



When managers cannot commit: Capital structure under inalienable managerial entrenchment

Catherine Thomas^{a,*}, Yongxiang Wang^{b,c}

^a Columbia Business School, United States

^b Marshall School of Business, University of Southern California, United States

^c CRACM, Jiangxi University of Finance and Economics, China

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ABSTRACT

When partially inalienable managerial entrenchment is introduced to Zwiebel's 1996 model of dynamic capital structure, anticipated debt renegotiation between a higher-type manager and the creditor reduces expected firm value. Only lower-type managers can issue debt to avoid shareholder takeover.

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1. Introduction

CEOs are infrequently fired for poor performance (Jensen and Murphy, 1990). While financial distress is associated with higher managerial turnover, studies show that incumbent managers often retain control of the firm even in bankruptcy.¹ In this paper, we study how inalienable managerial entrenchment – when it is costly to fire a manager even after poor performance – affects a manager's ability to issue debt prior to financial distress as a strategic commitment to avoiding investment projects generating negative returns.

Zwiebel's 1996 influential model of dynamic capital structure examines when shareholders prefer to remove competent managers *ex ante* in a setting with varying manager types and manager actions. He describes how a manager of intermediate ability can avoid takeover by issuing debt. His model assumes that a poorly performing manager will be fired by an unpaid creditor; there is no *ex ante* entrenchment when the firm is in financial distress. We focus on the subset of managers who issue debt in Zwiebel's case and show that a

firm's capital structure depends on the extent to which entrenchment is inalienable.

When entrenchment is only partly responsive to poor performance, managers whose type is above an ability cutoff cannot issue debt as a commitment to avoiding projects generating negative returns. The higher the *ex post* entrenchment cost, the lower the ability cutoff. Managers whose type is above this cutoff are immediately taken over by the shareholder, and so are unable to secure employment in either period. This leads to a non-monotonic relationship between manager type and the probability of immediate takeover.

2. The model

The firm generates a certain cash flow y from its present assets after each period in a two-period investment model. The firm's manager has the opportunity to make an investment that does not require additional financing in each period.² A bad investment project that reduces firm cash flows by r is always available. With a commonly known probability t , which measures management ability, there is also a good investment opportunity in each period. A good project, if available, generates additional cash flows of r for the firm.

² As in Zwiebel, all participants are risk-neutral and the interest rate is zero. We have used Zwiebel's notation throughout.

* Corresponding author. Columbia Business School, Uris Hall 605B, 3022 Broadway, New York, NY 10027, United States. Tel.: +1 212 854 5957; fax: +1 212 316-9219.

E-mail address: cmt2122@columbia.edu (C. Thomas).

¹ Hotchkiss et al. (2008) survey this literature. Chapter 11 of the US Bankruptcy code has been criticized, for example by Aghion et al. (1992), for favoring incumbent managers.

The manager obtains private benefits A from running the firm in each period and extra benefits of $B > 0$ whenever a new project is undertaken. The manager can be replaced by the shareholders prior to any investment choice at a cost e , which we define as ex ante entrenchment costs. Following poor performance – a bad investment project – the ex post entrenchment costs are given by l . Hence, the magnitude of l relative to e summarizes how managerial entrenchment responds to managerial performance.³ If the manager is replaced, the firm generates cash flow y under the new management team, which has no access to either type of project.

In each period, the manager first chooses a capital structure optimally to maximize his own total benefits; then a raider may attempt a takeover with a cost of e , replacing the manager. The availability of a good project is learned. The investment decision is made by the manager; returns are realized and any debt is repaid or bankruptcy occurs, in which case the creditor may choose to replace the manager, incurring a cost of l . The rest of this section presents the subgame perfect equilibrium to the two-period game for managers of different abilities in the presence of both ex ante and ex post entrenchment costs.⁴

As in Zwiebel's Proposition 1 (i), the firm will be taken over at the start of the first period for managers of a very low type $t < \underline{t} = \frac{1}{2} - \frac{e/r}{2}$. As in part (iii), managers of the highest type, $t > \bar{t} = \frac{1}{2} - \frac{e/r}{4}$, retain their jobs in all periods. Intermediate ability managers with $\underline{t} < t < \bar{t}$ would not be removed by the shareholder at the start of the second period if they survived to that point, since $y + tr - (1-t)r \geq y - e$ for any $t \in [\underline{t}, \bar{t}]$. Will these managers be taken over at the start of the first period? If the raider takes over the firm at the start of period 1, the firm's value is $2y - e$; if the raider does not instigate a takeover, the firm's expected value is $2(y + tr - (1-t)r)$ unless the manager can credibly commit to not taking on a bad project in the first period. In the absence of any such commitment, the manager will be removed in the first period since $2y - e > 2(y + tr - (1-t)r)$ for all t in this range.

In Zwiebel, all intermediate type managers can issue debt strategically in the first period. Suppose that the manager issues debt D_1 with $y - r < D_1 \leq y$ at the beginning of the first period. Taking on a bad project in that period would cause the firm to go bankrupt before the second period investment is made, since $y - r < D_1$. The manager would rather forgo the private benefits of taking on a project in the first period in order to avoid bankruptcy and keep his job, gaining the private benefits of running the firm and taking on a new project in period 2. The raider no longer finds it optimal to instigate a takeover at the start of period 1 since the expected firm value with debt D_1 is $y + tr + [y + tr - (1-t)r]$, which is greater than the expected value from a takeover, $2y - e$, when $\underline{t} \leq t \leq \bar{t}$. This establishes his Proposition 1 (ii).

Suppose now that the creditor must pay l to remove the manager at the end of the first period after a bad project. If the manager issues debt D_1 with $y - r < D_1 \leq y$ in the first period and then proceeds with a bad project, a subset of manager types can successfully negotiate with the creditor and remain in place for the next period. Whether the debt contract can be renegotiated for managers in this intermediate range depends on t and the relative magnitudes of ex ante and ex post managerial entrenchment.

Proposition 1. For all $t \in [\underline{t}, \bar{t}]$, when $l \leq \frac{e}{2}$, the manager can issue debt D_1 where $D_1 \in (y - r, y)$ at the start of the first period as a credible commitment to avoid a bad project in this period.

³ Unlike Shleifer and Vishny (1989), managers cannot choose projects that directly affect the extent of entrenchment.

⁴ A two-period investment model allows us to illustrate the key result of the non-monotonic relationship between manager type and takeover in a relatively simple setting. The model and central result generalize to the three-period model in Zwiebel (1996). One additional result is that some relatively high-ability agents unable to avoid takeover in a two-period setting can issue two-period debt at the start of the first period to credibly commit to not take on a bad project in the first period. This narrows the range of the relatively high-ability managers who are taken over at the start of the game.

When $l \leq e/2$, the debt holder prefers to incur the cost of firing a poorly performing manager, gaining access to the cash flow y generated in the second period. The incentives of the manager and the debt holder are no longer aligned at the end of the first period after a bad project. Anticipating this deterministic firing decision by the creditor, the rational manager avoids taking on a bad project during period 1 since he prefers to keep running the firm.⁵ Since the manager can commit to avoiding a bad project, neither takeover nor bankruptcy would happen in this case.

Proposition 2. For all $t \in [\underline{t}, \bar{t}]$, when $l \geq e$, the raider will take over the firm before the first period. In this case, there is no optimal capital structure.

The ex ante entrenchment cost is high enough that the creditor will not want to fire the manager even if he has invested in a bad project in the first period. The manager and creditor want to renegotiate the debt, and hence the manager will take on any project in period 1. For t in this intermediate range, anticipating that debt will not serve as a disciplining device, the raider takes over the firm before the first period investment.

Proposition 3. When $e/2 < l < e$, only managers of type $t \in [\underline{t}, (\frac{1}{2} - \frac{l/r}{2})]$ can avoid takeover at the start of the first period by issuing debt since the debt contract is robust to renegotiation. Managers with $t \in [(\frac{1}{2} - \frac{l/r}{2}), \bar{t}]$ – the relatively high-ability managers in the intermediate type range – cannot commit not to take a bad project in the first period and thus will be removed by the raider before the first period investment is made.

Proof. Let $e/2 < l < e$ and $t \in [\underline{t}, \bar{t}]$. The difference in creditor payoff from firing the manager after a bad project in period 1 and the payoff from leaving the manager in place for period 2 is $\Delta M \equiv \{(y - r) + [y - l]\} - \{(y - r) + [y + tr - (1-t)r]\}$.

When $\Delta M \geq 0$, i.e., when $t \in [\underline{t}, (\frac{1}{2} - \frac{l/r}{2})]$, it is optimal for the creditor to fire the manager after he takes a bad project in period 1 (and hence bankrupts the firm). Issuing debt of D_1 with $D_1 \in (y - r, y)$ at the start of the first period is a credible commitment to avoid a bad project in period 1 for these managers.

When $\Delta M < 0$, i.e., when $t \in [(\frac{1}{2} - \frac{l/r}{2}), \bar{t}]$, the creditor prefers to let the manager continue operating the firm in period 2 after the manager has undertaken a bad project. Since there is no prospect of termination, the manager is not deterred from taking on a bad project in period 1. Anticipating this, the raider will intervene and remove the manager before he can make any investment. □

In Zwiebel's model, the probability that a firm is taken over at the start of the first period is decreasing with t , the ability of the manager. With ex post entrenchment costs l where $e/2 < l < e$, this monotonicity disappears: When the manager's ability is very low ($t < \underline{t}$), the firm is taken over; when the manager's ability is $t \in [\underline{t}, (\frac{1}{2} - \frac{l/r}{2})]$, the firm is protected from takeover; when the manager's ability is $t \in [(\frac{1}{2} - \frac{l/r}{2}), \bar{t}]$, the firm is again taken over; and when $t > \bar{t}$, there is no takeover.

3. Conclusion

This letter introduces partial inalienable entrenchment to a variant of Zwiebel's 1996 model. Entrenchment following poor performance means creditors do not find it optimal to include a covenant restricting future debt into initial debt contracts. Only relatively low ability managers are able to use debt as a commitment to invest solely in efficient investment opportunities.

⁵ The total benefit for the manager if he continues is $2A + (1+t)B$, always greater than the $A + B$ he gains if he is replaced before period 2.

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