Proration Version

Under the Proration Version, to obtain control, the raider must acquire more than \( \beta \) percent of the equity (i.e., he must acquire \( \beta \) percent of the equity plus one share). The raider offers to buy up to a fraction \( \gamma \) of the equity at a per share price \( p \). If a fraction larger than \( \gamma \) is tendered, the raider prorates equally and acquires \( \gamma \). If a fraction smaller than \( \gamma \), but larger than \( \beta \), is tendered, the rival acquires all shares that are tendered. If a fraction less than or equal to \( \beta \) is tendered, the raider acquires no shares.

Having observed the bid, the incumbent \( I \) and the minority shareholders simultaneously make their tendering decision. This is different from the MR, where the incumbent controller makes decision first. Minority shareholders take the outcome of the contest for control as given when deciding what fraction, \( a \in [0,1] \),
of their equity to tender. The incumbent considers his influence on the outcome of the contest for control when choosing what fraction, \(x \in [0, 1]\), of his equity to tender.

Under this rule, to search for the equilibrium is very interesting. For \(I\), he has three strategies—tender, take an anti-takeover or not tender. He will take different strategy under different situation. As before, we assume that the information structure of the model is symmetric to all agents. The notion of equilibrium that we use is subgame perfect Nash equilibrium. The contest for control includes a bidding subgame, in which the raider submits a tender offer, and a tendering subgame, in which the minority shareholders and the incumbent controller simultaneously tender their shares. The above setting is mostly the same as Israel (1992), but there is a main difference. That is, we assume that this is a LAB situation. The raider will liquidate the firm just after his buy. This leads to some main differences between our conclusions. We also assume that the incumbent can make an anti-takeover if the price is not satisfied for him but for other shareholders.

5.4.1 The Tendering Subgame

Consider the best response of a typical atomistic investor to an outstanding bid \((p, \gamma)\). If the investor believes the rival will win, he must tender his shares since \(S_R \leq S_i\). Thus \(a\) is always equal to 1.

The best response of the incumbent \(I\) is totally different from that of atomistic investors. The incumbent is motivated not only by capital gains but also by the benefits of control. We can break the analysis of the incumbent’s best response into two mutually exclusive cases:

1. The raider wins for sure if all the minority shareholders would like to tender to him (i.e., \(\beta < a\alpha_A\));

2. The incumbent \(I\) is pivotal in determining the winner of the contest for control (i.e., \(a\alpha_A \leq \beta < a\alpha_A + \alpha_I\)).
In the first case, the incumbent $I$ has three strategies—tender, not tender or anti-takeover. The payoff for the three strategies is as follows:

\[
I \begin{cases} 
\text{bid at per share price } p & : S_I + B_I - n\alpha_{AP} \\
\text{tender} & : n\gamma \alpha_I p + (1 - \gamma)\alpha_I S_R \\
\text{not tender} & : \alpha_I S_R
\end{cases}
\]  
(5.10)

It follows from the above that if the following inequalities are satisfied, then the incumbent will tender.

\[
S_I + B_I - n\alpha_{AP} \leq n\gamma \alpha_I p + (1 - \gamma)\alpha_I S_R
\]  
(5.11)

\[
\alpha_I S_R \leq n\gamma \alpha_I p + (1 - \gamma)\alpha_I S_R
\]  
(5.12)

We solve the above, and can get that if $p > p_1$ (note that $S_R < S_I$), then the incumbent will intend to tender, where $p_1$ is given by

\[
p_1 = \frac{S_I + B_I - (1 - \gamma)\alpha_I S_R}{n(\alpha_A + \gamma\alpha_I)}
\]  
(5.13)

Thus, if $\beta < a\alpha_A$ (i.e., the first case), the raider wins if and only if $p \geq p_1$.

In the second case, when the incumbent is pivotal, the raider wins if the incumbent tenders his shares and he loses otherwise. The incumbent has two strategies. One is to retain his control; the other is to relinquish control. The payoffs of these two when he faces a bid ($\gamma, p$) are as follows:

\[
I \begin{cases} 
\text{not tender} & : \alpha_I S_I + B_I \\
\text{tender} & : n\gamma \alpha_I p + (1 - \gamma)\alpha_I S_R
\end{cases}
\]  
(5.14)

Thus a pivotal incumbent would like to tender if and only if he is offered at least his reservation price, $p_2$, given by

\[
p_2 = \frac{\alpha_I S_I + B_I - (1 - \gamma)\alpha_I S_R}{n\gamma\alpha_I}
\]  
(5.15)

In both of the above cases, if the incumbent is paid more than his reservation price ($p_1$ or $p_2$, note that $p_2 > p_1$), he tenders all his shares (i.e., $x = 1$).

Combining the atomistic investors' and the incumbent's best response, the following proposition characterizes all bids resulting in successful takeovers and the induced tendering subgame equilibria, $a^*$ and $x^*$. 

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Proposition 5 The winning bids and the induced tendering subgame equilibria under the EOR proration version and LAB are

1. \( a^* = x^* = 1 \), if \( p \geq p_2 \) and \( \gamma \in [\beta, 1] \);

2. \( a^* = x^* = 1 \), if \( p_2 > p \geq p_1 \), \( \gamma \in (\beta, 1] \), \( \alpha_A > \beta \).

5.4.2 The Bidding Subgame

In this subgame, the rival chooses the maximum fraction of equity he is willing to accept, \( \gamma \), and the price, \( p \), he wishes to offer. Recall that rival bids only if he wins. Thus, his payoff, \( \pi_R(p, \gamma) \), consists of the capital loss on shares purchased, and the benefits of control:

\[
\pi_R(p, \gamma) = B_R + \gamma S_R - n \gamma p. \tag{5.16}
\]

In the case where \( \alpha_A > \beta \), the raider can win by buying at the per share price \( p \geq p_1 \). Thus,

\[
\pi_R(p, \gamma) = B_R + \gamma S_R - n \gamma p \leq B_R - n \gamma p_1
\]

\[
= B_R + \gamma S_R - n \gamma \frac{S_I + B_I - (1 - \gamma)\alpha_I S_R}{n(\alpha_A + \gamma \alpha_I)}
\]

\[
= B_R - \frac{S_I + B_I - S_R}{\alpha_A + \alpha_I} \left( \text{since } \gamma \in [\beta, 1] \right) \tag{5.17}
\]

Thus the best response for the raider when \( \alpha_A > \beta \) is \((p_1, \beta)\) and he will not bid if \( B_R < \frac{\beta(S_I + B_I - S_R)}{\alpha_A + \beta \alpha_I} \).

When \( \alpha_A \leq \beta \), Proposition 5 implies that the rival must offer at least the reservation price, \( p_2 \). Thus, we have

\[
\pi_R(p, \gamma) = B_R + \gamma S_R - n \gamma p \leq B_R \gamma S_R - n \gamma p_2
\]

\[
\leq B_R + \gamma S_R - n \gamma \frac{\alpha_I S_I + B_I - (1 - \gamma)\alpha_I S_R}{n \gamma \alpha_I}
\]

\[
\leq B_R + S_R - \frac{\alpha_I S_I + B_I}{\alpha_I} \tag{5.18}
\]
Thus the best response for the raider when $\alpha_A \leq \beta$ is $(p_2, \gamma)$, $\gamma \in (\beta, 1]$, and he will not bid if $B_R < \frac{\alpha_l S_l + B_l - \alpha_l}{\alpha_l} - S_R$.

The following proposition summarizes the raider’s optimal bid.

**Proposition 6** Under the EOR proration version and LAB,

1. If $\alpha_A > \beta$, then $p^* = p_1$, $\gamma^* = \beta$ and the raider does not bid if $B_R < \frac{\beta(S_l + B_l - S_R)}{\alpha_l}$.

2. If $\alpha_A \leq \beta$, then $p^* = p_2$, $\gamma^* \in (\beta, 1]$ and the raider does not bid if $B_R < \frac{\alpha_l S_l + B_l}{\alpha_l} - S_R$.

### 5.4.3 The Efficiency Analysis

The social welfare difference after the take-over is

$$\Delta SW = B_R + L - (S_l + B_l + D) = (B_R - (S_l + B_l/\alpha_l)) + (L + \frac{\alpha_A B_l}{\alpha_l} - D)$$

(5.19)

If the firm after take-over is not default, i.e., $L > D$, then the above expression is greater than zero; otherwise, the above expression can be either greater than or less than zero. Thus we have the following proposition:

**Proposition 7** The transfer of control under the EOR proration acquisition version and LAB can be either efficient or inefficient.

### 5.5 The Comparison between Rules

We rewrite the lower bound of $B_R$ for a successful takeover as follows:

\[
\begin{cases}
\text{MR} & : B_R > \alpha_I (S_I - S_R) + B_I \\
\text{EOR, complete} & : B_R > S_l - S_R + \frac{B_l}{\alpha_l} \\
\text{EOR, proration, } \alpha_A > \beta & : B_R > \frac{\beta(S_l + B_l - S_R)}{\alpha_l} \\
\text{EOR, proration, } \alpha_A \leq \beta & : B_R > \frac{\alpha_l S_l + B_l}{\alpha_l} - S_R
\end{cases}
\]
Denote $\Delta S = S_I - S_R$. It can be shown that
\begin{align*}
\Delta S + \frac{B_I}{\alpha_I} &> \alpha_I \Delta S + B_I \\
\Delta S + \frac{B_I}{\alpha_I} &> \frac{\beta(\Delta S + B_I)}{\alpha_A + \beta \alpha_I}
\end{align*}
Thus, suppose $x = \{\text{LAB under the MR}\}, \ y = \{\text{LAB under the EOR complete acquisition version}\}, \ z = \{\text{LAB under the EOR proration version} \ (\alpha_A > \beta)\}, \ w = \text{LAB under the EOR proration version} \ (\alpha_A \leq \beta)$, then we have
\begin{equation}
Prob(x) > Prob(y) = Prob(w) \text{ and } Prob(z) > Prob(y) = Prob(w)
\end{equation}
Since we can not determine the relationship of $\frac{\beta(\Delta S + B_I)}{\alpha_A + \beta \alpha_I}$ and $\alpha_I \Delta S + B_I$, we can not compare $Prob(x)$ with $Prob(z)$.

Summarizing the above results and the previous propositions, we have one of our main results as follows.

Lemma 1. Given one-share-one-vote rule and standard debt contract,

1. Neither MR or EOR can prevent LAB;

2. Both efficient and inefficient transfers can occur under the MR and EOR;

3. Other things equal, the probability of LAB is the lowest under the EOR complete acquisition version or proration version when the incumbent is pivotal.

Proof of Lemma 1. See Appendix. \hfill $\blacksquare$

5.6 Optimal Ownership Structure

Suppose now that the raider's private benefit is not publicly known. Only its distribution is known. Suppose $B_R \sim F(\cdot)$, where $F' > 0, F'' < 0$. And we suppose that $S_R = 0$. 

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According to the above conditions of a successful take-over, we know that the transfer of control will occur if and only if the raider's private benefit is greater than a lower bound $B_R(\alpha_I)$, which is a function of $\alpha_I$. Suppose if the transfer can occur, the deal is made at the per share price $p(\alpha_I)$, which is also a function of $\alpha_I$.

Thus the expected return of the incumbent $I$ is

$$
\Pi_I(\alpha_I) = \int_{0}^{B_R(\alpha_I)} (\alpha_I S_I + B_I) dF(B_R) + \int_{B_R(\alpha_I)}^{+\infty} n\alpha_I p(\alpha_I) dF(B_R) - (C - D)\alpha_I
$$

(5.23)

Suppose the debt level is fixed, the incumbent’s problem is to maximize the above subject to $\alpha_I \geq \beta$, which guarantees the control rights for the incumbent. By solving this problem, he can obtain the optimal ownership structure.

Now we consider the situation under the Market Rule. According to Proposition 1, only if $B_R > \alpha_I S_I + B_I$, the transfer of control will occur. Thus, $B_R(\alpha_I) = \alpha_I S_I + B_I$. Suppose if the transfer can occur, the deal is made at the Nash bargaining price. That is, after the take-over, the payoffs of incumbent controller and the raider are as follows:

$$
\pi_I = \alpha_I S_I + B_I + \frac{1}{2} (B_R - (\alpha_I S_I + B_I)) = \frac{1}{2} (\alpha_I S_I + B_I + B_R)
$$

(5.24)

$$
\pi_R = B_R + \frac{1}{2} ((\alpha_I S_I + B_I) - B_R) = \frac{1}{2} (\alpha_I S_I + B_I + B_R)
$$

(5.25)

Thus the expected return of the incumbent $I$ is

$$
\Pi_I(\alpha_I) = \int_{0}^{\alpha_I S_I + B_I} (\alpha_I S_I + B_I) dF(B_R) + \int_{\alpha_I S_I + B_I}^{+\infty} \left( \frac{\alpha_I S_I + B_I + B_R}{2} \right) dF(B_R) - (C - D)\alpha_I
$$

(5.26)

That is, the incumbent chooses $\alpha_I$ to maximize the above. For a uniform distribution of $B_R \in [0, B]$, we have the following proposition:
Proposition 8 Under the MR and LAB, if the private benefit of \( B_R \in [0, \overline{B}] \) is uniformly distributed, then the optimal ownership structure for the incumbent is to hold a fraction of \( \alpha^*_I \) of the shares, where \( \alpha^*_I \) is determined by the follows.

\[
\alpha^*_I = \begin{cases} 
\beta & \text{if } \theta < \beta \\
\theta & \text{if } \beta \leq \theta < 1 \\
1 & \text{if } 1 \leq \theta 
\end{cases}
\]  

(5.27)

where

\[
\theta = \frac{(\overline{B} - B_I)S_I - 2\overline{B}(C - D)}{S^2_I}
\]  

(5.28)

Proof of Proposition 8. See Appendix □
Table 4: The difference between equity and debt

<table>
<thead>
<tr>
<th></th>
<th>Maturity</th>
<th>Payment</th>
<th>Voting Rights</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Before Default</td>
</tr>
<tr>
<td>Debt</td>
<td>limited life</td>
<td>fixed</td>
<td>No</td>
</tr>
<tr>
<td>Equity</td>
<td>unlimited life</td>
<td>variable</td>
<td>Yes</td>
</tr>
</tbody>
</table>

CHAPTER 6

DEBT AND VOTING RIGHTS

6.1 Introduction

In the corporate governance literature, little attention has been paid to the relationship of debtholders and control rights before default. Harris and Raviv (1988b) have raised the following questions: *why are voting rights never attached to bonds even though it has never been illegal to do so?* However, in the paper, they just derived conditions under which the simple majority voting rule for electing controlling management and one share-one vote constitute a socially optimal corporate governance rule.

Fluck (1998) presented a theory of outside equity based on the control rights and the maturity design of equity. And he established that the only outside equity that investors are willing to hold in equilibrium is that with unlimited life. According to this, we can understand that if debt is attached with voting rights before default, this kind of debt is just equity. To see this, we can first look at the table 4, which illustrates the difference between debt and equity.

If debtholders are given voting rights before the default of a firm, then obviously the contracts between the debtholders and entrepreneur are not complete. Since the debtholders has control rights before the default, they will not satisfy the fixed payment if the performance of the firm is very good and will have to
reduce their payments if the performance of the firm is temporarily bad. This kind of debts are in any sense equity.

However, this kind of explanation emphasizes that the voting rights before default play an important role in the difference of debt and equity. Is there any other consideration when issuing debt and equity? The following section will show that equityholders who allow to bundle debt with control rights before default risk holding themselves up. Thus, the entrepreneur will never give the debtholders voting rights before default.

6.2 An illustration under LAB

In this section, we will give another explanation why debtholders are not given voting rights before default.

First, if a debtholder is given voting rights before default but does not gain control of the firm, those voting rights is close to meaningless to him. This is because he has no cash claims to the firm. Thus he would otherwise like to get more interests from the firm than holding the voting rights, which is equivalent to sell the voting rights if given.

Therefore, in the following, we only assume that a debtholder \( D \) has the control of the firm. We also suppose that the take-over rule is somewhat like the MR. That is, a raider can only make a scheme of arrangement with the debtholders, and others who hold voting rights are irrelevant to this transaction. Since the debtholder has the control of the firm, we assume that he can enjoy the private benefit of control, which is supposed to be equal to \( B_I \). The other assumptions are unchanged. That is, if the raider \( R \) acquire the firm, the private benefit he will enjoy is \( B_R \). The liquidation value of the firm after the take-over is \( L \), and the level of debt that the controlling debtholder hold is \( D \). Then we can have the following propositions:

**Proposition 9** Under the MR and LAB, if a debtholder has the control of the
firm, then a transfer of control can occur if and only if

\[ B_R + L > B_I + D \] (6.1)

The left-hand side is the amount that the raider can obtain, while the right-hand side is the amount the debtholder can get if there is no takeover.

We can recall that in the Chapter 5, the different conditions for a successful transfer of control under LAB under different situations have been shown as follows.

\[
\begin{align*}
\text{MR} & : B_R > \alpha_I \Delta S + B_I \\
\text{EOR, complete} & : B_R > \Delta S + \frac{B_I}{\alpha_I} \\
\text{EOR, proration, } \alpha_A > \beta & : B_R > \frac{\beta(S_I + B_I)}{\alpha_A + \beta \alpha_I} \\
\text{EOR, proration, } \alpha_A \leq \beta & : B_R > \frac{\alpha I \Delta S + B_I}{\alpha_I}
\end{align*}
\]

It can also be shown that

\[ S_I + \frac{B_I}{\alpha_I} > \frac{\beta(S_I + B_I)}{\alpha_A + \beta \alpha_I} \text{ or } \alpha_I S_I + B_I \] (6.2)

If we suppose that there is a majority rule for control, that is, \( \beta \geq \frac{1}{2} \). Then the situation that the incumbent is pivotal in the EOR proration version will not exist since \( \alpha_I \geq \frac{1}{2} \).

If we assume that the liquidation value \( L \) after the take-over is very close to the debt level \( D \), i.e., \( L \approx D \), then the condition in the Proposition 9 can be rewritten as \( B_R > B_I \). From the equations 6.3, we have,

\[ \Delta S + \frac{B_I}{\alpha_I} > \alpha_I \Delta S + B_I > B_I \] (6.3)

Thus, suppose

\[
\begin{align*}
x & : \text{LAB under the MR;} \\
y & : \text{LAB under the EOR complete acquisition version;} \\
w & : \text{LAB under the EOR proration version } (\alpha_A \leq \beta); \\
v & : \text{LAB when a debtholder is given control rights.}
\end{align*}
\]

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then we have

\[ \text{Prob}(x) > \text{Prob}(y) = \text{Prob}(w) > \text{Prob}(v) \quad (6.4) \]

Summarizing the above results and the previous propositions, we have another one of our main results as follows.

**Lemma 2** Other things equal, the probability of LAB under MR is the highest if a debtholder is given control rights before default and majority rule is assumed.

This result is intuitive. Since if the equityholders have the control rights, the raider must also buy his cash claims when biding for their voting rights, but the voting rights are the only consideration for the transfer of control from a debtholder when the difference between the liquidation value and the debt is negligible. Thus the raider will pay less than others to acquire the control rights of debtholders.

Since after the takeover, the raider will liquidate the firm, and we assume that the liquidation value will be approximately the debt level. Thus, the equityholders will surfer losses after the take-over. Therefore, equityholders, expecting the possibility of LAB, will never allow to give control rights to debtholders. This just provides one explanation of why voting rights before default are not bundled with debt.
CHAPTER 7

CONCLUSIONS

In this thesis, we have considered a situation which was paid little attention in the corporate governance literature. We call the situation liquidation-after-buy (LAB). That is, a raider will liquidate the firm after acquiring it. And the liquidation value will be equal or less than the debt level. In this situation, the raider’s motivation to take over the firm is purely his future private benefit after the take-over. In chapter 3, we first give a real example of LAB, then using a stylized model to illustrate the possibility of LAB. In the model, we point out that LAB is profitable and the best choice for the raider when some take-over rule is in effect and the percentage of the controlling incumbent is low.

Under the LAB, we consider three situations of contest of corporate control. The first situation is the Market Rule (MR), in which the bidder can make a scheme of arrangement with the incumbent controller, while other equityholders are irrelevant to the transaction. We have given a condition that a transfer of control under MR and LAB will occur and have shown that the transfer of control under MR and LAB can be efficient or inefficient, depending on the private benefits of both the raider and the incumbent. The second situation is the complete acquisition version of the Equal Opportunity Rule (EOR). In this situation, we also give a condition of a successful transfer and pointed out that both efficient and inefficient transfers can occur under this situation, which is different from Bebchuk (1994), who claimed that under the EOR, inefficient transfers will not occur. The third situation is the general situation which is discussed in the literature. It is the proration version of the EOR. Similarly, we analyze the condition under which a transfer will happen and the efficiency of transfers.

By the comparison between those three rules, we show that given one-share-one-vote rule and standard debt contract, neither MR or EOR can prevent LAB,
and both efficient and inefficient transfers can occur under the MR and EOR. Most importantly, we point out that other things equal, the probability of LAB under MR is the highest; the lowest under the EOR complete acquisition version or proration version when the incumbent is pivotal.

We also investigate the optimal ownership structure under LAB and describe the situation under MR. Under MR, we have shown that even expecting the LAB, it is possible that the incumbent may hold all the shares.

Finally, in this thesis, we has given an explanation of why voting rights before default are not bundled with debts, which has been paid little attention in the corporate governance literature. After we analyze the conditions of a transfer of control from the controlling debtholders to a raider under MR and LAB, we show that other things equal, LAB will the most probably happen when a debtholder is given the control rights before default. Thus, expecting this, equityholders will never allow to distribute control rights to debtholders before default.

In this thesis, however, many issues related to LAB are not discussed. In this thesis, we only consider the best response of the incumbent and the raider, and take the response of minority holders and debtholders as given when debtholders are not given control rights before default. And we don't include the stock market in our model, thus silent for the changes of stock prices in the thesis. And we may consider further about why debt is not bundled with voting rights before default. All of these issues are sure to draw our attention in the future.
APPENDIX A

PROOFS

Proof of Proposition 1. Consider two situations as follows:

1. $\alpha_I \geq 1/2$: the raider can gain control if and only if he can make $I$ tender his shares. Thus, the take-over will be successful if and only if $B_R > \alpha_I \Delta S + B_I$.

2. $\alpha_I < \alpha_A$: $R$ can gain control either by making a scheme of arrangement with $I$ or submitting a tender offer to both $A$ and $I$. $I$ will either tender to $R$ or make a defense, i.e., buy $A$'s shares. The following is $I$'s payoffs under different situations:

$$ I \begin{cases} 
\text{bid at per share price $p$} & : S_I + B_I - n\alpha_{AP} \\
\text{tender} & : n\alpha_I p \\
\text{not tender} & : \alpha_I S_R 
\end{cases} \quad (A.1) $$

When $S_I + B_I - n\alpha_{AP} \leq n\alpha_I p$, i.e., $p \geq (S_I + B_I)/n$, $I$ will prefer to tender; otherwise, he prefers anti-takeover. Thus, in order to successfully acquire the firm, $R$ must bid at a higher price $p'$ than $(S_I + B_I)/n$ (from $S_I + B_I - n\alpha_{AP} \leq n\alpha_I p$). But at this price $p'$, $R$ would otherwise just buy $I$'s shares since his total payoff is greater by so doing than making a tender offer. That is,

$$ B_R + S_R - np' \leq B_R + S_R - (S_I + B_I) = (B_R - B_I) + (S_R - S_I) \quad (A.2) $$

$$ \leq (B_R - B_I) + \alpha_I (S_R - S_I) = B_R + \alpha_I S_R - (B_I + \alpha_I S_I) $$

where the first item in the above inequality is just the total payoff $R$ should pay if he makes a tender offer and the last item is just what he will get if he just buys $I$'s shares. Note that $\alpha_I S_R < B_I + \alpha_I S_I$, thus, if $R$ make a scheme of arrangement with $I$, $I$ will be sure to tender. Thus, no matter whether $\alpha_I$ is greater than or less $1/2$, $R$ will only buy $I$'s shares for the control of firm at the total amount larger or equal to $\alpha_I S_I + B_I$. 

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Thus, $B_R > \alpha_I \Delta S + B_I$ is a sufficient and necessary condition for a successful transfer of control under the MR and LAB.

**Proof of Proposition 3.** The complete acquisition version of the EOR require that the raider acquire all the shares of the target firm. Thus a price that all concerned parties can accept is necessary. The per share value of I's stake is $(\alpha_I S_I + B_I)/(n\alpha_I)$; that of A's is $S_I/n$. A per share price $p$ that satisfies $p > (\alpha_I S_I + B_I)/(n\alpha_I)$ is enough to make both A and I tender. Thus if $B_R + S_R > np > S_I + B_I/\alpha_I$, a transfer of control will occur only if $B_R + S_R > S_I + B_I/\alpha_I$.

**Proof of Lemma 1.** (1) and (2) can be easily obtained from the previous propositions. By comparing the lower bound of $B_R$ for a successful take-over, we can show (3).

**Proof of Proposition 8.** If the raider's private benefit $B_R \in [0, \bar{B}]$ is uniformly distributed, then the incumbent's problem is

$$
\max_{\alpha_I} \Pi_I(\alpha_I) = \int_0^{\alpha_I S_I + B_I} \frac{\alpha_I S_I + B_I}{\bar{B}} \, dB_R
$$

$$
+ \int_{\alpha_I S_I + B_I}^{\bar{B}} \left( \frac{\alpha_I S_I + B_I + B_R}{2\bar{B}} \right) \, dB_R - (C - D)\alpha_I \quad (A.3)
$$

subject to $\beta \leq \alpha_I \leq 1$

which is equivalent to

$$
\max_{\alpha_I} \Pi_I(\alpha_I) = \frac{\alpha_I S_I + B_I}{2} + \frac{\bar{B}^2 - (\alpha_I S_I + B_I)^2}{4\bar{B}} - (C - D)\alpha_I \quad (A.4)
$$

subject to $\beta \leq \alpha_I \leq 1$

by re-arranging the items, we have

$$
\max_{\alpha_I} \Pi_I(\alpha_I) = -\frac{S_I^2}{4\bar{B}} \alpha_I^2 + \left( \frac{S_I}{2} - C + D - \frac{B_I S_I}{2\bar{B}} \right)\alpha_I + \frac{B_I}{2} + \frac{\bar{B}}{4} - \frac{B_I^2}{4\bar{B}} \quad (A.5)
$$

subject to $\beta \leq \alpha_I \leq 1$

The objective function is a concave function. Using its FOC, we can show that the function is increasing in $\alpha_I$ for $\alpha_I \leq \theta$; and increasing for $\alpha_I > \theta$, where $\theta$
is as follows.

\[
\theta = \frac{(\bar{B} - B_l)S_I - 2\bar{B}(C - D)}{S_I^2}
\]  

(A.6)

Thus, the optimal fraction of shares is as follows.

\[
\alpha^{*}_I = \begin{cases} 
\beta & \text{if } \theta < \beta \\
\theta & \text{if } \beta \leq \theta < 1 \\
1 & \text{if } 1 \leq \theta
\end{cases}
\]  

(A.7)
REFERENCES


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