Creditor Rights, Bankruptcy Resolution, and the Role of Accounting Quality

by

Bingxu Fang

A thesis submitted in conformity with the requirements
for the degree of Doctor of Philosophy

Joseph L. Rotman School of Management
University of Toronto

Creditor Rights, Bankruptcy Resolution, and the Role of Accounting Quality

Bingxu Fang

Doctor of Philosophy

Joseph L. Rotman School of Management
University of Toronto

2021

Abstract

This dissertation investigates the effects of the creditor rights and the role of financial reporting in the debt markets. In Chapter 1, I focus on the impact of creditor rights and the role of accounting quality on the efficiency of bankruptcy resolutions. In Chapter 2, I study the relevance of the reporting of Key Performance Indicators (KPIs) in the debt markets.

Chapter 1 studies the effects of creditor rights and the role of accounting quality on the efficiency of Chapter 11 bankruptcy proceedings. I exploit the staggered adoption of anti-recharacterization statutes that induce variations in creditor rights across states and time. My findings suggest that stronger creditor rights lead to more efficient bankruptcy proceedings. Specifically, I show that stronger creditor rights lead to higher enterprise value of the firm at bankruptcy resolution, which results in higher recovery rates for creditors. Moreover, I show both analytically and empirically that the benefits of creditor rights are higher when the information frictions in bankruptcies are lower, which is captured by higher quality accounting information. Finally, I extend the generalizability of my findings to a broader sample using credit default swap data.

Chapter 2 studies the role of Key Performance Indicators (KPIs) in debt markets. I explore whether KPIs convey incremental information to debt investors and examine the reaction of the Credit Default Swap (CDS) market to the announcement of KPI news. Using data from four industries in which KPIs are common (airlines, retail, oil and gas, and telecommunication industries), I predict and find that the CDS market reacts significantly to the informational content embedded in KPIs. I further show that the impact of KPIs is stronger when investors' demand for KPI information is higher, when the company is closer to financial distress, when the sign of KPI news is negative, and when the KPI is lower than the industry-median value, and when the company has lower earnings quality. Overall, my findings contribute to the literature studying the informational content of KPIs by showing their relevance to debtholders and add to research on the determinants of credit risk by highlighting the role of KPIs.

Acknowledgments

I am deeply grateful to my supervisor, Ole-Kristian Hope, for his continuous support, guidance, and encouragement throughout my study at Rotman. His passion for research and professionalism has left a substantial impact on my journey toward Ph.D. and will keep motivating me for the rest of my life. I owe a special gratitude to my committee member and coauthor Dushyant Vyas for his generous help in my research. I would also like to thank two other members of my dissertation committee, Akash Chattopadhyay and Jee-Eun Shin, for their support and guidance. I am also grateful to Gordon Richardson, Jeff Callen, Partha Mohanram, Baohua Xin, Alex Edwards, Daehyun Kim, Hai Lu, Franco Wong, Yue Li, Ping Zhang, Dragan Stojanovic, and other faculty members at the Rotman School for their help during my doctoral study. I also cherish my time with all the fellow Ph.D. students at Rotman, including Mingyue Zhang, Michael Marin, Shushu Jiang, Shibin Tang, Jingjing Wang, Muhammad Azim, Stephanie Cheng, Wuyang Zhao, Emma Wang, Xijiang Su, and Yihan Liu. I dedicate this dissertation to my wife and my best friend, Rui Zhu, and my parents for their unconditional support and love throughout.

Table of Contents

Chapter 1 -- Creditor Rights, Bankruptcy Resolution, and the Role of Accounting Quality

1. Introduction

As the Covid-19 pandemic is leading to a record wave of corporate bankruptcies, an efficient and well-functioning bankruptcy system plays an increasingly important role in the economy. Such a procedure should allow economically viable firms to reorganize and continue operations and simultaneously let inefficient firms be liquidated (Jackson 1982). However, inefficiencies in bankruptcy may exist due to two sources of frictions based on the principal-agent relationship between the creditor and the debtor (e.g., Berkovitch and Israel 1999): (1) the conflict of interests between debtor's management, who enjoy private benefits in continuations regardless of the firm's profitability, and creditors who aim to maximize their recoveries; and (2) the information asymmetry between the well-informed management and outside creditors. The goal of this paper is to investigate how the control rights of creditors mitigate the frictions and affect the efficiency of bankruptcy proceedings. Moreover, I study the role of accounting information in this context by reducing the information frictions in bankruptcy.

There has been a wide debate about the efficiency of creditor rights among academics and policymakers. For example, the Chapter 11 process in the U.S aims to preserve the going-concern value of assets and it grants much controlling power to the incumbent management who enjoys an information advantage regarding the firm's operations. Chapter 11 has been perceived as overly debtor-friendly by tending to preserve economically inefficient firms (Baird 1986; Jensen 1989; Aghion, Hart, and Moore 1992; Hotchkiss 1995). Reforms that strengthen creditor rights in Chapter 11 cases (e.g., BAPCPA) also draw concerns from commentators that it leads to excess liquidations

of firms that would be better off if preserved (Gilson 2010). Despite the debate about the efficiency of bankruptcy procedures, the effects of creditor rights are usually difficult to test directly. In this study, I exploit the staggered adoption of anti-recharacterization statutes (*AR Law*) across U.S. states as a source of plausibly exogenous variation in creditor rights, and examine how creditor rights affect the efficiency of bankruptcy proceedings.[1]

The *AR Law* applies to firms that use special-purpose vehicles (SPVs) to conduct secured borrowing. Under the U.S. Bankruptcy Code, a bankruptcy estate is created once a firm files for Chapter 11 bankruptcy and it includes all property that the firm has an interest in at the time of filing. The automatic stay provision under the bankruptcy code prevents creditors from repossessing collateral that is part of the bankruptcy estate. To avoid the automatic stay, the firm can sell the assets to an SPV that is a legally distinct entity from the parent firm and borrow against the assets in the SPV. In case the parent firm files for bankruptcy, the SPV assets are isolated from the bankruptcy estate of the originator firm and are outside the scope of the automatic stay. However, before the enactment of *AR Law*, bankruptcy courts had the discretion to recharacterize the sale of assets to the SPV as secured borrowing and include the SPV assets in the bankruptcy estate. *AR Law* significantly reduces the courts' discretion and enhances the rights of SPV creditors by allowing them to repossess collateral in bankruptcy.

Building upon the analytical framework developed by Ayotte and Gaon (2011), I predict that stronger rights for SPV creditors induced by *AR Law* enhance the efficiency of the bankruptcy process and thus increase the total enterprise value of the firm during bankruptcy. When sales to SPVs are recharacterized as secured loans, the assets transferred to SPVs are included in the bankruptcy estate,

[1] In the rest of this paper, I refer to "anti-recharacterization statutes" and *AR Law* interchangeably.

which increases the amount of assets that can be subjugated by the management in bankruptcy. This gives the management a higher ability to invest in value-destroying projects and to continue operating firms that are economically inefficient. As *AR Law* excludes SPV assets from the bankruptcy estate, it has the potential to mitigate the overinvestment issue and therefore to enhance the efficiency of the bankruptcy process.

Next, I extend the Ayotte and Gaon (2011) framework by incorporating information frictions and the role of accounting quality into the model. My analytical analysis shows that the effects of creditor rights are stronger when the information frictions in bankruptcy are reduced by higher accounting quality. Specifically, I assume that the outside creditors do not perfectly observe the profitability of the firm's investment projects and instead only observe a noisy accounting signal. Higher quality of accounting information helps screen profitable investment projects and reduces the information asymmetry between the well-informed manager and creditors. As *AR Law* improves the control rights of creditors in bankruptcy, the efficiency of the bankruptcy process depends more on the ability of creditors to obtain information about the firm's fundamentals. I show that higher quality of accounting information reduces the inefficiencies due to excess continuations (liquidations) of unprofitable (profitable) firms that are driven by the information frictions and thus enhances the effects of creditor rights.

To empirically test my predictions, I construct a sample of public firms in default from Moody's Ultimate Recovery Database (URD). Next, I collect information on the usage of SPVs by searching each firm's 10-K filings prior to default and include firms with at least one SPV in the final sample. I use three sets of tests to examine the efficiency of the bankruptcy process and find empirical evidence consistent with my analytical analyses. First, I show that the enactment of *AR Law* leads to higher enterprise value of the firm that is available to be distributed to creditors at default resolution,

which results in better recovery rates for different types of creditors. Second, I examine operating and financial performance of firms that emerge from bankruptcy. The results show that the enactment of *AR Law* leads to better operating and stock market performance for firms that emerge from bankruptcy. I also find a reduced probability for firms to require further restructuring shortly after emergence. These findings support the notion that *AR Law* improves the efficiency of bankruptcy procedures and consequently increases the total enterprise value of the firm. Third, I examine the effects of *AR Law* on the indirect costs of the bankruptcy process, measured by the length of time spent in bankruptcy. I find that *AR Law* significantly reduces the time spent in bankruptcy proceedings. The findings are consistent with the argument that more efficient bankruptcies, which lead to higher enterprise value, reduce the incentives for shareholders to cause delays during bankruptcy in the hope of extracting rent from creditors.

To shed light on the underlying mechanism of the observed improvement in efficiency, I examine whether the effects of *AR Law* are stronger when inefficient continuations of unprofitable firms are more likely to happen. Based on the findings in Hotchkiss (2005), I expect the inefficiency issues to be more severe for firms with incumbent management remaining in place. Compared with a newly appointed manager, the incumbent manager's human capital is more likely to be firm-specific and possesses reputation tied to the firm's operations, and therefore has higher incentives to preserve an economically inefficient firm. I hand collect data on whether the firm's CEO is replaced in the two-year window prior to the filing of bankruptcy and find evidence consistent with my prediction, suggesting that the effects of *AR Law* are stronger when inefficiencies are more likely to exist. Overall, the findings are consistent with the argument that stronger creditor rights mitigate the overinvestment concern in bankruptcy and enhance the efficiency of bankruptcy procedures.

Next, I examine the role of accounting quality in bankruptcy and investigate how it moderates the effects of creditor rights. I construct a composite index of accounting quality based on three widely used individual measures (Jones 1991; Kothari, Leone, and Wasley 2005; Ball and Shivakumar 2006). Consistent with my prediction based on the analytical analyses, I find that the effects of creditor rights are stronger when the quality of accounting information is higher. These results suggest that higher accounting quality mitigates the information frictions during bankruptcies and enhances the effects of creditor rights.

Moreover, to generalize my findings based on a relatively small SPV sample, I conduct additional analyses using data from the credit default swap (CDS) market. Based on a large sample of the most liquid five-year CDS contracts referencing senior unsecured debt, I show that *AR Law* leads to a significant decrease in CDS spreads after controlling for factors that relate to default risk and liquidity effects. The findings are consistent with the argument that *AR Law* improves the efficiency of bankruptcy proceedings and increases creditors' expected recovery rate, which suggests that my primary findings can be generalized to a broader sample of firms.

This study makes several contributions. First, my study adds to the literature studying the effects of creditor rights on the efficiency of bankruptcy procedures. The effects of creditor rights are difficult to test directly due to the lack of natural experiments. Prior studies often employ data from countries other than the U.S. and examine the efficiency of bankruptcy systems under a different legal framework (Thorburn 2000; Strömberg 2000; Franks and Sussman 2005). The drawback of this strand of literature is the absence of in-sample variations in bankruptcy rules, which limits the ability to directly study the effects of creditor rights. Another type of research is based on cross-country analyses (Djankov, Hart, McLiesh, and Shleifer 2008; Davydenko and Franks 2008). The limitation of these studies is that it is difficult in a multi-country setting to exclude the possibility that the effects

are driven by other omitted factors at the country level. In addition, the samples examined in these articles are either based on a hypothetical case study or on private firms, which limits the generalizability of their findings to publicly traded firms. My study exploits a setting in which the enactment of state-level *AR Law* generates plausibly exogenous variations in creditor rights, while keeping country-level factors constant, and by investigating the effects on a sample of relatively large and public firms.

Second, my study contributes to research that examines the impact of accounting quality. Extant research documents that higher accounting quality improves internal investment efficiency for both public and private firms (Biddle and Hilary 2006; Biddle, Hilary, and Verdi 2009; McNichols and Stubben 2008; Chen, Hope, Li, and Wang 2011) and increases the efficiency of acquisition decisions (Marquardt and Zur 2015; McNichols and Stubben 2015). I highlight the effects of accounting quality on investment efficiency in a bankruptcy setting and study the role of accounting information on mitigating information frictions during Chapter 11 proceedings.

Third, my paper relates to the scarce literature on the role of accounting information during the bankruptcy process. Most studies examine the role of accounting numbers on covenant renegotiations outside of bankruptcy (e.g., Nikolaev 2018; Dou 2020). In contrast, research on the role of accounting information in bankruptcy proceedings is limited. To my knowledge, Carrizosa and Ryan (2013) and Donovan, Frankel, and Martin (2015) provide the only such evidence by examining the effects of accounting conservatism and financial covenants on creditor recovery rates. They find that conservative reporting preserves the firm's going-concern value and increases the recovery rates for creditors in bankruptcy. My study contributes by investigating the effects of accounting quality on reducing the information frictions in bankruptcies.

Finally, this article adds to the literature investigating the effects of creditor rights during bankruptcy on firms' *ex-ante* behavior. A number of international studies exploit cross-country variations in creditor rights measured by the index developed by La Porta, Lopez-De-Silanes, Shleifer, and Vishny (1997) and Djankov, McLiesh, and Shleifer (2007) and examine the impact on firms' risk-taking behavior (Acharya, Amihud, and Litov 2011), innovation (Acharya and Subramanian 2009), and loan contracts (Qian and Strahan 2007; Bae and Goyal 2009). There are also recent and concurrent studies on the effects of *AR Law* on firms' *ex-ante* reactions, such as capital structure (Li, Whited, and Wu 2016), innovation (Mann 2018), leasing activities (Chu 2019), investment policies (Favara, Gao, and Giannetti 2020; Ersahin 2020), loan contracts (Ghanbari 2019), and financial reporting (Cheng, Li, and Zhang 2020). My paper extends these studies in two ways. First, while most extant research focuses on firms' *ex-ante* reactions to variations in creditor rights, there is little research on the *ex-post* outcomes of insolvency resolutions. Second, my research shows that the effects of creditor rights depend on the information frictions during bankruptcies and that accounting quality plays a significant role in mitigating these frictions.

2. Institutional Background

2.1 Features of the U.S. Bankruptcy Code

In the U.S., the Bankruptcy Reform Act of 1978 introduces Chapter 11 for corporate reorganizations, which provides a relatively debtor-friendly framework for firms to reorganize under court supervision. Under Chapter 11, the filing firm's existing management is presumed to remain in control of the firm and continue to conduct normal day-to-day business activities without

interventions as "*debtor-in-possession,*" or "DIP."[2] The fact that the debtor remains in possession grants the management a natural information advantage about the firm's value, which could be exploited in bargaining with outside creditors.

The Bankruptcy Code also makes it possible for the debtor to get access to liquidity in order to fund normal operations. The DIP may use cash collateral that has been pledged to pre-petition lenders with creditors' consent or with a court order under Section 363(c) of the Code. In addition, the debtor can obtain post-petition credit known as DIP financing. In particular, Section 364(c) allows the debtor to get a super-priority claim or to issue new secured debt on unencumbered assets and Section 364(d) may authorize a DIP loan secured by a senior or equal lien on encumbered property. The debtor's request for cash-collateral usage and DIP loans is mostly part of the first day motion, which is usually approved by the judge in a timely fashion.

Moreover, the debtor has an exclusive right to file a reorganization plan during a period of 120 days after the bankruptcy petition.[3] To the extent that the management favors preserving the firm, the management has the leverage in having a plan that exploits the information advantage and extracts rents from the creditors. This could result in an inefficient resolution outcome for the bankrupted firm,

[2] Any transactions beyond the reasonable scope of normal business, such as disposals of essential assets, are subject to the approval of the court. The DIP is likely to be replaced by an independent trustee if the court finds "cause" for appointing a Chapter 11 trustee, or if a trustee is believed to be in the interest of creditors or owners (Altman, Hotchkiss, and Wang 2019). Cause usually includes fraud, dishonesty, criminal conduct, or incompetence in the management of the debtor. Such practice is not common because the board of directors can remove the management team prior to filing Chapter 11 to avoid losing control power during the reorganization process (Altman et al. 2019).

[3] A confirmed plan requires approval from two-thirds of each entitled creditor's class in terms of amount and from half in terms of the number of claims, and from two-thirds of shareholders in the amount of the outstanding shares if entitled to vote. Other parties, such as the equity holders' committee or a creditors' committee, can file a plan only if an independent trustee has been appointed, if the debtor fails to file a plan within 120 days of filing, or if the debtor's plan is not accepted within 180 days of filing (Altman et al. 2019).

such as allowing unprofitable firms to raise additional financing and continue operating, instead of choosing a more efficient liquidation.

Another key feature of Chapter 11 is the *automatic stay* provision that is accomplished with Section 362 of the Code. Once a firm files for Chapter 11, a bankruptcy estate is created that includes all property in which the firm has an interest in at the time of filing. The automatic stay prevents the creditors from taking actions to repossess assets that are part of the bankruptcy estate. Specifically, the creditors are prevented from foreclosing on collateral, collecting debt repayment, or recovering past claims. Under the 1978 Code, the secured creditors are entitled to adequate protection through replacement liens and cash payments as compensation for the diminution in the value of their collateral.[4] However, the value of adequate protection is generally lower to a creditor than the ability to repossess the collateral and sell it instantly. This is because the secured creditors are not required to be compensated for the time value of their claim when the firm continues to operate during bankruptcy and their claims can be diluted if the firm obtains new external financing that is of the same or higher seniority than the existing secured debts. The ability to dilute prepetition creditors can help an unprofitable firm to obtain additional funding in bankruptcy and continue operating, rather than resulting in a liquidation that could achieve better use of the firm's assets.

Overall, the Chapter 11 process has been perceived as *pro*-debtor and researchers have expressed concerns about whether the debtor-friendly features lead to inefficient bankruptcy outcomes, such as preserving firms that could be better off if liquidated. Jensen (1991) argues that such features give

[4] If the creditor is owed more than the value of the collateral, the claim is split into a secured piece that is equal to the value of the collateral upon the bankruptcy filing and an unsecured claim for the remainder. Only the secured piece is entitled to adequate protection. Pro-debtor judges might understate the true value of collateral to bifurcate the secured creditor's claim and to facilitate funding raising for the bankruptcy firm (Bebchuk and Fried 2001).

rise to "chronic inefficiencies," which could bring large costs to the economy. Consistent with the inefficiency concern, Hotchkiss (1995) shows that over 40% of firms emerging from bankruptcy continue to experience operating losses and many of them require further restructuring in the near future after emergence. Such concerns contributed to the passage of the Bankruptcy Abuse Prevention and Consumer Protection Act of 2005 (BAPCPA), which aims in particular at curbing repeat filings by strengthening creditor rights in repeated bankruptcy filings.[5] However, the stronger restrictions on debtors introduced by BAPCPA also drew concerns from commentators that they may lead to excess liquidations of efficient firms and lower recoveries for creditors (Gilson 2010).

2.2. Research Setting: Anti-Recharacterization Statutes

The enactment of state anti-recharacterization statutes in the U.S. creates plausibly exogenous variation in creditor rights across states and over time. This provides a useful setting to examine the effects of creditor rights on the bankruptcy process while keeping country-level factors constant. The automatic stay provision under the 1978 Code limits lenders' ability to repossess collaterals and weakens creditor rights during the bankruptcy process. To evade this limitation, the borrowing activity can be conducted via a bankruptcy-remote special purpose vehicle (SPV). The borrower transfers the collateral to the SPV first and then uses the SPV as the borrowing entity. The key advantage of an SPV is the bankruptcy remoteness feature, which implies that SPV assets are not considered as part of the borrowing firm's bankruptcy estate and thus not subject to the automatic

[5] Specifically, BAPCPA adds exceptions to the automatic stay provision, under which an automatic stay only lasts for 30 days if the case is filed within one year of the dismissal of a prior case and an automatic stay would not be granted if the case is filed within one year of the dismissal of two or more prior cases. BAPCPA also limits the debtor's exclusivity period to 18 months and no longer permits the grant of multiple extensions. Other new features include the increased pressures on the debtor's cash flow and limitations on payments to executives under Key Employee Retention Plans. See Gilson (2010) for more details.

stay. Prior research shows that borrowing through SPVs is common among public firms in the U.S. For example, Feng, Gramlich, and Gupta (2009) document that 42% of public firms use at least one SPV during the 1994 to 2004 period and the number is increasing over time.

However, the bankruptcy remoteness of SPVs is not guaranteed and the effectiveness of this borrowing strategy relies on the assumption that the asset transfers are characterized as true sales, instead of financing activities. *Before* the anti-recharacterization statutes, bankruptcy courts had the discretion to recharacterize the transfer as a financing transaction, which makes the collateral fall under the scope of the automatic stay provision and limits the usefulness of this borrowing strategy.[6] The risk of recharacterization has been the key concern for the industry and legal studies have reviewed a large number of bankruptcy cases involving the true sale disputes (Homburger and Andre 1989; Aicher and Fellerhoff 1991; Tracht 2012; Hughes 2017).[7]

To prevent the possibility of recharacterization, the following states adopted anti-recharacterization statutes: Texas and Louisiana in 1997, Alabama in 2001, Delaware in 2002, South Dakota in 2003, Virginia in 2004, and Nevada in 2005. Under the new *AR Law*, the uncertainty regarding whether the collateral in SPVs will be recharacterized as true sales or financial transactions by courts was mostly removed. Specifically, collateral transfers to SPVs are treated as true sales and

[6] Neither the Bankruptcy Code nor the Article 9 of the Uniform Commercial Code provides explicit guidance in distinguishing between a true sale or a security interest with respect to a property. Instead, courts generally rely upon a nonexclusive set of factors that are generally governed by state property law when determining whether the asset transferred to an SPVs is a true sale. These factors include recourse to the originator, repurchase option, control over the transferred assets, rights to excess collections, and rights to unilaterally adjust the transaction terms (Hughes 2017). Because there is no standardized list of factors or decisive rules, courts' discretion leads to uncertainty in the rights of SPV creditors during bankruptcy.

[7] Unlike the list of factors related to the true sale issue considered by the legal profession, accounting standards (SFAS No. 125, 140, 166, and 167) mainly rely on "surrender of control" to determine whether the transfer of financial assets is a sale or a secured financing transaction. Therefore, it is likely that a transfer is characterized as a true sale for legal purposes, but not for accounting purposes. See Cheng, Dhaliwal, and Neamtiu (2011) for further discussions on accounting treatment of transfers of financial assets.

SPV creditors are allowed to seize the collateral transferred to the SPV. As described in Kettering (2008), the adoption of the statutes was mainly due to the lobbying efforts by the banking and securitization industry, which makes the laws fairly exogenous to non-financial firms that are of interest to this study.[8] In addition, the fact that these seven states enacted the statutes in different years provides a useful setting for researchers to better isolate the effects of creditor rights.[9] As shown by Lemmon, Liu, Mao, and Nini (2014), the assets transferred to SPVs by nonfinancial firms are usually accounts receivables, which act as a crucial source of cash flows for firms in bankruptcy to fund daily operations (Ayer, Bernstein, and Friedland 2004). Therefore, *AR Law* is likely to have a meaningful impact on the bankruptcy process. I provide further details of the statutes in Appendix C.

3. Theoretical Framework and Testable Hypotheses

3.1 The Effects of Creditor Rights without Information Frictions

I build upon the analytical framework in Ayotte and Gaon (2011). First, I consider the case without information frictions and show that stronger rights for the creditors of SPVs can help improve the ex-post efficiency of the bankruptcy process. The intuition is that the ability of the debtor to raise new funding and continue operating in bankruptcy depends on not only the profitability of ongoing investment projects, but also on prepetition assets within the firm's bankruptcy estate. The fact that DIP loans usually take a priming lien on encumbered assets grants the management the ability to overinvest in negative NPV projects and leads to preservation of inefficient firms. The enactment of

[8] In the empirical analyses presented in Section 5.1, I test the dynamic effects of the statutes. If there are certain state-level economic factors that lead to adoption of the statutes, the effects of the laws may start to show up even before the adoption year. The results do not support this explanation.

[9] Several other states adopted similar statutes to prevent the recharacterization of sales of certain utility charges to SPVs. However, these statutes are narrowly tailored and only apply to the utility industry (Kettering 2008). Therefore, I do not consider these statutes in this study.

AR Law enhances the rights of SPV creditors by excluding SPVs assets from the firm's bankruptcy estate, which can mitigate the excess preservation of inefficient firms.

To better illustrate the intuition behind the analytical analysis, consider a simplified one-period model with a firm in default whose assets have a liquidation value of L. If the firm continues operating and emerges from bankruptcy, it requires fixed additional funding of K from a DIP loan and generates a cash flow of X. The value of the firm's assets will decrease to $L - L\gamma$ due to depreciation. Assuming the interest rate is equal to r, the firm's continuation decision will be ex-post efficient if and only if continuation generates a higher value than if liquidated:

$$X + L - \gamma L - (1 + r)K \geq L \quad \text{or} \quad X - \gamma L - (1 + r)K \geq 0. \tag{1}$$

Equation (1) suggests that the firm will only invest in positive NPV projects. This case will be referred to as the first-best scenario, when only profitable firms continue operating and emerge from bankruptcy.

Suppose the firm's assets of value L serve as collateral for a prepetition secured debt, the collateral is subject to the automatic stay during bankruptcy under the Bankruptcy Code, which prevents the creditor from foreclosures. [10] If the firm continues operating, the DIP loan of value K is assumed to enjoy super-priority status over existing debt and to be secured by a senior or equal lien on properties that is subject to an existing lien by prepetition lenders. This assumption on the DIP loan's seniority is consistent with the empirical findings in prior studies (Dahiya, John, Puri, and

[10] I assume that there is only one type of prepetition creditor in the analytical analyses because I am mainly focused on the bargaining process between the debtor and creditor. See Gertner and Scharfstein (1991) and James (1995) for models on the frictions among different types of creditors during bankruptcy. In my empirical analyses, I control for features of the firm's debt structure (e.g., the proportion of debt held by banks and the percentage of secured debt relative to total liabilities) to account for bargaining frictions among creditors.

Ramírez 2003; Eckbo, Li, and Wang 2020).[11] Prepetition secured creditors are ensured to receive *adequate protection* during bankruptcy under the current bankruptcy code, but the protection is economically less valuable than the collateral itself (Altman, Hotchkiss, and Wang 2019).[12]

Suppose that the secured creditor will receive a claim worth the value of $(1-\delta)L$ on the investment's cash flow, with δ capturing the level of value loss during bankruptcy under the adequate protection. I assume that the manager always prefers continuations over liquidations regardless of the firm's profitability. This assumption is consistent with empirical evidence that turnover induced by corporate bankruptcy is highly costly for incumbent CEOs (Eckbo, Thorburn, and Wang 2016). In this case, the continuation condition becomes

$$X + L - (1-\delta)L - \gamma L - (1+r)K \geq 0 \text{ or } X - \gamma L - (1+r)K \geq -\delta L. \quad (2)$$

Under this scenario, the firm may invest in negative NPV projects as long as the net present value is higher than $-\delta L$ and therefore inefficient continuations may occur.[13] This argument is consistent with theory work showing that a debtor-friendly bankruptcy code can lead to overinvestment and inefficient continuations (Gertner and Scharfstein 1991). It is also supported by empirical evidence that Chapter 11 allows unprofitable firms to continue operating instead of being liquidated (Hotchkiss 1995).

[11]For example, Eckbo et al. (2020) show that all DIP loans have super-priority status and most have a priming lien from the 2002 to 2014 period.

[12] Adequate protection does not require that secured creditors are compensated for the opportunity costs of their claims (see *United Savings Assn. v. Timbers* 1988). If the creditor's claim is under-secured, the claim is bifurcated into a secured piece equal to the value of the collateral at bankruptcy, and an unsecured piece that is not entitled to adequate protection.

[13] My inferences remain if the DIP financing is provided by prepetition lenders, which is empirically documented to be common in practice (Eckbo et al. 2020). The intuition is that the incentives for prepetition lenders to offer DIP financing may come from protecting their existing claims from dilution. If such incentives are internalized in the DIP lender's decision-making process, there would be less focus on the profitability of ongoing projects, which would also lead to excess continuation of inefficient firms.

Next, suppose the firm's assets of value L have been transferred to a bankruptcy remote SPV and the SPV is used to conduct the borrowing activities. In that case, the collateral is not subject to the automatic stay, and SPV creditors have the right to repossess the collateral during bankruptcy. Suppose the transferred assets can be replaced at price P, either by purchasing from third parties or from the SPV creditors, the firm's continuation condition becomes:

$$X - \gamma L - (1 + r)K - P + L \geq 0. \quad (3)$$

To the extent that P is close enough to L, the efficiency of the bankruptcy process approaches the first-best scenario. Thus, limiting the resources available with the firm's bankruptcy estate can help mitigate the overinvestment issue in bankruptcy and enhance the efficiency of the bankruptcy process.

However, the bankruptcy remoteness of SPVs also grants creditors more bargaining power and this may lead to a holdup problem. If the SPV assets are unique and essential to the firm's operations, the higher bargaining power of the creditors increases the replacement cost P. When $-P + L$ becomes negative, the continuation condition makes the firm pass on positive NPV projects and leads to inefficient liquidations. Considering that my study focuses on nonfinancial firms, for which the assets transferred to SPVs are often accounts receivable (Lemmon, Liu, Mao, and Nini 2014), the creditors' bargaining power is low because these assets are not unique for the firm's operations (Ayotte and Gaon 2011). Consequently, I do not expect the hold-up problem to be prominent.

Under my research setting, the enactment of *AR Law* helps preserve the bankruptcy-remoteness of SPVs, which keeps the SPV assets out of the firm's bankruptcy estate and makes the firm's investment decision captured by Equation (3). Without the *AR Law*, the asset sales to SPVs can be recharacterized as secured loans and the firm's investment policy will convert to Equation (2). *AR Law* reduces the amount of assets that can be subjugated in bankruptcy and limits the firm's ability

to invest in negative NPV projects. The predicted better investment efficiency in bankruptcy enhances the firm's value and thus increases the recovery rate to creditors. Moreover, I expect a more efficient continuation decision to also lead to better operating and financial performance for firms emerging from bankruptcy. To the extent that these effects are not dominated by the holdup problem, I expect the enactment of state *AR Law* to improve the efficiency of the bankruptcy process. These arguments lead to my first hypothesis:

Hypothesis 1: The enactment of state anti-recharacterization statutes leads to more efficient bankruptcy outcomes.

3.2 The Role of Accounting Quality in the Presence of Information Frictions

Next, I extend the framework in Ayotte and Gaon (2011) to study the effects of information frictions and the impact of accounting quality. My analytical analyses suggest that the effects of creditor rights tend to be stronger when the quality of accounting information is higher. The intuition is that when creditor rights are stronger, the efficiency of the bankruptcy process depends more on the ability of creditors to obtain information about the firm's fundamentals. Higher accounting quality helps screen profitable investment projects and lowers the information frictions faced by creditors, enhancing the benefits of creditor rights.

I extend the Ayotte and Gaon (2011) model by further incorporating information frictions and the role of accounting information into the framework.[14] I assume that the firm can be either a good type (type G) with probability θ or a bad type (type B) with probability $1-\theta$. If the firm raises the

[14] More detailed description of the model and all proofs are in Appendix B.

fixed additional funding of K and continues operating, a type G firm produces a cash flow of X_h and a type B firm generates a cash flow of X_l, where

$$X_h - \gamma L - (1 + r)K \geq X_l - \gamma L + \delta L - (1 + r)K = 0 \geq X_l - \gamma L - (1 + r)K.$$

This suggests that it is efficient for a type G firm to continue operating and for a type B firm to be liquidated. I assume that the manager privately observes the type, while outside creditors can only observe an imperfect accounting signal that reveals the type with noise. I assume that the firm has an unbiased accounting system which produces either a high signal S_H or a low signal S_L, where

$$P(S_H|G) = \frac{1+\lambda}{2} \; and \; P(S_L|G) = \frac{1-\lambda}{2},$$

$$P(S_H|B) = \frac{1-\lambda}{2} \; and \; P(S_L|B) = \frac{1+\lambda}{2}.$$

The design of the unbiased accounting system is similar to that in Gigler and Hemmer (1991) and Nan and Wen (2014). The parameter λ ranges from 0 to 1, which indicates the informativeness of the accounting system. To avoid a trivial solution of useless signals, I assume that λ is higher a threshold λ^*. (The details are available in Appendix B). A more informative accounting signal can reduce the information asymmetry between the firm and outside creditors and better reveal the profitability of the investment project. This is consistent with the argument in Bushman and Smith (2001) that accounting information can reduce adverse selection among investors.

As shown in Appendix B, when SPV assets are included in the bankruptcy estate under weak creditor rights, the optimal policy for the firm is to continue operating regardless of the accounting signal and inefficient continuation may happen. When creditor rights become stronger and SPV assets are excluded from the bankruptcy estate, the optimal investment decision is to continue operating if receiving a high signal S_H and to liquidate if receiving a low signal S_L. Because of the noisiness of

the accounting signal, both inefficient continuation and liquidation might occur. The model shows that the inefficiency costs are lower when accounting information is of higher quality. This finding is consistent with empirical evidence in other settings that higher quality of accounting information improves the firm's internal investment efficiencies (Biddle and Hilary 2006; McNichols and Stubben 2008; Biddle, Hilary, and Verdi 2009; Chen, Hope, Li, and Wang 2011) and acquisition performance in an M&A setting (Marquardt and Zur 2015; McNichols and Stubben 2015).

The benefits of creditor rights is given by the difference of expected value loss between weak creditor rights and strong creditor rights: $E\left[Value\ Loss_{weak\ CR} - Value\ Loss_{strong\ CR}\right] = (1 - \theta)\frac{1+\lambda}{2}\delta L - \theta\frac{1-\lambda}{2}[X_h - \gamma \mathrm{L} - (1 + \mathrm{r})\mathrm{K}]$, which increases with the quality of accounting information λ. The result suggests that the efficiency-enhancing effects of creditor rights are stronger when the quality of accounting information λ is higher. This is consistent with the intuition that when creditor rights are stronger, the continuation decision depends more on the creditor's ability to acquire to information about the firm's fundamentals. Higher accounting quality lowers the information frictions faced by creditors and enhances the benefits of creditor rights.[15] The above discussion leads to my second hypothesis:

Hypothesis 2: The effects of state anti-recharacterization statutes are stronger for firms with higher accounting quality.

[15] As a sensitivity analysis, I allow the liquidation value of the firm L to be random as well and the dispersion to be decreasing with accounting quality. I find that the effects of accounting quality are stronger under this assumption and the inferences are unchanged. Details are available upon request.

4. Sample Construction and Key Measures

4.1 Data Sources and Sample Construction

I obtain the data on defaults, recovery rates, and bankruptcy outcomes from Moody's Ultimate Recovery Database (URD) over the 1996 to 2010 period. The URD dataset includes data on large U.S. nonfinancial firms with at least $50 million in total debt outstanding at the time of default. A firm is identified as defaulted by Moody's if the firm has filed for bankruptcy, defaulted on debt payments, or entered into a distressed exchange with debtholders.[16] For each default included in the dataset, Moody's provides information on the firm's name, CUSIP number, ticker, default date, date of emergence, and detailed description of instruments outstanding at the time of default, such as seniority, collateral type, and principal and outstanding amount. I merge the URD database with CRSP and COMPUSTAT to obtain required accounting and stock price information using CUSIP numbers and company names. I manfully check the matched observations to ensure the accuracy of the matching process and this process leaves me with a sample of 406 defaults.

Next, I use SEC EDGAR to search the 10-K filings for the defaulted firms in the sample and collect information on each firm's SPV use prior to default. Following Feng et al. (2009), I use a Perl program to count the number of subsidiaries or affiliates listed in Exhibit 21 or Exhibit 22 with names that contain "Limited Partnership," "Limited Liability Partnership," "Limited Liability Corporation," "L.P.," "LP," "LLP," "L.L.P.," "LLC," "L.L.C.," or "trust." If such information is not available through the Exhibits, I follow Lemmon, Liu, Mao, and Nini (2014) and search the 10-Ks for keywords such as "sale of receivable," "securitize," "securitization," "special purpose," "off-balance sheet," and "purchase program." I manually read the text around the keywords and verify if the firm actually

[16] Specifically, the defaulted payment includes missed or delayed disbursement of interest, principal, or both, excluding missed payments that are cured within the grace period. Distressed exchange happens when the firm exchanges all or parts of the debt instruments for newly issued securities of inferior value.

uses an SPV. After dropping defaulted firms without SPV use, I end up with a final sample of 173 defaults with 163 unique firms.[17]

4.2 Key Variables

4.2.1 Dependent Variables

I use three types of measures to capture the efficiency of the bankruptcy process: enterprise value, post-emergence performance, and indirect bankruptcy costs. In terms of creditor recovery rates, I follow Donovan et al. (2015) and use the *Family Recovery Rate* measure at the firm level provided by Moody's for my main analyses.[18] The *Family Recovery Rate* measure calculates the enterprise value of the firm that is available to be distributed to all types of creditors, divided by total liabilities at default resolution.[19] A higher level of family recovery rates reflect a better use of the firm's assets and higher investment efficiency during the bankruptcy process. The advantage of using *Family Recovery Rate* is that it captures the total enterprise value of the firm in bankruptcy and controls for potential wealth transfers among different stakeholders. In additional analyses, I also examine recovery rates at the instrument level to shed light on the effects on different types of creditors.

The next set of dependent variables captures the performance of the firms that emerged from bankruptcy: accounting performance, stock return, and whether the firm files for bankruptcy again

[17] The reason that the number of defaults is higher than the number of unique firms is that a firm may default again after emergence from bankruptcy.

[18] Moody's uses three methods to calculate the value: the settlement method, the liquidity method, and the trading-price method. The settlement method calculates the value of the settlement instruments at or close to emergence. The liquidity method captures the value of the settlement instruments at the time of a liquidity event, such as the maturity of the instrument, the call of the instrument, or a subsequent default event. The trading-price method uses the trading price of the defaulted instrument at or post emergence. For each case in the sample, Moody's selects a recovery method that appears to be the best valuation strategy and the settlement method that is most commonly used.

[19] The recovery rate does not cover the payoffs to SPV creditors. As discussed in prior sections, *AR Law* would mechanically increase the recoveries for SPV creditors due to the limitations of adequate protection.

after emergence. Following prior research (Hotchkiss 1995; Denis and Rodgers 2007), I obtain data from COMPUSTAT and calculate accounting measures of accounting performance that are not associated with differences in capital structure. Specifically, *Accounting Performance* is defined as sales less cost of goods sold and selling, general, and administrative expenses (before deducting depreciation and amortization), calculated in the first fiscal year after emerging from bankruptcy. *Accounting Performance* is scaled by total assets to capture return on assets and adjusted by subtracting the median value among all public firms in the same 2-digit SIC industry-year in order to tease out industry-wide effects.

Following Eberhart, Altman, and Aggarwal (1999), I also examine the stock market performance for firms emerged from bankruptcy as public firms. *Post-Emergence Stock Return* is defined as the buy-and-hold stock return in the first calendar year after emerging from bankruptcy, adjusted for size and industry effects. Specifically, the adjustment is based on a portfolio of firms within the same size decile and 2-digit SIC industry.

Moreover, I investigate whether the emerged firms file for bankruptcy or restructure their debt again after emergence. *Chapter 22 or Second DE is* an indicator that equals one if the firm files for Chapter 11 or restructures through a second *Distressed Exchange* in the first five years after emergence. The rationale is that if the bankruptcy process leads to excess continuations of unprofitable firms, then the emerged firms would be more likely to need further restructuring after emergence.

The third type of variables measures the indirect costs of the bankruptcy process. I calculate the number of days that the firm spends in bankruptcy, which is the difference between the bankruptcy filing date and the date of emergence. The choice of this variable is supported by prior research that argues the costs of bankruptcy increases with the time in default (Franks and Torous 1989; Thorburn 2000; Bris, Welch, and Zhu 2006). The idea is that the potential negative impacts of the firm's

bankruptcy on its reputation in the product and capital markets increases with the time spent in bankruptcy.

4.2.2 Accounting Quality (AQ) Measure

Following Bharath, Sunder, and Sunder (2008) and Beatty, Liao, and Weber (2010), I use accrual-based measures to capture the general quality of the firm's accounting information, instead of focusing on each discretionary accounting choice that a firm makes prior to default. This choice is also supported by prior research that shows that accounting quality varies significantly across financially distressed firms, which could affect their bargaining power in debt renegotiations (DeFond and Jiambalvo 1992; Rosner 2003). The literature offers several types of accounting quality measures and there is no single measure that is universally preferred over others. Accordingly, I construct a comprehensive accounting quality measure based on three different proxies that are commonly employed in the literature: (1) absolute value of discretionary accruals from the cross-sectional modified Jones model; (2) absolute value of discretionary accruals from the cross-sectional modified Jones model controlling for return on assets (Kothari, Leone, and Wasley 2005); and (3) absolute value of discretionary accruals from Dechow-Dichev (2002) model as modified by Ball and Shivakumar (2006). Appendix A provides detailed descriptions of each measure. I calculate each variable in the year prior to default and multiply them by minus one to be increasing with reporting

quality.[20] Each measure is ranked from 0 to 4 and scaled by 4 to range from 0 to 1. The accounting quality (*AQ*) measure is calculated as the average rank.[21]

4.2.3 Control Variables

Following Acharya, Bharath, and Srinivasan (2007) and Donovan, Frankel, and Martin (2015), I select a broad set of control variables that are documented to be associated with creditor recovery rates and bankruptcy outcomes. I control for *Size* to account for the firm's ability to sell assets and satisfy liquidity needs in bankruptcy and for *MTB* to capture the company's growth opportunities. *Tangibility,* and *Redeployability* measure the reusability of the firm's assets by peer firms. *ROA* captures the firm's profitability prior to bankruptcy and *Leverage* measures the firm's capital structure before bankruptcy. These firm-level measures are calculated in the fiscal year prior to default.[22]

I also control for features of the firm's debt structure, such as *Bank Share, Secured Debt, Senior Debt,* and *Debt Concentration,* which are calculated using the information on debt outstanding at the time of default from the URD database. Prior studies show that the composition and concentration of creditors is associated with their incentives during bankruptcy and affect their recovery rate (Zhang 2009; Hotchkiss, Thorburn, and Mooradian 2008; Donovan, Frankel, and Martin 2015). I further

---

[20] The reason I calculate the *AQ* measure in the year prior to default is that the negotiations between the debtor and DIP lenders usually happen in the weeks or months prior to the filing of Chapter 11 bankruptcy (Altman et al. 2019), when the debtor's financial performance during bankruptcy is not available. In untabulated analyses, I also find that my inferences remain unchanged if I use the average *AQ* value during the three years prior to bankruptcy.

[21] The use of accrual-based measures to capture the quality of the firm's accounting information assumes that the financial statements are prepared under the going-concern assumption. However, some firms might adopt the liquidation basis of accounting if liquidation appears imminent. Consequently, I manually search the 10-Ks in the year that the accounting quality measure is calculated for all 173 cases. Specifically, I search for "liquidation basis," "liquidation," and "going concern" in the 10K to identify potential discussion of liquidation basis of accounting. I find all firms in my sample prepare the statements on the going-concern basis.

[22] In untabulated analyses, I find that my inferences remain if I further control for the level of accounting conservatism following the method in Donovan et al. (2015).

control for whether the debt restructuring is through a *Distressed Exchange* or *Prepackaged Bankruptcy* because a timelier resolution can lower the cost associated with in-court procedures. To control for macroeconomic conditions, I include *Spread,* which is the yield spread between Moody's BAA-rated and AAA-rated corporate bonds measured at the date of default to take. Appendix A contains detailed descriptions of all variables. As mentioned, all regressions also include year, industry, and state fixed effects.

5. Empirical Results

5.1 Descriptive Statics

Table 1 presents the descriptive statics for all sample firms in bankruptcy over the 1996-2010 period that use at least one SPV. The mean value of *AR LAW* is 0.45, indicating that 45% of defaults are subject to the effects of the anti-recharacterization statutes. The mean (median) creditor recovery rate for all creditor classes is 56.17% (57.42%), suggesting that creditors of the defaulted firms lose substantial value on their claims[23]. An average value of 0.76 for *Emerged* indicates that 76% of defaulted firms successfully emerge from bankruptcy. The 75th percentile of *ZSCORE* is 1.13, which is lower than the threshold of 1.8, suggesting that the majority of defaulted firms are of high bankruptcy risk in the year prior to default. On average, 12% of defaults are resolved through a distressed exchange and 18% are through a prepackaged bankruptcy. The average time spent in bankruptcy is 481 days, which is shorter than the average time of two to three years reported in Bris, Welch, and Zhu (2006) and longer than that of less than one year in Donovan, Frankel, and Martin

[23] The numbers are similar to those in Donovan, Frankel, and Martin (2015) who use the same URD database but with different sample-selection criteria

(2015). The number of days is consistent with the trend that bankruptcy proceedings are becoming faster over time due to the BAPCPA of 2005 and the use of prepackaged bankruptcies.[24]

In addition, most sample firms experience operating losses in the year prior to default with the 75th percentile of ROA (-0.03) falling below zero. The mean (median) value of *Leverage* is 0.75 (0.88), indicating that sample firms have high leverage prior to default with debt as a substantial portion of total assets. On average, 47% of debt is held by banks, 56% of debt value is of secured instruments, and 82% of debt value is senior. The mean value of *Debt Concentration* HHI measure is 0.42, showing that the debt is concentrated among a few creditors.

Table 2 splits the full sample into *Treat* and *Control* groups and compares the differences between these two groups. The *Treat* (*Control*) group consists of default firms that are (not) subject to the recharacterization statutes. The results show that the creditor recovery rate is higher for *Treat* firms than for *Control* firms. The difference is statistically significant at the one percent level, and the magnitude of the difference is economically meaningful, with a difference of 21.42%, representing a 46%=21.42/46.64 increase for the control group. This univariate analysis provides preliminary support for *H1*, suggesting that stronger rights for the SPV creditors leads to more efficient bankruptcy resolutions. Moreover, the firm-level control variables are *not* significantly different between the two groups, indicating that differences in recovery rate are not driven by fundamental differences in firm characteristics.

[24] I control for this time trend with year fixed effects in the regression models.

5.2 The Effects of Anti-Recharacterization Statutes

5.2.1 Creditor Recovery Rates

To test the effects of anti-recharacterization statutes on recovery rates, I employ the Heckman (1979) two-stage procedure to mitigate potential sample selection bias. This is because firms' use of SPV to conduct borrowing activities is likely to be non-random.[25] In the first stage estimation, I collect bankrupt firms without the use of SPVs from the URD database and pool these firms together with my main sample. Following Feng et al. (2009), I estimate the following probit model:

$$
\begin{aligned}
SPV_{i,j,t} = {} & \alpha_{x,j,t} + \beta_1 AR\ Law_{j,t} + \beta_2 AQ_{i,j,t-1} \\
& + \beta_3 Leverage_{i,j,t-1} + \beta_4 INTCOV_{i,j,t-1} + \beta_5 Debtiss_{i,j,t-1} + \beta_6 Stockiss_{i,j,t-1} \\
& + \beta_7 Funds_{i,j,t-1} + \beta_8 CLTD_{i,j,t-1} + \beta_9 SETR_{i,j,t-1} + \beta_{10} Foreign_{i,j,t-1} \\
& + \beta_{11} Tangibility_{i,j,t-1} + \beta_{12} ROA_{i,j,t-1} + \beta_{13} ZSCORE_{i,j,t-1} + \beta_{14} MTB_{i,j,t-1} \\
& + \beta_{14} SIZE_{i,j,t-1} + \epsilon_{i,j,t}
\end{aligned}
$$

where $SPV_{i,j,t}$ is an indicator equal to 1 if the firm uses at least one SPV. $AR\ Law_{j,t}$ is an indicator variable equal to one if state j is one of the states that adopted the anti-recharacterization statutes and year t is after the enactment year. AQ is the composite accounting quality measure. The other determinants are selected to capture the firm's incentives to use SPVs related to financial reporting purposes (*Leverage, INTCOV, Debtiss,* and *Stockiss*), availability of internal financing (*Funds* and *CLTD*), and tax motivations (*SETR*, *Foreign*, and *Tangibility*). All variables are defined in Appendix A. The results of the first-stage model are presented in Panel A of Table 3. Consistent with findings in Feng et al. (2009), I find that larger firms and firms with higher leverage, lower interest coverage ratio, more foreign income, and more intangible assets are more likely to use SPVs. I include the

[25] My inferences remain if I use OLS to estimate the effects of *AR Law* on creditor recovery rates (untabulated).

inverse Mills ratio (*IMR)* using the probit estimate obtained from the first-stage model in all subsequent empirical tests that are based on the full sample with 173 observations.[26]

In the second and primary stage, I estimate the following regression model:

$$Outcome_{i,j,t} = \alpha_{x,j,t} + \beta_1 AR\ Law_{j,t} + \beta_2 Controls_{i,j,t} + Industry\ FE + Year\ FE + State\ FE + \epsilon_{i,j,t} \quad (1)$$

where $Outcome_{i,j,t}$ is one of the variables that capture the outcome for firm i incorporated in state j in year t: recovery rates, post-emergence performance, whether the firm files bankruptcy again after emergence, and the time spent in bankruptcy. β_1 is the coefficient that captures the effect of the *AR Law* on the efficiency of the bankruptcy process. [27] The model includes industry, year, and state fixed effects to control for time-invariant differences across states and industries and for common time effects across all firms. State fixed effects allow me to compare the treated firms with other firms incorporated in the *same state* that are not subject to the *AR Law*. Standard errors are clustered by state.[28]

Panel B of Table 3 presents the second-stage regression results regarding the effects of *AR Law* on creditor recover rates. The dependent variable is *Family Recovery Rate* in all columns, which is based on the total enterprise value of the firm that is available to be distributed to creditors. The independent variable of interest is *AR Law*. In the first column, I only include *AR Law* without any controls. In Columns 2 to 6, I gradually add more control variables and fixed effects in the regression

[26] The reason to only keep firms with at least one SPV in the sample is to reduce the potential differences between treated and control firms. In untabulated analyses, I include *non*-SPV firms in the sample and find that creditor recovery rates are significantly higher for SPV firms than non-SPV firms and the differences are statistically significant at the 1% level. Furthermore, I find that the results are stronger after the enactment of *AR Law*.

[27] In additional analyses, I test the potential reversal effect driven by a 2003 federal court ruling on *Reaves Brokerage Company, Inc. vs. Sunbelt Fruit & Vegetable Company, INC*. The results are reported in Section 5.4.1

[28] As shown in Table 10, my inferences are unchanged if clustering by industry or by year, or by using robust standard errors that are not clustered. Moreover, my findings are robust to using the wild-bootstrapping method, which is robust to heterogeneity of unknown form. More detailed discussion is in Section 5.4.4.

models. Based on the discussion in Section 3, I predict that stronger rights for the SPV creditors will improve the efficiency of the bankruptcy process and increase the enterprise value of the firm that is distributable to creditors. Correspondingly, I expect *AR Law* to load positively.

The results presented in Panel B are consistent with *H1*. The coefficients of *AR Law* are positive and statistically significant at the 1% level (two-sided tests) using different specifications. The results suggest that the enterprise value of the firm that is available for creditor recovery is significantly higher when SPV creditors are better protected by the *AR Law*. The effect is also economically meaningful. The coefficient of *AR Law* is 29.244 in Column 6, which is equal to 52% (i.e., 29.244/56.17) of the sample mean value.

The signs of the coefficients on control variables are largely consistent with prior studies (Acharya, Bharath, and Srinivasan 2007; Donovan, Frankel, and Martin 2015). Based on the results reported in Column 4, large firms, firms with more tangible assets, and firms with more bank-held debt are associated with higher creditor recovery rates. The results also show that prepackaged bankruptcies and distressed changes are of higher recovery rates, which is consistent with the findings in prior papers (Franks and Torous 1994; Tashjian, Lease, and McConnell 1996).

In Panel C of Table 3, I investigate the dynamic effects of *AR Law* and test whether the reported effects of *AR Law* only start to manifest after their enactment year. In these regressions, I add *AR Law (-2) and AR Law (-1)* that are indicators equal to one if the state is one of the states that passed *AR Law* and year t is either two years or one year prior to the enactment year. The estimated coefficients on *AR Law (-2) and AR Law (-1)* are not statistically significant, while the coefficient on *AR Law* remains positive and statistically significant. The findings suggest that the reported effects of *AR Law* only start materializing after their enactment year, which corroborate the validity of the research setting.

In Panel D of Table 3, I conduct the analyses at the instrument level. Columns 1 and 2 estimate the effects of *AR Law* on recovery rates for secured and unsecured creditors, respectively.[29] Both columns include the full set of control variables and fixed effects. The coefficients of *AR Law* are positive and statistically significant at the 1% level in both columns, suggesting that the higher enterprise value under stronger creditor rights leads to higher recovery rates for both types of creditors. The magnitudes of the coefficients in two columns, 22.276 and 37.149, are both economically significant compared to the unconditional same mean of 56.17 reported in Table 1. Overall, the results in Table 3 show that *AR Law* improves the efficiency of the bankruptcy process as measured by creditor recovery rates, which is consistent with *H1*.

5.2.2 Post-Emergence Performance

Table 4 presents the regression results regarding the effects of *AR Law* on the performance of firms that emerge from bankruptcy. In Panel A, the dependent variable is *Accounting Performance* in Columns 1 and 2 and *Post-Emergence Stock Return* in Columns 3 and 4. Both measures are calculated in the first year after emergence. *Accounting Performance* is adjusted by subtracting the median value among all public firms in the same 2-digit SIC industry-year to control for industry-wide effects and better evaluate the emerged firm's performance. *Post-Emergence Stock Return* is adjusted using a portfolio of firms within the same size decile and 2-digit SIC industry. Because the analyses are focused on firms that successfully emerge from bankruptcy with post-emergence information available from COMPUSTAT and CRSP, the sample size with *Accounting performance* and *Post-*

[29] The classification of secured and unsecured loans is based on information from Moody's URD database.

Emergence Stock Return available decreases from 173 to 79 and 49, respectively.[30] The coefficients of *AR Law* are positive and statistically significant at the 5% level in all columns, suggesting that *AR Law* leads to better accounting and stock market performance for firms emerged from bankruptcy. The results reinforce the findings in Section 5.2.1 that stronger rights for SPV creditors improve the efficiency of the bankruptcy process.

To further corroborate my findings, I examine the cross-sectional variation in the effects of *AR Law*. Hotchkiss (1995) shows that inefficient continuation of unprofitable firms is more likely to exist when prebankruptcy management remain in office during bankruptcy. This is because the incumbent management have more firm-specific human capital, initial shareholding, and reputation that is more closely tied to existing assets. Correspondingly, I expect the effects of *AR Law* to be stronger when prebankruptcy management are not replaced prior to the filing of bankruptcy. I manually collect data on management turnover prior to the bankruptcy filing from 10-K and supplement these data with disclosure statements from the court documents if necessary. In untabulated analyses, the data show that the CEO in place two years prior to filing is replaced in 68% of the cases in my sample. I find some evidence consistent with the argument that the effects of *AR Law* on post-emergence operating performance are stronger when prebankruptcy management is not replaced prior to the filing of bankruptcy.[31]

[30] The reason that the sample size for the return analyses is smaller is that some firms emerge from bankruptcy as privately owned firms. Accordingly, their stock price information is missing after emergence.

[31] Specifically, I further add an interaction term *AR Law x CeoReplace* to the regressions in Table 4, where *CeoReplace* is an indicator that equals one if the prebankruptcy management is replaced in the two years window prior to the filing. The coefficient on the interaction term is negative and statistically significant at the 1% level when the dependent variable is *Accounting Performance*, and it is negative but not statistically significant when the dependent variable is *Post-Emergence Stock Return.*

In Panel B, I follow Hotchkiss (1995) and test whether the emerged firm requires further restructuring in the first five years after emergence. The dependent variable *Chapter 22 or Second DE* is an indicator variable that equals one if the emerged firm files for bankruptcy again or restructures through a *Distressed Exchange* in the first five years after emergence. I use the full sample in Columns 1 to 3 and only include firms that emerge from bankruptcy in Columns 4 to 6. The sample size is 132 for the last three columns, which is equal to 173 times the mean value of *Emerged* 0.76 reported in Table 1. The sample size is higher than that in Panel A because post-emergence performance information is not required. I estimate a linear probability model for this test, which allows for an easier interpretation of the regression coefficients.[32] The coefficients of *AR Law* are negative and significant using different specifications, suggesting that *AR Law* lowers the likelihood of emerged firms to restructure their debt again in the near future. The magnitude of the coefficient 0.062 in Column 3 is comparable to the unconditional sample mean of 0.08, thus the effect is also economically significant. The findings in Panel B are consistent with those in Panel A, indicating that *AR Law* improves the efficiency of continuation decisions in bankruptcy, and therefore, supports H1.

A potential alternative explanation of the results in Table 4 is that *AR Law* leads to excess liquidations in bankruptcy and that only highly profitable firms are able to emerge from bankruptcy. To test this alternative explanation, I examine the effects of *AR Law* on the likelihood of a sample firm emerging from bankruptcy. The *AR Law* indicator should load negatively if the excess-liquidation explanation holds. In untabulated analyses, I find that *AR Law* loads negatively when the dependent variable is *Emerged*, however, the coefficients are not statistically significant at

[32] The inferences are unchanged if I instead use a logit regression model.

conventional levels using different specifications. Therefore, my findings do not support the excess-liquidation explanation.

5.2.3 Indirect Bankruptcy Costs

The results on the effects of *AR Law* on indirect bankruptcy cost are presented in Table 5. The dependent variable is the number of days that the firm spent in bankruptcy. As discussed in Section 3, *AR Law* limits the amount of assets that can be subjugated in bankruptcy and increases the efficiency of the bankruptcy process. This mechanism leads to higher enterprise value of the firm, which lowers the incentives of shareholders to cause delays in bankruptcy and to extract rent from the creditors. Therefore, I predict that *AR Law* leads to a reduction in the time spent in bankruptcy. I exclude distressed exchanges and prepackaged bankruptcies from this test and the sample size decreases to 118.[33]

Because the dependent variable is the number of days in bankruptcy that is right skewed, I follow Donovan, Frankel, and Martin (2015) and estimate a hazard model to examine the effects of *AR Law* on time spent in bankruptcy:

$$\ln h_{i,j}(T) = h_0(T) + \beta_1 AR\ Law_{j,t} + \beta_2 Controls_{i,j,t} + Industry\ FE + Year\ FE + State\ FE + \epsilon_{i,j,t}, \quad (2)$$

where $h_{i,j}$(T) is the likelihood that a bankrupt firm i emerges from bankruptcy at time T, conditioning on the firm having survived till time T. Firms that fail to emerge from bankruptcy are censored in the regression.

[33] My conclusions are not affected by this research-design choice. For example, my inferences remain unchanged if I keep distressed exchanges in the sample and code the length of bankruptcy as 0.

The estimation results are reported in Table 5. The coefficient of *AR Law* is positive and statistically significant at the 1% level using different specifications, indicating that the enactment of *AR Law* reduces the time spent in bankruptcy. In terms of economic significance, the hazard ratio for *AR Law* is 2.02 (untabulated) in Column 2, which suggests that bankrupt firms that are subjected to *AR Law* are 2.02 times more likely to emerge from bankruptcy at a subsequent time interval if they have not emerged yet.

5.3 The Role of Accounting Quality

Table 6 presents the regression results regarding the impact of accounting quality on the effects of *AR Law*. I estimate similar regression models as those employed in Tables 3 and 4 and further add the interaction term *AR Law x AQ*. As discussed in Section 3, the firm's investment decisions focus more on the ability of creditors to acquire information about the firm's profitability when creditor rights are stronger. Because higher accounting quality can help screen profitable investment projects and lower the information frictions faced by creditors, I expect the effects of *AR Law* to be stronger with higher accounting quality and the interaction term between *AR Law* and *AQ* to load positively. The dependent variables are *Family Recovery Rate* in Column 1, *Accounting Performance* in Column 2, and *Post-Emergence Stock Return* in Column 3.

The coefficients on *AR Law x AQ* are positive and statistically significant in all three columns, indicating that the effects of *AR Law* increase with accounting quality. To interpret the estimated coefficients in Column 1, the results suggest that the effects of *AR Law* become 35.3% stronger with the firm's accounting quality increasing from 0 to 1. Similarly, the estimated coefficients on *AR Law x AQ* are 3.931 in Column 2 and 11.9% in Column 3. These effects are economically meaningful considering the unconditional mean values of 1.45 and -12%, respectively. Overall, the results in

Table 6 are consistent with H2 and support the argument that the effects of creditor rights are stronger for firms with higher accounting quality.

5.4 Additional Analyses

5.4.1 The Effects of a Federal Court's Ruling

A crucial assumption of my research design is that the state-level anti-recharacterization statutes preserve the bankruptcy remoteness of SPVs and enhance the rights of SPV creditors in bankruptcy. One potential concern for this assumption is that the effects of the *AR Law* might be partially reversed by a 2003 federal court ruling on *Reaves Brokerage Company, Inc. vs. Sunbelt Fruit & Vegetable Company, INC.* In this case, the court ignored the state *AR Law* and treated the sale of accounts receivables as a financing activity. Even though the federal court's ruling in this case did not completely overturn the state-level statutes and *AR Law* is typically enforced in bankruptcy cases (Favara et al. 2020), this case sets a precedent upon which *AR Law* can be challenged in future cases. This ruling opens the gate of federal laws pre-empting the state level *AR Law* and may partially reverse the effects of the state-level statutes. To account for this potential effect, I include an interaction term between *AR Law* and *Reaves* in Table 7, where *Reaves* is an indicator variable if the bankruptcy case happens after the 2003 federal court ruling. The results show that *AR Law* and *AR Law x AQ* continue to load similarly compared with prior tables, while the coefficients for *AR Law x Reaves* are negative and statistically significant. The results indicate that the effects of *AR Law* are mainly from the period prior to the federal court ruling, which is later partially reversed by the *Reaves* ruling.

5.4.2 Large Sample Evidence from the CDS Market

My primary analyses focus on a sample of firms in bankruptcy with SPV use. One potential limitation that arises from these analyses is the generalizability of the findings based on the relatively small sample. Consequently, I provide additional large sample analyses on the effects *AR Law* using data on the credit default swaps (CDS) market.

A CDS contract is an over-the-counter contract that provides protection for credit risk, where the protection buyer pays a fixed periodic CDS spread to the seller and receives a payoff if the underlying financial instrument defaults or experiences a similar pre-specified credit event. CDS spreads are largely determined by the default risk and recovery risk, and are less affected by factors that are independent of credit risk, such as systematic risk (Elton, Gruber, Agrawal, and Mann 2001), liquidity, and other market factors (Longstaff, Mithal, and Neis 2005; Geske and Delianedis 2001). If the enactment of *AR Law* enhances the efficiency of the bankruptcy process, it should increase the expected recovery for creditors and lead to lower CDS spreads.

I obtain CDS spread data from Markit over the 2001 to 2010 period and I use spreads only for the most liquid five-year CDS referencing senior unsecured debt. The daily CDS spreads are based on "on-market" rate for a trade starting on the next day. I take the monthly average of daily spreads to reduce noises and measurement errors in the daily data, and obtain a sample of 135,088 contract-month observations. Following prior research, I estimate a linear regression model and control for factors other than recovery risk that may affect CDS spreads (Collin-Dufresne, Goldstein, and Martin 2001; Ericsson, Jacobs, and Oviedo 2009; Callen, Livnat, and Segal 2009; Chiu, Guan, and Kim 2018). Specifically, I estimate the following Difference-in-Differences (DiD) regression model:

$$CDS\ Spread_{i,j,t} = \alpha + \beta_1 AR\ Law_{j,t} + \beta_2 AR\ Law_{j,t} * FRQ_{i,j,t} + \beta_3 FRQ_{i,j,t} + \gamma Controls_{i,j,t} + FEs, \quad (3)$$

where $AR\ Law_{j,t}$ is an indicator variable that equals one if state j is one of the states that adopted the anti-recharacterization statutes and year t is after the enactment year. To account for the effects of liquidity, I control for the Treasury-Eurodollar spread (*TED*), which is defined as the difference between the 90-day LIBOR and 90-day Treasury Bill yields, and for the CBOE Volatility Index (*VIX*), which is shown to capture liquidity provision in equity markets. I control for the firm's *Interest Coverage* ratio (Jones 2017), market implied credit *Rating* (Jansen and Fabozzi 2017) provided by Markit, and Altman's (1968) *ZSCORE* to capture the risk related to the probability of default. To account for factors independent of credit rights on recovery risk, I control for the return on the S&P 500 index to capture the general economic condition and include industry-year or more strict fixed effects in the regressions to account for industry-wide economic distress. (Acharya, Bharath, and Srinivasan 2007).

The regression results are presented in Table 8. In column 1, the coefficient on *AR Law* is negative and statistically significant at the 5% level, indicating that the enactment of *AR Law* leads to lower CDS spreads after controlling for other factors. The results are consistent with the argument that *AR Law* enhances the efficiency of bankruptcy process and increases the expected recovery rates. The effect is also economically meaningful. The coefficient of -0.146 represents a 7.3%=0.146/2.03 decrease relative to the unconditional sample mean value.[34] In columns 2 and 3, I gradually add more strict Industry-State-Year and Clause fixed effects to the regressions. The coefficients of *AR Law* continue to load negatively and remain statistically at the 5% level. Overall, the results are consistent

34 The coefficients on the control variables are generally consistent with findings in prior studies. For example, ROA and OCF load negatively, which is consistent with the findings in Callen et al. (2009) and suggests that better accounting performance is associated with lower CDS spreads. The positive coefficients on Loss, Leverage, Return Volatility, ZSCORE, Rating, and VIX are also consist with the results in prior studies (Callen et al. 2009; Ericsson et al. 2009; Jansen and Fabozzi 2017) and economic intuition.

with my primary findings based on the sample of bankrupt firms, suggesting that *AR Law* increase the expected recovery rates for creditors.

In columns 4 to 6, I examine whether the effects of *AR Law* vary with the quality of accounting information. The coefficients on *AR Law* x *AQ* are negative and statistically significant at the 10% level or better (using two-sided tests), suggesting that the effects of *AR Law* are stronger when accounting information is of higher quality. Overall, the results using the large CDS sample are consistent with my primary results and suggest that my findings have implications to a broader sample of firms.

5.4.3 Chapter 11 Sample Only

In most of the prior analyses, I employ the full sample of bankrupt firms with both distressed changes and formal in-court Chapter 11 cases and use an indicator *Distressed Exchange* to control for the differences between these two types of cases. The reason that I include distressed changes in prior analyses is that the rights for creditors in Chapter 11 bankruptcy may also affect their bargaining power and incentives in out-of-court restructurings (Sarkar 2013). In this section, I test whether the prior findings are robust to using a sample with only Chapter 11 cases, after controlling for firms' self-selection into Chapter 11. I employ the Heckman (1979) two-stage procedure and the results are presented in Table 9.

In Panel A, I estimate the first-stage probit regression, where the dependent variable *Distressed Exchange* is an indicator that equals one if the bankruptcy resolution is completed through a distressed exchange. The results show that *AR Law* loads positively and significantly, indicating that stronger creditor rights lower the benefits that the debtor can obtain through an in-court process and improves their incentive to engage in out-of-court restructurings. In Panel B, I re-run the tests for *H1* and *H2*

using a sample with only Chapter 11 cases and control for the inverse Mills ratio calculated from the first-stage estimation.[35] The coefficients for *AR Law* in Column 1 and *AR Law x AQ* in Column 2 are both positive and statistically significant at the 1% level. The results suggest that my findings are robust to examining only Chapter 11 cases.

5.4.4 Alternative Methods for Estimating Standard Errors

In the main empirical analyses, I cluster the standard errors at the state level because factors that affect the firm's bankruptcy outcome might be correlated within a state. To assess whether my conclusions are sensitive to this clustering choice, I conduct additional analyses using different methods to estimate standard errors. The t-statistics of the main independent variable of interest *AR Law* in Table 3 are presented in Table IA in the online appendix. The results show that the t-statistics are similar if clustering by 2-digit SIC industry or by year, or if using robust standard errors that are not clustered. Moreover, I show that the inferences remain when I employ the wild bootstrap method, which is documented to be effective in samples of moderate size (MacKinnon 2012). This approach allows me to conduct bootstrap tests that are robust to the presence heteroskedasticity of unknown form. Specifically, I draw 1,000 samples of the same size as the original sample with replacement and the "wild weight" used to generate the bootstrapped sample is drawn from the Rademacher distribution (Roodman, Nielsen, MacKinnon, and Webb 2019). Overall, the results show that my findings are not sensitive to the methods used when estimating standard errors.

[35] The inverse Mills ratio (*IMR)* is based on the probit estimate obtained from Panel A and it is calculated as the ratio of the standard normal probability density function divided by its cumulative probability.

6. Conclusion

This study examines the effects of creditor rights on the efficiency of the bankruptcy process. Using the enactment of state anti-recharacterization statutes as a source of plausibly exogenous variations of creditor rights, I predict and find that stronger creditor rights lead to more efficient bankruptcy proceedings in terms of higher recovery rate for creditors, better performance for firms that emerge from bankruptcy, and lower likelihood of emerged firm to require further restructuring. The staggered adoption of *AR Law* across several states allows me to examine the effects of creditor rights while keeping country-level institutional features constant. The findings are consistent that argument that the Chapter 11 process is overly debtor-friendly and leads to over continuation of economically inefficient firms (Baird 1986; Jensen 1989, 1991; Aghion et al. 1992). The *AR Law* strengthens the rights for SPV creditors in bankruptcies and enhances the efficiency of Chapter 11.

Moreover, I investigate the effects of information frictions and the role of accounting information in the bankruptcy setting. I extend the Ayotte and Gaon (2011) framework and analytically show that the effects of creditor rights are stronger when accounting information is of higher quality. I provide empirical evidence that is consistent with the theoretical prediction. This finding extends the literature on accounting quality by examining the role of accounting information in a bankruptcy setting and highlighting how the effects of creditor rights depend on the information frictions faced by creditors.

In this research, I exploit a U.S. setting where the variation in creditor rights is driven by whether the SPV assets are subjected to the automatic stay provision, which affects the amount of resources that can be subjugated in bankruptcies. It is a promising avenue for future research to exploit variations in creditor rights driven by other channels or by features in an international setting. For example, the recent insolvency law reforms in the EU could provide a useful setting for this research (Council of the European Union 2019). In addition, as the COVID-19 pandemic may lead to a wave

of corporate bankruptcies globally, it is of interest and importance to examine how cross-country variations in creditor rights affect the recovery from this crisis. Moreover, it is interesting for future research to further explore the role of accounting information in bankruptcies in international settings with different institutional features.

References of Chapter 1

Acharya, V. V, Amihud, Y., and Litov, L. 2011. Creditor rights and corporate risk-taking. Journal of Financial Economics, 102(1), 150–166.

Acharya, V. V, Bharath, S. T., and Srinivasan, A. 2007. Does industry-wide distress affect defaulted firms? Evidence from creditor recoveries. Journal of Financial Economics, 85(3), 787–821.

Acharya, V. V, and Subramanian, K. V. 2009. Bankruptcy Codes and Innovation. The Review of Financial Studies, 22(12), 4949–4988.

Aghion, P., Hart, O., and Moore, J. 1992. The Economics of Bankruptcy Reform. Journal of Law, Economics, and Organization, 8(3), 523–546.

Aicher, R., and Fellerhoff, W.J. 1991 Characterization of a Transfer of Receivables as a Sale or a Secured Loan upon Bankruptcy of the Transferor, American Bankruptcy Law Journal 65, 181- 212

Altman, E. I. 1968. Financial ratios, discriminant analysis and the prediction of corporate bankruptcy. The Journal of Finance, 23(4), 589–609.

Altman, E., Hotchkiss, E., and Wang, W. 2019. Corporate Financial Distress, Restructuring, and Bankruptcy, 4th Edition, Wiley Finance Series.

Ayer, J. D., Bernstein, M. L., and Friedland, J. 2004. Obtaining DIP financing and using cash collateral. American Bankruptcy Institute Journal, 23(7), 16-16,68

Ayotte, K., S. Gaon, 2011. Asset-backed securities: costs and benefits of bankruptcy remoteness. Review of Financial Studies 24(4), 1299–13

Bae, K. H., and Goyal, V. K. 2009. Creditor Rights, Enforcement, and Bank Loans. The Journal of Finance, 64(2), 823–860.

Baird, D. 1986, The uneasy case for corporate reorganization, Journal of Legal Studies 15, 127-147.

Basu, S. 1997. The conservatism principle and the asymmetric timeliness of earnings1. Journal of Accounting and Economics, 24(1), 3–37.

Ball, R., and Shivakumar, L. 2006. The Role of Accruals in Asymmetrically Timely Gain and Loss Recognition. Journal of Accounting Research, 44: 207-242.

Beatty, A., Liao, S., & Weber, J. 2010. Financial Reporting Quality, Private Information, Monitoring, and the Lease-versus-Buy Decision. The Accounting Review, 85(4), 1215-1238.

Bebchuk, L. A. 1988. A New Approach to Corporate Reorganizations. Harvard Law Review, 101(4), 775–804.

Bebchuk, L., and J. Fried. 2001. A New Approach to Valuing Secured Claims in Bankruptcy. Harvard Law Review 114:2386–436.

Becker, B., and Josephson, J. 2016. Insolvency resolution and the missing high-yield bond markets. Review of Financial Studies 29(10), 2814-2849.

Berkovitch, E., and R. Israel, 1999, Optimal Bankruptcy Laws across Different Economic Systems. Review of Financial Studies, 12, 347–77.

Bertrand, M., Duflo, E., and Mullainathan, S. 2004. How Much Should We Trust Differences-In-Differences Estimates? The Quarterly Journal of Economics, 119(1), 249–275.

Bharath, S., Sunder, J., & Sunder, S. 2008. Accounting Quality and Debt Contracting. The Accounting Review, 83(1), 1-28.

Biddle, G., and Hilary, G. 2006. Accounting Quality and Firm-Level Capital Investment. The Accounting Review, 81(5), 963-982.

Biddle, G. C., Hilary, G., and Verdi, R. S. 2009. How does accounting quality relate to investment efficiency? Journal of Accounting and Economics, 48(2), 112–131.

Bris, A., Welch, I., and Zhu, N. 2006. The Costs of Bankruptcy: Chapter 7 Liquidation versus Chapter 11 Reorganization. The Journal of Finance, 61: 1253-1303.

Bushman, R. M., and Smith, A. J. 2001. Financial accounting information and corporate governance. Journal of Accounting and Economics, 32(1), 237–333.

Callen, J. L., Livnat, J., and Segal, D. 2009. The impact of earnings on the pricing of credit default swaps. *The Accounting Review* 84 (5): 1363–1394.

Carrizosa, R., and Ryan, S. G. 2013. Conservatism, Covenants, and Recovery Rates. Working paper.

Chen, F., Hope, O., Li, Q., and Wang, X. 2011. Accounting quality and Investment Efficiency of Private Firms in Emerging Markets. The Accounting Review, 86(4), 1255-1288.
Cheng, M., Dhaliwal, D., and Neamtiu, M. 2011. Asset Securitization, Securitization Recourse, and Information Uncertainty. The Accounting Review, 86(2), 541-568.
Cheng, A., LI, X., and Zhang, J. 2020. Creditor Rights and Borrowers' Accounting Conservatism: Evidence from Anti-recharacterization Laws. Working Paper.
Chu, Y. 2020. Collateral, Ease of Repossession, and Leases: Evidence from Antirecharacterization Laws. Management Science, 66:7, 2951-2974
Collin-Dufresn, P., Goldstein, R.S., and Martin, J.S. 2001. The Determinants of Credit Spread Changes. The Journal of Finance, 56: 2177-2207.
Council of the European Union. 2019. Giving entrepreneurs a second chance: new rules on business insolvency adopted. Press Release, June 6, 2019.
Dahiya, S., John, K., Puri, M., and Ramírez, G. 2003. Debtor-in-possession financing and bankruptcy resolution: Empirical evidence. Journal of Financial Economics, 69(1), 259–280.
Davydenko, S.A., and Franks, J.R. 2008. Do Bankruptcy Codes Matter? A Study of Defaults in France, Germany, and the U.K. The Journal of Finance, 63: 565-608.
Dechow, P., and Dichev, I. 2002. The Quality of Accruals and Earnings: The Role of Accrual Estimation Errors. The Accounting Review, 77, 35-59.
DeFond, M. L., and Jiambalvo, J. 1994. Debt covenant violation and manipulation of accruals. Journal of Accounting and Economics, 17(1), 145–176.
Denis, D., and Rodgers, K. 2007. Chapter 11: Duration, Outcome, and Post-Reorganization Performance. The Journal of Financial and Quantitative Analysis, 42(1), 101-118.
Djankov, S., Hart, O., McLiesh, C., and Shleifer, A. 2008. Debt Enforcement around the World. Journal of Political Economy, 116(6), 1105–1149.
Djankov, S., McLiesh, C., and Shleifer, A. 2007. Private credit in 129 countries. Journal of Financial Economics, 84(2), 299–329.
Donovan, J., Frankel, R. M., and Martin, X. 2015. Accounting Conservatism and Creditor Recovery Rate. The Accounting Review, 90(6), 2267–2303.
Dou, Y. 2019. The Debt-Contracting Value of Accounting Numbers and Financial Covenant Renegotiation. Management Science, 66(3), 1124–1148.
Eberhart, A.C., Altman, E.I., and Aggarwal, R. 1999. The Equity Performance of Firms Emerging from Bankruptcy. The Journal of Finance, 54: 1855-1868.
Eckbo, B. E., Li, K., and Wang, W. 2020 Rent Extraction by Super-Priority Lenders. Working Paper.
Eckbo, B. E., Thorburn, K. S., and Wang, W. 2016. How costly is corporate bankruptcy for the CEO? Journal of Financial Economics, 121(1), 210–229.
Elton, E.J., Gruber, M.J., Agrawal, D., and Mann, C. 2001. Explaining the Rate Spread on Corporate Bonds. The Journal of Finance, 56: 247-277.
Ericsson, J., Jacobs, K., and Oviedo, R. 2009. The Determinants of Credit Default Swap Premia. Journal of Financial and Quantitative Analysis, 44(1), 109-132.
Ersahin, N. 2020. Creditor Rights, Technology Adoption, and Productivity: Plant-Level Evidence. Review of Financial Studies, forthcoming.
Favara, G., Gao, J., and Giannetti, M. 2020 Uncertainty, Access to Debt, and Firm Precautionary Behavior. Working Paper.
Financial Times. 2020. Pandemic triggers wave of billion-dollar US bankruptcies. https://www.ft.com/content/277dc354-a870-4160-9117-b5b0dece5360
Franks, J., and Torous, W. 1989. An Empirical Investigation of U.S. Firms in Reorganization. The Journal of Finance, 44(3), 747-769.
Franks, J. R., and Torous, W. N. 1994. A comparison of financial recontracting in distressed exchanges and chapter 11 reorganizations. Journal of Financial Economics, 35(3), 349–370.
Franks, J., and Sussman, O. 2005. Financial Distress and Bank Restructuring of Small to Medium Size UK Companies. Review of Finance, 9(1), 65–96.

Feng, M., Gramlich, J. D., and Gupta, S. 2009. Special Purpose Vehicles: Empirical Evidence on Determinants and Earnings Management. The Accounting Review, 84(6), 1833–1876.
Gertner, R., and Scharfstein, D. 1991. A Theory of Workouts and the Effects of Reorganization Law. The Journal of Finance, 46: 1189-1222.
Geske, R. L., and Delianedis, G. 2001. The Components of Corporate Credit Spreads: Default, Recovery, Taxes, Jumps, Liquidity, and Market Factors. UCLA Anderson Working Paper.
Ghanbari, N. 2019. Do Creditor Rights Affect Financial Contracts? Evidence from the Anti-Recharacterization Statute. Working paper.
Gigler, F., and Hemmer, T. 1998. On the Frequency, Quality, and Informational Role of Mandatory Financial Reports. Journal of Accounting Research, 36, 117-147.
Gilson, S. 2010. Creating Value Through Corporate Restructuring: Case Studies in Bankruptcies, Buyouts, and Breakups. Wiley Finance, New Jersey.
Gilson, S. C. 2012. Coming through in a crisis: How Chapter 11 and the debt restructuring industry are helping to revive the U.S. economy. Journal of Applied Corporate Finance 24(4): 23-35.
Heckman, J. 1979. Sample selection bias as a specification error. Econometrica, 47 (1): 153–161.
Homburger, T., and Andre, G. 1989. Real Estate Sale and Leaseback Transactions and the Risk of Recharacterization In Bankruptcy Proceedings. Real Property, Probate and Trust Journal, 24(1), 95-140.
Hotchkiss, E. S. 1995. Postbankruptcy Performance and Management Turnover. The Journal of Finance, 50(1), 3–21.
Hughes, H. 2017. Property and the true-sale doctrine. University of Pennsylvania Journal of Business Law, 19(4), 870-926.
Hotchkiss, E., K. J. Thorburn, and R. Mooradian. 2008. Bankruptcy and the resolution of financial distress. In Handbook of Corporate Finance: Empirical Corporate Finance, Volume 2: Chapter 14. Oxford, U.K.: Elsevier North-Holland.
Jackson, T. H. 1982. Bankruptcy, non-bankruptcy entitlements, and the creditors' bargain. The Yale Law Journal 91:857–907.
James, C.1995. When Do Banks Take Equity in Debt Restructurings? The Review of Financial Studies, Volume 8, Issue 4, October 1995, Pages 1209–1234.
Jansen, J., and Fabozzi, F. J. 2017. CDS Implied Credit Ratings. The Journal of Fixed Income, 26(4), 25 LP – 52.
Jensen, M. C. 1989. Active investors, LBOs, and the privatization of bankruptcy. Journal of Applied Corporate Finance 2, 35–44.
--- --- --- 1991. Corporate Control and The Politics of Finance. Journal of Applied Corporate Finance, 4(2), 13–34.
Jones, J. 1991. Earnings management during import relief investigations. Journal of Accounting Research 29, 193–228.
Jones, S. 2017. Corporate bankruptcy prediction: a high dimensional analysis. Review of Accounting Studies, 22(3), 1366–1422.
Kettering, K. C., 2008. True sales of receivables: A purpose analysis. American Bankruptcy Institute Law Review 16, 511.
Kim, H., and Kung, H. 2016. The Asset Redeployability Channel: How Uncertainty Affects Corporate Investment. The Review of Financial Studies, 30(1), 245–280.
Kothari, S. P., Leone, A. J., and Wasley, C. E. 2005. Performance matched discretionary accrual measures. Journal of Accounting and Economics, 39(1), 163–197.
La Porta, R., Lopez-De-Silanes, F., Shleifer, A., and Vishny, R. W. 1997. Legal Determinants of External Finance. The Journal of Finance, 52(3), 1131–1150.
Lehavy, R. 2002. Reporting Discretion and the Choice of Fresh Start Values in Companies Emerging from Chapter 11 Bankruptcy. Review of Accounting Studies 7, 53–73.
Li, S., Whited, T. M., and Wu, Y. 2016. Collateral, Taxes, and Leverage. The Review of Financial Studies, 29(6), 1453–1500.
Longstaff, F. A., S. Mithal, and E. Neis. 2005. Corporate yield spreads: Default risk or liquidity? New evidence from the credit default swap market. The Journal of Finance 60 (5): 2213–2253.

MacKinnon J.G. 2013. Thirty Years of Heteroskedasticity-Robust Inference. In: Chen X., Swanson N. (eds) Recent Advances and Future Directions in Causality, Prediction, and Specification Analysis. Springer, New York.
Marquardt, C., and Zur, E. 2015. The Role of Accounting Quality in the M&A Market. Management Science, 61(3), 604–623.
McNichols, M. F., and Stubben, S. R. 2008. Does Earnings Management Affect Firms' Investment Decisions? The Accounting Review, 83(6), 1571–1603.
McNichols, M. F., and Stubben, S. R. 2015. The effect of target-firm accounting quality on valuation in acquisitions. Review of Accounting Studies, 20(1), 110–140.
Nan, L., and Wen, X. 2014. Financing and Investment Efficiency, Information Quality, and Accounting Biases. Management Science, 60(9), 2308–2323.
Nikolaev, V. V. 2018. Scope for renegotiation in private debt contracts. Journal of Accounting and Economics, 65(2), 270–301.
Qian, J., and Strahan, P. E. 2007. How Laws and Institutions Shape Financial Contracts: The Case of Bank Loans. The Journal of Finance, 62(6), 2803–2834.
Roodman, D., Nielsen, M. Ø., MacKinnon, J. G., and Webb, M. D. 2019. Fast and wild: Bootstrap inference in Stata using boottest. The Stata Journal, 19(1), 4–60.
Rosner, R. L. 2003. Earnings manipulation in failing firms. Contemporary Accounting Research, 20(2), 361.
Sarkar, S. 2013. Distressed exchange, bargaining power, and prior capital structure. Journal of Economic Dynamics and Control, 37(12), 2695–2709.
Strömberg, P. 2000. Conflicts of Interest and Market Illiquidity in Bankruptcy Auctions: Theory and Tests. The Journal of Finance, 55(6), 2641–2692.
Tashjian, E., Lease, R. C., and McConnell, J. J. 1996. An empirical analysis of prepackaged bankruptcies. Journal of Financial Economics, 40(1), 135–162.
Thorburn, K. S. 2000. Bankruptcy auctions: costs, debt recovery, and firm survival. Journal of Financial Economics, 58(3), 337–368.
Tollenaar, N. 2017. The European Commission's Proposal for a Directive on Preventive Restructuring Proceedings. Insolvency Intelligence, Vol. 30 (5): 65-81.
Tracht, M. E. 2012. Leasehold Recharacterization in Bankruptcy: A Review and Critique. NYLS Legal Studies Research Paper, No. 12/13 #42.
U.K. Department of Business, Energy and Industrial Strategy (BEIS). 2018. Insolvency and Corporate Governance: Government Response.
Zhang, Z. 2009. Recovery Rates and Macroeconomic Conditions: The Role of Loan Covenants. Working paper, Boston College.

Appendices of Chapter 1

Appendix A: Variable Definitions

AR Law	An indicator variable that equals one if the firm is incorporated in one of states that passed the anti-recharacterization statute and year t is after then enactment year.
Family Recovery Rate	The enterprise value of the firm that is available to be distributed to creditors divided by total liabilities at default resolution, obtained from Moody's Ultimate Recovery Database (URD).
Accounting Performance	Sales less cost of goods sold, less selling, general, and administrative expenses before deducting depreciation and amortization, calculated in the first fiscal year after emerging from bankruptcy. The measure is scaled by total assets and then industry adjusted by subtracting the median value among all public firms in the same 2-digit SIC industry-year. The data are from Compustat.
Post-Emergence Return	Buy-and-hold stock return in the first calendar year after emerging from bankruptcy, adjusted for size and industry effects. Specifically, the adjustment is based on a portfolio of firms within the same size decile and 2-digit SIC industry. The data are obtained from CRSP.
Emerged	An indicator variable that equals one if the firm successfully emerge from Chapter 11 bankruptcy. The data on emergence is obtained from Moody's Ultimate Recovery Database (URD).
Chapter 22 or Second DE	An indicator variable that equals one if the firm files for Chapter 11 bankruptcy for restructures through a second distressed exchange in the first five years after emergence. The data on is obtained from Moody's Ultimate Recovery Database (URD).
AQ	A comprehensive accounting quality index based on three individual measures. Each measure is transformed into a quintile ranking The first measure is absolute discretionary accruals based on the modified Jones (1991) model. Specifically, I estimate the following regression model for each two-digit SIC industry-year with at least 20 observations: $Acc_{i,t} = \alpha_0 + \alpha_1 \left(\frac{1}{Assets_{i,t-1}}\right) + \alpha_2 \Delta Rev_{i,t} + \alpha_3 PPE_{i,t} + \epsilon_{i,t}$, where $Acc_{i,t}$ is total accruals defined as net income minus operating cash flows, scaled by lag total assets; $Assets_{i,t-1}$ is the lag value of total assets; $\Delta Rev_{i,t}$ is the annual change in revenue; $PPE_{i,t}$ is property, plant, and equipment scaled by lag total assets; The second measure is absolute discretionary accruals based on the Kothari, Leone, and Wasley (2005) model. Specifically, I estimate the following regression model for each two-digit SIC industry-year with at least 20 observations: $Acc_{i,t} = \alpha_0 + \alpha_1 \left(\frac{1}{Assets_{i,t-1}}\right) + \alpha_2 \Delta Rev_{i,t} + \alpha_3 PPE_{i,t} + \alpha_4 ROA_{i,t} + \epsilon_{i,t}$, where $Acc_{i,t}$ is total accruals defined as net income minus operating cash flows, scaled by lag total assets; $Assets_{i,t-1}$ is the lag value of total assets; $\Delta Rev_{i,t}$ is the annual change in revenue; $PPE_{i,t}$ is property, plant, and equipment scaled by lag total assets; $ROA_{i,t}$ is net income scaled by lagged total assets.

	The third measure is absolute discretionary accruals estimated from the Dechow and Dichev (2002) model as modified by Ball and Shivakumar (2006). Specifically, I estimate the following regression for each three-digit SEC industry with at least 30 observations: $Acc_{i,t} = \alpha_0 + \alpha_1 OCF_{i,t-1} + \alpha_2 OCF_{i,t} + \alpha_3 OCF_{i,t+1} + \alpha_4 DOCF_{i,t} + \alpha_5 DOCF_{i,t} * OCF_{i,t} + \epsilon_{i,t}$, where $Acc_{i,t}$ is total accruals defined as net income minus operating cash flows, scaled by lag total assets; $OCF_{i,t}$ is operating cash flows and $DOCF_{i,t}$ is an indicator variable that equals to one if $OCF_{i,t}$ is negative.
MTB	Ratio of the market value of equity to the book value of equity in the fiscal year before default. Accounting data are obtained from Compustat and market data are from CRSP.
Size	Natural log of total assets measured in the in the fiscal year before default. The data are obtained from Compustat.
ROA	Income before extraordinary items divided by total assets, measured in the in the fiscal year before default. The data are obtained from Compustat.
Leverage	Total debt divided by total assets in the quarter before default, measured in the in the fiscal year before default. The data are obtained from Compustat.
Tangibility	Tangible assets scaled by total assets. The data are obtained from Compustat.
Redeployability	A firm-year level measure that captures the reusability of assets within and across industries, obtained from Kim and Kung (2016).
ZSCORE	1. ZSCORE=$1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 0.99X_5$, where $X_1$is current assets minus current liabilities scaled by total assets; X_2 is retained earnings scaled by total assets; X_3 is earnings before interest and taxes scaled by total assets; X_4 is market value of equity scaled by total debt; X_5 is sales scaled by total assets.
Bank Share	Percentage of the firm's total debt held by banks at the time of default, calculated using data from Moody's Ultimate Recovery Database (URD).
Secured Debt %	Percentage of the firm's total debt that are secured at the time of default, calculated using data from Moody's Ultimate Recovery Database (URD).
Senior Debt %	Percentage of the firm's total debt that are senior at the time of default, calculated using data from Moody's Ultimate Recovery Database (URD).
Debt Concentration	HHI index of the firm's total debt across all lenders at the time of default, calculated using data from Moody's Ultimate Recovery Database (URD).
Prepackaged Bankruptcy	An indicator variable that equals one if the firm files a prepacked bankruptcy, obtained from Moody's Ultimate Recovery Database (URD).

Distressed Exchange	An indicator variable that equals one if the firm completed a distressed exchange with the creditors, calculated using data from Moody's Ultimate Recovery Database (URD).
Bankruptcy Time (days)	The number of days between the date of default and the data of emergence. The data on default date and emergence date is obtained from Moody's Ultimate Recovery Database (URD).
CDS Spread	Monthly average CDS spread (in percentage points) of five-year contracts referencing senior, unsecured debt obtained from Markit.
Interest Coverage	Pretax income plus interest expense, divided by interest expense. The data are from Compustat.
Rating	Market implied rating provided by Markit.
TB	One-year T-Bill rate obtained from the Federal Reserve.
TED	The difference between 90-day LIBOR and 90-Day Treasury Bill yields. The data on LIBOR and Treasury Bill yields are obtained from the Federal Reserve.
VIX	CBOE stock market volatility index constructed from S&P 500 index option prices, obtained from the Federal Reserve.
S&P500	Monthly return on the S&P 500, obtained from CRSP.

Appendix B: Proof of the Optimal Investment Policy

I assume that the DIP lender maximizes the expected payoff, which is the difference between repayment and the funding of K. I assume that the manager always prefers to continue operating if the lender is willing to provide the funding of K.

Without loss of generality, I assume that $X_l - \gamma L + \delta L - (1 + r)K = 0$. When creditor rights are weak, SPV assets of value L are included in the bankruptcy estate and the ability of the debtor to dilute the SPV creditors' claims provides a continuation subsidy of δL, which might enable economically inefficient firms to continue operating. If the DIP lender provides the funding of K to the debtor, the repayment is $(1 + r)K$ if the firm is type G, and the payoff would be $X_l - \gamma L + \delta L = (1 + r)K$ if the firm is type B. In other words, the DIP lender's net profit will be rK regardless of the firm's type when creditor rights are weak. The lender will always finance the investment project and both types of firms will continue operating. In this case, the quality of accounting information has no impact on the firm's investment decisions.

The expected value loss will be driven by inefficient continuation of firms of type B. The likelihood that the firm is type B is $(1 - \theta)$ and the value loss in an inefficient continuation is the NPV of the investment, which is equal to $-\delta L$. Therefore, the expected value loss under weak creditor rights is equal to $E[Value\ Loss_{weak\ CR}] = (1 - \theta)\delta L$.

The enactment of the anti-recharacterization statutes leads to stronger creditor rights and isolates SPV assets from the bankruptcy estate, and therefore, the continuation subsidy is no longer available. The DIP lender will receive the repayment of $(1 + r)K$ if the firm is type G and will receive a repayment of $X_l - \gamma L$, which is lower than $(1 + r)K$, if the firm is type B. Next, I will prove that the optimal financing decision for the DIP lender is to advance funds if the accounting signal is S_H, and not to lend if the accounting signal is S_L.

Following Nan and Wen (2014), I assume that the accounting signal is informative enough to avoid trivial solutions, where the accounting signal has no impact on the outcomes. Specially, I assume that $\lambda > \lambda^*$, where

$$\lambda^* = \max\left\{\frac{1-B}{B+1}, \frac{B-1}{B+1}\right\},$$

$$B = \frac{rK\theta}{(\delta L - rK)(1-\theta)}.$$

The DIP lender's expectation about the firm's type based on observed accounting signals, denoted by θ_H and θ_L:

$$\theta_H = P(G|S_H) = \frac{\theta(1+\lambda)}{\theta(1+\lambda)+(1-\theta)(1-\lambda)} = \frac{\theta(1+\lambda)}{2\theta\lambda - \lambda + 1}$$

$$\theta_L = P(G|S_L) = \frac{\theta(1-\lambda)}{\theta(1-\lambda)+(1-\theta)(1+\lambda)} = \frac{\theta(1-\lambda)}{-2\theta\lambda + \lambda + 1}.$$

It is obvious that $\frac{\partial\theta_H}{\partial\lambda} > 0$ and thus θ_H is an increasing function of λ. Similarly, θ_L is a decreasing function of λ. If the accounting signal is S_H, the DIP lender's expected net payoff conditional on lending is equal to

$$\theta_H rK + (1-\theta_H)(X_l - \gamma L - K) = rK - (1-\theta_H)\delta L$$

$$= rK - \frac{(1-\theta)(1-\lambda)}{\theta(1+\lambda)+(1-\theta)(1-\lambda)}\delta L$$

$$\geq rK - \frac{(1-\theta)B}{\theta+(1-\theta)B} \ (because\ \lambda > \lambda^*)$$

$$= rK - \frac{rK\theta \backslash (\delta L - rK)}{\theta + rK\theta \backslash (\delta L - rK)}\ \delta L$$

$$= rK - \frac{rK\theta}{\theta\delta L - \theta rK + \theta rK}\ \delta$$

$$= rK - rK = 0,$$

which is higher than the payoff of no investment 0. Therefore, it is optimal for the DIP lender to finance the project if accounting signal is S_H. Similarly, it is optimal for the DIP lender to choose no financing if accounting signal is S_L.

The value loss exists when the firm is type B (type G) and the DIP lender chooses to finance (not to finance) the investment. The expected value loss is given by:

$$E\left[Value\ Loss_{strong\ CR}\right] = \theta\frac{1-\lambda}{2}[X_h - \gamma L - (1+r)K] + (1-\theta)\frac{1-\lambda}{2}\delta L.$$

The benefits of stronger creditor rights are given by the differences of expected value loss under weak creditor rights and strong creditor rights:

$$E\left[Value\ Loss_{weak\ CR} - Value\ Loss_{strong\ CR}\right] = (1-\theta)\frac{1+\lambda}{2}\delta L - \theta\frac{1-\lambda}{2}(X_h - \gamma \mathrm{L} - \mathrm{K}),$$

which is an increasing function of the accounting quality λ.

Appendix C: Anti-Recharacterization Statutes

Texas Uniform Commercial Code (UCC): Section 9-109

(e) The application of this chapter to the sale of accounts, chattel paper, payment intangibles, or promissory notes is not to recharacterize that sale as a transaction to secure indebtedness but to protect purchasers of those assets by providing a notice filing system. For all purposes, in the absence of fraud or intentional misrepresentation, the parties' characterization of a transaction as a sale of such assets shall be conclusive that the transaction is a sale and is not a secured transaction and that title, legal and equitable, has passed to the party characterized as the purchaser of those assets regardless of whether the secured party has any recourse against the debtor, whether the debtor is entitled to any surplus, or any other term of the parties' agreement.

Louisiana Uniform Commercial Code (UCC): Section 9-109

(e) Certain sales. The application of this Chapter to the sale of accounts, chattel paper, payment intangibles, or promissory notes is not intended and shall not be used to recharacterize that sale as a transaction to secure indebtedness, but is intended to protect purchasers of those assets by providing a notice filing system. For all purposes, in the absence of fraud or intentional misrepresentation, the parties' characterization of a transaction as a sale of accounts, chattel paper, payment intangibles, or promissory notes shall be conclusive that the transaction is a true sale and is not a secured transaction and that title has passed to the party characterized as the purchaser, regardless of whether the purchaser (secured party) has any recourse against the seller (debtor), whether the seller is entitled to any surplus, whether the purchaser has possession of the note, contract, account agreement, invoice, or other evidence of indebtedness, or any other term of the parties' agreement.

Alabama: Code of Alabama Section 35-10A-2

(a) Notwithstanding any other provision of law including, but not limited to, Section 7-9-506 and Section 7-9A-623, to the extent set forth in the transaction documents relating to a securitization transaction:

(1) Any property, assets, or rights purported to be transferred, in whole or in part, in the securitization transaction shall be deemed to no longer be the property, assets, or rights of the transferor;

(2) A transferor in the securitization transaction, its creditors or, in any insolvency proceeding with respect to the transferor or the transferor's property, a bankruptcy trustee, receiver, debtor, debtor in possession, or similar person, to the extent the issue is governed by Alabama law, shall have no rights, legal or equitable, whatsoever to reacquire, reclaim, recover, repudiate, disaffirm, redeem, or recharacterize as property of the transferor any property, assets, or rights purported to be transferred, in whole or in part, by the transferor; and

(3) In the event of a bankruptcy, receivership, or other insolvency proceeding with respect to the transferor or the transferor's property, to the extent the issue is governed by Alabama law, such property, assets, and rights shall not be deemed to be part of the transferor's property, assets, rights, or estate.

(b) Nothing contained in this chapter shall be deemed to require any securitization transaction to be treated as a sale for federal or state tax purposes or to preclude the treatment of any securitization transaction as debt for federal or state tax purposes or to change any applicable laws relating to the perfection and priority of security or ownership interests of persons other than the transferor,

hypothetical lien creditor or, in the event of a bankruptcy, receivership, or other insolvency proceeding with respect to the transferor or its property, a bankruptcy trustee, receiver, debtor, debtor in possession, or similar person.

Delaware Asset-Back Securities Facilitation Act: Chapter 2703A

(a) Notwithstanding any other provision of law, including, but not limited to, § 9-506 of this title, "Debtor's right to redeem collateral," as said section existed prior to July 1, 2001, and § 9-623 of the title, "Right to redeem collateral," which became effective July 1, 2001, to the extent set forth in the transaction documents relating to a securitization transaction:

(1) Any property, assets or rights purported to be transferred, in whole or in part, in the securitization transaction shall be deemed to no longer be the property, assets or rights of the transferor;

(2) A transferor in the securitization transaction, its creditors or, in any insolvency proceeding with respect to the transferor or the transferor's property, a bankruptcy trustee, receiver, debtor, debtor in possession or similar person, to the extent the issue is governed by Delaware law, shall have no rights, legal or equitable, whatsoever to reacquire, reclaim, recover, repudiate, disaffirm, redeem or recharacterize as property of the transferor any property, assets or rights purported to be transferred, in whole or in part, by the transferor; and

(3) In the event of a bankruptcy, receivership or other insolvency proceeding with respect to the transferor or the transferor's property, to the extent the issue is governed by Delaware law, such property, assets and rights shall not be deemed to be part of the transferor's property, assets, rights or estate.

(b) Nothing contained in this chapter shall be deemed to require any securitization transaction to be treated as a sale for federal or state tax purposes or to preclude the treatment of any securitization transaction as debt for federal or state tax purposes or to change any applicable laws relating to the perfection and priority of security or ownership interests of persons other than the transferor, hypothetical lien creditor or, in the event of a bankruptcy, receivership or other insolvency proceeding with respect to the transferor or its property, a bankruptcy trustee, receiver, debtor, debtor in possession or similar person.

It is not the purpose of this chapter to change the tax treatment of securitizations that take place pursuant to this chapter.

South Dakota Codified Laws 54-1-10.

Transferor to lose interest in transferred property. Notwithstanding any other provisions of law specifically including § 57A-9-623, to the extent set forth in the transaction documents relating to a securitization transaction:

(1) Any property, assets, or rights purported to be transferred, in whole or in part, in the securitization transaction shall be deemed to no longer be the property, assets, or rights of the transferor;

(2) A transferor in the securitization transaction, its creditors or, in any insolvency proceeding with respect to the transferor or the transferor's property, a bankruptcy trustee, receiver, debtor, debtor in possession, or similar person, to the extent the issue is governed by South Dakota law, has no rights,

legal or equitable, whatsoever to reacquire, reclaim, recover, repudiate, disaffirm, redeem, or recharacterize as property of the transferor, any property, assets, or rights purported to be transferred, in whole or in part, by the transferor; and

(3) In the event of a bankruptcy, receivership, or other insolvency proceeding with respect to the transferor or the transferor's property, to the extent the issue is governed by South Dakota law, such property, assets, and rights may not be deemed to be part of the transferor's property, assets, rights, or estate.

***Virginia: Code of Virginia Asset-Backed Securities Facilitation Act Section* 6.1-473**

A. Notwithstanding any other provision of law, including, but not limited to, § 8.9A-623, to the extent set forth in the transaction documents relating to a securitization transaction:

1. Any property, assets, or rights purported to be transferred, in whole or in part, in the securitization transaction shall be deemed to no longer be the property, assets, or rights of the transferor;

2. A transferor in the securitization transaction, its creditors or, in any insolvency proceeding with respect to the transferor or the transferor's property, a bankruptcy trustee, receiver, debtor, debtor in possession, or similar person, to the extent the issue is governed by the laws of the Commonwealth, shall have no rights, legal or equitable, whatsoever to reacquire, reclaim, recover, repudiate, disaffirm, redeem, or recharacterize as property of the transferor any property, assets, or rights purported to be transferred, in whole or in part, by the transferor; and

3. In the event of a bankruptcy, receivership, or other insolvency proceeding with respect to the transferor or the transferor's property, to the extent the issue is governed by the laws of the Commonwealth, such property, assets, and rights shall not be deemed to be part of the transferor's property, assets, rights, or estate.

B. Nothing contained in this chapter shall be deemed to require any securitization transaction to be treated as a sale for federal or state tax purposes or to preclude the treatment of any securitization transaction as debt for federal or state tax purposes or to change any applicable laws relating to the perfection and priority of security or ownership interests of persons other than the transferor, hypothetical lien creditor or, in the event of a bankruptcy, receivership or other insolvency proceeding with respect to the transferor or its property, a bankruptcy trustee, receiver, debtor, debtor in possession, or similar person. Nothing in this chapter shall change the tax treatment of securitizations that take place pursuant to this chapter.

C. "Securitization transaction" means a transaction relating to the issuance or transfer by a special purpose entity of beneficial interests or undivided interests, which entitle their holders to receive payments or other distributions that depend primarily on the cash flow from assets, including financial assets and other credit exposures, in which that special purpose entity has rights or the power to transfer rights.

Nevada Asset-Backed Securities Facilitation Act 100.220

Effect of securitization transaction on property, assets and rights of transferor.

Notwithstanding any other provision of law, including, without limitation, NRS 104.9623, to the extent set forth in the transaction documents relating to a securitization transaction:

1. Any property, assets or rights purported to be transferred, in whole or in part, in the securitization transaction shall be deemed to be no longer the property, assets or rights of the transferor;

2. A transferor in the securitization transaction, its creditors or, in any insolvency proceeding with respect to the transferor or property of the transferor, a bankruptcy trustee, receiver, debtor, debtor in possession or similar person, to the extent that the issue is governed by the laws of this State, has no rights, legal or equitable, to reacquire, reclaim, recover, repudiate, disaffirm, redeem or recharacterize as property of the transferor any property, assets or rights purported to be transferred, in whole or in part, by the transferor; and

3. In the event of a bankruptcy, receivership or other insolvency proceeding with respect to the transferor or property of the transferor, to the extent that the issue is governed by the laws of this State, such property, assets and rights shall be deemed not to be part of the property, assets, rights or estate of the transferor.

Tables of Chapter 1

Table 1
Descriptive Statistics

This table presents the summary statistics for the sample of bankrupt firms using SPVs over the 1996-2010 period. Data for recovery rate, and debt structure, and bankruptcy features are obtained from Moody's Ultimate Recovery Rate Database (URD). Accounting information is obtained from COMPUSTAT and stock market data are from CRSP. All variables are defined in the Appendix A.

Variables	N	Mean	25th Pctl	Median	75th Pctl	Std Dev
AR Law	173	0.45	0.00	0.00	1.00	0.50
Family Recovery Rate	173	56.17	27.86	57.42	84.49	30.25
Accounting Performance	79	1.45	0.06	0.39	1.13	3.11
Post-Emergence Stock Return	49	-0.12	-0.27	-0.01	0.23	0.76
Emerged	173	0.76	1.00	1.00	1.00	0.43
Chapter 22 or Second DE	173	0.08	0.00	0.00	0.00	0.26
AQ	173	0.55	0.37	0.57	0.77	0.24
MTB	173	0.44	-0.16	0.12	0.73	3.47
Size	173	6.94	5.98	6.75	7.74	1.30
ROA	173	-0.24	-0.30	-0.13	-0.03	0.39
Leverage	173	0.75	0.45	0.64	0.88	0.55
Tangibility	173	0.38	0.19	0.35	0.58	0.23
ZSCORE	173	-0.43	-0.99	0.14	1.13	3.27
Redeployability	173	0.39	0.34	0.40	0.48	0.12
Bank Share	173	0.47	0.18	0.45	0.68	0.32
Secured Debt	173	0.56	0.32	0.54	0.91	0.33
Senior Debt	173	0.82	0.71	1.00	1.00	0.28
Debt Concentration	173	0.42	0.24	0.35	0.53	0.24
Prepackaged Bankruptcy	173	0.18	0.00	0.00	0.00	0.39
Distressed Exchange	173	0.13	0.00	0.00	0.00	0.34
Bankruptcy Time	173	480.88	127.00	337.00	621.00	555.89
Spread	173	1.20	0.79	0.97	1.30	0.66

Table 2
Summary Statistics between Treated and Control Groups

This table presents the summary statistics for the sample of bankrupt firms using SPVs over the 1996-2010 period for the treat and control separately, and the difference for all variables between the two groups. Data for recovery rate, and debt structure, and bankruptcy features are obtained from Moody's Ultimate Recovery Rate Database (URD). Accounting information is obtained from COMPUSTAT and stock market data are from CRSP. All variables are defined in the Appendix A.

	Treat			Control			Difference	
Variables	**N**	**Mean**	**Std Dev**	**N**	**Mean**	**Std Dev**	**Difference**	**t-stat**
Recovery Rate	77	68.06	29.12	96	46.64	27.79	-21.42	-4.91***
Accounting Performance	39	1.49	3.03	40	1.41	3.22	-0.08	-0.11
Post-Emergence Stock Return	29	-0.02	0.71	20	-0.26	0.83	-0.24	-1.06
Emerged	77	0.83	0.38	96	0.71	0.46	-0.12	-1.94
Chapter 22 or Second DE	77	0.06	0.25	96	0.08	0.28	0.02	0.46
AQ	77	0.53	0.23	96	0.57	0.25	0.04	1.18
MTB	77	0.50	2.18	96	0.40	4.25	-0.1	-0.19
Size	77	7.13	1.28	96	6.79	1.30	-0.34	-1.76
ROA	77	-0.24	0.42	96	-0.23	0.37	0.01	0.15
Leverage	77	0.76	0.49	96	0.73	0.60	-0.03	-0.36
Tangibility	77	0.37	0.23	96	0.39	0.24	0.02	0.62
ZSCORE	77	-0.69	3.47	96	-0.22	3.10	0.47	0.92
Redeployability	77	0.40	0.11	96	0.39	0.13	-0.01	-0.42
Bank Share	77	0.49	0.32	96	0.46	0.31	-0.03	-0.60
Secured Debt	77	0.61	0.30	96	0.53	0.35	-0.08	-1.64
Senior Debt	77	0.81	0.27	96	0.83	0.28	0.02	0.54
Debt Concentration	77	0.40	0.25	96	0.43	0.24	0.03	0.65
Prepackaged Bankruptcy	77	0.18	0.39	96	0.19	0.39	0.01	0.10
Distressed Exchange	77	0.21	0.41	96	0.07	0.26	-0.14	-2.51*
Bankruptcy Time	77	331.14	329.99	96	600.98	663.03	269.84	3.49***
Spread	77	1.48	0.87	96	0.98	0.29	-0.5	-4.81***

Table 3
The Effects of Anti-Recharacterization Statutes on Recovery Rate

This table presents the OLS regression results regarding the effects of anti-recharacterization statutes on creditor recovery rates for bankrupt firms using SPVs over the 1996-2010 period. The Heckman (1979) two-stage procedure is used to mitigate potential sample-selection bias. Panel A estimates the determinants of the use of SPVs. Panel B estimates the regression at the firm level and the dependent variable *Family Recovery Rate* is a dollar-weighted average of the recovery rates of all debt instruments in the prepetition capital structure. Panel C estimates the dynamics of the effects of anti-recharacterization statutes. Panel D estimates the regression at the instrument level and the results are presented separately for secured and unsecured debts. The main independent variable is *AR Law,* which is an indicator variable that equals one if the firm is incorporated in Texas or Louisiana after 1997, Alabama after 2001, Delaware after 2002, South Dakota after 2003, Virginia after 2004, and Nevada after 2005. Data for recovery rate, and debt structure, and bankruptcy features are obtained from Moody's Ultimate Recovery Rate Database (URD). Accounting information is obtained from COMPUSTAT and stock market data are from CRSP. All variables are defined in the Appendix A. T-statistics are presented in parentheses. Standard errors are corrected for heteroscedasticity and clustered at the state level. ***, **, * denote significance at 1%, 5%, and 10% levels, respectively.

Panel A: Determinants of the Use of SPVs

	First-Stage Estimation
VARIABLES	Coefficient
AR Law	0.396***
	(4.91)
AQ	0.322**
	(2.15)
Leverage	0.391**
	(2.31)
INTCOV	-0.018***
	(-4.55)
FUNDS	0.011
	(0.02)
CLTD	0.183
	(1.51)
SETR	3.549
	(0.38)
Foreign	2.931***
	(9.05)
Tangibility	-0.485*
	(-1.68)
ROA	0.008
	(0.06)
ZSCORE	0.031
	(1.40)
MTB	-0.029
	(-1.05)
Size	0.615***
	(11.05)
Constant	-4.192***
	(-9.45)
Observations	319

Panel B: Family Recovery Rate

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Family Recovery Rate					
AR Law	20.063***	24.762***	22.461***	24.170***	23.024***	29.244***
	(4.24)	(4.57)	(3.95)	(13.36)	(12.54)	(10.15)
AQ		-3.290	-4.617	-8.372*	-5.500	-3.780
		(-0.34)	(-0.47)	(-1.95)	(-1.16)	(-0.61)
MTB		-1.034	-0.749	-0.770*	-0.478	-0.341
		(-1.49)	(-1.07)	(-1.79)	(-1.31)	(-0.99)
Size		5.541	5.470	3.310	4.036	4.672*
		(1.22)	(1.18)	(0.92)	(1.52)	(1.91)
ROA		-0.792	-0.977	-0.504	1.330	-3.122
		(-0.09)	(-0.11)	(-0.11)	(0.27)	(-0.80)
Leverage		-5.013	-5.860	-6.398***	-4.452**	-3.865*
		(-0.87)	(-0.99)	(-4.03)	(-2.56)	(-1.78)
Tangibility		11.260	10.716	9.012*	4.760	4.107
		(1.09)	(1.01)	(1.78)	(1.10)	(0.91)
ZSCORE		0.870	0.625	0.813	0.363	1.200**
		(0.76)	(0.55)	(1.62)	(0.63)	(2.26)
Redeployability			-31.434	-32.428**	-30.737***	-22.639**
			(-1.61)	(-2.81)	(-3.10)	(-2.56)
Bank Share			15.116	16.475***	17.610**	16.902*
			(1.40)	(2.95)	(2.65)	(2.11)
Secured Debt			-1.618	-0.955	1.011	7.345
			(-0.17)	(-0.30)	(0.35)	(1.23)
Senior Debt			2.872	-0.910	-3.857	-6.088*
			(0.33)	(-0.25)	(-1.09)	(-1.91)
Debt Concentration			10.489	6.275	11.295**	6.577
			(0.93)	(1.10)	(2.53)	(1.43)
Prepackaged Bankruptcy			9.394	9.429**	12.536***	17.136***
			(1.54)	(2.29)	(3.36)	(4.77)
Distressed Exchange			20.341***	20.592***	22.221***	28.973***
			(3.02)	(18.40)	(18.73)	(9.95)
Spread			-3.987	-4.520***	-6.289***	-1.461
			(-1.11)	(-6.95)	(-8.02)	(-0.38)
Constant	49.842***	-0.069	5.755	33.452	27.145	6.429
	(9.48)	(-0.00)	(0.12)	(0.98)	(1.10)	(0.26)
IMR	Yes	Yes	Yes	Yes	Yes	Yes
State FE	No	No	No	Yes	Yes	Yes
Industry FE	No	No	No	No	Yes	Yes
Year FE	No	No	No	No	No	Yes
Observations	173	173	173	173	173	173
R-squared	0.1273	0.1964	0.2713	0.3379	0.3683	0.4518

Panel C: Family Recovery Rate: Dynamic Estimates

	(1)	(2)	(3)
VARIABLES		Family Recovery Rate	
AR Law (-2)	-1.656	-4.833	-2.550
	(-0.42)	(-1.11)	(-0.31)
AR Law (-1)	-1.283	1.513	-0.541
	(-0.76)	(0.68)	(-0.14)
AR Law	25.371***	23.607***	30.333***
	(20.65)	(15.24)	(7.91)
Controls	Yes	Yes	Yes
IMR	Yes	Yes	Yes
State FE	Yes	Yes	Yes
Industry FE	No	Yes	Yes
Year FE	No	No	Yes
Observations	173	173	173
R-squared	0.3262	0.3594	0.4472

Panel D: Instrument-Level Recovery Rate

	(1)	(2)
	Instrument Level Recovery Rate	
VARIABLES	Secured	Unsecured
AR Law	22.276***	37.149***
	(9.66)	(33.15)
Controls	Yes	Yes
Industry FE	Yes	Yes
State FE	Yes	Yes
Year FE	Yes	Yes
Observations	609	545
R-squared	0.5702	0.7085

Table 4
The Effects of Anti-Recharacterization Statutes on Post-Emergence Performance

This table presents the OLS regression results regarding the effects of anti-recharacterization statutes on post-emergence performance for bankrupt firms using SPVs over the 1996-2010 period. The dependent variables are *Accounting Performance* and *Post-Emergence Stock Returns* in Panel A and the dependent variable for Panel B is *Chapter 22 or Second DE.* The main independent variable is *AR Law,* which is an indicator variable that equals one if the firm is incorporated in Texas or Louisiana after 1997, Alabama after 2001, Delaware after 2002, South Dakota after 2003, Virginia after 2004, and Nevada after 2005. Data for debt structure and bankruptcy features are obtained from Moody's Ultimate Recovery Rate Database (URD). Accounting information is obtained from COMPUSTAT and stock market data are from CRSP. All variables are defined in the Appendix A. t-statistics are presented in parentheses. Standard errors are corrected for heteroscedasticity and clustered at the state level. ***, **, * denote significance at 1%, 5%, and 10% levels, respectively.

Panel A: Accounting and Stock-Market Performance

	(1)	(2)	(3)	(4)
VARIABLES	*Accounting Performance*		*Post-Emergence Stock Return*	
AR Law	0.511**	0.500**	0.386**	0.334**
	(2.59)	(3.18)	(4.17)	(3.50)
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
State FE	No	Yes	No	Yes
Observations	79	79	49	49
R-squared	0.4658	0.4669	0.5813	0.5839

Panel B: Further Restructuring in the Near Future

	(1)	(2)	(3)	(4)	(5)	(6)
	Chapter 22 or Second DE					
VARIABLES	Full Sample			Emerged Firms		
AR Law	-0.038*	-0.040***	-0.062**	-0.063**	-0.071***	-0.087*
	(-2.00)	(-3.04)	(-2.84)	(-2.67)	(-6.42)	(-1.99)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
IMR	Yes	Yes	Yes	No	No	No
Industry FE	Yes	Yes	No	Yes	Yes	No
State FE	No	Yes	No	No	Yes	No
Year FE	No	No	Yes	No	No	Yes
Observations	173	173	173	132	132	132
R-squared	0.1980	0.2806	0.2885	0.2279	0.3653	0.3473

Robust t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5
The Effects of Anti-Recharacterization Statutes on Indirect Bankruptcy Costs

This table presents the results of testing the effects of anti-recharacterization statutes on indirect bankruptcy costs for bankrupt firms using SPVs over the 1996-2010 period. I estimate a Cox proportional hazard model, where h(T) is the likelihood that a bankrupt firm emerges from bankruptcy at time T, conditioning on that the firm has survived till time T. The main independent variable is *AR Law,* which is an indicator variable that equals one if the firm is incorporated in Texas or Louisiana after 1997, Alabama after 2001, Delaware after 2002, South Dakota after 2003, Virginia after 2004, and Nevada after 2005. Data for debt structure and bankruptcy features is obtained from Moody's Ultimate Recovery Rate Database (URD). Accounting information is obtained from COMPUSTAT and stock market data are from CRSP. All variables are defined in the Appendix A. t-statistics are presented in parentheses. Standard errors are corrected for heteroscedasticity and clustered at the state level. ***, **, * denote significance at 1%, 5%, and 10% levels, respectively.

VARIABLES	(1)	(2)	(3)
AR Law	0.689***	0.677***	2.978***
	(7.36)	(4.23)	(2.70)
AQ	0.606	0.636	1.181*
	(1.56)	(1.33)	(1.87)
MTB	0.018	0.032	-0.009
	(1.16)	(1.33)	(-0.11)
Size	-0.384***	-0.392***	-0.340*
	(-4.54)	(-3.84)	(-1.69)
ROA	0.014	-0.154	0.245
	(0.05)	(-0.49)	(0.66)
Leverage	0.575***	0.583***	0.303
	(3.32)	(3.41)	(0.89)
Tangibility	0.236	0.141	-0.909
	(0.66)	(0.41)	(-1.10)
ZSCORE	-0.094	-0.053	-0.094
	(-1.53)	(-0.68)	(-1.59)
Redeployability	1.220	0.601	0.607
	(1.44)	(0.55)	(0.55)
Bank Share	-0.388*	-0.382	-0.092
	(-1.77)	(-1.43)	(-0.19)
Secured Debt	0.392*	0.395	1.764***
	(1.92)	(1.53)	(3.16)
Senior Debt	0.544***	0.769***	-0.000
	(3.86)	(4.61)	(-0.00)
Debt Concentration	-0.949	-1.040	-2.429
	(-1.14)	(-1.17)	(-1.59)
Spread	0.431***	0.458***	0.540**
	(2.65)	(2.97)	(2.56)
State FE	Yes	Yes	Yes
Industry FE	No	Yes	Yes
Year FE	No	No	Yes
Observations	118	118	118
Model p-value	<0.0001	<0.0001	<0.0001

Table 6
The Effects of Anti-Recharacterization Statutes and Accounting Quality

This table presents the OLS regression results regarding the effects of accounting information on the impacts of anti-recharacterization statutes for bankrupt firms using SPVs over the 1996-2010 period. The dependent variables are *Family Recovery Rate, Accounting Performance,* and *Post-Emergence Stock.* The Heckman (1979) two-stage procedure is used to mitigate potential sample-selection bias in the first column. The main independent variable is the interaction term *AR Law x AQ. AR Law* is an indicator variable that equals one if the firm is incorporated in Texas or Louisiana after 1997, Alabama after 2001, Delaware after 2002, South Dakota after 2003, Virginia after 2004, and Nevada after 2005. *AQ* is a measure for accounting quality that is based on the average quintile rank of three individual measures. Data for recovery rate, debt structure and bankruptcy features are obtained from Moody's Ultimate Recovery Rate Database (URD). Accounting information is obtained from COMPUSTAT and stock market data are from CRSP. All variables are defined in the Appendix A. t-statistics are presented in parentheses. Standard errors are corrected for heteroscedasticity and clustered at the state level. ***, **, * denote significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)
VARIABLES	Family Recovery Rate	Operating Performance	Stock Returns
AR Law x AQ	35.309***	3.931*	0.119*
	(3.59)	(2.36)	(2.92)
AR Law	15.492	-1.799	0.280*
	(0.82)	(-1.70)	(2.55)
Controls	Yes	Yes	Yes
IMR	Yes	No	No
State FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Industry FE	Yes	No	No
Observations	173	79	49
R-squared	0.4346	0.4833	0.5841

Table 7
The Effects of a Federal Court's Ruling

This table presents the OLS regression results regarding the effects of accounting quality on the impacts of anti-recharacterization statutes for bankrupt firms using SPVs over the 1996-2010 period by considering the Federal court's ruling on *Reaves Brokerage Company Inc. v. Sunbelt Fruit & Vegetable Company*. The dependent variables are *Family Recovery Rate, Accounting Performance,* and *Post-Emergence Stock.* The Heckman (1979) two-stage procedure is used to mitigate potential sample-selection bias in the first two columns. The main independent variables are *AR Law* and the interaction term *AR Law x AQ. AR Law* is an indicator variable that equals one if the firm is incorporated in Texas or Louisiana after 1997, Alabama after 2001, Delaware after 2002. *AQ* is a measure for accounting quality that is based on the average quintile rank of three individual measures. Data for recovery rate, debt structure and bankruptcy features are obtained from Moody's Ultimate Recovery Rate Database (URD). Accounting information is obtained from COMPUSTAT and stock market data are from CRSP. All variables are defined in the Appendix A. t-statistics are presented in parentheses. Standard errors are corrected for heteroscedasticity and clustered at the state level. ***, **, * denote significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Family Recovery Rate		Operating Performance		Post-Emergence Stock Returns	
AR Law x AQ		30.419*		4.665**		0.145***
		(1.79)		(2.54)		(19.21)
AR Law	36.428***	15.699	0.925***	-1.628	0.286**	0.213*
	(14.78)	(1.40)	(4.37)	(-1.64)	(3.64)	(2.53)
AR Law x Reaves	-15.109**	-13.916***	-1.295***	-1.833***	-0.121**	-0.105**
	(-2.75)	(-3.94)	(-6.90)	(-4.65)	(-5.76)	(-4.81)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
IMR	Yes	Yes	No	No	No	No
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	No	No	No	No
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	173	173	79	79	49	49
R-squared	0.4597	0.5076	0.4724	0.4826	0.6242	0.6245

Table 8
Large Sample Evidence from the CDS Market

This table presents the OLS regression results regarding the effects of anti-recharacterization statutes and accounting quality on CDS spread over the 2001-2010 period. The dependent variable is *CDS Spread* in percentage points. The main independent variables are *AR Law* and the interaction term *AR Law x AQ*. *AR Law* is an indicator variable that equals one if the firm is incorporated in Texas, Louisiana, Alabama after 2001, Delaware after 2002, South Dakota after 2003, Virginia after 2004, and Nevada after 2005. *AQ* is a measure for accounting quality that is based on the average quintile rank of three individual measures. Treasure yield, LIBOR rate, and VIX data are obtained from the Federal Reserve, and CDS spread data are obtained from Markit. Accounting information is obtained from COMPUSTAT and stock market data are from CRSP. All variables are defined in the Appendix A. t-statistics are presented in parentheses. Standard errors are corrected for heteroscedasticity and clustered at the firm level. ***, **, * denote significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES			*CDS Spread*			
AR Law	-0.146**	-0.672**	-0.670**	-0.032	0.130	0.134
	(-2.26)	(-2.09)	(-2.09)	(-0.40)	(0.24)	(0.25)
AR Law x AQ				-0.187**	-1.477*	-1.483*
				(-2.35)	(-1.84)	(-1.85)
AQ	0.457***	0.113	0.112	0.582***	1.435*	1.440*
	(8.79)	(0.43)	(0.43)	(8.45)	(1.90)	(1.91)
MTB	-0.001	0.001	0.001	-0.001	0.001	0.001
	(-0.41)	(0.05)	(0.04)	(-0.32)	(0.05)	(0.05)
Size	0.530***	0.638	0.640	0.529***	0.654	0.656
	(9.10)	(1.30)	(1.30)	(9.08)	(1.33)	(1.34)
Loss	0.453***	0.232	0.231	0.450***	0.211	0.210
	(10.17)	(0.69)	(0.69)	(10.11)	(0.63)	(0.63)
ROA	-4.875***	-3.676	-3.678	-4.891***	-3.752	-3.754
	(-11.85)	(-1.38)	(-1.38)	(-11.91)	(-1.42)	(-1.42)
OCF	-2.747***	-3.199*	-3.196*	-2.757***	-3.231*	-3.228*
	(-10.75)	(-1.77)	(-1.77)	(-10.80)	(-1.78)	(-1.78)
Leverage	1.493***	2.033	2.032	1.489***	2.039	2.038
	(5.92)	(1.19)	(1.19)	(5.90)	(1.20)	(1.20)
Tangibility	-0.841***	-0.365	-0.374	-0.862***	-0.372	-0.381
	(-3.25)	(-0.17)	(-0.18)	(-3.32)	(-0.18)	(-0.18)
Return Volatility	8.392***	5.925***	5.935***	8.386***	5.855***	5.865***
	(24.82)	(3.19)	(3.19)	(24.85)	(3.17)	(3.17)
ZSCORE	0.087***	-0.002	-0.003	0.087***	0.008	0.008
	(4.69)	(-0.02)	(-0.03)	(4.69)	(0.08)	(0.08)
Interest Coverage	0.012***	0.013**	0.013**	0.012***	0.013**	0.013**
	(11.85)	(2.14)	(2.14)	(11.85)	(2.09)	(2.09)
Rating	0.057***	0.094	0.094	0.056***	0.091	0.092
	(4.64)	(1.45)	(1.45)	(4.61)	(1.41)	(1.42)
TB	-0.149***	-0.153***	-0.153***	-0.149***	-0.153***	-0.154***
	(-15.38)	(-8.75)	(-8.77)	(-15.37)	(-8.78)	(-8.80)

TED	0.192***	0.192***	0.192***	0.192***	0.193***	0.193***
	(13.77)	(6.88)	(6.87)	(13.78)	(6.91)	(6.91)
VIX	0.075***	0.075***	0.075***	0.075***	0.075***	0.075***
	(57.13)	(15.91)	(15.90)	(57.14)	(15.92)	(15.92)
S&P500	4.435***	4.437***	4.440***	4.436***	4.442***	4.446***
	(28.55)	(15.11)	(15.12)	(28.56)	(15.13)	(15.14)
Constant	-5.415***	-5.856	-5.867	-5.471***	-6.731	-6.746
	(-9.30)	(-1.21)	(-1.22)	(-9.42)	(-1.42)	(-1.42)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year FE	Yes	No	No	Yes	No	No
Industry-State-Year FE	NO	Yes	Yes	NO	Yes	Yes
Clause FE	NO	NO	Yes	NO	NO	Yes
Observations	135,088	135,088	135,088	135,088	135,088	135,088
Adjusted R-squared	0.7976	0.8350	0.8353	0.7976	0.8352	0.8355

Table 9
Additional Analyses

This table presents additional regression results regarding the effects of accounting quality and anti-recharacterization statutes for bankrupt firms using SPVs over the 1996-2010 period through the Chapter 11 process. A first-stage probit model is estimated in Panel A using the full sample, where the dependent variable *Distressed Exchange* is an indicator variable that equals one if the bankruptcy resolution is completed through a distressed exchange, instead of a formal in-court Chapter 11 process. Panel B estimates a second stage model using the Chapter 11 only sample that controls for the inverse Mills ratio (*IMR*) estimated from Panel A. The dependent variable is *Family Recovery Rate* and the main independent variables are *AR Law* in Column 1 and the interaction term *AR Law x AQ* in Column 2. *AR Law* is an indicator variable that equals one if the firm is incorporated in Texas or Louisiana after 1997, Alabama after 2001, Delaware after 2002, South Dakota after 2003, Virginia after 2004, and Nevada after 2005. *AQ* is a measure for accounting quality that is based on the average quintile rank of three individual measures. Data for recovery rate, debt structure and bankruptcy features are obtained from Moody's Ultimate Recovery Rate Database (URD). Accounting information is obtained from COMPUSTAT and stock market data are from CRSP. All variables are defined in the Appendix A. t-statistics are presented in parentheses. Standard errors are corrected for heteroscedasticity and clustered at the state level. ***, **, * denote significance at 1%, 5%, and 10% levels, respectively.

Panel A: First-Stage Probit Regression on the Choice of DE vs. Chapter 11

	(1)
VARIABLES	*Distressed Exchange*
AR Law	0.801**
	(2.33)
AQ	-0.386
	(-0.57)
MTB	-0.060
	(-1.50)
Size	0.192
	(1.22)
ROA	-1.109
	(-1.28)
Leverage	-0.196
	(-0.40)
Tangibility	-0.081
	(-0.11)
ZSCORE	0.134
	(1.25)
Redeployability	0.837
	(0.60)
Bank Share	-2.530***
	(-3.47)
Secured Debt	0.532
	(0.91)
Senior Debt	0.746
	(1.21)
Debt Concentration	0.750
	(0.85)
Spread	0.029
	(0.13)
Interest Miss	-1.387**
	(-2.57)
Constant	-3.083*
	(-1.79)

Observations	173
Pseudo R2	0.290

Panel B: Second-Stage Regression with only Chapter 11 cases

	(1)	(2)
VARIABLES	Family Recovery Rate	
AR Law x AQ		41.295***
		(3.57)
AR Law	28.583***	8.255
	(2.95)	(0.79)
IMR	9.197**	9.240**
	(2.26)	(2.53)
Controls	Yes	Yes
State FE	Yes	Yes
Industry FE	Yes	Yes
Year FE	Yes	Yes
Observations	150	150
R-squared	0.3759	0.3925

Table 10

Creditor Recovery Regressions with Different Standard Error Estimation Methods

This table presents additional regression results regarding the effects of different standard error estimation methods. The dependent variable is *Family Recovery Rate* and the main independent variable is *AR Law,* which is an indicator variable that equals one if the firm is incorporated in Texas or Louisiana after 1997, Alabama after 2001, Delaware after 2002, South Dakota after 2003, Virginia after 2004, and Nevada after 2005. All variables are defined in the Appendix A.

	(1)	(2)	(3)	(4)
VARIABLES		Family Recovery Rate		
AR Law Coefficient	20.52	24.112	23.017	33.343
Cluster by state t-stat	4.39	8.32	8.7	2.21
Cluster by industry t-stat	4.18	4.34	3.96	3.17
Cluster by year t-stat	4.34	5.08	4.51	2.51
Robust t-stat	4.24	4.55	4.32	2.48
Wild Bootstrapped t-stat	4.39	4.39	4.45	1.98
Controls	Yes	Yes	Yes	Yes
State FE	No	Yes	Yes	Yes
Industry FE	No	No	Yes	Yes
Year FE	No	No	No	Yes
Observations	173	173	173	173
R-squared	0.2696	0.3379	0.3683	0.4220

Chapter 2 -- The Relevance of Key Performance Indicators in Debt Markets: Evidence from Credit Default Swaps

1. Introduction

As information disclosed in financial statements does not tell the full story of a business, market participants also rely on information contained in measures that are voluntarily disclosed and outside the scope of traditional financial statements to make economic decisions. For instance, Fitch downgraded Gap Inc's credit rating from BBB- to BB+ on May 11, 2016, two days after the company announced the sales results for the quarter. The downgrade decision was largely driven by Fitch's concern about the company's decline on same-store-sales, a major Key Performance Indicator (KPI) for the retail industry (Hufford 2016). As another example, the shares of Netflix dived 13% after the company reported lower-than-expected subscriber numbers on July 17, 2019, despite beating on earnings expectations.[36] In addition to the interests from investors and other market participants, regulators also devote much attention to the reporting of KPIs (e.g., SEC 2003, 2008, 2020; IASB 2010; AcSB 2019). To the extent that the disclosures of KPIs are voluntary and non-standardized, it is important to understand the usefulness of these metrics to capital markets.

The goal of this study is to examine the relevance of KPIs in debt markets. While prior studies have shed light on the usefulness of KPIs in the equity market (e.g., Amir and Lev 1996; Ittner and Larcker 1998; Givoly, Li, Lourie, and Nekrasov 2019), there are reasons to expect the role of KPIs to differ substantially in debt markets. First, debtholders have a different payoff function compared to equity investors. Specifically, debtholders' payoff is more sensitive to the downside risk of the

[36] https://www.cnbc.com/2019/07/17/netflix-earnings-q2-2019.html

company, while stockholders focus more on the upside potential. To the extent that the disclosures of KPIs cater to the information needs of stockholders and focus more on the growth of the firm, they could fail to convey relevant information to debtholders. Second, in contrast to the equity market where retail investors play an important role, debt markets are mostly populated by institutions with greater access to alternative sources of information, including private information (Acharya and Johnson 2007). Therefore, the usefulness of public disclosures of KPIs could be limited in debt markets. Third, the disclosures of KPIs are voluntary disclosures by managers and there is a lack of standardization requirement in accounting standards. Accordingly, the discretion in managers' disclosure behaviors could distort the relevance of KPIs. This effect is potentially especially important for the debt market as managers' incentive to misreport becomes stronger when the firm is close to financial distress (Koch 2002; Rogers and Stocken 2005).

To empirically study the relevance of KPIs in debt markets, I examine the reaction of the CDS market to the announcement of KPI news. The CDS market serves as a useful setting due to its fast price discovery and to the fact that the pricing of CDS contracts is less affected by factors unrelated to credit risk (e.g., Acharya and Johnson 2007; Longstaff, Mithal, and Neis 2005). Specifically, I focus on the change in CDS spreads over the three-day window surrounding the announcement date of KPIs. To assess whether KPIs are incrementally informative relative to traditional accounting numbers, I control for the news content in accounting earnings and sales revenue. In addition to controlling for a number of factors related to credit risk, I also include *firm, year, and clause fixed effects* in the regression analyses.[37]

[37] Clauses in CDS contracts specify the credit events that would trigger the payments from the contract sellers. There are four major types of clauses, full restructuring, modified restructuring, modified-modified restructuring, and no restructuring (Packer and Zhu 2005).

I obtain the sample of quarterly KPI forecasts and actual values from the I/B/E/S KPI database. I exclude KPIs that are directly related to financial statement items, such as cost of goods sold, cash flow from operations, or gross margin. I also exclude the financial industry from my sample as most of the KPIs for this industry are directly related to financial statement items. After taking the intersection of the KPI and CDS data and excluding KPIs with fewer than 50 observations, I end up with a final sample of 15,221 observations at the KPI-firm-quarter level, which covers four industries and 19 KPIs. The sample period is from 2012 to 2019.[38]

I use an approach similar to Givoly et al. (2019) to calculate the news content of KPIs. I first calculate the surprise of KPIs as the difference between the actual value and the consensus analyst forecast, scaled by the absolute value of the consensus forecast.[39] For each KPI, I sort the surprise into quintiles across all firm-quarter observations. I transform the rank into an index ranging from 0 to 1, which allows me to examine the relevance of a number of KPIs based on different units in a coherent framework.

The results show that the reaction of the CDS market during the three-day window is negatively associated with the news content in KPIs. Furthermore, the effect of KPIs remains significant after controlling for the impacts of earnings and sales news. The impact of KPIs is also economically meaningful. An increase in KPI news from the lowest quintile to the top quintile is associated with a 0.71% decrease in CDS spread, which is equivalent to a 1.68 basis points decrease based on the sample mean value. In addition, I also conduct analyses using a longer window and examine the association between the quarterly change in CDS spreads and the change

[38] The fact that the sample covers four industries and eight years is due to I/B/E/S KPI data availability.
[39] My inferences are robust to other scaling choices. See section 4.1.1 for more details.

in KPIs. Results suggest that CDS spread decreases by 3.35 basis points when the KPI measure experiences an increase over the quarter. This effect is statistically significant and further corroborates the analyses based on the three-day window.

In further analyses, I conduct the analyses at the firm-quarter by creating an aggregate measure to capture the firm's performance across the most important KPIs. Following Givoly et al. (2019), I use the total number of analyst forecasts for each KPI and select the five most followed KPIs. The aggregate KPI measure takes the mean value of the news content of the five KPIs. The results show that the CDS market reacts negatively and significant to the news content of the most important KPIs around the three-day window. An increase in aggregate KPI news measure from the lowest quintile to the top quintile is associated with a 1.68 basis points decrease in CDS spread.

Next, I examine cross-sectional variations in the usefulness of KPIs. Consistent with argument that analysts' issuance of KPI forecasts is in response to the information demand from investors, I find that the impact of KPIs is stronger when the demand is higher, which is captured by the number of KPI forecasts scaled by the number of earnings forecasts. Consistent with the nonlinear payoff functions of credit investors, my analyses indicate that the relevance of KPIs is stronger for firms that have a higher risk of financial distress, when the sign of KPI news is negative, and for companies with the level of the KPI lower than the industry-median value. In addition, I examine whether the impact of KPIs is related to the quality of accounting earnings. Using the Dechow and Dichev (2002) model, which captures the extent to which accounting earnings are translated into cash flows, to measure the quality of accounting earnings, I find that the effects of KPIs are stronger for firms with lower earnings quality. The results further corroborate the notion that KPIs provide incremental information relative to traditional accounting numbers.

This study contributes in the following ways. First, to the best of my knowledge, this research is the first to examine whether KPIs, including both financial and non-financial metrics, are relevant to debtholders. While prior studies focus on the impact of accounting earnings (Callen, Livnat, and Segal 2009; Easton, Monahan, and Vasvari 2009; DeFond and Zhang 2014), management earnings forecasts (Shivakumar, Urcan, Vasvari, and Zhang 2011), and risk factor disclosures (Chiu, Guan, and Kim 2018; Wang 2021), there is no evidence regarding the relevance of other types of performance measures in debt markets, especially the role of non-financial performance measures. My study fills the gap in the literature and shows that KPIs convey useful information to the debt markets.

Second, this paper contributes to the literature that studies the usefulness of KPIs. Most studies examine the role of KPIs in the equity market (e.g., Amir and Lev 1996; Trueman, Wong, and Zhang 2000, 2001; Rajgopal, Shevlin, and Venkatachalam 2003; Ittner and Larcker 1998; Givoly et al. 2019). However, research has not examined the impact of KPIs on other stakeholders. This paper contributes by highlighting the relevance of KPIs to an important group of stakeholders other than equity investors, namely debtholders. In addition, extant studies mostly focus on certain KPIs using a single industry setting, with Givoly et al. (2019) providing the only evidence on a larger set of KPIs. My research extends the literature with new evidence regarding a large group of KPIs across several industries.

Finally, my findings also have policy implications. Regulators have been concerned about the lack of standardization and regulation regarding the voluntary disclosures of KPIs, which could render these metrics less informative to investors. Accordingly, the SEC has been considering whether the definitions of KPIs should be standardized and the disclosures of these metrics be mandated, in order to enhance their usefulness (SEC 2016). My research suggests that the

disclosures of KPIs based on a discretionary basis by the managers convey useful information to investors.

2. Institutional Background, Literature Review, and Hypotheses Development

2.1 Institutional Background

CDSs have become the most common credit derivative in the credit market, with a total notional outstanding of 8.81 trillion dollars by the end of June 2020 (BIS 2020). The availability of a CDS, which is an over-the-counter contract, allows two parties to transfer credit risk with each other. The CDS buyer pays a fixed premium to the protection seller for a certain period of time. If a certain credit event occurs to a specific firm, which is also referred to as the reference entity, then the protection seller pays compensation to the protection buyer. The typical maturity of a CDS contract ranges from one year to ten years, with the five-year contracts being the most common and actively traded. The credit event in a CDS contract is pre-specified in the contractual clauses, and over time, four different types of clauses have evolved: full restructuring, modified restructuring, modified-modified restructuring, and no restructuring.[40]

I focus on the CDS market as the setting in this study, rather than alternatives such as the corporate bond market, due to several advantages offered by CDS instruments. First, in contrast to the heterogeneity in corporate bond features (e.g., seniority, coupon rate, embedded options, guarantees, and covenants), CDS contracts are relatively homogeneous and standardized and thus provide a useful setting to examine the pricing of credit risks (Callen et al. 2009). Second, the prices of corporate bonds reflect factors that are not directly related to the firm's credit risk (Elton, Gruber, Agrawal, and Mann 2001). For instance, evidence suggests that a meaningful portion of

[40] See Packer and Zhu (2005) for more detailed discussions and examinations on CDS contractual terms.

corporate yield spreads is explained by factors related to illiquidity (Longstaff, Mithal, Neis 2005; Chen, Lesmond, and Wei 2007; Driessen 2005). Finally, the CDS market reacts to credit-risk relevant information in a timely fashion. Studies show that the CDS market leads the corporate bond market in price discovery (Blanco et al. 2005). In addition, there is evidence suggesting that the CDS market also leads the stock market in the speed of reactions (Norden and Weber 2004; Acharya and Johnson 2007). Overall, the CDS market provides a powerful setting for research examining the determinants of credit risk.

2.2 Related Literature

2.2.1 The Impact of Accounting Information in Debt Markets

An emerging strand of literature in accounting focuses on the importance of accounting information in debt markets. Callen et al. (2009) examine the role of earnings information in the CDS market and show that earnings convey credit-risk information that is relevant for debt holders. Similarly, Easton et al. (2009) and DeFond and Zhang (2014) show that the bond market reacts significantly to the announcement of earnings information. Givoly et al. (2017) study the change in the relevance of accounting information over time for debt markets and find that the information content to bond holders has increased. In addition, Shivakumar et al. (2011) document that management earnings forecasts provide relevant information to debt markets using CDS data. Overall, these studies show that both mandated and voluntary earnings disclosures convey relevant information to debt holders.

Another line of research focuses on the role of voluntary disclosure in debt markets. Under the theoretical framework of Duffie and Lando (2001), debt investors do not perfectly observe the value of a firm's assets and rely on noisy accounting reports to access a firm's credit risk. As a

result, the quality of accounting information has the potential to shape a firm's credit spread. Empirical studies provide evidence that is supportive of the theoretical prediction. Bonsall and Miller (2017) show that firms with more readable 10-K filings have more favorable bond ratings, lower rating disagreement, and lower cost of debt. There is also evidence that risk factor disclosures convey relevant information to the CDS market. For example, Chiu et al. (2018) find that the SEC mandate of risk factor disclosures in 10-K/10-Q filings leads to lower CDS spreads and Wang (2021) shows that the CDS market reacts significantly to the tone of MD&A risk factor disclosures.

2.2.2 Key Performance Indicators (KPIs)

The disclosure of Key Performance Indicators (KPIs) has drawn much attention from regulators worldwide. In the U.S., the SEC has encouraged firms to discuss both financial and non-financial KPIs in the MD&A section of the annual report (SEC 2003). In 2008, the SEC Advisory Committee on Improvements to Financial Reporting recommended developing high-quality KPIs for specific business activities or industries (SEC 2008). Recently, the SEC has issued interpretive guidance regarding the disclosure of KPIs in MD&As, effective February 25, 2020 (SEC 2020).[41] While not materially changing the current disclosure requirements, the guidance serves as a reminder to companies to improve their disclosures of any metrics.

[41] The guidance indicates that metrics disclosed in MD&As should not deviate materially from those used to manage operations and or make strategic decisions. Firms should also consider whether an existing disclosure framework applies, such as those for the disclosures of GAAP or non-GAAP measures. When discussing a metric in the MD&A, the SEC expects the disclosures to include: a clear definition of the metric and how it is calculated; a statement indicating the reasons why the metric provides useful information to investors; and a statement indicating how management uses the metric in managing or monitoring the performance of the business. The SEC also states that companies should consider additional disclosures when the method of calculating or presenting the metric changes. See SEC (2020) for details.

Internationally, the EU and the International Accounting Standards Board (IASB) have provided guidelines to facilitate the reporting of both financial and non-financial performance measures (EU 2003; IASB 2010). The Accounting Standards Board (AcSB) in Canada has issued a Framework for Reporting Performance Measures in December 2018, aiming to enhance the reporting of performance measures, including KPIs, across different sectors and provide guidance to ensure disclosure of high-quality information (AcSB 2019).

Research examines the role of KPIs in the equity market and most studies focus on a single industry. Amir and Lev (1996) show that market share and penetration rate are value relevant for wireless companies. Trueman, Wong, and Zhang (2000, 2001), Demers and Lev (2001), and Rajgopal, Shevlin, and Venkatachalam (2003) demonstrate the informational role of web usage for internet companies. Other studies examine KPIs such as customer satisfaction (Behn and Riley 1999; Ittner and Larcker 1998), order backlog (Lev and Thiagarajan 1993; Behn 1996; Liu, Livnat, and Ryan 1996; Chandra, Procassini, and Waymire 1999; Rajgopal, Shevlin, and Venkatachalam 2003; Chang, Chen, Hsu, and Mashruwala 2018), customer acquisition cost, average revenue per user, number of subscribers (Simpson 2010; Livne, Simpson, and Talmor 2011), growth in same-store sales, the number of existing numbers, and stores opened/closed (Curtis, Lundholm, and McVay 2014). More recently, Givoly, Li, Lourie, and Nekrasov (2019) examine a larger number of KPIs across multiple industries and show that the stock market reacts significantly to news in KPIs.

While demonstrating that KPIs convey relevant information to investors, prior studies focus exclusively on the relevance of KPIs in equity markets and are silent about the impact of KPIs on other stakeholders, such as debt holders. As anecdotes suggest that KPIs also convey relevant information to the credit market, it is important to examine the impact of KPIs on other

stakeholders to better understand the informational content of these metrics (Hufford 2016). This paper fills this gap in the literature by examining the relevance of KPIs in the CDS market.

2.3 Hypotheses Development

Research documents that KPIs contain information that is incremental to earnings and sales for the equity market (e.g., Givoly et al. 2019). However, this does not necessarily imply that KPIs should also be relevant to the CDS market. First, debtholders have a nonlinear payoff function and focus more on the downside risk of the company, while equity holders are essentially holders of a call option on the firm and care more about the upside potential. To the extent that KPIs cater to the information needs of equity holders, they may not convey relevant information to debtholders. Second, in contrast to equity markets, where retail investors with limited sources of information play a role, credit market investors are mostly institutions that enjoy greater access to information and rely relatively less on firms' public disclosures (Acharya and Johnson 2007). Third, the informational content of KPIs depends on the voluntary disclosures of managers. A lack of detailed disclosures about the definitions or calculations of a KPI and the absence of standardization regarding the definition of the KPI could decrease the informativeness of the metric. In addition, as the manager's incentive to misrepresent becomes stronger when the firm is close to financial stress, the usefulness of KPIs could be very limited for credit investors (Koch 2002; Rogers and Stocken 2005).

Despite the above arguments, KPIs could still convey relevant information to the credit markets regarding the firm's default risk. Duffie and Lando (2001) demonstrate that a firm's CDS spread is driven by the imperfect accounting information that is available to investors when they cannot directly observe the reference entity's assets. If KPIs provide incremental information to

the investors regarding the dynamics of the reference entity's assets, they can provide useful information to credit investors. Research shows that KPIs are incrementally informative about a firm's future performance relative to accounting earnings (Rajgopal et al. 2003; Curtis et al. 2015). Furthermore, some evidence suggests that the informational content of earnings declines over time, which could further enhance the importance of KPIs (e.g., Collins et al. 1997; Lev and Zarowin 1999; Francis and Schipper 1999).

Overall, whether KPIs convey information that is relevant to the CDS market is an empirical question. The above discussions lead to my first hypothesis, stated in alternative form:

H1: The percent change in the CDS spread in the three-day window around the announcement date of Key Performance Indicators (KPIs) is negatively associated with the surprises of the reference entities' KPIs.

Next, I consider potential cross-sectional variations in the relevance of KPIs. Research shows that analysts' incentives to produce information are not exogenous, and instead, they are largely driven by the information demand from investors (e.g., DeFond and Hung 2003; Ertimur, Mayew, and Stubben 2011). Consistent with the demand effect, Givoly et al. (2019) show that more analysts issue KPI forecasts when the informativeness of earnings is lower and when the KPIs are more frequently mentioned in press releases. To the extent that investors' demand for KPI information is related to the importance of KPIs, I expect the impact of KPIs to be stronger when the demand for such information is higher.

H2: The relation between the change in CDS spread and the surprises of KPIs is stronger when the demand for KPI information is stronger.

Debtholders are entitled to a nonlinear payoff function of the firm's assets. Specifically, their payoff is more sensitive to the downside risk of the company, rather than the upside potential of the firm's profit. Research focusing on the role of accounting information in credit markets has provided evidence consistent with the nonlinear relation. For example, Shivakumar et al. (2011) show that the relevance of management earnings guidance is stronger for firms that are close to default, and Wang (2021) documents a similar nonlinearity regarding the role of risk factor disclosures. Accordingly, I also expect the impact of KPIs on CDS spreads to be stronger when the firm is close to financial distress.

H3A: The relation between the change in CDS spread and the surprises of KPIs is stronger for firms with higher risks of financial distress.

The relevance of KPIs is also likely associated with the sign the news contents. As debtholders are more sensitive to the downside risk of the firm, they may react more strongly to KPI news when the news content is negative. Consistent with this argument, Easton et al. (2009) show that the low-quality bonds react more strongly to extreme negative earnings news than other types of news. Another potential implication of the nonlinear payoff function of debtholders is that the usefulness of KPIs may depend on the *level* of the measure. If the level of the measure is relatively high compared to that of other companies, it suggests that the operating performance of the company is better and the risk of potential financial distress is lower, which lowers the information needs of debtholders. Consistent with this argument, Callen et al. (2009) show that the relevance of earnings when the profitability of the firm is lower than the industry-median level.

Overall, I expect the impact of KPIs on the pricing of CDS contracts to be stronger when the KPI news is negative and when the level of the KPI is lower than the median level within the industry.

H3B: The relation between the change in CDS spread and the surprises of KPIs is stronger for firms with negative KPI news.

H3C: The relation between the change in CDS spread and the surprises of KPIs is stronger for firms with below median levels of KPIs.

Finally, I consider whether the usefulness of KPIs is related to the quality of the firm's accounting earnings. If the earnings of the firms are of higher quality, as defined by the predictive power of future cash flows, then the relevance of KPIs for future cash flows and thus credit risk may become lower. Accordingly, I expect the impact of KPIs on CDS spreads to be stronger for firms with lower earnings quality.

H4: The relation between the change in CDS spread and the surprises of KPIs is stronger for firms with lower earnings quality.

3. Sample Selection

I obtain quarterly forecasts and actual values of KPIs from the I/B/E/S KPI dataset. Because the focus of this research is on KPIs that provide information incremental to traditional financial statement variables, I exclude non-industry-specific KPIs provided by the database that are directly related to financial statement items, such as cost of goods sold, cash flow from operations, or profit margin. I exclude the financial industry from the sample as most of the KPIs for this industry are directly related to financial statement items. I collect the quarterly forecasts and actual values of earnings and sales from I/B/E/S detail files. Financial information is obtained from Compustat and stock returns data are obtained from CRSP.

I collect CDS data from Markit Group's CDS database, which is widely used in prior studies (e.g., Zhang et al. 2009; Shivakumar et al. 2011; Wang 2021). I focus on 5-year CDS contracts of senior unsecured debts for my main analyses as 5-year contracts have the best liquidity and data coverage in the U.S. markets (Zhang et al. 2009).[42] Following Callen et al. (2009), I eliminate contracts with modified-modified restructuring clauses to improve the homogeneity of sample observations, and retain contracts with other types of clauses, Modified Restructuring, Exclude Restructuring, and Full Restructuring.[43] For each KPI-firm-quarter observation, I require that the data on five-year contracts be available for calculating the percentage change in CDS spread during the three-day window around the announcement date of KPIs. My final sample is based on the intersection of the CDS and KPI data. After excluding KPIs with fewer than 50 observations, I end up with a final sample of 15,221 observations at the KPI-firm-quarter level, which covers four industries and has a sample period from 2012 to 2019.[44]

Table 1 presents the distribution of sample observations. Panel A shows the distribution by industry and year. The sample covers four industries as defined by I/B/E/S: airline, oil and gas, retail, and telecommunication, and the availability of the KPI data over time varies across industries.[45] The sample period for the airline industry is from 2013 to 2019, for the oil and gas industry is from 2012 to 2019, for retail industry is from 2013-2019, and for telecommunication

[42] My findings are robust to using 1-year or three-year contracts.
[43] The inferences remain if I retain contracts with only Modified Restructuring clause. The results are reported in Table 8.
[44] The reason that my sample covers these four industries is that I require each KPI to have at least 50 observations. The I/B/E/S KPI database covers nine industries: Airlines, Banking and Finance, Technology, Oil and Gas, Insurance, Mining, Real Estate, Retail, and Pharmaceutical and Healthcare. The sample period and the four industries covered by the sample are largely determined by the data availability from I/B/E/S KPI database.
[45] The broad definition of the oil and gas industry includes companies operating in the integrated oil and gas, oil and gas exploration and production, oil and gas refining and marketing industries.

industries is over the 2016-2019 period. The number of observations increases over time until 2015 and becomes stable afterwards, except for telecommunication. This time trend is consistent with notion that the importance of KPIs increases over time and leads to a higher level of supply of such information. Among the four industries, the oil and gas industry has the highest number of observations of 10,304, followed by retail with 3,808 observations. The airline and telecommunication industries have 763 and 346 observations, respectively. The distribution of the sample employed in this paper is largely consistent with that in Givoly et al. (2019).

Panel B of Table 1 shows the sample distribution by each industry-specific KPI measure. *Revenue Passengers Miles* (RPM) has the largest number of observations of 137 for the airline industry, while the availability of KPI data is mostly similar across the six measures within the industry. The distribution of KPIs is relatively more heterogenous for the eight KPIs for the retail industry, for which *Same Store Sales Growth* (SSS) has the largest number of observations (1,231) and *Number of Store Closed/Relocated* (NSC) has the smallest (61). The oil and gas industry has 23 KPIs in the sample, which is the highest across the four industries. Among these KPIs, Distributable Cash Flow Aggregate (DFF) has the largest number of observations of 1,042. The data availability for the telecommunication industry is relatively limited compared with the other three industries with only four KPIs in total, among which *Churn* (CRN) has the highest number of observations (103).

4. Empirical Analyses

4.1 Research Design

4.1.1 Key Variables

Following prior research, I use an event-study approach to examine the reaction of the CDS market to the announcement of KPI news for my main analyses (Callen et al. 2009; Shivakumar et al. 2011; Wang 2021). Specifically, I calculate Δ*CDS Spread* as the percentage change in CDS spread over the three-day window surrounding the announcement day of KPIs.[46]

To capture the information content of KPIs, I use an approach that is similar to the method used by Givoly et al. (2019). I start with calculating the raw value of *KPI Surprise* as the actual value of the KPI minus the corresponding consensus forecast by sell-side analysts, scaled by the absolute value of the consensus forecast.[47] The consensus forecast is calculated as the median value of the most recent forecast by each individual analyst during the 90-day window prior to the announcement day. For each KPI, I sort the raw value of *KPI Surprise* into quintiles across all firm-quarter observations, subtract 1 from the rank, and scale it by 4, transforming the rank into an index ranging from 0 to 1. By transforming the surprise of different KPI measures into a rank variable, I can examine the relevance of a large number of KPIs with different units in a *single coherent* framework. To facilitate the comparison of KPIs with earnings and sales, I also calculate *Earnings Surprise* and *Sales Surprise* in a similar way.

[46] For more than 99% of my sample observations, the KPI measure and earnings are announced on the same day. My findings are robust to removing the observations for which KPIs and earnings have different announcement dates.
[47] My inferences remain if I scale the surprise by the average absolute value of the consensus forecast or the actual value. I do not scale the surprise by stock price because the KPIs might be based on different units. For instance, load factor for airline industry is a percentage term and thus cannot be scaled by stock price.

In additional analyses, I also use the change in CDS spread over the quarter to examine the robustness of my findings. For this test, I define a variable *KPI Increase* which is an indicator variable equal to one if the KPI measure increases over the fiscal quarter.

It is worth noting that some KPIs may have negative associations with firm performance, such as those capturing expenses (e.g., Exploration Expense or EXP), costs (e.g., Cost per Seat Miles or CPA), or unfavorable changes in the firm's operations (e.g., Number of Stores Closed/Relocated or NSC). I multiply the raw value of *KPI Surprise* by -1 for such measures, so a positive value of *KPI Surprise or KPI Increase* is expected to be favorable news for the firm's performance.

4.1.2 Regression Model

For my main analyses, I estimate the follow OLS regression model to examine the incremental relevance of KPIs during the three-day window around the announcement date:

$$\Delta CDS\ Spread_{j,t} = \alpha + \beta_1 KPI\ Surprise_{i,j,t} + \beta_2 Earnings\ Surprise_{j,t} + \beta_3 Sales\ Surprise_{j,t} + \beta_4 Controls + Firm\ FE + Year\ FE + Clause\ FE + \epsilon \quad (1)$$

The regression is estimated using all KPI-firm-quarter observations.[48] The test variable is *KPI Surprise*. If a positive value of *KPI Surprise* provides favorable information about changes in the firm's credit risk, then I expect *KPI Surprise* to load negatively. With respect to control variables, I include *Earnings Surprise* and *Sales Surprise* to test the incremental relevance of KPIs relative

[48] In additional analyses, I also run the regression at the firm-quarter level by aggregating the news of several KPIs.

to other accounting numbers. I also control for firm *Size*, Market-to-Book ratio (*MTB*), *Leverage*, and *Return Volatility.* I control for the cumulative market-adjusted stock returns over the three-day window, as equity returns could incorporate information of earnings and other variables (Callen et al. 2009; Shivakumar et al. 2011; Wang 2021). To account for the effects of liquidity, I control for the Treasury-Eurodollar spread (*TED*), which is defined as the difference between the 90-day LIBOR and 90-day Treasury Bill yields. I include the CBOE Volatility Index (*VIX*) as a control to capture liquidity provision in the market. I control for the return on the S&P 500 index to capture the economic condition. Furthermore, I use a relatively *strict fixed effects structure* by including *firm, year,* and *clause fixed effects*.[49] Such a fixed effects structure allows me to control for time-invariant differences across companies, common time trends, and variations across CDS contracts with different types of clauses.

In additional analyses, I also examine the relevance of KPIs using a relatively longer window and estimate the following OLS regression model:

$$\Delta CDS\ Spread\ Quarterly_{j,t} = \alpha + \beta_1 KPI\ Increase_{i,j,t} + \beta_2 ROAe_{j,t} + \beta_3 \Delta ROA_{j,t} + \beta_4 Controls + Firm\ FE + Year\ FE + Clause\ FE + \epsilon \quad (2)$$

where the dependent variable is quarterly change in CDS spread and the test variable is *KPI Increase*. I include ROA and ΔROA to control for the effects of earnings information (Callen et al. 2009). The choice of other control variables is similar to model (1).

[49] My findings are robust to using 5-year CDS contracts with only modified restricting clauses to further enhance the homogeneity of sample observations. The results are reported in Table 8.

4.2 Descriptive Statistics

Table 2 presents the descriptive statistics for the sample observations. The percentage change of CDS spread over the three-day window around the announcement date of KPIs, Δ*CDS Spread,* has a mean (median) value of 0.58% (0%). The quarterly percentage change of CDS spread, Δ*CDS Premium Quarterly,* which is calculated over the window from the day after the previous quarter's announcement date to the day after the current quarter's announcement, has a mean (median) value of 4.18% (28.82%). These statistics are comparable to those in prior studies (e.g., Callen et al. 2009). The mean (median) value of the KPI surprise is 0.17 (0.00), while the mean (median) value of earnings surprise and sales surprise are 0.20 (0.04) and 0.02 (0.00), respectively. The mean value of *KPI increase* is 0.53, suggesting that 53% of the observations are associated with an increase in the KPI.

Table 3 shows the correlations between variables, with Pearson and Spearman correlations reported below and above the diagonal, respectively. The Pearson (Spearman) correlation between Δ*CDS Spread* and *KPI Surprise* is -0.049 (-0.034), which is statistically significant at the 1% level (two-sided). Similarly, the Pearson correlation between Δ*CDS Spread Quarterly* and *KPI increase* is also negative with a coefficient of -0.033, which is significant at the 1% level. In addition, the correlation between Δ*CDS Spread* and *Earnings Surprise* is negative and statistically significant, which is consistent with the findings in Callen et al. (2009). Overall, the bivariate analyses provide initial findings that are supportive of *Hypothesis 1*, suggesting that positive KPI news is associated with a decrease in CDS spread. To examine whether the value relevance of KPIs prevails after controlling news in traditional accounting variables, such as earnings and sales, I turn to multivariate analyses in next sections.

4.3 Multivariate Analyses: The Relevance of KPIs

Table 4 reports the results of regression analyses examining the reaction of the CDS market to the announcement of KPIs. In Panel A, I conduct the analyses by pooling observations from all four industries, and in Panel B, I report the results for each industry separately. The dependent variable is Δ*CDS Spread* in both panels. In Panel A, I only include *KPI Surprise* in column (1) and add more controls in column (2). I further include year, firm, and clause fixed effects in column 3. The coefficient of *KPI Surprise* is negative and statistically significant at the 1% level (two-sided) in the three columns, suggesting that the change in CDS spread is negatively associated with the news conveyed by KPIs. To gauge whether KPIs provide incremental information about credit risk after controlling for news in traditional accounting numbers, I further include *Earnings Surprise* and *Sales Surprise* in columns (4) and (5). While the results show that *Earnings Surprise* is negatively associated the change in CDS spread, the coefficient of *KPI Surprise* remains negative and statistically significant at the 1% level.

The effect is also economically meaningful. Based on column (5), *KPI Surprise* moving from the bottom quintile to the top quintile is associated with a 0.71% decrease in CDS spread, which is equivalent to a 1.68 basis points decrease based on the sample mean value of CDS spread of 236 basis points. Additionally, the coefficient of *KPI Surprise* can be compared with that of *Earnings Surprise* to gauge its economic significance, as these two variables are both rank variables ranging from 0 to 1. Based on results in column (5), the magnitude of *KPI Surprise*'s coefficient is 25% (=0.707/2.767) as large as that of *Earnings Surprise.* In this sense, the relevance of KPIs is both statistically and economically meaningful. Overall, the regression results in Panel A of Table 4 are consistent with *Hypothesis 1*, suggesting that KPIs are incrementally informative about a firm's credit risk.

It is worth noting that the coefficients of control variables are largely consistent with the findings in prior research. For example, consistent with Shivakumar et al. (2011), I find that stock returns during the three-day window are negatively associated with the changes in CDS spread. In addition, the results show that *Earnings Surprise* is negatively associated with changes in CDS spread after controlling for stock returns during the three-day window, which is consistent with the findings in Callen et al. (2009).

Panel B of Table 4 reports the regression results by each industry. I employ the same regression model as in column (5) of Panel B, which includes the full set of controls and fixed effects. The results show that *KPI Surprise* is loading negatively and the coefficient is statistically significant at the 10% or better, except for the telecommunication industry with the smallest number of observations.

I also conduct the regression analyses at each KPI level to show the effect of each measure. Panel C tabulates the results for the Top 5 KPIs for each industry based on the number of available analyst forecasts.[50] The results show that 6 out of the total 19 measures have a negative and significant association with change in CDS spread and only one measure has a positive and significant coefficient.[51] The results indicate that the relevance of KPIs is not concentrated in a single KPI measure.

[50] Due to the limited sample size for each KPI measure, I do not include fixed effects in the regressions. For KPIs with a sufficient number of observations, such as SSS, DFF, OPD, TPD, and RES, the inferences are robust to the inclusion of firm, year, and clause fixed effects.

[51] 12 out of the 19 measures have a negative association with the change in CDS spread. The six measures that have a negative and significant effect are: PRK, DFF, OPD, TPD, SSS, RES, and NSA (please see the Appendix).

4.4 Cross-Sectional Analyses

In this section, I examine the cross-sectional variations in the relevance of KPIs. First, I study whether the impact of KPIs is related to the demand for such information from investors. If the demand for KPI information is related to the importance of these metrics, then I expect the relevance of KPIs to be stronger when the demand is higher. Following Givoly et al. (2019), I use the number of KPI forecasts scaled by the number of earnings forecasts (*N_KPI/N_EPS*) to capture the demand for each KPI at the firm-quarter level. Using such a ratio measure allows me to measure analysts' incentives to issue KPI forecasts while controlling for the firm's general information environment.[52] In Panel A of Table 5, I define an indicator variable *High Demand* to be equal to one if the ratio *N_KPI/N_EPS* for the KPI measure is higher than the median value among all KPIs in the quarter. The results show that the coefficient of the interaction term *High Demand* with *KPI Surprise* is negatively and statistically significant, suggesting that the relevance of KPIs is higher when the information demand from investors is stronger. The results are consistent with *Hypothesis H2.*

The next three tests are motivated by the nonlinear payoff functions for debt holders in the CDS market, which may also lead to nonlinear relation between *KPI Surprise* and Δ*CDS Spread.* When the firm is relatively distant from financial distress, KPIs could be less relevant for the firm's credit risk as the firm has a large enough cash holding to absorb the effects of potential negative KPIs shocks. In contrast, the relevance of KPIs could become stronger when the firm approaches financial distress and the ability of the firm to avoid future default would depend largely on operating performance. Accordingly, I expect the negative association between *KPI Surprise* and

[52] My inferences are not driven by this specific choice. The results are similar if I use the unscaled value of the number of KPI forecasts.

Δ*CDS Spread* to be stronger when the firm has a higher likelihood of financial distress. In Panel B of Table 5, I define *Distressed* as an indicator variable equal to one if the firm's Altman Z-Score is lower than the threshold of 1.8, zero otherwise. The results show that the coefficient of the interaction term between *Distressed* and *KPI Surprise* is negative and statistically significant at the 5% level or better, and the inferences remain after controlling for *Earnings Surprise and Sales Surprise.* The findings are supportive of *Hypothesis 3A*, indicating stronger relevance for *KPI Surprise* in the CDS market when the firm is closer to default.

I also study whether the impact of KPIs depends on the sign of the news content. As debtholders care more about the downside risk of firms, they may react more strongly when KPIs carry negative news than positive news. In Panel C of Table 5, I define an indicator *Neg* that equals one if the sign of KPI news is negative and I expect the interaction term between *Neg* and *KPI Surprise* to load negatively. The results show that the coefficient on the interaction term is negative and statistically significant using different specifications. The findings are consistent with *Hypothesis 3B*.

In Panel D of Table 5, I examine whether the relevance of KPIs depends on the *level* of the KPI measure. I define an indicator variable *Below Median* equal to 1 if the lagged value of the KPI is below the median value within the KPI-quarter group.[53] The results show that the interaction term between *Below Median* and *KPI Surprise* is loading negatively and significantly using different research specifications. Consistent with the nonlinear payoff functions of debt, the results suggest that the CDS market is more concerned about KPI news for firms with a lower level of the KPI measure. The findings are supportive of the prediction made in *Hypothesis 3C*.

53 Specifically, I calculate the median value for each KPI-quarter group.

Panel E of Table 5 tests whether the relevance of KPIs varies with the firm's earnings quality. If earnings provide a good signal about future cash flows and therefore be well informative about credit risk, then the relevance of KPIs could become weaker. Correspondingly, I expect the CDS market to react more strongly to *KPI Surprise* when the firm is associated with lower earnings quality. I use the Dechow and Dichev (2002) model as modified by Ball and Shivakumar (2006) to estimate earnings quality. This model captures how well current accruals are mapped into operating cash flows, which is well aligned with my hypothesis. Specifically, I estimate the following regression for each three-digit SEC industry with at least 30 observations:

$$Acc_{i,t} = \alpha_0 + \alpha_1 OCF_{i,t-1} + \alpha_2 OCF_{i,t} + \alpha_3 OCF_{i,t+1} + \alpha_4 DOCF_{i,t} + \alpha_5 DOCF_{i,t} * OCF_{i,t} + \epsilon_{i,t}, \quad (3)$$

where $Acc_{i,t}$ is total accruals defined as net income minus operating cash flows, scaled by lag total assets; $OCF_{i,t}$ is operating cash flows and $DOCF_{i,t}$ is an indicator variable that equals to one if $OCF_{i,t}$ is negative. I calculate earnings quality (EQ) as the absolute discretionary accruals estimated from the regression model above and define an indicator variable *Low EQ* equal to one if EQ is lower than the median value within the industry-year group. The results in Panel C show that the coefficient of the interaction term between *Low EQ* and *KPI Surprise* is negative and statistically significant at the 5% level or better, suggesting that the relevance of KPIs is stronger for firms with relatively lower earnings quality. The findings are consistent with *Hypothesis 4*.[54]

54 For the four cross-sectional analyses tabulated in Table 5, I use a similar research design to that in Table 4 to enhance the comparability of results. No inferences are affected if I do not include firm fixed effects in Table 5.

4.5 Additional Analyses

4.5.1 Firm-Quarter Level Analyses

The analyses in Tables 4 and 5 are based the full sample of all KPIs and the sample is at the KPI-firm-quarter level. A potential limitation of this research design is that a firm with more available KPIs could have more observations in the regressions and get a higher weight. To mitigate this limitation, I conduct additional analyses at the Firm-Quarter level. I create a new variable *Top 5 KPI Surprise,* which aggregates the information from the five most important KPIs in the industry, if any.[55] Following Givoly et al. (2019), I select the KPIs that are most followed by sell-side analysts, captured by the total number of analyst forecasts for each KPI.[56] *Top 5 KPI Surprise* is calculated as the average value of *KPI Surprise* of the selected measures. The results of the Firm-Quarter level analyses are reported in Table 6. The number of observations decreases to 4,509 after the aggregation process and the dependent variable is the percentage change in CDS spread over the three-day window. In addition to the variable of interest *Top 5 KPI Surprise,* I include the same set of controls and fixed effects in the regressions as in Tables 4 and 5. The coefficient of *Top 5 KPI Surprise* is -1.899 in column (1) and it is statistically significant at the 1% level. The result suggests that the CDS market reacts negatively and significantly to the news conveyed by the most important KPIs. The coefficient remains negative and significant after I

[55] The inferences remain if I use the Top 3 most important KPIs or all available KPIs.
[56] The KPIs selected for each industry are: RPM, PRK, CPA, ASM, and PLF for the Airline industry; DFF, OPO, TPD, GPD, and EBX for the Oil and Gas industry; NOS, FLS, SSS, NAS, and RES for the Retail industry; SUB, CRN, ARP, and NSA for the telecommunication industry.

further control for *Earnings Surprise* and *Sales Surprise* in columns (2) and (3), indicating incremental relevance of KPIs relative to earnings and sales numbers.

In terms of economic significance, the coefficient of 1.048 in column (3) is equivalent to a 2.47 basis points decrease in CDS spread when *Top 5 KPI Surprise* increasing from 0 to 1. The magnitude of this effect is 31.53% (=1.048/3.324) as large as that of *Earnings Surprise,* suggesting that the relevance of KPIs is economically meaningful.

4.5.2 Quarterly Change in CDS Spread

The analyses in the previous sections are based on the reaction of the CDS market over the three-day window around the announcement day of KPIs. The underlying assumption of this research design is that the information of KPIs only becomes available during this short window and the CDS market reacts to the new information in an efficient way. To address the potential limitation that the KPI news might be available to the public before the announcement day or the CDS market does not fully incorporate the informational content of KPIs during the short window, I conduct additional analyses using a relatively longer window. Specifically, I examine the association between the changes in CDS spread over the quarter and the changes in KPIs.

The results are reported in Table 7. The dependent variable is Δ*CDS Spread Quarterly*, which is the percentage change in CDS spread over the window from the day after the previous quarter's announcement day to the day after the current quarter's announcement. The independent variable of interest is *KPI Increase,* which is an indicator variable equal to 1 if the value of the KPI increases relative to the previous quarter. Focusing on whether the KPI is increasing or not, rather than the magnitude of the change, allows me to examine the relevance of KPIs with different basis in a

single coherent framework. I only include *KPI Increase* in column (1) and gradually add more control variables and fixed effects in columns (2) to (4). The results show that *KPI Increase* is loading negatively and the coefficient is statistically significant at the 5% level or better. The magnitude of the coefficient 1.259% in column (4) suggests that an increase in the KPI is associated with 3.35 basis points decrease in CDS spread, based on sample mean value of CDS spread of 266 basis points. Overall, the results using a longer time window are consistent with previous findings based on an event study approach focusing on the three-day window.

4.5.3 Robustness Analyses

I employ the sample of 5-year CDS contracts for my main analyses, since they are the most liquid contracts in the U.S. markets and have the best data coverage by Markit (Shivakumar et al. 2011). To examine whether my findings are robust to using other types of CDS contracts, I provide additional analyses and the results are presented in Table 8. I use the percentage change in the spread of 1-year CDS contracts as the dependent variable in column (1) and use 3-year contracts in column (2). In column (3), I use 5-year CDS contracts but only retain contracts with modified restructuring clauses to further enhance the homogeneity of sample observations. The results in the three columns are similar to those in previous sections, with *KPI Surprise* loading negatively and significantly.

Furthermore, I also consider whether the relevance of KPIs is affected by management earnings forecasts that might be issued within the same time window. Shivakumar et al. (2011) show that the CDS market reacts significantly to the information content of management guidance. If management forecasts incorporate the news of KPIs, then the relevance of KPIs might be simply reflecting the impact of management guidance. To test this possibility, I obtain management

earnings forecasts data from I/B/E/S and find that 3,094 observations in my sample have management forecasts that are issued in the three-day announcement window of KPIs. In Column 4 of Table 8, I *exclude* these observations from my sample and re-run my main analysis. The results show that the coefficient on *KPI Surprise* continues to load negatively and is statistically significant. The findings suggest that the relevance of KPIs is not reflecting the impact of management earnings forecasts.

5. Conclusion

This study examines whether KPIs convey relevant information to the debt markets. I use the reactions of the CDS market to the announcement of KPIs as the research setting. My results show that the CDS market reacts significantly to news embedded in KPIs and that the effects remain after controlling for the informational content of accounting earnings and sales. I further show that the impact of KPIs is stronger when the information demand from investors is higher. Motivated by the nonlinear payoff functions of debtholders, I predict and find that the relevance of KPIs is stronger for firms that are close to financial distress and for firms with KPIs lower than the industry-median level. Further analyses show that the impact of KPIs is higher for firms with lower earnings quality, suggesting that KPIs provide supplementary informative relative to accounting earnings. Additional analyses show that my findings are robust to using a relatively longer window, focusing on quarterly change in CDS spreads.

My findings contribute to the literature examining the determinants of firms' credit risk and factors that drive the pricing of CDS contracts. While prior accounting studies largely focus on the impact of financial accounting items, there is limited research on the role of other performance metrics. This study contributes by showing the relevance of KPIs to the CDS market. To the best

of my knowledge, this research provides the first evidence on the role of non-financial performance measures in the debt market.

This paper also adds to research on the disclosures of alternative performance measures. Despite the interests from regulators regarding KPI disclosure practices, which might affect the usefulness of the metrics for investors, there is limited research on the impact of KPIs in the capital markets. My findings add to this strand of literature by documenting the importance of KPIs in debt markets, while the extant research exclusively focuses on the equity market.

References of Chapter 2

Acharya, V. V, and Johnson, T. C. 2007. Insider trading in credit derivatives. *Journal of Financial Economics*, 84(1), 110–141.

AcSB. 2019. Reporting Performance Measures. Available at: https://www.frascanada.ca/en/acsb/news-listings/framework-for-performance-measures

Amir, E., and B. Lev. 1996. Value-Relevance of Nonfinancial Information: The Wireless Communications Industry. *Journal of Accounting and Economics,* 22 (1): 3–30.

Ball, R. and Shivakumar, L. 2006. The Role of Accruals in Asymmetrically Timely Gain and Loss Recognition. *Journal of Accounting Research*, 44: 207-242.

Barth, M., Cram, D., and Nelson, K. 2001. Accruals and the Prediction of Future Cash Flows. *The Accounting Review,* 76(1), 27-58.

Behn, B. 1996. Value Implications of Unfilled Order Backlogs. *Advances in Accounting,* 14: 61-84.

Behn, B, and R. A. Riley. 1999. Using Nonfinancial Information to Predict Financial Performance: The Case of the U.S. Airline Industry. *Journal of Accounting, Auditing and Finance,* 14 (1): 29–56.

BIS. 2020. OTC derivatives statistics at end-June 2020. Available at https://www.bis.org/publ/otc_hy2011.htm

Blanco, R., Brennan, S., and Marsh, I.W. 2005. An Empirical Analysis of the Dynamic Relation between Investment-Grade Bonds and Credit Default Swaps. *The Journal of Finance*, 60: 2255-2281.

Bonsall, S. B., and B. P. Miller. 2017. The impact of narrative disclosure readability on bond ratings and the cost of debt. *Review of Accounting Studies,* 22 (2): 608–643.

Callen, J. L., Livnat, J., and Segal, D. 2009. The impact of earnings on the pricing of credit default swaps. *The Accounting Review* 84 (5): 1363–1394.

Chandra, U., Procassini, A., and Waymire, G. 1999. The Use of Trade Association Disclosures by Investors and Analysts: Evidence from the Semiconductor Industry. *Contemporary Accounting Research,* 16: 643-670.

Chang, H., Chen, J., Hsu, S., and Mashruwala, R. 2018. The Impact of the Bullwhip Effect on Sales and Earnings Prediction Using Order Backlog. *Contemporary Accounting Research*, 35: 1140-1165.

Chen, L., Lesmond, D.A., and Wei, J. 2007. Corporate Yield Spreads and Bond Liquidity. *The Journal of Finance*, 62: 119-149.

Chiu, T.-T., Y. Guan, and J.-B. Kim. 2017. The effect of risk factor disclosures on the pricing of credit default swaps. *Contemporary Accounting Research,* 35(4):2191-2224.

Collins, D.W., Maydew, E. L., and Weiss, I. S. 1997. Changes in the value-relevance of earnings and book values over the past forty years. *Journal of Accounting and Economics*, 24(1), 39–67.

Curtis, A., Lundholm, R., and Mcvay, S. 2013. Forecasting Sales: A Model and Some Evidence from the Retail Industry. *Contemporary Accounting Research,* 31 (2): 581–608.

Dechow, P., and Dichev, I. 2002. The quality of accruals and earnings: the role of accrual estimation errors. *The Accounting Review*, 77, 35-59.

Dechow, P. M., Kothari, S. P., and Watts, R. 1998. The relation between earnings and cash flows. *Journal of Accounting and Economics*, 25(2), 133–168.

DeFond, M. and M. Hung. 2003. An Empirical Analysis of Analysts' Cash Flow Forecasts. *Journal of Accounting and Economics*. 35, 73–100.

DeFond, M. L., and J. Zhang. 2014. The timeliness of the bond market reaction to bad earnings news. *Contemporary Accounting Research*, 31 (3): 911–936.

Demers, E., and B. Lev. 2001. A Rude Awakening: Internet Shakeout in 2000. *Review of Accounting Studies*, 6 (2): 331–59.

Duffie, D., and D. Lando. 2001. Term structures of credit spreads with incomplete accounting information. *Econometrica*, 69 (3): 633–664.

Driessen, J. 2005. Is Default Event Risk Priced in Corporate Bonds? *The Review of Financial Studies*, 18(1), 165–195.

Easton, P.D., Monahan, S.J., and Vasvari, F.P. 2009. Initial Evidence on the Role of Accounting Earnings in the Bond Market. *Journal of Accounting Research*, 47: 721-766.

Elton, E.J., Gruber, M.J., Agrawal, D., and Mann, C. 2001. Explaining the Rate Spread on Corporate Bonds. *The Journal of Finance*, 56: 247-277.

Ertimur, Y., W. Mayew, and S. Stubben. 2011. Analyst Reputation and the Issuance of Disaggregated Earnings Forecasts to I/B/E/S. *Review of Accounting Studies* 16: 29–58.

European Union (EU) Accounting and Modernisation Directive. 2003. Directive 2003/51/EC of the European Parliament and of the Council.

Francis, J., and Schipper, K. 1999. Have Financial Statements Lost Their Relevance? *Journal of Accounting Research*, 37(2), 319-352.

Givoly, D., C. Hayn, and S. Katz. 2017. The changing relevance of accounting information to debt holders over time. *Review of Accounting Studies,* 22 (1): 64–108.

Givoly, D., Li, Y., Lourie, B., and Nekrasov, A. 2019. Key performance indicators as supplements to earnings: Incremental informativeness, demand factors, measurement issues, and properties of their forecasts. *Review of Accounting Studies* 24: 1147-1183.

Hufford, A. 2016. Fitch Downgrades Gap to Junk Status. *Wall Street Journal.*

International Accounting Standards Board (IASB). 2010. IFRS Practice Statement 1 Management Commentary: A framework for presentation.

Ittner, C., and Larcker, D. 1998. Are Nonfinancial Measures Leading Indicators of Financial Performance? An Analysis of Customer Satisfaction. *Journal of Accounting Research,* 36: 1–35.

Koch, A.S. 2002. Financial Distress and the Credibility of Management Earnings Forecasts. *Working Paper, University of Virginia.*

Lev, B., and Thiagarajan, S. R. 1993. Fundamental Information Analysis. *Journal of Accounting Research*, 31(2), 190–215.

Lev, B., and Zarowin, P. 1999. The Boundaries of Financial Reporting and How to Extend Them. *Journal of Accounting Research*, 37(2), 353-385.

Liu, C., Livnat, J., and Ryan, S.G. 1996. Forward-looking Financial Information: The Order Backlog as a Predictor of Future Sales. *The Journal of Financial Statement Analysis* (Fall), 89-99.

Livne, G., Simpson, A., and Talmor, E. 2011. Do Customer Acquisition Cost, Retention and Usage Matter to Firm Performance and Valuation? *Journal of Business Finance and Accounting*, 38: 334-363.

Longstaff, F.A., Mithal, S., and Neis, E. 2005. Corporate Yield Spreads: Default Risk or Liquidity? New Evidence from the Credit Default Swap Market. *The Journal of Finance*, 60: 2213-2253.

Norden, L., and Weber, M. 2004. Informational efficiency of credit default swap and stock markets: The impact of credit rating announcements. *Journal of Banking and Finance*, 28(11), 2813–2843.

Packer, F., and Zhu, H. 2005. Contractual terms and CDS pricing. *BIS Quarterly Review, Bank for International Settlements, March.*

Rajgopal, S., Shevlin, T., and Venkatachalam, M. 2003. Does the Stock Market Fully Appreciate the Implications of Leading Indicators for Future Earnings? Evidence from Order Backlog. *Review of Accounting Studies,* 8 (4): 461–92.

Rajgopal, S., Venkatachalam, M., and Kotha, S. 2003. The Value Relevance of Network Advantages: The Case of E–Commerce Firms. *Journal of Accounting Research,* 41 (1): 135–62.

Rogers, J. L., and Stocken, P. C. 2005. Credibility of Management Forecasts. *The Accounting Review*, 80(4), 1233–1260.

Securities and Exchange Commission (SEC). 2003. Interpretation: Commission Guidance Regarding Management's Discussion and Analysis of Financial Condition and Results of Operations.

Securities and Exchange Commission (SEC). 2008. Final report of the advisory committee on improvements to financial reporting to the United States Securities and Exchange Commission.

Securities and Exchange Commission (SEC). 2016. Concept Release: Business and Financial Disclosure Required by Regulation S-K.

Securities and Exchange Commission (SEC). 2020. Interpretive Release: Commission Guidance on Management's Discussion and Analysis of Financial Condition.

Simpson, A. 2010. Analysts' Use of Nonfinancial Information Disclosures. *Contemporary Accounting Research,* 27 (1): 249–88.

Shivakumar, L., Urcan, O., Vasvari, F.P., and Zhang, L. 2011. The debt market relevance of management earnings forecasts: evidence from before and during the credit crisis. *Review of Accounting Studies* 16 (3): 464–486.

Trueman, B., Wong, F., and Zhang, X. 2000. The Eyeballs Have It: Searching for the Value in Internet Stocks. *Journal of Accounting Research*, 38, 137-162.

Trueman, B, Wong, F., and Zhang, X.J. 2001. Back to Basics: Forecasting the Revenues of Internet Firms. *Review of Accounting Studies,* 6 (2): 305–29.

Wang, K. 2021. Is the tone of risk disclosures in MD&As relevant to debt markets? Evidence from the pricing of credit default swaps. *Contemporary Accounting Research*, forthcoming.

Zhang, B. Y., Zhou, H., and Zhu, H. 2009. Explaining credit default swap spreads with the equity volatility and jump risks of individual firms. *Review of Financial Studies* 22 (12): 5099–5131.

Appendix of Chapter 2: Variable Definitions

Δ*CDS Spread*	The percentage change in CDS spread in the three-day window around the announcement date of Key Performance Indicators (KPIs). It is calculated as the CDS spread on the day after the announcement date divide by the CDS spread on the day prior to the announcement date minus 1. It is multiplied by 100 to ease interpretations.
KPI Surprise	The difference between the actual value of the KPI and the consensus forecast of the KPI provided by sell-side analysts, scaled by the absolute value of the consensus forecast. Analyst consensus forecast is calculated as the median value of the most recent forecast of each individual analyst within the 90-day window prior to the announcement date. For each fiscal quarter-KPI group, the surprise is ranked into quintiles and assigned a rank of 0, 0.25, 0.5, 0.75, and 1 for each quintile, respectively. If the KPI is related to costs, expense, or reductions, the surprise is multiplied by -1 before sorting into quintiles.
Earnings Surprise	The difference between the actual value of earnings and the consensus forecast of earnings provided by sell-side analysts, scaled by the absolute value of the consensus forecast. Analyst consensus forecast is calculated as the median value of the most recent forecast of each individual analyst within the 90-day window prior to the announcement date. For each fiscal quarter, the surprise is ranked into quintiles and assigned a rank of 0, 0.25, 0.5, 0.75, and 1 for each quintile, respectively.
Sales Surprise	The difference between the actual value of total sales and the consensus forecast of sales provided by sell-side analysts, scaled by the absolute value of the consensus forecast. Analyst consensus forecast is calculated as the median value of the most recent forecast of each individual analyst within the 90-day window prior to the announcement date. For each fiscal quarter, the surprise is ranked into quintiles and assigned a rank of 0, 0.25, 0.5, 0.75, and 1 for each quintile, respectively.
Size	The natural logarithm of total assets.
MTB	The market-to-book ratio at the end of the fiscal quarter.
Leverage	Book value of total debt divided by total assets.
Stock Return	Cumulative market adjusted stock returns over the three-day window around the announcement date of the KPI, multiplied by 100.
Return Volatility	Standard deviation of daily stock returns over the fiscal quarter.
TED	The difference between 90-day LIBOR and 90-Day Treasury Bill yields at the end of the fiscal quarter.
VIX	The value of the S&P 500 implied volatility index at the end of the fiscal quarter.

SP500	Monthly return of the S&P 500 index at the end of the fiscal quarter.
Distressed	An indicator variable equals one if ZSCORE is smaller than 1.8. ZSCORE is computed as ZSCORE= $1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 0.99X_5$, where X_1 is current assets minus current liabilities scaled by total assets; X_2 is retained earnings scaled by total assets; X_3 is earnings before interest and taxes scaled by total assets; X_4 is market value of equity scaled by total debt; X_5 is sales scaled by total assets.
Below Median	An indicator variable equals one if the lag level of the KPI is smaller than the median value calculated in the previous quarter.
LOW EQ	An indicator variable equals one if EQ is lower than the median value within the industry-year group. EQ is calculated as the absolute discretionary accruals estimated from the Dechow and Dichev (2002) model as modified by Ball and Shivakumar (2006). Specifically, I estimate the following regression for each three-digit SEC industry with at least 30 observations: $Acc_{i,t} = \alpha_0 + \alpha_1 OCF_{i,t-1} + \alpha_2 OCF_{i,t} + \alpha_3 OCF_{i,t+1} + \alpha_4 DOCF_{i,t} + \alpha_5 DOCF_{i,t} * OCF_{i,t} + \epsilon_{i,t}$, where $Acc_{i,t}$ is total accruals defined as net income minus operating cash flows, scaled by lag total assets; $OCF_{i,t}$ is operating cash flows and $DOCF_{i,t}$ is an indicator variable that equals to one if $OCF_{i,t}$ is negative.
Δ*CDS Spread Quarterly*	The percentage change in CDS spread over the window from the day after previous quarter's announcement date to the day after the current quarter's announcement.

Tables of Chapter 2

Table 1 Sample Distribution

This table presents the distribution of the sample employed. Panel A presents the distribution of the sample by industry and year. Panel B shows the distribution of Key Performance Indicators (KPIs) by industry and by each specific measure. The sample of KPIs is obtained from I/B/E/S and the sample period is from 2011 to 2019.

Panel A: Sample Distribution by Industry and Year

Year	Industry				
	Airline	Oil & Gas	Retail	Telecommunication	Total
2012	0	11	0	0	11
2013	44	496	78	0	618
2014	141	1,194	656	0	1,991
2015	142	1,579	729	0	2,450
2016	112	1,681	519	64	2,376
2017	126	1,942	633	135	2,836
2018	94	1,765	622	80	2,561
2019	104	1,636	571	67	2,378
Total	763	10,304	3,808	346	15,221

Panel B: Distribution of Industry-Specific Key Performance Indicators (KPIs)

Measure	Description	Observations	Percentage
Airlines			
ASM	Available Seat Miles	128	0.84%
CPA	Cost per Seat Miles	129	0.85%
PLF	Passenger Load Factor	127	0.83%
PRK	Revenue per Available Seat Miles	131	0.86%
RPM	Revenue Passengers Miles	137	0.90%
RPP	Revenue per RPM	111	0.73%
Retail			0.00%
FLF	Franchise & Licensing Fee	93	0.61%
FLS	Floor Space	536	3.52%
NAS	Net Sales per Average Square Foot	333	2.19%
NOO	Number of Stores Opened	141	0.93%
NOS	Number of Stores	982	6.45%
NSC	Number of Stores Closed/Relocated	61	0.40%
RES	Retail Sales	431	2.83%

SSS	Same Store Sales Growth	1,231	8.09%
Oil & Gas			0.00%
CNC	Chemicals Income	96	0.63%
DFF	Distributable Cash Flow Aggregate	1,042	6.85%
DWI	Downstream Income	91	0.60%
EBX	EBITDAX	726	4.77%
EXP	Exploration Expense	643	4.22%
GPD	Gas Production Per Day	760	4.99%
LOE	Lease Operating Expense	324	2.13%
MCX	Maintenance CapEx	469	3.08%
NPP	Natural Gas Liquids Production Per Day	631	4.15%
OPD	Oil Production Per Day	773	5.08%
PEX	Production Expense	263	1.73%
PTX	Production Tax	386	2.54%
RPG	Realized Price Gas	595	3.91%
RPO	Realized Price Oil	603	3.96%
RZP	Realized Price	256	1.68%
TPC	Total Production	330	2.17%
TPD	Total Production Per Day	787	5.17%
TPG	Total Production Gas	299	1.96%
TPI	Throughput Info	57	0.37%
TPN	Total Production NGL	248	1.63%
TPO	Total Production Oil	279	1.83%
TPP	Total Production Per Day	553	3.63%
UPI	Upstream Income	93	0.61%
Telecom			0.00%
ARP	Average Revenue per Unit	80	0.53%
CRN	CHURN (%)	103	0.68%
NSA	Net Subscriber Additions	89	0.58%
SUB	Subscribers	74	0.49%
Total		15221	100%

Table 2 Descriptive Statistics

This table presents the descriptive statistics for the sample employed. See Appendix for detailed definitions of each variable.

Variables	Observations	Mean	SD	P25	Median	P75
Δ*CDS Spread*	15221	0.58	6.38	-1.59	-0.00	1.81
Δ*CDS Spread Quarterly*	15099	4.18	28.82	-14.21	-0.57	15.37
KPI Surprise (Raw)	15221	0.17	1.09	-0.06	0.00	0.06
KPI Increase	15221	0.53	0.5	0.00	1.00	1.00
Earnings Surprise (Raw)	15221	0.20	1.43	-0.04	0.04	0.22
Sales Surprise (Raw)	15221	0.02	0.13	-0.02	0.00	0.04
Size	15221	10.01	1.09	9.22	9.96	10.63
MTB	15221	0.76	12.95	1.03	1.67	2.74
Leverage	15221	0.36	0.21	0.20	0.33	0.45
Stock Return	15221	-0.00	6.87	-3.67	0.01	3.48
Return Volatility	15221	2.17	1.21	1.32	1.90	2.60
TED	15221	-0.30	0.11	-0.39	-0.27	-0.21
VIX	15221	15.17	3.81	12.37	14.04	16.31
SP500	15221	0.01	0.03	-0.00	0.01	0.02

Table 3 Correlation Table

This table presents the correlations among variables, with the Pearson and Spearman correlations below and above the diagonal, respectively. See Appendix for detailed definitions of each variable. *, **, and *** represent significance levels of 0.10, 0.05, and 0.01, respectively.

	Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1)	Δ*CDS Spread*		0.206***	-0.016*	-0.034***	-0.116***	-0.107***	-0.024***	-0.042***
(2)	Δ*CDS Spread Quarterly*	0.288***		-0.025***	0.001	-0.051***	-0.036***	-0.002	-0.045***
(3)	*KPI Increase*	-0.026***	-0.033***		0.181***	0.034***	0.045***	0.013*	0.066***
(4)	*KPI Surprise*	-0.049***	-0.008	0.179***		0.069***	0.112***	-0.018**	0.034***
(5)	*Earnings Surprise*	-0.163***	-0.080***	0.033***	0.068***		0.240***	-0.130***	-0.015*
(6)	*Sales Surprise*	-0.093***	-0.048***	0.045***	0.112***	0.238***		0.037***	0.104***
(7)	*Size*	-0.031***	0.024***	0.012	-0.047***	-0.126***	0.015*		0.131***
(8)	*M/B*	0.017**	0.050***	0.011	0.009	0.012	0.047***	0.048***	
(9)	*Leverage*	0.039***	-0.031***	-0.009	0.034***	0.015*	-0.068***	-0.398***	-0.262***
(10)	*Stock Return*	-0.447***	-0.110***	0.014*	0.000	0.000	0.000	0.000	0.000
(11)	*Return Volatility*	0.082***	0.117***	-0.083***	0.003	-0.000	-0.097***	-0.368***	-0.085***
(12)	*TED*	0.034***	0.075***	0.030***	-0.014*	-0.001	-0.008	0.035***	-0.007
(13)	*VIX*	-0.052***	0.271***	-0.028***	-0.006	0.006	0.007	0.025***	0.008
(14)	*SP500*	0.085***	-0.158***	0.025***	0.006	-0.005	-0.008	-0.021***	-0.018**

	Variables	(9)	(10)	(11)	(12)	(13)	(14)
(1)	Δ*CDS Spread*	0.050***	-0.358***	0.049***	0.004	-0.059***	0.058***
(2)	Δ*CDS Spread Quarterly*	-0.010	-0.058***	0.074***	0.092***	0.275***	-0.250***
(3)	*KPI Increase*	-0.002	0.001	-0.065***	0.024***	-0.031***	0.025***
(4)	*KPI Surprise*	0.048***	-0.017**	0.024***	-0.014*	-0.014*	0.006
(5)	*Earnings Surprise*	0.012	-0.052***	0.050***	-0.003	0.003	-0.005
(6)	*Sales Surprise*	-0.079***	-0.031***	-0.056***	-0.009	0.003	-0.011
(7)	*Size*	-0.347***	0.008	-0.383***	0.043***	0.047***	-0.035***
(8)	*M/B*	-0.160***	0.027***	-0.367***	-0.030***	-0.028***	0.002
(9)	*Leverage*		-0.014*	0.213***	-0.099***	-0.090***	0.063***
(10)	*Stock Return*	0.000		-0.022***	0.002	0.034***	0.008
(11)	*Return Volatility*	0.258***	0.000		-0.224***	0.182***	-0.062***
(12)	*TED*	-0.092***	0.000	-0.201***		-0.090***	0.270***
(13)	*VIX*	-0.076***	0.000	0.170***	-0.081***		-0.546***
(14)	*SP500*	0.058***	0.000	-0.007	0.135***	-0.644***	

Table 4 The Reaction of the CDS Market to Announcements of Key Performance Indicators

This table reports the results of the regressions examining the reaction of the CDS market to the announcement of Key Performance Indicators (KPIs). The dependent variable is the changes in CDS spread over the three-day window around the announcement of KPIs. Panel A presents the results using the full sample. Panel B reports the results for each industry. Panel C reports the results at each measure level. The reported t-statistics are based on standard errors cluster by four-digit SIC industry. See Appendix for detailed definitions of each variable. *, **, and *** represent significance levels of 0.10, 0.05, and 0.01, respectively.

Panel A: All Industries

	(1)	(2)	(3)	(4)	(5)
VARIABLES			All Industries		
KPI Surprise	-0.888***	-0.904***	-0.912***	-0.763***	-0.707***
	(-3.65)	(-5.49)	(-5.62)	(-5.51)	(-4.88)
Earnings Surprise				-2.938***	-2.767***
				(-4.16)	(-4.48)
Sales Surprise					-0.748
					(-1.17)
Size		0.068	-0.781	-1.017**	-1.037**
		(1.06)	(-1.61)	(-2.10)	(-2.04)
MTB		0.017	0.012	0.013	0.014
		(1.18)	(0.67)	(0.72)	(0.79)
Leverage		0.870	-4.435	-4.492	-4.486
		(1.05)	(-1.08)	(-1.19)	(-1.13)
Stock Return		-0.415***	-0.414***	-0.410***	-0.410***
		(-6.02)	(-5.82)	(-6.25)	(-6.83)
Return Volatility		0.499***	0.237	0.140	0.132
		(2.94)	(1.36)	(0.84)	(0.86)
TED		2.641**	-0.232	-0.041	-0.036
		(2.55)	(-0.06)	(-0.01)	(-0.01)
VIX		-0.034	-0.092**	-0.080**	-0.079**
		(-0.86)	(-2.23)	(-2.18)	(-2.09)
SP500		12.838***	6.935	7.176	7.183
		(3.14)	(1.22)	(1.32)	(1.19)
Constant	0.929**	0.078	11.099*	14.836**	15.282**
	(2.76)	(0.09)	(1.96)	(2.60)	(2.64)
Observations	15,221	15,221	15,221	15,221	15,221
Year FE	No	No	Yes	Yes	Yes
Firm FE	No	No	Yes	Yes	Yes
Clause FE	No	No	Yes	Yes	Yes
Adj. R-squared	0.00232	0.219	0.272	0.294	0.296

Panel B: Regression Results by Industry

VARIABLES	(1) Airline	(2) Oil & Gas	(3) Retail	(4) Telecommunication
KPI Surprise	-0.701*	-0.575***	-0.803***	0.207
	(-1.80)	(-3.79)	(-3.06)	(0.13)
Earnings Surprise	-0.496	-1.776***	-4.712***	-0.903
	(-1.26)	(-12.35)	(-12.75)	(-0.63)
Sales Surprise	0.976*	-0.017	-3.100***	-6.713***
	(1.95)	(-0.11)	(-10.10)	(-3.00)
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Clause FE	Yes	Yes	Yes	Yes
Observations	763	10,304	3,808	346
Adj. R-squared	0.387	0.256	0.377	0.0426

Panel C: Regressions at the Measure Level

VARIABLES	KPI Surprise	t-stat	Observations	Adj. R-squared
RPM	0.225	(0.19)	137	-0.007
PRK	-4.465***	(-3.70)	131	0.089
CPA	-0.975	(-0.78)	129	-0.003
ASM	1.300	(1.10)	128	0.002
PLF	-0.132	(-0.11)	127	-0.008
DFF	-0.602*	(-1.75)	1,042	0.002
OPD	-2.009***	(-3.29)	773	0.013
TPD	-1.653***	(-2.85)	787	0.009
GPD	-0.089	(-0.14)	760	-0.001
EBX	0.499	(0.85)	726	0.000
NOS	-0.436	(-0.59)	982	-0.001
FLS	0.933	(0.90)	536	0.000
SSS	-5.834***	(-8.90)	1,231	0.060
NAS	0.372	(0.40)	333	-0.003
RES	-2.563**	(-2.01)	431	0.007
SUB	-2.213	(-0.58)	74	-0.009
CRN	-1.955	(-0.87)	103	-0.002
ARP	5.719**	(2.42)	80	0.058
NSA	-4.972**	(-2.01)	89	0.033

Table 5 The Reaction of the CDS market to announcements of Key Performance Indicators (KPIs): Cross Sectional Analyses

This table reports the results of cross-sectional analyses regarding the reaction of the CDS market to the announcement of Key Performance Indicators (KPIs). The dependent variable is the changes in CDS spread over the three-day window around the announcement of KPIs. Panel A studies the effects of the demand for KPI information on its relevance. Panel B examines the variations between financial distressed firms and non-distressed firms. Panel D examines the effects when the lag level of the KPI is below median. Panel E studies the differences between firms with lower earnings quality and those with higher earnings quality. The reported t-statistics are based on standard errors cluster by four-digit SIC industry. See Appendix for detailed definitions of each variable. *, **, and *** represent significance levels of 0.10, 0.05, and 0.01, respectively.

Panel A: The Demand for KPI Information

	(1)	(2)	(3)
VARIABLES	Information Demand		
High Demand × KPI Surprise	-0.561**	-0.608*	-0.600*
	(-2.15)	(-1.89)	(-1.80)
KPI Surprise	-0.771***	-0.603**	-0.544**
	(-3.02)	(-2.29)	(-2.20)
Earnings Surprise		-2.858***	-2.682***
		(-4.27)	(-4.24)
Sales Surprise			-0.827
			(-1.65)
High Demand	0.029	0.074	0.071
	(0.15)	(0.34)	(0.31)
Size	1.351	1.075	1.084
	(1.37)	(1.05)	(1.04)
MTB	0.015	0.016	0.017
	(0.77)	(0.76)	(0.83)
Leverage	-0.001	-0.340	-0.149
	(-0.00)	(-0.29)	(-0.12)
Stock Return	-0.471***	-0.469***	-0.469***
	(-8.80)	(-9.26)	(-9.19)
Return Volatility	0.594*	0.518	0.504
	(1.81)	(1.57)	(1.49)
TED	-2.586	-2.384	-2.420
	(-1.27)	(-1.17)	(-1.20)
VIX	-0.270***	-0.263***	-0.260***
	(-3.15)	(-3.01)	(-2.95)
SP500	-6.692	-6.754	-6.556
	(-0.77)	(-0.79)	(-0.77)
Constant	-10.127	-5.871	-5.784
	(-0.98)	(-0.54)	(-0.52)
Observations	15,221	15,221	15,221
Year FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Clause FE	Yes	Yes	Yes
Adj. R-squared	0.313	0.327	0.328

Panel B: Financial Distressed Firms

VARIABLES	(1)	(2)	(3)
	Financial Distressed Firms		
Distressed x KPI Surprise	-0.761**	-0.831***	-0.811***
	(-2.32)	(-2.74)	(-2.72)
KPI Surprise	-0.482***	-0.292**	-0.248**
	(-2.90)	(-2.44)	(-2.04)
Earnings Surprise		-2.942***	-2.773***
		(-4.33)	(-4.50)
Sales Surprise			-0.740
			(-1.15)
Distressed	0.082	0.149	0.151
	(0.11)	(0.21)	(0.22)
Size	-0.692	-0.939**	-0.962**
	(-1.49)	(-2.13)	(-2.21)
MTB	0.012	0.013	0.014
	(0.68)	(0.72)	(0.80)
Leverage	-4.141	-4.223	-4.228
	(-0.99)	(-1.11)	(-1.09)
Stock Return	-0.414***	-0.410***	-0.410***
	(-6.41)	(-6.93)	(-6.85)
Return Volatility	0.252	0.153	0.144
	(1.51)	(0.94)	(0.87)
TED	-0.300	-0.107	-0.101
	(-0.09)	(-0.03)	(-0.03)
VIX	-0.093**	-0.080**	-0.079**
	(-2.24)	(-2.10)	(-2.10)
SP500	6.801	7.036	7.047
	(1.15)	(1.16)	(1.16)
Constant	10.010*	13.837**	14.317***
	(1.86)	(2.69)	(2.83)
	-0.761**	-0.831***	-0.811***
Observations	15,221	15,221	15,221
Year FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Clause FE	Yes	Yes	Yes
Adj. R-squared	0.273	0.295	0.296

Panel C: Negative KPI News

VARIABLES	(1) All Industries	(2) All Industries	(3) All Industries
Neg x KPI Surprise	-1.512**	-1.275*	-1.246**
	(-2.08)	(-1.99)	(-2.05)
KPI Surprise	0.413	0.377	0.385
	(0.52)	(0.53)	(0.56)
Neg	1.178	1.015	0.971*
	(1.67)	(1.66)	(1.73)
Earnings Surprise		-2.934***	-2.764***
		(-4.34)	(-4.49)
Sales Surprise			-0.746
			(-1.17)
Size	-0.779	-1.015*	-1.035**
	(-1.49)	(-1.98)	(-2.03)
MTB	0.011	0.013	0.014
	(0.65)	(0.70)	(0.77)
Leverage	-4.437	-4.493	-4.487
	(-1.05)	(-1.15)	(-1.13)
Stock Return	-0.414***	-0.410***	-0.410***
	(-6.41)	(-6.91)	(-6.84)
Return Volatility	0.238	0.141	0.132
	(1.52)	(0.96)	(0.87)
TED	-0.227	-0.039	-0.033
	(-0.07)	(-0.01)	(-0.01)
VIX	-0.092**	-0.080**	-0.079**
	(-2.23)	(-2.10)	(-2.09)
SP500	6.927	7.167	7.176
	(1.18)	(1.19)	(1.19)
Constant	9.940	13.829**	14.320**
	(1.62)	(2.33)	(2.45)
Observations	15,221	15,221	15,221
Year FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Clause FE	Yes	Yes	Yes
Adj. R-squared	0.273	0.294	0.296

Panel D: Below Median Level

VARIABLES	(1)	(2) Below Median	(3)
Below Median x KPI Surprise	-0.644**	-0.731***	-0.758***
	(-2.31)	(-3.28)	(-3.37)
KPI Surprise	-0.806***	-0.648***	-0.585***
	(-5.05)	(-4.99)	(-4.39)
Earnings Surprise		-2.963***	-2.780***
		(-4.31)	(-4.45)
Sales Surprise			-0.809
			(-1.24)
Below Median	0.291	0.286	0.306*
	(1.40)	(1.61)	(1.74)
Size	-0.728	-0.959*	-0.972*
	(-1.37)	(-1.87)	(-1.91)
MTB	0.012	0.014	0.015
	(0.68)	(0.73)	(0.80)
Leverage	-4.420	-4.451	-4.419
	(-1.05)	(-1.15)	(-1.12)
Stock Return	-0.414***	-0.410***	-0.410***
	(-6.44)	(-6.94)	(-6.85)
Return Volatility	0.331*	0.242	0.239
	(1.73)	(1.36)	(1.32)
TED	-0.604	-0.390	-0.392
	(-0.15)	(-0.10)	(-0.10)
VIX	-0.092**	-0.081**	-0.080**
	(-2.29)	(-2.18)	(-2.18)
SP500	6.380	6.669	6.696
	(0.91)	(0.92)	(0.92)
Constant	10.184*	13.895**	14.270**
	(1.68)	(2.37)	(2.44)
Observations	15,221	15,221	15,221
Year FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Clause FE	Yes	Yes	Yes
Adj. R-squared	0.274	0.297	0.298

Panel E: The Effects of Earnings Quality

VARIABLES	(1)	(2)	(3)
	Low Earnings Quality		
Low EQ × KPI Surprise	-1.471***	-1.312***	-1.249**
	(-2.84)	(-2.77)	(-2.43)
KPI Surprise	-0.166	-0.097	-0.075
	(-1.17)	(-0.88)	(-0.76)
Earnings Surprise		-2.940***	-2.778***
		(-4.27)	(-4.43)
Sales Surprise			-0.711
			(-1.10)
Low EQ	-0.496	-0.702	-0.724
	(-0.85)	(-1.14)	(-1.20)
Size	-1.053*	-1.312**	-1.329**
	(-1.95)	(-2.44)	(-2.49)
MTB	0.012	0.013	0.014
	(0.70)	(0.74)	(0.81)
Leverage	-4.731	-4.824	-4.816
	(-1.11)	(-1.21)	(-1.19)
Stock Return	-0.413***	-0.409***	-0.409***
	(-6.36)	(-6.88)	(-6.81)
Return Volatility	0.204	0.103	0.095
	(1.17)	(0.62)	(0.55)
TED	0.372	0.628	0.628
	(0.11)	(0.19)	(0.19)
VIX	-0.089**	-0.076*	-0.075*
	(-2.18)	(-2.01)	(-1.99)
SP500	6.439	6.612	6.619
	(1.10)	(1.11)	(1.11)
Constant	14.378**	18.489***	18.895***
	(2.25)	(2.88)	(2.96)
Observations	15,221	15,221	15,221
Year FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Clause FE	Yes	Yes	Yes
Adj. R-squared	0.275	0.297	0.298

Table 6 The Reaction of the CDS market to announcements of Key Performance Indicators (KPIs): Top 5 KPIs

This table reports the results of additional analyses using the surprises of Top 5 KPI for each industry. The dependent variable is the changes in CDS spread over the three-day window around the announcement of KPIs. The reported t-statistics are based on standard errors cluster by four-digit SIC industry. See Appendix for detailed definitions of each variable. *, **, and *** represent significance levels of 0.10, 0.05, and 0.01, respectively.

	(1)	(2)	(3)
VARIABLES		Top 5 Measures	
Top 5 KPI Surprise	-1.899***	-1.414***	-1.048**
	(-3.47)	(-2.83)	(-2.23)
Earnings Surprise		-3.750***	-3.324***
		(-4.10)	(-3.73)
Sales Surprise			-2.182***
			(-3.70)
Size	-0.062	-0.145	-0.151
	(-0.09)	(-0.21)	(-0.22)
MTB	-0.004	-0.004	-0.002
	(-0.26)	(-0.29)	(-0.17)
Leverage	-0.438	-0.494	-0.030
	(-0.24)	(-0.27)	(-0.02)
Stock Return	-0.512***	-0.503***	-0.506***
	(-6.71)	(-7.23)	(-7.17)
Return Volatility	0.089	0.117	0.056
	(0.28)	(0.46)	(0.21)
TED	2.127	2.300	2.334
	(0.65)	(0.74)	(0.81)
VIX	-0.106	-0.081	-0.069
	(-1.54)	(-1.42)	(-1.23)
SP500	10.955	11.811	12.894
	(1.25)	(1.36)	(1.52)
Constant	4.080	6.075	6.492
	(0.52)	(0.83)	(0.88)
Observations	4,509	4,509	4,509
Year FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Clause FE	Yes	Yes	Yes
Adj. R-squared	0.336	0.368	0.377

Table 7 Alternative Research Design: Quarterly Change in CDS Spread

This table reports the results of additional analyses examining the quarterly changes in CDS spread. The dependent variable is the changes in CDS spread over the window from the day after previous quarter's announcement date to the day after the current quarter's announcement. The reported t-statistics are based on standard errors cluster by four-digit SIC industry. See Appendix for detailed definitions of each variable. *, **, and *** represent significance levels of 0.10, 0.05, and 0.01, respectively.

	(1)	(2)	(3)	(4)
VARIABLES	Quarterly Change			
KPI Increase	-1.916***	-1.202**	-1.319**	-1.259**
	(-4.42)	(-2.32)	(-2.13)	(-2.16)
ΔROA				-31.812
				(-0.96)
ROA				13.811
				(0.57)
Size		1.555***	1.514	1.504
		(3.24)	(0.55)	(0.53)
MTB		0.129	0.129	0.133
		(1.45)	(1.48)	(1.52)
Leverage		1.080	-20.773***	-19.653***
		(0.36)	(-4.16)	(-3.82)
Return Volatility		2.978***	2.796***	2.946***
		(9.98)	(4.67)	(4.07)
TED		32.954	-10.096	-10.658
		(1.43)	(-0.99)	(-1.07)
VIX		1.933***	1.436**	1.428**
		(2.90)	(2.38)	(2.37)
SP500		-7.060	25.682	28.872
		(-0.24)	(0.61)	(0.69)
Constant	5.197***	-36.967***	-34.043*	-34.823
	(3.89)	(-4.75)	(-1.72)	(-1.67)
Observations	15,099	15,099	15,099	15,099
Year FE	No	No	Yes	Yes
Firm FE	No	No	Yes	Yes
Clause FE	No	No	Yes	Yes
Adj. R-squared	0.00103	0.0982	0.180	0.181

Table 8 Robustness Analyses

This table reports the results of additional robustness analyses. The dependent variable is the changes in CDS spread over the three-day window around the announcement of the KPIs. The reported t-statistics are based on standard errors cluster by four-digit SIC industry. See Appendix for detailed definitions of each variable. *, **, and *** represent significance levels of 0.10, 0.05, and 0.01, respectively.

	(1)	(2)	(3)	(4)
VARIABLES	1 Year Contract	3 Year Contract	5 Year MR Contract	No Management Forecasts
KPI Surprise	-0.014**	-0.011***	-0.842***	-0.620***
	(-2.07)	(-4.37)	(-4.89)	(-3.77)
Earnings Surprise	-0.042***	-0.037***	-2.704***	-1.949***
	(-3.01)	(-3.74)	(-5.14)	(-5.52)
Sales Surprise	-0.016	-0.008	-0.546	-0.371
	(-0.92)	(-1.18)	(-0.87)	(-0.88)
Size	-0.010**	-0.023**	-1.230**	-1.803***
	(-2.44)	(-2.58)	(-2.11)	(-3.08)
MTB	0.000	0.000	0.019	0.061***
	(1.33)	(0.84)	(1.06)	(3.28)
Leverage	-0.027	-0.103	-4.494	-10.463***
	(-0.87)	(-1.42)	(-1.03)	(-2.90)
Stock Return	-0.008***	-0.006***	-0.410***	-0.324***
	(-7.08)	(-8.18)	(-7.89)	(-18.90)
Return Volatility	0.010	0.006**	0.228	0.419**
	(1.67)	(2.25)	(1.49)	(2.67)
TED	-0.011	-0.015	-0.503	-2.368
	(-0.31)	(-0.40)	(-0.15)	(-0.76)
VIX	-0.001	-0.002***	-0.079**	-0.104**
	(-1.50)	(-3.61)	(-2.11)	(-2.31)
SP500	0.112	-0.006	8.743*	3.982
	(0.80)	(-0.05)	(1.87)	(1.00)
Constant	0.150***	0.309***	16.813**	23.372***
	(3.26)	(2.93)	(2.62)	(3.52)
Observations	15,221	15,221	6,581	12,127
Year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Clause FE	Yes	Yes	NO	Yes
Adj. R-squared	0.173	0.255	0.290	0.263