

The Double-Edged Sword of Withdrawal Rights

Kenneth Ayotte*

U.C. Berkeley School of Law

July, 2014

Abstract

A recent paper by Baird and Casey (2013) discusses the use of subsidiary legal entities to create a path around bankruptcy's automatic stay, giving a secured creditor a free right to withdraw collateral. In some cases, core assets of the firm are made separable from each other. This paper analyzes the trade-offs between allowing a secured creditor to freely withdraw a key asset, and a mandatory stay of withdrawal. I show that free withdrawal creates excess incentive for debtors to borrow from asset-based lenders who are uninformed about the debtor's going-concern value. This lack of information leads to bargaining inefficiencies that cause inefficient reorganizations and liquidations. A stay, by contrast, creates too much incentive to borrow from informed lenders, and excess continuation problems. I show that debtors will grant withdrawal rights excessively when permitted to do so, due to commitment problems caused by sequential contracting. This suggests caution in allowing a free opt-out of the stay through subsidiaries. The model suggests rules of thumb to guide application of a stay to non-debtor subsidiaries on a limited basis that targets the most inefficient withdrawals.

*Email: kayotte@law.berkeley.edu. Thanks to Ezra Friedman, Alan Schwartz, David Skeel, and workshop participants at the 2013 Law and Economics Theory conference for helpful comments.

1 Introduction

The automatic stay is one of the fundamental features of corporate reorganization. When a bankruptcy petition is filed, most rights against a debtor are temporarily suspended. The stay is most commonly justified as a way of defeating an unsecured creditor run due to a common pool problem. But, in practice, the stay operates more broadly than just preventing unsecured creditor runs. A secured creditor’s right to seize and sell collateral is automatically stayed, even when the creditor is fully secured.¹

The stay cannot be directly contracted around: attempts to waive the stay in loan contracts are not enforceable. But the stay is often contracted around indirectly. An important paper by Baird and Casey (2013) gives several examples suggesting that, in the modern firm, legal entity partitioning is used to create the same effective result. In some cases, the firm’s core assets are involved. The Los Angeles Dodgers placed each of the baseball team’s major assets (the team, the parking lot, and the stadium) in separate legal entities. While the baseball team entity filed for bankruptcy, a separate entity owning the team’s parking lot did not. Creditors of the parking lot entity were free to exercise their contractual rights as a result, notwithstanding the team entity’s bankruptcy case. The Dodgers case is not an isolated example: it has become common for firms with significant real estate exposure, such as retailers, nursing homes, and casinos, to separate their real estate into separate subsidiary entities that are separately financed (“OpCo-PropCo” structures)².

Baird and Casey (2013) argue that the ability to withdraw has ex-ante disciplinary benefits on management, and the observability of entity partitioning will likely lead to efficient creation of withdrawal rights. While this work and others explore the ex-ante benefits of secured creditor rights to seize collateral (Bolton and Scharfstein 1990, Hart and Moore 1994), the costs of these rights have not been fully developed. Doing so requires a theory explaining

¹11 U.S.C. 362(a)(4)

²The PropCo subsidiaries typically lease the assets back to the OpCo, and the lease payments form the backing assets for CMBS or other debt securities. Toys R’ Us, Station Casinos, and Genesis Healthcare are recent examples. While I do not model leases between the subsidiary and the parent formally here, Ayotte and Gaon (2011) show that such leases are not a complete cure for inefficient liquidation/continuation problems when necessary assets are transferred to a subsidiary.

why a mandatory stay of secured creditors—a policy rarely questioned by practitioners and policy makers, yet not fully explained by bankruptcy theory—may be valuable in the first place³. The increasing use of subsidiaries to hold firm-specific assets brings this issue to the forefront.

In this paper, I contrast a system of free withdrawal rights against the mandatory stay and structured bargaining that approximates the treatment of secured credit in bankruptcy. I show that asset-based lending coupled with withdrawal rights can be a double-edged sword, because it weakens incentives for secured creditors to acquire information about the debtor's business. In healthy states of the world, uninformed asset-based lenders provide a cheaper source of financing for borrowers. Because the collateral and withdrawal right limits downside risk, the asset-based lender is rationally less concerned about the value of the debtor's other assets and liabilities. But in bankruptcy states, the asset-based lender's right to withdraw the collateral can impose costs on other creditors. Specifically, limited information about the debtor's going concern value can cause bargaining imperfections that lead to inefficient bankruptcy outcomes when the creditor is permitted to withdraw. The main result of this paper is to show that when the debtor and a creditor create a withdrawal right, part of the costs of bargaining failure fall on the debtor's existing creditors. To the extent that existing debt contracts are incomplete, debtors do not fully internalize these costs ex-post. As a result, too much uninformed debt is issued in equilibrium, and bankruptcy outcomes are too often inefficient as a result.

Secured creditors are subject to an automatic stay in bankruptcy, but they are entitled to take their collateral when they can convince the judge that the creditor's value in withdrawal cannot be protected⁴. Withdrawal rights in bankruptcy, then, are state-contingent and

³As an example, Baird and Jackson (1984) argue in favor a stay of secured creditors:

“Because of the costs repossession and subsequent repurchase may bring, it is consistent with the purposes of bankruptcy to substitute for a secured creditor's actual substantive rights under nonbankruptcy law a requirement that the secured creditor accept the equivalent value of those rights.”

The contribution of this paper is to model these repossession costs and explain the stay's mandatory nature: i.e., why it might be contracted around even when it is efficient.

⁴Secured creditors are entitled to adequate protection of their security interest during the case (11 U.S.C. 361, 362(d)(1)), which protects them against depreciation of the collateral during the case. They are also

depend on the information made available to the bankruptcy judge and her ability to process it. I show that a stay of collateral seizure and structured bargaining eliminates inefficient liquidations, but creates more inefficient continuations, when creditors are uninformed. With respect to information creation, a stay creates the opposite problem: debtors have incentive to issue *too much* informed debt. This happens because the Bankruptcy Code requires that secured creditors provide information to defend their secured claim in bankruptcy court against expropriation by the other creditors. This potential zero-sum game leads to too much information production. When creditors are informed, bankruptcy outcomes are more efficient, but it is more costly to borrow from informed creditors.

With these costs and benefits in hand, I consider the choice of free withdrawal and a stay when a debtor can choose between the two options freely. I find that debtors create withdrawal rights too often from an efficiency perspective. This happens because the debtor's objective is to borrow at the lowest possible interest rate. For a given funding cost, this requires maximizing the new creditor's expected recovery in bankruptcy. This objective does not generally coincide with maximization of the bankruptcy estate: the debtor might borrow more cheaply by offering the new creditor a bigger piece of a smaller pie.

Overall, my analysis suggests a qualitative trade-off between a bankruptcy law that allows free contracting for withdrawal rights and a regime that enforces a mandatory stay. In the discussion that follows, I contrast withdrawal rights via subsidiaries (which generally are permissible⁵ under current law⁶) versus contractual waivers of the stay (which generally are not). Because subsidiaries are useful and/or necessary devices for making businesses entitled to the value of the collateral in a cramdown plan of reorganization. 11 U.S.C. 1129(b)(2)(A).

⁵A literal reading of the Bankruptcy Code would lead to this conclusion, since the stay applies only to actions against the debtor, which is the legal entity in bankruptcy. There are some cases, however, in which courts suggest the stay can be applied to actions against non-debtor subsidiaries. See *Queenie, Ltd. v. Nygard Intl.*, 321 F.3d 282 (2d Cir. 2003), *In re Residential Capital, LLC*, (2d Cir. 2013)

⁶To create a right to withdraw an asset when a parent defaults, the parent would need to create a subsidiary and transfer the asset to it. The creditor could take a security interest in the asset, and the debt contract could condition a default on a default or bankruptcy of the parent. The subsidiary would also likely need to be structured so that the parent could not bring it into bankruptcy; they could do this by putting creditor-friendly directors on the board. To see examples where courts undermined these attempts, see Baird and Casey (2013).

separable from each other, it is more likely that assets held in separate entities can be separated in bankruptcy without destroying going-concern value. This weighs against applying a stay broadly against withdrawal from entities that are not in bankruptcy themselves. On the other hand, a per se exception to the stay for subsidiaries effectively turns a mandatory stay into a default rule, opening the door for the types of inefficient withdrawal rights the model captures. Using the insights from the model, I suggest ways that a stay might be made available on a limited basis against subsidiary withdrawals in a way that targets going-concern value preservation and limits the potential for judicial error.

2 Related Literature

There is a large literature on the ex-ante benefits of secured credit, which allows the creditor to withdraw collateral in default. One branch focuses on preventing moral hazard, such as the diversion of cash flows (Bolton and Scharfstein 1990; Hart and Moore 2004). Secured debt can limit other moral hazard problems such as asset substitution and overinvestment in a way that limits monitoring costs associated with covenants in unsecured debt (Jackson and Kronman 1979, Triantis 1992). A second branch focuses on adverse selection. Collateral serves as a signal, thus limiting the need for creditors to be fully informed about firm value (Bester 1985, Besanko and Thakor 1987). This paper is most related to the second branch, as it demonstrates a cost to allowing a withdrawal right when creditors are not fully informed about firm value.

This paper adds to a literature that analyzes mandatory rules in bankruptcy. In the corporate context, mandatory rules are challenging to justify, as they may disturb efficient contractual bargains (Che and Schwartz 1999). Mandatory rules have been justified in environments where multiple creditors contract sequentially with the debtor, giving rise to potential externalities. Externalities are imposed on early creditors by later creditors to the extent that covenants cannot prevent subsequent dilutive contracts (Longhofer and Peters 2004) or imposed on late creditors by early creditors when information about existing rights is costly to verify (Ayotte and Bolton 2011). This paper's approach is similar to Longhofer and Peters (2004). It adds to it by analyzing a specific bankruptcy institution

(the stay of secured creditors and the structured bargaining in the U.S. Bankruptcy Code) and contrasting it against the alternative of free withdrawal.

My model bears resemblance to the normative debate about whether secured credit should receive full priority with respect to their collateral (Bebchuk and Fried 1996, Schwartz 1996). Different from this literature, which analyzes whether the substantive value of a secured creditor's collateral should be respected, I analyze how the choice of procedure (a mandatory stay and structured bargaining, or free withdrawal) affects efficiency. The trade-offs are also different, as I focus on information acquisition and its effect on the efficiency of the continuation/liquidation decision in bankruptcy, which is largely missing from that debate. My model also reaches a different normative prescription: it suggests that the substantive rights of secured creditors should be *better* defended, to limit the tendency to use inefficient withdrawal rights as a substitute for a traditional security interest.⁷

In contrasting the stay and free withdrawal, my model also relates to the bankruptcy literature that addresses the inherent tension between holdup and cramdown (Adler 2012). Different from Adler (2012), I allow for endogenous information generation by creditors ex-ante and consider its effects on bargaining ex-post. This paper also relates to the maturity rat race in Brunnermeier and Oehmke (2013). In their model, short maturity is similar to a withdrawal right in my model; they show that maturity can be too short due to creditor externalities. Their paper does not model or discuss bankruptcy law, however.

Previous literature suggests several benefits of creating separate subsidiaries and free withdrawal rights. Giving lenders a claim that is targeted only to a particular asset, via a separate legal entity, limits problems of moral hazard and adverse selection by borrowers (Hill 1996, Iacobucci and Winter 2005, Ayotte and Gaon 2011). Creditors secured by collateral of a known value with free withdrawal rights can focus their monitoring efforts on

⁷The case for a mandatory stay is likely stronger than the case for weakening a secured creditors' substantive rights. First, the ex-ante benefits of secured debt (such as preventing debtor moral hazard) generally rely on protecting the substantive value of the creditors' claim, not the procedural right. Second, early creditors can protect themselves against inefficient subsequent security interests by taking a security interest themselves (Schwartz 1996). The same is not true for withdrawal in this model: early creditors *are* secured by all assets available at the initial date. An inefficient withdrawal right reduces the value of the early creditors' deficiency claim, which is harder to defend against redistribution.

their collateral; they need not be as concerned about the debtor's other assets, liabilities, and operations.

3 Model Setup

3.0.1 Timeline

Consider a model that takes place over 4 relevant dates, 1,2,3,4. At date 1, an owner/equity holder (E) starts a firm by issuing debt to a creditor (P1) to finance the purchase of asset A. At date 2, the owner needs continuation financing i_2 to finance a new asset B. The financing must be provided by a new creditor (P2). At date 3, an interim signal is realized and a continuation or liquidation decision must be made. At date 4, a final cash flow is realized and distributed.

3.0.2 States of the World

At date 3, the firm will either succeed or default. Success occurs with probability p . If success occurs, the firm will produce a large cash flow X_3 at date 3, sufficient to pay off all creditors in full and leave a surplus for the owner. If default occurs, with probability $(1 - p)$, the final cash flow will not be sufficient to pay creditors in full, so the owner will receive zero. The continuation/liquidation decision will affect the recoveries of P1 and P2. Importantly, assets A and B are assumed to be essential for the firm to continue.

In default, there are three possible states (high, medium and low) that represent the continuation value of the firm. Conditional on default, state $j \in \{h, m, l\}$ occurs with probability p_j , so $p_h + p_m + p_l = 1$. The liquidation value of the firm at date 3 is $L_3 = \alpha_3 + \beta_3$, where $\alpha_3(\beta_3)$ is the liquidation value of asset A (B) at date 3, and is the same in all states. If continuation is chosen, the firm may recover or fail. Failure produces $L_4 = \alpha_4 + \beta_4$, and recovery produces $X_4 > L_4$. The states are represented by the probability of recovery. Let π_j represent the probability of recovery in state j . The continuation value of the firm at date 3 in state j , then, is $C_j = \pi_j X_4 + (1 - \pi_j) L_4$. I assume that continuation is efficient in the high and medium states but not the low state: $C_h > C_m > L_3 > C_l$. For convenience, let $\bar{\pi}$ denote

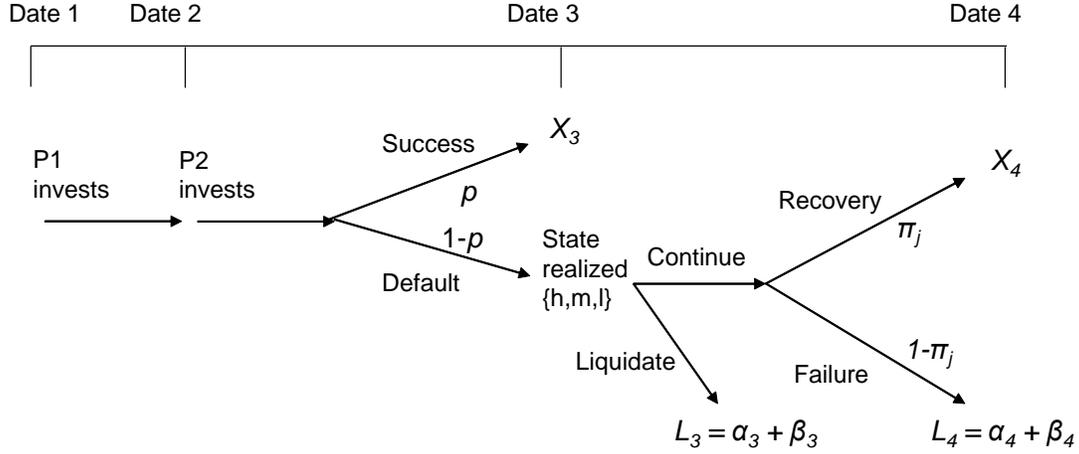


Figure 1: Timeline and Project Payoffs

the ex-ante expected probability of recovery if all types continue: $\bar{\pi} = p_h\pi_h + p_m\pi_m + p_l\pi_l$. The timeline and project payoffs are represented in Figure 1.

3.0.3 Creditors and Contracts

Though represented here as a single actor, P1 is intended to represent the general body of a firm's creditors, who are both secured in part and unsecured in part. When we discuss bargaining under the stay in Section 5, P1 will represent the interests of the bankruptcy estate. I assume that P1 has a debt claim, secured by asset A, that comes due no earlier than date 3. I also assume that P1 has full information about the continuation and liquidation values of the firm.

In borrowing at date 2, the owner has two choices of lender type (informed and uninformed) and two choices of creditor rights (free withdrawal and stay). An informed lender has full knowledge of the state of the world, including the firm's continuation value in default. An uninformed lender knows only the liquidation value of its collateral. As a concrete example, an informed lender could be a relationship bank. An uninformed lender is an asset-based lender such as mortgage lenders, purchasers of commercial mortgage-backed securities, or equipment vendors, with knowledge of the collateral's value but only minimal knowledge of the debtor's business. I assume that P1 knows whether P2 is informed or not.

Both types of lenders operate in a competitive market, but because an informed lender must acquire information that an uninformed lender does not, I assume that informed lending is more costly to provide. In exchange for lending i_2 , and uninformed lender requires only a claim with expected value of i_2 . But an informed lender requires θi_2 , where $\theta > 1$.

3.0.4 Bargaining Under Free Withdrawal

If P2 is given a withdrawal right in default, it may be inefficient for P2 to exercise it. P2 may prefer to bargain with P1 instead. I assume the following bargaining structure in default: nature chooses one of the two creditors to make a take-it-or-leave-it offer to the other. P1 and P2 are each chosen with probability $\frac{1}{2}$. Importantly (and realistically), because the firm is in financial distress, I assume that the players are liquidity-constrained when they bargain; thus, they can offer only a stake in the ongoing firm as currency. A player can either choose to make an offer of a state-contingent payoff in continuation or propose liquidation. Let $\{t_h, t_l\}$ denote P2's payoff in the proposed offer, where $t_h \leq X_4, t_l \leq L_4$. Alternatively, the offeror can propose liquidation, which causes liquidation to occur automatically. If a continuation offer is refused by the offeree, then liquidation also occurs.

Bargaining will proceed slightly differently if withdrawal rights are stayed; I postpone this discussion to Section 5.

3.1 Parameter assumptions

I make the following parameter assumptions:

Assumptions 1 and 2:

$$X_3 > \bar{F}_{\max}$$

$$C_h < \bar{F}_{\min}$$

where \bar{F}_{\max} (\bar{F}_{\min}) is the total face value of debt to all creditors when default is as

inefficient (efficient) as possible, and financing is as expensive (inexpensive) as possible:

$$\begin{aligned} p\bar{F}_{\max} + (1-p)\{(p_h + p_m)L_3 + p_l C_l\} &= i_1 + \theta i_2 \\ p\bar{F}_{\min} + (1-p)\{p_h C_h + p_m C_m + p_l L_3\} &= i_1 + i_2 \end{aligned}$$

The first assumption ensures that if success occurs, there will always be value left over for the owner. The second assumption ensures that debtor always gets nothing in default.

Assumption 3: It is always efficient to borrow at dates 1 and 2, no matter what choices are made in distress, and irrespective of whether financing is informed or uninformed:

$$\begin{aligned} pX_3 + (1-p)\{(p_h + p_m)L_3 + p_l C_l\} &> i_1 + \theta i_2 \\ (p_h + p_m)L_3 + p_l C_l &> \theta i_2 + L_2 \end{aligned}$$

This assumption rules out credit rationing at dates 1 and 2. By doing so, it merely cabins the potential inefficiencies that might occur in the model. Relaxing these assumptions would increase the number of cases to consider without affecting any of the qualitative insights.

3.1.1 The Maximization Problem

The essence of this problem is that E cannot commit to its financing choices at date 2 when it contracts at date 1. Hence, we state the objective by working backward from date 2. E's objective at date 2 is to choose the creditor type ($\eta = \{0,1\}$, where 0=uninformed, 1=informed), withdrawal right ($w = \{1,0\}$, where 1=free withdrawal, 0=stay) and debt repayment obligation F_2 to maximize her own expected payoff subject to the creditor's participation constraint:

$$\max_{\eta, w, F_2} p(X_3 - F_1 - F_2)$$

subject to

$$pF_2 + (1-p)R_{P2}^{\eta, w} \geq \eta\theta i_2 + (1-\eta)i_2$$

The $R_{P2}^{\eta, w}$ term is P2's expected recovery in a default, which will depend on whether P2 is informed and whether P2 has the right to withdraw. P2's participation constraint will always

bind in equilibrium, so we can substitute the constraint into the objective. Eliminating parameters that are fixed as of date 2, the date 2 problem is equivalent to maximizing the following:

$$\max_{\eta, w} (1-p)R_{P2}^{\eta, w} - \eta\theta i_2 - (1-\eta)i_2,$$

E's objective as of date 2, which is to maximize her payoff in the event of success, is equivalent to maximizing P2's expected recovery in default, less the cost of the funds raised from P2.

The Date 1 problem

If we call the solution to this problem $\{\eta^*, w^*, F_2^*\}$, then E's date 1 problem is to maximize

$$\max_{F_1} p(X_3 - F_1 - F_2)$$

subject to

$$pF_1 + (1-p)R_{P1}(\eta^*, w^*, F_2^*) \geq i_1$$

In our problem, F_1 does not affect F_2 or $R_{P1}(\eta^*, w^*, F_2^*)$. Hence, the period one problem is simply to minimize F_1 subject to the lender's participation constraint, which always binds. Solving using the binding participation constraint, we have $F_1^* = \frac{i_1 - (1-p)R_{P1}(\eta^*, w^*, F_2^*)}{p}$. Previous literature justifying mandatory features of bankruptcy focus heavily on "maladjusting" creditors who do not anticipate or respond to the debtor's subsequent actions (Warren and Westbrook 2005). It is worth emphasizing that the early creditors in this model are "fully adjusting": they price all anticipated future actions into their interest rate. These early creditors are only limited in their ability to police the debtor's subsequent actions.

If we plug in the solutions to the date 1 and 2 maximization problems, the debtor's date 1 utility is

$$pX_3 + (1-p)\{R_{P1}(\eta^*, w^*, F_2^*) + R_{P2}^{\eta^*, w^*}\} - i_1 - \eta\theta i_2 - (1-\eta)i_2$$

Since $R_{P1}(\eta, w, F_2) + R_{P2}^{\eta, w}$ is the total value of the bankruptcy estate, it is clear that any inefficient outcomes in bankruptcy are fully borne by the debtor in equilibrium. Nevertheless,

the debtor may not be able to eliminate inefficiencies, because it can not commit at date 1 to excluding redistributive terms in P2's loan.

Having set up E's problem, I will now examine the choice of informed versus uninformed debt under the two possible choices of creditor rights: free withdrawal and the stay.

4 Information Under Free Withdrawal Rights

To solve the model, I will work backward, starting from the date 3 bargaining game between P1 and P2 when P2 has the right to withdraw asset B in a default.

4.0.2 P2 is informed

When P2 is informed, the bargaining game between P1 and P2 is a game of complete information; i.e. both parties know the continuation and liquidation values of the firm. Hence, ex-post efficiency will obtain. When both players are informed, it is irrelevant how surplus is shared across the recovery and failure outcomes; hence I simply focus on the division of the firm's expected continuation value C .

When nature chooses P1 to make the offer and the low state occurs, P1 can do no better than proposing liquidation, so the firm will liquidate. In the medium and high states, P1 will offer P2 her liquidation payoff, β_3 . Hence, when P1 makes the offer, P2 always receives β_3 .

When nature chooses P2 to make the offer, P2 will choose liquidation in the low state, but will offer to keep all the continuation surplus in the medium and high states. Thus, P2 offers to keep $C_j - \alpha_3$ in state $j = \{h, m\}$, and continuation occurs.

4.0.3 P2 is uninformed

Under incomplete information, the bargaining game is slightly more complicated and can result in inefficient continuation and liquidation.

When nature chooses the informed party (P1) to make the offer, the offer can reveal information about the continuation value of the firm. I use Perfect Bayesian Equilibria (PBE) as the equilibrium concept: P2 must form a belief about the continuation value of

the firm for every offer P1 might make, and this belief must be consistent with Bayes rule along the equilibrium path. It is well-known from the corporate finance literature that a high-state P1 prefers an equilibrium in which P2 is offered the least information-sensitive claim possible, which is senior debt (Myers and Majluf 1984). That is, P1 will load P2's payoff into the failure outcome to the maximum extent possible, to minimize the payoff difference between recovery and failure to P2⁸. This occurs because a high-state P1 will want to minimize the cross-subsidy associated with offering a stake in the firm whose value is unknown.

I focus on PBE that take this form. I assume that P2's beliefs are as follows: any offer that is not senior debt is viewed skeptically by P2: it is assumed to come from the low-state P1. When senior debt is offered, P2's belief about the state is her prior belief, updated in a Bayesian way by assigning zero probability to states in which P1 would (weakly) prefer liquidation to continuation given the offer. More concretely, when P1 offers P2 a payoff function $\{t_h, t_l\}$ in the form of senior debt, P2's belief that the state is j is 0 if P1 would prefer liquidation to acceptance of the continuation offer in that state, and $\frac{p_j}{\Phi}$ otherwise, where $\Phi \leq 1$ is the sum of the probabilities of states in which P1 prefers acceptance of the offer to liquidation.⁹ Since the liquidation payoff is known, it is clear that whenever P1 prefers continuation in a given state, he prefers continuation in any higher state as well.

This leads us to the following proposition, which shows that inefficient outcomes can occur under asymmetric information:

Proposition 1 *Suppose that P1 makes the offer to P2, and P2's beliefs are as described above.*

a) *If $\beta_3 < L_4$, or $\beta_3 > L_4$ and $\pi_l(X_4 - \frac{\beta_3 - (1-\bar{\pi})L_4}{\bar{\pi}}) < \alpha_3$, then the unique PBE involves efficient outcomes: the high state and medium state P1's make a continuation offer of senior debt to P2, and P1 accepts. The low state P1 proposes liquidation.*

b) *If $\beta_3 > L_4$ and $\pi_l(X_4 - \frac{\beta_3 - (1-\bar{\pi})L_4}{\bar{\pi}}) > \alpha_3$, then the unique PBE is a pooling equilibrium*

⁸Formally, senior debt means that P2 is promised a fixed payment F and receives a payoff $\min\{x, F\}$ where x is the date 4 cash flow. In this context $t_l = t_h$ if $t_h < L_4$, and $t_l = L_4$ for any $t_h > L_4$.

⁹As an example, if P1 would prefer acceptance of a given offer to liquidation in the good and medium state but not the low state, then P2's belief that the state is {high, medium, low} is $\{\frac{p_h}{p_h+p_m}, \frac{p_m}{p_h+p_m}, 0\}$.

with inefficient continuation in the low state. All P1 types make a continuation offer $t^* = \{\frac{\beta_3 - (1-\bar{\pi})L_4}{\bar{\pi}}, L_4\}$ and P2 accepts.

All proofs are located in the appendix.

When the conditions in part (b) hold, a PBE with inefficient continuation may occur because the low state P1 may try to mimic the higher state P1's, and the higher state P1's cross-subsidize the low state P1 in continuation. If this continuation cross-subsidy is large enough relative to the inefficiency of continuation in the low state, the low type will make a continuation offer. P2 has rational expectations in equilibrium, and knows that all P1 types will make the continuation offer. A high state or medium state P1 can not improve on this outcome, since any $t_h < \frac{\beta_3 - (1-\bar{\pi})L_4}{\bar{\pi}}$ will be rejected by P2 given her beliefs. Since low state P1's prefer continuation to liquidation, then higher types also prefer it. If the inefficient pooling equilibrium results, P2's expected payoff is her liquidation value β_3 .

Part (a) suggests circumstances in which inefficiency is less of a concern. If the low type P1 has particularly poor prospects, he will never propose continuation, notwithstanding the cross-subsidy. More importantly, inefficiency can also be avoided if P1 can offer P2 a less informationally-sensitive claim. In the model, I allow P1 to offer the entire firm value to P2. In practice, the other creditors in the estate might be dispersed and unable to offer their entire collateral value to P1. The more free assets available to offer P2, the lower the cross-subsidy, and the more efficient continuation outcomes will be.

I have shown that inefficient continuation can occur when an informed P1 makes an offer to an uninformed P2. Next, consider the case where nature appoints P2 to make the offer. In this case, inefficient liquidation can result:

Proposition 2 *Suppose P2 makes the offer to P1. If $p_h \frac{(\pi_h - \pi_m)}{\pi_m} (\alpha_3 - L_4) > p_m (C_m - L_3)$, then inefficient liquidation occurs in the medium state.*

Intuitively, in making a take-it-or-leave-it offer, P2 tries to capture as much of the continuation surplus as possible from P1. If $\alpha_3 < L_4$, then P2 can acquire the entire going concern surplus from both high and medium types by simply offering P1 a risk-free debt claim on

the firm that pays α_3 , and keeping the remainder.¹⁰ If this is not possible, then P2 faces a trade-off. Because of P1's information advantage, P2 must choose between capturing all the surplus in the high state and risking rejection of the offer in the medium state, or capturing all the surplus in the medium state and leaving P1 with positive surplus in the high state. When the inequality holds, the high state is sufficiently attractive that P2 prefers to risk liquidation in the medium state for a greater share of the high state payoff. When these conditions holds, P2's payoff, state-by-state, is $\{C_h - \alpha_3, \beta_3, \beta_3\}$.

By examining the inequality $p_h \frac{(\pi_h - \pi_m)}{\pi_m} (\alpha_3 - L_4) > p_m (C_m - L_3)$, we can see that inefficient liquidation is more likely when there is more uncertainty by P2 about the going-concern value, conditional on continuation being efficient (i.e. $\pi_h - \pi_m$ is higher). We can also see, similar to Proposition 1 above, that inefficient liquidation is more likely when P2 is forced to offer P1 a more informationally sensitive claim. This happens when α_3 (P1's required payoff) is large relative to L_4 (the maximum guarantee that can be offered in continuation).

4.1 The Date 2 Borrowing Game

With these results in hand, now we can return to the date 2 borrowing game. Conditional on giving P2 a withdrawal right, will the debtor borrow from an informed or an uninformed lender? The following lemma gets us close to the answer:

Lemma 3 *Conditional on P2 making the offer, any efficiency costs of using uninformed debt (inefficient liquidation in the medium state) are borne entirely by P2 ex-post. But conditional on P1 making the offer, the efficiency costs of uninformed debt (inefficient continuation in the low state) are borne entirely by P1 ex-post.*

The Lemma illustrates that only part of the costs of incomplete information and bargaining failure fall on P2. This implies that the debtor incurs the full cost of borrowing from an informed creditor, but can only capture part of the benefits through the loan terms with P2. The following proposition proves this result, and suggests comparative statics about the information inefficiency:

¹⁰Strictly speaking, the offer would need to involve a small amount of risk for P1, so as to keep the low type from accepting, but this risk for P1 could be made arbitrarily small.

Proposition 4 *Suppose $\pi_l(X_4 - \frac{\beta_3 - (1-\pi)L_4}{\pi}) > \alpha_3$; i.e. there is a PBE with inefficient continuation in the low state. When E issues debt with a withdrawal right, E 's financing choice is biased toward uninformed debt, relative to efficiency. The distortion toward uninformed debt is larger when:*

- a) the probability of distress ($1 - p$) is higher;*
- b) the probability of inefficient continuation (p_l) is higher;*
- c) the expected cost of an inefficient continuation ($L_3 - C_l$) is higher.*

The comparative statics are intuitive. Perhaps the most important is part (a). It suggests that when borrowers are more distressed when they seek financing (i.e. bankruptcy is more likely), they are more likely to issue uninformed debt inefficiently.

In the next section, I consider an alternative to free withdrawal: a stay on withdrawal and structured bargaining, akin to the rights a secured creditor would have in bankruptcy.

5 Information Under the Stay

Consider the following alternative bargaining procedure when distress occurs, which approximates the treatment of secured credit in bankruptcy:

1. P2's right to withdraw is stayed.
2. If P1 wishes to continue, he must propose an allocation $\{t_h, t_l\}$ to P2. This allocation must give P2 an expected payoff of at least β_3 , the value of her withdrawal right in liquidation, and $t_l \geq \beta_4$: P2 must receive her collateral value at date 4 after continuation and failure.¹¹ Alternatively, P1 can propose liquidation, thus ending the game.
3. P2 can force liquidation if she can demonstrate to the bankruptcy judge that her interest in the collateral is not "adequately protected", by showing that $\{t_h, t_l\}$ is worth less than β_3 . If P2 can not convince the judge her collateral is not adequately protected, then

¹¹The need to guarantee β_4 in failure is motivated by the practice of providing adequate protection. Secured creditors generally keep the security interest in their original collateral, and receive additional collateral to the extent that their collateral is depreciating. It is also akin to the requirement in a cramdown plan of reorganization in which the debtor keeps the collateral and gives the secured creditor a note, that the secured creditor's new claim must be backed by the original collateral. 1129(b)(2)(a)(i).

continuation occurs under the terms proposed by P1.

The judge is not aware of the state ex-ante, but knows the probabilities of the states and the payoffs in each state. An informed P2 can credibly convey her information about the state of the world to the judge. Thus, an informed P2 will never receive less than β_3 . An uninformed P2 can not provide any information. I assume that an uninformed judge leans in favor of continuation, by deeming P2 adequately protected if there is at least some positive probability that P2's proposed allocation is worth β_3 .¹²

5.0.1 Informed P2

If P2 is informed, the outcome of the structured bargaining game is identical to the withdrawal game when P1 makes the offer. P1 will offer a continuation allocation that gives P2 exactly her liquidation value in the high and medium states. In the low state, P1 liquidates the firm.

5.0.2 Uninformed P2

If P1 proposes continuation when P2 is uninformed, P1 will propose an allocation that would give P2 her liquidation value at date 4 in failure, and a payoff in recovery that would give P2 an expected value of β_3 if the high state were the true state. Formally, P1 proposes $t = \{t'_h, \beta_4\}$ where t'_h solves $\pi_h t'_h + (1 - \pi_h)\beta_4 = \beta_3$, or $t'_h = \frac{\beta_3 - (1 - \pi_h)\beta_4}{\pi_h}$.¹³ P1 will always propose continuation in the high and medium states, because the going concern value is positive, and P2 receives no more than her liquidation value β_3 . Hence, P1 always receives more than his liquidation value. In the low state, P1 may propose liquidation if the cost of inefficient liquidation exceeds the amount that P1 redistributes from P2. Continuation will

¹²Though P1 is always informed, I do not allow P1 to present information to the court. This would follow from optimizing behavior by P1 when the only verifiable information is negative. P1 would have no incentive to reveal any negative information, and could not credibly convince the court of its absence.

¹³If P1 tries to keep more than this, P2 can convince the judge she is not receiving her liquidation value even if she is uninformed, since I assume that the judge is aware of the payoffs in the 3 possible states.

Note that, in contrast to the problem above, P1 wants to maximize the difference between P2's high state and low state payoff, to maximize the information rents from continuation when the high state does not occur.

occur in the low state if and only if

$$\pi_l(X_4 - t'_h) + (1 - \pi_l)\alpha_4 > \alpha_3. \quad (1)$$

The next proposition shows that incentives for P2 to gather information under a stay are very different than under free withdrawal rights:

Proposition 5 *Under a mandatory stay and structured bargaining, E's financing choice is biased toward informed debt, relative to efficiency. The distortion toward informed debt is larger, all else equal, when*

- a) *The uncertainty regarding going concern value is larger (higher π_h , holding $\bar{\pi}$ constant)*
- b) *The value of P2's collateral deteriorates faster in continuation ($\beta_3 - \beta_4$ is larger)*

The proposition demonstrates that being uninformed creates two sources of loss for P2: the deadweight loss from inefficient continuation in the low state (which is borne entirely by P2 ex-post), and an information rent that is captured by P1. In the high state, efficient continuation occurs, and P2 receives exactly her liquidation payoff in expectation, β_3 . In the medium state, efficient continuation also occurs, but P1 is able to give P2 a claim with an expected value less than her liquidation value. In the low state, if P1 prefers liquidation, then P2 gets her liquidation payoff. But if P1 prefers continuation, then P2 receives a claim worth no more than $\beta_3 - (L_3 - C_l)$, her liquidation value less the loss from inefficient continuation.

Because becoming informed has both an efficiency and a redistribution motive, the proposition illustrates that the debtor and P2 have too much incentive to issue informed debt in equilibrium. This point has important practical relevance. It is well-known that in financial distress, debt claims are increasingly originated and held by sophisticated and informed lenders. The proposition shows that the Bankruptcy Code generates demand for these kinds of lenders. While informed lenders increase ex-post efficiency, they are also more effective players in the zero-sum game of defending their claims against other creditors. The existence of these lenders can increase the firm's overall cost of capital, since they demand a higher rate of return on their money (in my model, the premium $\theta - 1$).

6 Free Withdrawal Versus the Stay

So far, I have analyzed a free withdrawal regime and a stay regime separately, to focus on the choice of informed and uninformed debt. Now, suppose that E can offer P2 the choice of whether to subject itself to the stay or not. In practice, E could offer P2 a traditional secured debt claim (which would be subject to the stay) or it could offer to place asset B in a subsidiary financed by P2 (which could avoid a stay if structured properly).

First, I analyze the efficiency consequences of the withdrawal vs. stay decision. The efficient choice of financing at date 2 balances the cost of financing against the value of the total bankruptcy estate. Formally, choosing an efficient choice of financing is equivalent to maximizing the following at date 2:

$$\max_{\eta, w} (1 - p) \{R_{P1} + R_{P2}\} - \eta \theta i_2 - (1 - \eta) i_2$$

As we saw above, E's private objective differs from this social objective, because E does not internalize the effect of his decision on P1's recovery, R_{P1} .

To start, note that conditional on issuing informed debt ($\eta = 1$), withdrawal and the stay are equivalent from an efficiency standpoint: bargaining results in ex-post efficiency, so the total estate $R_{P1} + R_{P2}$ is maximized. With that in mind, the next proposition shows that the choice of withdrawal or a stay is ambiguous from an efficiency perspective when θ is large:

Proposition 6 *Suppose that θ is large enough that uninformed debt is always efficient. Then either a stay or a withdrawal right in favor of P2 may be efficient, depending on the parameters. The stay is more likely to be efficient when:*

- a) *the probability of liquidation being efficient is lower (p_l is lower, holding $\frac{p_h}{p_m}$ constant);*
- b) *P2's collateral is less at risk under the stay (β_4 is greater, holding L_4 constant)*

When P2 is uninformed, the analysis above tells us that the inefficiencies from free withdrawal and the stay are different. Free withdrawal creates the possibility of inefficient liquidation in the medium state, which does not occur under a stay. Inefficient continuation can occur under both, but it occurs for a strictly greater range of parameters under the stay

than under withdrawal. If a withdrawal right is given, inefficient continuation occurs only when P1 has the bargaining power, and can convince P2 to accept a continuation offer. In the stay regime, by contrast, P2's consent is not required. P1 can offer P2 a smaller payoff in the stay regime, and this leads to greater excess continuation problems. Hence, the stay is more likely efficient when inefficient continuation is less likely, or less costly when it occurs.

Part (a) is intuitive, in that the stay is more likely to be efficient when continuation is more likely to be efficient. Part (b) suggests that a stay is more efficient when P2's claim is less subject to dilution by P1. Since P2 remains secured by its collateral, P2 is more protected when its collateral maintains its value. This, in turn, creates less incentive for P1 to seek an inefficient continuation.

The next result is that E and P2 do not have the incentive to make the right choice from an efficiency perspective. Instead, debtors always opt for granting free withdrawal rights to later creditors:

Proposition 7 *When E can choose between offering P2 a withdrawal right or a secured claim subject to a stay, E will always choose free withdrawal.*

When E and P2 contract, they will choose the option that maximizes P2's recovery in distress, because this allows E to borrow at a lower interest rate from P2, and a lower interest rate maximizes E's payoff in a success. P2 always does strictly better in withdrawal than under a stay. In withdrawal, P2's expected payoff is strictly more than her liquidation value: P2 receives her liquidation value (in expectation) when nature chooses P1 to make the offer, and P2 receives liquidation value plus any going-concern surplus when P2 makes the offer. Under the stay, by contrast, P2's expected payoff is strictly less than liquidation value: she receives her liquidation value in the good state, and a claim worth less than her liquidation value in the medium state. In the low state, she receives liquidation value if P1 chooses it, and a claim less than liquidation value if P1 chooses to continue.

The model's result is clearly stronger than we observe in reality: debtors do not always place new assets in subsidiaries to create withdrawal rights. There are several reasons why this strong result emerges. First, I assume that E always receives zero in any bankruptcy. If this assumption is relaxed, E will internalize some of the inefficiency from withdrawal

directly, and thus may seek to prevent it by contracting for a stay. Second, I have assumed that P1 controls the bankruptcy estate, and uses this control right to deny P2 any of the going-concern value in reorganization. If P2 were to receive some of this value, P2 might contract for a stay if sufficient value is put at risk through bargaining breakdown. Finally, I have assumed that creating a withdrawal right has no effect on E's payoff in a success. In reality, the creation of a separate subsidiary adds some legal constraints. In using assets A and B together, the subsidiary and the parent must transact as separate parties and this may impose some constraints on their operations (Iacobucci and Triantis 2007). Relaxing these assumptions would result in debtors subjecting some creditors to the stay voluntarily, but the debtors' tendency to grant withdrawal rights too often should be robust to these changes.

7 Discussion

7.1 Contractual Alternatives to a Stay

The discussion suggests that the choice between free contracting for withdrawal rights and a mandatory stay is a nontrivial one. This happens because the contract between E and P2 creates externalities that can negatively affect early creditors (P1 in the model), to the detriment of overall efficiency. Early creditors will anticipate these inefficiencies and price them into their loan contracts, but this merely shifts the costs of inefficient use of assets onto the debtor. The debtor, then, will prefer a regime that allows for a commitment to efficient financing terms and efficient resolution of distress to the extent possible.

An important assumption underlying the analysis is that early creditors' contracts are long-term and not contingent on E's contract with P2. Thus, P1 can not prevent any contracting externalities between E and P2. A possible objection to this assumption is that E and P1 have an incentive to include covenants that prevent subsequent inefficient contracts between E and P2. In a complete contracting world, P1 would include a covenant that would create an event of default any time an inefficient withdrawal right is created in favor of P2. This would deter any inefficiency, and would obviate the need for a mandatory

stay since any permissible withdrawal right would be an efficient one.

To the extent that early lenders are comprised of lenders that actively monitor and can renegotiate with the debtor, covenants can be effective. Bank loan facilities to large corporate borrowers typically mention subsidiaries for the purposes of calculating liquidity and leverage ratios, and restrict activity between parent and subsidiaries. Some require the lender's permission to create new subsidiaries. There are costs to this strategy, as covenants that require lender permission to create new subsidiaries are probably over-broad; but to the extent that renegotiation is flexible, the costs of overly broad covenants (the risk of acceleration and bankruptcy and inefficient outcomes) are less severe.

The strongest case against covenants preventing all inefficiency is the existence of creditors that are not active monitors. Examples of these types of lenders include trade creditors, lessors and other executory contract counterparties, asset-based lenders (such as mortgage lenders), tax and tort creditors, and to a lesser extent, public bondholders. These creditors rarely require covenants that are sufficiently detailed to prevent withdrawal rights through subsidiaries. Empirical evidence suggests that these creditors are an economically significant part of a firm's capital structure¹⁴. If a borrower wanted to include an inefficient withdrawal right, they would likely need to compensate their active monitors for any costs imposed on them, but they would not need to compensate inactive monitors.

7.2 Withdrawal Rights in Contracts Versus Subsidiaries

Under current law, a withdrawal right created through a subsidiary is more likely to be enforceable than a withdrawal right created by contract in an ordinary loan agreement. My model describes a potential inefficiency that can result from free contracting for withdrawal rights, but does not distinguish between these two possible ways a withdrawal right might be created. In this section, I consider whether the normative case for enforcing withdrawal

¹⁴Rajan and Zingales (1995) find that trade credit (as measured by accounts payable) are 22.7% of the total liabilities of public firms. Ayotte (2014) finds that capital and operating leases constitute 12% of assets and 21% of financial liabilities for large Chapter 11 filers in the year before the filing.

through subsidiaries is stronger than the (hypothetical) case for enforcing a waiver of the stay in an ordinary secured credit contract.

The two mechanisms provide slightly different forms of public notice, but these differences are not substantial. In both a subsidiary withdrawal, and a hypothetical stay waiver, the law requires that the later creditor provide some form of public notice of its interest, which is only partially informative about the presence of a withdrawal right¹⁵. That is, the public notice available in either mechanism would make an actively monitoring lender aware that the debtor *may have* created a withdrawal right. The scope of that withdrawal right (whether the later lender has the right to freely withdraw, and the states of the world in which it is possible), however, would require knowledge of the specific details of the agreement between the later lender and the borrower. In the stay waiver case, the early creditor would need to observe the loan contract to observe the presence or absence of a stay waiver. In the case of subsidiary withdrawal, the loan must include a covenant that creates an event of default whenever the parent defaults. The subsidiary creditor's ability to withdraw also depends upon the parent's control over the subsidiary. If the parent controls the subsidiary, it could deny withdrawal by bringing the subsidiary into bankruptcy along with the parent. For early creditors to target and prevent only those transactions that create withdrawal rights, then, they must condition covenants on non-public information that the debtor must be willing to provide voluntarily.

With respect to the potential for better notice to control the inefficient withdrawal rights the model analyzes, it is not clear that permitting withdrawal through subsidiaries is preferable to contractual withdrawals. A more important distinction is that subsidiaries are useful, and in some ways necessary, for making businesses distinct and separable from each other. Hence, the synergy between assets A and B assumed in the model are less likely true when A and B are in separate legal entities. Hansmann and Kraakman (2000) argue that legal entities are essential to create asset partitioning, which allows creditors to focus their monitoring efforts on a particular group of assets. Ayotte and Hansmann (2013) argue that

¹⁵In the case of the typical secured loan, the creditor must make a notice filing that lists the debtor, creditor, and type of collateral. In the case of a subsidiary, the debtor must register the new entity, and any real property it owns will be publicly recorded.

subsidiary entities are useful in creating bundles of contracts that can be freely transferred as bundles. Casey (2013) suggests that separate entities can be useful in confining the consequences of default. All of these theories predict that those assets/contracts with greater value as stand-alone projects will be more likely found in separate subsidiaries than inside a given legal entity. This difference explains why subsidiary withdrawal rights should be given more deference. Because it is difficult to identify whether a withdrawal right exists for efficiency reasons or redistributive reasons, it may be sensible to give greater deference to a withdrawal right through a subsidiary.

7.3 Comparative Statics and Principles

As Baird and Casey (2013) note, bankruptcy judges have occasionally limited the attempt to exercise withdrawal rights through subsidiaries in an ad-hoc fashion, without a consistent framework. The discussion above suggests reasons that non-debtor subsidiary withdrawals should be given more respect than a contractual waiver of the stay. It would be hard to argue for a stay to be automatic at all non-debtor subsidiaries, as it is for debtor entities. At the same time, the model suggests that allowing a per se exception to the stay for subsidiary withdrawals can be inefficient, and there may be scope to allow for judges to apply a stay selectively to prevent particularly inefficient outcomes. In identifying the set of assumptions that are necessary to justify a stay, the model can shed light on ways that bankruptcy law might limit its application to only those withdrawals that are inefficient.

1. A withdrawal right is inefficient only to the extent that it redistributes value from early creditors. This suggests that a stay should be unnecessary when the other lenders lend after the withdrawal right, and with notice of it.

2. A withdrawal right is inefficient only if the asset has synergies with the rest of the firm. Thus, withdrawal rights to assets in a subsidiary that are not necessary to the reorganization of other entities in the group should be fully honored. Bankruptcy law might do this through language as in 362(d)(2): a judge can apply a subsidiary stay only if the asset is necessary to an effective reorganization of the debtor entity¹⁶. Judicial discretion could be further

¹⁶362(d)(2) does not require the judge to lift the stay even if the property is unnecessary to an effective reorganization of the debtor, if the debtor has "equity in the property". This requirement might be removed

limited by providing a safe harbor for withdrawal rights over the types of non-specific assets that are typical in securitization transactions, such as accounts receivable or other cash-like assets.

3. In the model, the withdrawal right allows E to maintain control of the asset in non-default states, while permitting free withdrawal in a default. A natural corollary is that arrangements in which the creditor has the right to withdraw the asset when the parent is not in default should be presumptively safe. The most suspect withdrawals, then, should be those in which the subsidiary withdrawal right is triggered by a parent's bankruptcy filing. One approach is to permit the exercise of withdrawal rights in a non-debtor subsidiary, unless the default is an ipso-facto default that is triggered by the parent's bankruptcy filing.

4. The model demonstrates that the bias toward uninformed debt—which creates the potential for inefficient outcomes—is greatest when the debtor is financially distressed at date 2 (i.e. when $1 - p$, the probability of the default state, is high). One potential approach to preserve efficient withdrawal rights is to designate a safe harbor lookback period, as the Code does currently with fraudulent conveyances and voidable preferences. A subsidiary withdrawal right created more than one year before the bankruptcy, for example, could be considered safe from the stay in the parent's bankruptcy case.

5. Finally, the temptation to create an inefficient withdrawal right is larger to the extent that the later creditor's secured claim is less protected under an automatic stay. This suggests that full protection of the substantive rights of secured creditors under a stay regime is desirable. While curing any judicial bias toward continuation might be difficult, there are some substantive rights that might be changed. Under current law, secured creditors do not receive compensation for the lost time value of money due to the delay inherent in reorganization¹⁷. A change to the Bankruptcy Code that eliminates this dilution of secured credit would result in less temptation to create withdrawal rights, and less breakdown in bargaining as a result.

with respect to a subsidiary stay.

¹⁷United Sav. v. Timbers of Inwood Forest, 484 U.S. 365 (1988)

8 Conclusion

This paper adds to an ongoing debate about the use of subsidiaries in bankruptcy, and how an optimal bankruptcy law should respond to their use. As Baird and Casey (2013) show, financing through subsidiaries can be different from ordinary financing methods because bankruptcy operates at the level of the legal entity. Hence, when a parent company files for bankruptcy but its subsidiary does not, subsidiary assets are not subject to the automatic stay.

To answer whether bankruptcy should respect such arrangements, I construct a model that generates conditions under which a mandatory stay can be optimal. Three elements are necessary to generate a tradeoff, whereby a mandatory automatic stay can add value: 1) sequential, incomplete contracts that allow later lenders to redistribute from earlier lenders, 2) ex-post bargaining frictions, and 3) the financing of a complementary asset that is necessary to the going-concern value of the firm. When these elements are present, borrowers have incentive to issue claims that give creditors free withdrawal rights even when these rights are inefficient.

One payoff from the model, then, is a set of normative rules of thumb to guide the application of a stay. When firms use subsidiaries to separate replaceable assets, like cash and receivables, or when subsidiaries are used to separate distinct businesses from each other, the case for respecting them is greater. Allowing debtors to use a stay might simply exacerbate ex-ante moral hazard and create ex-post inefficient continuation problems. But when a specific and necessary asset is separated via a subsidiary, staying withdrawal can prevent inefficient liquidations and, in turn, encourage the use of more informed debt, which reduces the probability of bargaining failure.

Another payoff from the model is the explicit identification of the assumptions required to justify the stay, which can be empirically tested. In particular, how much are financing patterns driven by the incentives to redistribute value from pre-existing debt? This is an important question for future empirical research.

9 References

- Adler, B.E. 2012. Game Theoretic Bankruptcy Valuation. 41 *Journal of Legal Studies* 209.
- Adler, B.E. and M. Kahan. 2013. The Technology of Creditor Protection. 161 *U.Pa. L. Rev.* 1773.
- Ayotte, K. and P. Bolton. 2011. Optimal Property Rights in Financial Contracting. 24 *Review of Financial Studies* 3401.
- Ayotte, K. and S. Gaon. 2011. Asset-Backed Securities: Costs and Benefits of Bankruptcy Remoteness. *Review of Financial Studies*.
- Ayotte, K. and H. Hansmann. 2013. Legal Entities as Transferable Bundles of Contracts. 111 *Michigan Law Review* 715.
- Ayotte, K. 2014. An Empirical Investigation of Leases and Executory Contracts. Working Paper.
- Baird, D.G. and A.J. Casey. 2013. No Exit? Withdrawal Rights and the Law of Corporate Reorganizations. 113 *Colum. L. Rev.* 1.
- Baird, D.G. and T.H. Jackson. 1984. Corporate Reorganization and the Treatment of Diverse Ownership Interests: A Comment on Adequate Protection of Secured Creditors in Bankruptcy. 51 *U. Chi. L. Rev.* 97.
- Bester, H. 1985. Screening vs. Rationing in Credit Markets with Imperfect Information. 75 *American Economic Review* 850-855.
- Bolton, P., and D. S. Scharfstein, 1990, A theory of predation based on agency problems in financial contracting, *American Economic Review* 80, 93-106.
- Brunnermeier, M.K. and M. Oehmke. 2013. The Maturity Rat Race. 68 *Journal of Finance* 483.
- Casey, A.J. 2013. Tailoring the Corporate Web. Working Paper.
- Che, Y.K. and A. Schwartz. 1999. Section 365, Mandatory Bankruptcy Rules and Inefficient Continuance. 15 *Journal of Law, Economics and Organization* 441.
- Hansmann, H. and R. Kraakman. 2000. The Essential Role of Organizational Law. 110 *Yale Law Journal* 387.
- Hart, O. and J. Moore, 1994, A theory of debt based on the inalienability of human

capital, *Quarterly Journal of Economics*, 109, 841-879.

Hill, C. 1996. Securitization: A Low-Cost Sweetener for Lemons, 74 *Wash. U. L. Q.* 1061.

Iacobucci, E. M. and R. A. Winter. 2005. Asset securitization and asymmetric information *Journal of Legal Studies*, 34: 161-206.

Iacobucci, E. M. and G. G. Triantis 2007. Economic and Legal Boundaries of Firms. *Virginia Law Review*.

Jackson, T.H. and A.T. Kronman. 1979. Secured Financing and Priorities Among Creditors, 88 *Yale L.J.* 1143.

Jackson, T.H. 1986. The Logic and Limits of Bankruptcy Law.

Longhofer, S. D. and S. R. Peters. 2004. Protection for Whom? Creditor Conflict and Bankruptcy. 6 *American Law and Economic Review* 249-284.

Myers, S.C. and N.S. Majluf. 1984. Corporate Financing and Investment Decisions When Firms Have Information that Investors Do Not Have. 13 *Journal of Financial Economics* 187.

Rajan, R. and L. Zingales. 1995. What Do We Know About Capital Structure? Some International Evidence. 50 *Journal of Finance* 1421.

Schwartz, A. 1996. Priority Contracts and Priority in Bankruptcy. 82 *Cornell L. Rev.* 1396.

Smith, H. 2012. Property as the Law of Things. 125 *Harv. L. Rev* 1691.

Triantis, G.G. 1992. Secured Debt Under Conditions of Imperfect Information, 21 *J. Legal Stud.* 225.

Warren, E. and J. Westbrook. 2005. Contracting Out of Bankruptcy: An Empirical Investigation. 118 *Harvard L. Rev.* 1197.

10 Appendix

Proof of Proposition 1:

First, note that an offer of anything except senior debt or liquidation will never be optimal, since P2 adopts the most pessimistic beliefs upon a continuation offer other than

senior debt. Thus, we can restrict consideration to senior debt continuation offers and liquidation offers.

Part a): Suppose $\beta_3 < L_4$. P2 will accept an offer of riskless senior debt $\{\beta_3, \beta_3\}$. Under this offer, the high and medium type P1's receive the entire going-concern surplus, so they can do no better than making this offer. A low type P1 can do no better than liquidate given P2's beliefs: an offer of riskless debt would be accepted, and P1 would receive a payoff $C_l - \beta_3 < \alpha_3$.

Next, suppose $\beta_3 > L_4$ and $\pi_l(X_4 - \frac{\beta_3 - (1 - \bar{\pi})L_4}{\bar{\pi}}) < \alpha_3$. Let $\pi' = \frac{p_m}{p_m + p_h}\pi_m + \frac{p_h}{p_m + p_h}\pi_h$, the updated probability of success if only the high types and medium types are included. The unique PBE involves the low type proposing liquidation, and the high and medium type P1s offering one of two possible offers: i) if $\pi'X_4 - \pi'\frac{\alpha_3}{\pi_l} + (1 - \pi')L_4 > \beta_3$, an amount such that the low-type P1 is indifferent between making this offer and liquidation: $t = \{X_4 - \frac{\alpha_3}{\pi_l}, L_4\}$. ii) if the converse is true ($\pi'X_4 - \pi'\frac{\alpha_3}{\pi_l} + (1 - \pi')L_4 < \beta_3$), an amount such that P2 is indifferent between acceptance and rejection, given that only the high and medium types make the offer: $t = \{\frac{\beta_3 - (1 - \pi')L_4}{\pi'}, L_4\}$.

Under (i), it is clear by the construction of t that the low type P1 weakly prefers liquidation. Since the low type P1 is indifferent given the offer, the medium and high type P1s strictly prefer continuation. The expected value to P2 of this offer under a belief π' is $\pi'X_4 - \pi'\frac{\alpha_3}{\pi_l} + (1 - \pi')L_4$, which is greater than P2's liquidation value β_3 by condition (i), so P2 accepts. The high and medium types can do no better than make this offer, since any offer of a lower t_h will result in P2 having a belief $\bar{\pi}$. Note that $\pi_l(X_4 - \frac{\beta_3 - (1 - \bar{\pi})L_4}{\bar{\pi}}) < \alpha_3$, a required condition in the proposition, can be rewritten as $\bar{\pi}(X_4 - \frac{\alpha_3}{\pi_l}) + (1 - \bar{\pi})L_4 < \beta_3$. This implies that any t_h less than or equal to $X_4 - \frac{\alpha_3}{\pi_l}$ will be rejected by P2 under the belief $\bar{\pi}$.

Under (ii), it is clear by construction that P2 weakly prefers acceptance of the offer. The condition $\pi'X_4 - \pi'\frac{\alpha_3}{\pi_l} + (1 - \pi')L_4 < \beta_3$ can be rewritten as $\pi_l(X_4 - \frac{\beta_3 - (1 - \pi')L_4}{\pi'}) < \alpha_3$, implying that the low type P1 strictly prefers liquidation to making the offer. The high and medium type P1s can do no better, since a lower t_h pays P2 less than β_3 in expectation for any belief less than or equal to π' . Hence, P2 would reject.

Part (b):

First, note that t^* is the offer that causes P2 to receive her liquidation value in expectation given that all P1 types offer it, so she weakly prefers to accept. When $\pi_l(X_4 - \frac{\beta_3 - (1-\bar{\pi})L_4}{\bar{\pi}}) > \alpha_3$ holds, the low type P1 prefers acceptance of this offer to rejection, and hence the other types prefer acceptance as well. Any offer of a lower t_h will be rejected, because P2 will maintain the belief $\bar{\pi}$ at any lower offer. Hence, P2 expects to receive less than her liquidation value given her beliefs. Thus, $t = \{\frac{\beta_3 - (1-\bar{\pi})L_4}{\bar{\pi}}, L_4\}$ constitutes the unique offer made by all types in a pooling equilibrium.

Proof of Proposition 2:

The only way for P2 to capture all the surplus from both medium and high types while avoiding liquidation is to offer P1 riskless debt; then the maximum riskless debt that can be offered is $\{L_4, L_4\}$, that is, $t_h = X_4 - L_4$ and $t_l = 0$. (Can add a small amount of risk to P1's claim so that low type will not accept). If this is not enough to compensate P1 (that is, if $\alpha_3 > L_4$) then the high type P1 will receive a greater expected payoff under a given offer than the medium type. So, then, P2 has to choose between reaching for all surplus from the high type or taking all surplus only from the medium type. To take all surplus from the medium type in a way that draws in the most value from the high type, P2 will offer P1 senior debt; i.e. make $t_h - t_l$ as large as possible, which means setting $t_l = 0$.

To capture all surplus in the high state, P2 will offer to keep t_h such that P1 gets his liquidation value in the high state: $\pi_h(X_4 - t_h) + (1 - \pi_h)L_4 = \alpha_3$. Solving for t_h ,

$$t_h = X_4 - \frac{1}{\pi_h}\{\alpha_3 - (1 - \pi_h)L_4\}$$

To capture all surplus in the medium state, P2 will offer to keep t_h such that $\pi_m(X_4 - t_h) + (1 - \pi_m)L_4 = \alpha_3$.

This implies that to capture all surplus in the medium state, set $t_h = X_4 - \frac{1}{\pi_m}\{\alpha_3 - (1 - \pi_m)L_4\}$.

Comparing P2's expected payoffs, P2 will choose to capture all surplus in the high state, thus resulting in liquidation in the medium state, if and only if

$p_h(C_h - \alpha_3) + p_m\beta_3 > p_h\pi_h(X_4 - \frac{1}{\pi_m}\{\alpha_3 - (1 - \pi_m)L_4\}) + p_m(C_m - \alpha_3)$. This expression reduces to $p_h\frac{(\pi_h - \pi_m)}{\pi_m}(\alpha_3 - L_4) > p_m(C_m - L_3)$.

Proof of Lemma 3:

Suppose P2 makes the offer under parameters where an inefficient liquidation would occur for an uninformed P2. Comparing P2's payoff in the informed and uninformed cases state-by-state, we have $\{C_h - \alpha_3, C_m - \alpha_3, \beta_3\}$ and $\{C_h - \alpha_3, \beta_3, \beta_3\}$, respectively. P2's payoff falls by $C_m - \alpha_3 - \beta_3$ in the medium state, which is the efficiency loss from inefficient continuation in that state. P1 receives his liquidation payoff in all states.

If P1 makes the offer under parameters where an inefficient continuation would occur for an uninformed P2, P2's expected payoff in the informed and uninformed cases is her liquidation payoff β_3 . Hence, any costs of inefficient continuation fall entirely on P1.

Proof of Proposition 4:

The debtor's objective at date 2 is to choose the creditor type $\eta = \{\text{informed or uninformed}\}$ and debt contract terms to maximize her own expected payoff subject to the creditor's participation constraint:

$$\begin{aligned} & \max_{\eta, F_2} p(X_3 - F_1 - F_2) \\ & \text{subject to} \\ & pF_2 + (1-p)R_{P2}^u \geq i_2 \text{ (if } \eta = \text{uninformed)} \\ & pF_2 + (1-p)R_{P2}^i \geq \theta i_2 \text{ (if } \eta = \text{informed)} \end{aligned}$$

The R_{P2} terms are P2's expected recoveries in the default state. P2's participation constraint will always bind, so we can substitute the constraint into the objective. Eliminating common parameters that are fixed as of date 2, the debtor's objective reduces to

$$\max\{(1-p)R_{P2}^u - i_2, (1-p)R_{P2}^i - \theta i_2\}$$

At date 2, F_1 is fixed, so the problem reduces to minimizing F_2 . Ex-post efficiency, by contrast, reduces to

$$\max\{(1-p)(R_{P1}^u + R_{P2}^u) - i_2, (1-p)(R_{P1}^i + R_{P2}^i) - \theta i_2\}$$

The only difference is P1's expected recovery term, R_{P1} , which is part of the efficiency calculus but not part of the debtor's private objective. Hence, if $R_{P1}^i - R_{P1}^u > 0$ ($R_{P1}^i - R_{P1}^u < 0$), then there is a bias toward uninformed (informed) debt.

Suppose that $\pi_l(X_4 - \frac{\beta_3 - (1-\bar{\pi})L_4}{\bar{\pi}}) > \alpha_3$ holds, so that the unique PBE involves inefficient continuation in the low state when P1 makes the offer. In this equilibrium, P2 receives liquidation value β_3 in expectation when P1 makes the offer. (Note that P1 receives α_3 when P2 makes the offer, whether inefficient liquidation occurs or not in the medium state). Hence, P1's expected recoveries

P1's payoff	Informed P2	Uninformed P2
P1 makes offer	$p_h C_h + p_m C_m + p_l L_3 - \beta_3$	$p_h C_h + p_m C_m + p_l C_l - \beta_3$
P2 makes offer	α_3	α_3
R_{P1}	$\frac{1}{2}(p_h C_h + p_m C_m + p_l L_3 - \beta_3) + \frac{1}{2}\alpha_3$	$\frac{1}{2}(p_h C_h + p_m C_m + p_l C_l - \beta_3) + \frac{1}{2}\alpha_3$
Thus, $R_{P1}^i - R_{P1}^u = \frac{1}{2}p_l(L_3 - C_l) > 0$ whenever $\pi_l(X_4 - \frac{\beta_3 - (1-\bar{\pi})L_4}{\bar{\pi}}) > \alpha_3$.	Hence, the debtor's private incentive is to use too much uninformed debt.	

To understand the comparative statics, note that the bias toward uninformed debt is greater when $(1-p)(R_{P1}^i - R_{P1}^u)$ is larger. Thus, conditional on a PBE with inefficient continuation, the loss is larger to the extent that the expected loss from inefficient continuation in the low state is larger, i.e.

$$\frac{1}{2}(1-p)p_l(L_3 - C_l)$$

The comparative statics follow immediately from inspection of this term.

Proof of Proposition 5

Using the same logic as in Proposition 4, there is excess incentive to issue informed debt if the distressed state payoff difference to P2 between informed and uninformed debt exceeds the efficiency loss from any inefficient outcome (or, equivalently, exceeds the difference between the sum of P1 and P2's payoffs under informed and uninformed debt). I take the analysis state-by-state.

Informed P2	P1	P2	total (P1+P2)
high	$C_h - \beta_3$	β_3	C_h
medium	$C_m - \beta_3$	β_3	C_m
low	α_3	β_3	L_3

Uninformed P2	P1	P2	total (P1+P2)
high	$C_h - \beta_3$	β_3	C_h
medium	$C_m - (\pi_m t'_h + (1 - \pi_m)\beta_4)$	$\pi_m t'_h + (1 - \pi_m)\beta_4$	C_m
low (liquidation)	α_3	β_3	L_3
low (continuation)	$C_l - (\pi_l t'_h + (1 - \pi_l)\beta_4)$	$\pi_l t'_h + (1 - \pi_l)\beta_4$	C_l
Differences, Inf-Uninf	P2		total (P1+P2)
high	0		0
medium	$\beta_3 - (\pi_m t'_h + (1 - \pi_m)\beta_4)$		0
low	0 (liq) or $\beta_3 - (\pi_l t'_h + (1 - \pi_l)\beta_4)$ (con)		0 (liq) or $L_3 - C_l$ (con)

By the definition of t'_h , $\beta_3 - (\pi_m t'_h + (1 - \pi_m)\beta_4) > 0$. Thus, P2 loses strictly more than the overall efficiency loss (0) in the medium state.

In the low state, there is no difference in P2's payoff or the total payoff if liquidation occurs. But if continuation occurs, the efficiency loss $L_3 - C_l$ can be rewritten as

$$\begin{aligned}
L_3 - C_l &= L_3 - (\pi_l X_4 + (1 - \pi_l)L_4) \\
&= (\alpha_3 + \beta_3) - (\pi_l(X_4 - t'_h + t'_h) + (1 - \pi_l)(\alpha_4 + \beta_4)) \\
&= \{\alpha_3 - (\pi_l(X_4 - t'_h) + (1 - \pi_l)\alpha_4)\} + \{\beta_3 - (\pi_l t'_h + (1 - \pi_l)\beta_4)\}
\end{aligned}$$

By revealed preference (since P1 chooses continuation, P1 prefers it to liquidation), the first term in brackets, the difference between P1's payoff in liquidation and continuation, is negative. Hence, the second term in brackets, P2's payoff difference between informed and uninformed debt in the low state, is always (weakly) greater than the inefficiency loss in that state. Since I have shown that P2 bears more than 100% of the costs of inefficiency from being uninformed, E and P2 have excess incentive to issue informed debt.

Proof of Proposition 6:

Inefficient liquidation occurs in the medium state if and only if

$$p_h \frac{(\pi_h - \pi_m)}{\pi_m} (\alpha_3 - L_4) > p_m (C_m - L_3) \tag{2}$$

When this condition holds, the expected costs of the inefficient liquidation are $p_m(C_m - L_3)$.

Under a withdrawal right, inefficient continuation in the low state happens when P1 makes the offer, and the following conditions hold:

$$\beta_3 > L_4 \text{ and } \pi_l(X_4 - \frac{\beta_3 - (1 - \bar{\pi})L_4}{\bar{\pi}}) > \alpha_3$$

Under a stay, inefficient continuation happens when

$$\pi_l(X_4 - \frac{\beta_3 - (1 - \pi_h)\beta_4}{\pi_h}) + (1 - \pi_l)\alpha_4 > \alpha_3 \quad (3)$$

And the expected costs of inefficient continuation are

$$p_l(L_3 - C_l)$$

There are parameter values for which inefficient continuation occurs under a stay but not under withdrawal rights, but it can be shown, by comparing the expressions above, that the reverse is not true. Hence, to derive the comparative statics, I look for parameters that would either a) make inefficient liquidation (continuation) more (less) likely under withdrawal rights (the stay), and/or b) increase (decrease) the expected inefficiency costs of the inefficient liquidation (continuation) under withdrawal (the stay), without affecting any other conditions. For part (a), note that when p_l falls, the expected costs of inefficient continuation fall. If $\frac{p_h}{p_m}$ is held constant, the costs of inefficient liquidation increase and (2) is unaffected. For part (b), if β_4 rises holding L_4 constant, then the LHS of (3) increases, with no other conditions affected.

Proof of Proposition 7:

Recall that E's objective at date 2 is equivalent to maximizing P2's recovery in bankruptcy less financing costs.

$$\max_{\eta, w} (1 - p)R_{P2}^{\eta, w} - \eta\theta i_2 - (1 - \eta)i_2,$$

First, suppose that θ is low enough that E would choose informed debt conditional on issuing debt with a stay. Then P2's bankruptcy recovery R_{P2} is exactly her liquidation value β_3 . Under free withdrawal with informed debt, P2 does strictly better. She receives her liquidation payoff when P1 makes the offer, and all the going-concern surplus when she makes the offer:

$$\frac{1}{2}\beta_3 + \frac{1}{2}(p_h(C_h - \alpha_3) + p_m(C_m - \alpha_3) + p_l\beta_3) > \beta_3$$

Now suppose that θ is high enough that E would choose uninformed debt conditional on issuing debt with a stay. The proof to Proposition 5 above demonstrates that P2 receives a payoff strictly less than β_3 in expectation. If P2 has a withdrawal right, her expected payoff will be no less than β_3 . Since P2's recovery for both informed and uninformed debt under a stay is dominated by the same information option under a withdrawal right, a fortiori E's objective is always maximized by giving P2 a withdrawal right when E is free to offer informed and uninformed debt.