Distress Risk, Stock Returns, and the 1978 Bankruptcy Reform Act[1]

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Abstract

This paper employs a novel identification strategy around an important legal event to study the relation between distress risk and stock returns. Given the mixed evidence for distress risk premia in the cross-section of stock returns, we examine the impact of a major change in the bankruptcy code. The Bankruptcy Reform Act of 1978 unexpectedly increases shareholders' bargaining power in distressed reorganizations, leading, e.g., to large and widely documented violations of the absolute priority rule. We document that (1) the reform reduces portfolio- and firm-level distress premia along with characteristics of distressed stocks, such as CAPM betas and return standard deviations, (2) this reduction in distress premia due to reform-based shareholder advantage is weaker for firms with higher and with more substitutable firm-level shareholder advantage, and (3) the reform increases momentum profits for stocks of distressed firms. Finally, a significant increase in corporate bond credit spreads for riskier firms after the reform and lower distress premia for firms with absolute priority rule violations in bankruptcy provide supporting evidence for our identification strategy.

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1 Introduction

Co-movement in returns of financially distressed stocks is widely believed to make distress risk a systematic risk factor (Fama and French (1996)). Notwithstanding the compelling logic behind this widely held view, it has been surprisingly challenging to detect a positive distress risk premium. Empirical evidence is mixed and several studies even find significantly negative returns on distressed stocks (Dichev (1998), Griffin and Lemmon (2002), Campbell, Hilscher, and Szilagyi (2008)).

This paper uses an important legal event as a gauge for the relation between default risk and stock returns. We thus exploit an exogenous variation in the distribution of bargaining power in distressed renegotiations caused by a material change in the bankruptcy code, namely the Bankruptcy Reform Act of 1978 (henceforth, BRA). In essence, this new code has a major impact on distressed reorganizations because of a significant shift of bargaining power from creditors to debtors. Thus, the benefits for shareholders in financial distress are twofold. In case of an ordinary default due to insolvency, debtors can extract larger concessions from creditors in bankruptcy. In addition, there is an incentive to renegotiate debt by defaulting strategically (i.e., absent of insolvency), which in turn provides a credible threat in out-of-court restructurings. Following the BRA, we observe (1) a strongly increased incidence of corporate bankruptcy filings mostly driven by firms opting for reorganization, and (2) shareholders of financially distressed firms achieve higher deviations from the Absolute Priority Rule (APR) in bankruptcy proceedings, that is, equity obtains some value even when debt is not paid in full.[1] In addition, Franks and Torous (1994) establish that creditors are willing to accept even larger APR violations in distressed exchanges to avoid bankruptcy fillings.

Due to a complex codification process, it was difficult for lawmakers to foresee all the consequences of the reform for bargaining power. It was also difficult for market participants to anticipate the interpretation of the new code by bankruptcy judges, which contributed to the implications of the reform being unexpected. Therefore, the reform's actual (i.e., positive) effect on shareholders' bargaining power, both in formal bankruptcy and in private workouts, was hard to anticipate (Section 2.1 describes the institutional, legal, and legislative developments surrounding the BRA). This allows us to employ an identification strategy that is derived from three predictions for stock returns of distressed firms, which follow from a simple and widely used model with strategic debt service.[2]

[1] See Franks and Torous (1989), Eberhart, Moore, and Roenfeldt (1990), and Weiss (1990).

[2] See Fan and Sundaresan (2000), François and Morellec (2004), Davydenko and Strebulaev (2007), Hackbarth,

First, an increase in shareholders' bargaining power in bankruptcy should reduce the price of distress risk for equity. In particular, the adverse consequences of financial distress for shareholders decline if they can extract more from distressed firms (debt renegotiations, APR violations). Hence, stock returns of companies in or close to financial distress decrease relative to less distressed firms due to the BRA. Consistent with this prediction, we document a long-lasting and significant reduction of distress premia. During the 73 months before the passage of the reform, a long-short portfolio buying the most distressed quintile of stocks and selling the least distressed quintile yields reliably positive, average monthly returns of 1.70%. Abnormal returns are, on average, –0.07% and insignificant in the 73 months after the passage of the reform. Controlling for common risk factors, the monthly abnormal returns of the long-short portfolio decrease to 1.21% before and –0.12% after the BRA. Hence, shareholders reduce their return expectations by adjusting the price of distress risk following the BRA, which is consistent with a positive distress premium. In addition, we study firm-level stock returns, which produce qualitatively identical results.

These results are supported by a decline in characteristics of distressed stocks, such as CAPM betas and return standard deviations. We also verify the relevance of shareholders' bargaining power for stock returns of distressed firms by analyzing a hand-collected sample of bankruptcies for which previous studies, such as Franks and Torous (1989), report actual values of APR violations. For this uniquely identified subsample, we obtain reliably lower returns for firms with higher deviations from absolute priority when the firms are highly distressed.

Furthermore, we can also rule out that the results are due to a general decline in risk premia, as we confirm that price changes in the corporate bond market around the reform are consistent with our interpretation. Following a reduction in bondholder bargaining power, we observe a significant increase in corporate bond credit spreads for riskier firms after the reform, which is not driven by an increase in default risk. During the year prior to the passage of the reform, credit spreads remain almost constant, which confirms that the actual effect of the reform was largely unanticipated.

Second, we strengthen identification by exploiting firm-specific heterogeneity in shareholder bargaining power, which implies a differential impact of the reform on default risk pricing. Following Garlappi, Shu, and Yan (2008), who propose the concept of firm-level "shareholder advantage" (i.e.,

Hennessy, and Leland (2007), Garlappi, Shu, and Yan (2008), and Garlappi and Yan (2011). Extension to also allow for intensity-based, non-strategic default does not alter the model's predictions for stock returns of distressed firms.

the ability of shareholders to extract surplus from distressed firms) to explain the observed risk-return patterns, we allow for variation in shareholder advantage due to the reform. For example, firms with low asset tangibility that are more difficult to liquidate exhibit a higher degree of firm-level shareholder advantage, leading to lower distress premia. If the BRA is largely a substitute for this asset tangibility channel, then this channel should be economically and statistically less important after the reform.[3] In addition, if there is a significant reform-based effect on stock returns, heterogeneity in firm-level shareholder advantage proxies implies that the change in default risk pricing should be particularly strong for companies with little shareholder advantage prior to the BRA.

As suggested by the second prediction, stocks of firms with high firm-level shareholder advantage earn significantly lower distress premia during the pre-reform period. However, the return differential between distressed stocks of firms with high and low firm-level shareholder advantage is muted during the post-reform period. The reform's effect is also weaker for firms with a higher level of shareholder bargaining power (e.g., a lower tangibility ratio). That is, the monthly distress premium is 0.13% higher per tangibility ratio decile before the passage of the BRA, whereas after the reform there is no significant increase in distress premia for high tangibility firms with an insignificant increase of 0.01% per tangibility decile. Thus, the impact of firm-level shareholder advantage on stock returns of distressed firms is marginalized by the gain in reform-based shareholder advantage. These results lend further support to the view that the change in shareholder bargaining power due to the BRA drives the observed change in distress risk pricing.

While the first two predictions are consistent with a parallel shift of distress risk premia over the relevant range of default probability, the third component of our identification strategy follows from a potentially non-monotonic relation of default probability and expected returns for stocks at the extreme end of the default risk distribution. In this range of default probability, equityholders are increasingly likely to exchange a risky (levered) equity position for a less risky (de- or unlevered) cash position. This "de-leverage" effect of shareholder advantage reverses the standard "leverage" effect, which dominates for most of the range of default risk. Hence expected returns for the most part increase with default risk but decrease at the very high end of the default risk distribution, which stems from firm-level shareholder advantage and is strengthened by reform-based shareholder

[3] In addition to tangibility, we use firm size and research and development (R&D) intensity to proxy for firm-level shareholder advantage. We also confirm the theoretically predicted correlations between our proxies of firm-level shareholder advantage and observed deviations from absolute priority in a sample of firms that experienced APR violations.

advantage. Notably, a stock on the downward-sloping segment of the expected return profile will have lower expected returns after bad news and vice versa. Consistent with Garlappi and Yan (2011), realized returns predict changes in expected returns in the same direction (i.e., momentum) for the most distressed stocks. Relatively higher momentum profits for highly distressed stocks after the reform reinforce its effect on distress premia, because they are consistent with increased shareholder bargaining power that leads to a larger downward-sloping segment of the expected return profile (and to a smaller upward-sloping segment, implying weaker return reversals).

We examine the impact of the BRA on the profitability of standard momentum (portfolio) strategies. In particular, a long-short portfolio buying recent "winners" and selling recent "losers" should earn higher returns in the group of distressed stocks than among the least distressed stocks. Before the BRA, when shareholder advantage is limited, we find no reliably higher returns for the long-short portfolio among distressed stocks. Notably, after the reform, the monthly return to the long-short portfolio increases by 1.67% among the most distressed relative to the least distressed firms. Confirming the third theoretical implication, the return continuation (momentum) effect is stronger after the reform when shareholder recovery is documented to be higher.

Our findings survive various robustness tests. They are unaffected by the choice of the event date or time period. That is, all results are insensitive to three alternative event date definitions and larger or smaller time windows around the reform. A limited time period surrounding the BRA ensures that our identification strategy is informative. We also examine firm-level stock returns and introduce default risk as an explanatory variable. We find that stocks earn 0.38% higher monthly returns by moving into the next higher risk quintile before and insignificant –0.03% after the BRA. The monthly return per risk quintile drops to 0.19% before and –0.04% after the BRA when applying the Carhart (1997) four-factor model to calculate abnormal returns. In addition, firm-level analysis allows us to control for firm characteristics that potentially bias our portfolio-level results, e.g., industry fixed effects. Furthermore, after dropping the smallest stocks to alleviate liquidity concerns, the results remain qualitatively unchanged for both portfolio- and firm-level tests. Similarly, switching from monthly to annual updating of default risk portfolios yields qualitatively identical results. Finally, we compute both value-weighted and equal-weighted portfolio returns.

There are a number of broader implications of our results. First, we contribute to the literature in search of distress risk premia by providing evidence on rational pricing of default risk. In prior

studies, the price of default risk is potentially sensitive to the measure of default risk ranging from accounting-based models (Altman (1968), Ohlson (1980)) to structural debt pricing models based on Merton (1974). Furthermore, prior findings differ, e.g., depending on the portfolio formation strategy or the updating frequency of portfolios as well as the treatment of small, potentially illiquid stocks. We sidestep many measurement issues by using an identification strategy that focuses on *changes* in default risk pricing due to the BRA and keeps the methodology to determine default probability, portfolio formation, etc. constant.[4] Second, our findings advance the literature on bargaining in bankruptcy by focusing on the asset pricing implications of increased APR violations and bankruptcy filings. For both ordinary and strategic default, our results suggest shareholders' bargaining power is relevant for distress premia.[5] Third, the reform effect relates to the law and finance literature that identifies the impact of regulations on finance. More specifically, we show that the design of bankruptcy procedures (Bebchuk (2002)), and, in particular, the (in-)ability of creditors to enforce their claims (Djankov, Hart, McLiesh, and Shleifer (2008)) have important implications for the behavior of stock returns and the pricing of default risk.[6]

The rest of the paper is organized as follows. We provide details on the BRA and derive testable hypotheses in Section 2, Section 3 presents the data sources, and Section 4 describes our empirical strategy. In Section 5, we report the main results and provide additional supporting evidence in Section 6. Section 7 concludes.

2 Institutional Background and Theoretical Perspective

2.1 The Bankruptcy Reform Act of 1978

We start with briefly outlying the institutional background of the Bankruptcy Reform Act of 1978 and discuss how this reform influenced the distribution of bargaining power among creditors and shareholders in bankruptcy. On November 6, 1978, President Carter signed the BRA into law,

[4]Recently, Friewald, Wagner, and Zechner (2011) use another novel identification strategy by exploring the joint cross-section of credit default swaps and stocks from 2004 to 2010. Importantly, our results are in line with prior research finding negative distress premia after 1980 (see, e.g., Model 7 in Panel B of Table 4). Our methodology of *comparing* risk premia before and after the BRA allows us to identify a *change* in risk premia, which is consistent with *positive* distress risk pricing (see, e.g., Model 7 in Panel C of Table 4).

[5]For corporate bonds, Davydenko and Strebulaev (2007) study the influence of shareholders' strategic actions on credit spreads and find that the effect is statistically but not economically significant.

[6]See Favara, Schroth, and Valta (2011) for evidence on strategic default in an international cross-section of stocks.

replacing as of October 1, 1979 the Chandler Act of 1938.[7] According to Posner (1977) bankruptcy law under the Chandler Act was considered complicated and intolerably ambiguous, especially since the underlying laws were complicated and vague (see King (1979) for a detailed comparison of Chapter 11 to the pre-1978 bankruptcy laws). For this reason, large creditors and bankruptcy lawyers have been pushing for a reform in the bankruptcy code that resulted in the BRA of 1978. This new code included important legal changes that significantly improved shareholders' bargaining position. Since the codification was complex, it was difficult for lawmakers to foresee all the effects of this reform on the negotiation power of the different parties that are involved in bankruptcy proceedings (i.e., secured creditors, unsecured creditors, shareholders, and management).[8] Klee (1980) underlines that the BRA was not enacted in a simple procedure, and given it was such a major piece of legislation, the official documentation process was opaque. Thus, it was difficult for market participants to anticipate the effects of the reform and the interpretation of the new code by bankruptcy judges. These factors contributed to the implications of the reform being unexpected.

While liquidation proceedings were hardly affected by the BRA, reorganization under Chapter 11 has been amended considerably.[9] Reorganization procedures have been designed for firms that are temporarily in financial distress. Under Chapter 11, the "debtor-in-possession" continues the firm's operations, which leaves existing management in control, and rearranges the firm's debt structure under a plan (Klee (1979)). There are several procedures for formulating a plan that differ considerably from the pre-1978 bankruptcy code (White (1983, 1989)):

- Under the old code, a reorganization plan had to be approved by majority vote of all unsecured creditor classes. In contrast, the BRA requires that all classes of creditors and equity vote to approve the plan. As White (1989), p. 139, states: "For each class of creditors, the required voting margin in favor is at least two-thirds in amount of claims and one-half in number of claimants. For equity, the required voting margin is at least two-thirds in amount. Thus reorganization plans ... provide for a different division of the firm's assets than would

[7] Under the Chandler Act of 1938 failing firms could file for a reorganization bankruptcy under Chapter XI, and prior management continued to operate the firm in much the same form as before. One alternative form of business reorganization was Chapter X originally intended for public companies, but was rarely used in practice. (We consistently use Roman numerals to refer to the pre-BRA chapters and Arabic numerals for post-BRA chapters.)

[8] Posner (1977) outlines in detail the role of different interest groups during the formation of the new Act.

[9] Under the new code, a debtor may choose between liquidation under Chapter 7 and reorganization under Chapter 11. When a firm files for liquidation under Chapter 7, a trustee is appointed by the court who shuts down the firm, sells its assets and turns the proceeds over to the court for payment of creditors (White (1989)). Under liquidation, the absolute priority rule determines the priority ordering of the different claims.

occur under the APR liquidation rules" since every class "must receive something" to vote in favor of the plan. "Under the APR, equity and low priority creditors may quite possibly receive nothing at all." At the same time, management has the exclusive right to propose a plan for 120 days (and extensions to this exclusivity period are commonly granted) to encourage reorganization of the firm.[10]

- Another novelty of Chapter 11 relative to Chapter XI is so-called 'cramdown' reorganization.[11] If no plan is agreeable, 'cramdown' reorganization lets the firm continue operating while a buyer is sought for all or part of it as a going concern (see Klee (1979) for details). 'Cramdown' plans are subject to court-imposed discount rates and result in higher transactions costs compared to regular plans since the court typically requires appraisals by outside experts. It is considered as complicated and costly and therefore acts as a disciplining tool in negotiations. As such, Chapter 11's role is to "bring the parties to the bargaining table" (Broude (1984)) to "negotiate a plan even to the point that those holding senior interests allow junior interests to realize some distribution" (King (1979)).

- The conditions under which firms can voluntarily file for Chapter 11 changed. The pre-1978 law required a firm to be insolvent to voluntarily file for Chapter XI.[12] Under the new code, "Chapter 11 does not require that a debtor be insolvent in order to qualify for reorganization" (Bradley and Rosenzweig (1992)). "Such grounds of bankruptcy as insolvency no longer need to be shown—in fact, a debtor company may file for Chapter 11 for any legitimate business purpose" (Kaplan (1987)). This change enables debtors to use the threat of Chapter 11 as a strategic tool against creditors as will be outlined below.

The intention of the BRA was to balance the rights of creditors and debtors. Nevertheless, debtors were able to use the new bankruptcy legislation to better accomplish their own interests. LoPucki (1995) writes that "it also can be seen, in retrospective, that Chapter 11 gave debtors more control than necessary or appropriate." The sole right to propose a plan combined with the

[10] H.R.Rep.595, 95th Cong., 1st Session 232 (1977): "In most cases, 120 days will give the debtor adequate time to negotiate a settlement, without unduly delaying creditors." However, Weiss and Wruck (1998) argue that this is one of the two major reasons for why Chapter 11 exacerbates agency problems. Their case study of "Eastern Airlines" is an example of the failure of Chapter 11 to protect debtholders by facilitating wealth transfers to equityholders.

[11] Chapter X featured 'cramdown' reorganization but, in line with our arguments, it was hardly used (King (1979)).

[12] See Bradley and Rosenzweig (1992), footnote 6: "Compare Bankruptcy Act of 1898, paragraph 130(1), 323, 423, as amended by 11 U.S.C. paragraph 520, 723, 823 (1971) (requiring insolvency)."

modified voting procedures and the threat of 'cramdown' place management and hence equity in an excellent bargaining position in negotiations over the reorganization plan. To avoid unfavorable outcomes creditors are willing to accept a plan that violates absolute priority in favor of equity or give up part of their claims in out-of-court restructuring to avoid a bankruptcy filling.

The consequences of these changes to reorganization proceedings have been discussed widely in the law as well as finance literature. Theoretically, Bebchuk and Chang (1992) show that equityholders can extract value even when creditors are not paid in full under the new BRA.[13] Thus, one important implication of the BRA is the wide acceptance of deviations from the APR (e.g., Peeples (1989)). The motivation for allowing such deviations was the general perception that successful reorganizations are in the interest of both creditors and debtors as it was believed that the continuation of businesses rather than liquidation maximizes asset value. Additionally, bankruptcy judges were biased towards reorganization (LoPucki and Whitford (1990)). Therefore, they typically extended the exclusivity period, which was originally intended to be limited to 120 days for most cases to prevent equity from abusing it to dilute creditor claims. Accordingly, Kerkman (1987) states that creditor rights implemented in the law were in reality weakly enforced by bankruptcy judges, which further amplified the imbalance between creditor and shareholder bargaining power.[14] While claimants could hardly evade from the APR prior to 1978, the new code intended to facilitate consensual agreement on reorganization plans (LoPucki and Whitford (1990)) and hence relaxed the adherence to APR. More specifically, the BRA leaves the decision of the reorganization value of the firm to a process of bargaining among managers, equityholders and different classes of creditors (Bebchuk (1998)).

The empirical and anecdotal evidence on deviations from the APR under the new Act is remarkable. Notably, Franks and Torous (1989) "conjecture from the provisions of the 1978 code and from conversations with lawyers and a bankruptcy judge that deviations from absolute priority have increased as a result of the 1978 Act." LoPucki and Whitford (1990) document considerable

[13] Based on the observation that equityholders' consent is necessary, Bebchuk and Chang (1992) also list several reasons for APR violations: (1) equityholders have an "option value" that induces them to delay resolution unless they are compensated for giving it up early; (2) equityholders' early consent can limit "financial distress costs" borne by debt holders; (3) equityholders can initiate Chapter 7, which tends to produce larger losses for debt holders than Chapter 11.

[14] For instance creditors received the right to propose a reorganization plan after the exclusivity period elapsed. However, bankruptcy judges were reluctant to terminate the exclusivity period early and instead extended this period, which actually impeded creditors' position and debtors were successful in "dictating the terms of reorganization to their creditors" (LoPucki (1983)). As argued earlier, the effect of the reform was hard to anticipate given that shortening the previously unlimited exclusivity period reveals the legislator's intention to help creditors (not debtors).

distributions to equityholders of insolvent debtors as a consequence of bankruptcy reorganization of large, publicly held companies. They argue that payments made to equity are neither justified by financial nor legal considerations but result from the increased bargaining power of equity in Chapter 11. Deviations from the APR in favor of equity are frequently referred to as a "price of peace" by attorneys, in order to avoid costly cram down as well as a delay and extension of bankruptcy cases. Eberhart, Moore, and Roenfeldt (1990) report that equityholders receive, on average, 7.6% of the total awarded to all claimants in their sample of 30 filings under the BRA and that equity prices reflect deviations from the APR. Moreover, for a sample of 37 firms, Weiss (1990) finds violations of priority claims for 29 firms and this breakdown of absolute priority occurs primarily between unsecured creditors and equityholders. In addition to deviations from the APR in Chapter 11 cases, Franks and Torous (1994) establish that creditors are willing to accept even larger APR violations in distressed exchanges to avoid bankruptcy fillings to begin with. This provides further evidence for the statement of Franks and Torous (1989) that debtor protection is much greater after the BRA than that prevailing prior to the BRA, so that the increase in Chapter 11 fillings and attendant APR violations are just "the tip of the iceberg" of shareholder recovery under Chapter 11. Under reorganization all repayments to creditors are postponed until the process is complete and the average period spent in reorganization is nearly four years. Thus, the new Chapter 11 can be regarded as an important tool for managers and shareholders to settle disputes with creditors even if the firm is still solvent.

To summarize, the BRA had a major impact on corporate reorganization in financial distress. The increase in bargaining power for shareholders as a consequence of the BRA results in an increase of bankruptcy filings, especially of debtors filing for reorganization as shown in Table 1 (see column 1 and column 3). Besides the sharp increase in total filings following the BRA, the proportion among these firms filing for Chapter 11 has also increased strongly (see last column of Table 1).

[Insert Table 1 here]

2.2 Testable Hypotheses

This section introduces testable hypotheses that establish how stock returns are related to default risk around the reform. We establish the direction of the possible influence of the reform on stock returns under different assumptions, and identify conditions under which this influence of the BRA (overall and on the margin) is likely to be higher or lower. The three hypotheses presented below are

consistent with the intuition of many models of strategic debt service. In Appendix A, we demonstrate how our hypotheses can be derived in a simple framework of strategic debt service, which builds on Fan and Sundaresan (2000) and reinforces the insights from Garlappi, Shu, and Yan (2008) to derive the asset pricing implications of the reform. The first two hypotheses can also be obtained within the Merton (1974) model. Since the third hypothesis requires at least a three-period model, Appendix A contains a model based on Leland (1994) to derive the three testable hypotheses.[15]

Suppose that irrespective of the reform stockholders and bondholders of firm i play a Nash bargaining game with respective bargaining power η_i and $1 - \eta_i$, which might be determined by firm i's asset characteristics, complexity of debt structure, number of creditors, etc. The increase in deviations from absolute priority and the increase in the incidence of bankruptcy filings indicate an improvement of the bargaining position of shareholders vis-à-vis creditors due to the passage of the BRA. We model this additional bargaining power parameter that all firms' equityholders will obtain due to the reform by η_r, which might be an imperfect complement or substitute for η_i. Thus, we model shareholders' bargaining power for firm i, after the reform, as $\eta_i + \eta_r - \gamma_i \cdot \min\{\eta_i, \eta_r\}$, where $\gamma_i \in [0, 1]$ allows for firm-level heterogeneity of the reform's effect on the increase in shareholder advantage. A lower value of γ_i means that the reform is more complementary. On the other hand, a higher value of γ_i means that the reform is more substitutable and hence firms with an already high shareholder advantage do not gain as much as firms with low shareholder advantage prior to the reform. Intuitively, the value of γ_i depends on the nature of firm-level advantage shareholder and its overlap with the specific features of the BRA.

Figure 1 illustrates the testable implications for the relation between default probability and expected returns. For a set of baseline parameter values, the figure shows risk-return profiles before the BRA ($\eta_r = 0\%$) in the first panel and after the BRA ($\eta_r = 20\%$) in the second and third panels. In each panel, the black, dotted line represents no firm-level shareholder bargaining power ($\eta_i = 0\%$), the red, dashed line represents low firm-level shareholder bargaining power ($\eta_i = 10\%$), and the blue, solid line represents high firm-level shareholder bargaining power ($\eta_i = 20\%$).

[Insert Figure 1 here]

[15] Debt renegotiation requires a structural (diffusion) model rather than a reduced-form (intensity) model, which features exogenous (i.e., non-strategic) default. Our predictions derive from strategic default but also obtain in mixed reduced-form and structural models, such as the jump-diffusion model in Leland (2006), when debt renegotiation is feasible, so they are consistent with the possibility of non-strategic default following from intensity-based (jump) risk.

To begin, observe that shareholders' expected returns are weakly lower after the reform. That is, even in the special case of high substitutability ($\gamma_i = 1$), firms with a sufficiently low pre-form bargaining power ($\eta_i < \eta_r$) gain from the reform under this specification. Figure 1 shows that an increased value of the option to default strategically after the BRA decreases stock returns of firms across all levels of default probabilities. This is because equity's option to exchange risky physical assets for safe cash becomes increasingly valuable as the firm's financial health deteriorates. Hence, the adverse consequences in case of default for shareholders are mitigated by the reform, which leads to a reduction in expected returns of financially distressed stocks.

Hypothesis 1 *For a given default probability, expected returns should be higher before the reform. The magnitude of this reform effect increases with the firm's default probability.*

Another important issue is how the reform affects the relation between stock returns of financially distressed firms and firm-level shareholder advantage. Intuitively, prior to the reform shareholders of firms with a high shareholder advantage have the ability to extract higher rents through renegotiations with creditors. After the reform, shareholders of firms that were previously equipped with low shareholder bargaining power (i.e., a low value of η_i) are better protected by the bankruptcy law (i.e, the value of η_r is larger than the value of η_i), especially when the reform is largely complementary (i.e., a low value of γ_i in the second panel of Figure 1). In contrast, this effect is weaker for firms that are equipped with a higher degree of shareholder bargaining power to begin with (i.e., a high value of η_i) and that benefit relatively less from the reform because the potential gain in bargaining power is more of a substitute to their pre-reform shareholder advantage (i.e., a high value of γ_i in the third panel of Figure 1). For these firms, the effect of firm-level shareholder advantage should be more pronounced before the reform when their marginal effects are stronger. Because shareholders of all firms are subject to a minimum level of protection after the reform, the incremental value of firm-level shareholder advantage is lower.

Hypothesis 2 *The influence of firm-level shareholder advantage interacted with the firm's default probability on expected returns is weaker after the reform. The magnitude of this "interaction effect" declines more if the reform's effect on shareholder bargaining power is less complementary.*

Another risk implication of strategic debt service models is a hump-shaped relation between

default probability and expected returns. As seen in Figure 1, the reform strengthens the non-monotonic (and non-standard) effect of default risk on stock returns. The standard region in which the model produces an upward-sloping risk-return pattern shrinks, while the region with the downward-sloping risk-return relation grows due to the gain in bargaining power via η_r from the reform irrespective of the value of the complementarity parameter γ_i. Due to the larger downward-sloping region, there should be more return continuation (i.e., momentum) after the reform.

The logic behind this implication of the model is simple. It is based on the region in which expected returns are downward-sloping (i.e., the default probability is sufficiently high, so that the gains from the anticipated violation of the absolute priority rule outweigh the standard channel of default risk on returns). In this region of sufficiently high default probabilities at time t, subsequently bad shocks causing low returns in period $t+1$ further decrease expected returns for period $t+2$ and vice versa as implied by the downward-sloping risk-return pattern. Thus, Figure 1 implies, on average, more positive autocorrelation for high default risk stocks after the reform. Put differently, higher momentum profits are an unambiguous prediction for the high default risk range because the risk-return profile is more downward-sloping after the reform, especially for firms with no firm-level shareholder bargaining power ($\eta_i = 0\%$; black, dotted lines). At the same time, there might also be less negative autocorrelation (i.e., reversals) depending on where the option to exchange risky physical assets for safe cash becomes dominating and hence the hump-shape obtains.

Hypothesis 3 *On average, there should be an increase in return continuation (i.e., momentum) in high default risk portfolios after the reform relative to low default risk portfolios.*

3 Data Description

To investigate the BRA's effect on the pricing of default risk, we construct a sample that comprises 73 months before and after the passage of the reform. We classify monthly observations from October 1972 to October 1978 as the pre-reform sample and observations from December 1978 to December 1984 as the post-reform sample in our main analysis. Importantly, because contracts might change in response to the changes in the bankruptcy code and because bankruptcy proceedings are subject to changes even in the absence of regulatory changes, we focus on a limited time interval around the BRA to ensure that our identification strategy is informative. As several

studies document that bankruptcy proceedings significantly changed with creditors recovering a substantial part of bargaining power by the start of the 1990s (see, e.g., Skeel (2003), Bharath, Panchapegesan, and Werner (2008)), we restrict our sample to the first half of the 1980s. At the same time, we have verified that our results are robust to various event date definitions (i.e., passage or enactment of the reform or dropping the period between those two dates) as well as different sample periods (i.e., shorter time periods of 49 months around the reform or longer time periods of 97 months before and after the reform).

Accounting and stock market data are taken from the annual COMPUSTAT and the daily and monthly Center for Research in Security Prices (CRSP) databases and from Kenneth French's website. To measure default risk, we use Campbell, Hilscher, and Szilagyi's (2008) hazard model, which estimates the default probability in one year given survival after eleven months by optimizing accounting- and market-based explanatory variables applied in similar approaches (see, e.g., Shumway (2001)).[16] The parameters of the model are annually updated starting in 1981 using historically available data only to avoid look ahead bias.[17] Since our data analysis starts in 1972, we apply the first available estimates from 1981 to the preceding years. The explanatory variables of the model comprise the relative size of the firm, the past return in excess over the market return, net income to the sum of total liabilities and market capitalization, total liabilities to the sum of total liabilities and market capitalization, cash and short-term assets to the sum of total liabilities and market capitalization, the standard deviation of daily stock returns over the past three months, and the market-to-book ratio. The accounting variables are based on the prior fiscal year end, the market-based variables are updated every month. For a firm-month observation to be included, we require that information is available from the annual COMPUSTAT database as well as the daily and monthly CRSP databases. Following standard practice, we drop financial and utility firms (SIC codes 4900-4999 and 6000-6999).

Table 2 summarizes the sample properties of the variables for the default measure. It reveals that the descriptive statistics of the model's explanatory variables for our sample period are similar

[16] Appendix B provides brief description of the hazard model and variable definitions. The default probability computed by Campbell, Hilscher, and Szilagyi (2008) is not a cumulated default probability for the 12 months period. However, we refer to the Campbell, Hilscher, and Szilagyi default measure using the expressions "default probability" or "default risk" since for our analysis the ranking of firms according to their default measure suffices.

[17] We are grateful to Jens Hilscher, who provided us with the annually updated parameter estimates for the model.

to those reported in Campbell, Hilscher, and Szilagyi (2008).

[Insert Table 2 here]

In Table 3, we split the sample into (monthly updated) decile portfolios according to their default risk measure, and summarize sample averages of the default measure, portfolio returns, and portfolio characteristics, such as CAPM betas and standard deviations, for the pre- and post-reform subsamples. Panel A reveals that the average default measure (in basis points) is not higher for the top quintile (decile) portfolio before the reform. Hence, our results are not driven by a decrease in default risk after the passage of the BRA. Panels B and C, which show, respectively, average equal- and value-weighted portfolio returns (percentage points) per month, are precursors of our first finding in that the reform leads to a larger reduction of stock returns for more distressed companies. Panels D, E, and F report relevant characteristics for the portfolios: the annualized standard deviation of each portfolio's return, the value-weighted standard deviation of individual stock returns in each portfolio, and the CAPM betas for value-weighted portfolios. Notice that, for the full sample, the portfolio characteristics are comparable to the ones reported by Campbell, Hilscher, and Szilagyi (2008, 2011). We discuss the implications of the pre- and post-reform portfolio characteristics in Section 5.1 when we interpret our first finding.

[Insert Table 3 here]

Finally, for a small sample of firms we are able to collect data on actual occurrences of APR violations in bankruptcy proceedings. We construct a data set from three empirical studies on deviations from absolute priority (i.e., Franks and Torous (1989), Eberhart, Moore, and Roenfeldt (1990), and Weiss (1990)) and examine those firms' stock returns. The first two papers document computed values for deviations from the APR, whereas Weiss (1990) only documents whether deviations from the APR occur or not.[18] In Appendix C, we provide a list of firms that we were able to match with COMPUSTAT or CRSP data for the relevant tests.

[18]For some firms, both Franks and Torous (1989) and Eberhart, Moore, and Roenfeldt (1990) report APR violations. In these cases, we use the estimates of Franks and Torous. The results are unaffected by this choice.

4 Empirical Strategy

4.1 Default Risk and Stock Returns

To test our first hypothesis, we sort stocks into quintiles (deciles) according to their default measure every month. Following common practice, we skip one month between portfolio formation and computation of portfolio returns. We apply standard factor models, the CAPM, the Fama and French (1993) three-factor model, and a four-factor model including the Carhart (1997) momentum factor to calculate abnormal portfolio returns using data on the factor-mimicking portfolios from Kenneth French's data library. The appeal of estimating abnormal returns using this approach is that it has been purged for the covariance of the portfolio's return with the market and the additional factors of the model. This is particularly important since firms at different levels of distress risk feature distinct characteristics concerning their returns' covariance with the models' factors. Applying various common factor models ensures that results are insensitive to the choice of factor model.

Provided systematic factors not captured by the factor model affect all portfolio returns, the abnormal portfolio returns may be biased. In fact, they not solely incorporate the pricing of default risk, but additionally incorporate other systematic factors the factor-mimicking portfolios fail to account for. To control for such systematic factors, we compute monthly abnormal returns of a long-short portfolio investing in the riskiest stocks and selling the safest stocks. This long-short portfolio approach removes any time-specific bias that affects all firms equally.We test the hypothesis that the long-short portfolio's abnormal return is equal to zero and interpret a rejection of the hypothesis as evidence for the existence of a risk premium on distressed stocks. We apply the model separately to the periods before and after the BRA and finally the entire sample period including a reform dummy taking the value of one for the post-reform period. We exclude the observations from the month when the Act was signed into law. In addition, we analyze firm-level abnormal returns, introducing default risk as explanatory variable on the right-hand side of the equation. For this specification, we split the stocks into quintiles (deciles) according to their risk measure each month. The default risk variable ranges from 1 for the safest stocks to 5 (10) for the riskiest stocks.

4.2 Heterogeneity in Firm-Level Shareholder Advantage

We test our second hypothesis by allowing for a differential effect on firms, i.e., exploiting heterogeneity in firm-level shareholder advantage. We use three proxies of shareholder advantage, which have been found to be reflected in stock returns. The first proxy is firm size. APR deviations are more common for large firms (Weiss (1990), Betker (1995)) since they tend to have more dispersed, and public bond ownership with atomistic bondholders. Thus, the coordination of creditors' interests is complex compared to concentrated lenders in small firms. We define firm size as logarithm of total book assets ($log(at)$) since market capitalization of distressed firms is often artificially low, not reliably reflecting creditor structure. Second, we use R&D intensity to proxy for shareholder advantage as distressed firms with high R&D ratio feature a lower ability to withstand liquidity shortages (Opler and Titman (1994)). These firms' urgent need of liquidity weakens their bargaining power vis-à-vis creditors. We define R&D intensity as R&D expenditures scaled by total assets and transform it into a rank variable (xrd). Finally, it tends to be easier and more profitable for creditors to liquidate firms with more tangible assets. High tangibility thus decreases shareholders' bargaining power (Bergman and Callen (1991)). We define tangibility as plant, property and equipment scaled by total assets and transform it into a rank variable ($tang$) (see Garlappi, Shu, and Yan (2008) for a more detailed motivation of these shareholder advantage proxies).

We investigate firm-level heterogeneity by estimating the specification from Garlappi, Shu, and Yan (2008) for the periods before and after the reform separately. We include all firm-month observations for which we can obtain values for all shareholder advantage proxies from the annual COMPUSTAT database. Using Fama and MacBeth (1973) regression analysis, we estimate:

$$\begin{aligned} ret_{it+2} &= \alpha + \beta_1 \cdot equity\ beta_{it} + \beta_2 \cdot log(at)_{it} + \beta_3 \cdot log(bm)_{it} + \beta_4 \cdot pastret_{it} + \beta_5 \cdot default_{it} \\ &\quad + \beta_6 \cdot SA\ proxy_{it} + \beta_7 \cdot default_{it} * SA\ proxy_{it} + \epsilon_{it} \end{aligned} \tag{1}$$

where ret_{it+2} is a firm's return two months after default measure computation, $equity\ beta_{it}$ is calculated in a rolling window every month from daily stock returns, $log(at)_{it}$ is the logarithm of total assets, and $log(bm)_{it}$ is the logarithm of the book-to-market ratio. We calculate the market value of equity as the firm's market capitalization and follow the approach outlined in Cohen, Polk, and Vuolteenaho (2003) to compute the book value of equity. The variable $pastret_{it}$ is a firm's

past return from $t-5$ to t and $default_{it}$ is a rank variable normalized between 0 and 1, based on the monthly updated default measure. Finally, the variable $SA\ proxy_{it} \in \{log(at)_{it}, xrd_{it}, tang_{it}\}$ is the respective proxy for shareholder advantage, where we independently split the sample into deciles according to firm size, R&D intensity, and asset tangibility ratio. We interpret a relatively stronger effect of firm-level shareholder advantage before the reform when shareholders are less protected by the bankruptcy code (and hence the marginal effect of shareholder advantage proxies matters more) as evidence for the relevance of reform-based shareholder advantage.

As a motivation for the economic underpinnings of the test design proposed by Garlappi, Shu, and Yan (2008), we investigate whether firms with higher shareholder advantage experience higher APR violations in a number of actual bankruptcy cases. We construct a data set on APR violations from Franks and Torous (1989) and Eberhart, Moore, and Roenfeldt (1990). We include all cases with APR violations, for which we can calculate the respective shareholder advantage proxy using COMPUSAT data and where bankruptcy proceedings do not exceed a period of five years. Figure 2 plots firms' APR violations on the vertical axis and the value of the respective shareholder advantage proxy on the horizontal axis. Deviations from the APR should be higher for firms with a high book value of assets, while firms with a high level of tangibility should exhibit lower deviations from the APR. Despite of the small sample size, the scatter plots in Figure 2 are indicative of these relations between firm-level shareholder advantage and APR violations and hence support the validity of the shareholder advantage proxies used in the literature.[19]

[Insert Figure 2 here]

4.3 Return Continuation and Momentum Strategies

Additionally, we examine the impact of the BRA on the profitability of momentum strategies. This set of return continuation tests is particularly interesting for our purposes, since it allows us to study the interaction between default risk, stock returns, and shareholder advantage in another application. We follow the "6-1-6" strategy of Jegadeesh and Titman (1993) to compute momentum returns. At the beginning of each month, we sort stocks separately into quintiles according to their past return from $t-6$ to $t-1$ and their default probability at $t-1$. The "winner" portfolio invests

[19] We cannot obtain reliable evidence for the R&D proxy, since there are only six firms reporting R&D expenditures in COMPUSTAT among the hand-collected sample firms. We thank Julian Franks for suggesting this analysis to us.

$1 value-weighted (equal-weighted) in all stocks in the top quintile according to their past return at time t and sells stocks identically added six month before at time $t-6$. The "loser" portfolio is formed in the same way for the stocks in the lowest quintile of past returns. Momentum profits of the "6-1-6" strategy are calculated as the difference in returns of the winner and the loser portfolio over the period from $t+1$ to $t+6$. We compute momentum profits for unadjusted returns and for returns adjusted by a market factor. As described by the third hypothesis, there should, on average, be higher momentum profits in high default risk portfolios subsequent to the BRA because of the rise in shareholder advantage. By comparing momentum profits across default risk quintiles before and after the BRA, we obtain an alternative channel to validate the decrease in distress premia of financially distressed stocks due to an increase in shareholder advantage.

5 Results

5.1 Default Risk and Stock Returns

We begin with a graphical analysis of portfolio returns. Figure 3 examines the reform effect on default risk pricing by plotting cumulated monthly returns of the long-short portfolio buying the firms in the top quintile (decile) of the default risk measure and selling the stocks in the lowest quintile (decile). The vertical line represents the passage of the BRA in November 1978. The red, dashed lines chart unadjusted returns and the blue, solid lines chart returns adjusted for market, size, book-to-market, and momentum factors. The graphs provide evidence that there is a distinct change in default risk pricing around the passage of the BRA.

[Insert Figure 3 here]

Consistent with economic intuition, the reform effect is stronger when comparing firms in the top and the bottom deciles rather than quintiles. In the 49 months period before the BRA, the abnormal return of the highest risk quintile in excess of the lowest risk quintile portfolio accumulates to 75% for adjusted and 125% for unadjusted returns. In the 49 months period after the Act, the accumulated excess return is negative with –9% for adjusted and positive with 1% for unadjusted returns. For the portfolio including the firms in the top decile of our default risk measure, the accumulated portfolio returns are 105% for adjusted and 175% for the unadjusted returns. After the reform, the

accumulated portfolio returns are significantly lower with 12% for adjusted and 20% for unadjusted returns. Observe also that the change in distress premia is persistent for the entire period and largely unaffected by the impact of recessions, represented by the gray, shaded areas in Figure 3.[20] Thus, the results provide evidence of a stable trend instead of being driven by a short period of extreme returns. Taken together, the evidence in Figure 3 supports the validity of our identification strategy.

Figure 4 displays the magnitude of the reduction in risk pricing due to the reform for portfolios split according to their default measure. Panel A shows quintiles, whereas Panel B depicts the reform effect for risk deciles. The return on the highest risk quintile is reduced by –1.41% per month for the adjusted and –1.12% for the unadjusted returns in the 49 months after the BRA compared to 49 months before the reform. For the lowest risk quintile the return slightly decreases by –0.07% for the adjusted and increases for the unadjusted returns by 0.69% suggesting that the effect of the reform is strong for distressed firms but marginal to the firms most unlikely to enter financial distress. The reform effect is clearly monotonic for unadjusted returns with a slightly steeper slope at the high end of the default risk distribution. For adjusted returns, the effect is almost monotonic and exhibits the steepest slope for the high default risk portfolio, indicating that the reform has the strongest impact on highly distressed stocks. The results in Panel B are similar. As expected, the differences are stronger when focusing on the top and bottom decile of the default risk distribution. The monthly return for the portfolio of the most distressed firms decreases by –1.64% for adjusted and –1.68% for unadjusted returns, whereas the return of the portfolio comprising the least distressed ten percent of stocks is basically unaffected with a monthly decrease of –0.14% for the adjusted and increase of 0.76% for the unadjusted returns. The effect is strictly monotonic for the unadjusted returns and clearly downward trending for the adjusted returns.

[Insert Figure 4 here]

Next, we examine the statistical significance of the graphical analysis. Table 4 shows the results of the portfolio-level analysis. Panel A shows the results for the period before the BRA (October 1972 to October 1978), whereas Panel B shows the results for the period after the Act (December 1978 to December 1984). In Panel C the displayed number is the coefficient of a reform dummy

[20] During our sample period there are several recessions according to the National Bureau of Economic Research's Business Cycle Dating Committee: November 1973 to March 1975, January 1980 to July 1980, and July 1981 to November 1982. This information is available on the National Bureau of Economic Research (NBER), Inc.'s website.

taking the value of one after the passage of the BRA and zero before. The coefficient can be interpreted as the change in monthly returns of the long-short portfolio buying the quintile of most distressed stocks and selling the quintile of least distressed stocks after the reform relative to the pre-reform period.

[Insert Table 4 here]

Model A presents the monthly abnormal return on an equal-weighted portfolio comprising the quintile of riskiest firms one month after portfolio formation. We observe significantly positive abnormal returns before the reform with 1.66% per month. However, there are no significant abnormal returns after the reform. As shown in Panel C, monthly abnormal returns on the portfolio comprising the riskiest quintile of firms decrease by 1.41% after the reform. Model A does not control for common systematic factors affecting all stocks. We control for such factors in Models 1-7 with our long-short portfolio buying the riskiest 20% and selling the safest 20% of stocks. In Models 1-4, we apply different factor models; the Carhart four-factor model controlling for market return, size, book-to-market ratio, and momentum (Model 1), a model with only a constant (Model 2), the CAPM (Model 3), and the Fama and French three-factor model (Model 4). Models 1 and 2 are the statistical counterparts of the graphical analysis in Figures 3 and 4. For all models, there is a statistically significant excess return for the quintile of the riskiest firms over the quintiles of safest firms before the reform ranging from 1.01% in the Fama and French three-factor model to 1.70% for unadjusted returns in Model 2. After the reform, shareholders no longer require a distress premium regardless of the factor model applied as displayed in Panel B. Panel C reveals a reduction of the distress premium through the BRA. The magnitude ranges from –1.34% in case of the Carhart four-factor model to –1.76% for the unadjusted returns. The effect is economically and statistically significant in all specifications. We interpret this observation as evidence for a reduction in the share of default risk borne and hence priced by shareholders of distressed firms due to the BRA. That is, for the same level of distress the negative consequences for shareholders are mitigated by increased shareholder recovery induced by the BRA.

Models 5-7 display the outcomes of various robustness tests applying the Carhart four-factor model. Model 5 excludes stocks with prices below $1 to reduce concerns about unobserved liquidity factors influencing our findings. Compared with the full sample, the magnitude of the return reduction induced by the reform declines from –1.34% to –1.02%. However, since the excluded stocks

also tend to be among the most distressed, it is not clear whether the reduction can be attributed to the elimination of liquidity factors or simply to the exclusion of some of the most distressed stocks. Next, instead of updating the default risk portfolios every month, Model 6 updates them in January each year. This addresses the concern that frequent updating biases portfolio returns by tracking only badly performing stocks in the group of distressed stocks, whereas well performing stocks are continuously removed from the portfolio. The reform effect drops to –0.98%, which is intuitive since infrequent updating of the default measure leads to stocks remaining in the quintile of most distressed stocks even after significantly improving their financial situation and vice versa. In Model 7, the portfolio returns are calculated by weighting each firm's return by its market capitalization. Interestingly, for value-weighted returns, there is no reliably positive risk premium prior to the BRA, but a significantly negative premium after the reform.[21] The negative post-reform premium for value-weighted portfolios after the reform is a replication of the findings in Campbell, Hilscher, and Szilagyi (2008) for our shorter time period, since they investigate distress premia for value-weighted portfolios after 1980 applying the same hazard model. The reform effect remains negative (i.e., –1.02%) for value-weighted portfolios and significant at the 5% level. The differences between equal- and value-weighted portfolios are in line with earlier findings in the literature. Previous empirical studies suggest that there are positive abnormal returns for firms with a high default risk measure in equal-weighted portfolios (Vassalou and Xing (2004)), whereas value-weighted portfolios show negative excess returns for stocks at the high end of the default risk distribution (Griffin and Lemmon (2002), Campbell, Hilscher, and Szilagyi (2008)). In value-weighted portfolios the smallest and most distressed stocks are given only marginal weight. Therefore, their impact on portfolio returns is negligible. In sum, the results of Table 4 confirm our first hypothesis that the pricing of default risk is reduced as a consequence of the BRA and the associated increase in shareholder advantage. The difference between equal-weighted and value-weighted portfolios underlines the sensitivity of the results to the selection of estimation technique that we can sidestep by our identification strategy of focusing on changes in distress premia and differencing out technical biases by keeping them constant when calculating risk premia before and after the reform.

The portfolio characteristics reported in Table 3 are in line with the estimation results and verify that what we observe is indeed a pricing effect. While the average default measure of the riskiest

[21] This result is in line with Chava and Purnanandam (2010) who find negative excess returns on high default risk portfolios after 1980 and no significantly negative returns before 1980.

20% of firms is *not* lower after the reform (Panel A), the riskiness of these stocks decreases as indicated by reductions of individual and portfolio return volatilities (Panels D and E). In addition, Panel F shows lower CAPM betas after the reform. As the average distress risk of firms in the top quintile is unchanged, these results suggest a shift in recoveries from debtholders to equityholders (i.e., for the same level of firm risk, risk premia decrease for stocks and increase for bonds). While there is no general reduction of distress risk for the most distressed firms after the reform, risk exposure for shareholders is reduced through the increase in shareholder recovery. Importantly, those changes are only present in the group of distressed firms, whereas the safest firms exhibit no or only mild changes in returns,[22] volatilities, and CAPM betas after the reform. Taken together, this further strengthens the evidence that the BRA, which is most relevant for distressed firms, is the source of the patterns that we find in the data.[23]

We next turn to firm-level analysis of stock returns and default risk surrounding the BRA, which is gathered in Table 5. The dependent variable is the abnormal return for each firm one month after the calculation of the default risk measure. We introduce a default risk (rank) variable on the right-hand side of the equation. For this independent variable, firms are split into quintiles according to their default risk measure. A positive value of the coefficient for the default variable indicates a positive risk premium for distressed stocks. The results for the pre-reform subsample are displayed in Panel A, the results for the post-reform subsample in Panel B. Panel C contains the specification for the entire sample additionally introducing a reform dummy. For Models 1-4, the coefficient estimates for the default risk measure are economically and statistically significant before the reform and insignificant after the passage of the Act. The risk premium is highest for unadjusted returns with 0.38% per default risk quintile and smallest for the Carhart (1997) four-factor model with 0.19% per default risk quintile. The reform effect is strongest for the unadjusted returns with –0.45% and weakest for the Carhart (1997) four-factor model with –0.24% per default risk quintile. Similar to the portfolio-level analysis, Models 5-6 confirm that the reform effect survives changes in the portfolio formation strategy and the exclusion of potentially illiquid (i.e., small) stocks. Additionally, Model 7 verifies that the results are robust to the inclusion of industry fixed effects controlling for industry-specific factors. Finally, for both portfolio- and firm-level re-

[22]Note that, while unadjusted returns for the safest stocks are higher after the BRA, returns adjusted for a market, value, size, and momentum factor are almost identical for safe stocks before and after the BRA (see Figure 4).

[23]This evidence is even more striking in combination with the increase of credit spreads on BAA- over AAA-rated corporate bonds after the reform (see Section 6.2 for a discussion of corporate bond yields surrounding the BRA).

turns, we verify that including dummies for the NBER recessions during our sample period leaves our results qualitatively unchanged. Overall, these findings indicate a positive risk premium for distressed stocks, which is not limited to the extreme end of the default risk distribution, but tends to be monotonic as the analysis in Figures 3 and 4 suggests.

[Insert Table 5 here]

5.2 Shareholder Advantage Proxies and Stock Returns

We validate our identification by exploiting firm-level heterogeneity in shareholder advantage (η_i). Tables 6 and 7 confirm the second testable hypothesis statistically.[24] The results for the pre-reform sample is displayed in Table 6 and for the post-reform sample in Table 7. Model 1 confirms that the control variables enter with the expected sign in both models. Large firms earn lower returns, while high book-to-market and high momentum stocks earn higher returns in both subsamples. The comparison of Model 2 in Tables 6 and 7 confirms in a cross-sectional regression our previous findings that the BRA reliably reduces the distress premium. Before the reform the coefficient estimate on $default$ is insignificant, whereas after the reform it is significantly negative. Hence, the reform effect on the distress premium confirms previous tests in this different estimation framework.

[Insert Table 6 here]

As outlined in Section 4.2, our shareholder advantage proxies are firm size ($log(at)$), R&D ratio (xrd) and tangibility ratio ($tang$). Models 3 and 4 confirm that before the reform there is an economically and statistically significant shareholder advantage effect as indicated by a negative coefficient on the interaction term of firm size with the default measure in Model 3 and a positive interaction term of R&D ratio and the default variable in Model 4. The negative interaction term in Model 3 means that shareholders of distressed firms expect lower returns in large firms because their bargaining power is higher. The positive coefficient in Model 4 indicates that shareholders of firms that are less likely to experience liquidity shortage in distress (i.e., firms with a lower R&D ratio) expect lower returns when firms are distressed. The results confirm our conjecture that for

[24] In untabulated tests, we replicate the regression analysis of Table 6 in Garlappi, Shu, and Yan (2008), who use EDF of Moody's KMV as default risk measure. We confirm their findings for our default risk measure and, in particular, for our specific (i.e, much shorter) sample period.

shareholders with a higher bargaining power in renegotiations (i.e., higher η_i) the consequences of financial distress are weaker. The results in Model 5 show a weaker effect for tangibility. The coefficient estimate for the interaction term of default risk and tangibility has the expected sign, but it is economically and statistically weaker than for the other proxies. In Model 6, when all shareholder advantage proxies enter the regression simultaneously the significance of the interaction between tangibility and default risk increases materially. This might be due to the fact that firms with less tangible assets often exhibit higher R&D ratios and the effect of tangibility appears only after accounting for this correlation. The positive coefficient on the interaction term provides evidence that shareholders of firms with a higher tangibility ratio expect higher returns when firms are financially distressed since the ease of liquidation leaves them with reduced bargaining power.

For the period after the BRA, the bargaining power proxies in Models 3-5 exhibit lower economic and statistical significance levels and their impact on distress premia is not significantly different from zero. Hence, the relevance of firm-level shareholder advantage is reduced. The positive effect of the reform on shareholders' bargaining power equips all shareholders with a minimum level of bargaining power, particularly ameliorating the position of shareholders in firms with previously low levels of shareholder advantage. Altogether, comparison of Tables 6 and 7 confirms that shareholder advantage changes significantly through the passage of the BRA. In line with the discussion on complementarity of firm-level and reform-based shareholder advantage in Section 2.2, the reduced impact of firm-level shareholder advantage through the reform is economically and statistically significant. That is, statistical significance for coefficient estimates of the interaction terms to be different is highest for large firms (at the 1% level) followed by firms with a low level of tangibility (at the 10% level). For firms with a low R&D ratio the differential effect of the reform is the weakest. This finding strengthens our identification strategy by ruling out alternative explanations that can explain a reduction in default risk pricing after the reform other than a change in bargaining power, but cannot explain the differential impact on firms at different levels of pre-reform shareholder advantage.

[Insert Table 7 here]

The BRA has a differential impact on firm-level shareholder advantage proxies depending on how substitutable reform-based shareholder advantage is to firm-level shareholder advantage (i.e., the level of γ_i). Recall that, e.g., for small firms the concentrated creditor structure facilitates the

coordination of creditors' interests and gives creditors higher bargaining power in renegotiations. Through the BRA shareholders gain bargaining power as they can, e.g., threaten creditors to extend bankruptcy proceedings regardless of creditor structure. This reduces the difference in relative bargaining power between shareholders of small and large firms and hence the difference in distress premia. The pre-reform estimate of β_7 equals –0.39% (statistically significant at the 5% level). After the reform, the decrease of distress premia with firm size drops economically (i.e., $\beta_7 = -0.12\%$) and vanishes statistically. Hence, we observe a substitutable effect of the reform on stock returns of large and small firms (i.e., a high γ_i). Our estimation results also indicate that tangibility provides largely substitutable bargaining power relative to reform-based bargaining power. That is, the increase in the distress premium is 0.13% lower per tangibility ratio decile before the passage of the BRA (significant at the 5% level), whereas after the reform it is insignificantly higher at 0.01% per decile. Yet, the situation is different for shareholders of firms with high R&D ratios. When entering bankruptcy, such firms are subject to liquidity problems, which weakens shareholders' bargaining position. Shareholders of such firms are not capable of exploiting the increase in bargaining power induced by Chapter 11 fully due to their urgent need for liquidity (i.e., a low γ_i). This explains the lower reduction in the relevance of firm-level shareholder advantage for firms with more R&D, which captures a more complementary bargaining power effect relative to reform-based bargaining power.

5.3 Return Continuation and Momentum Strategies

Next, we focus on return continuation (i.e., momentum returns) before and after the reform. Table 8 shows the profitability of the momentum strategies for portfolios with different default risk characteristics. During the pre-reform period (Panel A), the value-weighted portfolio buying past "winners" and selling past "losers" earns average monthly momentum returns of 1.37% among the stocks in the lowest quintile of default risk. Among the stocks in the highest quintile of default risk the same portfolio earns monthly momentum returns of 0.73%. Following our previous analysis, before the reform a higher price of default risk is associated with higher return expectations of shareholders. Consequently, a negative shock to the firm leading to negative returns and an increase in default probability induces higher expected returns, particularly at the high end of the default risk distribution. This return reversal effect leads to lower momentum profits for high default risk

firms than for low default risk firms. The results are similar for equal-weighted portfolios.

[Insert Table 8 here]

After the BRA, shareholders are equipped with a higher level of bargaining power and hence the risk-return relation is more downward-sloping at the extreme end of the default risk distribution. Consequently, a positive past return associated with a decrease in default risk no longer leads to lower expected returns (as in the region of an upward-sloping risk-return pattern) but to higher expected returns in the future for highly distressed stocks. Accordingly, return reversals that are relatively more prominent before the reform are replaced by return continuation, especially at the high end of the default risk distribution. Panel B of Table 7 shows that the monthly momentum return of the portfolio buying past winner and selling past losers is 0.54% among the least distressed and 1.56% among the most distressed quintile of stocks showing a positive momentum effect in the group of financially distressed stocks. The difference in momentum profits between the riskiest and safest stocks is statistically significant with 1.02% per month. For equal-weighted portfolios, there is no significant difference between the group of least distressed and the group of most distressed stocks. For the stocks in the safest quintile of the default risk distribution the portfolio return is 0.91% per month and 1.02% among the stocks in the quintile of stocks with the highest default probability. Panel C displays the results of the reform effect. After the BRA the average monthly return of the buying-winners-selling-losers portfolio decreases by –0.83% among the 20% of least distressed firms, whereas the portfolio's return increases by 0.84% per month for the most distressed firms. Hence, the increase among the riskiest firms is higher by 1.67% per month than among the safest stocks and statistically significant at the 5% level. This confirms the hypothesized relation between default risk and momentum returns within our relatively small sample period. Returns adjusted for a market factor (Panels D-F) deliver qualitatively similar results.[25]

[25]This is consistent with the evidence in Avramov, Chordia, Jostova, and Philipov (2007) for firms with low S&P firm-level credit ratings over the 1985-2003 period and Garlappi and Yan (2011) for firms with a high EDFs of Moody's KMV over the 1969-2007 period. These authors' much larger samples produce momentum profits even after controlling for a market, a size, a value, and a momentum factor. Strictly speaking, the momentum prediction from Section 2.2 only applies to unadjusted returns.

6 Supporting Evidence

6.1 The Effect of Actual APR Violations on Stock Returns

To provide additional evidence on the relation between distress premia and shareholder advantage, we use data on actual APR violations as described in Section 3. We obtain stock returns in CRSP for 29 of these firms during our sample period (see Appendix C). For each firm, we identify the maximum of its default risk measure and analyze stock returns in the subsequent months when the firm is most distressed. We regress the firm's stock returns for the 24, 12 and 6 months after the maximum of its default risk measure on an APR dummy, taking the value of one if the firm exhibits deviations from absolute priority in Chapter 11 reorganizations.[26] We examine both raw returns and returns adjusted for a market, size, value and momentum factor.

The estimation results are displayed in Table 9. Columns 1-3 show findings for adjusted returns. For the 24 months after reaching the maximum of the default risk measure, firms with APR violations in Chapter 11 earn reliably lower monthly returns of 14.60% compared to firms without APR deviations. The magnitude of this effect becomes even stronger when looking at a shorter interval of monthly returns after the determination of the maximum default risk. The results for unadjusted returns are shown in columns 4-6. For the 24 months after the firm reached its maximum default risk, firms with APR violations earn significant 8.37% lower monthly returns. The magnitude also increases for unadjusted returns for shorter intervals, with 15.68% lower returns on stocks with APR violations for the six months after the firm reaches its maximum of the default measure. Thus, stockholders of firms that exhibit APR violations in bankruptcy proceedings demand lower distress premia. Those results strengthen the connection between shareholder recovery and return expectations, and therefore reinforce the view that shareholder advantage is an important factor in explaining distress premia in the cross-section of stock returns.

[Insert Table 9 here]

[26] Unreported results for crossing sufficiently high cutoffs of the default measure instead of the maximum are qualitatively similar but quantitatively smaller, as firms are then less distressed when we study their stock returns.

6.2 The Effect of the BRA on Corporate Bond Yields

An alternative explanation that is in line with most of our findings would be a general decrease in risk premia for distressed firms after 1978 that is not associated with the reform. This would explain the decline in characteristics, such as CAPM betas and portfolio- and firm-level return standard deviations documented in Table 3, and to some extent the reduced relevance of firm-level shareholder advantage proxies as seen in Tables 6 and 7 (if firms are less prone to default risk, then debtors' gain in bargaining power vis-à-vis creditors in renegotiations should be less important). In other words, bankruptcy proceedings may have become more efficient for both creditors and debtors reducing some of the adverse effects of financial distress. Corporate bond yields allow us to differentiate between an increase in shareholder advantage (at the expense of creditors) and a general reduction in risk premia for bonds and stocks of distressed firms. While we would expect that a general decline in adverse consequences of distress translates into lower credit spreads on corporate bonds, an increase in shareholder advantage worsens bondholders' position in distress and hence credit spreads on corporate bonds of more distressed firms should be higher after the reform.

Ideally, we want to compare bond yields of the riskiest (lowest rated) firms with those of the safest (AAA rated) firms. The lowest rated corporate bonds, for which monthly yields are readily available during our observation period, have a Moody's BAA rating.[27] However, because the effect of frictions in distress on yields monotonically increases with default risk, comparison of yields on BAA and AAA rated bonds is informative about corporate bond yields of even riskier firms. Consistent with our interpretation of the reform, we observe a long-lasting and significant increase in the Moody's BAA over AAA credit spread (henceforth, BAA-AAA spread) after the reform. When the new code is signed into law in November 1978, the BAA-AAA spread is 0.80%. In the years following the passage of the reform, the spread rises monotonically to 1.23% in November 1979, 1.67% in November 1980, 2.17% in November 1981, and continues to increase up to 2.62% in November 1982. This evolution of the BAA-AAA spread is inconsistent with a parallel movement of risk premia for bonds and stocks of distressed firms. Instead, the increase of the BAA-AAA spread, especially the 50% widening of the spread during the first year after the reform, supports the view that bondholders of distressed firms increase their return expectations, as a consequence

[27] Data on corporate bond yields are from the Fed's website: http://www.federalreserve.gov/releases/h15/data.htm. Unreported results using corporate bond yields provided by Francis Longstaff produce qualitatively identical results.

of the BRA's adverse implications for bondholder bargaining power. Thus, following a reduction in bondholder bargaining power, we observe a significant increase in corporate bond credit spreads after the reform, which is not driven by an increase in default risk as documented in Panel A of Table 3. It is important to note that the increase in the BAA-AAA spread begins directly after the passage of the reform and therefore clearly precedes the recessions that occur after the reform, and the increase persists even in periods without recessions. This evidence from the corporate bond market therefore reinforces the view that shareholders of distressed firms reduce their return expectations, because the BRA implies a gain in shareholder bargaining power.

Moreover, the increase in the BAA-AAA spread starts only after the passage of the reform. During the four years preceding the reform there is no increase in the spread; in fact, there is a decrease from 1.71% in November 1974 to 0.80% in November 1978. Over the twelve months prior to the passage of the reform, spreads remain almost constant, being 0.87% in November 1977 just 0.07% above its November 1978 level, which suggests that the actual effect of the reform was largely unanticipated. In sum, the evidence from corporate bond yields indicates that the BRA triggered an unexpected shift in bargaining power from creditors to debtors. It also helps us to dissolve concerns about our findings being related to a general reduction in risk premia for distressed firms.

7 Conclusion

This paper examines an important legal event as a gauge for the relation between default risk and stock returns. The Bankruptcy Reform Act of 1978 introduces an exogenous variation to shareholder bargaining power in formal bankruptcy and out-of-court restructuring. This novel identification strategy allows us to sidestep many of the difficulties with respect to the measurement of default risk by focussing on *changes* in default risk pricing due to the reform and keep the methodology to determine default probability, portfolio formation, etc. constant.

The change in the bargaining process between creditors and debtors in financial distress produces numerous interesting insights. First, portfolio- and firm-level tests demonstrate that shareholders require a lower risk premium on distressed stocks when they are affected less severely by the negative consequences of financial distress (i.e., after the reform). These results are in line with a reduction in characteristics of distressed stocks, such as CAPM betas and return standard

deviations. Moreover, we find support for our identification strategy based on corporate bond yields and based on a distressed stock returns of firms with actual deviations from absolute priority. Second, we explore firm-specific heterogeneity in characteristics that increase shareholders' bargaining power vis-à-vis creditors. These characteristics reduce the adverse effects of financial distress for shareholders. Consequently, the distress premium is lower for companies that feature higher shareholder advantage. After the reform, the distress premium decreases significantly and the relevance of firm-level shareholder advantage is reduced, since the reform-based shareholder advantage is partly substitutable. Third, we examine return continuation among distressed firms and find an increase in momentum profits for stocks of financially distressed firms after the legal event.

Appendix A. A Simple Model of Default Risk and Stock Returns

To study the pricing of default risk and stock returns before and after the bankruptcy reform, we follow Garlappi, Shu, and Yan (2008) who embed the strategic debt service model by Fan and Sundaresan (2000) in an asset pricing framework. The Fan and Sundaresan (2000) model (FS) is based on the Leland (1994) model of risky infinite-maturity debt and incorporates strategic debt service with varying degrees of equityholders' bargaining power vis-à-vis creditors in renegotiations. Given that the bankruptcy reform affects all firms similarly but there is no a priori reason for all firms to have similar bargaining positions in renegotiations, we augment the FS model by incorporating two types of bargaining parameters (i.e., η_i and η_r) with varying degrees of complementarity (i.e., γ_i).

While FS address numerous issues, the simplest version of their model — transformed into an earnings-based setting as in Hackbarth, Hennessy, and Leland (2007) — is sufficient for deriving asset pricing implications that follow from the bankruptcy reform. At every point in time $t > 0$, each firm in the economy owns machines that generate uncertain earnings, X_t, which evolve over time according to a geometric Brownian motion with drift μ under the physical measure, volatility σ, and an initial value $X_0 > 0$ at $t = 0$. Furthermore, firms cannot sell their assets to pay dividends, the risk-free interest rate is r, and the economy's pricing kernel, Λ_t, follows a geometric Brownian motion with volatility σ_Λ and correlation ρ with X_t, characterizing the economy's risk-reward trade-off.

Consider a firm with a single class of risky debt with an instantaneous, perpetual coupon C per unit of time. When the firm pays its contractual coupon, it receives tax benefits τC per unit of time. With the tax shield, the value of the levered firm is always larger than the value of unlevered firm, as long as the firm is not liquidated. If the firm defaults non-strategically, claims are settled, tax benefits are lost, and liquidation costs proportional to unlevered firm value, α, are incurred. Strategic default, however, optimally occurs to avoid liquidation when the firm's earnings fall below an endogenously determined threshold X_S. At that point, equityholders stop making the contractual payments to debtholders but keep control of the firm, servicing the debt strategically until the earnings process returns above the threshold for strategic debt service X_S.[28]

In case of strategic debt service, equityholders and debtholders enter into a Nash bargaining game, in which they split the levered firm value according to their bargaining powers η and $1 - \eta$,

[28] When debt renegotiation is feasible in a jump-diffusion model, such as Leland (2006), our predictions for stock returns of distressed firms also obtain in the presence of non-strategic default following from intensity-based (jump) risk.

and use liquidation values 0 and $(1-\alpha)\,(1-\tau)\,X/(r-\hat{\mu})$ as disagreement point, where $\hat{\mu} = \mu + \rho\,\sigma\,\sigma_\Lambda$ is the risk-neutral drift for which a regularity condition requires that $\hat{\mu} < r$. Recall that, prior to the reform $\eta = \eta_i$ and equityholders' bargaining power potentially rises at the time of the reform:

$$\eta \;=\; \begin{cases} \eta_i & \text{before the reform} \\ \eta_i + \eta_r - \gamma_i \cdot \min\{\eta_i, \eta_r\} & \text{after the reform} \end{cases} , \tag{A.1}$$

where $\gamma_i \in [0,1]$ is the degree of complementarity of reform's η_r relative to firm i's η_i. In particular, a low (high) value of γ_i means that the BRA's effect is more complementary (substitutable).

To derive equity value, $E(X)$, we first need to derive levered firm value, $v(X)$, because it determines the bargaining surplus of the bargaining game. Standard arguments imply that the value of the levered firm, $v(X)$, satisfies two ordinary differential equations (ODEs):

$$\tfrac{1}{2}\,\sigma^2 X^2 v''(X) \;+\; \hat{\mu}\,X\,v'(X) \;+\; (1-\tau)\,X \;+\; \tau\,C \;-\; r\,v(X) \;=\; 0 \qquad \text{if } X \geq X_S\ , \tag{A.2}$$

$$\tfrac{1}{2}\,\sigma^2 X^2 v''(X) \;+\; \hat{\mu}\,X\,v'(X) \;+\; (1-\tau)\,X \;-\; r\,v(X) \;=\; 0 \qquad \text{if } X < X_S\ . \tag{A.3}$$

The two ODEs are solved subject to suitable boundary conditions (see Lemma 1 in FS):

$$\lim_{X\uparrow\infty} v(X) \;=\; \frac{(1-\tau)\,X}{r-\hat{\mu}} + \frac{\tau\,C}{r}\ , \tag{A.4}$$

$$\lim_{X\uparrow X_S} v(X) \;=\; \lim_{X\downarrow X_S} v(X)\ , \tag{A.5}$$

$$\lim_{X\uparrow X_S} v'(X) \;=\; \lim_{X\downarrow X_S} v'(X)\ , \tag{A.6}$$

$$\lim_{X\downarrow 0} v(X) \;=\; 0\ . \tag{A.7}$$

Solving the problem yields the value of the levered firm under the risk-neutral (pricing) measure:

$$v(X) \;=\; \begin{cases} \dfrac{(1-\tau)\,X}{r-\hat{\mu}} + \dfrac{-\lambda_-}{\lambda_+ - \lambda_-}\dfrac{\tau\,C}{r}\left(\dfrac{X}{X_S}\right)^{\lambda_-} & \text{if } X \geq X_S\ , \\[2ex] \dfrac{(1-\tau)\,X}{r-\hat{\mu}} + \dfrac{-\lambda_-}{\lambda_+ - \lambda_-}\dfrac{\tau\,C}{r}\left(\dfrac{X}{X_S}\right)^{\lambda_+} & \text{if } X < X_S\ , \end{cases} \tag{A.8}$$

where the positive and negative characteristic roots of the ODEs are given by:

$$\lambda_\pm \;=\; (\tfrac{1}{2} - \hat{\mu}/\sigma^2) \;\pm\; \sqrt{(\tfrac{1}{2} - \hat{\mu}/\sigma^2)^2 + 2\,r/\sigma^2}\ . \tag{A.9}$$

Similarly, equity value, $E(X)$, satisfies the following ODE in the non-renegotiation region:

$$\tfrac{1}{2}\,\sigma^2 X^2 E''(X) \;+\; \hat{\mu}\,X\,E'(X) \;+\; (1-\tau)\,(X-C) \;-\; r\,E(X) \;=\; 0 \quad \text{if } X \geq X_S\ , \tag{A.10}$$

and equity value in that region solves the boundary conditions (see Proposition 3 in FS):

$$\lim_{X\uparrow\infty} E(X) \;=\; (1-\tau)\left(\frac{X}{r-\hat{\mu}} - \frac{C}{r}\right) \;, \tag{A.11}$$

$$\lim_{X\downarrow X_S} E(X) \;=\; \eta\left(\frac{\alpha\,(1-\tau)X_S}{r-\hat{\mu}} + \frac{-\lambda_-}{\lambda_+-\lambda_-}\,\frac{\tau\,C}{r}\right) \;, \tag{A.12}$$

$$\lim_{X\downarrow X_S} E'(X) \;=\; \eta\left(\frac{\alpha\,(1-\tau)}{r-\hat{\mu}} + \frac{-\lambda_-\,\lambda_+}{\lambda_+-\lambda_-}\,\frac{\tau\,C}{r\,X_S}\right) \;. \tag{A.13}$$

Solving yields equity value in the non-renegotiation region under the risk-neutral (pricing) measure:

$$E(X) \;=\; (1-\tau)\left(\frac{X}{r-\hat{\mu}} - \frac{C}{r}\right) + \frac{(1-\tau)\,C}{(1-\lambda_-)\,r}\left(1+\frac{\eta\,\tau}{1-\tau}\,\frac{\lambda_-\,(\lambda_+-1)}{\lambda_+-\lambda_-}\right)\left(\frac{X}{X_S}\right)^{\lambda_-} \tag{A.14}$$

where the threshold for strategic debt service, X_S, from the optimality condition (A.13) equals:

$$X_S \;=\; \frac{-\lambda_-}{1-\lambda_-}\,\frac{r-\hat{\mu}}{1-\tau}\,\frac{1-\tau+\tau\,\eta}{1-\alpha\,\eta}\,\frac{C}{r} \;. \tag{A.15}$$

Next, we invoke the standard equilibrium condition that says $\mathrm{E}[dE/E]+[(1-\tau)(X-C)]/E-r = -\mathrm{cov}[dE, d\Lambda]$. Using Ito's Lemma and (A.14) to derive dE, we find $\mathrm{E}[\cdot]$ and $\mathrm{cov}[\cdot]$. Consequently, we also obtain a closed-form solution of equity's expected excess return, $EER(X)$, for $X \geq X_S$:

$$EER(X) \;=\; -\,\rho\,\sigma\,\sigma_\Lambda\left(1 \;+\; \frac{(1-\tau)\,C}{r\,E(X)} \;-\; \frac{(1-\tau)\,C}{r\,E(X)}\left(1+\frac{\eta\,\tau}{1-\tau}\,\frac{\lambda_-(\lambda_+-1)}{\lambda_+-\lambda_-}\right)\left(\frac{X}{X_S}\right)^{\lambda_-}\right) \;, \tag{A.16}$$

where $-\,\rho\,\sigma\,\sigma_\Lambda$ is the risk premium of (unlevered) X-risk. The second and the third term in parentheses on the r.h.s. of (A.16) are, respectively, the "standard leverage" effect and the "de-leverage" effect of shareholder advantage. While the former increases returns with default risk, the latter does the opposite, since for higher default risk equityholders are more likely to exchange a risky (levered) equity position for less risky (unlevered) cash position. This produces a hump-shaped relation.

Finally, the T-year default probability under the physical measure is (see Harrison (1985)):

$$DP(X) \;=\; \Phi\left(\frac{\log\left(\frac{X_S}{X}\right) - (\mu-\frac{1}{2}\sigma^2)T}{\sigma\sqrt{T}}\right) + \left(\frac{X}{X_S}\right)^{1-2\mu/\sigma^2}\Phi\left(\frac{\log\left(\frac{X_S}{X}\right) + (\mu-\frac{1}{2}\sigma^2)T}{\sigma\sqrt{T}}\right) \;, \tag{A.17}$$

for $X \geq X_S$, and where $\Phi(\cdot)$ is the standard normal distribution function. Given a set of parameter values, Figure 1 plots expected excess return in (A.16) against default probability in (A.17) for various levels of firm i's shareholder advantage, η_i and various degrees of reform complementarity, γ_i.

Appendix B. Details on the Default Risk Estimation Procedure

Throughout the paper we calculate default probabilities by the Campbell, Hilscher, and Szilagyi (2008) 12 months ahead hazard model. The reported default probability is the likelihood of default at time $t+12$ given survival until $t+11$. Accordingly, it cannot be interpreted as the likelihood of default within the next twelve months, as for example Moody's EDF used in Garlappi, Shu, and Yan (2008) and other papers. However, for our analysis the relevant exercise is the ordering of firms according to their default risk. The calculation of an explicit default probability over a distinct period of time is not necessary. Campbell, Hilscher, and Szilagyi consider several accounting and market-based explanatory variables to predict default in their model.

All variables are calculated using the annual COMPUSTAT as well as the monthly and daily CRSP databases. Accounting variables are taken from the most recent fiscal year ending, market variables are updated on a monthly bases. We update the computation of the default probability every month. Below are the variable definitions taken from Campbell, Hilscher, and Szilagyi (2008).[29]

$$RSIZE_{i,t} = \log\left(\frac{Market\ Capitalization_{it}}{Total\ Market\ Capitalization_t}\right) \tag{B.1}$$

$$EXRET_{i,t} = \log(1+R_{it}) - \log(1+R_{S\&P500,t}) \tag{B.2}$$

$$NIMTA_{i,t} = \frac{Net\ Income_{it}}{Firm\ Market\ Equity_{it} + Total\ Liabilities_{it}} \tag{B.3}$$

$$TLMTA_{it} = \frac{Total\ Liabilities_{it}}{Firm\ Market\ Equity_{it} + Total\ Liabilities_{it}} \tag{B.4}$$

$$CASHMTA_{it} = \frac{Cash\ and\ Short\ Term\ Investments_{it}}{Firm\ Market\ Equity_{it} + Total\ Liabilities_{it}} \tag{B.5}$$

$$SIGMA_{it} = \left(252 * \frac{1}{N-1}\sum_{j=1}^{3} r_{it-j}^2\right)^{\frac{1}{2}} \tag{B.6}$$

$$MB_{it} = \frac{Market\ Capitalization_{it}}{Book\ Value\ of\ Equity_{it}} \tag{B.7}$$

The default probability is finally calculated as:

$$DP_t\left(Y_{it+12} = 1 | Y_{it+11} = 0\right) = \frac{1}{1+\exp\left(-\alpha_j - \beta_j x_{it}\right)} \tag{B.8}$$

[29] For an extended explication and motivation for the variables please refer to the paper by the authors. The EXRET variable enters the model in a modified version as a geometrically weighted average of the past return from $t-1$ to $t-12$ as in the original model. For NIMTA we do not calculate a similar weighted average since we use the annual value-weighting each quarter equally.

where the coefficients α_j and β_j are estimated exclusively with historically available data at the time of computation of default probability to avoid a look ahead bias. Thus, the coefficients are updated annually with an increasing number of observations. We also apply the updated model each year. Since the updated model is only available from 1981 we apply the 1981 model to the years before, which allows us to minimize the look ahead bias as much as possible. As Campbell, Hilscher, and Szilagyi we winsorize the variables at the 5/95 percentile interval to eliminate outliers potentially influencing the results.

Appendix C. Sample of Bankruptcy Cases

[Insert Table 10 here]

References

Altman, Edward I., 1968, Financial ratios, discriminant analysis and the prediction of corporate bankruptcy, *Journal of Finance* 23, 589–609.

Avramov, Doron, Tarun Chordia, Gergana Jostova, and Alexander Philipov, 2007, Momentum and credit rating, *Journal of Finance* 62, 2503–2520.

Bebchuk, Lucian Arye, 1998, Chapter 11, NBER Working Paper 6473, National Bureau of Economic Research, Inc.

——— , 2002, Ex ante costs of violating absolute priority in bankruptcy, *Journal of Finance* 57, 445–460.

Bebchuk, Lucian Ayre, and Howard F Chang, 1992, Bargaining and the division of value in corporate reorganization, *Journal of Law, Economics and Organization* 8, 253–79.

Bergman, Yaacov Z., and Jeffrey L. Callen, 1991, Opportunistic underinvestment in debt renegotiation and capital structure, *Journal of Financial Economics* 29, 137–171.

Betker, Brian L, 1995, Management's incentives, equity's bargaining power, and deviations from absolute priority in chapter 11 bankruptcies, *Journal of Business* 68, 161–183.

Bharath, Sreedhar T., Venky Panchapegesan, and Ingrid Werner, 2008, The changing nature of chapter 11, Working paper, Ohio State University.

Bradley, Michael, and Michael Rosenzweig, 1992, The untenable case for chapter 11, *The Yale Law Journal* 101, 1043–1095.

Broude, Richard F., 1984, Cramdown and chapter 11 of the bankruptcy code: The settlement imperative, *The Business Lawyer* 39, 1341–1377.

Campbell, John Y., Jens Hilscher, and Jan Szilagyi, 2008, In search of distress risk, *Journal of Finance* 63, 2899–2939.

——— , 2011, Predicting financial distress and the performance of distressed stocks, *Journal of Investment Management* 9, 1–21.

Carhart, Mark M., 1997, On persistence in mutual fund performance, *Journal of Finance* 52, 57–82.

Chava, Sudheer, and Amiyatosh Purnanandam, 2010, Is default risk negatively related to stock returns?, *Review of Financial Studies* 23, 2523–2559.

Cohen, Randolph B., Christopher Polk, and Tuomo Vuolteenaho, 2003, The value spread, *Journal of Finance* 58, 609–642.

Davydenko, Sergei A., and Ilya A. Strebulaev, 2007, Strategic actions and credit spreads: An empirical investigation, *Journal of Finance* 62, 2633–2671.

Dichev, Ilia D., 1998, Is the risk of bankruptcy a systematic risk?, *Journal of Finance* 53, 1131–1147.

Djankov, Simeon, Oliver Hart, Caralee McLiesh, and Andrei Shleifer, 2008, Debt enforcement around the world, *Journal of Political Economy* 116, 1105–1149.

Eberhart, Allan C., William T. Moore, and Rodney L. Roenfeldt, 1990, Security pricing and deviations from the absolute priority rule in bankruptcy proceedings, *Journal of Finance* 45, 1457–1469.

Fama, Eugene F., and Kenneth R. French, 1993, Common risk factors in the returns on stocks and bonds, *Journal of Financial Economics* 33, 3–56.

——— , 1996, Multifactor explanations of asset pricing anomalies, *Journal of Finance* 51, 55–84.

Fama, Eugene F., and James D. MacBeth, 1973, Risk, return, and equilibrium: Empirical tests, *Journal of Political Economy* 81, 607–636.

Fan, Hua, and Suresh M. Sundaresan, 2000, Debt valuation, renegotiation, and optimal dividend policy, *Review of Financial Studies* 13, 1057–1099.

Favara, Giovanni, Enrique Schroth, and Paolo Valta, 2011, Strategic default and equity risk across countries, *Journal of Finance* Forthcoming.

François, Pascal, and Erwan Morellec, 2004, Capital structure and asset prices: Some effects of bankruptcy procedures, *Journal of Business* 77, 387–412.

Franks, Julian R., and Walter N. Torous, 1989, An empirical investigation of u.s. firms in reorganization, *Journal of Finance* 44, 747–769.

——— , 1994, A comparison of financial recontracting in distressed exchanges and chapter 11 reorganizations, *Journal of Financial Economics* 35, 349–370.

Friewald, Nils, Christian Wagner, and Josef Zechner, 2011, The cross-section of credit risk premia and equity returns, Working paper, Vienna University of Economics and Business.

Garlappi, Lorenzo, Tao Shu, and Hong Yan, 2008, Default risk, shareholder advantage, and stock returns, *Review of Financial Studies* 21, 2743–2778.

Garlappi, Lorenzo, and Hong Yan, 2011, Financial distress and the cross-section of equity-returns, *Journal of Finance* 66, 789–822.

Griffin, John M., and Michael L. Lemmon, 2002, Book-to-market equity, distress risk, and stock returns, *Journal of Finance* 57, 2317–2336.

Hackbarth, Dirk, Chrisopher A. Hennessy, and Hayne E. Leland, 2007, Can the tradeoff theory explain debt structure?, *Review of Financial Studies* 20, 1389–1428.

Harrison, J. Michael, 1985, *Brownian Motion and Stochastic Flow Systems* (John Wiley and Sons, New York, NY).

Jegadeesh, Narasimhan, and Sheridan Titman, 1993, Returns to buying winners and selling losers: Implications for stock market efficiency, *Journal of Finance* 48, 65–91.

Kaplan, Harold L., 1987, Bankruptcy as a corporate management tool, *ABA Journal* Jan. 1, 64–67.

Kerkman, Jerome R., 1987, The debtor in full control: A case for adoption of the trustee system, *Marquette Law Review* 70, 159–209.

King, Lawrence P., 1979, Chapter 11 of the 1978 bankruptcy code, *American Bankruptcy Law Journal* 53, 107–132.

Klee, Kenneth, 1979, All you ever wanted to know about cram down under the new bankruptcy code, *American Bankruptcy Law Journal* 53, 133–171.

——— , 1980, Legislative history of the new bankruptcy law, *American Bankruptcy Law Journal* 54, 275–298.

Leland, Hayne E., 1994, Corporate debt value, bond covenants, and optimal capital structure, *Journal of Finance* 49, 1213–1252.

——— , 2006, A new structural model, Princeton lecture series in finance, lecture 2.

LoPucki, Lynn M., 1983, Debtor in full control: System failure under chapter 11 of the bankruptcy code, *American Bankruptcy Law Journal* 57, 99–126.

——— , 1995, Chapter 11: An agenda for basic reform, *American Bankruptcy Law Journal* 69, 573–582.

——— , and William C. Whitford, 1990, Bargaining over equity's share in the bankruptcy reorganization of large, publicly held companies, *University of Pennsylvania Law Review* 139, 125–196.

Merton, Robert C, 1974, On the pricing of corporate debt: The risk structure of interest rates, *Journal of Finance* 29, 449–70.

Newey, Whitney K, and Kenneth D West, 1987, A simple, positive semi-definite, heteroskedasticity and autocorrelation consistent covariance matrix, *Econometrica* 55, 703–08.

Ohlson, James A, 1980, Financial ratios and the probabilistic prediction of bankruptcy, *Journal of Accounting Research* 18, 109–131.

Opler, Tim C, and Sheridan Titman, 1994, Financial distress and corporate performance, *Journal of Finance* 49, 1015–1040.

Peeples, Ralph A., 1989, Staying in: Chapter 11, close corporations and the absolute priority rule, *American Brankruptcy Law Journal* 63, 65–106.

Posner, Eric A., 1977, The political economy of the bankruptcy reform act of 1978, *Michigan Law Review* 96, 47–126.

Shumway, Tyler, 2001, Forecasting bankruptcy more accurately: A simple hazard model, *Journal of Business* 74, 101–124.

Skeel, David, 2003, Creditors' ball: The 'new' new corporate governance in chapter 11, *University of Pennsylvania Law Review* 152, 917–951.

Vassalou, Maria, and Yuhang Xing, 2004, Default risk in equity returns, *Journal of Finance* 59, 831–868.

Weiss, Lawrence A., 1990, Bankruptcy resolution: Direct costs and violation of priority of claims, *Journal of Financial Economics* 27, 285–314.

——— , and Karen H. Wruck, 1998, Information problems, conflicts of interest, and asset stripping: Chapter 11's failure in the case of eastern airlines, *Journal of Financial Economics* 48, 55–97.

White, Michelle J, 1983, Bankruptcy costs and the new bankruptcy code, *Journal of Finance* 38, 477–488.

——— , 1989, The corporate bankruptcy decision, *Journal of Economic Perspectives* 3, 129–151.

Table 1. Bankruptcy Code Petitions Commenced by Chapter of the Bankruptcy Code

Year	Total filings (1)	Chapter VII or Chapter 7 (2)	Chapter X (3)	Chapter XI or Chapter 11 (4)	Active firms in CRSP (5)	% Chapter X and XI or Chapter 11 of total fillings [(3)+(4)]/(1)
1972	182,860	153,934	82	1,361	2,650	0.79%
1973	173,197	145,914	89	1,458	3,964	0.89%
1974	189,513	157,967	152	2,171	4,002	1.22%
1975	254,484	209,330	169	3,506	4,038	1.44%
1976	246,549	209,067	116	3,235	4,101	1.36%
1977	214,399	181,194	86	3,046	4,157	1.46%
1978	202,951	168,771	63	3,266	4,183	1.64%
1979	226,476	183,259	51	3,042	4,222	1.37%
1980*	**210,359***	**159,346***		**4,119***	**4,342**	**1.96%***
1981	360,327	265,721		7,823	4,743	2.17%
1982	367,858	255,095		14,058	4,995	3.82%
1983	374,726	251,319		21,206	5,380	5.66%
1984	344,262	232,991		19,913	5,801	5.78%

The table illustrates the sharp increase in bankruptcy fillings (particularly Chapter 11 fillings – column (4)) after the passage of the BRA. The last column documents the higher proportion of Chapter 11 fillings in total fillings and hence underlines the importance of the new Chapter 11 introduced through the Bankruptcy Reform Act of 1978. The numbers for each year are fillings from July of the previous year to June of the respective year. Cases filed prior to October 1, 1979 are under the old Bankruptcy Code, and those filed on or after October 1, 1979 are under the new BRA. Column (5) shows the number of active firms in the CRSP database in each year. * reflects figures from 9 month only (November 1979 to June 1980).
Source: The Administrative Office of the United States Courts – Table F-2

Table 2. Default Model Parameters

	Variable	NIMTA	TLMTA	EXRET	RSIZE	SIGMA	CASHMTA	MB	PRICE
Campbell et al. Data	Mean	0.000	0.445	–0.011	–10.456	0.562	0.084	2.041	2.019
	Std	0.023	0.280	0.117	1.922	0.332	0.097	1.579	0.883
Full Sample	Mean	0.009	0.467	0.001	–10.654	0.651	0.086	1.600	1.940
	Std	0.024	0.246	0.138	1.887	0.386	0.112	1.482	0.979
Pre-Reform	Mean	0.012	0.509	0.005	–10.651	0.651	0.087	1.261	1.978
	Std	0.019	0.237	0.135	1.849	0.382	0.104	1.186	0.808
Post-Reform	Mean	0.006	0.431	–0.003	–10.659	0.650	0.084	1.890	1.903
	Std	0.027	0.247	0.142	1.919	0.396	0.119	1.641	1.114

This table reports sample averages (Mean) and standard deviations (Std) for the accounting and market-based variables that predict default in the model of Campbell, Hilscher, and Szilagyi (2008). In particular, we reproduce these authors' summary statistics along with our summary statistics for these variables during the full sample period, the pre-reform period, and the post-reform period. Details on the definition of the variables are provided in the body of Appendix B. The full sample starts in October 1972 and ends in December 1984. While the pre-reform sample period is from October 1972 to October 1978, the post-reform sample period ranges from December 1978 to December 1984.

Table 3. Descriptive Statistics

	1	2	3	4	5	6	7	8	9	10
Panel A. Default Measure										
Pre-Reform	0.08	0.18	0.32	0.52	0.83	1.33	2.21	3.89	8.21	35.26
Post-Reform	0.09	0.19	0.32	0.50	0.76	1.19	1.95	3.50	7.55	39.91
Difference	0.01	0.01	0.00	–0.02	–0.07	–0.14	–0.26	–0.39	–0.66	4.65
Panel B. Returns EW										
Pre-Reform	0.17	0.35	0.42	0.56	0.69	0.71	0.91	1.07	1.21	2.62
Post-Reform	0.98	1.07	1.04	1.00	0.90	0.89	0.85	0.70	0.69	1.29
Difference	0.81	0.72	0.62	0.44	0.22	0.18	–0.06	–0.36	–0.52	–1.33
Panel C. Returns VW										
Pre-Reform	0.11	0.39	0.54	0.89	1.04	1.03	1.12	0.69	1.11	0.95
Post-Reform	1.30	1.41	1.32	1.52	1.51	1.77	1.59	1.10	0.64	0.22
Difference	1.19	1.02	0.78	0.63	0.47	0.74	0.47	0.41	–0.47	–0.73
Panel D. Portfolio SD										
Pre-Reform	15.51	15.03	14.50	14.48	15.28	16.12	16.42	17.25	17.42	18.81
Post-Reform	15.15	15.68	14.88	14.81	13.97	14.54	15.02	15.48	15.51	16.10
Difference	–0.36	0.65	0.38	0.33	–1.31	–1.58	–1.40	–1.77	–1.91	–2.71
Panel E. Individual SD										
Pre-Reform	35.97	39.21	41.35	43.00	45.15	47.78	50.99	55.54	61.80	79.16
Post-Reform	36.97	39.79	41.77	44.33	45.60	47.30	49.32	52.22	56.71	68.83
Difference	1.00	0.58	0.42	1.33	0.45	–0.48	–1.67	–3.32	–5.09	–10.33
Panel F. CAPM Beta										
Pre-Reform	0.93	1.06	1.00	1.14	1.17	1.23	1.34	1.47	1.52	1.51
Post-Reform	1.00	1.05	1.00	0.96	0.93	1.09	1.26	1.27	1.19	1.19
Difference	0.07	–0.01	0.00	–0.18	–0.24	–0.14	–0.08	–0.20	–0.33	–0.32

In this table, we split the sample into (monthly updated) portfolios using deciles according to the default risk measure, where 1 stands for the portfolio comprising the least distressed stocks and 10 represents the portfolio including the most distressed stocks. We calculate portfolio characteristics (averages) for the full sample period, the pre-reform period, and the post-reform period for each of the ten portfolios. We also compute the difference before and after the reform for each of the ten portfolios. Panel A reports average default measures (in basis points). Panels B and C show, respectively, average equal-weighted and value-weighted portfolio returns (percentage points) per month. Panels D and E tabulate, respectively, annualized standard deviations of value-weighted portfolio returns and individual returns. Panel F summarizes averages of CAPM betas for value-weighted portfolios. The full sample starts in October 1972 and ends in December 1984. While the pre-reform sample period is from October 1972 to October 1978, the post-reform sample period ranges from December 1978 to December 1984.

Table 4. Reform Effect – Portfolio-Level Regressions

	Model A	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Panel A. Pre-Reform								
Alpha	1.66***	1.21***	1.70**	1.63**	1.01**	0.96**	0.95**	0.21
t-statistic	[4.80]	[3.21]	[2.53]	[2.38]	[2.54]	[2.61]	[2.63]	[0.65]
Panel B. Post-Reform								
Alpha	0.25	–0.12	–0.07	0.12	–0.48	–0.07	–0.04	–0.81**
t-statistic	[0.71]	[0.35]	[0.17]	[0.29]	[1.32]	[0.24]	[0.12]	[2.42]
Panel C. Reform Effect								
Alpha	–1.41***	–1.34**	–1.76**	–1.51*	–1.48***	–1.02**	–0.98*	–1.02**
t-statistic	[2.85]	[2.61]	[2.27]	[1.88]	[2.77]	[2.20]	[1.96]	[2.21]
Model	Carhart	Carhart	Constant	CAPM	FF	Carhart	Carhart	Carhart
Price < $1 excluded	no	no	no	no	no	yes	no	no
Updating frequency	monthly	monthly	monthly	monthly	monthly	monthly	yearly	monthly
Value Weighted	no	no	no	no	no	no	no	yes

For this table, we sort stocks into quintile according to their predicted default measure, where HR stands for the portfolio comprising the most distressed and LR for the portfolio comprising the least distressed stocks. The portfolio is updated monthly and we skip one period between portfolio formation and portfolio returns. We show the results from the regression of equal weighted excess returns over the risk free rate on a constant (column 3), a market factor (column 4), the three (column 5) and four (columns 1-2 and 6-8) Fama-French factors ($MKT_RF, HML, SMB, and\ UMD$). The entries in columns 1 show monthly alphas for the HR portfolio, whereas columns 2-8 show alphas of a long-short portfolio investing in the riskiest 20% and selling and safest 20% of stocks. The parameters are displayed in percentage points per month. While the pre-reform sample period is from October 1972 to October 1978, the post-reform sample period ranges from December 1978 to December 1984. That is, the estimation spans the 73 months before the BRA in November 1978 (Panel A) and 73 months after the reform (Panel B). Panel C shows the parameter estimates for the entire sample including a reform dummy, taking the value of one after November 1978 and zero before. That is, the full sample starts in October 1972 and ends in December 1984. The bottom of the table provides information on the factor model applied, the filtering of small stocks, portfolio updating frequency and portfolio weights. Further details on the estimations are provided in the text. * indicates statistical significance at the 10% level, ** at the 5% level and *** at the 1% level.

Table 5. Reform Effect – Firm-level Regressions

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Panel A. Pre-Reform							
default	0.19**	0.38**	0.34**	0.19**	0.10	0.15*	0.24**
t-statistic	[2.02]	[2.41]	[2.07]	[2.00]	[1.06]	[1.68]	[2.53]
Observations	220032	220032	220032	220032	217159	208063	220032
Panel B. Post-Reform							
default	–0.04	–0.03	0.05	–0.05	–0.08	–0.02	0.02
t-statistic	[0.46]	[0.33]	[0.43]	[0.41]	[1.08]	[0.28]	[0.20]
Observations	247740	247740	247740	247740	235610	240328	247740
Panel C. Reform Effect							
default	0.19***	0.40***	0.37***	0.19***	0.09***	0.16***	0.19***
t-statistic	[4.87]	[20.08]	[16.17]	[6.01]	[2.50]	[4.22]	[4.88]
default*reform	–0.24***	–0.45***	–0.34***	–0.26***	–0.18***	–0.20***	–0.22***
t-statistic	[4.22]	[15.21]	[8.59]	[3.41]	[3.71]	[3.77]	[4.00]
Observations	467772	467772	467772	467772	452769	448391	467772
Model	Carhart	Constant	CAPM	FF	Carhart	Carhart	Carhart
Price < $1 excluded	no	no	no	no	yes	no	no
Updating frequency	monthly	monthly	monthly	monthly	monthly	yearly	monthly
Industry fixed effects	no	no	no	no	no	no	yes

The entries in this table are the parameter estimates from Fama and MacBeth (1973) regression analysis with t-statistics in parentheses for the 73 month before the BRA in November 1978 (Panel A), and the 73 after the passage of the Act (Panel B). That is, the pre-reform sample period is from October 1972 to October 1978, and the post-reform sample period ranges from December 1978 to December 1984. Firms are sorted into quintiles according to their default risk measure. The rank variable, $default$, is updated monthly and we skip one period between updating and portfolio returns. Panel C shows the results for the reform effect. The dummy variable $reform$ takes the value one after November 1978 and zero otherwise. The bottom of the table provides information on the factor model applied, updating frequency, the filtering of small stocks and introduction of industry fixed effects. The Carhart model is a four-factor model controlling for market return, size, book-to-market ratio and momentum, the CAPM controls for the market return, and the FF model controls for market return, size and book-to-market ratio. Further details on the estimations are provided in the text. * indicates statistical significance at the 10% level, ** at the 5% level and *** at the 1% level.

Table 6. Shareholder Advantage during the Pre-Reform Period

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
equity beta	–0.0000	0.0000	0.0001	–0.0001	0.0001	–0.0000
	[0.03]	[0.01]	[0.05]	[0.09]	[0.05]	[0.01]
log(at)	–0.0021*	–0.0024***	–0.0009	–0.0023***	–0.0027***	–0.0010
	[1.86]	[3.08]	[0.82]	[2.99]	[3.72]	[0.96]
log(bm)	0.0066***	0.0074***	0.0078***	0.0076***	0.0073***	0.0080***
	[2.95]	[4.51]	[4.58]	[4.72]	[4.44]	[4.78]
pastret	0.0088	0.0084	0.0092*	0.0092*	0.0081	0.0096*
	[1.45]	[1.53]	[1.68]	[1.66]	[1.52]	[1.78]
default		–0.0042	0.0110	–0.0110*	–0.0066	–0.0031
		[0.63]	[1.12]	[1.84]	[0.89]	[0.30]
default*log(at)			–0.0038*			–0.0039**
			[1.95]			[2.01]
xrd				–0.0002		–0.0003
				[0.59]		[0.74]
default*xrd				0.0014**		0.0015**
				[2.04]		[2.30]
tang					0.0002	–0.0002
					[0.47]	[0.36]
default*tang					0.0005	0.0013**
					[0.79]	[2.33]
Observations	115484	115484	115484	115484	115484	115484
R-squared	0.040	0.044	0.048	0.048	0.048	0.055

This table shows the parameter estimates of the Fama and MacBeth (1973) regression analysis with Newey and West (1987) adjusted t-statistics in parentheses for different versions of equation (1). The regressions span the pre-reform sample period from October 1972 to October 1978. The dependent variable is a firm's two months ahead return r_{it+2}. The control variables are: *equity beta* the monthly updated equity beta calculated from daily stock returns, $log(at)$ the logarithm of total book assets, $log(bm)$ the logarithm of the book-to-market ratio, and *pastret* the firm's average return from $t-5$ to t. $default$ is a rank variable of the Campbell, Hilscher, and Szilagyi (2008) default risk model calculated in t normalized between zero and one. $default * SAproxy$ are the interaction terms of the different shareholder advantage proxies with the normalized default rank variable. The shareholder advantage proxies are defined as follows: size as logarithm of total book assets ($log(at)$), R&D ratio as R&D expenditures divided by total assets (xrd), and tangibility as property, plant and equipment scaled by total assets ($tang$). The shareholder advantage proxies R&D ratio and tangibility ratio are rank variables ranging from one to ten calculated at the previous fiscal year end. * indicates statistical significance at the 10% level, ** at the 5% level and *** at the 1% level.

Table 7. Shareholder Advantage during the Post-Reform Period

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
equity beta	–0.0002	–0.0001	–0.0000	–0.0003	–0.0001	–0.0002
	[0.15]	[0.10]	[0.04]	[0.34]	[0.08]	[0.25]
log(at)	–0.0016	–0.0023***	–0.0017	–0.0022***	–0.0024***	–0.0018*
	[1.52]	[2.61]	[1.44]	[2.57]	[2.87]	[1.75]
log(bm)	0.0048***	0.0058***	0.0060***	0.0061***	0.0060***	0.0062***
	[3.05]	[3.77]	[3.75]	[4.17]	[3.78]	[4.20]
pastret	0.0161***	0.0139***	0.0143***	0.0143***	0.0138***	0.0146***
	[4.48]	[3.90]	[4.00]	[3.95]	[3.91]	[4.06]
default		–0.0102**	–0.0045	–0.0145***	–0.0088	–0.0109
		[2.36]	[0.47]	[3.22]	[1.49]	[1.19]
default*log(at)			–0.0014			–0.0012
			[0.77]			[0.65]
xrd				0.0001		0.0001
				[0.12]		[0.10]
default*xrd				0.0010		0.0011*
				[1.62]		[1.84]
tang					0.0002	0.0002
					[0.35]	[0.40]
default*tang					–0.0003	0.0001
					[0.42]	[0.09]
Observations	123705	123705	123705	123705	123705	123705
R-squared	0.031	0.034	0.037	0.039	0.037	0.044

This table shows the parameter estimates of the Fama and MacBeth (1973) regression analysis with Newey and West (1987) adjusted t-statistics in parentheses for different versions of equation (1). The regressions span the post-reform period from December 1978 to December 1984. The dependent variable is a firm's two months ahead return r_{it+2}. The control variables are: *equity beta* the monthly updated equity beta calculated from daily stock returns, $log(at)$ the logarithm of total book assets, $log(bm)$ the logarithm of the book-to-market ratio and *pastret* the firm's average return from $t-5$ to t. $default$ is a rank variable of the Campbell, Hilscher, and Szilagyi (2008) default risk model calculated in t normalized between zero and one. $default * SAproxy$ are the interaction terms of the different shareholder advantage proxies with the normalized default rank variable. The shareholder advantage proxies are defined as follows: size as logarithm of total book assets ($log(at)$), R&D ratio as R&D expenditures divided by total assets (xrd), and tangibility as property, plant and equipment scaled by total assets ($tang$). The shareholder advantage proxies R&D ratio and tangibility ratio are rank variables ranging from one to ten calculated at the previous fiscal year end. * indicates statistical significance at the 10% level, ** at the 5% level and *** at the 1% level.

Table 8. Effect of Reform on Momentum Profits

		1	2	3	4	5	Diff.
Unadjusted Returns							
Panel A – Pre-reform							
VW	Momentum	1.37**	1.17**	0.95*	1.25***	0.73	–0.64
	t-statistic	[2.27]	[2.01]	[1.77]	[3.08]	[1.46]	[1.27]
EW	Momentum	1.16**	0.82*	0.76*	0.76*	0.19	–0.97**
	t-statistic	[2.13]	[1.78]	[1.78]	[1.95]	[0.42]	[2.07]
Panel B – Post-Reform							
VW	Momentum	0.54	1.02***	1.27***	1.31***	1.56***	1.02*
	t-statistic	[0.94]	[2.21]	[2.90]	[3.27]	[3.21]	[1.77]
EW	Momentum	0.91*	1.03**	1.46***	1.29***	1.02***	0.11
	t-statistic	[2.22]	[2.59]	[3.79]	[3.46]	[2.84]	[0.30]
Panel C – Reform Effect							
VW	Reform	–0.83	–0.15	0.32	0.07	0.84	1.67**
	t-statistic	[1.00]	[0.20]	[0.47]	[0.12]	[1.20]	[2.17]
EW	Reform	–0.24	0.21	0.70	0.52	0.84	1.08*
	t-statistic	[0.36]	[0.34]	[1.22]	[0.97]	[1.46]	[1.82]
Adjusted Returns							
Panel D – Pre-Reform							
VW	Momentum	1.44***	1.48***	1.28***	1.38***	0.84**	–0.60
	t-statistic	[2.83]	[3.31]	[2.92]	[4.52]	[2.39]	[1.18]
EW	Momentum	1.16***	1.00**	1.00***	0.82***	0.10	–1.06**
	t-statistic	[2.73]	[2.97]	[3.19]	[3.02]	[0.30]	[2.45]
Panel E – Post-Reform							
VW	Momentum	0.62	1.40***	1.28***	1.28***	1.46***	0.84
	t-statistic	[1.24]	[3.34]	[3.45]	[3.53]	[3.33]	[1.65]
EW	Momentum	0.88**	1.10***	1.28***	1.02***	0.74**	–0.14
	t-statistic	[2.50]	[3.02]	[3.69]	[3.25]	[2.16]	[0.40]
Panel F – Reform Effect							
VW	Momentum	–0.82	–0.08	0.00	–0.10	0.62	1.44**
	t-statistic	[1.14]	[0.13]	[0.01]	[0.22]	[1.11]	[2.00]
EW	Momentum	–0.28	0.10	0.28	0.20	0.64	0.92*
	t-statistic	[0.50]	[0.19]	[0.59]	[0.50]	[1.34]	[1.67]

This table reports the results of the "6-1-6" momentum strategies developed in Jegadeesh and Titman (1993) for portfolios with different risk characteristics for value-weighted and equal-weighted portfolios. In the computation of momentum profits, Panels A-C use unadjusted returns, while Panels D-F use returns adjusted for a market factor. Columns 1-5 display the returns of the portfolio buying recent winners and selling recent loser for the firms, where the lowest default risk is in column 1 (bottom quintile) and the highest default risk is in column 5 (top quintile). The column labeled "Diff." calculates the difference in the portfolio return of the riskiest minus the safest stocks. The *t*-statistics are displayed in parentheses. Panels A and D show the results for the period before the BRA. Panels B and E tabulate the results for the period after the BRA. Panels C and F display the reform effect. The pre-reform sample period is from October 1972 to October 1978, and the post-reform sample period ranges from December 1978 to December 1984. * indicates statistical significance at the 10% level, ** at the 5% level and *** at the 1% level.

Table 9. Distress Premia and Deviations from the APR

	1	2	3	4	5	6
APR dummy	–0.1460**	–0.1560**	–0.2629**	–0.0837**	–0.0946*	–0.1568*
t-statistic	[2.46]	[2.12]	[2.25]	[2.25]	[1.92]	[1.94]
Observations	410	277	145	410	277	145
Firms	29	29	29	29	29	29
Months	24	12	6	24	12	6
Model	Carhart	Carhart	Carhart	Unadjusted	Unadjusted	Unadjusted

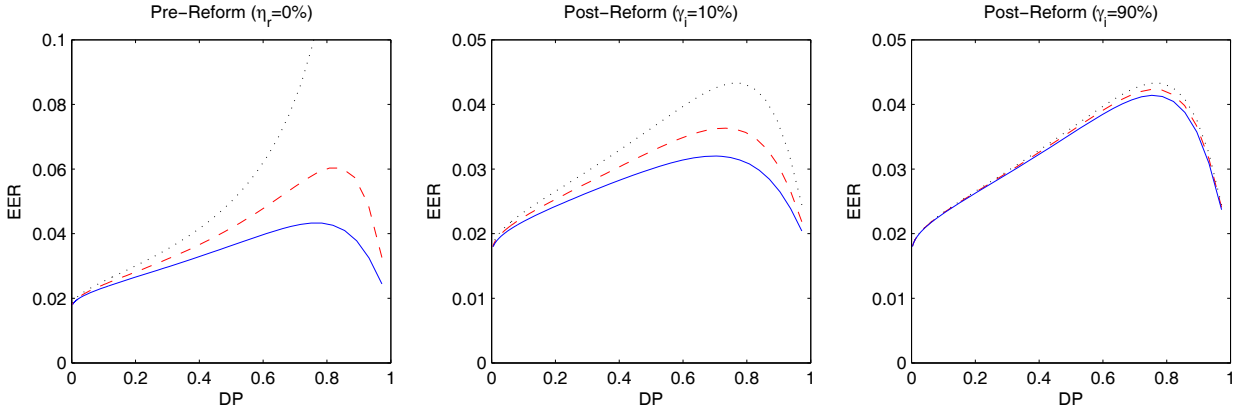
This table shows the β estimates of the regression $ret_{it} = \alpha + \beta \cdot APR\ dummy_i + \epsilon_{it}$ with t-statistics in parentheses, where $APR\ dummy$ is a dummy variable taking the value of one if firm i features positive deviations from the APR in Chapter 11 reorganization and zero otherwise. For each firm i, we identify the maximum of the default risk measure and regress the monthly returns from the following 24, 12 and 6 months on the APR dummy for all firms. The Carhart model is a four-factor model controlling for market return, size, book-to-market ratio and momentum. * indicates statistical significance at the 10% level and ** at the 5% level.

Table 10. Sample of Bankruptcy Cases

Company Name	APR deviations in %	APR dummy	Paper(s)
Allied Supermarkets	45.50	1	FT
Allied Technology	0.43	1	EMR
Bobbie Brooks	6.34	1	FT, EMR, W
Bohack	0.98	1	FT
Colonial Commercial	21.89	1	EMR
Commonwealth Oil Refining Co.	3.50	1	FT
Computer Communications	3.53	1	EMR
HRT Industries	5.88	1	EMR, W
Inforex	3.43	1	FT, EMR
KDT Industries	4.61	1	EMR, W
Leisure Dynamics	24.63	1	EMR
Lionel Corp.	4.93	1	EMR, W
Partners Oil	8.01	1	EMR
Penn-Dixie Industries	5.10	1	FT, EMR, W
Revere Copper & Brass	3.00	1	FT, EMR, W
Richton International	28.14	1	EMR, W
Saxon Industries	38.00	1	FT, EMR, W
Seatrain Lines	1.42	1	EMR, W
Steelmet	0.90	1	EMR
Threshold Technology	12.02	1	EMR
Victor Technologies	35.71	1	EMR
Braniff International	0.00	0	FT, EMR
Continental Airlines	0.00	0	FT, EMR
Daylin	0.00	0	FT
Evans Products	0.00	0	EMR, W
Interstate Stores	0.00	0	FT
J.W. Mays	0.00	0	EMR
Kenilworth	0.00	0	EMR
Storage Technology	0.00	0	EMR

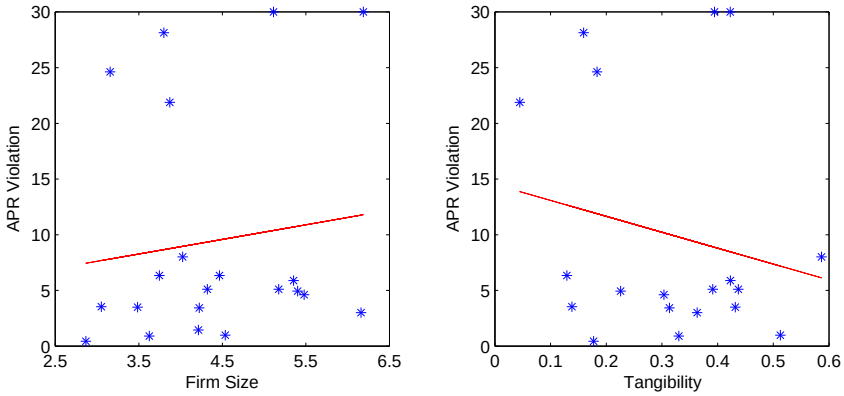
This table lists the bankruptcy cases collected from the papers by Franks and Torous (1989) (FT), Eberhart, Moore, and Roenfeldt (1990) (EMR) and Weiss (1990) (W). We include all cases for which we can identify the company in COMPUSTAT and CRSP. Column 4 displays the respective paper, which the case is taken from. For the APR violations we rely on the first two papers, since they compute actual deviations from the APR, while the Weiss paper only documents whether there are deviation from APR or not. In case of appearing in both FT and EMR, we list the FT values.

Figure 1. Default Probability and Expected Excess Return



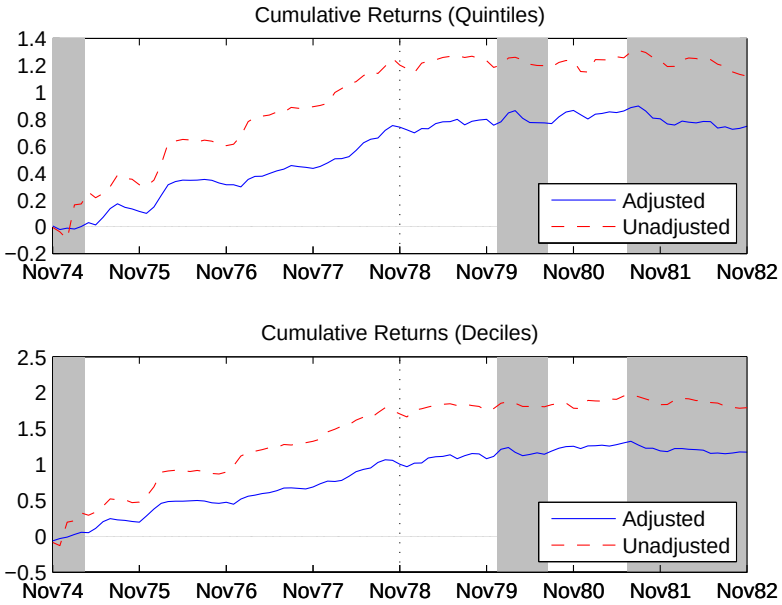
This figure plots expected excess return (EER) in (A.16) as a function of default probability (DP) in (A.17) before the BRA ($\eta_r = 0\%$) and after the BRA ($\eta_r = 20\%$) for firms with no firm-level shareholder bargaining power ($\eta_i = 0\%$; black, dotted lines), low firm-level shareholder bargaining power ($\eta_i = 10\%$; red, dashed lines), and high firm-level shareholder bargaining power ($\eta_i = 20\%$; blue, solid lines). Due to the BRA, shareholders' bargaining power rises from η_i to $\widetilde{\eta}_i \equiv \eta_i + \eta_r - \gamma_i \min\{\eta_i, \eta_r\}$ and hence the BRA's effect is more complementary ($\gamma_i = 10\%$) in the second panel and more substitutable ($\gamma_i = 90\%$) in the third panel. The graphs vary the level of earnings, X, between the initial level, $X_0 = \$20$, and the level at which strategic debt service is initiated, X_S, for a debt coupon payment of $C = \$4$ in the non-renegotiation region and for a $T = 10$ year time horizon of the default probability. The bankruptcy cost, α, is 50%, the corporate tax rate, τ, is 15%, the growth rate of earnings, μ, is 1%, the volatility of earnings, σ, is 25%, the correlation of earnings with the pricing kernel, ρ, is -25%, the volatility of the pricing kernel, σ_Λ, is 25%, and the risk-free rate, r, is 4%.

Figure 2. Shareholder Advantage Proxies and APR Violations



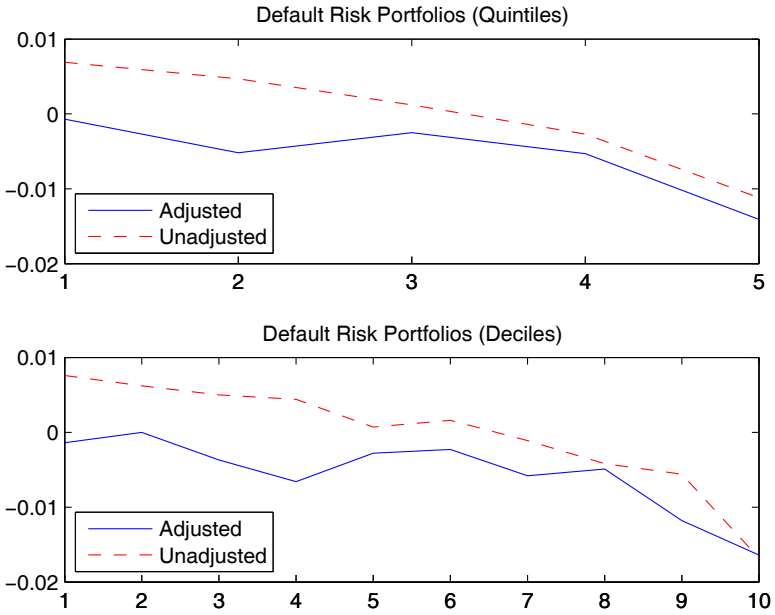
This figure shows the deviation from the APR with respect to firms' level of shareholder advantage. The firm-level shareholder advantage proxies are computed as the logarithm of total book assets for Firm Size, and property, plant and equipment scaled by total book assets for Tangibility. The value of APR violations is drawn from hand-collected data sets in Franks and Torous (1989) and Eberhart, Moore, and Roenfeldt (1990). In the graphs we limit APR violations above by 30% for better visibility of the differences for lower values of APR deviations. This upper bound leaves the results qualitatively unchanged. The plots confirm that these shareholder advantage proxies lead to APR violations in the predicted way. The upward-sloping trend in the left plot provides evidence that large firms exhibit higher APR violations in Chapter 11 restructurings. The downward-sloping trend in the right plot shows that firms with high ratios of tangible assets have lower APR violations in Chapter 11 restructurings.

Figure 3. Cumulative Portfolio Returns



This figure plots cumulative returns of the long-short portfolio buying stocks in the top quintile (decile) of default risk and selling stocks in the bottom quintile (decile). The results for quintiles is displayed in the top graph, the results for deciles in the bottom graph. The red, dashed lines chart unadjusted returns and the blue, solid lines chart returns adjusted for market, size, book-to-market, and momentum factors. The gray, shaded areas indicate recession periods during our sample period according to the NBER classifications.

Figure 4. Reform Effect and Default Risk Portfolios



This figure shows the reduction in quintile (decile) portfolio returns for different default risks (1 = Low, ..., 5 or 10 = High) due to the BRA (i.e., post- minus pre-reform average monthly portfolio returns) on the y-axis. The top graph displays the results for quintiles, the bottom graph the results for deciles according to the monthly updated default measure. The red, dashed lines represent unadjusted returns and the blue, solid lines represent returns adjusted for market, size, book-to-market, and momentum factors.