Creditor-on-Creditor Violence and Secured Debt Dynamics*

Samuel Antill† Zhaoli Jiang‡ Neng Wang§

Major Revision in Progress, Preliminary and Incomplete

June 27, 2025

Abstract: Distressed firms now raise liquidity by stripping collateral from syndicated-loan creditors and pledging it to new lenders. We model this "creditor-on-creditor violence" trend. An insolvent firm needs liquidity to avoid bankruptcy. Potential investors privately observe their required return. This information asymmetry causes inefficient bankruptcies in equilibrium. This resembles debt overhang: equity holders refuse to negotiate generously, ensuring successful financing and maximizing expected surplus, because it subsidizes existing debt holders. By stealing collateral from existing debt holders, equity holders receive more surplus, aligning incentives and improving equilibrium efficiency. Our theory explains why new debt contracts intentionally enable this creditor violence.

*We are grateful for helpful comments from Andrey Malenko, an anonymous associate editor, two anonymous referees, Patrick Bolton, Vince Buccola, Thomas Geelen, Sam Hanson, Barney Hartman-Glaser, Edie Hotchkiss, Paymon Khorrami, Simon Mayer, Martin Oehmke, Giorgia Piacentino, David Scharfstein, Jeremy Stein, Adi Sunderam, Hongda Zhong, Pavel Zryumov, and participants at LSE, Oxford, Harvard Business School, the WFA, the UCLA Fink Conference on Financial Markets, the UBC Winter Finance Conference, the Finance Theory Group, the Duke UNC Corporate Finance Conference, and the Financial Intermediation Research Society.

†Harvard Business School, santill@hbs.edu

‡The Hong Kong Polytechnic University, zhaoli.jiang@polyu.edu.hk

§Cheung Kong Graduate School of Business, newang@gmail.com

1 Introduction

Revlon, a leading beauty company, was struggling financially in 2020. Revlon had substantial secured term loan debt from a leveraged acquisition. Its sales were falling due to the pandemic and the growth of online retail. In May 2020, Revlon's problems led to a creative debt restructuring. A coalition holding just over 50% of Revlon's secured term loan consented to amend their credit agreement. The coalition included distressed-debt hedge funds such as Oak Hill and Angelo Gordon. The amendment allowed Revlon to "dropdown" the term loan collateral into a new subsidiary that was not covered by the credit agreement. The coalition lent Revlon $910 million in new funds and rolled over $950 million of their old term loan, receiving a new debt instrument secured by the newly available transferred collateral. Thus, Revlon raised $910 million in liquidity and the participating coalition maintained their secured priority. Crucially, the nonparticipating term loan holders, who owned just under 50% of the debt, lost their rights to any collateral in default. The excluded investors, including distressed-debt hedge funds such as Brigade and Symphony, suffered a massive loss: the secondary-market trading price of the term loan fell from 80 to 28 cents on the dollar (Mugford and Gulick, 2022). While the transaction was fervently disputed and litigated, it was ultimately upheld in court as valid (Ellis, Margolis, and Yeh, 2023).

Practitioners have divided views on these transactions, which have become increasingly common in the last decade (Credit Sights, 2025). Lenders and other practitioners call this "creditor-on-creditor violence." They point out that many of these barely legal transactions are quickly followed by bankruptcies (e.g., Revlon). These critics believe this trend is harmful, eroding trust in the corporate borrowing system. Firms like Revlon euphemistically call these restructurings liability-management transactions ("LMTs"). They argue these restructurings are a beneficial way to increase liquidity and prevent bankruptcies. Supporting

the proponents' view, Buccola and Nini (2024) study recent loan contracts and show that lenders knowingly enable Revlon-style dropdown LMTs: "Contracts could adjust to prevent dropdowns but did not." Both before and after dropdowns became common, roughly half of contracts enable them, suggesting that LMTs can create value.

To resolve the conflicting views, we build a formal model of how LMTs impact both ex-post and ex-ante firm value. We show that both critics and proponents of LMTs are partially right. The trend increases the cost of secured debt due to the anticipation of future lender mistreatment. However, we also vindicate the proponents: LMTs can prevent some costly bankruptcies that could not have been avoided by traditional debt renegotiation. As a result, enabling LMTs increases total surplus when firms borrow ex ante.

Intuitively, when an insolvent firm needs liquidity to prevent a costly bankruptcy, a debt overhang problem arises: equity holders do not internalize the value of preventing bankruptcy because bankruptcy costs primarily harm debt holders. Absent any frictions, this debt overhang can be solved by efficient negotiation between the firm and its existing debt holders. However, even in our setting where a few hedge funds own most of the term-loan debt, asymmetric information impedes negotiation. Equity holders cannot observe debt holders' required returns, so *another* debt overhang problem arises in renegotiation: equity holders offer a low return for new liquidity, risking rejection if required returns are high, because they do not internalize the value destroyed by a failed negotiation. We show that LMTs solve this problem. LMTs effectively allow equity to steal value from debt holders and offer it as compensation for new liquidity. Thus, LMTs mitigate debt overhang because equity holders internalize more of the benefit from a successful liquidity injection.

Our main contribution is a theoretical formalization of the above intuition. At the start of our three period model, a firm issues a secured term loan. In this first period, the firm decides

whether to enable LMTs in the debt contract. Competitive bank lenders price the debt fairly, given rational expectations of the future firm behavior. In the second period, a random shock determines whether the firm fully repays debt or experiences distress. A distressed firm is insolvent and needs liquidity. Absent liquidity, it immediately files for bankruptcy. If the firm raises liquidity, it has a chance of avoiding bankruptcy. However, in the third period, some firms that raise liquidity still end up in bankruptcy. While bankruptcy can create value in some cases (Ayotte, 2015), we focus on the type of firm that suffers meaningful deadweight losses in bankruptcy.[1] Accordingly, we assume that it is always efficient, in the sense of maximizing total ex-ante surplus, for the firm to raise liquidity.

As in practice, the original bank lenders sell the distressed firms' debt to specialized distressed debt investors (e.g., hedge funds). Although the firm could in principle approach any distressed debt investors for liquidity, we prove that it optimally approaches the investors who own the debt. We make three key assumptions about these investors. First, we assume that investing in distressed insolvent firms requires expertise. Accordingly, there are a limited number of distressed debt investors (e.g. hedge funds) and they can earn excess returns through their specialized knowledge. This implies that some investors require a high return to inject liquidity in the distressed firm because their opportunity cost is high. Second, we assume that each investor's required return is private information.[2] This asymmetric information between investors and the distressed firm is the key friction that impedes efficient negotiation. Third, we assume that the firm has limited time to raise liquidity from these

[1]For example, Antill (2022) shows that agency conflicts in Chapter 11 bankruptcy lead to inefficient liquidations and acquisitions that destroy 14% of firm value in expectation (see also Ayotte and Morrison (2009)). Antill and Hunter (Forthcoming) show that indirect costs from lost customers amount to 12%-15% of firm value in large public Chapter 11 cases. Antill (2024) shows that inefficiently high professional fees destroy 16% of value in smaller Chapter 7 liquidations.

[2]In Appendix C, we prove that our results hold under an alternative assumption: required returns are zero, but hedge funds privately observe signals about the probability that raising liquidity prevents bankruptcy.

investors. For simplicity, we assume that the equity holders who run the firm have only one chance to offer a deal to raise liquidity.

To begin our analysis, we study a firm that chooses to ban LMTs in its debt contract. In our subgame perfect equilibrium, equity holders make a take-it-or-leave it offer to raise liquidity from the investors who own the debt. Each investor privately observes its required return and forms a rational expectation about the strategies and types of other investors. In any subgame, the simultaneous decisions of investors to accept or reject offers comprise a Nash equilibrium. With simultaneous decisions, a freeriding incentive arises, since each investor knows that another investor might provide liquidity and save the firm. However, unlike in bond restructurings, the small number of term-loan holders mitigates freeriding: each investor has a strong chance of being pivotal if their few competitors turn out to have high required returns. Moreover, while investors have a right to collateral in bankruptcy, they internalize that they could be undersecured in a bad state and suffer losses in bankruptcy.

Moving backward in time, equity holders rationally anticipate how investors will respond to any potential offer. However, equity holders do not observe investors' required returns, which creates a tradeoff: offering investors a high return makes raising liquidity more likely, but offering a low return allocates more value to equity in the lucky event that investors have low required returns. We prove that equity holders have an ex-post preference for offering a low return, risking deal failure, if and only if leverage exceeds a threshold. This is a form of debt overhang. Equity holders "underinvest" in raising liquidity, offering a low interest rate and risking bankruptcy, because part of the surplus from avoiding bankruptcy goes to debt holders. This underinvestment persists even when debt holders provide liquidity because of asymmetric information: equity holders cannot observe required returns, so they cannot extract all of the surplus by setting a rate equal to debt holders' reservation rate.

Stepping back to the first period, lenders charge a high interest rate because they rationally anticipate an ex-post inefficient bankruptcy, which reduces the price that hedge funds pay for distressed debt. In this sense, equity holders suffer ex-ante from their ex-post failure to raise liquidity. Thus, our first result is that asymmetric information prevents distressed firms from efficiently negotiating with debt holders to avoid bankruptcy.[3]

Next, we introduce LMTs by changing one assumption: if a majority of investors agree to a LMT, then the investors who reject the offer lose their right to collateral. This loss of collateral is a defining feature of most LMTs (e.g., Revlon), as we describe in Section 2. Following the steps described above, we construct a subgame perfect equilibrium with LMTs. For any fixed return that equity holders offer for new liquidity, we show that investors are more willing to accept if the deal is a LMT. This is straightforward: rejecting is costlier because the investor receives zero recovery if the firm ends up in bankruptcy after the LMT. Crucially, moving backward in time, we prove that LMTs make equity holders more willing to offer a return that guarantees acceptance. Intuitively, LMTs allow equity holders to steal from debt holders by using their collateral to raise new liquidity. This theft makes equity holders internalize more of the benefit of a successful deal with LMTs, so they are more willing to pay a higher return to guarantee success. Thus, LMTs mitigate debt overhang in renegotiation. Moving back to period one, lenders charge a higher interest rate to account for the future collateral theft. However, this is just a transfer: the overall pie being shared between equity holders and lenders grows, so everyone benefits from the avoided inefficient bankruptcies. For this reason, we prove that equity holders optimally enable LMTs ex ante.

We set up our baseline model to provide intuition in the simplest setting possible. However, the intuition that LMTs solve a debt overhang problem in debt renegotiation is robust.

[3]Note that this first result is similar to results in the literature (Giammarino, 1989), we discuss this below.

In several extensions that generalize our model, the main results continue to hold.

First, we introduce convex required returns: hedge funds require higher returns in deals with fewer participants, since each must provide more capital. We also introduce exclusive (also called "non-pro-rata") LMTs, in which only a handpicked subset of investors have the opportunity to participate. We show that equity holders find exclusive LMTs attractive ex post, because handpicked investors internalize that they are pivotal and accept lower returns. However, exclusive LMTs are inefficient ex-ante, because participating investors pay convex opportunity costs. As a result, we prove that equity holders find it optimal to ban exclusive LMTs but enable nonexclusive LMTs. This is precisely what Buccola and Nini (2024) show empirically: while new loan contracts enable nonexclusive dropdowns, they now include clauses to ban a popular form of exclusive non-pro-rata LMTs.

Second, we introduce a wider pool of available investors: in non-LMT deals, equity holders can approach the investors who hold the debt or a distinct pool of investors who do not hold the debt. We prove that equity holders optimally approach the investors who hold the debt, because debt holders accept lower returns in liquidity injections: debt holders internalize that injecting liquidity makes their existing debt claims safer. In this sense, our baseline-model assumption that equity holders raise liquidity from debt holders is without loss of generality.[4]

Third, we consider an alternative solution to the debt overhang problem: issue unsecured debt in period one, preserving collateral for new investors in period two. Under some conditions, issuing unsecured debt ex ante can improve value, relative to issuing secured debt and enabling LMTs. In this sense, our results are most relevant when firms have no choice but to issue secured bank debt: many lenders are "asset-based" lenders who require collateral, and

[4]For LMTs, it is realistic to assume that firms have to raise liquidity from existing debt holders: firms often require consent from a majority of existing lenders to transfer collateral. See Section 2 for details.

secured debt is often the only option in recessions (Benmelech, Kumar, and Rajan, 2022). Nonetheless, it is interesting from a theoretical perspective to study when a firm that *can* issue unsecured debt would *prefer* to issue secured debt with a LMT option. We show this is true for certain parameterizations of the model. Intuitively, even when a distressed firm can use unencumbered collateral to issue secured debt, it still faces the frictions in our model: few investors have the expertise to invest in insolvent firms and they are privately informed about their required returns. In some situations, the coercive nature of a LMT allows equity holders to raise financing at a lower rate than they would pay for secured debt with unencumbered collateral. This makes equity holders more inclined to guarantee successful financing, which improves value ex ante.

Finally, we generalize our results in an abstract mechanism-design setting. We assume an arbitrary finite number of investors have required returns that are drawn from an arbitrary distribution. Equity holders design an optimal mechanism to incentivize the revelation of investors' private information and then raise liquidity from the investor with the lowest required return. We characterize LMTs by assuming that an investor who refuses to participate in the mechanism loses collateral if a deal succeeds and the firm files for bankruptcy. Our main results continue to hold in this general setting, showing that our simplifying assumptions do not drive the results.

Contribution to the literature: Our novel contributions to the literature include the following main results: (i) when asymmetric information impedes negotiation, LMTs align equity holders' and debt holders' incentives by transferring value to equity, preventing costly bankruptcies; and (ii) because of this ex-post improvement in surplus, equity holders and debtholders jointly benefit from enabling LMTs ex ante.

We contribute to a long literature modeling distressed debt restructurings.[5] None of these papers study LMTs. From a theoretical perspective, our assumptions are closest to Giammarino (1989) and Detragiache and Garella (1996), who show that distinct asymmetric information frictions (regarding collateral values or firm fundamentals) can impede debt renegotiation. Asymmetric information is a more appropriate friction in our setting than other frictions studied in this literature: for example, term loans are held by a few parties, so the holdout problem is far less relevant than in bond restructurings. Likewise, distressed firms in our setting often avoid default by contractually promising future cash flows to debt holders, which suggests that a common assumption in the incomplete contracts literature is inappropriate for our setting. From a practical perspective, our setting is closest to a strand of this literature modeling exit consents in bond restructurings (Gertner and Scharfstein, 1991; Kahan and Tuckman, 1993; Bernardo and Talley, 1996; Hege and Mella-Barral, 2005; Donaldson et al., 2020). Like LMTs, exit consents allow firms to steal value from debt holders who refuse to participate in a debt restructuring. However, there are two important differences: (1) exit consents apply to bond restructurings, while LMTs are predominantly used to steal collateral from term loans through a novel legal innovation, and (2) exit consents target a holdout friction that is relevant in bond markets, while we show that LMTs can address a different friction that is relevant for term loans — asymmetric information about debt holders' required returns. In this sense, our results regarding the role of LMTs in promoting efficiency are novel.

[5]See, for example, Bulow and Shoven (1978); White (1980); Roe (1987); Hart and Moore (1988); Giammarino (1989); Gertner and Scharfstein (1991); Aghion and Bolton (1992); Rajan (1992); Kahan and Tuckman (1993); Aghion, Dewatripont, and Rey (1994); Hart and Moore (1994); Berglöf and Von Thadden (1994); Bernardo and Talley (1996); Bolton and Scharfstein (1996); Detragiache and Garella (1996); Padilla and Pagano (1997); Mella-Barral and Perraudin (1997); Bolton and Freixas (2000); Detragiache, Garella, and Guiso (2000); Hubert and Schäfer (2002); Carletti (2004); Hege and Mella-Barral (2005); Carletti, Cerasi, and Daltung (2007); Hackbarth, Hennessy, and Leland (2007); Von Thadden, Berglöf, and Roland (2010); Bannier (2010); Donaldson et al. (2020); Glode and Opp (2023).

We also contribute to a long literature studying how debt contract features can mitigate debt overhang ex post.[6] Again, none of these papers study LMTs. We do not claim that LMTs are the only solution to the debt overhang problem that arises in debt renegotiation. Instead, we show that LMTs are another useful tool that firms have recently used in practice to complement existing options (maturity choices, covenant choices, unsecured debt, bonds versus bank debt, credit lines, DIP loans in bankruptcy, etc). See Section 5 for further discussion.

Finally, we contribute to a recent law and finance literature on LMTs (Dick, 2021; Ayotte and Scully, 2021; Buccola, 2022, 2023; Ayotte and Badawi, 2023; Buccola and Nini, 2024; Badawi, Buccola, and Nini, 2024; Buccola and Kahan, 2024; McKinley, 2024; Ivashina and Vallee, 2025). Some of these papers include informal arguments that LMTs might address debt overhang or address holdout problems for term loans without concentrated ownership. However, none of these papers include formal models of how LMTs can create value ex ante, which is our key contribution. Indeed, the only formal model in this recent literature is a contemporaneous working paper by Ayotte and Badawi (2023).[7] In their model, contracts are imperfect and evolving and contracting parties gradually learn how to permit more activity without worsening an underlying managerial agency conflict. They capture this with a genetic algorithm and show that even when LMTs are a value destroying flaw, they are a

[6] See, for example, Hackbarth and Mauer (2012); Ayotte and Skeel Jr (2013); Diamond and He (2014); Donaldson, Gromb, and Piacentino (2025).

[7] In an appendix of an undistributed contemporaneous working paper, McKinley (2024) extends Donaldson, Gromb, and Piacentino (2020) and models LMTs as a reduction in the initial debt outstanding due to a reduction in debt capacity. This reduction reduces expected deadweight losses from bankruptcy and improves efficiency. We differ in at least two important ways: (1) The assumption that atomistic creditors face a holdout problem makes McKinley (2024) closer to a model of exit consents in bond restructurings, as in Donaldson, Gromb, and Piacentino (2020). In contrast, we show how LMTs, which target term-loan debt, solve a different friction that arises even when a few hedge funds hold most of the term loan. (2) Rather than explicitly assuming LMTs reduce initial debt outstanding, we model how LMTs endogenous solve an ex-post renegotiation friction and how this in turn changes the ex-ante size and split of firm value.

necessary part of learning to contract. We complement their work by showing how a more traditional rational expectations framework can explain the continued use of contracts that allow for LMTs (Buccola and Nini, 2024). More broadly, we are the first to formally model how LMTs create value ex ante by solving bargaining frictions that arise in the renegotiation of a term loan held by a few parties.

2 Institutional Details

Broadly speaking, in a liability management transaction (LMT), a firm raises new financing by transferring the highest priority collateral rights from an existing term loan to a new loan. Providing a precise definition for a LMT is challenging because each deal is unique. Accordingly, it is impossible to write a model that faithfully reflects the features of every LMT. Instead, our goal is to model the key LMT features that appear in most deals.

To characterize the key features of a typical LMT, we collect data on a broad sample of LMTs. There is no universal database of these deals, many of which involve private companies. Instead, we combine several sources that track LMTs to construct a list of 86 LMTs. While not comprehensive, our list likely includes the majority of LMTs. Our sources include websites such as Credit Sights (2025), S&P Global (2024b), and S&P Global Debt Restructuring Snapshots covering specific deals such as S&P Global (2024a). Combining our list with facts documented in earlier academic work, we attempt to characterize the deal features that appear in most LMTs. We now summarize the key features of LMTs that are relevant for our model.

2.1 LMTs transfer collateral from existing debt to new debt

Unlike unsecured debt, secured debt is explicitly backed by collateral—a specific asset or all of a firm's assets. Outside of bankruptcy, secured lenders have the right to take their collateral if the borrower defaults (e.g., a foreclosure). If the collateral is sold, the "first-lien" secured lender gets repaid out of the sale proceeds before any lender gets paid (see, for example, §9-615 of the Uniform Commercial Code). In bankruptcy, a plan can only be confirmed if secured lenders receive full recovery or secured lenders receive the value of their collateral (see 11 U.S.C. §1129(b)(2)(A)). In this sense, both in bankruptcy and out of bankruptcy, first-lien secured debt holds the highest priority in a firm's capital structure.

Most experts agree that a defining feature of a LMT is that it strips existing secured debt of this highest-priority status.[8] The firm issues a new security that "cuts in line" and gains first priority ahead of the existing first-lien secured debt, which previously had the strongest right to the collateral. This is called priming or subordinating existing debt.

LMTs use several legal approaches to prime existing secured debt. The two most common approaches are called the "dropdown" and the "uptier."

Dropdowns: In a dropdown, the firm transfers collateral to a subsidiary that is not bound by the credit agreement for the existing secured debt. The subsidiary is then free to

[8]For example, Buccola (2023) defines the LMT trend as follows: "Among the most striking developments in reorganization during the last decade has been a proliferation of hardball priming transactions. These are out-of-court deals in which a distressed company creates new senior secured debt that subordinates (previously) first-lien obligations with minimal support from the affected creditors. The company can use the newly created, 'super senior' debt capacity to raise new money... the aim is to secure liquidity for the company without having to resort to Chapter 11." Similarly, Dick (2021) writes: "Financially distressed companies increasingly use highly aggressive out-of-court restructuring transactions—referred to by finance professionals as 'liability management transactions' or 'lender-on-lender violence'—to achieve, in substance, the sort of senior loan modifications that they previously could only achieve through a bankruptcy reorganization... Relying on hypertechnical interpretations of loan agreements, one increasingly popular hostile restructuring method involves issuing new debt that enjoys higher priority than the existing debt; another involves transferring the most valuable collateral away from existing lenders to secure new borrowing."

issue new secured debt and grant new lenders a first lien on the newly available collateral, priming the existing debt.

While there were some earlier attempts, J. Crew is commonly credited as achieving the first dropdown transaction in 2017 (Ayotte and Scully, 2021; Ivashina and Vallee, 2025). As Ayotte and Scully (2021) describe, J. Crew's existing secured term-loan agreement included a "trapdoor" that allowed it to transfer up to $250 million in collateral between subsidiaries. First, J. Crew transferred $250 million in trademark collateral to a foreign "restricted non-loan-party" Cayman Islands subsidiary. As Ayotte and Scully (2021) explain, J. Crew's agreement likely allowed for this arrangement because the "restricted-subsidiary status protects lenders by allowing those subsidiaries to remain subject to the covenants in the loan documents, while the non-loan-party status prevents triggering the adverse tax consequences." However, once this first transfer was achieved, the trapdoor allowed for a second transfer of "the trademarks into a newly formed unrestricted subsidiary, freeing them from both the covenants and the debt obligations." (Ayotte and Scully, 2021). As Buccola and Nini (2024) explain, "collateral moved to an unrestricted subsidiary ceases to be collateral for the original loan." Finally, J. Crew sought consent from the term-loan holders to transfer additional collateral beyond what the contract allowed. As Ayotte and Scully (2021) describe,

> J. Crew then set about creating an offer to the term lenders. If it could get a majority of the lenders to agree, it could have the loan amended... and move the remaining 28% of the trademark value. To do so, the company created an exchange offer on a short timeline that subjected the individual term lenders to a prisoner's dilemma. The terms included partial repayment of the loan at par... if a majority consented, then those who refused to participate would be stuck

> with no repayment and no litigation right... over 88% of the lenders supported the amendments.

Once all of the trademark collateral was transferred, J. Crew issued new secured debt with a first lien on the trademarks.[9]

Thus, at a high level, J. Crew (1) offered a bribe (partial repayment) to coerce a majority of term-loan holders to yield collateral rights, then (2) bolstered its liquidity by creating new secured debt with the existing collateral. While each new dropdown differs slightly from the previous one, most dropdowns share these two features with the J. Crew LMT. As Buccola and Nini (2024) summarize, "collateral for an existing loan is transferred downstream, free and clear of liens; the downstream entity borrows against the assets and uses the proceeds to relieve an upstream entity's capital needs; upstream creditors are subordinated." By our own subjective categorization, roughly 26% of the 86 LMTs in our list are dropdowns.

Lender consent in dropdowns: Importantly, dropdowns typically require some degree of consent from term-loan holders. Some credit agreements like J. Crew's allow for limited collateral transfers without lender consent (Ivashina and Vallee, 2025). In theory, these firms could conduct a dropdown with no consent from term-loan holders. However, in practice, many firms executing a dropdown follow J. Crew's strategy and coerce a majority of term-loan holders to amend the agreement to allow for a larger collateral transfer. For example, in addition to J. Crew, Revlon induced such an amendment in its dropdown by allowing consenting debt holders to exchange the primed debt for the new secured debt. Similarly, Buccola (2022) describes how Envision Healthcare "arguably needed lender support to transfer assets into an unrestricted subsidiary. Without the lenders' support the

[9]Specifically, J. Crew created "superpriority notes backed by its iconic brands, which had theretofore been part of its lenders' collateral, and then exchanged the new notes for junior, but maturing, unsecured notes" (Buccola and Nini, 2024).

transaction might not have survived a challenge... Envision was able to peel off enough of its potentially litigious lenders, by offering them superior rights to participate in the new capital structure."

Uptiers: In an uptier, which was popularized by Serta Simmons in 2020, the firm coerces a majority of first-lien secured debt holders to amend their credit agreement and yield priority to new debt. The firm can then raise liquidity by issuing new secured debt with a first lien on collateral, and thus a higher priority than existing debt. Often, the firm coerces the existing debt holders by (1) issuing the new debt to them, conditional on agreement to the amendment and (2) allowing participating investors to exchange their now subordinated debt for the new first-lien debt, taking priority over nonparticipating debt holders. As Ayotte and Scully (2021) write,

> In Serta Simmons, Boardriders, and TriMark, borrowers employed "uptier exchanges," whereby a majority of loan holders use required lender provisions to amend loan agreements and take a priority position over the minority.

Buccola (2022) summarizes uptiers in the same way:

> Two essential features defined these so-called "uptier exchanges": (1) a bare majority of lenders in each secured facility consented to a loan amendment that would permit the borrower to issue additional debt through a new facility that would subordinate existing liens; and (2) the borrower, in consideration for the favored lenders' consents, agreed to exchange some of the to-be-issued, super-priority loans for existing loans.

By our own subjective categorization, roughly 56% of the 86 LMTs in our list are uptiers. The remaining LMTs that are neither uptiers nor dropdowns are either (1) difficult to

categorize or (2) based on a less common structure (e.g., "double dips.")

Lender consent in uptiers: Like most dropdowns, uptiers require consent from existing term-loan holders to transfer collateral to the new loan. While some dropdowns can be achieved without any lender consent (i.e., if J. Crew had only transferred $250 million), all uptiers require a credit amendment by definition. Typically, the threshold for an amendment is that 50% of loan holders must consent.[10]

Exclusive versus nonexclusive LMTs: In some LMTs, all term-loan holders are given the opportunity to participate.[11] These LMTs are called "nonexclusive" or "pro-rata" LMTs. In these deals (e.g., Revlon), only term-loan holders who intentionally refuse to participate in a LMT are subordinated to the new secured debt without compensation.

In contrast, in many LMTs, only a handpicked subset of term-loan holders are given the opportunity to participate. By design, this handpicked coalition holds over 50% of the term-loan debt, so they can amend the credit agreement without the support of the excluded minority. These are called "exclusive" or "non-pro-rata" LMTs. As Buccola (2022) summarizes,

> In a conventional workout, the company offers ratable consideration to all consenting creditors in a facility whose contractual rights are to be waived or altered. In a non-pro rata transaction, by contrast, the inducement is offered only to a subset of creditors whose consent is sufficient to bind the facility.

[10] Badawi, Buccola, and Nini (2024) write "The key construct is the 'required lenders,' which is the fraction of lenders—usually a bare majority by amount of outstanding loan held—that can direct the agent bank in its application of discretion and, crucial for our purposes, consent to most types of amendments to the loan contract."

[11] For example, in Revlon's dropdown, all term-loan holders could in principle have participated, but some chose not to. As Mugford and Gulick (2022) write, the nonparticipating investors "organized and signed a joint co-operation agreement that would bind them to vote against the deal," which was only meaningful because they had the chance to vote in favor. Likewise, in J. Crew's dropdown, 88% of term loan holders participated (Ayotte and Scully, 2021). The remaining 12% were not excluded, but rather "refused to consent" (LawJustia, 2018).

Buccola (2022) classifies many uptiers in this way, including Serta Simmons, TriMark, Boardriders, and TPC Group. The author also points out that dropdowns can in principle be exclusive (e.g., Envision Healthcare). However, many believe that uptiers are more likely to be structured as an exclusive deal than dropdowns: for example, Buccola and Nini (2024) refer to uptiers as "non-pro-rata uptiers" and write "the non-pro-rata character of uptiers, in contrast to dropdowns, might similarly produce distinctive efficiency properties."

2.2 LMTs target term loans

Some practitioners only use the term LMT to refer to a transfer of collateral away from a *loan* (S&P Global, 2024b). Others use a broader definition that includes, for example, TPC Group's 2022 transaction that subordinated secured *notes* (Melveny, 2022) or Incora's subordination of secured notes (Buccola, 2022). In our list that uses this second broader definition, 76% of LMTs feature a transfer of collateral away from a term loan. Thus, regardless of the definition, it is fair to say that a typical LMT transfers collateral away from a term loan.

More specifically, LMTs usually target a type of syndicated term loan called an "institutional term loan." As Badawi, Buccola, and Nini (2024) write,

> Among the most remarkable developments in leveraged finance over the last two decades has been the emergence and proliferation of institutional term loans... These are loans made to speculative-grade and unrated borrowers, arranged by a bank with an eye toward syndicating the credit immediately upon closing to non-bank institutions such as collateralized loan obligations (CLOs), loan mutual funds, hedge funds, and other asset managers... An active secondary market is an important ingredient in the institutional term loan's viability.

Roughly 90% of these are secured first-lien loans (Nini and Smith, 2024).

In LMTs, a few hedge funds own most of the loan: In many instances, ownership of institutional term loans is dispersed. However, by the time a firm enters its distress, it is common for the majority of the term loan to be owned by a small number of hedge funds. Giannetti and Meisenzahl (2021) use data on the secondary market for loans to show that (1) on average, ten debtholders own 80% of a term loan; (2) ownership concentration spikes as the borrower's credit quality declines, and (3) CLOs sell distressed loans and hedge funds buy them.[12] This highly concentrated ownership is partly due to the nature of the secondary market for term loans: "trading is opaque and illiquid. The market is mediated by a small number of dealers" (Nini and Smith, 2024). It is also partly due to the fact that the Trust Indenture Act applies only to public bonds, not institutional term loans (Buccola, 2022).

As an example of concentrated ownership, consider J. Crew's term loan that was impacted by its LMT. At the time of the LMT, one hedge fund called Anchorage Capital owned 28% of the term loan (Jessica DiNapoli, 2017) and another hedge fund called Eaton Vance owned 10% (LawJustia, 2018). There are many other examples, such as the following. Three asset managers owned 74% of Neiman Marcus's term loan when it filed for bankruptcy.[13] When Robertshaw negotiated a LMT with four asset managers, the coalition held 76% of its term loan.[14] Three hedge funds jointly owned roughly 23% of Revlon's term loan at the time of its LMT; another fund owned 10%.[15] Similarly, for the relevant "PTL" term loan in Serta's

[12] Blickle et al. (2020) find that the lead arranger of an institutional syndicated loan sells its entire position in 70% of deals. Demiroglu and James (2015) show that firms frequently fail to restructure term loans out of court when they are originally funded by nonbank lenders (e.g., hedge funds). Hotchkiss and Mooradian (1997) also show vulture funds buy distressed debt.

[13] See docket entry 146 at https://cases.stretto.com/public/X064/10214/PLEADINGS/10214050820800000000011.pdf.

[14] See https://globalrestructuringreview.com/review/restructuring-review-of-the-americas/2024/article/investment-fund-activity-in-us-debt-restructurings and https://caselaw.findlaw.com/court/us-ban-crt-s-d-tex-hou-div/116510401.html.

[15] See https://news.bloomberglaw.com/banking-law/citi-sues-hps-symphony-over-mistaken-

LMT, a group of three hedge funds (Eaton Vance, Barings, and Farallon capital) owned roughly 44%.[16] When Wellpath filed for Chapter 11, five hedge funds owned 67% of its first-lien term loan.[17]

Perhaps the best evidence of concentrated term-loan ownership is the fact that firms are able to negotiate LMTs with term-loan holders in the first place. For example, representatives of the hedge funds Angelo Gordon and Centerbridge Partners met directly with Envision's legal team (Kirkland and Ellis) to negotiate the Envision dropdown (Eliza Ronalds-Hannon and Davide Scigliuzzo, 2022).

2.3 LMTs raise liquidity and sometimes feature debt forgiveness

Practitioners agree that LMTs are primarily used for two purposes: raising new liquidity and reducing outstanding debt obligations. For example, Global Restructuring Review (2025) write "[LMTs] allow borrowers to access liquidity and reduce their debt burden." Quinn Emanuel (2025) write that LMTs offer "mechanisms for companies to raise debt capital where they may otherwise be facing a liquidity crunch and have no unencumbered assets to offer." While the new liquidity is often used to pay for some immediately maturing debt (i.e., a refinancing), it is also commonly used for other operating expenses — for example, Renfro "issued a new $10 million super priming term loan facility to provide additional liquidity in

payment-on-revlon-loan-1, which mentions three hedge funds held 46% of the 50% of the term loan that was not exchanged. See also docket entry 43 of Revlon's bankruptcy (stating Angelo Gordon held over $300 million in B-1 and B-2 term loans) and docket entry 30 (listing roughly $2.7 billion in term loans outstanding).

[16] See docket entry 1116 in Serta's bankruptcy showing these hedge funds owned roughly $450 million and docket entry 26 for the total amount of $1.027 billion.

[17] The investors collectively owned $321 million, see https://document.epiq11.com/document/getdocumentbycode?docId=4404529&projectCode=WPT&source=DM. The total amount outstanding was $475 million, see https://disclosure.spglobal.com/ratings/en/regulatory/article/-/view/sourceId/13054062.

order to fund its operations."[18]

A LMT can reduce debt outstanding when participating borrowers exchange their now subordinated debt for new debt at an exchange rate that implies a haircut. For example, in the Serta Simmons uptier, the participating loan holders exchanged the old debt for the new super secured debt at a 26% haircut, eliminating 26% of their previous debt claim.[19] Not all LMTs feature such debt reduction.

It is extremely common for a LMT to raise new liquidity: the participating loan holders inject new money as part of the terms of the deal. Buccola (2023) views this as a primary goal of LMTs: "the aim is to secure liquidity for the company without having to resort to Chapter 11." Our list of 86 LMTs includes many cases that raised new liquidity, including the following: Renfro, Shutterfly, Revlon, Del Monte, Magenta Buyer, Serta Simmons, and Cineworld. Accordingly, we focus on the role of a LMT in providing liquidity. However, LMTs can also endogenously reduce debt outstanding in our model, depending on the willingness of the debt holders to provide liquidity on subsidized terms that imply a haircut.

2.4 Distressed firms use LMTs and often avoid bankruptcy

According to a study of 38 LMTs conducted by S&P Global, 37% subsequently filed for bankruptcy shortly after the LMT (S&P Global, 2024b). On one hand, this is much higher than the base rate at which firms file for bankruptcy. Thus, this high filing rate suggests that LMTs are predominantly used by highly distressed firms. This fact motivates our assumption that the distressed firm seeking liquidity in our model is insolvent.

On the other hand, the same statistic implies that 63% of firms avoid bankruptcy after

[18] See https://disclosure.spglobal.com/ratings/en/regulatory/article/-/view/type/HTML/id/2599057.

[19] See https://www.kslaw.com/attachments/000/008/308/original/How_did_they_do_it_Serta.pdf?1611686371.

a LMT. This motivates our assumption that many, but not all, distressed firms can avoid bankruptcy by raising liquidity with a LMT.

2.5 LMTs are a new and ongoing phenomenon

In our list of 86 LMTs, the first LMT occurred in 2014. By 2019, nine firms had conducted LMTs. The rate of LMTs exploded in 2020, with 15 LMTs in that year alone. In 2023 and 2024, there were 25 and 22 LMTs, respectively. Thus, LMTs are a new phenomenon.

In contrast, a similar device called an "exit consent" has been used in *bond restructurings* for decades (Gertner and Scharfstein, 1991). Buccola (2022) defines an exit consent as follows:

> An exit consent refers to a practice in which an issuer conditions a bondholder's eligibility to participate in an exchange offer on its consent to an amendment stripping covenants from the indenture on its way out.

The key difference between an exit consent and a LMT is that a LMT works for term loans (Section 2.2). At a high level, this is the sense in which LMTs are new.[20]

Court responses to LMTs: LMTs are often followed by litigation disputing the validity of the transaction. Overall, courts have typically validated LMTs, though there is a great deal of nuance. Dropdowns have been broadly validated: As Buccola and Nini (2024) write,

> The legality of a generic dropdown has not been seriously questioned. Although lenders have expressed a combination of surprise and outrage at borrowers' use of unrestricted subsidiaries to subordinate unwilling lenders, the contractual permissions underpinning such transactions are relatively clear.

[20] Buccola (2022) argues that the non-pro-rata nature of exclusive LMTs is also a departure from prior exit consents.

In contrast, uptiers have been more contentious in court. Most notably, the U.S. Court of Appeals ruled that Serta Simmon's non-pro-rata uptier transaction, arguably the original uptier, was invalid. Serta had claimed that it was able to hand pick participating debt holders and exchange only their debt for new supersecured debt as an "open market transaction." As Holland & Knight (2025) summarize,

> The U.S. Court of Appeals for the Fifth Circuit has unanimously held that the debt exchange undertaken by Serta Simmons Bedding did not qualify as an "open market purchase" under the terms of Serta's 2016 credit agreement. Therefore, the "uptier transaction" was not permitted.

Importantly, this ruling is specific to the terms of Serta's credit agreement and did not invalidate all uptiers. Instead, it ruled out one approach for implementing an uptier. Indeed, "on the same day as the Fifth Circuit's decision, the New York Supreme Court's First Appellate Division issued a separate ruling ratifying an uptier transaction executed by Mitel Networks" (Holland & Knight, 2025).

Loan market responses to LMTs: Before J. Crew's LMT, it is likely that most term-loan holders did not believe LMTs were possible. In this sense, early LMTs probably involved debt contracts that did not intentionally permit LMTs. However, once investors learned that LMTs were possible, one might expect new debt contracts to include novel clauses preventing them. As Ayotte and Scully (2021) write,

> After the fact, it is obvious that J. Crew's lenders could have stopped this specific maneuver with a simple change to the contract. Indeed, some subsequent loan agreements did exactly that. But this hardly implies that J. Crew's lenders intended to permit it, as an omniscient-actor perspective would require... it is much

> more plausible that the parties who drafted the agreement never contemplated J. Crew's interpretation of the trapdoor.[21]

Buccola and Nini (2024) study a large sample of loans issued after LMTs became common to examine whether contract terms adapted. Interestingly, they find that many subsequent loan contracts *intentionally* allowed for LMTs. Specifically, the authors:

> read more than 600 leveraged loan contracts executed between January 2016, about 1 year before J. Crew announced the first phase of its dropdown, and June 2022, 2 years after Serta Simmons announced its uptier, and record whether the loan blocks or mitigates each form of priming transaction.

The key result of Buccola and Nini (2024) is that new loans intentionally enable nonexclusive dropdowns but they ban exclusive uptiers:

> Loans originated after the Serta transaction became much more likely to block uptier transactions, which suggests that loan contracts can adjust rapidly to curtail borrowers' flexibility. Conversely, the frequency of loans susceptible to a dropdown transaction changed little after the J. Crew transaction, which suggests that giving borrowers flexibility to repledge collateral may be valuable... Contracts could adjust to prevent dropdowns but did not.

Buccola and Nini (2024) conclude from this evidence that the possibility of a dropdown must create value ex ante. This is precisely what we show in our model. Moreover, we prove in an extension why firms benefit from banning uptiers.

[21] Based on the idea that LMTs were enabled by an unintentional contractual flaw, Ayotte and Badawi (2023) build a theory in which contracts evolve as firms and lawyers learn to improve contract terms, and a necessary part of that process is that mistakes happen.

However, it is important to note that there are alternative interpretations of these facts. Firms and lenders might not bother to block dropdowns because it is ultimately impossible to prevent LMTs: Ayotte and Scully (2021) write that

> A variety of "J. Crew blocker" terms emerged in response, but covenant analysts argued that most of them are only partially effective at preventing unrestricted subsidiary transfers. Many other contracts continued to leave them out entirely.

Likewise, Ayotte and Scully (2021) write "Contracting parties, no matter how sophisticated, cannot possibly imagine and contract to prevent all possible loopholes that other sophisticated parties might exploit."

In our view, it is instructive that *some* contracts block dropdowns and most loan contracts now intentionally ban exclusive LMTs. This pattern suggests that participants view these contractual defenses as meaningful, or they would not bother including these terms. Likewise, given that participants now know about "J. Crew blockers," anyone who believes LMTs are purely harmful would see some benefit and no cost in including such a clause. By this argument, the continued absence of J. Crew blockers in a large fraction of contracts suggests that dropdowns create value ex ante. Nonetheless, we acknowledge that this is not the only interpretation of Buccola and Nini (2024). At the very least, we show that these facts *can* be explained by a formal model in which optimal contracts enable LMTs.

2.6 Informing our model assumptions

Together, these facts motivate our main assumptions. First, we assume distressed insolvent firms use LMTs to raise liquidity, which sometimes prevents a bankruptcy filing (Sections 2.3 and 2.4). Second, we assume that a firm must obtain consent from a majority of existing

term-loan holders to conduct a LMT and transfer collateral (Section 2.1). As a result, the firm approaches these term-loan holders to raise liquidity. Third, we assume the firm negotiates with a small number of hedge funds who own the term-loan debt (Section 2.2). Given the small number of hedge funds, we do not assume a classical hold out problem in which no individual debt holder is pivotal. Instead, we assume a different friction described in the following section. Finally, our main results explain why contracts enable nonexclusive LMTs, while an extension shows why firms optimally ban exclusive LMTs (Section 2.5).

3 Baseline Model

In this section, we describe the assumptions of our baseline model and present our main result: LMTs can create value ex-ante by preventing costly bankruptcies ex-post that could not have been prevented by "traditional" term-loan restructuring.

3.1 Assumptions

Timing and project payoffs: There are three periods $t = 0, 1, 2$ and no time discounting. A firm is run by equity holders. At date 0, the firm has a project that requires new financing $D > 0$ for an exogenous parameter D. At date 1, the project pays $C^H > D$ with probability $1 - p_1$. With probability p_1, the firm is in distress. It requires a liquidity injection I to avoid a costly bankruptcy. In bankruptcy, the project pays $C^L < D$.[22] If the firm receives a liquidity injection, it survives until date 2. At date 2, the project pays C^H with probability $1 - p_2$ or it fails and pays C^L with probability p_2.

Debt: At date 0, the firm raises the necessary funds D by issuing an institutional term

[22] In this sense, the debt is undersecured. However, the debt could be interpreted as fully secured in the initial state, and in distress the collateral value falls.

loan in the broadly syndicated loan market. The firm's initial debt contract promises to pay K_0 if the project ever realizes the high payoff C^H. Thus, lenders receive K_0 in total at date 1 if there is no distress. For simplicity, we assume the firm issues a debt contract in which all of the value in default is promised to lenders. Thus, absent a liquidity injection (we also call this a "restructuring"), debt holders receive C^L in default. We assume that the loan is secured, so it cannot be subordinated by new financing in the absence of a LMT. We relax this assumption in Section 4.3. When the firm issues secured debt at date 0, it decides whether to include a contract term banning LMTs. We discuss this decision in detail below.

We assume the banks that originate term loans are perfectly competitive, so they earn zero profit in expectation. Specifically, K_0 is determined endogenously at date zero to make these banks break even when they lend D. However, if the firm ends up in distress at date 1, then the banks sell the debt to distressed debt investors (e.g., hedge funds). We assume the market for distressed debt investors is not perfectly competitive, so these investors earn a positive expected return. For simplicity, we assume that there are two distressed debt investors who each buy half of the debt.[23] The banks account for the possibility of this distressed debt transaction when they price the debt at date 0 to break even.

Distress and insolvency: At date 1, if the firm is in distress, it needs a liquidity injection I to avoid costly bankruptcy. We assume that the firm is insolvent in distress:

Assumption 1: *The firm is insolvent in the distress state:*

$$p_2 C^L + (1 - p_2) C^H - I < D. \tag{1}$$

Without liquidity, the firm fails and pays C^L to debt holders. With liquidity, it has a chance

[23] Section 4.4 shows that our result holds for any finite number of debt investors.

$1 - p_2$ of surviving and chance p_2 of requiring bankruptcy in spite of the liquidity injection.

Because the firm is insolvent and has a high chance of filing for bankruptcy, we assume that only specialized distressed-debt investors (e.g., hedge funds) are willing to buy its debt or inject liquidity. In our baseline model, we assume that equity holders must approach the two hedge funds who own the term-loan debt to raise liquidity. This is a realistic assumption for LMTs: the firm requires consent from one of the two term-loan holders to conduct a LMT (Section 2.1). In the absence of a LMT, the firm could in principle raise liquidity from other investors who do not own the debt. However, we prove in Section 4.2 that equity holders optimally choose to raise liquidity from debt holders even if other investors are available.[24] In this sense, our assumption that the firm raises liquidity from existing debt holders, with or without a LMT, is without loss of generality. Because the firm negotiates with debt holders, we call this a "restructuring."

Restructuring and asymmetric information about investor costs: At date 1, if there is distress, the equity holders make a take-it-or-leave-it restructuring offer to the two distressed debt investors. In a restructuring, equity holders offer a total payment K_1 in exchange for a total liquidity injection I. We allow the endogenous offer K_1 to be less than I, which reflects either (i) a below-market interest rate on the injected funds I, (ii) a haircut on the previously promised debt payment, or (iii) both.

If the restructuring succeeds and the firm realizes the high payment C^H, equity holders receive the residual value $C^H - K_1 - K_0$. If the firm avoids distress entirely, equity holders receive $C^H - K_0$.

In a successful restructuring, participating investors jointly inject the funds I needed to

[24] Intuitively, injecting liquidity into an insolvent firm subsidizes existing debt holders because it reduces the risk of a bankruptcy that leaves them impaired. For this reason, debt holders are willing to accept a lower return in exchange for injecting new liquidity. Relatedly, an investor injecting liquidity would benefit from also buying the debt and internalizing this subsidy.

avoid a costly bankruptcy. Both investors simultaneously decide whether to participate or not. If both investors participate, they each inject $I/2$ and each receive $K_1/2$. If only one investor participates, it injects the entire I and receives the entire K_1. If neither investor participates, the firm files for bankruptcy. This simple deal structure does not drive the results: In Section 4.4, we show the same results when liquidity is raised through an arbitrary optimally designed mechanism.

Because the market for distressed debt investors is not perfectly competitive, some investors require a positive expected return. Specifically, we assume that investor i has a "cost" θ_i for each dollar injected in the firm. This can be interpreted as an opportunity cost: the positive return that the investor requires for forgoing a different deal. Alternatively, this can be interpreted as the investor's cost of capital. Thus, investor i pays $I(1+\theta_i)$ to inject I dollars, or $I(1+\theta_i)/2$ to inject $I/2$.

Crucially, investor i's realization of θ_i is private information. Each investor $i = 1, 2$ draws θ_i independently from a binary distribution: for simplicity, we assume $\theta_i \in \{0, \overline{\theta}\}$ where $0 < \overline{\theta}$. All of our results hold if we instead assume that θ_i is drawn from an arbitrary distribution, under certain technical conditions (Section 4.4). We let Q denote the probability that investor i has a high cost:

$$Q \equiv \mathbb{P}(\theta_i = \overline{\theta}), \qquad 1 - Q = \mathbb{P}(\theta_i = 0). \tag{2}$$

This asymmetric information regarding investor funding costs is the key friction in our model. Equity holders make their restructuring offer K_1 without observing $\{\theta_1, \theta_2\}$. As we will show, this friction can lead to an inefficient equilibrium in which (i) restructurings always create value for any realization of $\{\theta_1, \theta_2\}$ but (ii) restructurings nonetheless fail with positive probability on the equilibrium path.

These assumptions align with empirical evidence that *expected* returns vary across hedge funds by at least 11 percentage points annually (Bali, Brown, and Caglayan, 2012). If expected returns vary, required returns should as well. Further, it is reasonable to view required returns as private information: each hedge fund i has an incentive to pretend its θ_i is high to justify demanding a high return, but θ_i cannot be communicated credibly,[25] so claiming a high θ_i is cheap talk. Accordingly, we view our assumptions regarding θ_i as realistic. Nonetheless, in Appendix C, we prove that our results hold under an alternative assumption: hedge funds privately observe signals about the probability p_2 that a successful restructuring is followed by bankruptcy. Thus, our results hold as long as hedge funds are privately informed about something that drives the attractiveness of the transaction, even if required returns are zero.

Initial contract choice, traditional restructuring vs LMTs: At date 0, equity holders choose whether to ban LMTs in the debt contract. If they ban LMTs, only "traditional" restructurings are allowed. In a traditional restructuring, an investor who accepts the offer receives $C^L/2$ in bankruptcy or $K_0/2 + K_1/n$ if the firm avoids bankruptcy, where $n = 1, 2$ is the number of investors accepting the deal. An investor who rejects retains their existing contract, receiving $C^L/2$ if the firm files for bankruptcy or $K_0/2$ otherwise.

Alternatively, equity holders can enable LMTs. A LMT works exactly the same as a traditional restructuring with one exception: if one investor accepts the offer and the other rejects the offer ($n = 1$), then the rejecting investor loses their right to any payment in bankruptcy. Specifically, if only one investor accepts the offer and the firm files for bankruptcy, the accepting investor receives C^L and the rejecting investor receives 0.

[25] For example, even if a hedge fund could reveal a term sheet for an alternative potential deal, there is no way to communicate the probability of successful closing.

3.2 Traditional restructuring equilibrium

We solve the model in three steps. First, we assume that equity holders opt for traditional restructuring and solve for the equilibrium equity and debt values. Second, we assume that they opt for the LMT exposed contract and solve for equilibrium values. Finally, we compare ex-ante values to determine whether equity holders choose to allow for LMTs.

In the first step, we assume that equity holders have committed to only traditional restructurings. We solve for a subgame perfect equilibrium, which consists of a pair $\{K_0^*, K_1^*\}$ satisfying the following conditions:

1. Consider a subgame in which equity holders promised K_0^* at $t = 0$, entered distress at $t = 1$, and made a restructuring offer K_1. Each investor i observes their cost θ_i and the restructuring offer K_1. Investor i forms a rational expectation $\tilde{P}$ of the probability that the other investor j accepts the offer. Investor i's decision to accept or reject must be optimal in any such subgame, given the rational expectation $\tilde{P}$. Specifically, defining investor i's expected payoff from accepting an offer:

$$R_{\text{accept}}(K_0^*, \tilde{P}, K_1, \theta_i) \equiv \underbrace{\frac{(1-p_2)K_0^* + p_2 C^L}{2}}_{\text{Original debt contract}} + \underbrace{\big[1 - \frac{\tilde{P}}{2}\big]}_{\text{Share}} \times \underbrace{\big[-I(1+\theta_i) + (1-p_2)K_1\big]}_{\text{Restructuring payoff}}, \tag{3}$$

and investor i's expected payoff from rejecting an offer:

$$R_{\text{reject}}(K_0^*, \tilde{P}, K_1, \theta_i) \equiv \underbrace{[1 - \tilde{P} + \tilde{P}p_2]\frac{C^L}{2}}_{\text{Bankruptcy payoff}} + \underbrace{\tilde{P}\frac{(1-p_2)K_0^*}{2}}_{\text{Original debt}}, \tag{4}$$

we require that investor i accepts if and only if

$$R_{\text{accept}}(K_0^*, \tilde{P}, K_1, \theta_i) \geq R_{\text{reject}}(K_0^*, \tilde{P}, K_1, \theta_i). \tag{5}$$

The acceptance probability $\tilde{P}$ then solves a fixed point problem: $\tilde{P}$ is equal to the probability of a θ_i realization satisfying (5).

2. At date 1, if the firm is distressed, equity holders anticipate this investor strategy (5). Equity holders can thus calculate the acceptance probability $\tilde{P}(K_1)$ associated with an offer K_1. Then K_1^* must be an optimal solution to the equity holders' problem of choosing K_1, without observing the realization of $\{\theta_1, \theta_2\}$, to maximize their ex-post objective:

$$\max_{K_1} \; E(K_1) = \underbrace{(1-p_2)(C^H - K_0^* - K_1)}_{\text{Payoff if accepted}} \times A(K_1), \tag{6}$$

where $A(K_1)$ is the probability that at least one investor accepts the offer K_1:

$$A(K_1) \equiv \underbrace{1 - \left(\, 1 - \tilde{P}(K_1) \,\right)^2}_{\text{Probability at least one investor accepts}}. \tag{7}$$

3. At date 0, lenders break even on their investment D. Lenders have rational expectations of the equilibrium offer K_1^* solving (6) and the strategies (5). Thus, date-0 lenders can calculate the indicator $\mathbf{1}_{accept}(K_1^*, \theta_i)$ equal to one if a subsequent date-1 investor with cost θ_i accepts the equilibrium offer K_1^*. Given this, lenders break even if and only if

$$D = (1-p_1)K_0^*$$
$$+ p_1\Bigg[C^L + A(K_1^*)\ \big(\ (1-p_2)(K_0^* + K_1^* - C^L) - I\ \big) - \underbrace{I\mathbb{E}\big[\frac{\sum_i \theta_i \mathbf{1}_{accept}(K_1^*,\theta_i)}{1+\prod_i \mathbf{1}_{accept}(K_1^*,\theta_i)}\big]}_{\text{Expected cost for participating investors}}\ \Bigg], \tag{8}$$

where the final term captures the average funding cost among participating investors: it is θ_i if only one investor participates or $(\theta_1+\theta_2)/2$ if both participate.

4. At date 0, equity holders choose K_0^* to make lenders break even according to (8). Crucially, equity holders cannot commit at date 0 to the their subsequent renegotiation strategy K_1.

Intuitively, at date one, each distressed debt investor maximizes its expected payoff by choosing whether to accept or reject the debt restructuring offer, given a rational expectation of the other investor's strategy. Equity holders anticipate these investor strategies and choose a restructuring offer K_1. Equity holders face a tradeoff: a higher offer K_1 is more likely to be accepted, but it risks overpaying if investors would have been willing to accept less surplus ($\theta_i = 0$). At date 0, equity holders internalize the value created by future restructurings through the rational debt pricing. Specifically, in the instant before equity holders issue debt, the firm value is given by the following lemma:

Lemma 1. *Fix an equilibrium. In the instant before debt is issued at date zero, the total ex-ante firm value is*

$$(1-p_1)C^H + p_1\Bigg[C^L + A(K_1^*)\ \big(\ (1-p_2)(C^H - C^L) - I\ \big) - I\mathbb{E}\big[\frac{\sum_i \theta_i \mathbf{1}_{accept}(K_1^*,\theta_i)}{1+\prod_i \mathbf{1}_{accept}(K_1^*,\theta_i)}\big]\Bigg]. \tag{9}$$

All proofs appear in the Appendix. This lemma shows that the promised debt payments K_0^*, K_1^* only affect total ex-ante firm value through the probability of restructuring at date one. This is intuitive: K_0^* and K_1^* are transfers between agents, so they only impact total surplus through the probability of restructuring and the composition of funding costs among investors who participate in restructuring in equilibrium. This lemma has the following implication for equilibrium efficiency:

Lemma 2. *Define*

$$\mathbb{Z} \equiv I\left[1 + \frac{\overline{\theta}}{Q}\right]. \tag{10}$$

Suppose that the following condition holds:

$$(1 - p_2)(C^H - C^L) > \mathbb{Z}. \tag{11}$$

Then ex-ante firm value (9) *is maximized by any offer* K_1^* *that ensures* $A(K_1^*) = 1$.

Intuitively, at date one, equity holders choose between three strategies: (1) a very low K_1^* that ensures restructuring fails, (2) a medium value of K_1^* that ensures an investor with low cost $\theta_i = 0$ will accept, or (3) a high value of K_1^* that ensures even investors with the high cost $\theta_i = \overline{\theta}$ will accept. From Lemma 1, strategy (1) yields firm value $(1 - p_1)C^H + p_1 C^L$. Strategy (2) ensures that only low cost investors accept. Thus, the restructuring succeeds as long as one investor has the low funding cost, an event with probability $1 - Q^2$. From Lemma 1, we see that moving from strategy (1) to strategy (2) adds the following term to firm value

$$p_1(1-Q^2)\ \big(\ (1-p_2)(C^H-C^L)-I\ \big) \tag{12}$$

Thus, ex-ante, it is preferable to ensure only type-0 investors accept restructuring offers, relative to all restructurings failing, if the injection cost I is lower than the value $(1-p_2)(C^H-C^L)$ created by restructuring. Finally, consider a comparison between strategy (2) and strategy (3). The benefit of strategy (3) is that it creates the restructuring benefit $(1-p_2)(C^H-C^L)$ even when all investors have high funding costs. The downside to strategy (3) is that it increases the expected funding cost of participating investors in equilibrium. This occurs through two channels. First, there is now a chance that both investors pay the high cost $\overline{\theta}$ to restructure the firm. Second, in the event that one investor has the low cost and the other has the high cost, both investors participate under strategy (3) while only the low-cost investor participates under strategy (2). Thus, strategy (3) increases the expected funding cost even in this event that led to restructuring under strategy (2). If (11) holds, the restructuring benefit (the left side) is higher than this marginal increase in the funding cost (the right side). Thus, when (11) holds, restructurings are always efficient in the sense that a social planner who maximizes ex-ante firm value would always restructure debt at date one.

While date-1 restructurings are always ex-ante efficient under the condition of Lemma 2, they can nonetheless fail in equilibrium. We formalize this in the following proposition.

Proposition 1. *Suppose that condition* (11) *holds. Define*

$$\mathbb{B} \equiv \underbrace{I\left(1+\frac{\overline{\theta}}{Q^2}\right)}_{\textit{Greater than } \mathbb{Z}} + \underbrace{\frac{1-p_2}{Q}\left(\frac{D-C^L-p_1 I(1-Q)\overline{\theta}}{1-p_1p_2}\right)}_{\textit{Greater than } 0}. \tag{13}$$

If $(1-p_2)(C^H - C^L) \geq \mathbb{B}$*, then there exists an equilibrium in which restructurings always succeed:* $A(K_1^*) = 1$*. However, if* $(1-p_2)(C^H - C^L) < \mathbb{B}$*, then restructuring fails in any equilibrium when* $\theta_1 = \theta_2 = \overline{\theta}$*:* $A(K_1^*) \leq 1 - Q^2$*. Further,* $\mathbb{Z} < \mathbb{B}$*. Thus, combining this with Lemma 2, asymmetric information creates an ex-ante inefficient equilibrium with too little restructuring when* C^H *is in an intermediate range:*

$$\mathbb{Z} < (1-p_2)(C^H - C^L) < \mathbb{B}. \tag{14}$$

Under condition (11), ex ante surplus is maximized when the firm is certain to raise liquidity in distress. However, Proposition 1 shows that equity holders' ex post incentives can cause them to offer a low K_1^* that risks rejection at date one. Thus, Proposition 1 shows that asymmetric information creates inefficiency in equilibrium. The following corollary sheds further light on this inefficiency.

Lemma 3. *As* D *increases, the range of parameter values* C^H *with inefficient restructuring failure grows:* $\mathbb{Z}$ *stays constant and* $\mathbb{B}$ *increases.*

This corollary reveals that failed restructurings are analogous to a debt overhang problem. As D grows, equity holders internalize less of the benefit from a successful restructuring. Making a high K_1 offer that is always accepted is an efficient investment, but equity holders do not fully internalize the benefit. As a result, when D grows, they underinvest and offer a low K_1 that risks negotiation failure but is less costly if investors have low required returns. We now show that LMTs can help solve this debt overhang problem.

3.3 Introducing LMTs

We now consider a contract that allows for LMTs at date 1. We define an equilibrium with LMTs in the same way as before, with one exception: if investor i accepts a LMT and investor j rejects, then investor i receives the entire bankruptcy payoff if the firm files for bankruptcy after the restructuring. Formally, the acceptance payoff becomes

$$R^{LMT}_{\text{accept}}(K_0^*, \tilde{P}, K_1, \theta_i) \equiv \underbrace{\frac{(1-p_2)K_0^*}{2}}_{\text{Original debt contract}} + \underbrace{\left[1 - \frac{\tilde{P}}{2}\right]}_{\text{Share}} \times \underbrace{\left[p_2 C^L - I(1+\theta_i) + (1-p_2)K_1\right]}_{\text{Restructuring payoff}}. \tag{15}$$

This is the same as equation (3) in the previous equilibrium definition, except that investor i receives the entire expected bankruptcy payoff $p_2 C^L$ if investor j rejects. Investor i's expected payoff from rejecting an offer becomes:

$$R^{LMT}_{\text{reject}}(K_0^*, \tilde{P}, K_1, \theta_i) \equiv \underbrace{[1 - \tilde{P}]\frac{C^L}{2}}_{\text{Bankruptcy payoff}} + \underbrace{\tilde{P}\frac{(1-p_2)K_0^*}{2}}_{\text{Original debt}}. \tag{16}$$

This is the same as equation (4) in the previous equilibrium definition, except that investor i loses any bankruptcy payoff if they reject and investor i accepts. As before, we require in equilibrium that investor i accepts if and only if the acceptance payoff exceeds the rejection payoff:

$$R^{LMT}_{\text{accept}}(K_0^*, \tilde{P}, K_1, \theta_i) \geq R^{LMT}_{\text{reject}}(K_0^*, \tilde{P}, K_1, \theta_i). \tag{17}$$

Otherwise, the equilibrium definition is unchanged. Equity holders have the same date-1 and date-0 objectives. Because a LMT simply transfers bankruptcy value between debt holders, the total date-0 expected lender payoff is unchanged. Thus, equation (8) continues

to hold. As a result, Lemma 1 and Lemma 2 continue to hold.

However, the new restructuring acceptance rule (17) changes the equilibrium incentives of equity holders that shape K_1^*. This in turn changes K_0^*. Because of this, the efficiency properties of an equilibrium with LMTs are different than before. We formalize this in the following proposition:

Proposition 2. *Suppose that condition (11) holds. Define*

$$\mathbb{B}^{LMT} \equiv \mathbb{B} - \underbrace{\frac{C^L}{Q}\left[1 - \frac{1-p_2}{1-p_1p_2}\right]}_{\text{Greater than 0}} < \mathbb{B}. \tag{18}$$

If $(1-p_2)(C^H - C^L) \geq \mathbb{B}^{LMT}$*, then there exists an equilibrium in which LMT restructurings always succeed:* $A(K_1^*) = 1$*. Relative to the equilibrium with traditional restructuring,* K_0^* *is higher and* K_1^* *is lower. Combining this with Proposition 1, the LMT-only contract improves ex-ante firm value when*

$$\mathbb{B}^{LMT} < (1-p_2)(C^H - C^L) < \mathbb{B}. \tag{19}$$

Finally, suppose that (11) holds and $(1-p_2)(C^H - C^L) \geq \mathbb{B}^{LMT}$*. Then (1) if equity holders write a contract that allows for LMTs or traditional restructurings at date one, lenders will price debt expecting a LMT at date one and equity holders will find it optimal ex-post to conduct a LMT, and (2) ex-ante firm value is maximized by this LMT-enabling contract.*

Thus, when restructuring is efficient, equity holders can create value ex ante by enabling LMTs at date zero. The initial cost of debt K_0^* rises with LMTs, but this is just a transfer:[26]

[26]The broad idea that ex-post efficiency-enhancing transfers can be offset by ex-ante pricing appears in other contexts in papers such as Hotchkiss, Iverson, and Zheng (2024).

the overall value being shared between equity and debt grows because ex-post inefficient bankruptcies are avoided. Moreover, if a contract enables LMTs or traditional restructurings, equity holders will choose a LMT ex post and firm value will nonetheless be higher ex ante.

3.4 Intuition

Proposition 1 shows that equity holders have a debt overhang problem. When the firm needs to raise substantial debt at date zero, it owes a great deal at date one. This leaves little value for equity holders, even if the project is successful. When the outstanding debt balance grows, equity holders have less and less to gain from ensuring that a restructuring succeeds. Thus, while restructuring is an efficient investment, equity holders do not internalize this, so they offer a low return to investors and risk deal failure. As one would expect, this debt overhang problem grows with the outstanding debt: the lower bound $\mathbb{B}$ increases with D.

Figure 1 illustrates the equilibrium inefficiency. Moving from the bottom of the figure to the top, the y axis plots the social benefit of restructuring $(1 - p_2)(C^H - C^L)$. The flat dashed black line at the bottom corresponds to $\mathbb{Z}$. Thus, in the region above this line, restructuring is ex-ante efficient by Lemma 2. However, Figure 1 shows there is a large region above this line in which (i) restructuring is ex-ante efficient but (ii) restructuring cannot always be supported in equilibrium. Specifically, moving from left to right, the x axis plots the original debt D that must be raised. As D grows, the boundary $\mathbb{B}$ grows, which is plotted by the blue dashed line. In the area between the flat black dashed line and the increasing blue dashed line, the equilibrium without LMTs is inefficient because of the debt overhang problem described above. As one would expect, this debt overhang gets worse as D increases: Figure 1 shows that the range of restructuring benefit values (the y axis) for which restructuring can fail in equilibrium grows as D grows. In this sense, debt interacts

with debt-holder information asymmetry in a manner that destroys value.

Finally, LMTs help solve this inefficient debt overhang problem. Intuitively, giving equity holders the ability to reallocate value between cooperating and noncooperating debt holders allows them to achieve a restructuring with a lower payoff to debt holders. In this sense, LMTs are a transfer from debt holders to equity holders. The entire debt overhang problem arises because equity holders do not internalize enough of the benefit of a successful restructuring. Since LMTs increase equity holders' share of the restructuring surplus, LMTs help mitigate the debt overhang problem: equity holders have more to lose from a failed restructuring. Figure 1 demonstrates this: the range of values for which efficient restructuring is guaranteed in equilibrium grows when LMTs are available. Specifically, the solid black line plots the boundary $\mathbb{B}^{LMT}$ above which the equilibrium with LMTs is efficient. The black line is lower than the blue line, so LMTs enable efficient equilibria for a wider range of parameters.

4 Extensions

In this section, we consider extensions of our baseline model.

4.1 Exclusive LMTs

In our first extension, we consider exclusive "non-pro-rata" LMTs, in which only a subset of debt holders are given the chance to participate. We model this using the same assumptions as before, with two exceptions. First, in addition to the previously modeled options of a traditional restructuring or a nonexclusive LMT, we assume that equity holders can also choose to pursue an exclusive LMT. In an exclusive LMT, when equity holders make a take-

it-or-leave-it LMT offer, they randomly select one debt holder and offer them the exclusive opportunity to participate in a LMT. If the debt holder accepts, they receive the entire payoff associated with the LMT. If they reject, we assume that the firm must file for bankruptcy. This assumption is a simple reduced-form manner of capturing how one group of investors might infer from deal failure that the other group of investors received a negative signal in the process of negotiating and conducting due diligence.

Second, we assume that investors have funding costs or required returns that are convex in the amount of funding that they must provide. For example, a hedge fund might have to rely on more expensive sources of financing to fund larger deals. Alternatively, any investor might lose some diversification benefit when investing more of their funds in a single deal and thus require a higher return. For simplicity, we continue to assume that low-cost investors ($\theta_i = 0$) have zero funding cost in all situations. However, we now assume that high-cost investors have convex funding costs. If two high-cost investors split the deal, each injecting $I/2$, then they each pay a funding cost $\overline{\theta}_2 I/2$ for a total funding cost $\overline{\theta}_2$. However, if one high-cost investor funds the deal alone, then they pay a higher funding cost $\overline{\theta}_1 I$, where $\overline{\theta}_1 > \overline{\theta}_2$. Finally, if a high-cost investor splits a deal with a low-cost investor, then the high-cost investor pays $\overline{\theta}_2 I/2$. In summary:

$$\text{One high-cost investor} \Rightarrow \text{Total funding cost} = \overline{\theta}_1 I \tag{20}$$

$$\text{One or two low-cost investors} \Rightarrow \text{Total funding cost} = 0 \tag{21}$$

$$\text{One low-cost investor and one high-cost investor} \Rightarrow \text{Total funding cost} = \overline{\theta}_2 I/2 \tag{22}$$

$$\text{Two high-cost investors} \Rightarrow \text{Total funding cost} = \overline{\theta}_2 I. \tag{23}$$

Other than these two changes, we take all of the same assumptions as in our baseline model.

Consider a subgame in which the date-0 contract specified a payment K_0^*, the firm entered distress at date 1, and equity holders make an exclusive LMT offer K_1 to debt holder i. The debt holder knows that if they reject, the deal fails and the firm enters bankruptcy, so they receive $C^L/2$. If the debt holder accepts, they receive their original debt value and the entire LMT payoff:

$$R^{EXC}_{\text{accept}}(K_0^*, \tilde{P}, K_1, \theta_i) = \underbrace{\frac{(1-p_2)K_0^*}{2}}_{\text{Original debt contract}} + \underbrace{\left[p_2 C^L - I(1+\overline{\theta}_1 \mathbf{1}(\theta_i > 0)) + (1-p_2)K_1\right]}_{\text{Entire Restructuring payoff}}, \quad (24)$$

Note that since investor i funds the whole deal, their funding cost is either 0 or $\overline{\theta}_1$, depending on their type. Also, note that this does not depend on $\tilde{P}$ since the other investor j is not given the opportunity to accept in an exclusive LMT. Other than this change, if equity holders contractually commit to an exclusive LMT, the equilibrium is defined in the same manner as before.

At $t = 0$, equity holders choose whether to (1) allow any form of restructuring, (2) ban any LMT, (3) only ban nonexclusive LMTs, or (4) only ban exclusive LMTs. The following proposition shows that banning exclusive LMTs can create value:

Proposition 3. *Assume the conditions of Proposition 2 hold for $\overline{\theta} = \overline{\theta}_2$: Condition (11) holds so restructuring is ex-ante efficient and condition (19) holds so that banning LMTs at $t = 0$ is strictly suboptimal.*

1. *As long as $\overline{\theta}_1 > \overline{\theta}_2$, equity holders weakly prefer a contract that (1) allows nonexclusive LMTs and (2) bans exclusive LMTs.*

2. *Equity holders strictly prefer a contract that (1) allows nonexclusive LMTs and (2) bans exclusive LMTs if $\overline{\theta}_1$ is small:*

$$\frac{(1-p_2)}{2}\underbrace{\left(\frac{D-p_1 I\overline{\theta}_2(1-Q)}{1-p_1p_2}\right)}_{K_0^* \text{ from Proposition 2}} \geq I(\overline{\theta}_1-\overline{\theta}_2)+\frac{C^L}{2}. \tag{25}$$

Intuitively, the assumption that $\overline{\theta}_1 > \overline{\theta}_2$ introduces convex funding costs that make exclusive LMTs ex-ante inefficient, relative to the first-best ex-ante firm value that arises from guaranteeing two-investor restructuring through traditional restructuring or nonexclusive LMTs. Under the conditions of Proposition 2, this first-best ex-ante firm value can be achieved through nonexclusive LMTs. Thus, when nonexclusive LMTs already achieve the first best, exclusive LMTs can only do worse. This leads to the first result of Proposition 3.

Moreover, exclusive LMTs can be attractive ex-post to equity holders. Comparing equation (24) to the rejection payoff of $C^L/2$, we observe that a debt holder is likely to accept even a low-K_1 exclusive LMT because it preserves their ability to realize the original debt value K_0^*. In this sense, exclusive LMTs can be more coercive, allowing equity holders to achieve restructuring with low K_1 payments. While this could potentially improve efficiency if restructurings otherwise fail in equilibrium, the attractive nature of exclusive LMTs becomes a problem if nonexclusive LMTs already guarantee restructuring. In this case, which is considered in the above proposition, guaranteeing restructuring with a nonexclusive LMT is preferable ex-ante to guaranteeing restructuring with an exclusive LMT, which entails higher funding costs due to the convexity assumption. Thus, equity holders want to commit ex-ante to a nonexclusive LMT to reassure lenders that restructuring will be less costly. This leads to the second result of Proposition 3: equity holders can strictly benefit ex-ante from banning exclusive LMTs. However, if $\overline{\theta}_1$ become very large relative to $\overline{\theta}_2$, then exclusive LMTs become less attractive ex post: equity holders must compensate the investor for their

high convex funding cost. In this case, there is no need to ban exclusive LMTs because equity holders do not choose them ex-post even when they are available. Likewise, equity holders will not choose exclusive LMTs if K_0^* is low, since then they are less coercive (and thus more expensive) than nonexclusive LMTs.

Proposition 3 provides an explanation for the empirical evidence of Buccola and Nini (2024): while new debt contracts intentionally allow for nonexclusive LMTs, they increasingly feature clauses that block exclusive LMTs, suggesting that exclusive LMTs are harmful ex ante. In our model, this can be explained by convex funding costs. However, we acknowledge that there are other reasons outside of our model that a firm may prefer to ban exclusive LMTs. For example, firms might worry that exclusive LMTs deter small investors in the secondary market, who worry they would not be among the chosen few to participate in an exclusive LMT. Similarly, investors in the secondary market might have some slight aversion to the uncertainty regarding whether they will be in the exclusive group. Either of these effects could cause banks to charge more ex-ante, anticipating that it will be harder to sell the loans in the secondary market later.

4.2 Liquidity injection from non debt holders

What if the firm could raise financing from distressed investors who do not hold the existing debt? As discussed in Section 2, a core feature of a LMT is that a majority of existing debt holders must typically agree to transfer collateral. However, an insolvent firm contemplating raising liquidity without a LMT does not have the same need to raise financing from its existing debt holders.

We now consider an extension in which a firm chooses between three options: (a) raise liquidity from two specialized distressed debt investors who do not hold the firm's debt, (b)

raise liquidity, without a LMT, from two specialized distressed debt investors who currently hold the firm's debt, or (c) raise liquidity from two specialized distressed debt investors who currently hold the firm's debt through a LMT.

As in our main model, we assume that a firm raises D at $t = 0$ by promising a future payoff of K_0^*. Lenders have rational expectations and sell the debt to two specialist investors if the firm enters distress. As before, at $t = 1$, the firm must raise I to avoid a certain bankruptcy (paying C^L). A successful liquidity raise leads to a high payoff C^H with probability $1 - p_2$ or a bankruptcy with probability p_2.

Suppose that the initial debt contract banned LMTs. At $t = 1$, we now introduce a choice for equity holders. They can approach a group of two investors who do not hold debt and make a take-it-or-leave-it offer. Alternatively, they can approach the two existing debt holders and make a take-it-or-leave-it offer. We assume that equity holders can only pursue one of these approaches. This assumption is a simple reduced-form manner of capturing how one group of investors might infer from deal failure that the other group of investors received a negative signal in the process of negotiating and conducting due diligence.

If equity holders make an offer K_1^* to the non-debt-holder group, each of the two potential investors weighs a payoff of 0 from rejecting against the following payoff from accepting:

$$R_{\text{accept}}^{\text{Outside}}(K_0^*, \tilde{P}, K_1, \theta_i) \equiv \underbrace{\left[1 - \frac{\tilde{P}}{2}\right]}_{\text{Share}} \times \underbrace{\left[- I(1 + \theta_i) + (1 - p_2)K_1\right]}_{\text{Restructuring payoff}}, \tag{26}$$

where θ_i is the investor's privately observed funding cost and $\tilde{P}$ is their perceived probability that the other investor accepts. Since the payoff from rejecting is zero, the potential lender accepts if and only if

$$K_1 \geq \frac{I(1+\theta_i)}{1-p_2}. \tag{27}$$

Thus, equity holders choose between four options at $t = 1$: (1) forgo financing and file for bankruptcy, (2) offer $K_1 = I/(1-p_2)$ to external investors and risk failure when $\theta_1 = \theta_2 = \overline{\theta}$, (3) offer $K_1 = I(1+\overline{\theta})/(1-p_2)$ to external lenders and ensure financing success, (4) ignore external investors and follow the equilibrium offer to existing debt holders described by Proposition 1. Equity holders choose between these options to maximize their date-1 objective. Other than this change, we define an equilibrium in the same manner as in Section 3.2. We now show that it is without loss of generality to ignore the external investors:

Proposition 4. *Suppose that equity holders ban LMTs at $t = 0$. As in Proposition 1, assume that ensuring financing success maximizes ex-ante value (condition (11) holds).*

1. *If $(1-p_2)(C^H - C^L) \geq \mathbb{B}$, there exists an equilibrium in which restructurings always succeed: $A(K_1^*) = 1$. In this equilibrium, equity holders are indifferent between making an offer to external investors or debt holders.*

2. *If $(1-p_2)(C^H - C^L) < \mathbb{B}$, there does not exist an equilibrium in which $A(K_1^*) = 1$. In any equilibrium, equity holders optimally make offers to existing debt holders.*

This proposition shows that the availability of external investors has no impact on equilibrium efficiency. Intuitively, equity holders always weakly prefer to make offers to existing debt holders because these debt holders enjoy some of the surplus from a successful restructuring, which leads them to accept lower interest rates. Thus, if equity holders have a choice, they will offer a deal to existing debtholders, even when they do not need their approval to move collateral as in a LMT.

Finally, we show that LMTs continue to improve efficiency even when outside investors are available. This follows naturally from the above proposition and the fact that LMTs can only be achieved with some consent from existing debt holders.

Lemma 4. *Proposition 2 continues to hold even if equity holders have the option to instead make an offer to external investors at* $t = 1$.

4.3 The choice between secured and unsecured debt

In our baseline model, a firm issues debt and anticipates that it will face a debt overhang problem in the future when raising liquidity. We show that issuing secured debt with an option to conduct a LMT can solve this debt overhang problem. However, there are many other natural solutions to this problem. For example, the firm might issue unsecured debt ex-ante so that it is free to pledge collateral in the future, reducing the cost of capital and the resultant debt overhang problem.

For many firms, issuing unsecured debt is not an option. Many "asset-based lenders" require collateral, so unsecured debt dramatically reduces the pool of available lenders and increases the cost of capital.

Nonetheless, it is interesting to study from a theoretical perspective when LMTs can do even better at addressing debt overhang than an alternative of initially issuing unsecured debt. We now explore this in an extension.

In this extension, at $t = 0$, the firm chooses between (1) unsecured debt, (2) secured debt banning LMTs (which is equivalent to traditional restructuring in Section 3.2), or (3) secured debt enabling LMTs (which is equivalent to the LMT equilibrium in Section 3.3). We focus on option (1), which is novel in this extension. We characterize when unsecured debt can reach the first-best ex-ante firm value. We show that in some circumstances, equity

holders strictly prefer to issue secured debt with a LMT option.

We now characterize the equilibrium when a firm issues unsecured debt at $t = 0$. At $t = 1$, if the firm enters distress, we assume that it has two options: it can issue secured debt to existing debt holders (similar to traditional restructuring in Section 3.2) or it can issue secured debt to outside investors (as in the extension of Section 4.2). Either way, as in Section 4.2, we assume the firm makes a take-it-or-leave-it offer to a pool of two distressed debt investors. Each investor has a funding cost θ_i and decides whether to accept or reject. Once the firm makes an offer to one investor group (debt holders or outside investors), they cannot make an offer to the other group due to a perception that the first group must have observed a negative signal.

Consider a subgame in which the firm issued unsecured debt at $t = 0$ with promised payment K_0^*, the firm entered distress, and equity holders chose to make an offer to issue secured debt with promised payment K_1 to outside investors. Crucially, we assume that the new secured debt is senior to the previously issued unsecured debt. Thus, for any $K_1 < C^L$, the debt is oversecured and risk free. For any $K_1 < C^L$, we accordingly assume that outside investors receive $K_1 - I(1 + \theta_i)$ for funding the entire deal, regardless of what subsequently happens to the firm. An outside investor receives half of this for funding half of the deal. We assume an outside investor receives nothing if they reject (they do not hold the firm's debt so they are unaffected by its failure). Given this, outside investors have a simple decision rule if $K_1 < C^L$: accept if and only if $K_1 \geq I(1 + \theta_i)$. Accordingly, equity holders know they can offer $K_1 = I(1 + \overline{\theta})$ to outside investors and guarantee successful restructuring. Alternatively, equity holders can offer $K_1 = I$ to outside investors and achieve restructuring with probability $1 - Q^2$. We assume that $I(1 + \overline{\theta}) < C^L$, so equity holders can always guarantee restructuring with risk free secured debt if they are willing to pay $K_1 = I(1 + \overline{\theta})$.

Alternatively, equity holders can make a financing offer to the two distressed debt investors who currently own the unsecured debt. If a debt holder i accepts an offer, they receive the following payoff:

$$R^{\text{Sec}}_{\text{accept}}(K_0^*, \tilde{P}, K_1, \theta_i) \equiv \underbrace{\frac{(1-p_2)K_0^* + p_2(C^L - K_1)}{2}}_{\text{Original debt contract}} + \underbrace{\big[1 - \frac{\tilde{P}}{2}\big]}_{\text{Share}} \times \underbrace{\big[-I(1+\theta_i) + K_1\big]}_{\text{Restructuring payoff}}. \quad (28)$$

The first term captures the fact that accepting prevents bankruptcy with probability $1 - p_2$, yielding the original unsecured debt payoff K_0^*, and leads to bankruptcy with probability p_2, which yields an impaired unsecured payoff equal to half of the residual value $C^L - K_1$ after paying new secured debt. The second term captures the payoff from funding the new secured debt, which is potentially split if the other investor accepts. If debt holder i rejects an offer, they get the following payoff:

$$R^{\text{Sec}}_{\text{reject}}(K_0^*, \tilde{P}, K_1, \theta_i) \equiv (1 - \tilde{P})\frac{C^L}{2} + \tilde{P}\left[\frac{(1-p_2)K_0^* + p_2(C^L - K_1)}{2}\right]. \quad (29)$$

The first term captures the bankruptcy payoff if no secured debt is issued. The second term captures the payoff from holding the previously issued unsecured debt given that the new secured debt avoids certain bankruptcy and takes priority.

As before, equity holders choose the offer K_1 to maximize their ex-post payoff, where the probability of restructuring acceptance depends on which investor pool receives the offer and which types of investors accept the offer. At $t = 0$, all lenders have rational expectations. If lenders anticipate that equity holders make an offer to the distressed debt investors holding the debt, they can price this in when they sell the debt:

$$D = (1-p_1)K_0^* + p_1\Bigg[(1-A(K_1^*))C^L \tag{30}$$

$$+ A(K_1^*)\left(\, p_2(C^L - K_1^*) + (1-p_2)K_0^* + \underbrace{K_1^* - I}_{\text{New secured debt}} \,\right) - I\mathbb{E}\Big[\frac{\sum_i \theta_i \mathbf{1}_{accept}(K_1^*, \theta_i)}{1 + \prod_i \mathbf{1}_{accept}(K_1^*, \theta_i)}\Big]\Bigg]. \tag{31}$$

Alternatively, if lenders anticipate that equity holders will offer the secured debt to outside investors (not the ones who buy the unsecured debt), then debt is priced as

$$D = (1-p_1)K_0^* + p_1\Bigg[(1-A(K_1^*))C^L + A(K_1^*)\left(\, p_2(C^L - K_1^*) + (1-p_2)K_0^* \,\right)\Bigg]. \tag{32}$$

In equilibrium, we will show that this implies that the first-best ex-ante firm value can only be achieved if equity holders find it optimal ex-post to issue secured debt to existing debt holders. Otherwise, the information rent that is usually transferred from equity holders to lenders is instead transferred to third party investors, reducing ex-ante firm value.

Proposition 5. *Suppose that equity holders issue unsecured debt at $t = 0$. Assume that condition (11) holds so that restructuring is efficient. Suppose that*

$$\mathbb{B}^{LMT} < (1-p_2)(C^H - C^L) < \mathbb{B}^{Sec}, \tag{33}$$

where

$$\mathbb{B}^{Sec} = \frac{Q+1-p_2}{Q+1-Qp_2}\mathbb{B} + \frac{Ip_2}{Q(Q+1-Qp_2)}\left[(1+\overline{\theta})(p_1Q+p_1-1)\frac{1-p_2}{1-p_1p_2} - (Q^2+\overline{\theta})\right]. \tag{34}$$

Then ex-ante firm value is strictly worse with unsecured debt than the value that is achieved by issuing secured debt with a LMT option.

Intuitively, LMT-exposed secured debt can do better than unsecured debt ex ante because (1) the coercive nature of a LMT makes it even cheaper than issuing secured debt with unencumbered collateral, incentivizing equity holders to ensure restructuring success, and (2) offering the information rent to existing debt holders maximizes ex ante firm value.

4.4 Optimal mechanism design and robustness

Our baseline model is intended to provide intuition in the simplest setting possible. Accordingly, it relies on many simplifying assumptions to streamline the exposition: there are only two distressed debt holders, the private type θ_i takes one of two values, both investors are allowed to inject liquidity even if one has a higher funding cost, and equity holders are restricted to make take-it-or-leave-it offers.

In this section, we show that our main result is robust to relaxing all of these assumptions. We consider a general setting with N distressed investors. Each investor has a type $\theta_i \in [0, \overline{\theta}]$ drawn independently from a cumulative distribution function F with probability density function f. The only restrictions we make on this distribution are that it has full support and satisfies a monotone likelihood ratio property: $F(x)/f(x)$ increases monotonically in x. This property is satisfied by many common distributions (e.g., uniform). Further, we allow equity holders to design an arbitrary optimal mechanism to raise liquidity. By the revelation principle, it is without loss of generality to focus on mechanisms that elicit the truthful revelation of each investor's type. Once equity holders incentivize investors to truthfully reveal their type θ, equity holders are free to raise liquidity from any arbitrary combination of investors, including from only the investor with the lowest funding cost.

We assume that restructuring is efficient in the following sense:

$$(1 - p_2)(C^H - C^L) > I(1 + \overline{\theta}). \tag{35}$$

Given this assumption, once equity holders incentivize investors to truthfully report their private cost θ_i, raising liquidity from the lowest cost investor always increases ex-post joint surplus. In spite of this, in equilibrium, equity holders optimally choose a mechanism that sometimes fails to raise liquidity. Intuitively, a mechanism that always raises liquidity is too "expensive" for privately-optimizing equity holders, because they must pay investors a great deal to truthfully reveal their private cost. Equity holders do not internalize that this cost of incentivizing the revelation of information is simply a transfer. Equity holders instead find it privately optimal to reduce costs by committing to fail if investor funding costs are too high, which reduces joint surplus. This is a core insight from the mechanism design literature, which was applied in the context of debt restructurings in Detragiache and Garella (1996). Differing from earlier work, we now study how LMTs interact with this inefficiency.

As in our baseline model, we compare two restructuring approaches. In a traditional restructuring, no debt holder can be made worse off by a mechanism. In particular, while all investors optimally choose to participate in the mechanism on the equilibrium path, we assume that an off-equilibrium path deviation to not participate in the mechanism would not harm an investor: the investor retains their right to collateral in bankruptcy and their right to the initially promised payment K_0^* if the firm avoids bankruptcy. In contrast, in a LMT, the firm can take away collateral rights from any investor who does not participate in the mechanism.[27]

[27]For tractability, we must assume that at most $N-1$ investors participate in the mechanism. Thus, if all investors choose to participate as they do in equilibrium, one is randomly excluded. If, off the equilibrium path, an investor refuses to participate, the other $N-1$ investors proceed. This assumption allows for a clean calculation of how a mechanism determines the off-equilibrium path payoff that results from refusal to participate. This assumption is analogous to assuming that one investor misses the announcement that a

We replicate the main insight of our baseline model.

Proposition 6. *Assume that (35) holds. Fix a time-0 debt payment K_0^*. At date 1, equity holders maximize their ex-post payoff by optimally designing a mechanism.*

1. *If equity holders design a "traditional restructuring" mechanism that cannot make an investor worse off for refusing to participate, the ex-post optimal mechanism raises liquidity if and only if*

$$(1-p_2)\underbrace{(C^H-K_0^*)}_{\text{Debt Overhang}} > I\min_i\left(1+\theta_i+\underbrace{\frac{F(\theta_i)}{f(\theta_i)}}_{\text{Incentive to Reveal Information}}\right), \tag{36}$$

2. *If equity holders design a "LMT" mechanism that can take collateral from an investor who does not participate, the ex-post optimal mechanism raises liquidity if and only if*

$$(1-p_2)\underbrace{(C^H-K_0^*)}_{\text{Debt Overhang}} > I\min_i\left(1+\theta_i+\frac{F(\theta_i)}{f(\theta_i)}\right)-\underbrace{\frac{N-1}{N}p_2C^L}_{\text{LMT Efficiency}}. \tag{37}$$

Proposition 6 formalizes the above intuition. Given equation (35), surplus is always maximized by restructuring. However, equation (36) shows that equity holders optimally choose a mechanism that can fail to restructure in equilibrium. The failure has two sources. First, the quantity on the left side is the private improvement $(1-p_2)(C^H-K_0^*)$ for equity holders from a successful restructuring, rather than the total improvement $(1-p_2)(C^H-C^L)$ in firm value. This is the debt overhang effect. Second, the quantity on the right side is the cost of compensating a lender for both their funding cost and an incentive to reveal their private information (an "information rent"). Even when $(1-p_2)(C^H-C^L) > I\min_i(1+\theta_i)$, so the social benefit is higher than the social cost, it could be that $(1-p_2)(C^H-C^L) < I\min_i(1+\theta_i+F(\theta_i)/f(\theta_i))$, where the right side includes the transfer that equity holders pay

LMT or restructuring is occurring.

to investors to reveal their private information. In this sense, equity holders optimally choose not to restructure when it would be too privately costly to induce information revelation.

We provide further details about this mechanism design setup and the proof of Proposition 6 in Appendix B.

5 Conclusion

Distressed firms have recently used aggressive tactics to raise liquidity, stripping collateral from existing secured lenders unless they inject new money. Critics of this "creditor-on-creditor violence" argue that this trend is harmful, eroding trust among corporate lenders. Proponents argue that these "LMTs" help firms raise liquidity and avoid bankruptcy. In line with this view, Buccola and Nini (2024) show that borrowers and lenders continue to agree to include clauses in loan contracts that intentionally enable dropdown LMTs.

We provide a formal model showing that (1) in the presence of information asymmetry, equity holders "underinvest" in debt renegotiation by offering low returns to investors and risking deal failure, because part of the benefit of avoiding bankruptcy accrues to debt holders, (2) LMTs solve this inefficiency because equity holders internalize more of the benefit of a successful deal when they can steal collateral from dissenting investors, and (3) as a result, firms create value ex ante by enabling LMTs in contracts.

While we do not model this scenario, it is possible that some liquidity injections destroy surplus: equity holders simply gamble for resurrection at the expense of debt holders. It is likely that in this scenario, LMTs destroy value by worsening equity holders' "overinvestment" in value-destroying opportunities. Likewise, LMTs might prevent bankruptcies that create value (Ayotte, 2015) because equity holders do not internalize the bankruptcy ben-

efits. To be clear, we do not believe that LMTs always create value; instead, we provide a positive explanation for why *some* firms enable LMTs in contracts.

Additionally, we do not believe that LMTs are the only solution to the debt negotiation inefficiency that we model. For example, a firm could issue unsecured debt ex ante to preserve collateral for raising liquidity in distress. We believe this is quite plausible. Nonetheless, when firms have no choice but to issue secured debt (e.g., they only have access to asset-based lenders or a recession limits credit availability), then our model shows how firms can create value by allowing for LMTs. Likewise, firms and borrowers often include revolving lines of credit in term-loan agreements, which are another way of ensuring that firms raise liquidity in distress. However, a deeply distressed and insolvent firm might not be able to access a credit line. For example, administrative agents for syndicated loans are required to issue a "stop funding notice" and close a revolving credit line if the borrower's financial conditions deteriorate.[28] Secured debt with a LMT option can thus be another useful tool for the contingency when a firm needs liquidity and is insolvent, making it ineligible to draw on a credit line.

Finally, the LMTs that we model are similar in some ways to the use of debtor-in-possession (DIP) financing in bankruptcy. Firms issue new secured DIP loans in bankruptcy that are senior to existing secured debt. Indeed, Ayotte and Skeel Jr (2013) argue that the ability to raise liquidity in bankruptcy through priming DIP loans can address renegotiation frictions quite similar to the ones that we study:

> We argue that two well-known problems that cause illiquidity—debt overhang and adverse selection—are also caused by multiple-creditor-coordination prob-

[28]See, for example, the case of Fontainebleau Las Vegas LLC, in which Fontainebleau exceed its projected costs and the term lenders closed the revolving line of credit: https://media.ca11.uscourts.gov/opinions/pub/files/201211815.pdf.

lems. As such, bankruptcy law is justified in solving these problems in addition to creditor-run problems.

A key difference between the LMTs we study and the DIP loans studied in Ayotte and Skeel Jr (2013) is that LMTs occur before a bankruptcy filing. As a result, LMTs have the potential to avoid deadweight losses that occur as soon as a firm files for bankruptcy. For example, Antill and Hunter (Forthcoming) show that deadweight losses due to lost customers can occur the moment a firm's bankruptcy filing becomes publicized. A DIP loan can only be issued once a firm is in bankruptcy. As a result, DIP loans cannot serve the same purpose of avoiding these deadweight losses. Thus, a firm with large potential indirect bankruptcy costs might enable LMTs in its contracts, while a firm that benefits from bankruptcy might simply achieve the same outcome with a DIP loan. In summary, we provide a novel positive explanation for the empirical fact that firms use LMTs and lenders enable them; we do not claim that LMTs are the sole solution to the frictions that we study.

References

Aghion, P., and P. Bolton. 1992. An incomplete contracts approach to financial contracting. *The review of economic Studies* 59:473–94.

Aghion, P., M. Dewatripont, and P. Rey. 1994. Renegotiation design with unverifiable information. *Econometrica: Journal of the Econometric Society* 257–82.

Antill, S. 2022. Do the right firms survive bankruptcy? *Journal of Financial Economics* 144:523–46.

———. 2024. Are bankruptcy professional fees excessively high? *The Review of Financial Studies* 37:3595–647.

Antill, S., and M. Hunter. Forthcoming. Consumer choice and corporate bankruptcy. *Journal of Finance* .

Ayotte, K. 2015. Leases and executory contracts in chapter 11. *Journal of Empirical Legal Studies* 12:637–63.

Ayotte, K., and A. B. Badawi. 2023. Loopholes in complex contracts. *Available at SSRN 4579276* .

Ayotte, K., and C. Scully. 2021. J. crew, nine west, and the complexities of financial distress. *Yale LJF* 131:363–.

Ayotte, K., and D. A. Skeel Jr. 2013. Bankruptcy law as a liquidity provider. *The University of Chicago Law Review* 1557–624.

Ayotte, K. M., and E. R. Morrison. 2009. Creditor control and conflict in chapter 11. *Journal of Legal Analysis* 1:511–51.

Badawi, A. B., V. S. Buccola, and G. Nini. 2024. Price discipline for non-price loan terms. *University of Chicago Coase-Sandor Institute for Law & Economics Research Paper* .

Bali, T. G., S. J. Brown, and M. O. Caglayan. 2012. Systematic risk and the cross section of hedge fund returns. *Journal of Financial Economics* 106:114–31.

Bannier, C. E. 2010. Is there a holdup benefit in heterogeneous multiple bank financing? *Journal of Institutional and Theoretical Economics (JITE)/Zeitschrift für die gesamte Staatswissenschaft* 641–61.

Benmelech, E., N. Kumar, and R. Rajan. 2022. The secured credit premium and the issuance of secured debt. *Journal of Financial Economics* 146:143–71.

Berglöf, E., and E.-L. Von Thadden. 1994. Short-term versus long-term interests: Capital structure with multiple investors. *The quarterly journal of economics* 109:1055–84.

Bernardo, A. E., and E. L. Talley. 1996. Investment policy and exit-exchange offers within financially distressed firms. *The Journal of Finance* 51:871–88.

Blickle, K., Q. Fleckenstein, S. Hillenbrand, and A. Saunders. 2020. The myth of the lead arranger's share. *FRB of New York Staff Report* .

Bolton, P., and X. Freixas. 2000. Equity, bonds, and bank debt: Capital structure and financial market equilibrium under asymmetric information. *Journal of Political Economy* 108:324–51.

Bolton, P., and D. S. Scharfstein. 1996. Optimal debt structure and the number of creditors. *Journal of Political Economy* 104:1–25.

Buccola, V. S. 2022. Efficacious answers to the non-pro rata workout. *U. Pa. L. Rev.* 171:1859–.

———. 2023. Sponsor control: A new paradigm for corporate reorganization. *U. Chi. L. Rev.* 90:1–.

Buccola, V. S., and M. Kahan. 2024. Getting to yes: The role of coercion in debt renegotiations. *University of Chicago Coase-Sandor Institute for Law & Economics Research Paper* .

Buccola, V. S., and G. Nini. 2024. The loan market response to dropdown and uptier transactions. *The Journal of Legal Studies* 53:489–526.

Bulow, J. I., and J. B. Shoven. 1978. The bankruptcy decision. *The Bell Journal of Economics* 437–56.

Carletti, E. 2004. The structure of bank relationships, endogenous monitoring, and loan rates. *Journal of Financial Intermediation* 13:58–86.

Carletti, E., V. Cerasi, and S. Daltung. 2007. Multiple-bank lending: Diversification and free-riding in monitoring. *Journal of Financial Intermediation* 16:425–51.

Credit Sights. 2025. Liability management transactions: Quarterly update through q1 2024. https://know.creditsights.com/liability-management-transactions-quarterly-update-through-q1-2024/.

Demiroglu, C., and C. James. 2015. Bank loans and troubled debt restructurings. *Journal of Financial Economics* 118:192–210.

Detragiache, E., P. Garella, and L. Guiso. 2000. Multiple versus single banking relationships: Theory and evidence. *The Journal of finance* 55:1133–61.

Detragiache, E., and P. G. Garella. 1996. Debt restructuring with multiple creditors and the role of exchange offers. *Journal of Financial Intermediation* 5:305–36.

Diamond, D. W., and Z. He. 2014. A theory of debt maturity: the long and short of debt overhang. *The Journal of Finance* 69:719–62.

Dick, D. L. 2021. Hostile restructurings. *Wash. L. Rev.* 96:1333–.

Donaldson, J. R., D. Gromb, and G. Piacentino. 2020. The paradox of pledgeability. *Journal of Financial Economics* 137:591–605.

———. 2025. Conflicting priorities: A theory of covenants and collateral. *The Journal of Finance* 80:1739–68.

Donaldson, J. R., E. R. Morrison, G. Piacentino, and X. Yu. 2020. Restructuring vs. bankruptcy. *Columbia Law and Economics Working Paper* .

Eliza Ronalds-Hannon and Davide Scigliuzzo. 2022. The Debt Deal That Shows How Ugly Things Are Getting for Lenders. https://www.bloomberg.com/news/articles/2022-10-05/kkr-s-envision-deal-shows-how-ugly-creditor-battles-are-getting.

Ellis, J., S. Margolis, and R. Yeh. 2023. Navigating creditor-on-creditor violence: Lessons from the revlon and serta cases. *Journal of Corporate Renewal* https://www.mololamken.com/assets/htmldocuments/Journal%20of%20Corporate%20Renewal_Navigating%20Creditor-On-Creditor%20Violence_November%202023.pdf.

Gertner, R., and D. Scharfstein. 1991. A theory of workouts and the effects of reorganization law. *The Journal of Finance* 46:1189–222.

Giammarino, R. M. 1989. The resolution of financial distress. *Review of Financial studies* 2:25–47.

Giannetti, M., and R. Meisenzahl. 2021. Ownership concentration and performance of deteriorating syndicated loans .

Global Restructuring Review. 2025. Liability management in finance: Points to consider for the Dutch debt market. https://globalrestructuringreview.com/review/europe-middle-east-and-africa-restructuring-review/2025/article/liability-management-in-finance-points-consider-the-dutch-debt-market.

Glode, V., and C. C. Opp. 2023. Private renegotiations and government interventions in credit chains. *The Review of Financial Studies* 36:4502–45.

Hackbarth, D., C. A. Hennessy, and H. E. Leland. 2007. Can the trade-off theory explain debt structure? *The Review of Financial Studies* 20:1389–428.

Hackbarth, D., and D. C. Mauer. 2012. Optimal priority structure, capital structure, and investment. *The Review of Financial Studies* 25:747–96.

Hart, O., and J. Moore. 1988. Incomplete contracts and renegotiation. *Econometrica* 755–85.

———. 1994. A theory of debt based on the inalienability of human capital. *The Quarterly Journal of Economics* 109:841–79.

Hege, U., and P. Mella-Barral. 2005. Repeated dilution of diffusely held debt. *The Journal of Business* 78:737–86.

Holland & Knight. 2025. A Tale of 2 Rulings: Serta, Mitel Cases Remind Why Contract Language Matters in Debt Documents. https://www.hklaw.com/en/insights/publications/2025/01/a-tale-of-2-rulings-serta-mitel-cases-remind-why-contract-language.

Hotchkiss, E., B. Iverson, and X. Zheng. 2024. Can small businesses survive chapter 11? *Available at SSRN* .

Hotchkiss, E. S., and R. M. Mooradian. 1997. Vulture investors and the market for control of distressed firms. *Journal of financial economics* 43:401–32.

Hubert, F., and D. Schäfer. 2002. Coordination failure with multiple-source lending: the cost of protection against a powerful lender. *Journal of Institutional and Theoretical Economics (JITE)/Zeitschrift für die gesamte Staatswissenschaft* 256–75.

Ivashina, V., and B. Vallee. 2025. Weak credit covenants. *Management Science* .

Jessica DiNapoli. 2017. J. crew clinches key lender support for debt deal. https://www.reuters.com/article/business/j-crew-clinches-key-lender-support-for-debt-deal-idUSKBN1972H2/.

Kahan, M., and B. Tuckman. 1993. Do bondholders lose from junk bond covenant changes? *Journal of Business* 499–516.

LawJustia. 2018. Eaton vance mgt. v wilmington sav. fund socy. https://law.justia.com/cases/new-york/other-courts/2018/2018-ny-slip-op-30727-u.html.

McKinley, A. 2024. Perfectly incomplete: Holdouts and efficiency-enhancing fiduciary duties. *Available at SSRN 5065068* .

Mella-Barral, P., and W. Perraudin. 1997. Strategic debt service. *The Journal of Finance* 52:531–56.

Melveny, O. 2022. Priming transactions update: Tpc group inc. https://www.omm.com/insights/alerts-publications/priming-transactions-update-tpc-group-inc/.

Mugford, K., and S. Gulick. 2022. Revlon: Surviving covid-19. Working Paper, Harvard Business School Case No. 9-221-084.

Nini, G., and D. C. Smith. 2024. Leveraged finance. In *Handbook of Corporate Finance*, 249–93. Edward Elgar Publishing.

Padilla, A. J., and M. Pagano. 1997. Endogenous communication among lenders and entrepreneurial incentives. *The review of financial studies* 10:205–36.

Quinn Emanuel. 2025. Liability Management Exercises: What They Are and What They Mean for Market Participants. https://www.quinnemanuel.com/the-firm/publications/lead-article-liability-management-exercises-what-they-are-and-what-they-mean-for-market-participants/.

Rajan, R. G. 1992. Insiders and outsiders: The choice between informed and arm's-length debt. *The Journal of finance* 47:1367–400.

Roe, M. J. 1987. The voting prohibition in bond workouts. *Yale LJ* 97:232–.

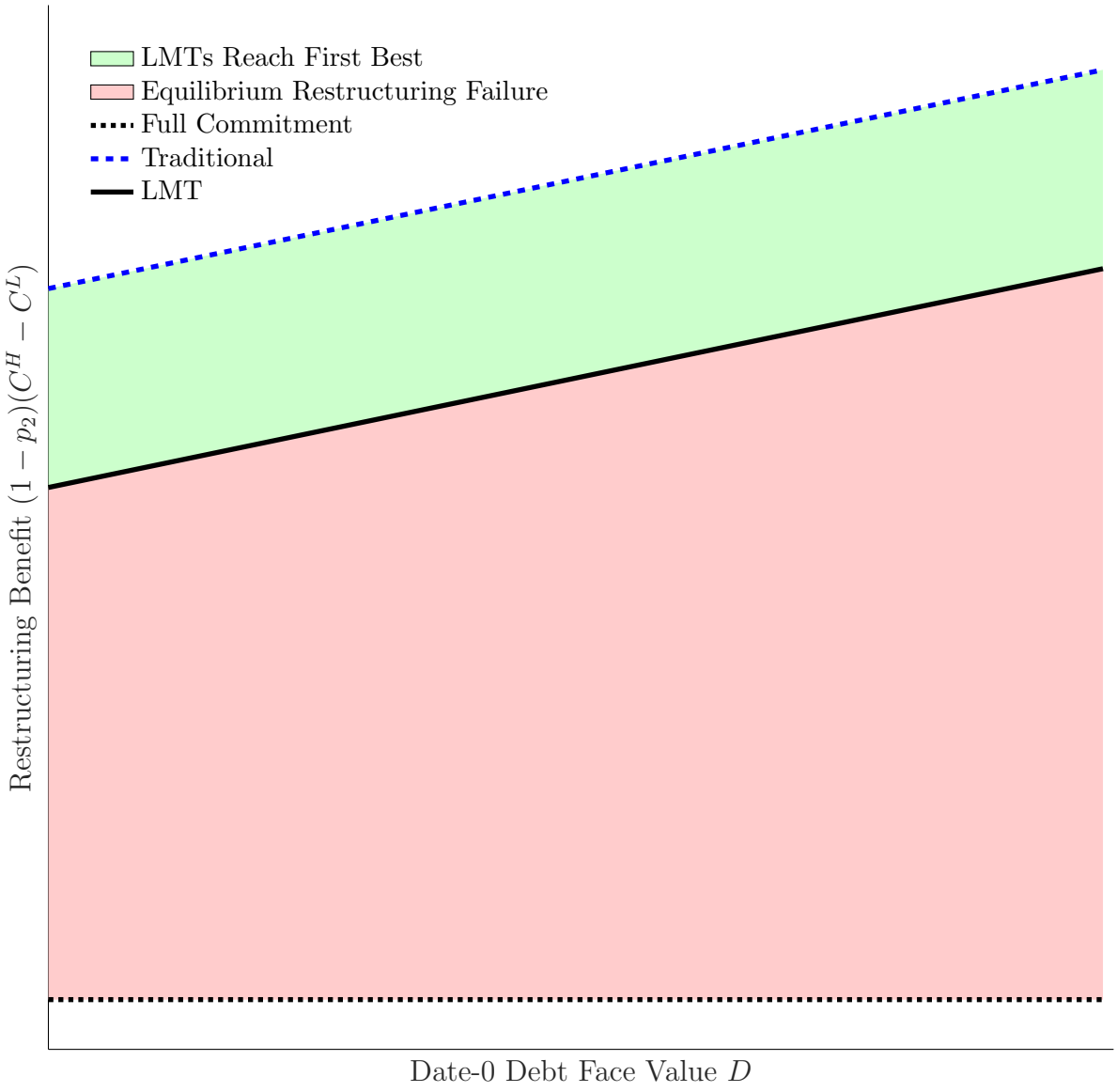
S&P Global. 2024a. Debt restructuring snapshot: Del monte foods inc. https://www.spglobal.com/ratings/en/research/articles/241008-debt-restructuring-snapshot-del-monte-foods-inc-101604765.

———. 2024b. Demystifying loan liability management transactions and their impact on first-lien lenders. https://www.capitaliq.spglobal.com.

Von Thadden, E.-L., E. Berglöf, and G. Roland. 2010. The design of corporate debt structure and bankruptcy. *The Review of Financial Studies* 23:2648–79.

White, M. J. 1980. Public policy toward bankruptcy: Me-first and other priority rules. *The Bell Journal of Economics* 550–64.

Figure 1: Ex-Ante Efficiency: Equilibrium vs Full Commitment



Appendix

A Proofs

A.1 Proof of Lemma 1

At $t = 0$, immediately after issuing debt, equity value is

$$(1 - p_1)(C^H - K_0^*) + p_1 A(K_1^*)(1 - p_2)(C^H - K_0^* - K_1^*). \tag{A.1}$$

Adding this to the value of debt (8) and cancelling terms, we arrive at (9).

A.2 Proof of Lemma 2

As discussed in the text, in any equilibrium, Lemma 1 implies that ex-ante firm value takes one of three values. First, if $A(K_0^*) = 0$, then $\mathbf{1}_{accept}(K_1^*, \theta_i) = 0$ almost surely and ex-ante firm value is

$$(1 - p_1)C^H + p_1 C^L. \tag{A.2}$$

Second, suppose K_1^* is such that $\mathbf{1}_{accept}(K_1^*, \theta_i) = 1$ for $\theta_i = 0$ but $\mathbf{1}_{accept}(K_1^*, \theta_i) = 0$ for $\theta_i = \overline{\theta}$. Then $\tilde{P}(K_1^*) = 1 - Q$, $A(K_1^*) = 1 - Q^2$, and the expected funding cost for participating lenders is

$$I\mathbb{E}\Big[\frac{\sum_i \theta_i \mathbf{1}_{accept}(K_1^*, \theta_i)}{1 + \prod_i \mathbf{1}_{accept}(K_1^*, \theta_i)}\Big] = I(1 - Q^2)0 = 0. \tag{A.3}$$

Using Lemma 1, ex-ante firm value for such an equilibrium is then

$$(1 - p_1)C^H + p_1 C^L + p_1(1 - Q^2)\Big[(1 - p_2)(C^H - C^L) - I\Big]. \tag{A.4}$$

Finally, suppose K_1^* is such that $\mathbf{1}_{accept}(K_1^*, \theta_i) = 1$ for any θ_i. Then $P(K_1^*) = A(K_1^*) = 1$, and the expected funding cost for participating lenders is

$$I\mathbb{E}\Big[\frac{\sum_i \theta_i \mathbf{1}_{accept}(K_1^*, \theta_i)}{1 + \prod_i \mathbf{1}_{accept}(K_1^*, \theta_i)}\Big] = I\left[Q^2\overline{\theta} + (1-Q)^2 0 + 2Q(1-Q)\frac{\overline{\theta}+0}{2}\right] = IQ\overline{\theta}. \tag{A.5}$$

From Lemma (1), ex-ante firm value is

$$(1-p_1)C^H + p_1 C^L + p_1\Big[(1-p_2)(C^H - C^L) - I(1+Q\overline{\theta})\Big]. \tag{A.6}$$

This value is higher than the value in (A.4) if and only if

$$\begin{aligned}
&(1-p_2)(C^H - C^L) - I(1+Q\overline{\theta}) > (1-Q^2)\Big[(1-p_2)(C^H - C^L) - I\Big] \\
&Q^2\big[(1-p_2)(C^H - C^L) - I\big] > IQ\overline{\theta} \\
&(1-p_2)(C^H - C^L) > I(1 + \frac{\overline{\theta}}{Q}).
\end{aligned}$$

Finally, note that if this condition holds, then $(1-p_2)(C^H - C^L) > I(1+\overline{\theta}/Q) > I$. Thus, if this holds, (A.6) is higher than (A.4) and (A.4) is higher than (A.2), completing the proof.

A.3 Proof of Proposition 1

First, note that the insolvency assumption 1 implies that $K_0^* > D$ in any equilibrium: from (8),

$$D = (1-p_1)K_0^* + p_1\Bigg[C^L + A(K_1^*)\ \big(\ (1-p_2)(K_0^* + K_1^* - C^L) - I\ \big)\ - I\mathbb{E}\big[\frac{\sum_i \theta_i \mathbf{1}_{accept}(K_1^*,\theta_i)}{1+\prod_i \mathbf{1}_{accept}(K_1^*,\theta_i)}\big]\Bigg] \tag{A.7}$$

$$\leq (1-p_1)K_0^* + p_1\Bigg[C^L + A(K_1^*)\ \big(\ (1-p_2)(C^H - C^L) - I\ \big)\Bigg] \tag{A.8}$$

$$\leq (1-p_1)K_0^* + p_1\Bigg[C^L + \big(\ (1-p_2)(C^H - C^L) - I\ \big)\Bigg] \tag{A.9}$$

$$< (1-p_1)K_0^* + p_1 D, \tag{A.10}$$

which leads to contradiction unless $K_0^* > D$.[29] Combined with the assumption that $C^L < D$, we have $C^L < K_0^*$ in any equilibrium.

Fix an equilibrium in which investors and lenders anticipate that $A(K_1^*) = \tilde{P}(K_1^*) = 1$. Then (5) must hold for all θ_i, including $\theta_i = \overline{\theta}$, so

$$\frac{(1-p_2)K_0^* + p_2 C^L}{2} + \frac{1}{2}\big[-I(1+\overline{\theta}) + (1-p_2)K_1^*\big] \geq p_2\frac{C^L}{2} + \frac{(1-p_2)K_0^*}{2} \tag{A.11}$$

$$\iff (1-p_2)K_1^* \geq I(1+\overline{\theta}). \tag{A.12}$$

If this did not hold with equality, equity holders could reduce K_1^* without changing $A(K_1^*) = 1$, improving their objective (6). Thus, in any equilibrium in which $A(K_1^*) = 1$, this must hold with equality, so

$$K_1^* = \frac{I(1+\overline{\theta})}{1-p_2}. \tag{A.13}$$

Suppose lenders anticipate this at $t = 0$. Since $A(K_1^*) = 1$, all lenders participate in restruc-

[29] Note that the second inequality assumes $(1-p_2)(C^H - C^L) \geq I$, but if that were not true, then the second inequality could be replaced with $\leq (1-p_1)K_0^* + p_1 C^L$ and then the result would follow from the assumption that $C^L < D$.

turings, so the expected investor funding cost is

$$I\mathbb{E}\big[\frac{\sum_i \theta_i \mathbf{1}_{accept}(K_1^*, \theta_i)}{1 + \prod_i \mathbf{1}_{accept}(K_1^*, \theta_i)}\big] = I\big[Q^2\overline{\theta} + (1-Q)^2 0 + Q(1-Q)(\overline{\theta} + 0)\big] = IQ\overline{\theta}. \tag{A.14}$$

Let $S \equiv IQ\overline{\theta}$ denote this expected funding cost. Then (8) implies that

$$D = (1-p_1)K_0^* + p_1\Big[C^L + \big(\,(1-p_2)(K_0^* + K_1^* - C^L) - I - S\,\big)\Big] \tag{A.15}$$

$$= (1 - p_1 p_2)K_0^* + p_1\Big[p_2 C^L + I\overline{\theta} - S\Big]. \tag{A.16}$$

Thus, plugging in $S = IQ\overline{\theta}$, in any equilibrium in which lenders expect $A(K_1^*) = 1$,

$$K_0^* = \frac{D - p_1\Big[p_2 C^L + I\overline{\theta}(1-Q)\Big]}{1 - p_1 p_2}. \tag{A.17}$$

Finally, we need to verify that $K_1^* = \frac{I(1+\overline{\theta})}{1-p_2}$ solves equity's date one problem (6). Consider the alternative. Equity could set a low K_1^* ensuring restructuring fails, which yields a value of zero for the objective. Alternatively, equity could set the lowest K_1^* that ensures a type 0 investor accepts. To calculate this, note that if $\mathbf{1}_{accept}(K_1^*, \theta_i) = 0$ when $\theta_i = \overline{\theta}$ and $\mathbf{1}_{accept}(K_1^*, \theta_i) = 1$ when $\theta_i = 0$, then $\tilde{P}(K_1^*) = 1 - Q$. Off the equilibrium path, investors would accept such an offer if (5) holds with this $\tilde{P}(K_1^*)$:

$$\frac{(1-p_2)K_0^* + p_2 C^L}{2} + \big[1 - \frac{\tilde{P}}{2}\big] \times \big[-I(1+\theta_i) + (1-p_2)K_1\big] \geq [1 - \tilde{P} + \tilde{P}p_2]\frac{C^L}{2} + \tilde{P}\frac{(1-p_2)K_0^*}{2} \tag{A.18}$$

$$\frac{(1-p_2)K_0^* + p_2 C^L}{2} + \frac{1+Q}{2} \times \big[-I(1+\theta_i) + (1-p_2)K_1\big] \geq [Q + (1-Q)p_2]\frac{C^L}{2} + \frac{(1-Q)(1-p_2)K_0^*}{2} \tag{A.19}$$

$$Q\frac{(1-p_2)K_0^* + p_2 C^L}{2} + \frac{1+Q}{2} \times \big[-I(1+\theta_i) + (1-p_2)K_1\big] \geq \frac{QC^L}{2}. \tag{A.20}$$

Plugging in $\theta_i = 0$, dividing by $(1+Q)(1-p_2)/2$, and rearranging, a type 0 investor accepts if and only if

$$K_1 \geq \frac{I}{1-p_2} + \frac{2}{(1+Q)(1-p_2)}\left[\frac{QC^L}{2} - Q\frac{(1-p_2)K_0^* + p_2 C^L}{2}\right]. \tag{A.21}$$

As before, if equity holders deviate to set $A(K_1) = 1-Q$, then they optimally choose the lowest K_1 that achieves this. Replacing the inequality with equality and simplifying,

$$K_1 = \frac{I}{1-p_2} - \frac{Q}{1+Q}(K_0^* - C^L). \tag{A.22}$$

Finally, we compare the value of the date one equity objective under these two strategies. Dividing (6) by $1-p_2$, it is optimal to follow the equilibrium strategy K_1^* rather than deviating to the above if and only if

$$C^H - K_0^* - K_1^* \geq (1-Q^2)\big[C^H - K_0^* - \left(\frac{I}{1-p_2} - \frac{Q}{1+Q}(K_0^* - C^L) \right)\big] \tag{A.23}$$

$$C^H - K_0^* - K_1^* \geq (1-Q^2)\big[C^H - \frac{K_0^*}{1+Q} - \left(\frac{I}{1-p_2} + \frac{QC^L}{1+Q} \right)\big] \tag{A.24}$$

$$C^H - K_0^* - K_1^* + (1-Q)K_0^* \geq (1-Q^2)\big[C^H - \frac{I}{1-p_2}\big] - Q(1-Q)C^L \tag{A.25}$$

$$Q^2(C^H - C^L) \geq K_1^* - (1-Q^2)\frac{I}{1-p_2} + Q(K_0^* - C^L) \tag{A.26}$$

$$Q^2(C^H - C^L) \geq \frac{I(1+\overline{\theta})}{1-p_2} - (1-Q^2)\frac{I}{1-p_2} + Q(K_0^* - C^L) \tag{A.27}$$

$$(1-p_2)(C^H - C^L) \geq \frac{1}{Q^2}\left[I \left(Q^2 + \overline{\theta} \right) \right] + \frac{1-p_2}{Q}(K_0^* - C^L). \tag{A.28}$$

Define

$$\mathbb{B} \equiv I \left(1 + \frac{\overline{\theta}}{Q^2} \right) + \frac{1-p_2}{Q}(K_0^* - C^L). \tag{A.29}$$

Then we have shown that $A(K_1^*) = 1$ is an equilibrium if and only if $(1-p_2)(C^H - C^L) \geq \mathbb{B}$. Further, by the argument at the start of this proof, $K_0^* > C^L$, and thus

$$\mathbb{B} \geq I \left(1 + \frac{\overline{\theta}}{Q^2} \right) \geq I \left(1 + \frac{\overline{\theta}}{Q} \right) = \mathbb{Z}. \tag{A.30}$$

Finally, we calculate $\mathbb{B}$ in terms of exogenous objects. Plugging in the expression above for K_0^*,

$$\mathbb{B} = I \left(1 + \frac{\overline{\theta}}{Q^2} \right) + \frac{1-p_2}{Q}(K_0^* - C^L) \tag{A.31}$$

$$= I \left(1 + \frac{\overline{\theta}}{Q^2} \right) + \frac{1-p_2}{Q}\left(\frac{D - p_1\left[p_2 C^L + I\overline{\theta}(1-Q) \right]}{1-p_1 p_2} - C^L \right). \tag{A.32}$$

Note that

$$\frac{D - p_1 p_2 C^L}{1 - p_1 p_2} - C^L = \frac{D - C^L}{1 - p_1 p_2}. \tag{A.33}$$

Thus,

$$\mathbb{B} = I\left(1 + \frac{\overline{\theta}}{Q^2}\right) + \frac{1 - p_2}{Q}\frac{D - C^L - p_1 I\overline{\theta}(1 - Q)}{1 - p_1 p_2}. \tag{A.34}$$

A.4 Proof of Proposition 2

By (17), investors accept an offer K_1 if and only if

$$\underbrace{\frac{(1-p_2)K_0^*}{2}}_{\text{Original debt contract}} + \underbrace{\left[1 - \frac{\tilde{P}}{2}\right]}_{\text{Share}} \times \underbrace{\left[p_2 C^L - I(1+\theta_i) + (1-p_2)K_1\right]}_{\text{Restructuring payoff}} \geq \underbrace{\left[1 - \tilde{P}\right]\frac{C^L}{2}}_{\text{Bankruptcy payoff}} + \underbrace{\tilde{P}\frac{(1-p_2)K_0^*}{2}}_{\text{Original debt}} \tag{A.35}$$

We follow the same steps as in the previous proof. Fix an equilibrium in which $A(K_1^*) = 1$. Then this becomes

$$\frac{(1-p_2)K_0^*}{2} + \frac{1}{2}\left[p_2 C^L - I(1+\theta_i) + (1-p_2)K_1\right] \geq \frac{(1-p_2)K_0^*}{2} \tag{A.36}$$

$$K_1 \geq \frac{I(1+\theta_i) - p_2 C^L}{1 - p_2}. \tag{A.37}$$

This must hold with equality at $\theta_i = \overline{\theta}$ or else it violates optimality for equity, so

$$K_1^* = \frac{I(1+\overline{\theta}) - p_2 C^L}{1 - p_2}. \tag{A.38}$$

Suppose lenders anticipate this at $t = 0$. Since $A(K_1^*) = 1$, all lenders participate in restruc-

turings, so the expected investor funding cost is

$$I\mathbb{E}\big[\frac{\sum_i \theta_i \mathbf{1}_{accept}(K_1^*,\theta_i)}{1+\prod_i \mathbf{1}_{accept}(K_1^*,\theta_i)}\big] = I\big[Q^2\overline{\theta} + (1-Q)^2 0 + Q(1-Q)(\overline{\theta}+0)\big] = IQ\overline{\theta} = S. \tag{A.39}$$

Then (8) and (A.38) imply that

$$D = (1-p_1)K_0^* + p_1\Big[C^L + \big(\,(1-p_2)(K_0^*+K_1^*-C^L) - I - S\,\big)\Big] \tag{A.40}$$

$$= (1-p_1p_2)K_0^* + p_1\Big[I\overline{\theta} - S\Big]. \tag{A.41}$$

Thus, in any equilibrium in which lenders expect $A(K_1^*)=1$,

$$K_0^* = \frac{D - p_1 I\overline{\theta}(1-Q)}{1-p_1p_2}. \tag{A.42}$$

This is higher than before.

Finally, we need to verify that $K_1^* = \frac{I(1+\overline{\theta})-p_2C^L}{1-p_2}$ solves equity's date one problem (6). Consider the alternative. Equity could set a low K_1^* ensuring restructuring fails, which yields a value of zero for the objective. Alternatively, equity could set the lowest K_1^* that ensures a type 0 investor accepts. To calculate this, note that if $\mathbf{1}_{accept}(K_1^*,\theta_i)=0$ when $\theta_i=\overline{\theta}$ and $\mathbf{1}_{accept}(K_1^*,\theta_i)=1$ when $\theta_i=0$, then $\tilde{P}(K_1^*)=1-Q$. Off the equilibrium path, investors would accept such an offer if (17) holds with this $\tilde{P}(K_1^*)$:

$$\frac{(1-p_2)K_0^*}{2}+\big[1-\frac{\tilde{P}}{2}\big]\times\big[p_2C^L-I(1+\theta_i)+(1-p_2)K_1\big]\geq[1-\tilde{P}]\frac{C^L}{2}+\tilde{P}\frac{(1-p_2)K_0^*}{2} \tag{A.43}$$

$$\frac{(1-p_2)K_0^*}{2}+\frac{1+Q}{2}\times\big[p_2C^L-I(1+\theta_i)+(1-p_2)K_1\big]\geq Q\frac{C^L}{2}+\frac{(1-Q)(1-p_2)K_0^*}{2} \tag{A.44}$$

$$\frac{Q(1-p_2)K_0^*}{2}+\frac{1+Q}{2}\times\big[-I(1+\theta_i)+(1-p_2)K_1\big]\geq\frac{C^L}{2}\big[Q(1-p_2)-p_2\big]. \tag{A.45}$$

Plugging in $\theta_i=0$, dividing by $(1+Q)(1-p_2)/2$, and rearranging, a type 0 investor accepts if and only if

$$K_1\geq\frac{I}{1-p_2}+\frac{2}{(1-p_2)(1+Q)}\left[\frac{C^L}{2}\big[Q(1-p_2)-p_2\big]-\frac{Q(1-p_2)K_0^*}{2}\right] \tag{A.46}$$

$$=\frac{I}{1-p_2}+\frac{1}{1+Q}\left[C^L\big[Q-\frac{p_2}{1-p_2}\big]-K_0^*Q\right] \tag{A.47}$$

$$=\frac{I}{1-p_2}+\frac{Q}{1+Q}(C^L-K_0^*)-\frac{p_2C^L}{(1+Q)(1-p_2)}. \tag{A.48}$$

Finally, we compare the value of the date one equity objective under these two strategies. Dividing (6) by $1-p_2$, it is optimal to follow the equilibrium strategy K_1^* rather than deviating to the above if and only if

$$C^H-K_0^*-K_1^*\geq(1-Q^2)\big[C^H-K_0^*-\left(\frac{I}{1-p_2}-\frac{Q}{1+Q}(K_0^*-C^L)-\frac{p_2C^L}{(1+Q)(1-p_2)}.\right)\big] \tag{A.49}$$

$$C^H-K_0^*-K_1^*\geq(1-Q^2)\big[C^H-\frac{K_0^*}{1+Q}-\left(\frac{I}{1-p_2}+\frac{QC^L}{1+Q}-\frac{p_2C^L}{(1+Q)(1-p_2)}.\right)\big] \tag{A.50}$$

$$C^H-K_0^*-K_1^*+(1-Q)K_0^*\geq(1-Q^2)\big[C^H-\frac{I}{1-p_2}\big]-Q(1-Q)C^L+\frac{p_2C^L(1-Q)}{(1-p_2)}. \tag{A.51}$$

$$Q^2(C^H-C^L)\geq K_1^*-(1-Q^2)\frac{I}{1-p_2}+Q(K_0^*-C^L)+\frac{p_2C^L(1-Q)}{(1-p_2)}. \tag{A.52}$$

Finally, multiplying both sides of (A.52) by $(1-p_2)/Q^2$, we have

$$(1-p_2)(C^H - C^L) \geq \frac{1-p_2}{Q^2}\left[K_1^* - (1-Q^2)\frac{I}{1-p_2} + Q(K_0^* - C^L) + \frac{p_2 C^L(1-Q)}{(1-p_2)}\right]. \tag{A.53}$$

The right side is

$$\mathbb{B}^{LMT} \equiv \frac{1-p_2}{Q^2}\left[K_1^* - (1-Q^2)\frac{I}{1-p_2} + Q(K_0^* - C^L) + \frac{p_2 C^L(1-Q)}{(1-p_2)}\right] \tag{A.54}$$

$$= \frac{I(1+\overline{\theta}) - p_2 C^L}{Q^2} - \frac{1-Q^2}{Q^2} I + \frac{1-p_2}{Q}(K_0^* - C^L) + \frac{p_2 C^L(1-Q)}{Q^2} \tag{A.55}$$

$$= I\left(1 + \frac{\overline{\theta}}{Q^2}\right) + \frac{1-p_2}{Q} K_0^* - \frac{C^L}{Q} \tag{A.56}$$

$$= I\left(1 + \frac{\overline{\theta}}{Q^2}\right) + \frac{1-p_2}{Q(1-p_1 p_2)}\left[D - p_1 I\overline{\theta}(1-Q)\right] - \frac{C^L}{Q}. \tag{A.57}$$

Comparing this to

$$\mathbb{B} = I\left(1 + \frac{\overline{\theta}}{Q^2}\right) + \frac{1-p_2}{Q}\frac{D - C^L - p_1 I\overline{\theta}(1-Q)}{1-p_1 p_2}. \tag{A.58}$$

we see that

$$\mathbb{B}^{LMT} = \mathbb{B} - \frac{C^L}{Q}\left[1 - \frac{1-p_2}{1-p_1 p_2}\right] < \mathbb{B}. \tag{A.59}$$

To prove the final part, take the listed assumptions. Conjecture lenders expect a LMT that ensures restructuring, so by the above,

$$K_0^* = \frac{D - p_1 I(1-Q)\overline{\theta}}{1-p_1 p_2}. \tag{A.60}$$

Also, the above conditions are sufficient to ensure that equity holders prefer a LMT that ensure restructuring to a LMT that risks restructuring failure ($\overline{\theta}$ rejects). Next, we check if equity holders

prefer a traditional restructuring that ensures restructuring. The derivation of (A.13) did not depend on K_0^*, so equity holders would set

$$K_1 = \frac{I(1+\overline{\theta})}{1-p_2} \tag{A.61}$$

and it would be accepted with probability one. This is a higher payment than K_1^* above, so this is a suboptimal deviation. Thus, equity holders prefer a LMT that ensures restructuring to a traditional restructuring that is guaranteed to succeed, regardless of the value of K_0^*. Finally we consider whether equity holders would prefer to deviate to a traditional restructuring that risks failure when $C_1 = C_2 = \overline{\theta}$. From the proof of Proposition 1, this strategy entails setting

$$K_1 = \frac{I}{1-p_2} - \frac{Q}{1+Q}(K_0^* - C^L). \tag{A.62}$$

However, by the above analysis, equity holders can achieve the same restructuring probability $(1-Q^2)$ with an LMT by setting

$$K_1 = \frac{I}{1-p_2} + \frac{Q}{1+Q}(C^L - K_0^*) - \frac{p_2 C^L}{(1+Q)(1-p_2)}. \tag{A.63}$$

Thus, if equity holders were to deviate to a strategy with restructuring probability $1-Q^2$, they would rather deviate to the LMT. Since $(1-p_2)(C^H - C^L) > \mathbb{B}^{LMT}$, this is not a profitable deviation, completing the proof.

A.5 Proof of Proposition 3

In this new setup, we continue to assume the same date-0 debt pricing condition: exclusive LMTs simply shift the potential acceptance probability and the expected funding costs of participating lenders. Thus, Lemma 1 and Lemma 2 continue to hold. We begin by using these lemmas to characterize the potential ex-ante firm values that could arise from different ex-post outcomes.

First, if the ex-post outcome is that restructuring always fails, ex-ante firm value is

$$(1-p_1)C^H + p_1 C^L. \tag{A.64}$$

Second, if the ex-post outcome is that (1) equity holders forgo an exclusive offer and (2) only low-cost investors accept offers, then the ex-ante firm value is

$$(1-p_1)C^H + p_1(Q^2 C^L + (1-Q^2)(p_2 C^L + (1-p_2)C^H - I)). \tag{A.65}$$

Third, if the ex-post outcome is that (1) equity holders forgo an exclusive offer and (2) both low-cost and high-cost investors accept offers, then the ex-ante firm value is

$$(1-p_1)C^H + p_1 \left((1-p_2)C^H + p_2 C^L - I - I\left[(1-Q)^2 0 + Q^2\overline{\theta}_2 + 2Q(1-Q)\overline{\theta}_2/2\right] \right), \tag{A.66}$$

where $\overline{\theta}_2$ appears in this expression since there are always two investors funding the deal. Simplifying, this is

$$(1-p_1)C^H + p_1 \left(p_2 C^L + (1-p_2)C^H - I\left[1 + Q\overline{\theta}_2\right] \right). \tag{A.67}$$

Fourth, if the ex-post outcome is that (1) equity holders make an exclusive offer and (2) only a low-cost investor accepts, then ex-ante firm value is:

$$(1-p_1)C^H + p_1(QC^L + (1-Q)(p_2 C^L + (1-p_2)C^H - I)). \tag{A.68}$$

Finally, if the ex-post outcome is that (1) equity holders make an exclusive offer and (2) any type of investor accepts, then ex-ante firm value is:

$$(1-p_1)C^H + p_1(p_2C^L + (1-p_2)C^H - I(1+Q\overline{\theta}_1)). \tag{A.69}$$

Given the assumptions of the proposition, Lemma 2 implies that the third ex-post outcome delivers the highest ex-ante firm value of the first three options. The fourth option is strictly worse than the second because $Q > Q^2$ and condition (11) implies that $C^L < p_2C^L + (1-p_2)C^H - I$. The fifth option is strictly worse than the third since $\overline{\theta}_1 > \overline{\theta}_2$. Thus, any contract that delivers the third ex-post outcome is optimal ex-ante.

Under the conditions of Proposition 2, the following contract delivers the third outcome ex-post: (1) allow for nonexclusive LMTs and (2) ban exclusive LMTs. Thus, this contract is ex-ante weakly optimal for any $\overline{\theta}_1 > \overline{\theta}_2$, which proves the first part of Proposition 3.

It remains to show that the contract is strictly optimal for low values of $\overline{\theta}_1 - \overline{\theta}_2$. To show this, we prove that a contract enabling exclusive LMTs cannot support an equilibrium featuring the third ex-post outcome described above. Since the third outcome is strictly the best outcome ex-ante under condition (11), equity holders thus strictly benefit from banning exclusive LMTs so that the third outcome can be achieved (Proposition 2).

To show that a contract enabling exclusive LMTs cannot support the third ex-post outcome, we proceed in a proof by contradiction. Suppose that it could. By definition of the third outcome, lenders at $t = 0$ expect equity holders to forgo an exclusive LMT and they expect any investor type will accept the offer. Since we have assumed $(1-p_2)(C^H - C^L) < \mathbb{B}$, it cannot be that lenders at $t = 0$ expect a traditional restructuring: if debt were priced accordingly, Proposition 1 implies that equity holders would deviate to a strategy that implements the second outcome described above. Thus, lenders must expect a nonexclusive LMT with $A(K_1^*) = 1$. By Proposition 2, they expect

$$K_1^* = \frac{I(1+\overline{\theta}_2) - p_2C^L}{1-p_2}, \tag{A.70}$$

and they set a $t = 0$ price of

$$K_0^* = \frac{D - p_1 I\overline{\theta}_2(1-Q)}{1-p_1p_2}. \tag{A.71}$$

However, we have assumed that exclusive LMTs are now an available deviation ex-post for equity holders. If equity holders make an exclusive offer K_1, it is accepted by a high cost investor if

$$\frac{(1-p_2)K_0^*}{2} + \left[p_2C^L - I(1+\overline{\theta}_1) + (1-p_2)K_1\right] \geq \frac{C^L}{2} \tag{A.72}$$

$$K_1 \geq \frac{I(1+\overline{\theta}_1)}{1-p_2} + \frac{C^L(1-2p_2)}{2(1-p_2)} - \frac{K_0^*}{2}. \tag{A.73}$$

Thus, equity holders can deviate to offer the exclusive LMT and ensure a successful restructuring by offering a price K_1 determined by replacing the above inequality with equality. This is a profitable deviation ex post if

$$(C^H - K_0^* - K_1^{Exc}) \geq (C^H - K_0^* - K_1^*) \tag{A.74}$$

$$\iff K_1^* \geq K_1^{Exc} \tag{A.75}$$

$$\iff \frac{I(1+\overline{\theta}_2) - p_2C^L}{1-p_2} \geq \frac{I(1+\overline{\theta}_1)}{1-p_2} + \frac{C^L(1-2p_2)}{2(1-p_2)} - \frac{K_0^*}{2}. \tag{A.76}$$

Multiplying by $1-p_2$ and adding $p_2C^L - I$ to both sides, this holds if and only if

$$I\overline{\theta}_2 \geq I\overline{\theta}_1 + \frac{C^L}{2} - \frac{(1-p_2)K_0^*}{2} \tag{A.77}$$

$$\iff \frac{(1-p_2)K_0^* - C^L}{2} \geq I(\overline{\theta}_1 - \overline{\theta}_2). \tag{A.78}$$

Plugging in K_0^* from above, we arrive at the proposition statement.

A.6 Proof of Proposition 4

The first point follows almost immediately from the proof of Proposition 1. Under the stated conditions, there exists an equilibrium in which restructurings always succeed, equity holders offer existing debt holders

$$K_1^* = \frac{I(1+\overline{\theta})}{1-p_2}, \tag{A.79}$$

and at date one they prefer this to a deviation that elicits approval only from type 0 debt holders:

$$K_1 = \frac{I}{1-p_2} - \frac{Q}{1+Q}(K_0^* - C^L). \tag{A.80}$$

As discussed in the text, if equity holders instead approach outside investors, they can ensure success by offering

$$K_1 = \frac{I(1+\overline{\theta})}{1-p_2}, \tag{A.81}$$

and they can ensure approval only from type 0 lenders by offering

$$K_1 = \frac{I}{1-p_2}. \tag{A.82}$$

Once date 1 is reached, Proposition 1 implies that equity holders prefer offering debtholders (A.79) to offering debtholders (A.80). Offering outside investors (A.81) yields the same equity payoff and restructuring probability success as offering debt holders (A.79), because the two expressions are identical. Thus, equity holders are indifferent between these, so it is an equilibrium for them to make the offer to debt holders. Further, equity holders achieve the same restructuring probability by offering debt holders (A.80) or offering outside investors (A.82). It is clear that the expression

in (A.82) is higher, so it is costlier for equity, so they always prefer offering debt holders (A.80). However, by Proposition 1, this is not a profitable deviation, so (A.82) is also not a profitable deviation. This proves the first part of Proposition 4.

Now, take the assumptions from part 2 of Proposition 4. We proceed in a proof by contradiction. Suppose there exists an equilibrium with $A(K_1^*) = 1$. By Proposition 1, it cannot be that date-0 lenders expect equity holders to make an offer to debt holders. Since $A(K_1^*) = 1$, date-0 lenders must thus expect equity holders to make the offer (A.81) to outside investors, guaranteeing acceptance. Since the expression in (A.81) is the same as in (A.79), the date-0 debt price must be the same as if lenders expected an offer (A.79) to existing debt holders. Given this debt price, the proof of Proposition 1 shows that equity holders would prefer at date-1 to offer (A.80) to existing debt holders, rather than offering (A.79) to existing debt holders. But offering (A.79) to debt holders yields the same date-1 equity objective as the conjectured equilibrium, since the expression is the same as in (A.81). Thus, offering (A.80) to existing debt holders is a profitable deviation that risks restructuring failure, yielding a contradiction.

By the same argument, in any equilibrium with $A(K_1^*) < 1$, it must be that only type 0 investors accept offers. Since (A.82) is higher than (A.80) for any K_0^*, it could never be an equilibrium to offer (A.82) to external investors, since equity holders would deviate and offer (A.80) to debt holders to get the same restructuring probability success.

A.7 Proof of Lemma 4

For Proposition 2 to fail, there must exist a profitable deviation from an equilibrium with LMTs to make an offer to outside investors. By the arguments used in the proof of Proposition 4, any deviation to make an offer to outside investors is worse than an analogous deviation to make a traditional restructuring offer to existing debt holders. This is true for any K_0^*. By Proposition 2, there are no profitable deviations to make traditional restructuring offers to existing debt holders,

so there must be no profitable deviations to make offers to external investors.

A.8 Proof of Proposition 5

First, consider a subgame in which the debt price is K_0^* and equity holders offer K_1 to debt holders. Suppose $\tilde{P} = 1$. Comparing the accept and reject payoffs from the text and subtracting terms that appear on both sides, the accept payoff is higher if and only if

$$\frac{1}{2}\Big[- I(1+\theta_i) + K_1\Big] \geq 0. \tag{A.83}$$

Thus, if equity holders wish to achieve $\tilde{P} = 1$ with an offer to debt holders, they optimally offer $K_1 = I(1+\overline{\theta})$ and all investors accept. As described in the text, this is the same as the lowest offer that achieves $\tilde{P} = 1$ with outside investors. Next, suppose that $\tilde{P} = 1 - Q$. Comparing the accept and reject payoffs from the text, a debt holder accepts an offer K_1 if and only if

$$Q\frac{(1-p_2)K_0^* + p_2(C^L - K_1)}{2} + \frac{1+Q}{2}\Big[- I(1+\theta_i) + K_1\Big] \geq Q\frac{C^L}{2}. \tag{A.84}$$

Rearranging and plugging in $\theta_i = 0$,

$$K_1[1 + Q(1-p_2)] \geq QC^L + (1+Q)I - Q((1-p_2)K_0^* + p_2C^L) \tag{A.85}$$

$$K_1 \geq \frac{1}{1+Q(1-p_2)}\big[Q(1-p_2)(C^L - K_0^*) + (1+Q)I\big]. \tag{A.86}$$

Adding and subtracting Qp_2I in the brackets and setting both sides equal, we see that a type 0 investor is indifferent between accepting and rejecting if

$$K_1^{Alt} = I + \frac{1}{1+Q(1-p_2)}\big[Q(1-p_2)(C^L - K_0^*) + p_2QI\big]. \tag{A.87}$$

This is the lowest equity offer that achieves $\tilde{P} = 1 - Q$ with debt holders.

Now, we turn back to $t = 0$. As before, ex-ante equity value is

$$(1 - p_1)(C^H - K_0^*) + p_1 A(K_1^*)(1 - p_2)(C^H - K_0^* - K_1^*). \tag{A.88}$$

Recall that expected investor funding costs are either 0 if only low-cost investors accept or the following if all investors accept:

$$I\mathbb{E}\big[\frac{\sum_i \theta_i \mathbf{1}_{accept}(K_1^*, \theta_i)}{1 + \prod_i \mathbf{1}_{accept}(K_1^*, \theta_i)}\big] = IQ\overline{\theta}. \tag{A.89}$$

We now calculate ex-ante firm value. Summing debt and equity values, we get

$$(1 - p_1)C^H + p_1\Bigg[(1 - A(K_1^*))C^L + A(K_1^*)\left(\, p_2 C^L + (1 - p_2)C^H - K_1^* \,\right) \tag{A.90}$$

$$+ \mathbf{1}(\text{Inside offer})\left(\, A(K_1^*)(K_1^* - I) - I\mathbb{E}\big[\frac{\sum_i \theta_i \mathbf{1}_{accept}(K_1^*, \theta_i)}{1 + \prod_i \mathbf{1}_{accept}(K_1^*, \theta_i)}\big] \,\right)\Bigg]. \tag{A.91}$$

There are three cases. First, suppose there is no restructuring: firm value is

$$(1 - p_1)C^H + p_1 C^L. \tag{A.92}$$

Second, suppose there is an inside offer to debt holders: the K_1^* terms cancel and we obtain

$$(1 - p_1)C^H + p_1\Bigg[(1 - A(K_1^*))C^L + A(K_1^*)\left(\, p_2 C^L + (1 - p_2)C^H - I \,\right) - I\mathbb{E}\big[\frac{\sum_i \theta_i \mathbf{1}_{accept}(K_1^*, \theta_i)}{1 + \prod_i \mathbf{1}_{accept}(K_1^*, \theta_i)}\big]\Bigg] \tag{A.93}$$

$$= (1 - p_1)C^H + p_1\Bigg[C^L + A(K_1^*)\left(\, (1 - p_2)(C^H - C^L) - I \,\right) - I\mathbb{E}\big[\frac{\sum_i \theta_i \mathbf{1}_{accept}(K_1^*, \theta_i)}{1 + \prod_i \mathbf{1}_{accept}(K_1^*, \theta_i)}\big]\Bigg]. \tag{A.94}$$

This is the expression from Lemma 1. Finally, suppose there is an outside offer to non debt holders:

$$(1-p_1)C^H + p_1\Big[(1-A(K_1^*))C^L + A(K_1^*)\Big(\ p_2(C^L-K_1^*) + (1-p_2)(C^H-K_1^*)\ \Big)\Big] \tag{A.95}$$

$$= (1-p_1)C^H + p_1\Big[C^L + A(K_1^*)\Big(\ (1-p_2)(C^H-C^L) - K_1^*\ \Big)\Big]. \tag{A.96}$$

If $A(K_1^*) = 1-Q^2$, then this ex-ante firm value is the same as the ex-ante firm value for the inside offer: $K_1^* = I$ for outside investors by the argument in the text and the funding cost expression in the ex-ante value for inside offers is zero. If $A(K_1^*) = 1$, then $K_1^* = I(1+\overline{\theta})$ for outside investors so ex-ante firm value for the outside offer is

$$(1-p_1)C^H + p_1\Big[C^L + \Big(\ (1-p_2)(C^H-C^L) - I(1+\overline{\theta})\ \Big)\Big]. \tag{A.97}$$

Putting this together, if $A(K_1^*) = 1$, ex-ante firm value is strictly higher when equity expects the inside offer. If $A(K_1^*) = 1-Q^2$, the ex-ante firm value is the same for inside or outside offers. But by Lemma 2, this implies that ex-ante firm value is maximized by an inside offer that ensures $A(K_1^*) = 1$.

We now examine when this is supported in equilibrium. From the above, the equilibrium inside offer that guarantees acceptance is $K_1^* = I(1+\overline{\theta})$. Plugging this into the ex-ante debt pricing equation for inside offers,

$$D = (1-p_1)K_0^* + p_1\Big[p_2(C^L - K_1^*) + (1-p_2)K_0^* + K_1^* - I(1+Q\overline{\theta})\Big] \tag{A.98}$$

$$= (1-p_1p_2)K_0^* + p_1\Big[p_2C^L + (1-p_2)K_1^* - I(1+Q\overline{\theta})\Big] \tag{A.99}$$

$$= (1-p_1p_2)K_0^* + p_1\Big[p_2C^L + (1-p_2)I(1+\overline{\theta}) - I(1+Q\overline{\theta})\Big] \tag{A.100}$$

$$= (1-p_1p_2)K_0^* + p_1\Big[p_2C^L + I\Big[-p_2 + \overline{\theta}(1-p_2-Q)\Big]\Big]. \tag{A.101}$$

Thus,

$$K_0^* = \frac{D - p_1p_2C^L - p_1I\Big[-p_2 + \overline{\theta}(1-p_2-Q)\Big]}{1-p_1p_2}. \tag{A.102}$$

Move to time 1. By the above, equity holder is indifferent between an outside offer that sets $A(K_1^*) = 1$ or an inside offer that sets $A(K_1^*) = 1$: both require the same K_1^*. An inside offer K_1^{Alt} that achieves $A(K_1^*) = 1 - Q^2$ yields a strictly lower payoff, relative to equity's equilibrium strategy, if

$$(C^H - K_0^* - K_1^*) \geq (1-Q^2)(C^H - K_0^* - K_1^{Alt}) \tag{A.103}$$

$$Q^2(C^H - K_0^*) \geq K_1^* - (1-Q^2)K_1^{Alt} \tag{A.104}$$

$$C^H \geq K_0^* + \frac{1}{Q^2}[K_1^* - (1-Q^2)K_1^{Alt}] \tag{A.105}$$

$$C^H - C^L \geq K_0^* - C^L + \frac{1}{Q^2}[K_1^* - (1-Q^2)K_1^{Alt}]. \tag{A.106}$$

Plugging in the K_1^{Alt} given by (A.87) and plugging in $K_1^* = I(1+\overline{\theta})$, the right side is

$$K_0^* - C^L + \frac{K_1^* - (1-Q^2)\left(I + \frac{1}{1+Q(1-p_2)}\left[Q(1-p_2)(C^L - K_0^*) + p_2 QI\right] \right)}{Q^2} \tag{A.107}$$

$$= K_0^* - C^L + I + \frac{1}{Q^2}\left(I\overline{\theta} - \frac{1-Q^2}{1+Q(1-p_2)}\left[Q(1-p_2)(C^L - K_0^*) + p_2 QI\right] \right) \tag{A.108}$$

$$= (K_0^* - C^L)\left(1 + \frac{(1-Q^2)(1-p_2)}{Q(1+Q(1-p_2))}\right) + I\left(1 + \frac{1}{Q^2}\left(\overline{\theta} - \frac{1-Q^2}{1+Q(1-p_2)} p_2 Q \right)\right) \tag{A.109}$$

$$= (K_0^* - C^L)\frac{Q+1-p_2}{Q(1+Q-Qp_2)} + I\left(1 + \frac{\overline{\theta}}{Q^2} - \frac{(1-Q^2)p_2}{Q(1+Q(1-p_2))}\right) \tag{A.110}$$

Plugging in $K_0^* - C^L = \frac{D - C^L - p_1 I\left[\overline{\theta}(1-p_2-Q) - p_2\right]}{1-p_1 p_2}$ and rearranging, this is

$$\begin{aligned}
&\frac{D - C^L - p_1 I\left[\overline{\theta}(1-p_2-Q) - p_2\right]}{1-p_1 p_2}\frac{Q+1-p_2}{Q(1+Q-Qp_2)} + I\left(1 + \frac{\overline{\theta}}{Q^2} - \frac{(1-Q^2)p_2}{Q(1+Q(1-p_2))}\right) \\
=&\frac{D - C^L - p_1 I\overline{\theta}(1-Q)}{1-p_1 p_2}\frac{Q+1-p_2}{Q(1+Q-Qp_2)} + I(1+\overline{\theta})\frac{p_1 p_2}{1-p_1 p_2}\frac{Q+1-p_2}{Q(1+Q-Qp_2)} \\
&+ I\left(1 + \frac{\overline{\theta}}{Q^2} - \frac{(1-Q^2)p_2}{Q(1+Q(1-p_2))}\right) \\
=&I\left(1 + \frac{\overline{\theta}}{Q^2}\right) + \frac{D - C^L - p_1 I\overline{\theta}(1-Q)}{1-p_1 p_2}\frac{Q+1-p_2}{Q(Q+1-Qp_2)} \\
&+ \frac{Ip_2}{Q(Q+1-Qp_2)}\left((1+\overline{\theta})\frac{p_1(Q+1-p_2)}{1-p_1 p_2} - (1-Q^2)\right)
\end{aligned} \tag{A.111}$$

Multiplying $(1-p_2)$ to above equation, we get

$$\begin{aligned}
\mathbb{B}^{Sec} =& I\left(1 + \frac{\overline{\theta}}{Q^2}\right)(1-p_2) + \frac{D - C^L - p_1 I\overline{\theta}(1-Q)}{1-p_1 p_2}\frac{1-p_2}{Q}\frac{Q+1-p_2}{Q+1-Qp_2} \\
&+ \frac{Ip_2(1-p_2)}{Q(Q+1-Qp_2)}\left((1+\overline{\theta})\frac{p_1(Q+1-p_2)}{1-p_1 p_2} - (1-Q^2)\right)
\end{aligned} \tag{A.112}$$

Combining the above with (13), we have

$$\begin{aligned}
&\mathbb{B}^{Sec} - \frac{Q+1-p_2}{Q+1-Qp_2}\mathbb{B} = I\left(1+\frac{\overline{\theta}}{Q^2}\right)\left(1-p_2-\frac{Q+1-p_2}{Q+1-Qp_2}\right) \\
&\quad + \frac{Ip_2(1-p_2)}{Q(Q+1-Qp_2)}\left((1+\overline{\theta})\frac{p_1(Q+1-p_2)}{1-p_1p_2} - (1-Q^2)\right) \\
=&I\left(1+\frac{\overline{\theta}}{Q^2}\right)(-p_2)Q\left(\frac{2-p_2}{Q+1-Qp_2}\right) \\
&\quad + \frac{Ip_2(1-p_2)}{Q(Q+1-Qp_2)}\left((1+\overline{\theta})\frac{p_1(Q+1-p_2)}{1-p_1p_2} - (1-Q^2)\right) \\
=&\frac{Ip_2}{Q(Q+1-Qp_2)}\left[(1-p_2)\left((1+\overline{\theta})\frac{p_1(Q+1-p_2)}{1-p_1p_2} - (1-Q^2)\right) - (Q^2+\overline{\theta})(2-p_2)\right] \\
=&\frac{Ip_2}{Q(Q+1-Qp_2)}\left[(1-p_2)\left((1+\overline{\theta})\frac{p_1(Q+1-p_2)}{1-p_1p_2} - (1+\overline{\theta})\right) - (Q^2+\overline{\theta})\right] \\
=&\frac{Ip_2}{Q(Q+1-Qp_2)}\left[(1-p_2)(1+\overline{\theta})\frac{p_1Q+p_1-1}{1-p_1p_2} - (Q^2+\overline{\theta})\right] \qquad \text{(A.113)}
\end{aligned}$$

Then we have

$$\mathbb{B}^{Sec} = \frac{Q+1-p_2}{Q+1-Qp_2}\mathbb{B} + \frac{Ip_2}{Q(Q+1-Qp_2)}\left[(1+\overline{\theta})(p_1Q+p_1-1)\frac{1-p_2}{1-p_1p_2} - (Q^2+\overline{\theta})\right]. \qquad \text{(A.114)}$$

Thus if $(1-p_2)(C^H - C^L)$ is smaller than this, then there is at least one strictly profitable deviation to the equilibrium strategy of $K_1^* = I(1+\overline{\theta})$: make an inside offer K_1^{Alt}. Thus, if $(1-p_2)(C^H - C^L) < \mathbb{B}^{Sec}$, it is not an equilibrium to have $A(K_1^*) = 1$ with an inside offer. Therefore, the only equilibria have lower ex-ante firm value, so equity can do better ex-ante with an LMT when

$$\mathbb{B}^{LMT} < (1-p_2)(C^H - C^L) < \mathbb{B}^{Sec}. \qquad \text{(A.115)}$$

QED.

B Optimal Mechanism Design Proofs and Details

In this appendix, we describe our mechanism design setup. We focus on date 1 and assume that the firm has already issued debt K_0^*.

The firm is in distress. Differing from our baseline model, we assume the debt is sold to N investors. Each investor i independently draws a funding cost θ_i from a distribution F_i with pdf f_i. We assume that each f_i has full support on the interval $[0, \overline{\theta}]$ and satisfies a monotone likelihood ratio property: $F_i(\theta_i)/f_i(\theta_i)$ increases monotonically in θ_i.

Equity holders design a mechanism. By the revelation principle, it is without loss of generality to focus on direct mechanisms in which investors send a report $\hat{\theta}_i$ of their type θ_i.

For tractability, we must assume that at most $N-1$ investors participate in the mechanism. Let n denote the number of investors participating in the mechanism, where $2 \leq n \leq N-1$. We assume each investor has the same distribution F_i and we let $F(\theta)$ denote the CDF of the $n \times 1$ vector $\theta = \{\theta_1, ..., \theta_n\}$. We define $f_i, f, \hat{\theta}$ accordingly.

If all investors choose to participate as they do in equilibrium, $N-n$ are randomly excluded. This assumption allows for a clean calculation of how a mechanism determines the off-equilibrium path payoff that results from refusal to participate.

A mechanism is a correspondence that maps the n reports $\hat{\theta}$ to three objects: (1) a probability $A(\hat{\theta})$ that the firm raises liquidity, (2) a payment $K_1^i(\hat{\theta})$ for each lender $i = 1, ..., n$ who participates if the restructuring succeeds and the firm avoids bankruptcy, and (3) an amount $I_i(\hat{\theta})$ that investor i injects, where $\sum_{i=1}^n I_i = I$.

By the revelation principle, it is without loss of generality to focus on truthtelling equilibria: equity holders optimally choose a mechanism subject to the constraint that there is an equilibrium in which each investor finds it optimal to report their true type θ_i.

We also focus on mechanisms and equilibria in which each investor finds it optimal to participate. If, off the equilibrium path, an investor refuses to participate, they receive a payoff X that does

not depend on their type or their report because they inject no liquidity, making their funding cost θ_i irrelevant. Likewise, if all investors participate, one is selected and random and receives X.

In a traditional restructuring,

$$X = \frac{C^L}{N} + \int_{J_n} A(\theta)(1-p_2)\frac{K_0^* - C^L}{N} f(\theta)d\theta. \tag{A.116}$$

The investor gets their bankruptcy payoff C^L/N if the firm files for bankruptcy or the originally promised payment K_0^*/N if the firm avoids bankruptcy. Note that the term $A(\theta)$ in the integral reflects the fact that the participating n investors follow their equilibrium strategies and report truthfully.

In a LMT,

$$X = \frac{C^L}{N} + \int_{J_n} A(\theta)\left[(1-p_2)\frac{K_0^* - C^L}{N} - p_2\frac{C^L}{N}\right] f(\theta)d\theta. \tag{A.117}$$

The term $-p_2 C^L/N$ reflects the investor's loss of collateral if the restructuring succeeds, which occurs with probability A.

In either type of restructuring mechanism, if an investor i with type θ_i chooses to participate in the mechanism and reports $\hat{\theta}_i$, and if all other investors follow their equilibrium strategies of participation and truthtelling, then investor i receives the following payoff in expectation:

$$U(\theta_i, \hat{\theta}_i) \equiv \frac{X(N-n)}{N} + \frac{n}{N}\left(\frac{C^L}{N} + \int_{J_{n-1}} A\left(\{\hat{\theta}_i, \theta_{-i}\}\right)\left[(1-p_2)\left(K_1^i\left(\{\hat{\theta}_i, \theta_{-i}\}\right) + \frac{K_0^* - C^L}{N}\right)\right.\right.$$
$$\left.\left. - I_i\left(\{\hat{\theta}_i, \theta_{-i}\}\right)(1+\theta_i)\right] f_{-i}(\theta_{-i})d\theta_{-i}\right). \tag{A.118}$$

The first term reflects the probability $(N-n)/N$ that the investor is excluded and receives X. The rest of the terms reflect the probability n/N that the investor is included. The integral takes an expectation over the vector θ_{-i} of the $n-1$ investors who participate in the mechanism

(they are not excluded) and are not investor i. Investor i receives $K_1^i + K_0^*/N$ if the firm avoids bankruptcy, receives C^L/N in bankruptcy, and pays $I_i(1+\theta_i)$ if the restructuring succeeds.

We can write the truthtelling constraint as follows:

$$\theta_i \in \text{argmax}_{\hat{\theta}} U(\theta_i, \hat{\theta}). \tag{A.119}$$

We can write the participation constraint as

$$\hat{U}(\theta_i) \equiv U(\theta_i, \theta_i) \geq X \quad \text{for all } \theta_i. \tag{A.120}$$

If both hold, then it is an equilibrium for each investor to participate and truthfully report. In such an equilibrium, the ex-post payoff for equity holders is:

$$V \equiv \int_{J_n} A(\theta)(1-p_2) \left(C^H - K_0^* - \sum_{i=1}^{n} K_1^i(\theta) \right) f(\theta) d\theta. \tag{A.121}$$

With this setup, we prove Proposition 6

B.1 Proof of Proposition 6

Fix any mechanism with a truthtelling equilibrium. Let U_1, U_2 denote the partial derivatives of U with respect to the first and second arguments. Equation (A.119) holds if and only if

$$U_2(\theta_i, \theta_i) = 0. \tag{A.122}$$

Define $\hat{U}(\theta_i) \equiv U(\theta_i, \theta_i)$. Then the above equation holds if and only if

$$\frac{d}{d\theta_i}\hat{U}(\theta_i) = \frac{d}{d\theta_i}U(\theta_i, \theta_i) = U_1(\theta_i, \theta_i) + U_2(\theta_i, \theta_i) = U_1(\theta_i, \theta_i). \tag{A.123}$$

This is the Envelope theorem. From (A.118),

$$U_1(\theta_i, \hat{\theta}_i) = \frac{\partial}{\partial \theta_i} U(\theta_i, \hat{\theta}_i) \tag{A.124}$$

$$= \frac{\partial}{\partial \theta_i} \frac{n}{N} \int_{J_{n-1}} A\left(\{\hat{\theta}_i, \theta_{-i}\} \right) \Bigg[(1-p_2) \left(K_1^i \left(\{\hat{\theta}_i, \theta_{-i}\} \right) + \frac{K_0^* - C^L}{N} \right) \tag{A.125}$$

$$- I_i \left(\{\hat{\theta}_i, \theta_{-i}\} \right) (1+\theta_i) \Bigg] f_{-i}(\theta_{-i}) d\theta_{-i} \tag{A.126}$$

$$= -\frac{n}{N} \int_{J_{n-1}} A\left(\{\hat{\theta}_i, \theta_{-i}\} \right) I_i \left(\{\hat{\theta}_i, \theta_{-i}\} \right) f_{-i}(\theta_{-i}) d\theta_{-i}. \tag{A.127}$$

Thus,

$$\frac{d}{d\theta_i} \hat{U}(\theta_i) = -\frac{n}{N} \int_{J_{n-1}} A\left(\{\theta_i, \theta_{-i}\} \right) I_i \left(\{\theta_i, \theta_{-i}\} \right) f_{-i}(\theta_{-i}) d\theta_{-i}. \tag{A.128}$$

This shows that $\frac{d}{d\theta_i} U(\theta_i, \theta_i) \leq 0$. Applying the fundamental theorem of calculus:

$$\begin{aligned}
\hat{U}(\theta_i) &= \hat{U}(\overline{\theta}) - \int_{\theta_i}^{\overline{\theta}} \frac{d}{du} \hat{U}(u) du \\
&= \hat{U}(\overline{\theta}) - \frac{n}{N} \int_{\theta_i}^{\overline{\theta}} \Bigg[- \int_{J_{n-1}} A\left(\{u, \theta_{-i}\} \right) I_i \left(\{u, \theta_{-i}\} \right) f_{-i}(\theta_{-i}) d\theta_{-i} \Bigg] du \\
&= \hat{U}(\overline{\theta}) + \frac{n}{N} \int_{J_{n-1}} \left[\int_{\theta_i}^{\overline{\theta}} A\left(\{u, \theta_{-i}\} \right) I_i \left(\{u, \theta_{-i}\} \right) du \right] f_{-i}(\theta_{-i}) d\theta_{-i}.
\end{aligned}$$

Equating this with the definition implied by (A.118) with $\hat{\theta}_i = \theta_i$,

$$\begin{aligned}
&\hat{U}(\overline{\theta}) + \frac{n}{N} \int_{J_{n-1}} \left[\int_{\theta_i}^{\overline{\theta}} A\left(\{u, \theta_{-i}\} \right) I_i \left(\{u, \theta_{-i}\} \right) du \right] f_{-i}(\theta_{-i}) d\theta_{-i} = \frac{X(N-n)}{N} + \frac{n}{N} \Bigg(\frac{C^L}{N} \\
&+ \int_{J_{n-1}} A\left(\{\theta_i, \theta_{-i}\} \right) \Bigg[(1-p_2) \left(K_1^i \left(\{\theta_i, \theta_{-i}\} \right) + \frac{K_0^* - C^L}{N} \right) \\
&- I_i \left(\{\theta_i, \theta_{-i}\} \right) (1+\theta_i) \Bigg] f_{-i}(\theta_{-i}) d\theta_{-i} \Bigg).
\end{aligned} \tag{A.129}$$

We now take an expectation of both sides of (A.129) with respect to θ_i: we integrate both sides of this equation over all possible values of θ_i, weighting by the pdf $f_i(\theta_i)$. The right side of the equation simply becomes

$$\frac{X(N-n)}{N} + \frac{n}{N}\left(\frac{C^L}{N} + \int_{J_n} A(\theta) \times \left[(1-p_2) \left(K_1^i \left(\theta \right) + \frac{K_0^* - C^L}{N} \right) - I_i \left(\theta \right) (1+\theta_i) \right] f(\theta) d\theta \right). \tag{A.130}$$

For the left side, define

$$\tilde{A}(\{u, \theta_{-i}\}) \equiv \frac{n}{N} A \left(\{u, \theta_{-i}\} \right) I_i \left(\{u, \theta_{-i}\} \right). \tag{A.131}$$

Note that $f_i(\theta_i) = F_i'(\theta_i)$ and apply integration by parts:

$$\int_0^{\overline{\theta}} \left[\int_{\theta_i}^{\overline{\theta}} \tilde{A} \left(\{u, \theta_{-i}\} \right) du \right] f(\theta_i) d\theta_i \tag{A.132}$$

$$= \left[\left(\int_{\theta_i}^{\overline{\theta}} \tilde{A} \left(\{u, \theta_{-i}\} \right) du \right) F_i(\theta_i) \right]_0^{\overline{\theta}} - \int_0^{\overline{\theta}} \left(-\tilde{A} \left(\{\theta_i, \theta_{-i}\} \right) \right) F_i(\theta_i) d\theta_i. \tag{A.133}$$

The second term in the second line follows from Leibniz rule. The first term on the second line is zero because $F_i(0) = \int_{\overline{\theta}}^{\overline{\theta}} du = 0$. Thus,

$$\int_0^{\overline{\theta}} \left[\int_{\theta_i}^{\overline{\theta}} \tilde{A}(\{u, \theta_{-i}\}) du \right] f(\theta_i) d\theta_i = \int_0^{\overline{\theta}} \tilde{A}(\{\theta_i, \theta_{-i}\}) F_i(\theta_i) d\theta_i \tag{A.134}$$

$$= \int_0^{\overline{\theta}} \tilde{A}(\{\theta_i, \theta_{-i}\}) \frac{F_i(\theta_i)}{f_i(\theta_i)} f_i(\theta_i) d\theta_i \tag{A.135}$$

The expectation of the left side of (A.129) over θ_i is thus

$$\hat{U}(\overline{\theta}) + \frac{n}{N}\int_{J_n} A\left(\theta\right) I_i\left(\theta\right) \frac{F_i(\theta_i)}{f_i(\theta_i)} f(\theta)d\theta. \tag{A.136}$$

Putting this together, (A.129) holds if and only if

$$\hat{U}(\overline{\theta}) + \frac{n}{N}\int_{J_n} A\left(\theta\right) I_i\left(\theta\right) \frac{F_i(\theta_i)}{f_i(\theta_i)} f(\theta)d\theta = \frac{X(N-n)}{N} + \frac{n}{N}\left(\frac{C^L}{N} \right.$$
$$\left. + \int_{J_n} A(\theta) \times \left[(1-p_2)\left(K_1^i\left(\theta\right) + \frac{K_0^* - C^L}{N} \right) - I_i\left(\theta\right)(1+\theta_i) \right] f(\theta)d\theta \right). \tag{A.137}$$

Rearranging, multiplying through by N/n, and summing over $i = 1$ to n,

$$\int_{J_n} A\left(\theta\right)(1-p_2)\left(\frac{n}{N}K_0^* + \sum_{i=1}^{n} K_1^i\left(\theta\right) \right) f(\theta)d\theta \tag{A.138}$$
$$= N\hat{U}(\overline{\theta}) - (N-n)X - \frac{n}{N}C^L + \int_{J_n} A\left(\theta\right)\left((1-p_2)\frac{n}{N}C^L + \sum_{i=1}^{n} I_i(\theta)(1+\theta_i + \frac{F_i(\theta_i)}{f_i(\theta_i)}) \right) f(\theta)d\theta.$$

Now, start with traditional restructuring:

$$X = \frac{C^L}{N} + \int_{J_n} A(\theta)(1-p_2)\frac{K_0^* - C^L}{N} f(\theta)d\theta. \tag{A.139}$$

It must be that $\hat{U}(\overline{\theta}) = X$. Thus,

$$N\hat{U}(\overline{\theta}) - (N-n)X = \frac{n}{N}\left(C^L + \int_{J_n} A(\theta)(1-p_2)(K_0^* - C^L) f(\theta)d\theta \right). \tag{A.140}$$

Plugging this in to (A.138) and rearranging terms,

$$\int_{J_n} A\ (\ \theta\ )\ (1-p_2)\left(\ \sum_{i=1}^{n} K_1^i\ (\ \theta\ )\right) f(\theta)d\theta \tag{A.141}$$

$$= \int_{J_n} A\ (\ \theta\ )\left(\ \sum_{i=1}^{n} I_i(\theta)(1+\theta_i+\frac{F_i(\theta_i)}{f_i(\theta_i)})\ \right) f(\theta)d\theta. \tag{A.142}$$

Plugging this into the definition of V from (A.121),

$$V \equiv \int_{J_n} A(\theta)(1-p_2)\left(\ C^H - K_0^* - \sum_{i=1}^{n} K_1^i(\theta)\ \right) f(\theta)d\theta \tag{A.143}$$

$$= \int_{J_n} A(\theta)\Bigg[(1-p_2)\left(\ C^H - K_0^*\ \right) - \sum_{i=1}^{n} I_i(\theta)(1+\theta_i+\frac{F_i(\theta_i)}{f_i(\theta_i)})\Bigg] f(\theta)d\theta. \tag{A.144}$$

Thus, we have shown that a mechanism has a truthtelling equilibrium if and only if this is the equity objective in that equilibrium. Thus, equity can freely manipulate $A, \{I_i\}$ to maximize this objective, and then set the transfers K_1^i that ensure truthtelling and participation. It is clear that this is maximized by setting $I_i = I$ for the lowest θ_i and 0 for other i and setting

$$A = \mathbf{1}\left(\ (1-p_2)(C^H - K_0^*) - I \min_{1\le i\le n}\left(\ 1+\theta_i+\frac{F_i(\theta_i)}{f_i(\theta_i)}\ \right) > 0\ \right). \tag{A.145}$$

Hence, we have

$$V = \int_{J_n}\Bigg[(1-p_2)(C^H - K_0^*) - I \min_{1\le i\le n}\left(\ 1+\theta_i+\frac{F_i(\theta_i)}{f_i(\theta_i)}\ \right)\Bigg]^+ f(\theta)d\theta. \tag{A.146}$$

In contrast, a planner would set

$$A = \mathbf{1}\left(\ (1-p_2)(C^H - C^L) - I \min_{i}\left(\ 1+\theta_i\ \right) > 0\ \right). \tag{A.147}$$

Thus, there is inefficiently low restructuring.

Denote the value given in (A.146) as $V(n)$. We have

$$\begin{aligned} V(n) =& \int_0^{\overline{\theta}} \int_{J_n} \left[(1-p_2)(C^H - K_0^*) - I \min_{1 \le i \le n} \left(1 + \theta_i + \frac{F_i(\theta_i)}{f_i(\theta_i)} \right) \right]^+ \Pi_{i=1}^{n+1} f_i(\theta) d\theta_i \\ \le& \int_0^{\overline{\theta}} \int_{J_n} \left[(1-p_2)(C^H - K_0^*) - I \min_{1 \le i \le n+1} \left(1 + \theta_i + \frac{F_i(\theta_i)}{f_i(\theta_i)} \right) \right]^+ \Pi_{i=1}^{n+1} f_i(\theta) d\theta_i \\ =& V(n+1). \end{aligned} \tag{A.148}$$

This proves part 1 of Proposition 6. For part 2, recall that X for a LMT is

$$X = \frac{C^L}{N} + \int_{J_n} A(\theta) \left[(1-p_2) \frac{K_0^* - C^L}{N} - \frac{p_2 C^L}{N} \right] f(\theta) d\theta. \tag{A.149}$$

The extra term reflects that the holdout loses C^L/N if the restructuring is accepted, regardless of whether the firm avoids bankruptcy. As before, it must be that $\hat{U}(\overline{\theta}) = X$. Thus,

$$N\hat{U}(\overline{\theta}) - (N-n)X = \frac{n}{N} \left(C^L + \int_{J_n} A(\theta) \left[(1-p_2)(K_0^* - C^L) - p_2 C^L \right] f(\theta) d\theta \right). \tag{A.150}$$

Plugging into (A.138),

$$\begin{aligned} & \int_{J_n} A\left(\theta\right) (1-p_2) \left(\sum_{i=1}^{n} K_1^i \left(\theta\right) \right) f(\theta) d\theta \\ =& \int_{J_n} A\left(\theta\right) \left(-p_2 \frac{n}{N} C^L + \sum_{i=1}^{n} I_i(\theta) (1 + \theta_i + \frac{F_i(\theta_i)}{f_i(\theta_i)}) \right) f(\theta) d\theta. \end{aligned} \tag{A.151}$$

Plugging this into the definition of V from (A.121),

$$V \equiv \int_{J_n} A(\theta)(1-p_2)\left(C^H - K_0^* - \sum_{i=1}^{n} K_1^i(\theta) \right) f(\theta)d\theta \tag{A.152}$$

$$= \int_{J_n} A(\theta)\left[(1-p_2)\left(C^H - K_0^* \right) + \frac{p_2 C^L n}{N} - \sum_{i=1}^{n} I_i(\theta)(1+\theta_i + \frac{F_i(\theta_i)}{f_i(\theta_i)}) \right)\right] f(\theta)d\theta. \tag{A.153}$$

It is clear that this is maximized by setting $I_i = I$ for the lowest θ_i and

$$A = \mathbf{1}\left((1-p_2)(C^H - K_0^*) + \frac{p_2 C^L n}{N} - I\sum_{i=1}^{n}\left(1 + \theta_i + \frac{F_i(\theta_i)}{f_i(\theta_i)} \right) > 0 \right). \tag{A.154}$$

Then we have

$$V = \int_{J_n}\left[(1-p_2)(C^H - K_0^*) + \frac{p_2 C^L n}{N} - I \min_{1\le i\le n}\left(1 + \theta_i + \frac{F_i(\theta_i)}{f_i(\theta_i)} \right)\right]^+ f(\theta)d\theta. \tag{A.155}$$

Thus, if restructuring is efficient, LMTs increase value. Similar to (A.148), we can show the value given by (A.155) is non-decreasing in n.

C Differences in Beliefs

In this extension, we show that our results hold when we assume all required returns are zero ($\theta_i = 0$) and instead assume a different friction: differences in beliefs and asymmetric information about the probability p_2 of bankruptcy after a liquidity injection.

At $t = 0$, the firm and the bank agree on the value of p_2. At $t = 1$, after buying the distressed debt, each hedge fund receives new information and forms an updated belief p_2^i about the probability of bankruptcy. We assume that each investor i is certain that their estimate p_2^i is correct: the investor does not update based on the actions of other agents. This is often called a "differences in beliefs" or "agree to disagree" framework. We assume $p_2^i \in \{p_2^L, p_2^H\}$, where $0 < p_2^L < p_2^H < 1$. We let Q denote the probability that $p_2^i = p_2^H$. We assume that at $t = 0$, the firm and the bank share

a belief that $p_2 = \bar{p}_2$, where $\bar{p}_2$ is the expected belief of hedge funds at $t = 1$:

$$\bar{p}_2 = Qp_2^H + (1 - Q)p_2^L. \tag{A.156}$$

C.1 Efficiency

If the firm never raises liquidity, firm value at $t = 0$ is

$$p_1 C^L + (1 - p_1)C^H. \tag{A.157}$$

Next, suppose that the firm raises liquidity only if at least one hedge fund is optimistic ($\min_i p_2^i = p_2^L$). Then at $t = 0$, firm value is

$$(1 - p_1)C^H + p_1 \left(C^L + (1 - Q^2)(-I + (1 - \bar{p}_2)(C^H - C^L)) \right). \tag{A.158}$$

Firm value with certain liquidity injection is

$$(1 - p_1)C^H + p_1 \left(C^L - I + (1 - \bar{p}_2)(C^H - C^L) \right). \tag{A.159}$$

Thus, liquidity injection is efficient if $(1 - \bar{p}_2)(C^H - C^L) > I$.

C.2 Equilibrium without LMTs

Proposition 7. *Assume that liquidity injection is efficient:*

$$(1 - \bar{p}_2)(C^H - C^L) > I. \tag{A.160}$$

In the absence of LMTs, an efficient equilibrium exists if and only if

$$C^H - C^L \geq \frac{1}{Q^2}\left(\frac{I}{1-p_2^H} - \frac{(1-Q^2)I}{1-p_2^L}\right) + \frac{1}{Q}\left(\frac{D - p_1\left[-I + C^L\bar{p}_2 + \frac{I(1-\bar{p}_2)}{1-p_2^H}\right]}{1-p_1\bar{p}_2} - C^L\right). \quad \text{(A.161)}$$

Proof: Assume LMTs are banned and consider a subgame in which equity offers K_1. Each investor i forms a rational expectation of the probability $\tilde{P}$ that the competing investor accepts. From the perspective of investor i, the payoff from accepting is

$$R_{\text{accept}}(K_0^*, \tilde{P}, K_1, p_2^i) = \frac{(1-p_2^i)K_0^* + p_2^i C^L}{2} + \left[1 - \frac{\tilde{P}}{2}\right] \times \left[-I + (1-p_2^i)K_1\right]. \quad \text{(A.162)}$$

The payoff from rejecting is

$$R_{\text{reject}}(K_0^*, \tilde{P}, p_2^i) = \left[1 - \tilde{P} + \tilde{P}p_2^i\right]\frac{C^L}{2} + \tilde{P}\frac{(1-p_2^i)K_0^*}{2}. \quad \text{(A.163)}$$

First, suppose $\tilde{P} = 1$. Then we can subtract the original debt terms from both expressions and see that the offer is accepted if and only if

$$(1-p_2^i)K_1 \geq I \Rightarrow K_1 \geq \frac{I}{1-p_2^i}. \quad \text{(A.164)}$$

If equity wants to implement $\tilde{P} = 1$, they optimally make this bind at the higher value: $K_1^* = I/(1-p_2^H) > I/(1-p_2^L)$. Moving back to $t = 0$, the bank rationally expects $A(K_1^*) = 1$. In distress, the bank expects to sell half the debt to an investor who will pay the expected value of their post-signal valuation

$$\frac{1}{2}\Big[Q\left(-I+p_2^H C^L+(1-p_2^H)(K_0^*+K_1^*)\right)$$
$$+(1-Q)\left(-I+p_2^L C^L+(1-p_2^L)(K_0^*+K_1^*)\right)\Big]$$
$$=\frac{1}{2}\Big[-I+C^L\bar{p}_2+(1-\bar{p}_2)(K_0^*+K_1^*)\Big],$$

where

$$\bar{p}_2 \equiv Qp_2^H+(1-Q)p_2^L. \tag{A.165}$$

Summing across investors, at $t=0$ the debt pricing equation is

$$D=(1-p_1)K_0^*+p_1\Big[-I+C^L\bar{p}_2+(1-\bar{p}_2)(K_0^*+K_1^*)\Big].$$

Substituting $K_1^*=I/(1-p_2^H)$ into the above equation, we obtain

$$K_0^*=\frac{1}{1-p_1\bar{p}_2}\left(D-p_1\Big[-I+C^L\bar{p}_2+\frac{I(1-\bar{p}_2)}{1-p_2^H}\Big]\right).$$

When does equity deviate? If $\tilde{P}=1-Q$, then investor i accepts if and only if

$$\begin{aligned}
&(1-\tilde{P})\frac{(1-p_2^i)K_0^*+p_2^iC^L}{2}+\big[1-\frac{\tilde{P}}{2}\big]\times\big[-I+(1-p_2^i)K_1\big]\geq(1-\tilde{P})\frac{C^L}{2}\\
\iff& Q\frac{(1-p_2^i)K_0^*+p_2^iC^L}{2}+\big[\frac{1+Q}{2}\big]\times\big[-I+(1-p_2^i)K_1\big]\geq Q\frac{C^L}{2}\\
\iff& Q\frac{(1-p_2^i)(K_0^*-C^L)}{2}+\big[\frac{(1+Q)(1-p_2^i)}{2}\big]\times\big[-\frac{I}{1-p_2^i}+K_1\big]\geq 0\\
\iff& K_1\geq\frac{I}{1-p_2^i}-\frac{Q}{1+Q}(K_0^*-C^L).
\end{aligned}$$

If equity wants to achieve $\tilde{P} = 1 - Q$, they optimally make this bind at p_2^L:

$$K_1^{Alt} = \frac{I}{1 - p_2^L} - \frac{Q}{1+Q}(K_0^* - C^L). \tag{A.166}$$

Assume equity does not update and believes $p_2 = \bar{p}_2$. Equity's objective is higher at the equilibrium offer if and only if

$$\begin{aligned}
&C^H - K_0^* - K_1^* \geq (1 - Q^2)(C^H - K_0^* - K_1^{Alt}) \\
\iff &Q^2(C^H - K_0^*) \geq \frac{I}{1 - p_2^H} - (1 - Q^2)\left(\frac{I}{1 - p_2^L} - \frac{Q}{1+Q}(K_0^* - C^L) \right) \\
\iff &Q^2(C^H - K_0^*) \geq \frac{I}{1 - p_2^H} - \frac{(1 - Q^2)I}{1 - p_2^L} + Q(1 - Q)(K_0^* - C^L) \\
\iff &Q^2(C^H - C^L) \geq \frac{I}{1 - p_2^H} - \frac{(1 - Q^2)I}{1 - p_2^L} + Q(K_0^* - C^L) \\
\iff &C^H - C^L \geq \frac{1}{Q^2}\left(\frac{I}{1 - p_2^H} - \frac{(1 - Q^2)I}{1 - p_2^L} \right) + \frac{1}{Q}\left(\frac{D - p_1\left[-I + C^L\bar{p}_2 + \frac{I(1-\bar{p}_2)}{1-p_2^H} \right]}{1 - p_1\bar{p}_2} - C^L \right).
\end{aligned}$$

Thus, an efficient equilibrium exists if and only if D is low.

C.3 Equilibrium with LMTs

Proposition 8. *Assume that liquidity injection is efficient:*

$$(1 - \bar{p}_2)(C^H - C^L) > I. \tag{A.167}$$

Assume also that the pessimistic investor is more willing to accept offers:

$$\frac{I - p_2^H C^L}{1 - p_2^H} > \frac{I - p_2^L C^L}{1 - p_2^L}. \tag{A.168}$$

Then an efficient equilibrium exists if and only if

$$C^H - C^L \geq \frac{1}{Q^2}\left(\frac{I}{1-p_2^H} - \frac{(1-Q^2)I}{1-p_2^L}\right) + \frac{1}{Q}\left(\frac{D - p_1\left[-I + C^L\bar{p}_2 + \frac{I(1-\bar{p}_2)}{1-p_2^H}\right]}{1-p_1\bar{p}_2} - C^L\right)$$
$$+ \underbrace{\frac{p_2^H C^L}{Q(1-p_2^H)}\left[\frac{p_1 - p_1\bar{p}_2}{1-p_1\bar{p}_2} - \frac{1}{Q}\right] + \frac{1-Q}{Q^2}\frac{p_2^L C^L}{1-p_2^L}}_{<0}. \tag{A.169}$$

Consider a subgame in which equity offers K_1. Each investor i forms a rational expectation of the probability $\tilde{P}$ that the competing investor accepts. Now, suppose LMTs are allowed. From the perspective of investor i, the payoff from accepting is

$$R_{\text{accept}}(K_0^*, \tilde{P}, K_1, p_2^i) = \frac{(1-p_2^i)K_0^*}{2} + \left[1 - \frac{\tilde{P}}{2}\right] \times \left[p_2^i C^L - I + (1-p_2^i)K_1\right]. \tag{A.170}$$

The payoff from rejecting is

$$R_{\text{reject}}(K_0^*, \tilde{P}, p_2^i) = \left[1 - \tilde{P}\right]\frac{C^L}{2} + \tilde{P}\frac{(1-p_2^i)K_0^*}{2}. \tag{A.171}$$

First, suppose $\tilde{P} = 1$. Then we can subtract the K_0^* terms from both sides and see that the offer is accepted if and only if

$$p_2^i C^L - I + (1-p_2^i)K_1 \geq 0 \Rightarrow K_1 \geq \frac{I - p_2^i C^L}{1-p_2^i}. \tag{A.172}$$

We assume this is higher at $p_2^i = p_2^H$, though this is not important:

$$\frac{I - p_2^H C^L}{1-p_2^H} > \frac{I - p_2^L C^L}{1-p_2^L}. \tag{A.173}$$

Equity optimally makes this bind at the higher value: $K_1^* = (I - p_2^H C^L)/(1-p_2^H)$.

Moving back to $t = 0$, the bank rationally expects $A(K_1^*) = 1$. In distress, the bank expects to sell half the debt to an investor who will pay

$$\begin{aligned}
&\frac{1}{2}\Big[Q\left(-I+p_2^H C^L+(1-p_2^H)(K_0^*+K_1^*)\right)\\
&+(1-Q)\left(-I+p_2^L C^L+(1-p_2^L)(K_0^*+K_1^*)\right)\Big]\\
&=\frac{1}{2}\Big[-I+C^L\bar{p}_2+(1-\bar{p}_2)(K_0^*+K_1^*)\Big],
\end{aligned}$$

where

$$\bar{p}_2 \equiv Qp_2^H+(1-Q)p_2^L. \tag{A.174}$$

Summing across investors, at $t=0$ the debt pricing equation is

$$D=(1-p_1)K_0^*+p_1\Big[-I+C^L\bar{p}_2+(1-\bar{p}_2)(K_0^*+K_1^*)\Big].$$

Substituting $K_1^*=(I-p_2^H C^L)/(1-p_2^H)$ into the above equation, we obtain

$$K_0^*=\frac{1}{1-p_1\bar{p}_2}\left(D-p_1\Big[-I+C^L\bar{p}_2+(1-\bar{p}_2)\frac{I-p_2^H C^L}{1-p_2^H}\Big]\right).$$

When does equity deviate? If $\tilde{P}=1-Q$, then investor i accepts if and only if

$$\begin{aligned}
&(1-\tilde{P})\frac{(1-p_2^i)K_0^*}{2}+\big[1-\frac{\tilde{P}}{2}\big]\times\big[p_2^i C^L-I+(1-p_2^i)K_1\big]\geq(1-\tilde{P})\frac{C^L}{2}\\
\iff& Q\frac{(1-p_2^i)K_0^*}{2}+\big[\frac{1+Q}{2}\big]\times\big[p_2^i C^L-I+(1-p_2^i)K_1\big]\geq Q\frac{C^L}{2}\\
\iff& Q\frac{(1-p_2^i)(K_0^*-C^L)}{2}+\frac{p_2^i C^L}{2}+\big[\frac{1+Q}{2}\big]\times\big[-I+(1-p_2^i)K_1\big]\geq 0\\
\iff& Q\frac{(1-p_2^i)(K_0^*-C^L)}{(1+Q)(1-p_2^i)}+\frac{p_2^i C^L}{(1+Q)(1-p_2^i)}+\big[-\frac{I}{1-p_2^i}+K_1\big]\geq 0\\
\iff& K_1\geq\frac{I}{1-p_2^i}-\frac{1}{(1+Q)(1-p_2^i)}\Big[Q(1-p_2^i)(K_0^*-C^L)+p_2^i C^L\Big]\\
\iff& K_1\geq\frac{I}{1-p_2^i}-\frac{p_2^i C^L}{(1+Q)(1-p_2^i)}-\frac{Q}{1+Q}(K_0^*-C^L).
\end{aligned}\tag{A.175}$$

Given the earlier assumption that $(I - p_2 C^L)/(1 - p_2)$ increases in p_2, this left side expression is higher for p_2^H, because this is higher for p_2^H when

$$\frac{I}{1-p_2^H} - \frac{p_2^H C^L}{(1+Q)(1-p_2^H)} > \frac{I}{1-p_2^L} - \frac{p_2^L C^L}{(1+Q)(1-p_2^L)}$$
$$\iff I\Big(\frac{1}{1-p_2^H} - \frac{1}{1-p_2^L}\Big) > \frac{C^L}{1+Q}\Big(\frac{p_2^H}{1-p_2^H} - \frac{p_2^L}{1-p_2^L}\Big),$$

and the earlier assumption implies this holds for $Q = 0$ so it must hold for $Q > 0$. Thus, if equity wants to achieve $\tilde{P} = 1 - Q$, they optimally make this bind at p_2^L (see (A.175)):

$$K_1^{Alt} = \frac{I}{1-p_2^L} - \frac{Q}{1+Q}(K_0^* - C^L) - \frac{p_2^L C^L}{(1+Q)(1-p_2^L)}. \tag{A.176}$$

Assume equity does not update and believes $p_2 = \bar{p}_2$. Equity's objective is higher at the equilibrium offer if and only if

$$\begin{aligned}
&C^H - K_0^* - K_1^* \geq (1-Q^2)(C^H - K_0^* - K_1^{Alt}) \\
\iff &Q^2(C^H - K_0^*) \geq \frac{I - p_2^H C^L}{1-p_2^H} - (1-Q^2)\left(\frac{I}{1-p_2^L} - \frac{Q}{1+Q}(K_0^* - C^L) - \frac{p_2^L C^L}{(1+Q)(1-p_2^L)}\right) \\
\iff &Q^2(C^H - K_0^*) \geq \frac{I - p_2^H C^L}{1-p_2^H} - \frac{(1-Q^2)I}{1-p_2^L} + Q(1-Q)(K_0^* - C^L) + \frac{(1-Q)p_2^L C^L}{1-p_2^L}. \\
\iff &Q^2(C^H - C^L) \geq \frac{I - p_2^H C^L}{1-p_2^H} - \frac{(1-Q^2)I}{1-p_2^L} + Q(K_0^* - C^L) + \frac{(1-Q)p_2^L C^L}{1-p_2^L} \\
\iff &C^H - C^L \geq \frac{1}{Q^2}\left(\frac{I}{1-p_2^H} - \frac{(1-Q^2)I}{1-p_2^L}\right) + \frac{1}{Q}\left(\frac{D - p_1\left[-I + C^L\bar{p}_2 + \frac{I(1-\bar{p}_2)}{1-p_2^H}\right]}{1-p_1\bar{p}_2} - C^L\right) \\
&\quad + \frac{p_1(1-\bar{p}_2)\frac{p_2^H C^L}{1-p_2^H}}{Q(1-p_1\bar{p}_2)} - \frac{1}{Q^2}\frac{p_2^H C^L}{1-p_2^H} + \frac{(1-Q)p_2^L C^L}{Q^2(1-p_2^L)}.
\end{aligned}$$

This is the same as before, but the following additional terms appear on the right side:

$$
\begin{aligned}
&\frac{p_1(1-\bar{p}_2)\frac{p_2^H C^L}{1-p_2^H}}{Q(1-p_1\bar{p}_2)} - \frac{1}{Q^2}\frac{p_2^H C^L}{1-p_2^H} + \frac{(1-Q)p_2^L C^L}{Q^2(1-p_2^L)} \\
&= \frac{p_2^H C^L}{Q(1-p_2^H)}\Big[\frac{p_1-p_1\bar{p}_2}{1-p_1\bar{p}_2} - \frac{1}{Q}\Big] + \frac{1-Q}{Q^2}\frac{p_2^L C^L}{1-p_2^L} \\
&< \frac{p_2^H C^L}{Q(1-p_2^H)}\Big[\frac{p_1-p_1\bar{p}_2}{1-p_1\bar{p}_2} - \frac{1}{Q}\Big] + \frac{1-Q}{Q^2}\frac{p_2^H C^L}{1-p_2^H} \\
&= \frac{p_2^H C^L}{Q(1-p_2^H)}\Big[\frac{p_1-p_1\bar{p}_2}{1-p_1\bar{p}_2} - \frac{1}{Q} + \frac{1-Q}{Q}\Big] \\
&= \frac{p_2^H C^L}{Q(1-p_2^H)}\Big[\frac{p_1-p_1\bar{p}_2}{1-p_1\bar{p}_2} - 1\Big] < 0.
\end{aligned}
$$

Thus, the expression on the right is smaller than before, so restructuring occurs for a wider range of parameters. We simply need to find parameters such that (1) efficiency is reached with LMTs, (2) not reached without LMTs, and (A.168) holds.