

# THE ABSOLUTE PRIORITY RULE AND THE FIRM'S INVESTMENT POLICY

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## I. INTRODUCTION

Until recently, bankruptcy scholarship focused on the ex post case; scholars in evaluating competing bankruptcy proposals asked which scheme would be efficient, distributionally just, and administratively feasible. This research program implicitly assumes that the type of bankruptcy law in place could not affect how firms and investors behaved prior to bankruptcy. The recognition that this premise is erroneous has led to a new research program, under which scholars ask how the bankruptcy law influences parties' efforts to resolve disputes once insolvency has occurred<sup>1</sup> and, moving backward in time, how the law influences the parties' incentives to invest.<sup>2</sup>

Robert Rasmussen's paper makes a useful contribution to the latter line of research.<sup>3</sup> His paper discusses the effect of current bankruptcy law on a firm's investment incentives and inquires whether proposed bankruptcy reforms improve these incentives. In Rasmussen's well-argued view, none of the new schemes is an improvement in all circumstances; but each of them could be superior in particular cases. This conclusion then becomes the premise for Rasmussen's central normative claim: because no imaginable bankruptcy system clearly dominates, parties should be free to choose the bankruptcy system that will apply to their case. Further, the

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1. See, e.g., Helmut Bester, *The Role of Collateral in a Model of Debt Renegotiation*, 26 J. MONEY, CREDIT & BANKING 72 (1994); Alan Schwartz, *Bankruptcy Workouts and Debt Contracts*, 36 J.L. & ECON. 595 (1993).

2. See Barry E. Adler, *Voidable Preferences and Corporate Investment* (Mimeograph 1994) (on file with author); Barry E. Adler, *Financial and Political Theories of American Corporate Bankruptcy*, 45 STAN. L. REV. 311 (1993); David A. Skeel, Jr., *Markets, Courts, and the Brave New World of Bankruptcy Theory*, 1993 WIS. L. REV. 465; Susan Rose-Ackerman, *Risk Taking and Ruin: Bankruptcy and Investment Choice*, 20 J. LEGAL STUD. 277 (1991).

3. Robert K. Rasmussen, *The Ex Ante Effects of Bankruptcy Reform on Investment Incentives*, 72 WASH. U. L.Q. 1159 (1994).

state minimizes contracting costs by supplying parties with a menu of bankruptcy options from which to select.<sup>4</sup>

Modern economies are highly heterogeneous; hence, that a particular bankruptcy scheme would be optimal in all cases regarding both settlement and investment incentives is unlikely. Thus, Rasmussen's conclusion that bankruptcy law should be a set of defaults seems correct.<sup>5</sup> As a consequence, this Comment will focus on an aspect of the various reform schemes that Rasmussen notes but does not discuss in detail: each of these schemes increases the likelihood that the absolute priority rule will be strictly followed in bankruptcy. When absolute priority is strictly followed, senior claims are paid in full before junior claims get paid at all. Of particular significance, strict adherence to absolute priority eliminates the equity claim because it is the most junior.

The effect of strictly following absolute priority on a firm's incentive to invest is now thought to be ambiguous. As a normative matter, scholars hold, firms should only invest in positive net present value projects. Strict adherence to absolute priority is now thought to increase the likelihood in some circumstances that firms will invest appropriately, but to reduce that likelihood in others. Conversely, not strictly following absolute priority will sometimes do good and other times not.

This Comment argues that a relaxed absolute priority rule (i.e., the current rule) worsens investment incentives more frequently than is commonly supposed. Even if this is true, the debate over absolute priority should go on; for, as said, deviations also can have positive effects. A general model that takes account of all relevant trade-offs, and thus permits a general solution, is badly wanted. So also is empirical evidence respecting how bankruptcy law incentives actually affect firms' investment behavior. In the absence of general models and good data, clarifications of the sort developed below are helpful but not conclusive.

Part II briefly summarizes the prevailing view respecting the effect of

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4. This latter view is argued for at greater length in Robert K. Rasmussen, *Debtor's Choice: A Menu Approach to Corporate Bankruptcy*, 71 TEX. L. REV. 51 (1992).

5. Rasmussen suggests that the current Code should provide the default rules if parties do not choose another bankruptcy option. Rasmussen, *supra* note 3, at 1210 n.142. This change would have an "information forcing" effect for parties who preferred one of the options. See Ian Ayres & Robert Gertner, *Filling Gaps in Incomplete Contracts: An Economic Theory of Default Rules*, 99 YALE L.J. 87, 97-107 (1989). The items on the menu themselves would be "problem solving defaults" because they would supply solutions to the various insolvency problems that firms face. For a taxonomy of default rule types, see Alan Schwartz, *The Default Rule Paradigm and the Limits of Contract Law*, 3 S. CAL. INTERDISCIPLINARY L.J. 389 (1994).

absolute priority on the firm's investment incentives. Part III argues that deviating from absolute priority worsens the underinvestment problem. This problem exists when firms reject projects that have positive net present values (an overinvestment problem exists when firms take projects that have negative net present values). Rasmussen's paper follows the conventional view that the underinvestment problem exists only in connection with insolvent firms. This Comment goes beyond his analysis to show that the underinvestment problem can affect solvent firms as well. The reason is this: unless a firm has excess cash, it cannot take a project unless it can persuade investors to provide the money. If the firm has prior debt, or if moral hazard is possible, investors may demand such a high return to provide funds that the project becomes unprofitable for the firm, though the project generates revenues in excess of nonfinancing costs.

The models that yield this result assume that the firm can credibly promise to pay as large a fraction of its assets to investors as profit maximization requires. Deviations from absolute priority exacerbate the underinvestment problem exposed by these models; for such deviations reserve a share of the firm's assets to the equity in the "failure state," regardless of what the debt contract says. As a consequence, the firm either must promise to repay a larger share of project returns to investors in the "success state," or it must promise to make available a larger amount of assets to investors in the failure state to overcome the effect of priority deviations. When the promise to repay a larger sum in the success state would convert a profitable project into a loser, or when the firm does not have excess assets to offer, the firm will reject a positive value project that it would have taken had absolute priority been strictly followed. This is inefficient; for doing the project would have made the firm and its investors better off on an expected basis while making no one worse off. Moreover, this inefficiency is unavoidable because current law prevents parties from contracting out of bankruptcy or altering the bankruptcy rules that make deviations from absolute priority possible.<sup>6</sup>

Part III.A. discusses the prior debt case; Part III.B. discusses moral hazard. The analyses in these sections show that a relaxed absolute priority rule causes harm in a context that previously had been thought irrelevant to the rule's effects. Part IV is a conclusion.

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6. These rules are discussed in Lucian A. Bebchuk & Howard F. Chang, *Bargaining and the Division of Value in Corporate Reorganization*, 8 J.L. ECON. & ORGANIZATION 253 (1992).

## II. ABSOLUTE PRIORITY AND INVESTMENT: A SUMMARY

There are two defining circumstances that lead to four relevant cases: whether the absolute priority rule is strictly followed in bankruptcy or it is not; and whether a firm is solvent when it has an investment opportunity or it is not. Suppose initially that absolute priority is strictly followed and the firm is solvent. The rule then has three possible bad effects. First, the current equity would lose the firm were bankruptcy to occur; for their interest then is worthless. This increases the likelihood that the current managers will be fired. A manager may respond to this possibility by causing his firm to take projects, when the firm is solvent, that the manager has a peculiar capability to manage, whether these are the most profitable projects or not. Then if the firm becomes insolvent but is not liquidated piecemeal, the new owners have an incentive to retain the manager; he may be the only person who knows what is going on.<sup>7</sup>

Second, when the firm already has debt, there is an overinvestment problem.<sup>8</sup> Creditors can ameliorate this problem by requiring the firm to use convertible debt or to include call provisions in its bonds. The former mitigates the incentive of equity to take high risk projects because the equity must share the gains with converting bondholders in the event of a high payoff.<sup>9</sup> The latter mitigates the overinvestment problem because overinvestment reduces the value of the debt; this reduces the value of the equity's call option. Third (as this Comment later shows), there is an underinvestment problem.

If the firm is insolvent when it has an investment opportunity, everyone agrees that the overinvestment problem is worsened. The firm also faces an underinvestment problem, though for different reasons than those briefly described in Part I. To understand these "insolvency reasons," assume that an insolvent firm has the resources to undertake a positive value project whose returns in the success state are insufficient to restore the firm to solvency. Then project returns, in both success and failure states, would

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7. The result that managers have an incentive to invest in projects that they can best manage in order to preserve their jobs was first established in the context of hostile takeovers in Andrei Shleifer & Robert W. Vishny, *Management Entrenchment: The Case of Manager-Specific Investments*, 25 J. FIN. ECON. 123 (1989). It was extended to the bankruptcy context in LUCIAN A. BEBCHUK & RANDAL C. PICKER, *BANKRUPTCY RULES, MANAGERIAL ENTRENCHMENT AND FIRM-SPECIFIC HUMAN CAPITAL* (University of Chicago, Law & Economics Working Paper No.16, 2d Series, 1993).

8. The more debt the firm has, the more serious is this problem. See Richard C. Green & Eli Talmor, *Asset Substitution and the Agency Costs of Debt Financing*, 10 J. BANKING & FIN. 391 (1986).

9. See T. Harikumar et al., *Convertible Debt and Investment Incentives*, 17 J. FIN. RES. 15 (1994).

accrue exclusively to the creditors. As a consequence, the firm's owners have no incentive to pursue the project; rather, they are likely to use firm cash to meet current expenses. Finally, the existence of insolvency may reduce the ability of a firm's managers to choose projects only they can manage because there will be less cash to do projects.

Assume next that absolute priority is not followed. Scholars now agree that deviations from absolute priority worsen the overinvestment problem for solvent firms.<sup>10</sup> These deviations increase the payoff to equity in the failure state while not affecting its payoff in the success state. Hence, the equity has a greater incentive to invest in a project with a high failure probability if the project has a high payoff in the success state: some such projects can have negative net present values. Deviations from absolute priority would worsen the "management entrenchment problem" only if these deviations increase the probability that the equity will retain the firm after a bankruptcy. This seems unlikely. Finally, as said above and developed below, deviations from absolute priority worsen the underinvestment problem for solvent firms.

When the firm is insolvent at the time it must decide to invest, neither convertibles nor call provisions can mitigate the overinvestment problem. The conversion option is worthless when the firm is insolvent because the debt is then worth more than the equity; hence, the creditors never will convert. The call privilege also is valueless because the debt is worth less than the option price; consequently, it will never be called. Deviations from absolute priority are helpful, however, because when absolute priority is not strictly followed, the equity participates in the creditors' payoff. This participation creates an incentive for equity not to reduce the value of the debt; and this incentive partly countervails the equity's incentive to take high risk projects with high payoffs.<sup>11</sup> Deviations from absolute priority

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10. This point was first made in Barry Adler, *Bankruptcy and Risk Allocation*, 77 CORNELL L. REV. 439, 473-75 (1992). Deviations from absolute priority may cure overinvestment, however, when there is little serial correlation between a firm's cash flows. In this circumstance, the firm will default when the private payoff to the equity from violating absolute priority exceeds the private value from continuance. Default commonly induces renegotiation among affected parties, and renegotiation can create a capital structure with efficient incentives. See Robert Heinkel & Josef Zechner, *Financial Distress and Optimal Capital Structure Adjustments*, 4 J. ECON. & MGMT. STRATEGY 531 (1994). However, a firm's cash flows would seem generally to have high serial correlations—today's earnings are much like yesterday's—so the practical importance of this insight is unclear.

11. Rasmussen's paper shows how deviations from absolute priority mitigate the overinvestment problem for insolvent firms. Rasmussen, *supra* note 3, at 1178-79. A more formal treatment with numerical simulations is in Allan C. Eberhart & Lemma W. Senbet, *Absolute Priority Rule Violations and Risk Incentives for Financially Distressed Firms*, FIN. MGMT., Autumn 1993, at 101.

also solve the underinvestment problem that otherwise would arise from the creditors' ability to take all project returns in both failure and success states. If the equity anticipates a deviation from absolute priority, it expects to share in project returns in the bankruptcy proceeding; the better the project is, the more valuable the share is. Thus the insolvent firm has an incentive to take optimal projects.<sup>12</sup>

To summarize, deviations from absolute priority apparently have little effect on the management entrenchment problem. Otherwise, these deviations are ambiguous. They worsen the overinvestment problem for solvent firms but mitigate it for insolvent firms, and also, in the common view, solve the underinvestment problem for insolvent firms. This Comment next shows, in contrast, that deviations from absolute priority worsen the underinvestment problem for both solvent and insolvent firms.<sup>13</sup>

### III. ABSOLUTE PRIORITY AND THE EX ANTE UNDERINVESTMENT PROBLEM

#### A. Debt Overhang

A firm that has prior debt may be unable to raise sufficient debt or new equity to invest in positive value projects. This is because, as discussed above, the firm may have to promise the later creditor such a high return that even a positive value project may not be worth pursuing. To see how this can happen,<sup>14</sup> suppose that at  $t^0$  a firm finances a positive net present value project with debt. The firm borrows in a competitive credit market, and the debt contract requires it to repay  $d_1$  at  $t^2$ . The project returns  $y_l$  at  $t^2$  with probability  $\pi$ , and  $y_h$  with probability  $(1 - \pi)$  where  $y_l < y_h$ . The

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12. Rasmussen establishes this result formally. See Rasmussen, *supra* note 3, at 1185-86.

13. There is a question when solvent firms face under- and overinvestment problems. The former is more likely to affect firms that have growth opportunities; these firms may be caused to reject good projects. The latter problem is more likely to affect mature firms with few growth opportunities but with cash to invest. These possibilities are reviewed in John J. McConnell & Henri Servaes, *Equity Ownership and the Two Faces of Debt* (Mimeograph 1994) (on file with the *Washington University Law Quarterly*).

14. The model in this section is based on Elazer Berkovitch & E. Han Kim, *Financial Contracting and Leverage Induced Over- and Under-Investment Incentives*, 45 J. FIN. 765 (1990). Rasmussen claims that solvent firms will take all positive value projects, but the model on which this claim is based implicitly assumes that a firm with debt can finance later projects with internal funds. Such a firm has an incentive to put its funds to the best use. The analysis here, in contrast, assumes that the firm needs external financing to do its projects.

firm's only assets are these returns. The failure-state return,  $y_b$ , is assumed to be less than the debt,  $d_1$ , so there is a positive probability of default. Thus, the value of the equity if the firm does the project is  $E_y = (1 - \pi)(y_h - d_1)$ : the owners keep the excess after repaying the debt in the success state, while the creditors take the firm in the failure state.<sup>15</sup>

The firm can take a second project at  $t^1$  that it must finance with external funds. This project returns  $z$  at  $t^2$  with probability  $\pi$ , and  $z + s$  with probability  $(1 - \pi)$ ; that is, the new project returns  $z$  with certainty and  $z + s$  only with positive probability.<sup>16</sup> The project costs  $i$  to do, which the firm will borrow; the later debt,  $d_2$ , will take behind the earlier.<sup>17</sup> Project returns are sufficiently positively correlated so that  $y_l + z < d_1 + d_2$ ; the firm will be insolvent if the failure state is realized.

The face value of the later loan is obtained by solving the following equation:

$$i = \pi b + (1 - \pi)d_2 \quad (1)$$

where  $b = \max[y_l + z - d_1, 0]$ . The firm needs the sum  $i$ . The first term in equation (1) is the later creditor's expected payoff in the failure state: the probability of failure is  $\pi$  and the payoff is  $b$ . Regarding  $b$ , if the firm defaults, it has to pay the initial debt first. The amount from which the firm must pay this debt is the firm's total return in the failure state  $y_l + z$ . The sum  $y_l + z - d_1$  is left over for the later creditor if this sum is positive; otherwise, this creditor receives nothing if the project fails. The second term in equation (1) is the later creditor's expected payoff in the success state—i.e., the probability of success  $(1 - \pi)$  times the creditor's success payoff,  $d_2$ . Hence,  $d_2$  is obtained by asking how much the creditor will require to lend  $i$  given the expected return on the firm's projects and the level of prior debt.

If the firm takes the second project, the value of its equity becomes  $E_n = (1 - \pi)(y_h + z + s - d_1 - d_2)$ ; the equity is only paid in the success state,

15. The analysis ignores discount rates for simplicity. It also assumes that the parties are symmetrically informed about relevant economic variables.

16. Decomposing project returns into a certainty component and a risky component is analytically convenient and realistic. Firms commonly can anticipate that new projects will always return some minimal sum (even the Edsel had positive sales); the uncertainty concerns the upside.

17. Debt from later projects commonly is junior to earlier project debt because substantial lenders routinely require covenants that prevent firms from borrowing elsewhere without the earlier lender's consent. That consent usually is purchased with a subordination agreement, under which the later lender agrees to take second priority. See Alan Schwartz, *A Theory of Loan Priorities*, 18 J. LEGAL STUD. 209 (1989).

and then receives the returns from the two projects less the total debt payments. Rearranging terms and using the expression above for the value of the equity after it takes the first project yields

$$E_n = E_y + (1 - \pi)(z + s - d_2) \quad (2)$$

Next, substituting for  $d_2$  and rearranging terms yields

$$E_n = E_y + z + q + \pi(b - z) \quad (3)$$

where  $q = (1 - \pi)s - i$ . Notice that the net present value of the *later* project is  $z + (1 - \pi)s - i$ ; the project always returns  $z$ , it returns  $s$  with probability  $(1 - \pi)$ , and it costs  $i$  to do. Thus, the sum  $z + q$  is the net present value of the later project.

Equation (3) illustrates this important point: were the firm to do the later project, its value would become the *sum* of (a) its equity had it done only the initial project ( $E_y$ ); (b) the new project's net present value ( $z + q$ ); and (c) the third term  $\pi(b - z)$ . This term can be negative; and if it is negative by a sufficient amount, the equity if the project is taken would be worth less than the original equity *although* the project has positive value. In this case, the firm will reject the project, because doing it would reduce the equity stake.

The intuition underlying this result was stated above: the firm may have to promise the new creditor so much to raise the investment cost  $i$  that doing the project is not worthwhile. Look again at equation (2): if the value of the new debt,  $d_2$ , exceeds the returns the firm will earn in the success state,  $z + s$ , then the sum in parenthesis is negative, thereby causing the new equity to be worth less than the old. To see how this can happen, review equation (1) specifying how much the later creditor will lend. This equation implies that the firm must promise to repay more than the investment cost ( $d_2 > i$  when  $\pi > 0$ ) in order to raise that cost. Rearranging this expression shows that

$$d_2 = \frac{i - \pi b}{1 - \pi} \quad (4)$$

Notice that the required return the firm must promise to the later creditor in the success state,  $d_2$ , is maximized when the payoff to the later creditor in the failure state,  $b$ , equals zero, and  $d_2$  falls as  $b$  rises.<sup>18</sup> Also,  $b$  will

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18. This appears to be true by inspection and is confirmed by differentiating  $d_2$  with respect to  $b$ . The result is  $\frac{\partial d_2}{\partial b} = \frac{-\pi}{(1 - \pi)}$ . This expression is negative because  $\pi < 1$ ;  $d_2$  is decreasing in  $b$ .



be zero when  $z + y_1 - d_1$  is zero or negative. Thus, the larger the earlier debt,  $d_1$ , is relative to returns in the failure state,  $z + y_1$ , the larger  $d_2$  will have to be. Hence, a firm whose earlier debt is substantial relative to failure state returns may have to promise so much to the later creditor that taking a second positive value project is not worthwhile. This phenomenon sometimes is referred to as "debt overhang"—the existence of too much prior debt can prevent firms from undertaking even good projects.<sup>19</sup>

Returning to the subject at issue, if the absolute priority rule is not strictly followed in bankruptcy, the debt overhang effect is worsened, and the firm will have to reject more good projects. This result occurs because deviations from absolute priority worsen the later creditor's failure-state payoff,  $b$ ; consequently, the creditor's success-state payoff must increase from  $d_2$  to some value  $d_2'$  greater than  $d_2$ . To understand this result, suppose that were absolute priority strictly followed,  $b$  would be positive: that is,  $b = y_1 + z - d_1 > 0$ . Violating absolute priority has two effects: it raises  $d_1$  and reduces the fraction of  $y_1 + z$  that remains after  $d_1$  is paid; both effects reduce  $b$ .

For the first effect, the value of the initial debt  $d_1$ , would be  $v(d_1) = \pi y_1 + (1 - \pi)d_1$  were absolute priority strictly followed; the initial creditor takes  $y_1$  in the failure state and is fully repaid in the success state. If the initial creditor anticipates a deviation, however, it will expect to get *less than*  $y_1$  in the failure state. This reduces the value of its debt. In a competitive credit market, lenders earn zero profits; hence,  $v(d_1)$  is a break-even return. When this return falls, the creditor can avoid losses only by requiring the firm to promise to return more than  $d_1$  in the success state. Concerning the latter effect, under absolute priority the later creditor gets the fraction of  $y_1 + z$  that remains after  $d_1$  is paid. When absolute priority is violated, the creditor must share its failure-state payoff with the equity and so recovers  $\alpha(y_1 + z - d_1) = \alpha b$ , where  $\alpha < 1$ . These two effects lower the later creditor's failure-state payoff below  $b$  and cause that creditor to demand a

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19. An underinvestment problem also would exist if the firm finances the second project with equity. The equity would take behind the initial debt. As a consequence, the firm may have to promise equity investors such favorable terms that a positive value project will not be worth doing. The underinvestment problem can be mitigated if the later creditor is given seniority in the assets constituting the new project. See René M. Stulz & Herb Johnson, *An Analysis of Secured Debt*, 14 J. FIN. ECON. 501 (1985). To do this is, in effect, to decompose the borrower into two firms, one that does the first project and one that does the second. When there is one project per firm, the agency cost problem described above vanishes. Giving later creditors seniority in new assets is sometimes done in real estate finance (e.g., shopping centers in two cities), but such sharp project separations are otherwise hard to do. For example, a new project can be the modernization of an old project.

sum that exceeds  $d_2$ .

The consequence of relaxing absolute priority is illustrated by calculating the interest rate for the later loan. When absolute priority is strictly followed, the effective interest rate that the later creditor charges for supplying  $i$  is  $r = \frac{d_2 - i}{i} - 1$ . Relaxing the rule yields an interest rate of  $r' = \frac{d_2' - i}{i} - 1$ . Because  $d_2' > d_2$ ,  $r' > r$ . When the interest rate increases, it is more difficult for the firm credibly to promise to repay in the failure state; hence, the probability that the firm will have to forgo a positive value project also increases. Deviations from absolute priority thus worsen the underinvestment problem that solvent firms face.<sup>20</sup>

The debt overhang problem is maximized when the firm is insolvent because it may be unable to finance projects at all if later lenders are subordinate to earlier ones (or even take pro rata). The Bankruptcy Code authorizes the bankruptcy court to give later lenders a superpriority in any (or all) of the firm's assets,<sup>21</sup> which mitigates the debt overhang effect for insolvent firms.<sup>22</sup> The possibility that bankruptcy courts will so act, however, exacerbates this effect for solvent firms. This is because the possibility that "bankruptcy creditors" will get superpriorities lowers the expected failure-state payoffs of nonbankruptcy creditors; these creditors know that assets subject to their claims (i.e.,  $y_1 + z$  in the model here) can be devoted to latecomers. This will induce the nonbankruptcy creditors to demand higher success-state payoffs, and that demand would decrease the number of positive value projects that are profitable for firms.<sup>23</sup>

20. It is inefficient to forgo a positive net present value project. Hence, all good projects would get done despite the difficulties described above were the parties—actual and potential creditors, equityholders and managers—able to divide a project's expected surplus among themselves in such fashion that each would consent to go forward. It is generally assumed that transaction costs preclude such Coasian bargaining.

21. 11 U.S.C. § 364 (1988).

22. See George G. Triantis, *A Theory of the Regulation of Debtor-In-Possession Financing*, 46 VAND. L. REV. 901, 918-20 (1993).

23. To illustrate this result, recall the second creditor's failure-state payoff above:  $b = y_1 + z - d_1$ . Suppose that the bankruptcy court gives a bankruptcy creditor a superpriority if it lends the sum  $d_2$ . The second creditor would then be subordinate to both the initial creditor and the bankruptcy creditor. As a consequence, its failure-state payoff falls to  $b = y_1 + z - d_1 - d_2$ . Thus, the second creditor will require the firm to repay more than  $d_2'$ , thereby further decreasing the likelihood that the firm will take positive value projects.

## B. *Moral Hazard*

The model just discussed assumed that those in control of the firm sought to maximize firm value. When investors cannot conveniently monitor the firm's decisionmakers, however, these persons have an incentive to consume personal benefits rather than to single-mindedly maximize profits. For example, decisionmakers may reject projects with high expected values in favor of projects that promise to return less but are easier to manage. When moral hazard such as this is a concern, an underinvestment problem can arise even when the firm has no prior debt. This possibility is demonstrated below both in an intuitive and a formal version, respectively.<sup>24</sup> Its relevance to the absolute priority rule is also explored.

### 1. *Moral Hazard: A Story*

A firm without cash has a project it wishes to undertake that requires outside funds. The project has a stochastic element: that is, the project could fail whether the firm used investors' funds exclusively to maximize project returns or whether the firm instead diverted some cash to the consumption of perks. The project has a higher probability of success if the firm's managers attempt to maximize value. Outside investors can observe whether a project ultimately succeeds or not, but they cannot observe whether managers took the maximizing action; it is too costly for them to monitor the managers' behavior.<sup>25</sup> The firm could promise to use investors' funds only to maximize value, but such a promise would not be credible; investors know that managers who can operate in secret have a strong incentive to cheat.

In these circumstances, an optimal investment contract has a carrot-and-stick property. The carrot is a bribe to the firm to take the profit-maximizing action (i.e., to eschew perks); the stick is to give project assets to the investors if the firm fails to repay them (this contract thus is a loan). If the bribe is high enough, the firm does better when it consumes the

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24. The analysis in the next sections is drawn from Bengt Holmstrom & Jean Tirole, *Financial Intermediation, Loanable Funds, and the Real Sector* (Mimeograph 1994) (on file with the *Washington University Law Quarterly*). A similar model is in Takeo Hoshi et al., *The Choice Between Public and Private Debt: An Examination of Post-Regulation Corporate Financing in Japan* (MIT Working Paper, 1992).

25. The moral hazard in this story arises between the firm and new investors, who cannot monitor the manager's behavior.

bribe, maximizes expected project returns, and repays investors than when it slacks off to consume perks. The investors also know that they will be repaid when they observe success because the stick permits them to take over project assets.

Accordingly, project returns under this contract must support both the bribe that will induce the firm to maximize project value and a return on the investors' money. Some projects that have positive expected value, however, cannot ensure the investors a sufficient return *given that* the projects also must support the bribe—call such projects “weak.” The investors' return under any project is the sum of the expected value of payments to them in the success and failure states. Weak projects, *ex hypothesis*, generate insufficient revenue in success states to support bribes to the firm and payments to investors. Hence, a weak project can be funded only if the firm can increase the investors' payoff in the failure state. Thus, a firm that has a weak project must allow investors to take nonproject assets as well as project assets if the project fails; i.e., the “stick” in an optimal investment contract sometimes permits investors to take not only project assets but other of the firm's assets as well.

A relevant implication of this analysis is that an underinvestment problem can exist. Firms with weak positive value projects but few other assets sometimes will be unable to get financing. This analysis explains the common perception that borrowers without liquid assets often have trouble getting money.

On this view, deviations from absolute priority are undesirable. To see why, realize that when absolute priority is violated, creditors receive only a share of the firm's assets. Then assume that investors (i.e., creditors) will not finance a project that has positive net present value unless the firm also possesses nonproject assets of at least  $v^*$  that the investors can reach in the failure state, and that the firm has assets of only  $v^*$ . If absolute priority is followed, the firm will be able to do the project because it can promise all of  $v^*$  to investors in the failure state. But if absolute priority is violated, the firm cannot credibly promise to repay as much as  $v^*$ ; for the firm's owners, *ex post*, will take some of these assets for themselves. Thus, if investors anticipate that absolute priority will not be followed, the firm will be unable to do the project even though the project has positive value; the firm cannot credibly promise the investors enough in the failure state to induce them to provide the money.

This result may be expressed a little more broadly. The bankruptcy scheme that is in place can be viewed as an implied term in the parties' investment contract. Therefore, the optimal bankruptcy scheme cannot be

determined independently of the determination of the optimal investment contract. A moral hazard explanation of a standard investment contract was just set out: the firm is unable to commit not to misuse investment funds, and so must be able, in some other way, to make a credible repayment promise. To do that may require the firm to possess liquid assets other than those that constitute the project at issue. A bankruptcy scheme that encourages deviations from absolute priority reduces the assets that a firm can devote to investors in the failure state, and thus lessens the firm's ability to make a credible repayment promise. Thus, such a scheme would not, *ceteris paribus*, be part of an optimal debt contract.

The effect of deviations from absolute priority on firms that already are in bankruptcy is ambiguous. Moral hazard may be less of a danger because the firm is under (indirect) judicial supervision and heightened creditor scrutiny. Thus the owners' ability to misappropriate returns is circumscribed. On the other hand, to the extent moral hazard remains a danger, the firm may require nonproject assets to pursue needed positive value projects: deviations from absolute priority lessen the insolvent firm's ability to devote those assets to project finance. Section 364 of the Bankruptcy Code can mitigate this difficulty because it authorizes the court to give the later creditor a broad, senior security interest. Doing this, however, worsens the *ex ante* underinvestment problem: when creditors anticipate superpriorities, they know that the firm's promise to offer up nonproject assets in the failure state is not credible. Thus, fewer positive value projects will be funded initially.

## 2. *Moral Hazard: A Model*<sup>26</sup>

Assume that at  $t^0$ , the firm has an investment project that returns  $r$  at  $t^1$  if it succeeds and nothing if it fails. The firm has  $v$  of fixed assets that will be used in production but has no cash; thus, it must raise  $c$  from investors to do the project. Both the firm and the investors are risk neutral. The firm can take either of two actions after it raises  $c$ . A good action dedicates all of  $c$  to the project and generates a success probability of  $p_g$ . A bad action diverts a portion of  $c$ , denoted  $b$ , to the owners' personal satisfaction. When assets are diverted, the success probability is  $p_b$ , where  $p_b < p_g$ . Investors can observe whether the project succeeds or not but cannot observe which action the firm took. Assume that

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26. This section formally restates the results set out above. Readers uninterested in technical analysis should move to the Conclusion.

$$p_g r - c > 0 > p_b r - (c - b) \quad (1)$$

The expected value of the bad action is negative (the second inequality) while the expected value of the good action will fully cover project cost (the first inequality). An investment contract will promise to repay investors  $z_i$  where  $i = g$  (for success) or  $b$  (for failure). Such a contract is feasible only if  $z_g \leq r + v$  and  $z_b \leq v$ : the firm cannot promise to repay more than it has—assets plus return in the good state, and assets alone in the bad state. The firm is the residual claimant. Its return from doing the investment is  $a_g = r + v - z_g$  (for success) and  $a_b = v - z_b$  (for failure).

There are two questions: whether to invest in the project, and whether a feasible investment contract exists. Since the project earns negative returns when the firm takes the bad action and consumes the perk, a necessary condition for investors to supply the funds is that the investment contract must satisfy the incentive compatibility constraint:

$$p_g a_g + (1 - p_g) a_b \geq p_b a_g + (1 - p_b) a_b + b \quad (2)$$

This constraint requires the firm to earn a higher expected return from taking the good action—generating the high success probability—than from taking the bad action—generating the low success probability—but consuming the perk. Equation (2) simplifies to:

$$a_g - a_b \geq \frac{b}{\Delta p} \quad (3)$$

where  $\Delta p = p_g - p_b$ . Hence, for the firm to invest efficiently, it must be given a reward that is at least as great as the opportunity cost of maximizing the success probability (which is  $a_g - a_b$ ).

It is optimal to undertake the project if a contract exists that satisfies the incentive compatibility constraint—i.e., equation (3)—and under which the investor at least breaks even. This can be represented as:

$$p_g z_g + (1 - p_g) z_b \geq c \quad (4)$$

To see why, realize that (4), the investors' participation constraint, can be written as an equality by subtracting a constant from  $z_g$  and  $z_b$  (i.e. reducing the investors' payoff and increasing the firm's payoff). When (4) is an equality, the firm gets all the surplus. By equation (1) the firm will then take the good action because the total return from doing that exceeds the total return from taking the bad action and consuming the perk.

Thus, the question is whether there is a viable investment contract that satisfies equations (3) and (4). The set of such contracts will make  $a_b$ , the

firm's failure-state payoff, zero. Any contract that gives the firm more in the failure state can be replaced by a contract that gives it less then and more in the success state (i.e., raises  $a_g$ ) without changing the investor's payoff or, consequently, the firm's payoff. Reducing  $a_b$  to zero is desirable because this reduction makes the incentive compatibility constraint easier to satisfy. Equation (3) becomes

$$a_g \geq \frac{b}{\Delta p} \quad (5)$$

This is easier to satisfy than (3) because the left side is larger while the right side remains the same. The easier the constraint is to satisfy, the wider is the range of project returns that can support bribes to take the good action. Put simply, when the incentive compatibility constraint is easiest to satisfy, the number of weak positive value projects that are financed is maximized.

We are interested in the relation between the firm's investment policy and the amount of liquid assets,  $v$ , that the firm has. To analyze this, recall that the minimum payment necessary to keep the firm diligent is  $a_g = b/\Delta p$  and  $a_b = 0$ . Substituting these values into equation (4), the investors' participation constraint, and solving for  $v$  yields

$$v \geq v^* = c - p_g(r - \frac{b}{\Delta p}) \quad (6)$$

The right side of equation (6) can be zero or negative: in these cases, the expected value of the investor's return (the second term), even after subtracting the expected value of the bribe, equals or exceeds the investment cost,  $c$ . Then  $v^* \leq 0$ ; that is, no nonproject assets are required to finance the project because it generates sufficiently high expected returns. When the right side of equation (6) is positive, however, so also is  $v^*$ : the project alone cannot both support the bribe and ensure the investor a competitive return. In this event, the firm will be capital constrained unless it has enough nonproject assets to offer the investor.

To make clear that positive value projects can be rejected, rewrite equation (6):

$$p_g r - c = p_g(\frac{b}{\Delta p}) - v^* \quad (7)$$

Recall that the left side of this equality (the project's net present value) is assumed to exceed zero. Because this is an equality, the right side must exceed zero as well. Consequently, the firm earns a positive rent: the expected value of the bribe ( $p_g(\frac{b}{\Delta p})$ ) exceeds the nonproject assets that the

firm would have to yield in the failure state,  $v^*$ . This rent must be paid from the left side of (7), the project's surplus. Thus, project returns must support both the investor's payoff and the bribe. When  $v < v^*$ , the rent must increase, but then there would not be sufficient funds to pay it: a positive value project cannot support both the investor's payoff and the rent, so the project will not be financed.

Now consider the effect of deviations from absolute priority. A deviation ensures the firm a payoff in the failure state:  $a_b > 0$ . Recall that the incentive compatibility constraint requires the optimal investment contract to satisfy the condition  $a_b = 0$  (equation (5)). This makes the constraint easiest to satisfy while insuring the investor a competitive return. The easier the constraint, the more positive value projects are funded. When the law requires the firm's failure-state payoff to exceed zero, the left side of equation (5) falls to  $a_g - a_b < a_g$  while the right side remains the same. Consequently, the incentive compatibility constraint becomes harder to satisfy. This is inefficient. The greater is the expected deviation from absolute priority (i.e., the larger  $a_b$  is), the greater is the inefficiency. Hence, an anticipated deviation from absolute priority can create a capital-constrained firm when otherwise such a firm would not exist.

#### IV. CONCLUSION

The analysis here unfortunately does not support particular policy prescriptions. The conventional wisdom holds that the absolute priority rule exacerbates the overinvestment problem that solvent firms sometimes face. It is difficult to say how serious this problem is, however, because investors can mitigate it by using convertible debt or demanding debt with call provisions. These contract clauses are unhelpful in bankruptcy, but then deviations from absolute priority reduce the firm's incentive to overinvest. This suggests that deviations are desirable on net. Also, deviations can mitigate an underinvestment problem that is peculiar to insolvent firms: that a firm has no reason to pursue a positive value project when project returns would accrue only to creditors. On the other hand, this Comment has shown that an underinvestment problem exists for solvent firms that is worsened by deviations from absolute priority. The causes of this problem, the existence of prior debt and moral hazard, exist for insolvent firms as well. Bankruptcy courts have the authority to, and do, mitigate this problem for these firms, but if investors anticipate how bankruptcy actually works, the ex ante underinvestment problem is exacerbated. That investors are not myopic is a plausible view.



Thus, the question whether deviations from absolute priority are desirable or not is difficult to answer.<sup>27</sup> There is a need for more theory and more data. Analysts may be tempted to have recourse to norms of distributional justice or desert in the absence of these, but those norms offer little assistance and seem irrelevant. Deviations from absolute priority benefit equity at the expense of junior debt *ex post*.<sup>28</sup> The question of which of these investor groups is more deserving or more needy in general apparently poses an intractable problem in moral theory. Resolution of the problem seems unnecessary, however, because sophisticated investors anticipate deviations and so price them out. Therefore, moral theory is both unhelpful and seldom germane (due to investor behavior). The search for efficient solutions should continue.

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27. In an earlier paper, *see* Schwartz, *supra* note 1, I argued that anticipated deviations from absolute priority could act as a bribe to induce insolvent firms to settle disputes privately rather than make excessive use of formal bankruptcy procedures. The analysis which generated that conclusion assumed that firms could contract out of bankruptcy but that otherwise the current Code remained in place. Whether relaxing absolute priority would be the best way to encourage efficient settlement in a world with a satisfactory bankruptcy system is hard to say.

28. *See, e.g.*, Allan C. Eberhart et al., *Security Pricing and Deviations From the Absolute Priority Rule in Bankruptcy Proceedings*, 45 J. FIN. 1457, 1468 (1990) (reporting that of a sample of 30 bankruptcy cases filed after 1978, 24 resulted in creditor deficits, and in 23 of these 24 cases shareholders received payments in violation of the absolute priority rule).

