BANKRUPTCY RULES, MANAGERIAL
ENTRENCHMENT, AND
FIRM-SPECIFIC HUMAN CAPITAL

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ABSTRACT

Bankruptcy rules often enable equityholders to obtain value even though debtholders are not paid in full. This paper addresses the ex ante effects of violations of absolute priority. These violations should influence decisions concerning project choice and human capital investment that determine the extent to which a firm's managers have an advantage over others in operating the firm's assets. In an absolute priority regime, managers will "entrench" themselves by overinvestment in assets that require their unique skills. Managers will also underinvest in firm-specific human capital. Allowing ex post violations of absolute priority decreases the severity of these two problems.

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Lucian Arye Bebchuk and Randal C. Picker[*]

I. INTRODUCTION

Bankruptcy rules—and especially the rules governing corporate reorganizations—often enable the equityholders of an insolvent company to obtain some value even though the debtholders are not paid in full. Given the minimal requirements for invoking the protection of the Bankruptcy Code, one way in which the equityholders can extract value is by putting (or threatening to put) the firm into Chapter 11. In Chapter 11, equityholders have the power to prevent or delay confirmation of a plan of reorganization. The procedural rights and powers conferred on equityholders by the Bankruptcy Code—such as the automatic stay[1] and the exclusive period[2]—should enable equityholders to extract value from debtholders.[3] Although the out-of-bankruptcy priority structure—very roughly, secured debt before unsecured debt before equity—is respected in bankruptcy *de jure,* we can expect that it will be violated *de facto.*

And it in fact is. The available empirical evidence demonstrates that "absolute priority" is routinely violated. The extent of the deviations from absolute priority may vary from study to study, but their direction is clear.[4] The existence of these deviations have led to proposals calling for a substantial overhaul of the current Chapter 11 in the hope of restoring an absolute priority regime.[5] Yet, the question arises whether the observed violations of absolute priority are indeed undesirable. Because these ex post deviations are by now largely anticipated, they may well be reflected in the terms under which credit is extended, and thus may not compromise the interests of the creditors. Clearly, to determine whether these

[1] 11 U.S.C. § 362.

[2] 11 U.S.C. § 1121.

[3] For a detailed analysis of the factors that enable shareholders to extract value, see Bergman and Callen (1991), Baird and Picker (1991) and Bebchuk and Chang (1992).

[4] See Francks and Torous (1989), Eberhart, Moore and Roenfeldt (1990), LoPucki and Whitford (1990) and Weiss (1990). This work is summarized and extended in White (1992b).

[5] Baird (1986), (1992) and Jackson (1986, p.218-24) suggest replacing Chapter 11 with auctions; Bebchuk (1988) suggests that participants in a reorganization receive certain options that would ensure absolute priority. See also Bradley and Rosenzweig (1991) and Aghion, Hart and Moore (1992), which build on Bebchuk (1988).

deviations are undesirable, it is necessary to identify their ex ante effects—that is, to analyze how parties alter their behavior ex ante in light of the ex post anticipated deviations. Some work has recently pursued this line.[6]

In this article, we seek to contribute to this inquiry by analyzing an ex ante effect that has not thus far been considered in the literature: the way violations from absolute priority may influence the degree of manager-specificity that the assets of the firm may have. By manager-specificity, we mean the degree to which the assets of the firm require certain skills unique to the firm's current managers. These skills allow the managers to employ the assets more effectively than other managers could. Manager-specificity, in turn, will be determined by the initial choice of the firm's assets and also by the manager's decision to invest in human capital. For given managerial human capital, some projects will make better use of that capital than others. Similarly, for a given project, investment in specific human capital would increase the advantage of the existing managers over others in operating the assets. Each decision—selection of the firm's projects and selection of managerial human capital—influences the extent of manager-specificity of assets. And these decisions, in turn, may be influenced by the degree to which absolute priority is respected, so long as investment decisions are not fully contractible.

To examine the effects of ex post extraction on these two ex ante decisions, we contrast two legal regimes. In the first, which we will label the absolute priority regime, priority is respected: Equity receives value only after creditors are paid in full. In contrast, in our second regime, which we label the extraction regime, we assume that equity has the power to extract a given fraction of the value available for distribution, even if that violates absolute priority. Our extraction regime corresponds most naturally with the current Chapter 11, as deviations from priority are associated with it. Our absolute priority regime might track the Bankruptcy Code's Chapter 7 if it stood alone or those reforms of Chapter 11 that would ensure absolute priority.

To facilitate our analysis, we assume that there is a single equityholder-manager. Accordingly, we will use the term manager and equityholder interchangeably. Our assumption is obviously most appropriate for closely-held companies. Fortunately—for both the relevance of our analysis and perhaps for the overall health of the economy—bankruptcy cases involving public corporations are exceedingly rare.[7] More generally, even large cases—say, cases involving more than $100 million in assets—make up less than 2% of the cases in which Chapter 11 plans are confirmed. (See Flynn (1989).) And this overstates the presence of large cases, as the probability of confirmation appears to be positively correlated with asset size. (See Flynn (1989).) Bankruptcy cases involving closely-held companies are therefore of substantial importance, and our model should match those cases quite closely. In our concluding section, Section IV, we suggest reasons why the type of effects that we identify in our model may also be present in the case of publicly-traded companies.

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[6] See Adler (1992), Bebchuk (1991), Daigle and Maloney (1990), Gertner and Scharfstein (1991), Gertner and Picker (1992), Harris and Raviv (1992), Picker (1992) and White (1992a). None of these papers, however, has considered the type of ex ante effects on which we focus here.

[7] Bradley and Rosenzwieg (1992) put the figure at well-under 1% both before and after the enactment of the Bankruptcy Code.

To summarize our results, our analysis suggests that the extraction regime is superior to the absolute priority regime in the ways that it influences manager-specificity of assets. First, with respect to initial project choice, the extraction regime reduces the inefficient bias in favor of specific projects that is present in the absolute priority regime. Second, with respect to investment in firm-specific human capital, the extraction regime encourages such investments and moves them closer to the efficient level.

We find it easiest to discuss these effects separately. Accordingly, Section II focuses on initial project choice in a model of managerial entrenchment. Managers can choose among different projects. Some of the projects are more valuable with the current managers than they would be with outsiders (we call these "specific projects"), other projects can be managed equally well by outsiders ("general projects"). If project choice cannot be contracted, managers will seek to entrench their positions by choosing specific projects. Nonetheless, the failure regime directly influences the extent to which managers will seek to entrench themselves.

The key point to note is that even with absolute priority, it is hard to keep equityholders from sharing in the value of the project. If the general project is chosen, under absolute priority, equityholders get nothing if the project fails. If the specific project is chosen, though, they will get a fraction of the value attributable to their specific skills. The former equityholder will strike a deal with the new owners of the project and will thereby share in the project's value. The consequences of this for ex ante project choice should be clear. If the general and the specific projects have the same upside potential, equityholders will clearly prefer the specific project. In fact, the equityholders will be willing to sacrifice a general project with a higher expected value than the specific project has to ensure that they get a share of the value if the project fails.

Under the extraction regime, these same effects are at work, but they are tempered. The equityholder gets a fraction of the value of a failing project not only when the specific project is chosen but also when the general project is chosen. The extent to which the equityholders benefit by selecting the specific project is decreased. As a result, even though decisionmaking under the extraction regime still falls short of a first-best solution, it is an improvement over the absolute priority regime. To put the point differently, equityholders can entrench their positions by choosing projects that match their given skills. This phenomenon is generally recognized in healthy companies[8] but it also matters a great deal for the choice of the failure regime. Equityholders will choose projects with an eye to weakening their competition for the project if it fails. This entrenchment strategy produces a distorted preference for specific projects. Because the extraction regime allows the managers to share always in the value of a failing project, it moves the manager's project choice closer to that required for efficiency.

In Section III, we switch to considering investment in human capital by a manager. The firm has a given project for which it needs debt financing. The returns to the project depend directly on whether the manager invests in human capital. We will assume that such an investment increases the expected return. Whether the manager will invest depends, of course, on how the benefits and bur-

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[8] See Shleifer and Vishny (1989); see also Edlin and Stiglitz (199(2)).

dens of investment are borne. We will assume that the manager bears the full cost of such investments, or equivalently, that reimbursement for investment is not contractible. Given this, whether the manager will invest depends on how the manager shares in the increment as compared to the realized cost of investment. If the firm fails, the price paid for the firm will reflect, in part, whether the manager invested in human capital. If the manager did invest, a prospective earner will pay more than it would otherwise as it knows that it can garner some fraction of the extra value that will be realized when the old manager is rehired.

How this plays out depends on the applicable legal regime. In the absolute priority regime, the manager is limited to whatever share of the increment it can obtain in ex post negotiations with the firm's new owners. In the extraction regime, the manager gets that amount, plus it shares another fraction of the increment received by the creditors from the higher purchase price. Again, while in both regimes, investment will fall short of the first-best level, the extraction regime leads to higher overall welfare than the absolute priority regime. Thus, in both the entrenchment model and the human capital model, neither regime is able to achieve the first-best outcome, but the deviation from absolute priority that defines our extraction regime leads to more efficient investment.

I. MANAGERIAL ENTRENCHMENT

A.   *Framework of Analysis*

In this section, we present the model of managerial entrenchment. The equity of the firm is owned by a single equityholder-manager, an entrepreneur we will call E. This avoids problems of conflict between managers and equityholders.[9] The firm has a project that requires debt financing of D. We assume D is given exogenously and that the amount of debt financing required is given by a wealth constraint on E. We abstract from the state verification issues that might justify the form of the debt contract (see Gale and Hellwig (1985)) and instead assume that the debt contract takes on the standard form. The debt may be raised from any number of lenders.

E has a certain "unique" skills, which we will take in this section as given. (Section II will consider the issue of E's investment in human capital.) E's human capital is more critical for some projects than for others. As a result, as will be seen, E's choice of project may produce an effect of "entrenchment."

The sequence of events in the model is as follows. At $T = 0$, the firm borrows an amount $D > 0$. At $T = 1$, an investment project is chosen. Finally, at $T = 2$, the debt becomes due, and the firm's value is divided between E, as equityholder, and the debtholders. Our assumptions about each of the model's elements are described below. Let i denote the interest rate set at $T = 0$ for the period between the raising and payment of debt; that is, at $T = 2$ the firm will owe its debtholders the amount of $D(1 + i)$. Let i_0 denote the corresponding risk-free interest rate. We assume for simplicity that all participants are risk-neutral and that the lending market is competitive. Accordingly, the firm will have to offer an interest rate i such that the expected payment to the debtholders is $D(1 + i_0)$.

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[9] On the possible consequences of these issues for behavior in bankruptcy, see Rose-Ackerman (1991).

At T = 1, the firm will choose between two investment projects. The choice between the two projects is assumed to be non-verifiable and thus cannot be specified in the initial debt contract. One project is "specific" to E in that it will take advantage of E's unique skills; consequently, the specific project will be more valuable when managed by E then when managed by anyone else. In contrast, the "general" project will be one with respect to which E will not have any advantage over other potential managers.

To be more specific, at time 1, E will face two projects. The value of the firm's project at time 2 depends on the realized state. For simplicity, we assume two possible states: a bad state and a good state. We further assume that the low value of the project is realized in the bad state, the high value in the good state, and that that holds for both projects. None of this is essential to the analysis, but these assumptions allow us to present the model in streamlined fashion.

The probability of the bad state is p and of the good state 1-p. If the general project is chosen and it succeeds—meaning the good state is realized—it will have a value of G, independent of who manages the project. If the general project is chosen and it fails—the bad state is realized—it will have a value of B, again independent of who manages it. In contrast, the value of the specific project depends on who manages it and that fact is true both when the project succeeds and when it fails. If the specific project succeeds, it has a value of S when E manages it and a value of $S - \sigma$ when it is managed by the best alternative manager. If the specific project fails, it has a value of B in E's hands and $B - \delta$ in the best alternative hands. Note that if E manages the specific project, its value on failure is the same as that of the general project, but nothing turns on this assumption.

All of the values other than S—B, G, p, δ and σ—are common knowledge at time 0. S is a random variable having support $[S_1, S_2]$, with the density function f(.), and the cumulative density function F(.). We assume that $S_1 < G$ and $S_2 > G$. S is realized at time 1. The information about the distribution of S is common knowledge.

To facilitate analysis, we assume that

$$B < D(1 + i_0) \text{ and } Min\{G, S_1\} > \frac{D(1 + i_0)}{1 - p}$$ (1)

The first assumption ensures that a bad state of nature leads to insolvency at time 2, regardless of which project is chosen. The second assumption ensures that there is an interest rate i for which the debt can be raised. Weaker assumptions would suffice, but again, these simplify the analysis.[10]

To solve the model, we use backwards induction, commencing at T = 2. At that date, all of the debt becomes due and the value of the project is realized. If the value of the project at T = 2, W, is greater than D(1 + i), then the firm will be "solvent." The debtholders will get D(1 + i) and E will get the balance, or W - D(1 + i). If the project has at T = 2 a value W lower than D(1 + i), the firm will be insolvent and will go through insolvency proceedings. We simply assume that

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[10] Note that if the assumptions embodied in equation (1) fail to hold, an extraction regime may lower welfare by preventing funding of projects that should be funded.

insolvency proceedings ensue if the firm cannot pay the debt and ignore the complicated issues associated with initiating these proceedings.[11]

Our insolvency proceedings consist of two rules. The first rule establishes how much value is available for distribution to E and the lenders. The second rule divides that value among the firm's claimants. As to the first rule, we assume that the value available for division is that which will come from a sale of the project at the end of the insolvency proceedings. If the firm chooses the general project, B will be realized, as the project does not require E's unique skills. Any buyer will know that, whether it hires E or any other manager, it will not need to pay more than the competitive salary. Accordingly, with competition among buyers, the price that will be obtained in the sale is B.

If the firm chose the specific project, however, a buyer that purchases the project knows that it will have a project that is worth B with E's unique skills but only B - δ without these skills. Thus, the buyer expects that, once it purchases the project, it will face a bilateral monopoly with E over δ, and that it can expect to split δ with E. Without loss of generality, we assume that it is expected that the buyer and E will split δ evenly.[12] In sum, E can expect to be hired as a manager with a salary $\frac{1}{2}\delta$ higher than the competitive salary. A buyer will attach a value of B - $\frac{1}{2}\delta$, and, with competition among buyers, this is the price that will be obtained in the sale. Thus, if the general project is chosen and the firm fails, B will be available for distribution; if the specific project is chosen and the firm fails, B - $\frac{1}{2}\delta$ will be available.

The legal regimes differ in the way the available value is divided. We contrast an absolute priority regime with an extraction regime. Under the absolute priority regime, the value available is distributed per the nonbankruptcy allocation: first to debtholders and then to equity, if the debtholders are paid in full. Under the extraction regime, E is able to extract some of the value available for distribution. That is, E has some legal, procedural, etc. powers that enable it to extract some of this value. Specifically, we assume that E can extract a fraction β, $0 < \beta < \frac{1}{2}$ from whatever is available for division.[13]

B. First Best Outcomes

To evaluate social welfare in our models, we focus on the ex ante value of equity to the sole equityholder-manager. This is equivalent to the question of whether *efficiency* in the sense of ex ante expected *total* value is better served by the extraction regime or the absolute priority regime. The questions are equivalent because in our model there is competition among lenders to provide the initial debt and competition among buyers to buy the firm's project in the event of insolvency. Consequently, the risk-neutral debtholders always get an expected return given by the risk-free rate, and in the event of insolvency, the buyer does not make any profit. Thus, the question of which regime will best give efficiency (and,

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[11] On these issues, see Baird (1991) and Picker (1992).

[12] The results of the paper will be the same for any division of the surplus δ in which both sides get some positive amount.

[13] Under the existing rules of chapter 11, β is likely to be less than $\frac{1}{2}$. See Bebchuk and Chang (1992).

specifically, lead to more efficient project choice) is equivalent to the question of which regime will maximize the ex ante expected value of equity. Let V_0 denote the ex ante value of E's equity at T = 0. We will ask whether V_0 is higher with or without extraction.

Let V_0* denote the first-best value for V_0. E's expected value is the expected value of output minus the expected value of what the debtholders will get. In a first-best world, E would choose the general project if S < G, and the specific project if S ≥ G. This follows from that fact that the value of the project in the bad state is independent of the choice of project, but the value in the good state turns directly on which project is chosen. The value in the good state therefore determines project choice. The value of equity is just the expected value of the project given optimal project choice at T = 1 less the required payment to the lenders:

$$V_0^* = pB + (1-p)\Big[\Pr[S < G]G + \Pr[S \geq G]E[S|S \geq G]\Big] - D(1+i_0) \qquad (2)$$

Unfortunately, as we demonstrate below, this first-best result cannot be obtained under either regime. The question of interest then becomes whether one of the regimes does a better job of inducing the appropriate choice of projects.

C.   The Absolute Priority Regime

If E chooses the general project, E gets G - D(1 + i) if the project succeeds and 0 if the project fails. E gets nothing if it fails, because E has no unique skills for the general project and the applicable legal regime confers no leverage on E. In contrast, if E chooses the specific project, if the project succeeds, E gets S - D(1 + i). If the project fails, E gets ½δ. This represents E's share of the upside from having E rather than a third party manage the assets.

Thus, E will choose the specific project over the general project if

$$(1-p)\big[S - D(1+i)\big] + p\frac{\delta}{2} \geq (1-p)\big[G - D(1+i)\big] \qquad (3)$$

Note that the left-hand-side is increasing in S, whereas the right-hand-side is independent of S. Thus, there is a threshold S_{AP}, so that E will choose the specific project if S ≥ S_{AP}. S_{AP} is that value of S for which the left-hand-side of (3) is equal to the right-hand-side. Manipulation of (3) results in

$$S_{AP} = G - \frac{p}{1-p}\frac{\delta}{2} \qquad (4)$$

Taken together, these two equations suggest a "moral hazard" problem. E may choose the specific project even if S < G so that its expected value is lower than that of the general project. Given the fixed payment to the lenders, E will prefer a specific project with S = G to the general project. If the project fails, with the specific project E will still capture ½δ in light of E's unique skills, whereas with the general project E will not capture such value.

Having identified E's project choice at T = 1, we can now turn to identify the expected total value under the absolute priority regime, K^{AP}:

$$K^{AP} = pB + (1-p)\Big[\Pr[S < S_{AP}]G + \Pr[S \geq S_{AP}]E[S|S \geq S_{AP}]\Big] \qquad (5)$$

with a corresponding value for equity of

$$V_0^{AP} = pB + (1-p)\Big[\Pr[S < S_{AP}]G + \Pr[S \geq S_{AP}]E[S|S \geq S_{AP}]\Big] - D(1+i_0) \quad (6)$$

Note that since $S_{AP} < G$ (see (4)), V_0^{AP} falls short of the first-best value V_o^* (see (2)). Specifically, V_0^{AP} is lower than V_o^* by the difference:

$$(1-p)\Pr[S_{AP} < S < G]E[G - S|S_{AP} < S < G] \quad (7)$$

E is too inclined to choose the specific project over the general project. The lender must be compensated for the cost that imposes. E would be better off if E could precommit regarding the choice of project—that is, if project choice were contractible.

D. *The Extraction Regime*

Next consider the extraction regime. As before, we focus on E's choice of project at $T = 1$ as a function of the realized value of S. If E chooses the general project and the project succeeds, E will get $G - D(1 + i)$. If the project fails, then the firm will be insolvent, the value for division will be B, and, given the possibility of extraction, E will get βB. In contrast, if E chooses the specific project and the project succeeds, then E will get $S - D(1 + i)$. If the project fails, E will get two amounts. First, because the specific project is more valuable if E manages it, E will get $\frac{1}{2}\delta$ to continue to manage the project. E will also get $\beta(B - \frac{1}{2}\delta)$, the amount that E extracts from the value divided among the participants.

Thus, E will choose the specific project if

$$(1-p)\big[S - D(1+i)\big] + p\left(\frac{\delta}{2} + \beta\left(B - \frac{\delta}{2}\right)\right) \geq (1-p)\big[G - D(1+i)\big] + p\beta B \quad (8)$$

Reasoning about (8) in the same way we did about (3), we conclude that E will choose the specific project if S is greater than or equal to the threshold S_E, where S_E is defined by

$$S_E = G - \frac{p}{1-p}\frac{\delta}{2}(1-\beta) \quad (9)$$

Once again, we confront a "moral hazard" problem. So long as $\beta < 1$—that is, so long as E cannot extract all of the value to be distributed—E's decision is distorted in favor of the specific project. When the firm is insolvent, E continues to do better with the specific project than with the general project. But, as will be seen below, the distortion under the extraction regime is less severe than under the absolute priority regime.

We now compute V_0^E the value of equity under the extraction regime, at $T = 0$ given E's decision rule at $T = 1$. It is given by:

$$V_0^E = pB + (1-p)\Big[\Pr[S < S_E]G + \Pr[S \geq S_E]E[S|S \geq S_E]\Big] - D(1+i_0) \quad (10)$$

Once again, this is simply the expected value of the project given E's decision rule, less the required expected payment to the lenders. As before, since $S_E < G$, the initial value of equity will fall short of the first-best value V_o^* by the difference:

$$(1-p)\Pr[S_E < S < G]E[G - S | S_E < S < G] \qquad (11)$$

E. Comparing the Extraction and Absolute Priority Regimes

All of this allows us to compare the extraction and absolute priority regimes. Comparing the r.h.s. of (4) with that of (9) allows us to establish the following proposition:

Proposition 1: The likelihood that the specific rather than general project will be chosen is smaller under the extraction regime than under the absolute priority regime: $S_E > S_{AP}$.

The intuition behind this result should be apparent. We have seen that under both regimes there is some distortion in favor of the specific project. For under both regimes, in the event of insolvency, E will be better off with a specific project that depends critically on his unique skills than with a general project. But the distortion is more severe under the absolute priority regime than under the extraction regime. Under the extraction regime, E can get something of the project's value even if the project is the general project. This reduces the benefit to E from choosing the specific project and thereby weakens the distortion in favor of the specific project.

We can now compare the expected ex ante value under the two regimes. Comparing (6) and (10) allows us to establish that:

Proposition 2: The expected project output and the initial equity value are greater under the extraction regime than under the absolute priority regime: $K^E > K^{AP}$ and $V_0^E > V_0^{AP}$. The difference is:

$$(1-p)\Pr[S_{AP} < S < S_E]E[G - S | S_{AP} < S < S_E] \qquad (12)$$

As noted above, the question of expected output and initial value are equivalent. In both cases, comparison of the regimes depends on the decisions with respect to project choice induced by the regime. As we have shown in the previous proposition, the distortion in favor of the specific project is less severe under the extraction regime. From this follows the conclusion that the extraction regime is superior from the perspectives of both efficiency and E.

F. Implications for Managerial Turnover

In the model just presented, managers will be kept on, as their special skills make them the best managers of the assets. This flies in the face of the facts: studies under the Bankruptcy Act[14] and the Bankruptcy Code[15] confirm that managers of failed firms often lose their jobs. A more general and more complete model would surely allow for the possibility that hiring new managers is the better

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[14] See Ang and Chua (1981) and Schwartz and Menon (1985).

[15] See Gilson (1989) and LoPucki and Whitford (1991). See also Gilson (1990).

outcome. In such a model, it might be possible to test the extraction analysis by investigating managerial turnover. In the view of most legal observers, the 1978 change to the Bankruptcy Code enhanced the power of equityholders to extact value.[16] The entrenchment model demonstrates that increasing the fraction reserved for equity should lead to greater selection of general projects. That in turn should increase the turnover of management of failed firms, as the need to retain the old managers decreases. An increase in the extent of the deviations from absolute priority would correlate with increased management turnover in failed firms. If the changes in the federal bankruptcy law in 1978 actually did further entrench managers, we would expect to see an increase in management turnover. Unfortunately, the available data is primarily for public firms and does not contrast pre- and post-Code practices.[17]

II.   INVESTMENT IN MANAGERIAL HUMAN CAPITAL

A.   Framework of Analysis

We now make certain changes in our assumptions in order to illustrate how ex post extraction may affect ex ante investment in managerial human capital. Whereas before we took E's human capital as given, we now make it the focus of our analysis. The main change that we make concerns the decision made by E at $T = 1$. We now assume that there is one project, so that no project choice decision is made. Instead, E chooses whether to invest in human capital to enhance E's ability to manage the project. Specifically, if E invests an amount H, then the project will have under E's management (but not under someone else's management) an additional value of δ.

As before, the project has a probability of success of 1-p and of failure of p. If E does not invest in human capital, the project has a value of C if it succeeds and B if it fails. We assume that $B < D(1 + i_0)$; that is, if the project fails, the firm is insolvent. We also assume that

$$C > \frac{D\left(1 + i_0\right)}{1 - p} \tag{13}$$

This assumption ensures that there is an equilibrium interest rate at which the debt D can be raised. (Weaker assumptions would suffice, but we use this assumption for simplicity.)

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[16] The 1978 law may have made it easier for absolute priority to be violated. Under the prior law, the rigid application of the "fair and equitable" test of Chapter X made it difficult for senior classes to give value to lower classes consensually in the face of any objecting class. See Treister, Trost, Forman, Klee and Levin (1988, p.411-13). The new Chapter 11 provisions changed these rules to allow senior classes to agree to give value to a lower class, even over the objection of a still junior class. Beyond this, the 1978 changes further strengthened the position of equityholders by giving them additional control over the process. Appointing a Chapter 11 trustee became an extraordinary remedy, rather than than a required step, as took place under the old Chapter X.

[17] The only empirical work to consider both deviations and turnover seems to be LoPucki and Whitford (1990) and (1991). This work addresses the levels of deviations and turnover after 1978 and therefore does not attempt to measure the change in these levels between the pre- and post-Code periods.

If E does invest H in human capital, then at T = 2, if the project is expected to continue to be managed by E, then the project will have a value of C + δ if it succeeds, and a value of B + δ if it fails. The human capital is non-transferable, so that if E does not subsequently manage the project, then the project will have a value of only C (if successful) and B (if it fails).

At T = 0, it's known that E will have to make such a choice at T = 1. It's not known, however, what the efficient decision will be. Specifically, we assume that δ is known in advance but that H, the cost of investment, is a random variable. There is no private information about H and it is common knowledge that H is distributed on the support $[0,\overline{H}]$ with a density function g(.) and a cumulative density function of G(.).

All the rest of our assumptions remain the same. In particular, we retain the definitions of the two regimes—the extraction and the absolute priority regimes—which can apply to the division of value at T = 2. If E invests H, then we are at T = 2 in a situation in which the firm's project is specific. If E doesn't invest H, then we'll be at T = 2 in a situation as if the firm's project is general. Thus, we can expect that if E invests H, then the surplus δ will be realized whether the state of nature is favorable or unfavorable. The efficient decision is for E to invest H if H < δ. If E could be induced to make that choice, the first-best values of expected output and the initial equity value would be obtained. As can be expected, neither regime can obtain the first-best. But, as shown below, the extraction regime does better than the absolute priority regime.

B. *The Absolute Priority Regime*

If E does not invest in human capital, then at T = 2 the firm will have a general project. If the state of nature is unfavorable the firm will be insolvent, and E will get nothing, but with probability (1-p), E will get C - D(1 + i). If E invests in human capital, then if the firm becomes insolvent, E will still get ½δ (when hired by the buyer of the assets), and if the firm ends up solvent E will get C + δ - D(1 + i). Thus, E will invest in human capital if

$$-H+(1-p)\big[C+\delta-D(1+i)\big]+p\frac{\delta}{2}\geq(1-p)\big[C-D(1+i)\big] \tag{14}$$

Proceeding in a way similar to that done with respect to (3) and (8), we obtain that E will invest in human capital as long as H is lower than the threshold H_{AP} defined by

$$H_{AP}=\delta\left(1-\frac{p}{2}\right) \tag{15}$$

Equation (15) implies that there will be "underinvestment" in human capital. If the realized value of H, $\hat{H}$, is such that $\delta > \hat{H} > H_{AP}$, E will not invest in human capital even though, from a standpoint of overall efficiency, E should do so. The reason for this is that E must bear the full cost of the investment in human capital H, but E will not capture the full benefit of the investment. If the firm becomes insolvent, E will split the surplus δ with the buyer (and hence with the debtholders who will have "control" over the assets which together with E's human capital would be necessary to produce the surplus δ).

Thus, the expected value of equity under the absolute priority regime will be

$$V_0^{AP} = pB + (1-p)C + \Pr[H \le H_{AP}]E[\delta - H | H \le H_{AP}] \quad (16)$$

Both the expected value of the project K^{AP} and the expected value of equity V_0^{AP} will fall short of the first-best values by:

$$\Pr[H_{AP} < H < \delta]E[\delta - H | H_{AP} < H < \delta] \quad (17)$$

C.   The Extraction Regime

If E does not invest in human capital, E gets βB if the project fails, C - D(1+i) if it succeeds, for an expected payoff of

$$(1-p)[C - D(1+i)] + p\beta B \quad (18)$$

If E does invest in human capital, E spends H and receives

$$\frac{\delta}{2} + \beta\left(B + \frac{\delta}{2}\right) \quad (19)$$

if the project fails and C + δ - D(1+i) if it succeeds, for an expected payoff of

$$-H + (1-p)[C + \delta - D(1+i)] + p\left[\frac{\delta}{2} + \beta\left(B + \frac{\delta}{2}\right)\right] \quad (20)$$

Thus, E will invest in human capital if equation (20) greater than or equal to equation (18).

Reasoning in a way similar to that used before, we can conclude that E will invest if H is lower than the threshold H_E defined by

$$H_E = \delta\left[1 - \frac{p}{2}(1-\beta)\right] \quad (21)$$

Once again, E will invest in human capital too infrequently. The value of equity under the extraction regime will be:

$$V_0^E = pB + (1-p)C + \Pr[H \le H_E]E[\delta - H | H \le H_E] - D(1+i_0) \quad (22)$$

This is less than the first-best value by an amount equal to:

$$\Pr[H_E < H < \delta]E[\delta - H | H_E < H < \delta] \quad (23)$$

D.   Comparing the Absolute Priority and Extraction Regimes

Comparing the r.h.s. of (15) with that in (21) we get the following proposition:

Proposition 3: The likelihood that E will make the investment in human capital is greater under the extraction regime than under the absolute priority regime: H_E > H_{AP}.

This result makes intuitive sense. The distortion against investing in human capital results from the fact that under both regimes, while E must bear all the costs of the investment, E captures only a fraction of the benefits produced by the

investment. Under the extraction regime, however, E can expect to capture a greater fraction of the benefits produced by E's investment. For under the extraction regime E will get a fraction of the value produced by selling the firm's assets, and E's investment in human capital will increase the value of these assets.

Let us now turn to comparing the expected total value and the expected value of E's position under both regimes. Comparing (16) with (22), we can establish the following proposition:

Proposition 4: The expected total value and the expected value of E's position are greater under the extraction regime than under the absolute priority regime: $K^E >$ K^{AP} and $V_0^E > V_0^{AP}$. The difference is given by:

$$\Pr\left[H_{AP} < H < H_E\right]E\left[\delta - H \middle| H_{AP} < H < H_E\right] \qquad (24)$$

As we have noted, the question of which regime produces a higher expected total value is equivalent to the question of which regime produces a higher expected value for E. Both questions depend on how the regimes compare in providing incentives for E's making efficient decisions with respect to investment in human capital. As we have seen in the previous proposition, the distortion against investing in human capital is more severe under the absolute priority regime. From this follows the conclusion that the extraction regime is superior from the perspective of both efficiency (total value) and the shareholder-manager E.

E. Implications for Managerial Turnover

The human capital model also speaks to managerial turnover. More extraction leads to greater investment in human capital, meaning more specificity. More managers should be rehired and turnover should be reduced. Larger deviations from absolute priority would correlate with reduced management turnover in bankruptcy. These effects, of course, run directly contrary to the effects found in the managerial entrenchment model. In that model, increasing the fraction reserved for equity should lead to greater selection of general projects, which in turn should increase the turnover of management of failed firms, as the need to retain the old managers decreases. Unfortunately, our two effects work in opposite directions and it would take some work to disentangle them. We would first have to determine whether there was indeed a regime shift when the federal bankruptcy law was reworked in 1978. Assuming we could do that, an appropriate data set on turnover should let us determine whether the entrenchment effect or the human capital effect is the more powerful.

IV. CONCLUSION

Much of the current criticism of Chapter 11 focuses, naturally enough, on the social losses that result from fights over how to divide the pie when the firm fails. This criticism evaluates bankruptcy rules by looking at outcomes for failed firms. The fact that bankruptcy often is the end-of-the-line makes it particularly natural to use an ex post perspective to evaluate bankruptcy rules. As others have begun to realize, though, it is a mistake to focus only on how the failure rules influence the end-of-game play. That static point-in-time view should instead be replaced by a dynamic view that also addresses the decisionmaking at the time of initial project selection and on the eve of bankruptcy.

This paper has sought to contribute to our understanding of the ex ante effects of bankruptcy rules that enable extraction and violations of absolute priority. In particular, it has shown that such rules have a beneficial effect on those decisions that determine the extent to which corporate assets are manager-specific. First, we have shown that extraction reduces the incentive of managers to choose projects tailored to their existing human capital. In an absolute priority regime, managers will embrace such specific projects and will reject superior general projects, thereby reducing overall welfare. The extraction regime tempers those incentives and thereby improves overall welfare. Second, we have shown that an extraction regime encourages investment in firm-specific human capital and moves such investments closer to the efficient level. Again, this increases social welfare over that obtainable under an absolute priority regime. Of course, these two effects of the legal regime are only one part of the many relevant effects, so we cannot conclude that the extraction regime is superior to the absolute priority regime.[18]

We have focused our analysis on the closely-held corporation. Nonetheless, we think the same issues will arise for publicly-held corporations. If project choice and investment in human capital are not observable and verifiable—and thus not contractible—then the problems we identified also arise in a company with a separation of management and ownership. Given the problems in contracting, we will again have too much investment in specific assets and too little investment in human capital. Thus, a regime in which the managers—now as distinct from the equityholders—can get some of the value emerging out of bankruptcy proceedings may improve the investment decisions for the same reasons seen in our analysis of the closely-held corporation. Note that what is important in the case of the public corporation is that the *managers* get such a fraction, either through their stockholdings or otherwise. But to understand this issue fully, we would need to explore the contracting problem between managers, equityholders and debtholders and would have to establish empirically the effect of the existing bankruptcy rules on the fraction of value captured by managers. These are issues for another day.

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[18] Note also that our analysis does no more than suggest that a deviation from absolute priority might be useful. But even if such deviations are desirable, this does not imply that they should be produced by the mandatory rules of the Bankruptcy Code. Creditors could contract directly with manager-shareholders to create "bankruptcy parachutes" that would provide them with some value even when the creditors were not paid in full. In fact, the standard justification for golden parachutes in the takeover context focuses on an effect that is similar to the beneficial effects that we have identified as arising from the extraction regime. See Harris (1990).

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