CORPORATE FAMILIES AND CREDITOR RECOVERY RATES

A Dissertation in
Business Administration
by
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Submitted in Partial Fulfillment
of the Requirements
for the Degree of

Doctor of Philosophy

August 2016
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ABSTRACT

I examine whether the legal separation between a parent company and its subsidiaries within a corporate family affects creditors’ recovery rates in the event of the parent company default. A substantial body of academic and practitioner research explores the determinants and benefits of legal separation. However, there is limited empirical evidence on the potential risks associated with this organizational form. Using default events from Moody’s Default and Recovery Database, I show that legal separation in US corporate families reduces creditor recovery rates, an important risk factor in pricing financial contracts. In particular, lower recovery rates are more pronounced for US firms that are holding companies with significant overseas operations in countries with weak governance.

Keywords: Creditor recovery rates, Organizational form, Subsidiaries
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Acknowledgements

I thank my dissertation committee members for their guidance and support: Dan Givoly (Co-chair), Jeremiah Green, Karl Muller (Co-chair), Fenghua Song, and Hal White. I thank Kimball Chapman and Ian Tarrant for help with extracting Form 10-K Exhibit 21 data, Scott Dyreng and Andy Leone for providing notes on Exhibit 21 and PERL, respectively, through their websites, and professionals from financial and non-financial firms for helpful comments on the loan contracting process. The following also provided helpful comments: Badryah Alhusaini, Ed Babcock, Mark Bagnoli, Dane Christensen, Steve Huddart, Ed Jenkins, Henock Louis, Jed Neilson, Mark Nelson, Becky Perez, Adrienne Rhodes, Dan Russomanno, Florin Vasvari, Susan Watts, Chris Williams, and participants at the 2015 AAA/Deloitte/J. Michael Cook Doctoral Consortium, the 2015 PhD Project Accounting Doctoral Student Association conference, the 2015 AAA Diversity Section Meeting, the 2015 Washington University in St. Louis Annual Accounting Research Conference in Honor of Nick Dopuch, Duke University, University of Miami, Harvard Business School, University of California at Los Angeles, Northwestern University, George Washington University, University of Illinois at Chicago, University of Southern California, Purdue University, and Baruch College CUNY. I acknowledge financial support from the Smeal College of Business and the KPMG Foundation. All errors are my own.
1. INTRODUCTION

The modern corporate landscape is dominated by corporate families, which are firms consisting of a parent company and subsidiaries. The parent company and subsidiaries are separate legal entities within the firm. In this paper, I examine whether the legal separation between the parent and its subsidiaries affects creditors’ recovery rates upon default of the parent company. Creditor recovery rates refer to the portion of debt claims that creditors to the firm recover upon the firm’s default. I posit and find that the legal separation between the parent and its subsidiaries decreases creditor recovery rates.

I take the position that legal separation creates debtholder-shareholder conflicts that can result in lower creditor recoveries upon default of parent entities in corporate families. Debtholder-shareholder agency conflicts arise because debtholders and shareholders face different incentives and payoffs in corporate families. Shareholders are residual claimants to the assets of the firm and can increase the value of their holdings at the expense of the debtholders by taking on projects that potentially shift wealth from the debtholders. Shareholders can use legal separation to facilitate tax planning, which can yield significant tax savings to the firm and enhance shareholder value. Moreover, shareholders have the incentive to separate businesses into distinct legal entities in order to insulate different aspects of the business from the risks associated with liabilities in other entities.

However, legal separation can transfer wealth from debtholders and subject debtholders to losses upon default of the firm. Debtholders are fixed claimants to the assets of the firm, with asymmetric payoffs in that they do not share the benefits from any upside from legal separation but can lose their claims due to any risks from legal separation. Due to limited liability, legal separation implies that the debtholders are separated away from
the firms’ assets held in separate legal entities even if the firm employs borrowed funds to acquire the assets. Whittred [1987] and Fang et al. [2015] suggests that parent companies can transfer assets to separate entities not subject to initial debt agreements and at other than market prices. Yet, on default, parent company creditors do not automatically obtain recovery from the separate, independent subsidiaries (West and Smeltzer [2011]). In fact, firms can create subsidiaries in order to avoid their liability to debtholders. Accordingly, I posit that legal separation between the parent company and its subsidiaries decreases the parent company’s creditor recovery rates upon default.

It is not obvious that legal separation lowers recovery rates because creditors can write contracts that enhance recoveries. For instance, covenants in contracts can limit borrowers’ ability to transfer assets to other separate entities within the firm. Moreover, creditors can enter into contracts with the parent and the subsidiaries, and thereby have the ability to demand payment in accordance with terms of the loan arrangement from any one or combination of separate entities (Whittred [1987]; Kolasinski [2009]).

I test my proposition using a sample of US parent firms. Nearly all US firms have some form of legal separation. Accordingly, within the sample of parent firms, I identify a measure of the strength of the effect of legal separation on the recovery rates. My primary measure is the mode of operations of the parent company, specifically whether it is a holding company (in which the operational activities are entirely conducted on the subsidiaries level) or a firm directly involved in the operations. The second proxy is the number of separate legal entities (i.e., subsidiaries) within the firm.

My empirical tests relate creditor recovery rates to these proxies for legal separation. Following existing literature (Acharya, Bharath, and Srinivasan [2003];
Jankowitsch, Nagler, and Subrahmanyam [2014]), I measure creditor recovery rates using the price of debt instruments upon default of the firm. I obtain default events from Moody's Default and Recovery Database (DRD). Moody's definition of default is intended to capture events whereby issuers fail to meet debt service obligations outlined in their original debt agreements (e.g., missed payments, bankruptcy, or distressed exchanges).

My findings are consistent with the proposition that legal separation lowers creditor recovery rates upon default of the firm. I document that creditor recovery rates are negatively related to the proxies for legal separation. The baseline evidence suggests that a holding company is associated with 7.32 percent of par lower recoveries, which is approximately $20.43 million lower recoveries on an average debt obligation in the sample. A one standard deviation change in the number of subsidiaries decreases creditor recovery rates by 2.78 percent of par; equivalent to $7.75 million. These findings suggests that legal separation has both a statistical and economic significance on creditor recovery rates.¹

Next, I examine whether the presence of overseas entities exacerbate the bondholder-shareholder conflicts arising from legal separation. Instead of creating branch offices or units that they can closely monitor, shareholders may prefer to maintain separation between entities in order to avoid being held accountable for liabilities in overseas subsidiaries. Moreover, shareholders prefer to exclude assets held by foreign subsidiaries as collateral in debt contracts because US Internal Revenue Service regulation stipulates that using foreign assets as collateral constitutes distribution of dividends which would trigger tax obligations in the US.² Shareholders benefit in terms of limited liability

¹ To provide more evidence, I use minority interest as an alternative measure of legal separation, and find results that legal separation lowers creditor recoveries. Additionally, I show that legal separation affects other aspects of default. Specifically, legal separation increases the resolution duration.
² Section 956 of the Internal Revenue Code
or tax savings, but debtholders of the US parent company are disadvantaged as they are left without a direct claim to the value of assets held in subsidiaries and, due to other local restrictions, it can be difficult for debtholders to access assets held in foreign jurisdictions.

I find evidence consistent with lower creditor recovery rates for holding companies with overseas entities. Specifically, I fail to document evidence that holding parent companies have lower creditor recovery rates in domestic firms (i.e., no overseas subsidiaries), but I document significant negative relation between holding company and creditor recovery rates in multinational enterprises. A likely explanation is that holding companies with domestic subsidiaries only are easily manageable by creditors, as IRS regulation does not penalize firms for using subsidiary assets as collateral in debt contracts. These results are more pronounced for holding companies with subsidiaries incorporated in countries with weak rule of law, where the ability of creditors to access assets is limited. However, the number of subsidiaries for both domestic and multinational enterprises exhibit a negative relation to creditor recovery rates, and there is no difference between the effects of the number of subsidiaries in countries with strong and with weak rule of law. I interpret these findings as evidence that the number of entities within a corporate family creates problems regardless of the jurisdiction of the separate entities.3

Finally, I examine the implications of legal separation on pricing of debt. I find evidence suggesting that, at least in part, lower creditor recovery rates arising from legal separation are associated with higher debt pricing, as captured by bank loan interest spread.

These findings build on, and contribute to, a few streams of accounting research. A

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3 These findings suggest that the proxies, holding company and number of subsidiaries, capture different aspects of legal separation. Holding company closely resembles the presence of legal separation, while the number of subsidiaries reflects the extent of legal separation.
growing line of accounting research explores various aspects of organizational complexity, as captured by legal separation. Lewellen and Robinson [2013] and Dyreng et al. [2015] provide evidence on the determinants of the firm’s choice of its organizational structure. They document that ownership links between separate entities within a firm are driven by several factors, including tax planning, internal financing ties, and investment risks.\(^4\) However, they do not explore costs related to legal separation. In this vein, Black, Dikolli, and Dyreng [2014] provide evidence that an enterprise’s subsidiaries may represent high agency costs, which affect executive pay. Further, Beaver et al. [2015] find that incorporating subsidiaries’ financial information improves the parent companies’ bankruptcy prediction models, and likewise, incorporating the parents’ information improves the subsidiaries’ bankruptcy prediction models. I extend these studies by investigating how the organization of the firm as a group of parents and subsidiaries (creating legal separation between the group’s entities) affects creditor recovery rates.

The findings in my paper complement evidence in audit research. Several studies in the audit literature use legal separation, particularly the number of subsidiaries, as a measure of audit client complexity and find higher audit fees (i.e., higher costs) for firms with more subsidiaries (e.g., Palmrose [1984]; Craswell, Stokes, and Laughton [2002]; Hay, Knechel, and Wong [2006]; Weber, Willenborg, and Zhang [2008]). More recently, Fang et al. [2015] document that legal separation (referred to as corporate groups) affects auditor choice and increases audit costs. These studies provide evidence of significant costs related to legal separation. In particular, these costs are related to the bonding and

\(^4\) My paper focuses on legal separation between the parent and its subsidiaries without regard to the ownership links between the subsidiaries. I also explore total subsidiaries, whereas these studies focus on overseas subsidiaries.
monitoring agency costs of debt. I complement these findings by exploring another important agency cost of debt, namely creditor recovery upon default.

Moreover, my findings contribute to a growing literature on creditor recoveries in the wake of a broad market interest in disaggregating the components of credit risk as reinforced by the Basel II framework, which conceptualized credit risk as composed of probability of default, loss given default, exposure at default, and effective maturity (see Solomon, Emery, and Gates [2009]). In particular, Solomon, Emery, and Gates [2009] suggest that recoveries are ‘notoriously difficult to predict and have not been found to correlate with industrial sector or other fundamental variables’. Academic studies have since provided evidence that creditor recoveries are associated with certain debt features, firm characteristics, and macro factors (e.g., Acharya, Bharath, and Srinivasan [2007]; Donovan, Frankel, and Martin [2015]; Jankowitsch, Nagler, and Subrahmanyam [2014], see a review of early literature and empirical Evidence in Altman [2006]). I extend these studies by examining the effects of a dominant corporate form (i.e., corporate families) on creditor recovery rates.

The remainder of the paper proceeds as follows. I describe corporate families and develop my hypotheses in section 2. I describe sample selection, variables, and empirical tests in Section 3. I discuss results for primary, robustness, and additional tests in Section 4 and conclude in Section 5.
BACKGROUND AND HYPOTHESES DEVELOPMENT

1.1 Corporate families

A corporate family exists when one legal business entity holds a controlling interest in at least one other legal business entity. The notion that presence of a family has an effect on the cost of debt is recognized by rating agencies that assign Corporate Family Rating (CFR) to firms that have multiple entities (Solomon, Emery, and Gates [2009]). There is only limited academic work on the effect of a family structure on the risk and cost of debt.

In a recent study Beaver et al. [2015] provide evidence showing that incorporating financial information of separate entities within a corporate family (described as corporate groups) improves the prediction models of the parent company’s, as well as the subsidiaries’, likelihood of bankruptcy. This finding provides important evidence towards understanding the effects of corporate families on the risk and cost of debt. The probability of bankruptcy is one ingredient of the cost of debt, the other being the recovery rate, conditional on default (see Valta [2012]). Recovery rate is the focus of my study. While it has been assumed that the legal separation between the parent and subsidiaries in a corporate family affects the recovery risk of the parent company, to the best of my knowledge there is no direct empirical evidence on the presence and magnitude of this effect.

1.2 The effect of legal separation on creditor recovery rates

Legal separation can affect creditor recovery rates because, as noted in Whittred [1987], the parent company can transfer assets to separate entities not subject to initial debt agreements and at other than market prices (see also Fang et al. [2015]; Shleifer and Vishny [1997]). Fang et al. [2015] suggest that complicated organizational structures facilitate expropriation through opaque transactions between separate entities. Yet, upon default,
lenders cannot automatically obtain recovery from the separate, independent subsidiaries because limited liability stipulates that separate entities cannot be used to satisfy claims of other entities (West and Smeltzer [2011]). The business press has noted that the ability of parent companies to keep assets separate from creditors has long been an issue, and that parent companies can employ complex separate legal structures in order to prevent creditors from laying claim to the assets held by subsidiaries.5

Consistent with the discussion above, I formulate the following hypothesis (stated in its alternative form):

\[ \text{Hypothesis 1 (H1): The legal separation between the parent company and its subsidiaries within the corporate family decreases the recovery rates of the parent company’s creditors.} \]

1.3 Legal separation across jurisdictions of incorporation

Shareholders prefer to exclude assets held foreign subsidiaries as collateral in debt contracts because US Internal Revenue Service regulation stipulates that using foreign assets as collateral constitutes distribution of dividends which would trigger tax obligations in the US. The shareholders benefit in terms of limited liability or tax savings, but debtholders of the US parent company are disadvantaged as they are left without a direct claim to the value of assets held overseas. Consistent with this discussion, I test the following propositions

\[ \text{Hypothesis 2 (H2): The effect of legal separation between the parent company and its subsidiaries within the corporate family is stronger for firms with overseas subsidiaries.} \]

2. RESEARCH DESIGN

2.1 Sample selection

I perform my analyses of creditor recovery rates at the time of default. My initial sample for consists of default events included in the Moody’s Default and Recovery Database (DRD) available by subscription to Moody’s Analytics. All DRD data is derived from Moody’s own proprietary database of issuer, default, and recovery information. In this study I use the default data.

I provide a summary of the complete data on default events in Table 1. The master default table (MAST_DFLT) in DRD contains 7,168 default events associated with 22,747 individual issues outstanding at the time of default (DFLT_ISSU) for several US and non-US corporations and organizations (including governments and municipalities). Panel A shows that default events and debt issues are distributed across a variety of industries. Panel B shows the distribution by default type, including distressed exchange, bankruptcy, and missed payments. Panel C shows the distribution across the debt classes, including bank loans and regular bonds. Panel D shows that most of the debt instruments are classified as senior debt, but the majority of debt instruments are unsecured. The last column in each panel (Def_Price) shows the average debt trading price (% of par) and represents the distribution of recoveries at default.

My analyses focus on the default events and the associated trading prices for US publicly traded industrial firms (i.e., non-financial firms) for the period covering 1994 -

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6 DRD is updated monthly. The data discussed here are based on tables updated on August 8, 2015. Moody's definition of default is intended to capture events whereby issuers fail to meet debt service obligations outlined in their original debt agreements. Moody’s may also classify as defaults some distressed debt exchanges that do not constitute an event of default under any of the company's debt agreements.
2013. I match each default instrument to the most recent fiscal year in the Compustat annual files prior to the default date.⁷ A parent company is identified as the reporting entity, i.e., the entity (or registrant) that files financial statements with the SEC and for which data is available in Compustat.⁸ I obtain a sample of 3,637 observations representing individual defaulted debt instruments with nonzero face amount and that are matched to a firm-year in Compustat. Not all defaulted instruments have trading prices available. Table 3 shows that of these, only 2,075 observations have price at default.

### 2.2 Measuring legal separation

My research questions and hypotheses focus on the effect of legal separation between a parent company and its subsidiaries within a corporate family on the recovery rate to the creditors of the parent company at time of default and the cost of debt at the initial contract. Ideally, on assessing the impact of legal separation on the recovery rates and cost of debt, one would like to compare a sample of firms that are parent entities within corporate families and firms that are stand-alone. Unfortunately, the latter sample is nearly non-existent for US publicly traded firms.

As a result, I have to identify, within the sample of parent firms, a measure of the strength of the effect of legal separation on the recovery rates. I resort to two proxies for the strength of the potential effect of legal separation on the recovery rates of the parent’s debt at default. One is the mode of operations of the parent company, specifically whether it is a holding company (in which the operational activities are entirely conducted on the

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⁷ DRD provides the CUSIP and/or Ticker symbol at the time of default, and I match these to the historical CUSIP and/or Ticker symbol provided in the Compustat Snapshot Names file.
⁸ This definition includes publicly traded subsidiaries with SEC filings. The subsidiaries are included in the analyses so long as they have their own subsidiaries, and thus have a legal separation with their subsidiaries.
subsidiaries level) or a firm directly involved in the operations. The second proxy is the number of separate legal entities within the firm. I explain these proxies and comment on their limitations next.

2.2.1 Holding parent company

The first proxy for the existence and strength of legal separation is whether or not the parent company is a holding company. A parent that is a holding company holds assets and conducts all its business through its separate, independent subsidiaries. In general, the parent company, as a separate entity, does not have significant cash flows or assets, but relies on the cash distributions and assets from the subsidiaries to service debt. This can affect creditor recovery rates upon default because a contract with the parent company entitles the creditors to the limited resources within the parent, as a separate entity, and does not automatically extend to the subsidiaries’ assets.

I identify holding companies by searching the business overview section of the Form 10K, as captured in WorldScope, for the following selected key words: ‘THROUGH ITS’ or ‘THROUGH SUB’ to capture firms that operate or conduct their businesses through subsidiaries. I randomly confirm that returned results do indeed capture the intended classifications, which is that the firm operate its operations through subsidiaries. Further, I search for the terms ‘HOLDING CO’, ‘THE GROUP’, or ‘SHELL CO’ to capture firms that identify themselves as holding or shell corporations and whose operations are conducted through subsidiaries. I present examples of the business descriptions in Appendix C.
2.2.2 The number of separate legal entities

The number of separate legal entities captures legal separation in that it identifies a firm that has a parent company and one or more subsidiaries that are separately incorporated. The higher the number of separate entities within a firm the greater the extent of legal separation. A higher count of subsidiaries present more opportunities for intricate and less obvious tunneling of assets away from the reach of creditors and make it difficult for creditors to guard against such activity. Moreover, upon default of the parent, there are costs and uncertainties (e.g., bankruptcy costs and outcomes) that can reduce creditor payoffs even when the contract gives creditors ownership rights to subsidiaries’ assets.

The number of subsidiaries has obvious limitations as a measure of legal separation. Subsidiaries are formed for a number of reasons, some of which do not create a real legal separation between the parent and the subsidiary. As a result, a firm may have a lot of subsidiaries but with little impact from a legal separation standpoint. Conversely, another firm may have very few subsidiaries but that are legally complex and create significantly stronger legal boundaries between the parent and the subsidiaries. This discussion suggests that the number of subsidiaries is a noisy measure of legal separation and is likely to reduce my ability to reject the hypotheses in favor of their alternatives.

I obtain data on subsidiaries from Form 10-K Exhibit 21. The SEC requires firms to disclose all significant subsidiaries in this exhibit. I retrieve the exhibit 21 from the SEC’s Electronic Data Gathering, Analysis, and Retrieval system (EDGAR) using Perl programming language (PERL). A typical exhibit 21 lists all its subsidiaries and/or affiliates by name and jurisdiction of incorporation (see Appendix B for an example). In limited cases, firms also list the percentage of their ownership in the subsidiary and the
different ownership links between subsidiaries. Most, if not all, subsidiaries listed on Exhibit 21 are separate legal entities in which the parent company directly or indirectly owns more than 50% of the control rights.

I obtain the number of subsidiaries by counting the number of jurisdictions, which are a listing of all US and Canadian states/regions (abbreviated and full names) and all countries in the world. If a firm has multiple subsidiaries incorporated in one jurisdiction, I count each occurrence of the jurisdiction as a separate entity. I do not simply count the subsidiaries (based on their names) due to the difficulty in retrieving the subsidiary names from exhibit 21, especially for the early years available on EDGAR.

There are challenges with this data retrieval. In some cases subsidiary names include the country or state of incorporation (e.g., Name: “Microsoft Ireland”, Jurisdiction: “Ireland”). In these case, the PERL for this study is structured to pick up the last mention of the country Ireland on each line in the list of subsidiaries, which is the jurisdiction, and thereby minimizes the potential for double counting subsidiaries. However, errors still occur due to inconsistencies in the underlying 10K text formats, some of which do not specify line or column breaks.

Moreover, firms have discretion in the subsidiaries they disclose from year to year. The SEC requires disclosure of significant subsidiaries only. While some firms list all their subsidiaries in exhibit 21, the number of subsidiaries for most of the corporations are understated in this study. For illustrative purposes, Table 2 presents descriptive statistics of subsidiaries of all US public firms including those not utilized in any of the subsequent

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9 The following identifies disclosure of significant subsidiaries only: “The following is a list of subsidiaries of the company, omitting subsidiaries which, considered in the aggregate, would not constitute a significant subsidiary”
analyses. Overall, a public firm has an average of 33 and median of 10 subsidiaries.

### 2.3 Measuring creditor recovery rates

My primary analyses examine the relation between legal separation and creditor recovery rates. Following Acharya, Bharath, and Srinivasan [2003] and Jankowitsch, Nagler, and Subrahmanyam [2014], I capture creditor recovery rates across defaulting firms using the market price of each debt instrument at the time of default.\(^{10}\) Acharya, Bharath, and Srinivasan [2003] and Metz et al. [2012] suggest that price at default reflects the market’s assessment of recovery risk and is a predictor of ultimate creditor recovery rates upon borrower default. A lower price implies a lower creditor recovery and thus higher recovery risk.

I obtain price at default from DRD’s default issue table (DFLT_ISSU) using the variable \(\text{Def\_Price}\). This is the trading price of defaulted debt, expressed as a percentage of par, as of the default date for distressed exchanges, or within 30 days after default for all other types of default. Following Metz et al. [2012], my analysis is based on debt instruments with a default price within 0 to 100 percent. I denote this as Default price.

### 2.4 Modeling the effect of legal separation on creditor recovery rates

My proposition is that the legal separation between the parent company and its subsidiaries within the corporate family decreases creditor recovery rates. My empirical tests relate recovery rates (i.e., Default price) to the legal separation between the parent company and its subsidiaries. I perform empirical tests using Ordinary Least Squares

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\(^{10}\) Recovery rates can also be measured as price at default resolution (e.g., emergence from bankruptcy). However, price at default is a reasonable estimate of actual recovery without concerns for correcting for time value of money for varying default resolution periods. Moreover, for investors who sell their instruments after default, the price at default is indeed the relevant measure of recovery. Furthermore, many credit risk models do not explicitly capture the bankruptcy proceeding, reorganization, emergence, etc., in their recovery risk framework such that the price at default is a more appropriate measure of recovery risk (Acharya, Bharath, and Srinivasan [2003]).
(OLS) regressions on pooled data of all defaulted instruments from the period covering 1994 - 2013. A single firm may have multiple defaulted instruments per default event. Accordingly, estimates in my tests are based on standard errors corrected for clustering at the firm. Additionally, I include industry fixed effects using the eleven industry classification employed by Moody’s. I estimate the following OLS regression model:

\[
\text{Default Price}_{i,t} = \gamma \cdot \text{Legal Separation}_{i,t-1} + \beta_1' \cdot \text{Default Characteristics}(k)_{i,t} + \beta_2' \cdot \text{Firm Characteristics}(k)_{i,t-1} + \alpha_i + \delta_t + \epsilon_{i,t}
\]  

(1)

where subscripts \(i\) and \(t\) represent firm and time, respectively. \(\alpha_i\) and \(\delta_t\) are industry and year dummies, respectively. \(\epsilon_{i,t}\) is the stochastic error term. I describe \textit{Default} and \textit{Firm Characteristics} below, and I present complete definition and measurement of all the variables in Appendix A.

The dependent variable is the price upon default (\textit{Default Price}), measured as a percentage of par, within one month after default. Legal separation (\textit{Legal Separation}), which is the explanatory variable of interest, is alternatively captured by holding company indicator and the number of subsidiaries. I expect a negative coefficient on \textit{Legal Separation} (\(\gamma < 0\)) indicating lower creditor recovery rates upon default.

I include default characteristics, namely \textit{Log Debt Issue}, \textit{Senior Debt}, \textit{Senior Secured Debt}, \textit{Senior Subordinated Debt}, \textit{Bank Loan}, \textit{Chapter 11}, \textit{Missed Interest}, and \textit{Distressed Exchange}. \textit{Senior debt} is an indicator variable equal to one if the defaulted debt instrument is senior debt and zero otherwise. \textit{Secured (Subordinated) debt} is an indicator variable equal to one if the defaulted debt instrument is secured (subordinated) debt and zero otherwise. \textit{Chapter 11}, \textit{Missed Interest}, and \textit{Distressed Exchange} are indicator variables for the default type. I include these control variables because the size of the
default issue and the type of default likely affect the expected recovery. That is, default on large debt and the seriousness of default likely increase recovery risk. Further, senior, secured instruments and bank loans are likely to receive higher recovery upon default due to their seniority and covenant protections that are prevalent in bank loans.

Consistent with prior literature, I also include firm characteristics to control for growth opportunities, profitability, asset tangibility, leverage, firm size, and, as well as financial strength and liquidity. Upon default, firm profitability and growth prospects are likely to affect the ability of the firm to emerge from default or the value a potential buyer would be willing to pay for the firm. Similarly, the tangibility of assets can enhance recovery rates as tangible assets are easily transferrable to acquiring firms or may be liquidated for higher values. Higher leverage may imply a greater number of parties involved in default resolution and a greater number of stakeholders seeking recovery from the firm’s assets. The size of the firm allows for potential bankruptcy economies of scale (e.g., ability of large firms to absorb constant bankruptcy costs) or diseconomies of scale (e.g., difficulty in re-organizing large firms).

While the price at default is potentially affected by firm characteristics at the time of default, data on firm characteristics at default is limited so consistent with prior literature I measure firm characteristics at the end of the most recent fiscal year prior to default. I use Market to book ratio (Market-To-Book) and sales growth (Sales Growth) to proxy growth opportunities, return on assets (Return on Assets) and profit margin (Profit Margin) to proxy for firm profitability, the ratio of property, plant, and equipment to total assets (Asset Tangibility) to proxy for asset tangibility, long term debt to total assets ratio (Leverage) and whether total liabilities exceed the value of assets (Negative Equity) to proxy for firm
leverage or indebtedness, and book value of assets \((\text{Log Total Assets})\) to proxy for firm size. I include firm credit ratings \((\text{Credit Ratings})\), credit worthiness \((\text{Zscore})\), and demand for external finance \((\text{Ext. Fin. Demand})\) to proxy for the financial health of the firm, as well as its ability to access and its demand for external capital markets. I also add recession period \((\text{Recession Year})\) and litigation \((\text{Litigation})\) indicators to control for events that may reduce resources available to pay creditors.
3. RESULTS

3.1 Descriptive statistics

Table 3 shows summary statistics for the debt instrument and firm characteristics used in my primary sample. Variables have different number of observations depending on data availability, but the sample is limited to firms with at least one defaulted instrument with nonzero face amount and are included in the Compustat Annual files for the period covering 1994 – 2013.

The measure of creditor recovery rates, $Def\_Price$, in my sample ranges from 1 percent to 122.63 percent, with an average of 43.89 percent and median of 40 percent. $Default\_Price$, after eliminating prices over 100 percent such that the range is from 0 to 100 percent, has an average of 42.65 percent and a median of 39.72. An average issue size (i.e., face amount) is $278.99 million and the median is $150 million. Senior debt instruments account for 67 percent, senior secured debt instruments account for 24 percent, and bank loans account for 21 percent of all defaulted debt instruments. The results suggest that the major default types are distributed as follows: 43 percent of defaults are a result chapter 11 bankruptcy filing, 35 percent results from missed interest payments, and 14 percent from distressed exchanges.

Results on firm characteristics suggest that 26.5 percent of firms filing with the SEC (i.e., parent companies) identify as holding companies and an average public firm owns 37.79 subsidiaries, of which 22.47 subsidiaries are incorporated in the US. The median number of total subsidiaries in the sample is 15.50. An average firm has total assets in excess of $2.5 billion. The average long term debt to total assets is 0.41 suggesting that defaulting firms have a relatively high indebtedness. I document average return on assets
of five percent, and decent sales growth of ten percent. About 19 percent of the firms in the sample operate in high litigation industries.

Table 4 presents simple pairwise correlations for default and firm characteristics. The correlations between default price and subsidiaries (-0.08) and holding company (-0.10) suggests that legal separation is negatively correlated with creditor recovery rates, as predicted. Similarly, as suggested in prior literature, secured debt and bank loans are positively correlated with creditor recovery rates, and defaults resulting from bankruptcy and missed payment are negatively correlated with creditor recovery rates.

Notably, the results in Table 4 show that the number of subsidiaries is strongly correlated with the total assets of the firm (0.57). While positive and significant, the correlation between holding company and total assets is not as strong (0.09).

3.2 Baseline multivariate results

Table 5 presents baseline results from regressions of creditor recovery on legal separation, captured by the number of subsidiaries and holding company indicator. As predicted, I document an overall negative relation between creditor recovery rates in the parent company and both the number of subsidiaries and holding company. Column 1 and 2 show negative and significant coefficients on Holding Company (coeff. = -7.322, t-stat = -2.859) and Log Subs (coeff. = -3.108, t-stat = -2.639). The results are consistent in column 3, when both measures are included in the same regression model. I document negative and significant coefficients on Holding Company (coeff. = -8.732, t-stat = -2.981) and Log Subs (coeff. = -3.113, t-stat = -2.729).

These findings suggests that legal separation between the parent and its subsidiaries is associated with lower creditor recovery rates measured as price at default (% of par).
The findings in column 1 for holding company (coeff. = -7.322) suggests that a holding company receives 7.322 percentage points lower recovery than non-holding company.\textsuperscript{11} The coefficient in column 2 suggests that a one percent change in the number of subsidiaries is associated with a 0.031 decrease in price at default (i.e., -3.108 * log(1.01)).\textsuperscript{12} This suggests that one standard deviation change in the number of subsidiaries from the mean is associated with 2.78 percentage points lower price at default (i.e., -3.108 * log(1+1.45)).\textsuperscript{13}

3.3 Subsidiaries’ jurisdiction of incorporation and creditor recovery

I provide results on the effects of the location of the firms’ subsidiaries in Table 6 and Table 7. The results in Table 6 are consistent with lower creditor recovery rates for holding companies firms with overseas entities. Column 1 shows a negative but insignificant coefficient (coeff. = -2.983, \(t\)-stat = -0.586) on holding company indicator for domestic firms (i.e., do not have overseas subsidiaries), but column 2 shows a negative and significant coefficient (coeff. = -11.250, \(t\)-stat = -3.717) on holding company indicator for multinational firms (i.e., have both domestic and overseas subsidiaries).\textsuperscript{14} These findings suggests that creditor recovery rates are lower for holding companies, but only for multinational firms.

Additionally, Table 7 shows that holding companies have significantly lower creditor recovery rates when the firms have at least one subsidiary incorporated in countries

\textsuperscript{11} For an average debt issue of $278.99 million, this implies a total loss of $20.43 million (i.e., $278.99 * 7.322%).
\textsuperscript{13} [1.45 = Standard deviation 54.62 / Mean 37.79]. For an average debt issue of $278.99 million, this reflects $7.75 million lower recovery (i.e., $278.99 * 2.78%).
\textsuperscript{14} This measure is prone to measurement error resulting from difficulties in distinguishing between some US states and foreign countries (e.g., the state Georgia and the country Georgia) of the subsidiary of incorporation.
with weak rule of law (weak governance). These findings are consistent with the notion that the ability of creditors to access assets in these countries is extremely limited. Moreover, the US internal revenue code penalizes firms for using subsidiary assets as collateral in debt contracts such that creditors have limited access to subsidiary assets for holding companies in multinational firms; creditors can more easily securitize or require guaranty by subsidiaries in domestic firms.

However, these findings do not necessarily mean that creditor recovery rates are driven solely by firms with overseas subsidiaries. When looking at the number of subsidiaries, Table 6 shows that the number of subsidiaries for both domestic firms and multinational enterprises exhibit a negative relation to creditor recovery rates. I document a strong negative relation between domestic subsidiaries and creditor recovery rate in column 1 (coeff. = -3.182, t-stat = -2.002) for domestic firms. Column 2 is limited to multinational firms, and documents a negative but insignificant relation between domestic subsidiaries and creditor recovery (coeff. = -1.065, t-stat = -0.833), and a stronger negative relation between recoveries and overseas subsidiaries (coeff. = -3.284, t-stat = -2.699).\(^{15}\) Similarly, Table 7 shows that there is no difference between the effects of the number of subsidiaries for firms with entities in countries with strong and weak governance.

Overall, I interpret these findings as evidence that legal separation creates recovery problems at home and overseas. However, effects of legal separation are more pronounced across jurisdictions for holding companies, possibly due to the difficulty in securitizing debts with assets in overseas subsidiaries.

\(^{15}\) The coefficient on domestic subsidiaries, albeit insignificant, is not statistically different than the coefficient on overseas subsidiaries ($F$-test = 1.430, $p = 0.233$).
3.4 Additional control variables for diversification and collateral

3.4.1 Geographic diversification

The results above suggest that legal separation has a distinct effect on creditor recovery rates than that of merely having overseas operations. To further provide evidence on this notion, I re-estimate the baseline results with an additional covariate for geographic diversification. The findings are presented in Table 8 and show that coefficients on legal separation proxies are robust to controlling for geographic diversification. I interpret these findings as evidence that legal separation introduces a source of complexity that is not necessarily captured by geographic diversification (Solomon, Emery, and Gates [2009]; Black, Dikolli, and Dyreng [2014]).

3.4.2 Debt collateral

Moreover, the discussion of the results point to difficulty in accessing overseas assets as a potential explanation for lower creditor recovery rates across jurisdictions. This implies that debt security is an important factor for creditor recovery rates. My empirical findings are consistent with this notion; coefficients on Senior Secured Debt are positive and strongly significant across all my analyses. As an additional tests, I separate the sample into debt obligations that have backing of another entity in addition to the direct issuer and obligations that do not have backing.

However, unlike secured debt which I expect to increase creditor recovery rates, I do not have a clear prediction for the effect of backing by another entity. On the one hand, backing by another entity can increase creditor recovery rates by providing a contractually binding option for the creditors to recover their claim in the even the direct issuer is unable to meet its obligations. On the other hand, backing by another separate legal entity can
lower creditor recovery rates by introducing the costs of adjudicating across legal boundaries depending on the terms of the backing, or by subjecting creditors to legal costs legal actions for fraud on, or oppression of, minority interests that may exists in the separate entity (Rosenberg [1976]; Whittred [1987]).

Table 9 presents the results on creditor recovery rates when debt obligations have a backing in addition to the direct issuer. Using holding company indicator, the results show that legal separation has a negative relation with creditor recovery rates in both samples, with backing (coeff. = -3.987, $t$-stat = -1.233) and without backing (coeff. = -26.808, $t$-stat = -5.677). However, the results are significant and more pronounced for the sample of debt obligations with a backing ($Chi-Sq. = 20.70$, $p$-value = 0.000). Using the number of subsidiaries, I document more intuitive results. Debt obligations that have no backing have lower creditor recovery rates as the creditors do not have a contractually binding option to recover claims from another entity (coeff. = -2.633, $t$-stat = -2.020) compared with obligations with backing (coeff. = 3.213, $t$-stat = 1.061).\footnote{The data on backing requires further investigation. Only a small percentage (14\%) of debt obligation has a backing. This is either a data error or it implies a sample selection issue in that firms with debt obligations that do have a backing are more likely to default.}

### 3.5 Minority Interest as an alternative measure of extent of legal separation

The effect of legal separation on creditor recovery rates of the creditors to the parent company may depend on the extent of ownership of the parent company in the subsidiary. When the parent company has full ownership of the subsidiaries, it can be easier for the managers (on behalf of the parent shareholders) to transfer assets in and out of the subsidiaries without being subjected to third party scrutiny by other owners of the subsidiaries. This may increase the agency costs when lending to parent companies and
lower creditor recovery rates. Nonetheless, while having third party owners in the subsidiaries may indeed provide a layer of governance to mitigate opportunism by the parent, creditors attempting to repossess assets in subsidiaries with minority interest may be subject to legal costs legal actions for fraud on, or oppression of, minority interests that may exists in the separate entity (Rosenberg [1976]; Whittred [1987]). Thus absence and present of minority interest can lower creditor recovery rates.

To examine the effect of the ownership in the subsidiaries, I use the level of minority interest as a measure of the extent of legal separation.¹⁷ Minority interest captures the parent company’s non-controlling interest (i.e., the portion not owned by the parent) in the subsidiary (Compustat variable MIBT - Minority Interest, Total, Balance Sheet).

Table 10 and Table 11 present the results on creditor recovery rates using minority interest. Table 10 shows that increasing values of minority interest (levels and rank values) are associated with lower creditor recovery rates. These findings support the notion that minority interests in subsidiaries of a firm may increase the cost of accessing resources in those subsidiaries as lenders can face legal action for fraud on, or oppression of, the minority interests. Additionally, the evidence in Table 11 suggests that the baseline results are more pronounced for holding parent companies with reported minority interest than for holding companies without reported minority interest.

### 3.6 Additional effects of legal separation upon default

To provide further evidence, this section explores the effects of legal separation on other characteristics of default. Specifically, I examine the effects of legal separation on

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¹⁷ Alternatively, I can use the percent ownership of the parent company in the subsidiaries along with the size and importance of the subsidiaries to the corporate family. However, the data is not readily available. I elect to use minority interest, which is available in Compustat.
the length of time it takes to resolve the default. The expectation is that legal separation is associated with longer resolution duration because legal separation adds complexity to adjudication of defaults because of the multiple legal boundaries that creditors must cross.

Table 12 presents the results. I measure resolution duration as the number of days between the date the issuer went into default and the resolution date (column 1). I also measure the resolution based on the date the issue went into default, which is not necessarily the same date as the issuer default date (column 2). As expected, the coefficient on holding company is positive and significant in both column 1 (coeff. = 0.263, \(t\)-stat = 2.029) and column 2 (coeff. = 0.233, \(t\)-stat = 1.677) suggesting that the resolution duration is longer for holding companies than for non-holding companies by about 26.2 percent to 30.1 percent more days. However, I fail to find evidence for the number of subsidiaries in both column 1 (coeff. = -0.005, \(t\)-stat = -0.094) and column 2 (coeff. = -0.005, \(t\)-stat = -0.096).

3.7 Robustness test to address potential endogeneity concerns

As with many empirical research, my analysis potentially suffers from an endogeneity problem. Specifically, the issue is whether there exists an omitted variable that is correlated with both the legal separation and the creditor recovery rates. For example, firms can use legal separation to insulate business risk that I cannot observe as a researcher, and likewise the default price reflects that underlying risk irrespective of whether the firm is a holding company or the number of subsidiaries. My empirical approach is designed to control for potential risk factors using covariates that capture firm indebtedness, performance, and future growth opportunities.

Nonetheless, I examine potential impact of unobserved confounding factors using
the approach in Frank [2000]. The approach relies on the notion that omitted factors can affect results when they are correlated with both the dependent and independent variables, after controlling for all other factors. Frank [2000] derives an Impact Threshold for a Confounding Variable (ITCV) to assess the minimum partial correlations necessary for the omitted variable to overturn significant results. If the ITCV is large enough, one can assert causality as the OLS results are likely robust to omitted variable bias (Frank [2000]; Larcker and Rusticus [2010]).

Table 13 presents the results on holding company indicator. The threshold value is -0.032. This threshold value imply that to invalidate the inferences based on the holding company indicator in the paper an omitted variable would have to have an impact greater than -0.032 after controlling for all other factors. To develop a benchmark for the likely impact of the unobserved confounding factor, I compute the impact of the inclusion of each of the control variables. Similar to ITCV, I compute partial correlations of the holding company indicator and default price with each control variable after controlling for all other covariates. I then compute impact (Column 3) as the partial correlation of holding company indicator and each covariate (Column 1) times the partial correlation of default price and each covariate (Column 3). The variable with an impact closest to -0.032 is size of debt issue (Log Debt Issue) and the impact is -0.016. This suggests that the impact of a confounding factor has to be over two times greater than that for size of debt issue (i.e., -0.032 divided by -0.016) to overturn the results.

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18 Larcker and Rusticus [2010] suggest that this approach is an alternative to the method of Instrumented Variable analyses, which can be difficult to implement for lack of good instrumental variables.

19 Computed from the baseline results in Table 5 using the excel spreadsheet provided by K. Frank (Frank [2014]).

20 Moreover, using replacement cases analysis in Frank et al. [2013], to invalidate the inference 43.2% of the cases would have to be replaced with cases for which there is an effect of zero.
Overall, threshold values are higher than the likely impact of unobserved confounding variables, as captured by the impact of observed variables, and they provide greater confidence on the causal relation between legal separation (captured by holding company indicator) and creditor recovery rates (captured by default price).21

### 3.8 Implications for debt pricing

Creditor recovery is an important risk factor in pricing financial contracts (Jankowitsch, Nagler, and Subrahmanyam [2014]) and is a key component of credit risk as reinforced by the Basel II framework, which conceptualized credit risk as composed of probability of default, loss given default, exposure at default, and effective maturity (see Solomon, Emery, and Gates [2009]). In this section, given the findings in this paper that legal separation lowers creditor recovery, I examine the effects of legal separation on the pricing of debt.

I present the results in Table 14. Using a sample of bank loans to US parent companies for the period covering 1996 and 2010, I document an overall positive relation between legal separation and the cost of debt to the parent companies.22 The coefficient on holding company indicator is positive and significant in column 1 (coeff. = 0.037, \( t\)-stat = 2.320) and in column 2 (coeff. = 0.036, \( t\)-stat = 2.262). Similarly, coefficient on the number of subsidiaries is positive and significant in column 1 (coeff. = 0.012, \( t\)-stat = 1.985) and in column 2 (coeff. = 0.015, \( t\)-stat = 2.379). These findings are robust to controlling for loan and firm characteristics, including geographic diversification suggesting that legal

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21 Results for the number of subsidiaries are not tabulated. The results show that omitted variable is potentially an issue, but to invalidate the inference using the number of subsidiaries as a proxy 33% of the cases would have to be replaced with cases for which there is an effect of zero.

22 The analyses uses data and models in existing studies (e.g., Dichev and Skinner [2002]; Graham, Li, and Qiu [2008]; Costello and Wittenberg-Moerman [2011]; Badertscher et al. [2014]; Hasan et al. [2014]).
separation has a distinct effect on cost of debt from that of geographic diversification. I document a negative and significant coefficient on geographic diversification (coeff. = -1.044, t-stat = -3.680). Other control variables are mostly significant and the signs on firm characteristics are generally in line with prior findings. For instance, I document a positive association (i.e., higher interest spreads) for firms with high leverage and negative association for firms with more assets, valuable growth opportunities, high profitability, and investment grade credit ratings.

I interpret these findings as evidence that creditors demand higher debt costs in anticipation of lower recoveries upon default of parent companies. However, legal separation can affect the cost of debt for other reasons, independently of its effect on the recovery rate. For example, legal separation can increase monitoring costs to creditors because the quality of financial information available to creditors of parents is somewhat lower than what would be available to creditors of a single-entity company. Financial statements of the parent, as a separate entity, are not routinely available, definitely not publicly and not in an audited form. Even when the creditors privately access these stand-alone statements, these statements are not subject to the “quality controls” of the official filings that must pass scrutiny of the SEC (and the public). These statements also do not reveal the intricate relationships between the parent and the subsidiaries. While this is somewhat corrected by the availability of consolidated financials, from the perspective of the parent’s creditors these statements are misleading since the creditors may not have recourse to some of the consolidated assets.

Another reason that legal separation would affect the parent company’s cost of debt, independently of its effect on the recovery rate, is its effect on the precision by which
defaults may be predicted. Beaver et al. [2015] find that incorporating subsidiaries’ financial information in bankruptcy prediction models for parent companies improves these models. Likewise, incorporating the parent’s financial information improves the subsidiaries’ bankruptcy models. This finding supports the notion that legal separation have an effect on the information risk associated with lending to parents.

Legal separation can also affect the cost of debt through its effect on the default risk of the firm. Although parent companies can use limited liability to separate assets from the creditors, limited liability can also insulate parent companies from liabilities related to risks in activities that are delegated to other entities in the corporate family and thereby reduce default risk or legal costs of the parent company (e.g., Douglas and Shanks [1929]; Chiappinelli [2006]; Lewellen and Robinson [2013]). Furthermore, firms use subsidiaries to facilitate tax planning, which can yield substantial tax savings (Altshuler and Grubert [2003]; Lewellen and Robinson [2013]). Tax savings increase the free cash flows and thereby reduce default risk.

To tease out the effect of creditor recovery rates, I include a number of control variables to capture these monitoring costs, information risk, and the default risk described above. Already included in my model of cost of debt and recovery are firm size, credit ratings, and default probability which control for default risk, information risk, or monitoring costs. Firm size can proxy for monitoring costs because large firms are associated with less information asymmetry. Credit ratings and default probability proxy for the default (or bankruptcy) factors. The notion that presence of a family has an effect on the cost of debt is recognized by rating agencies that assign Corporate Family Rating to firms that have multiple entities (Solomon, Emery, and Gates [2009]). However, while they
proxy for bankruptcy or default risk, credit ratings are unlikely to absorb the effect of recovery risk on the cost of debt because evidence suggests that credit ratings do not predict recovery rates (Solomon, Emery, and Gates [2009]).

Furthermore, I re-estimate the baseline equation for the results shown in Table 14 with additional control variables and find consistent results (not tabulated). First, I include an indicator for a big four auditor to capture information risk. Second, I include measures of tax aggressiveness and avoidance to control for the notion that legal separation facilitates tax planning which can affect firms’ default risk. These additional control variables do not affect the signs and significance of my results. Overall, these findings suggest that the higher cost of debt to the parent company can be attributed, at least in part, to the effect of legal separation on the creditor recovery rates upon default of the parent company in corporate families.
4. CONCLUSION

I examine the effects of legal separation between the parent and its subsidiaries within a corporate family on the creditor recovery rates. Using the variability in creditor recovery rates measured as the price of debt instruments at default, I document that legal separation decreases creditor recovery rates. My primary measure of legal separation is an indicator equal to one when a parent company operates as a holding company and zero otherwise. The findings on holding company indicator are more pronounced for holding companies with overseas operations in countries with weak governance. I also use the number of subsidiaries as a measure of legal separation, and find that the number of subsidiaries are associated with lower creditor recoveries regardless of the location the subsidiaries are incorporated.

Consistent with the notion that creditor recovery rates are an important factor in the pricing of financial contracts, I provide some evidence on the implications of legal on debt pricing. Using a sample of bank loans, I show that the lower creditor recovery rates arising from legal separation are associated, at least in part, with higher interest spread.

My findings are robust, but the measures of legal separation have limitations. Future research can investigate the effects of legal separation using international data from countries with considerable single-entity firms and that require extensive disclosures on the separate entities within a corporate family. These settings may deepen our understanding of how creditors design contracts to mitigate bondholder-shareholder agency costs.

Recent global regulatory developments related to corporate governance around separate legal entities emphasize the importance of my research question and future
research in this area. In particular, Gibson, Elsdon, and Johnson [2013] suggest that separate legal entities within a firm are a source of significant and unappreciated risk. Accordingly, it is important to examine the implications of organizing a firm with a parent and separate subsidiaries. Such evidence not only contribute to academic literature, but also inform regulators who may have interest in understanding how separate legal entities affect capital markets (including debt markets).
References


Beaver, William H., Stefano Cascino, Maria Correia, and Maureen F. McNichols. 2015. “Bankruptcy in Groups.”


Appendix A: Variable definitions

### Default Characteristics

*Data in this part obtained from Moody’s Default and Recovery Data (DRD)*

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>DESCRIPTION AND MEASUREMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Def_Price (% of par)</td>
<td>Trading price of defaulted debt, expressed as a percentage of par, as of the default date for distressed exchanges, or 30 days after default for all other types of default.</td>
</tr>
<tr>
<td>Default Price (% of par)</td>
<td>Def_Price excluding prices above 100 percent.</td>
</tr>
<tr>
<td>Debt Issue ($ million)</td>
<td>Face amount of instrument expressed in U.S. Dollars (in millions).</td>
</tr>
<tr>
<td>Log Debt Issue</td>
<td>Natural logarithm of Debt Issue ($ million).</td>
</tr>
<tr>
<td>Senior Debt</td>
<td>Indicator variable equal to one if the debt instrument is senior debt, and zero otherwise.</td>
</tr>
<tr>
<td>Senior Secured</td>
<td>Indicator variable equal to one if the debt instrument is senior secured debt, and zero otherwise.</td>
</tr>
<tr>
<td>Senior Subordinated</td>
<td>Indicator variable equal to one if the debt instrument is senior subordinated debt, and zero otherwise.</td>
</tr>
<tr>
<td>Bank Loan</td>
<td>Indicator variable equal to one if the debt instrument is bank loan or bank credit facility, and zero otherwise.</td>
</tr>
<tr>
<td>Chapter 11</td>
<td>Indicator variable equal to one if the default type is chapter 11 bankruptcy, and zero otherwise.</td>
</tr>
<tr>
<td>Missed Interest</td>
<td>Indicator variable equal to one if the default type is missed interest payment, and zero otherwise.</td>
</tr>
<tr>
<td>Distressed Exchange</td>
<td>Indicator variable equal to one if the default type is distressed exchange, and zero otherwise.</td>
</tr>
</tbody>
</table>

### Firm Characteristics

*Unless stated otherwise, the firm characteristics are measured using data from Compustat*

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subs</td>
<td>The number of subsidiaries and/or affiliates disclosed on Form 10-K, Exhibit 21.</td>
</tr>
<tr>
<td>Dom Subs</td>
<td>The number of subsidiaries that are incorporated in the US.</td>
</tr>
<tr>
<td>Ovrs Subs</td>
<td>The number of subsidiaries that are incorporated overseas.</td>
</tr>
<tr>
<td>Holding Company</td>
<td>An indicator variable equal to one if the firm is a holding company, and zero otherwise. (See Appendix C).</td>
</tr>
<tr>
<td>Geog. Diversification</td>
<td>The income from foreign operations, measured as foreign pre-tax income (PIFO) scaled by total assets.</td>
</tr>
<tr>
<td>Market-to-Book</td>
<td>The ratio of the market value of assets (market value of equity plus book value of debt) to the book value of assets. ([PRCC_F * CSHO + (AT – CEQ)] / AT).</td>
</tr>
<tr>
<td>Sales Growth</td>
<td>Change in sales from prior year to the current year [(SALE_t – SALE_{t-1}) / SALE_{t-1}].</td>
</tr>
</tbody>
</table>
### Return on Assets
\[ \text{Return on Assets} = \frac{\text{Earnings before interest and depreciation (EBITDA), scaled by total assets.}}{\text{Total assets.}} \]

### Profit Margin
\[ \text{Profit Margin} = \frac{\text{Earnings before interest and depreciation (EBITDA), scaled by total sales.}}{\text{Total sales.}} \]

### Asset Tangibility
\[ \text{Asset Tangibility} = \frac{\text{Net property, plant and equipment (PPENT) scaled by total assets.}}{\text{Total assets.}} \]

### Leverage
\[ \text{Leverage} = \frac{\text{Total long-term debt (DLTT + DLC) scaled by total assets.}}{\text{Total assets.}} \]

### Negative Equity
\[ \text{Negative Equity} = \begin{cases} 1 & \text{if total assets are less than total liabilities (AT < LT),} \\ 0 & \text{otherwise.} \end{cases} \]

### Total Assets ($ million)
\[ \text{Total Assets ($ million)} = \text{Total assets (AT) in US dollars (millions).} \]

### Log Total Assets
\[ \text{Log Total Assets} = \text{The natural logarithm of total assets.} \]

### Credit Ratings
\[ \text{Credit Ratings} = \begin{cases} 1 & \text{if the issuer long-term credit ratings (SPLTICRM) is above investment grade,} \\ 0 & \text{otherwise.} \end{cases} \]

### Z-Score
\[ \text{Z-Score} = \frac{(1.2\times\text{WCAP} + 1.4\times\text{RE} + 3.3\times\text{PI} + 0.999\times\text{SALE}) / \text{AT}}{\text{AT}}, \text{where WCAP is working capital, RE is retained earnings, PI is pretax income, SALE is total sales, and AT is total assets.} \]

### Ext. Fin. Demand
\[ \text{Ext. Fin. Demand} = \begin{cases} 1 & \text{if } \text{FREECASH} < -0.5, \text{and zero otherwise.} \end{cases} \text{FREECASH is cash flows from operations minus average capital expenditure scaled by lagged current assets, (OANCF}_t - \text{average CAPX}_t)/ACT_{t-1}. \text{Capital expenditures are averaged over the preceding three years.} \]

### Recession Year
\[ \text{Recession Year} = \begin{cases} 1 & \text{if the fiscal year falls within a recessionary period as defined by the National Bureau of Economic Research at http://www.nber.org/cycles.html} \\ 0 & \text{otherwise.} \end{cases} \]

### Litigation
\[ \text{Litigation} = \begin{cases} 1 & \text{if the firm is in a high litigation risk industry,} \\ 0 & \text{otherwise. SIC codes 2833-2836, 3570-3577, 3600-3674, 5200-5961, 7370-7374 are deemed high litigation risk industries following Beatty et al. [2008] and Donovan et al. [2015].} \end{cases} \]

### Loan variables – Cost of debt

**Data in this part obtained from Thomson Reuters LPC’s DealScan database.**

### Spread
\[ \text{Spread} = \text{The interest spread over LIBOR measured as the All-in-Drawn-Spread measure reported in DealScan. All-in-Drawn-Spread is the amount the borrower pays in basis points over LIBOR for each dollar drawn down.} \]

### Log Spread
\[ \text{Log Spread} = \text{The natural logarithm of the interest spread} \]

### Loan Size
\[ \text{Loan Size} = \text{The natural logarithm of the facility (or loan) amount in US dollars ($ millions) scaled by total assets.} \]

### Log Maturity
\[ \text{Log Maturity} = \text{The natural logarithm of number of months between the} \]
loan’s issue date and the date when the loan matures.

<table>
<thead>
<tr>
<th><strong>Secured Loan</strong></th>
<th>= Indicator variable equal to one if the loan is secured (has collateral), and zero otherwise.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of Lenders</strong></td>
<td>= The number of banks and other lenders (e.g., insurance companies, institutional investors) participating in the loan syndicate.</td>
</tr>
<tr>
<td><strong>Relationship Lending</strong></td>
<td>= An indicator variable equal to one if at least one of the lenders for the current loan is a lender to the same borrower/firm in the prior five years, and zero otherwise.</td>
</tr>
<tr>
<td><strong>Revolver</strong></td>
<td>= Indicator variable equal to one if the loan’s type is revolver, and zero otherwise.</td>
</tr>
<tr>
<td><strong>Institutional Investor</strong></td>
<td>= Indicator variable equal to one if the loan’s type is term loan B, C, or D (institutional term loans), and zero otherwise.</td>
</tr>
<tr>
<td><strong>PP Indicator</strong></td>
<td>= Indicator variable equal to one if the loan contract has performance pricing provisions, and zero otherwise.</td>
</tr>
<tr>
<td><strong>Financial Covenants</strong></td>
<td>= The number of debt covenants included in the loan contract that are based on financial ratios from both the income statement and balance sheet.</td>
</tr>
<tr>
<td><strong>General Covenants</strong></td>
<td>= The number of general covenants in the loan contract identified as dividend restrictions, equity issuance sweeps, debt issuance sweeps, asset sales sweeps, and insurance proceeds sweeps.</td>
</tr>
<tr>
<td><strong>Capex Restrictions</strong></td>
<td>= Indicator variable equal to one if the loan contract has capital expenditure restrictions, and zero otherwise.</td>
</tr>
</tbody>
</table>
Appendix B: Subsidiaries disclosures - Form 10-K Exhibit 21

Example 1 – Hershey, Form 10-K for the fiscal year ended December 31, 2006

**SUBSIDIARIES OF REGISTRANT**

Below is a listing of our subsidiaries, their jurisdictions of incorporation, and the name under which they do business. Each is wholly owned. **We do not list certain subsidiaries because when considered in the aggregate as a single subsidiary, they do not constitute a significant subsidiary as of December 31, 2006.**

<table>
<thead>
<tr>
<th>Subsidiary Name</th>
<th>Jurisdiction of Incorporation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hershey Chocolate &amp; Confectionery Corporation</td>
<td>Delaware</td>
</tr>
<tr>
<td>Hershey Chocolate of Virginia, Inc.</td>
<td>Delaware</td>
</tr>
<tr>
<td>Hershey Canada, Inc.</td>
<td>Canada</td>
</tr>
<tr>
<td>Mauna Loa Macadamia Nut Corporation</td>
<td>Hawaii</td>
</tr>
</tbody>
</table>

Example 2 – General Motors

**GENERAL MOTORS COMPANY**

**AND SUBSIDIARIES, JOINT VENTURES AND AFFILIATES OF THE REGISTRANT**

**AS OF DECEMBER 31, 2013**

<table>
<thead>
<tr>
<th>Company Name</th>
<th>State or Sovereign Power of Incorporation</th>
</tr>
</thead>
<tbody>
<tr>
<td>06 Ormskirk Limited</td>
<td>England and Wales</td>
</tr>
<tr>
<td>2140879 Ontario Inc.</td>
<td>Canada</td>
</tr>
<tr>
<td>6153933 Canada Ltd.</td>
<td>Ontario</td>
</tr>
<tr>
<td>ACF Investment Corp.</td>
<td>Delaware</td>
</tr>
<tr>
<td>Adam Opel AG</td>
<td>Germany</td>
</tr>
<tr>
<td>AFS Management Corp.</td>
<td>Nevada</td>
</tr>
<tr>
<td>AFS SenSub Corp.</td>
<td>Nevada</td>
</tr>
<tr>
<td>Aftermarket (UK) Limited</td>
<td>England</td>
</tr>
</tbody>
</table>

**-- over 10 pages and random rows redacted for brevity --**

<table>
<thead>
<tr>
<th>Company Name</th>
<th>State or Sovereign Power of Incorporation</th>
</tr>
</thead>
<tbody>
<tr>
<td>TÜV NORD Bildung Opel GmbH</td>
<td>Germany</td>
</tr>
<tr>
<td>Union Motors Car Sales S.r.l.</td>
<td>Romania</td>
</tr>
<tr>
<td>United States Advanced Battery Consortium, LLC</td>
<td>Michigan</td>
</tr>
<tr>
<td>Valentine Buick GMC, Inc.</td>
<td>Delaware</td>
</tr>
<tr>
<td>Van Kouwen Automotive I B V</td>
<td>Netherlands</td>
</tr>
<tr>
<td>Vauxhall Defined Contribution Pension Plan Trustees Limited</td>
<td>England and Wales</td>
</tr>
<tr>
<td>Vauxhall Motors Limited</td>
<td>England</td>
</tr>
<tr>
<td>Wheacroft (Workop) Limited</td>
<td>England and Wales</td>
</tr>
<tr>
<td>Whitehead (Rochdale) Limited</td>
<td>England and Wales</td>
</tr>
<tr>
<td>Wilson &amp; Co. (Motor Sales) Limited</td>
<td>England and Wales</td>
</tr>
<tr>
<td>Wind Point Partners III, L.P.</td>
<td>Delaware</td>
</tr>
<tr>
<td>Woodbridge Buick GMC, Inc.</td>
<td>Delaware</td>
</tr>
<tr>
<td>WRE, Inc.</td>
<td>Michigan</td>
</tr>
<tr>
<td>Zona Franca Industrial Colmotores SAS</td>
<td>Colombia</td>
</tr>
</tbody>
</table>
Appendix C: Identifying Holding Companies

The examples below are obtained from WorldScope (WC06092 - BUSINESS DESCRIPTION – EXTENDED) and correspond to the descriptions found in Item 1 of the Form 10K

Keyword search: “HOLDING CO/GROUP” (capture ‘Holding company/ies/corporation’ or ‘Corporate Groups’ with non-operating reporting entities)
Keyword search: “THROUGH ITS/THROUGH SUB” (capture ‘operates (conducted) through (its/wholly-owned) subsidiaries’)

Revlon, Inc. is a holding company. The Company operates its business through its direct wholly owned subsidiary, Revlon Consumer Products Corporation (Products Corporation) and its subsidiaries.

The Company was incorporated as Synercom Technology, Inc., in Texas in 1969, and was reincorporated in Delaware in 1983. In April 1995, it changed its name to Alpha Technologies Group, Inc. The Company's business is conducted through its wholly-owned subsidiaries.

Lodgian, Inc. The Group's principal activity is of an independent owner and operator of full-service hotels in the United States. The Group operates substantially all of its hotels under brands, such as Crowne Plaza, Four Points by Sheraton, Hilton, Holiday Inn, Marriott and Wyndham [...] Its portfolio of hotels consists of 27 hotels that the Group wholly owns and, operates through subsidiaries and one hotel that it operates in a joint venture in the form of a limited partnership, in which a Lodgian subsidiary serves as the general partner, has a 51% voting interest and exercises significant control.

Crystal Gas Storage, Inc. (formerly Crystal Oil Company) operates through subsidiaries under two business segments namely natural gas storage and transportation segment and exploration and production of crude oil and natural gas segment.

Keyword search: “SHELL CO” (capture ‘Shell company/ies or corporation’)
Allegro Biodiesel Corporation (Allegro) is a shell company. The Company's wholly owned subsidiary, Vanguard Synfuels, LLC (Vanguard), is a producer of biodiesel fuel that owns and operates a production facility located in Pollock, Louisiana. On September 9, 2008, the Company completed the sale of Vanguard to Consolidated Energy Holdings, LLC. The Company is seeking alternatives, including additional financing for acquisitions and evaluating potential strategic transactions, either in renewable energy or other industries.

Odimo Incorporated (Odimo) is a non-operating shell corporation. The company focuses on a merger, acquisition or other business combination with an operating company by using a combination of capital stock, cash on hand, or other funding
sources, if available by identifying potential merger or acquisition candidates. The Company intends to identify potential merger or acquisition candidates. As of December 31, 2012, the Company's financial statements reflect negative working capital and a stockholders' equity deficiency.
Appendix D: Tables

Table 1 – Distribution of default and creditor recovery for all years
Panel A: Creditor recovery and default distribution by industry (by Total Issue)

<table>
<thead>
<tr>
<th>Moody's Industry</th>
<th>Issuers</th>
<th>Defaults</th>
<th>Issues</th>
<th>Avg. Issue ($ million)</th>
<th>Total Issue ($ million)</th>
<th>Def Price (% of par)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sovereign &amp; Public</td>
<td>158</td>
<td>214</td>
<td>1,145</td>
<td>808.13</td>
<td>742,667</td>
<td>33.93</td>
</tr>
<tr>
<td>Fin, Insurance, Real Estate</td>
<td>282</td>
<td>305</td>
<td>3,300</td>
<td>296.19</td>
<td>656,368</td>
<td>41.87</td>
</tr>
<tr>
<td>Banking</td>
<td>406</td>
<td>438</td>
<td>1,810</td>
<td>373.91</td>
<td>523,098</td>
<td>39.08</td>
</tr>
<tr>
<td>Capital Industries</td>
<td>712</td>
<td>841</td>
<td>2,512</td>
<td>246.33</td>
<td>486,494</td>
<td>43.59</td>
</tr>
<tr>
<td>Technology</td>
<td>320</td>
<td>349</td>
<td>1,063</td>
<td>324.71</td>
<td>301,005</td>
<td>31.31</td>
</tr>
<tr>
<td>Media &amp; Publishing</td>
<td>213</td>
<td>240</td>
<td>810</td>
<td>395.74</td>
<td>279,390</td>
<td>43.2</td>
</tr>
<tr>
<td>Consumer Industries</td>
<td>500</td>
<td>573</td>
<td>1,494</td>
<td>227.91</td>
<td>270,075</td>
<td>46.59</td>
</tr>
<tr>
<td>Energy &amp; Environment</td>
<td>224</td>
<td>262</td>
<td>791</td>
<td>383.25</td>
<td>233,780</td>
<td>47.38</td>
</tr>
<tr>
<td>Unassigned</td>
<td>3,216</td>
<td>3,389</td>
<td>7,236</td>
<td>28.86</td>
<td>104,457</td>
<td>38.32</td>
</tr>
<tr>
<td>Retail &amp; Distribution</td>
<td>209</td>
<td>242</td>
<td>834</td>
<td>156.53</td>
<td>94,860</td>
<td>41.87</td>
</tr>
<tr>
<td>Transportation</td>
<td>205</td>
<td>258</td>
<td>1,413</td>
<td>87.5</td>
<td>91,783</td>
<td>38.57</td>
</tr>
<tr>
<td>Utilities</td>
<td>47</td>
<td>57</td>
<td>339</td>
<td>117.51</td>
<td>25,499</td>
<td>67.09</td>
</tr>
<tr>
<td>Total</td>
<td>6,492</td>
<td>7,168</td>
<td>22,747</td>
<td>246.90</td>
<td>3,809,476</td>
<td>41.63</td>
</tr>
</tbody>
</table>

Panel B: Creditor recovery and default distribution by default type (by Total Issue)

<table>
<thead>
<tr>
<th>Default Type Code</th>
<th>Issuers</th>
<th>Defaults</th>
<th>Issues</th>
<th>Avg. Issue ($ million)</th>
<th>Total Issue ($ million)</th>
<th>Def Price (% of par)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distressed exchange</td>
<td>516</td>
<td>557</td>
<td>3,050</td>
<td>522.91</td>
<td>1,344,923</td>
<td>54.90</td>
</tr>
<tr>
<td>Chapter 11</td>
<td>967</td>
<td>996</td>
<td>5,779</td>
<td>163.22</td>
<td>682,914</td>
<td>36.88</td>
</tr>
<tr>
<td>Missed interest payment</td>
<td>2,606</td>
<td>2,696</td>
<td>6,354</td>
<td>152.83</td>
<td>640,834</td>
<td>37.54</td>
</tr>
<tr>
<td>Suspension of payments</td>
<td>82</td>
<td>82</td>
<td>348</td>
<td>1,540.05</td>
<td>335,730</td>
<td>32.58</td>
</tr>
<tr>
<td>Prepackaged Chapter 11</td>
<td>133</td>
<td>134</td>
<td>437</td>
<td>465.34</td>
<td>173,107</td>
<td>42.01</td>
</tr>
<tr>
<td>Dividend omission</td>
<td>218</td>
<td>227</td>
<td>556</td>
<td>310.32</td>
<td>125,058</td>
<td>36.52</td>
</tr>
<tr>
<td>Bank holiday</td>
<td>6</td>
<td>6</td>
<td>97</td>
<td>6,565.32</td>
<td>124,741</td>
<td>37.74</td>
</tr>
<tr>
<td>Bankruptcy</td>
<td>236</td>
<td>237</td>
<td>705</td>
<td>178.43</td>
<td>82,612</td>
<td>37.74</td>
</tr>
<tr>
<td>Missed principal and interest payment</td>
<td>432</td>
<td>459</td>
<td>1,100</td>
<td>91.04</td>
<td>69,551</td>
<td>52.69</td>
</tr>
<tr>
<td>Seized by regulators</td>
<td>27</td>
<td>27</td>
<td>428</td>
<td>143.21</td>
<td>52,127</td>
<td>12.06</td>
</tr>
<tr>
<td>Receivership</td>
<td>326</td>
<td>326</td>
<td>482</td>
<td>135.21</td>
<td>50,298</td>
<td>28.58</td>
</tr>
<tr>
<td>Missed principal payment</td>
<td>366</td>
<td>368</td>
<td>658</td>
<td>93.61</td>
<td>49,896</td>
<td>57.20</td>
</tr>
<tr>
<td>Grace period default</td>
<td>80</td>
<td>97</td>
<td>184</td>
<td>145.55</td>
<td>22,414</td>
<td>54.78</td>
</tr>
<tr>
<td>Payment moratorium</td>
<td>97</td>
<td>98</td>
<td>252</td>
<td>94.08</td>
<td>18,346</td>
<td>59.65</td>
</tr>
<tr>
<td>Placed under</td>
<td>24</td>
<td>24</td>
<td>48</td>
<td>405.50</td>
<td>14,598</td>
<td>48.59</td>
</tr>
</tbody>
</table>
administration

<table>
<thead>
<tr>
<th>Event</th>
<th>Issuers</th>
<th>Defaults</th>
<th>Issues</th>
<th>Avg. Issue ($ million)</th>
<th>Total Issue ($ million)</th>
<th>Def Price (% of par)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deposit Freeze</td>
<td>38</td>
<td>38</td>
<td>73</td>
<td>156.52</td>
<td>5,165</td>
<td>75.33</td>
</tr>
<tr>
<td>Indenture modified</td>
<td>223</td>
<td>232</td>
<td>444</td>
<td>13.04</td>
<td>4,278</td>
<td>34.87</td>
</tr>
<tr>
<td>Liquidated</td>
<td>17</td>
<td>17</td>
<td>44</td>
<td>147.92</td>
<td>3,846</td>
<td>44.96</td>
</tr>
<tr>
<td>Chapter 7</td>
<td>12</td>
<td>12</td>
<td>34</td>
<td>105.63</td>
<td>2,852</td>
<td>15.23</td>
</tr>
<tr>
<td>Cross default</td>
<td>8</td>
<td>8</td>
<td>10</td>
<td>233.70</td>
<td>2,337</td>
<td>8.21</td>
</tr>
<tr>
<td>[Blank]</td>
<td>438</td>
<td>466</td>
<td>1,460</td>
<td>55.29</td>
<td>1,548</td>
<td>34.90</td>
</tr>
<tr>
<td>Chapter 9</td>
<td>13</td>
<td>13</td>
<td>109</td>
<td>9.50</td>
<td>960</td>
<td>88.77</td>
</tr>
<tr>
<td>Loan forgiven</td>
<td>7</td>
<td>8</td>
<td>10</td>
<td>81.43</td>
<td>570</td>
<td>34.00</td>
</tr>
<tr>
<td>Conservatorship</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>105.00</td>
<td>420</td>
<td>20.88</td>
</tr>
<tr>
<td>Bankruptcy, Section 77</td>
<td>30</td>
<td>30</td>
<td>71</td>
<td>16.48</td>
<td>346</td>
<td>27.49</td>
</tr>
<tr>
<td>War</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3.00</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Chapter 10</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>2.00</td>
<td>2</td>
<td>21.38</td>
</tr>
<tr>
<td>Ultra Vires</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Panel C: Distribution by debt class (by Total Issue)

<table>
<thead>
<tr>
<th>Debt Class</th>
<th>Issuers</th>
<th>Defaults</th>
<th>Issues</th>
<th>Avg. Issue ($ million)</th>
<th>Total Issue ($ million)</th>
<th>Def Price (% of par)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bond/Debenture</td>
<td>1,625</td>
<td>1,810</td>
<td>5,351</td>
<td>331.25</td>
<td>1,673,819</td>
<td>39.81</td>
</tr>
<tr>
<td>Bank Loan</td>
<td>1,065</td>
<td>1,110</td>
<td>2,015</td>
<td>392.81</td>
<td>651,666</td>
<td>61.36</td>
</tr>
<tr>
<td>Bank Credit Facility</td>
<td>547</td>
<td>575</td>
<td>1,256</td>
<td>309.66</td>
<td>388,937</td>
<td>61.34</td>
</tr>
<tr>
<td>Long Term Public Debt</td>
<td>3,134</td>
<td>3,308</td>
<td>6,410</td>
<td>93.12</td>
<td>384,231</td>
<td>37.31</td>
</tr>
<tr>
<td>Sovereign Bank Loan</td>
<td>59</td>
<td>97</td>
<td>662</td>
<td>405.13</td>
<td>213,099</td>
<td>50.77</td>
</tr>
<tr>
<td>Preferred Stock</td>
<td>368</td>
<td>422</td>
<td>805</td>
<td>309.21</td>
<td>196,351</td>
<td>26.56</td>
</tr>
<tr>
<td>Medium-Term Note</td>
<td>17</td>
<td>17</td>
<td>23</td>
<td>6,442.10</td>
<td>128,842</td>
<td></td>
</tr>
<tr>
<td>Conv./Exch. Bond</td>
<td>281</td>
<td>307</td>
<td>395</td>
<td>237.92</td>
<td>73,992</td>
<td>30.25</td>
</tr>
<tr>
<td>Unknown (Missing)</td>
<td>457</td>
<td>486</td>
<td>1,469</td>
<td>197.25</td>
<td>29,785</td>
<td>48.69</td>
</tr>
<tr>
<td>Municipal Bond</td>
<td>716</td>
<td>766</td>
<td>3,487</td>
<td>16.65</td>
<td>19,213</td>
<td>49.82</td>
</tr>
<tr>
<td>Enhanced Equip Trust</td>
<td>6</td>
<td>7</td>
<td>91</td>
<td>172.67</td>
<td>15,713</td>
<td></td>
</tr>
<tr>
<td>First Mortgage Bonds</td>
<td>62</td>
<td>64</td>
<td>115</td>
<td>206.19</td>
<td>14,433</td>
<td>55.65</td>
</tr>
<tr>
<td>Commercial Paper</td>
<td>65</td>
<td>66</td>
<td>72</td>
<td>435.31</td>
<td>6,965</td>
<td>88.00</td>
</tr>
<tr>
<td>Equipment Trust</td>
<td>139</td>
<td>143</td>
<td>495</td>
<td>19.60</td>
<td>6,018</td>
<td>31.52</td>
</tr>
<tr>
<td>Pass-Through</td>
<td>4</td>
<td>4</td>
<td>6</td>
<td>523.17</td>
<td>3,139</td>
<td>95.67</td>
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<tr>
<td>Preference Stock</td>
<td>7</td>
<td>7</td>
<td>8</td>
<td>177.14</td>
<td>1,240</td>
<td>57.44</td>
</tr>
<tr>
<td>Surplus Notes</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>200.00</td>
<td>800</td>
<td>23.71</td>
</tr>
<tr>
<td>Revenue Bonds</td>
<td>23</td>
<td>23</td>
<td>35</td>
<td>29.10</td>
<td>611</td>
<td>60.50</td>
</tr>
<tr>
<td>Sec. Lease Oblig. Bond</td>
<td>2</td>
<td>3</td>
<td>7</td>
<td>86.29</td>
<td>604</td>
<td>74.26</td>
</tr>
<tr>
<td>Promissory Note</td>
<td>8</td>
<td>8</td>
<td>10</td>
<td>2.00</td>
<td>2</td>
<td></td>
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<tr>
<td>Deposit Rating</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>SDLT</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Stoke Options</td>
<td>21</td>
<td>22</td>
<td>23</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 1 presents the summary of creditor recovery and other default details for all default events from Moody’s Default and Recovery Database (DRD) as reported in the master default table [MAST_DFLT], default issues tables [DFLT_ISSU], and master issues [MAST_ISSU]. Firm, country, and industry information are from master issuer [MAST_ISSR] and domain tables [GOVT_DOMN]. **Issuers** is the count of unique issuers (MAST_ISSR_NUM) in the intersection of the default and master issuer tables. **Defaults** is the number of default events as denoted by unique default number (Def_Num) in the default table. **Issues** is the number of debt instruments (MAST_ISSU_NUM) outstanding for the issuers that have defaulted (the majority of the issues are in default at the default date). **Avg. Issue** is the average face amount (FACE_US_AMNT) of the Issues in millions of dollars ($ million). **Total Issue** is the sum of face amount (FACE_US_AMNT) of Issues in millions of dollars ($ million). **Def_Price** is the average trading price of defaulted debt, expressed as a percentage of par, as of the default date for distressed exchanges, or within 30 days after default for all other types of default. The name of tables in DRD are in brackets [TABLES] and variable names are in parenthesis and in italics (VARIABLES).
Table 2 – Subsidiaries by fiscal year for US public firms

<table>
<thead>
<tr>
<th>Year</th>
<th>N</th>
<th>Mean</th>
<th>Stdev</th>
<th>Q1</th>
<th>Median</th>
<th>Q3</th>
<th>Max</th>
<th>ΔSubs</th>
<th>Abs(ΔSubs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994</td>
<td>646</td>
<td>29.7</td>
<td>44.4</td>
<td>6.0</td>
<td>15.0</td>
<td>34.0</td>
<td>337</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1995</td>
<td>1,942</td>
<td>25.9</td>
<td>54.1</td>
<td>4.0</td>
<td>10.0</td>
<td>26.0</td>
<td>901</td>
<td>14.8%</td>
<td>26.3%</td>
</tr>
<tr>
<td>1996</td>
<td>3,344</td>
<td>22.2</td>
<td>48.6</td>
<td>3.0</td>
<td>8.0</td>
<td>21.0</td>
<td>866</td>
<td>19.8%</td>
<td>31.5%</td>
</tr>
<tr>
<td>1997</td>
<td>3,682</td>
<td>24.0</td>
<td>61.0</td>
<td>4.0</td>
<td>8.0</td>
<td>22.0</td>
<td>1,420</td>
<td>35.5%</td>
<td>47.3%</td>
</tr>
<tr>
<td>1998</td>
<td>3,790</td>
<td>25.9</td>
<td>67.9</td>
<td>4.0</td>
<td>9.0</td>
<td>24.0</td>
<td>1,525</td>
<td>39.0%</td>
<td>50.5%</td>
</tr>
<tr>
<td>1999</td>
<td>3,814</td>
<td>27.9</td>
<td>78.2</td>
<td>4.0</td>
<td>10.0</td>
<td>25.0</td>
<td>2,123</td>
<td>35.2%</td>
<td>47.9%</td>
</tr>
<tr>
<td>2000</td>
<td>3,859</td>
<td>29.3</td>
<td>87.6</td>
<td>4.0</td>
<td>10.0</td>
<td>25.0</td>
<td>2,574</td>
<td>25.9%</td>
<td>37.7%</td>
</tr>
<tr>
<td>2001</td>
<td>3,718</td>
<td>31.5</td>
<td>89.8</td>
<td>4.0</td>
<td>10.0</td>
<td>27.0</td>
<td>2,206</td>
<td>23.0%</td>
<td>35.0%</td>
</tr>
<tr>
<td>2002</td>
<td>3,774</td>
<td>33.0</td>
<td>90.2</td>
<td>4.0</td>
<td>11.0</td>
<td>29.0</td>
<td>2,256</td>
<td>24.0%</td>
<td>37.8%</td>
</tr>
<tr>
<td>2003</td>
<td>3,746</td>
<td>35.4</td>
<td>96.8</td>
<td>4.0</td>
<td>11.0</td>
<td>31.0</td>
<td>2,433</td>
<td>19.6%</td>
<td>34.1%</td>
</tr>
<tr>
<td>2004</td>
<td>3,786</td>
<td>36.7</td>
<td>87.9</td>
<td>4.0</td>
<td>11.0</td>
<td>33.0</td>
<td>1,683</td>
<td>27.8%</td>
<td>40.7%</td>
</tr>
<tr>
<td>2005</td>
<td>3,860</td>
<td>39.3</td>
<td>90.6</td>
<td>4.0</td>
<td>12.0</td>
<td>35.0</td>
<td>1,618</td>
<td>36.0%</td>
<td>48.4%</td>
</tr>
<tr>
<td>2006</td>
<td>3,900</td>
<td>40.3</td>
<td>93.7</td>
<td>4.0</td>
<td>12.0</td>
<td>36.0</td>
<td>1,721</td>
<td>31.2%</td>
<td>43.2%</td>
</tr>
<tr>
<td>2007</td>
<td>4,023</td>
<td>38.9</td>
<td>89.7</td>
<td>4.0</td>
<td>11.0</td>
<td>36.0</td>
<td>2,237</td>
<td>28.2%</td>
<td>40.1%</td>
</tr>
<tr>
<td>2008</td>
<td>4,178</td>
<td>38.5</td>
<td>96.2</td>
<td>4.0</td>
<td>11.0</td>
<td>35.0</td>
<td>2,161</td>
<td>21.1%</td>
<td>32.9%</td>
</tr>
<tr>
<td>2009</td>
<td>4,114</td>
<td>38.6</td>
<td>99.4</td>
<td>4.0</td>
<td>11.0</td>
<td>35.0</td>
<td>2,895</td>
<td>12.2%</td>
<td>24.6%</td>
</tr>
<tr>
<td>2010</td>
<td>4,017</td>
<td>40.1</td>
<td>103.3</td>
<td>4.0</td>
<td>11.0</td>
<td>36.0</td>
<td>2,933</td>
<td>29.6%</td>
<td>42.3%</td>
</tr>
<tr>
<td>2011</td>
<td>3,957</td>
<td>34.5</td>
<td>87.9</td>
<td>2.0</td>
<td>8.0</td>
<td>28.0</td>
<td>1,654</td>
<td>5.7%</td>
<td>36.0%</td>
</tr>
<tr>
<td>2012</td>
<td>3,911</td>
<td>27.2</td>
<td>81.5</td>
<td>1.0</td>
<td>5.0</td>
<td>18.0</td>
<td>1,674</td>
<td>3.7%</td>
<td>36.7%</td>
</tr>
<tr>
<td>Total</td>
<td>68,061</td>
<td>33.0</td>
<td>85.9</td>
<td>4.0</td>
<td>10.0</td>
<td>29.0</td>
<td>2,933</td>
<td>24.0%</td>
<td>38.9%</td>
</tr>
</tbody>
</table>

Δ represent percent change from Year\(_{t-1}\) to Year\(_{t}\). Abs = absolute value.

Table 2 presents summary of subsidiaries for all US public firms with Form 10K Exhibit 21 available on [www.sec.gov/edgar](http://www.sec.gov/edgar) and is readable in the PERL Programming language. An example of Exhibit 21 is presented in Appendix B. This table is for illustrative purposes only and presents all US public firms including those not utilized in any of the subsequent analyses.
<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>N</th>
<th>Mean</th>
<th>Stdev</th>
<th>Min</th>
<th>Median</th>
<th>Max</th>
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</thead>
<tbody>
<tr>
<td><strong>Default Characteristics</strong></td>
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<td></td>
</tr>
<tr>
<td>Def_Price (% of par)</td>
<td>2,075</td>
<td>43.83</td>
<td>29.38</td>
<td>0.01</td>
<td>40.00</td>
<td>122.63</td>
</tr>
<tr>
<td>Default Price (% of par)</td>
<td>2,034</td>
<td>42.66</td>
<td>28.48</td>
<td>0.01</td>
<td>39.72</td>
<td>100.00</td>
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<tr>
<td>Debt Issue ($ millions)</td>
<td>2,893</td>
<td>278.99</td>
<td>498.82</td>
<td>1.00</td>
<td>150.00</td>
<td>13,400</td>
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<tr>
<td>Log Debt Issue</td>
<td>2,893</td>
<td>4.94</td>
<td>1.26</td>
<td>0.69</td>
<td>5.01</td>
<td>7.59</td>
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<tr>
<td>Senior Debt</td>
<td>3,637</td>
<td>0.67</td>
<td>0.47</td>
<td>0.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Senior Secured</td>
<td>3,637</td>
<td>0.24</td>
<td>0.43</td>
<td>0.00</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Senior Subordinated</td>
<td>3,637</td>
<td>0.10</td>
<td>0.31</td>
<td>0.00</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Bank Loan</td>
<td>3,637</td>
<td>0.21</td>
<td>0.41</td>
<td>0.00</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Chapter 11</td>
<td>3,637</td>
<td>0.43</td>
<td>0.49</td>
<td>0.00</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Missed Interest</td>
<td>3,637</td>
<td>0.35</td>
<td>0.48</td>
<td>0.00</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Distressed Exchange</td>
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<td>0.14</td>
<td>0.35</td>
<td>0.00</td>
<td>0.00</td>
<td>1.00</td>
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<tr>
<td><strong>Firm Characteristics</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subs</td>
<td>394</td>
<td>37.79</td>
<td>54.62</td>
<td>1.00</td>
<td>15.50</td>
<td>313.00</td>
</tr>
<tr>
<td>Dom Subs</td>
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<td>22.47</td>
<td>34.52</td>
<td>0.00</td>
<td>10.00</td>
<td>175.00</td>
</tr>
<tr>
<td>Ovrs Subs</td>
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<td>14.07</td>
<td>30.40</td>
<td>0.00</td>
<td>2.00</td>
<td>191.00</td>
</tr>
<tr>
<td>Holding Company</td>
<td>729</td>
<td>0.26</td>
<td>0.44</td>
<td>0.00</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Geog. Diversification</td>
<td>729</td>
<td>0.00</td>
<td>0.02</td>
<td>-0.06</td>
<td>0.00</td>
<td>0.10</td>
</tr>
<tr>
<td>Market-to-Book</td>
<td>716</td>
<td>1.49</td>
<td>2.26</td>
<td>0.35</td>
<td>1.18</td>
<td>57.28</td>
</tr>
<tr>
<td>Sales Growth</td>
<td>709</td>
<td>0.10</td>
<td>0.91</td>
<td>-0.98</td>
<td>-0.01</td>
<td>8.36</td>
</tr>
<tr>
<td>Return on Assets</td>
<td>711</td>
<td>0.05</td>
<td>0.18</td>
<td>-1.66</td>
<td>0.07</td>
<td>0.44</td>
</tr>
<tr>
<td>Profit Margin</td>
<td>705</td>
<td>-0.20</td>
<td>2.42</td>
<td>-45.30</td>
<td>0.06</td>
<td>0.61</td>
</tr>
<tr>
<td>Asset Tangibility</td>
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<td>0.37</td>
<td>0.24</td>
<td>0.00</td>
<td>0.34</td>
<td>0.92</td>
</tr>
<tr>
<td>Leverage</td>
<td>716</td>
<td>0.41</td>
<td>0.36</td>
<td>0.00</td>
<td>0.35</td>
<td>1.37</td>
</tr>
<tr>
<td>Negative Equity</td>
<td>729</td>
<td>0.39</td>
<td>0.49</td>
<td>0.00</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Total Assets ($ millions)</td>
<td>717</td>
<td>2,499</td>
<td>10,587</td>
<td>0.00</td>
<td>579.77</td>
<td>218,328</td>
</tr>
<tr>
<td>Log Total Assets</td>
<td>716</td>
<td>6.32</td>
<td>1.68</td>
<td>-0.85</td>
<td>6.37</td>
<td>10.07</td>
</tr>
<tr>
<td>Credit Ratings</td>
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<td>0.13</td>
<td>0.00</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Z-Score</td>
<td>716</td>
<td>-0.74</td>
<td>7.67</td>
<td>-177.6</td>
<td>0.28</td>
<td>5.66</td>
</tr>
<tr>
<td>Ext. Fin. Demand</td>
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<td>0.45</td>
<td>0.50</td>
<td>0.00</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Recession Year</td>
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<td>0.15</td>
<td>0.36</td>
<td>0.00</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Litigation</td>
<td>729</td>
<td>0.19</td>
<td>0.40</td>
<td>0.00</td>
<td>0.00</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Stdev = Standard deviation, Min = Minimum, Q1 = 25th percentile, Q3 = 75th percentile, Max = Maximum

Table 3 presents simple statistics for the variables in the primary analyses. Default characteristics are summarized at the individual defaulted debt instrument, and firm characteristics are summarized at the individual (unique) firm-year. Observations for debt instruments differ from the firm-years because a firm-year can have multiple defaulted debt instruments. Observations for the individual variables are different based on data availability. The sample covers the period 1994 to 2013. All variables are as described in Appendix A.
Table 4 – Correlation matrix for default and firm characteristics

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>[1]</td>
<td>Default Price (% of par)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[2]</td>
<td>Log Debt Issue</td>
<td>-0.05</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[3]</td>
<td>Senior Debt</td>
<td>0.26*</td>
<td>0.32*</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[4]</td>
<td>Senior Secured</td>
<td>0.42*</td>
<td>0.06*</td>
<td>0.41*</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[5]</td>
<td>Senior Subordinated</td>
<td>-0.17*</td>
<td>0.01</td>
<td>0.25*</td>
<td>-0.20*</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[6]</td>
<td>Bank Loan</td>
<td>0.43*</td>
<td>0.02</td>
<td>0.34*</td>
<td>0.80*</td>
<td>-0.18*</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[7]</td>
<td>Chapter 11</td>
<td>-0.11*</td>
<td>-0.12*</td>
<td>-0.21*</td>
<td>-0.03</td>
<td>-0.15*</td>
<td>-0.01</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>[8]</td>
<td>Missed Interest</td>
<td>-0.00</td>
<td>-0.03</td>
<td>0.11*</td>
<td>0.07*</td>
<td>0.15*</td>
<td>0.08*</td>
<td>-0.66*</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>[9]</td>
<td>Distressed Exchange</td>
<td>0.20*</td>
<td>0.21*</td>
<td>0.23*</td>
<td>-0.03</td>
<td>0.02</td>
<td>-0.05*</td>
<td>-0.36*</td>
<td>-0.30*</td>
<td>1</td>
</tr>
<tr>
<td>[10]</td>
<td>Log Subsidiaries</td>
<td>-0.08*</td>
<td>0.19*</td>
<td>0.07*</td>
<td>-0.05</td>
<td>-0.11*</td>
<td>-0.06*</td>
<td>0.08*</td>
<td>-0.13*</td>
<td>0.06*</td>
</tr>
<tr>
<td>[11]</td>
<td>Holding Company</td>
<td>-0.10*</td>
<td>0.03</td>
<td>-0.02</td>
<td>0.00</td>
<td>-0.02</td>
<td>0.05*</td>
<td>-0.00</td>
<td>0.06*</td>
<td>-0.08*</td>
</tr>
<tr>
<td>[12]</td>
<td>Market-to-Book</td>
<td>-0.03</td>
<td>-0.00</td>
<td>0.04</td>
<td>-0.01</td>
<td>0.11*</td>
<td>-0.02</td>
<td>-0.06*</td>
<td>0.07*</td>
<td>-0.01</td>
</tr>
<tr>
<td>[13]</td>
<td>Sales Growth</td>
<td>-0.01</td>
<td>0.01</td>
<td>-0.01</td>
<td>0.02</td>
<td>0.00</td>
<td>0.02</td>
<td>-0.02</td>
<td>-0.05*</td>
<td>0.05*</td>
</tr>
<tr>
<td>[14]</td>
<td>Return on Assets</td>
<td>0.06</td>
<td>0.09*</td>
<td>0.06*</td>
<td>0.07*</td>
<td>0.03</td>
<td>0.07*</td>
<td>-0.07*</td>
<td>0.13*</td>
<td>-0.12*</td>
</tr>
<tr>
<td>[15]</td>
<td>Profit Margin</td>
<td>0.03</td>
<td>0.01</td>
<td>0.01</td>
<td>0.00</td>
<td>0.01</td>
<td>0.01</td>
<td>-0.03</td>
<td>0.07*</td>
<td>-0.02</td>
</tr>
<tr>
<td>[16]</td>
<td>Asset Tangibility</td>
<td>-0.02</td>
<td>-0.08*</td>
<td>-0.17*</td>
<td>-0.05*</td>
<td>-0.14*</td>
<td>-0.06*</td>
<td>0.21*</td>
<td>-0.09*</td>
<td>-0.15*</td>
</tr>
<tr>
<td>[17]</td>
<td>Leverage</td>
<td>0.00</td>
<td>0.06*</td>
<td>0.14*</td>
<td>0.06*</td>
<td>0.06*</td>
<td>0.02</td>
<td>-0.16*</td>
<td>0.04</td>
<td>0.18*</td>
</tr>
<tr>
<td>[18]</td>
<td>Negative Equity</td>
<td>-0.04</td>
<td>-0.02</td>
<td>0.04</td>
<td>0.03</td>
<td>-0.03</td>
<td>-0.01</td>
<td>0.09*</td>
<td>-0.05*</td>
<td>-0.01</td>
</tr>
<tr>
<td>[19]</td>
<td>Log Total Assets</td>
<td>-0.04</td>
<td>0.19*</td>
<td>-0.16*</td>
<td>-0.20*</td>
<td>-0.22*</td>
<td>-0.19*</td>
<td>0.39*</td>
<td>-0.42*</td>
<td>0.07*</td>
</tr>
<tr>
<td>[20]</td>
<td>Credit Ratings</td>
<td>0.08*</td>
<td>0.09*</td>
<td>0.04</td>
<td>-0.05*</td>
<td>-0.04*</td>
<td>-0.04</td>
<td>-0.03</td>
<td>0.02</td>
<td>0.04</td>
</tr>
<tr>
<td>[21]</td>
<td>Z-Score</td>
<td>0.03</td>
<td>-0.01</td>
<td>-0.04</td>
<td>0.01</td>
<td>-0.06*</td>
<td>0.02</td>
<td>0.07*</td>
<td>-0.06*</td>
<td>-0.01</td>
</tr>
<tr>
<td>[22]</td>
<td>Ext. Fin. Demand</td>
<td>-0.02</td>
<td>0.12*</td>
<td>0.01</td>
<td>-0.08*</td>
<td>-0.08*</td>
<td>-0.07*</td>
<td>-0.00</td>
<td>-0.05*</td>
<td>0.12*</td>
</tr>
<tr>
<td>[23]</td>
<td>Recession Year</td>
<td>-0.06</td>
<td>0.18*</td>
<td>0.19*</td>
<td>0.06*</td>
<td>0.00</td>
<td>0.04</td>
<td>-0.05*</td>
<td>-0.15*</td>
<td>0.34*</td>
</tr>
<tr>
<td>[24]</td>
<td>Litigation</td>
<td>0.02</td>
<td>-0.12*</td>
<td>-0.03</td>
<td>0.02</td>
<td>0.03</td>
<td>0.05*</td>
<td>0.07*</td>
<td>0.01</td>
<td>-0.07*</td>
</tr>
</tbody>
</table>
Table 4 presents simple pairwise correlation matrix for the variables in the primary analyses. Each observation represents an individual debt instrument. The sample covers the period 1994 to 2013. All variables are as described in Appendix A.
Table 5 – Baseline results on creditor recovery upon default
Dependent variable: Price of debt instruments at default (Default Price, % of par)

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Column (1)</th>
<th></th>
<th>Column (2)</th>
<th></th>
<th>Column (3)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coeff.</td>
<td>t-stat</td>
<td>Coeff.</td>
<td>t-stat</td>
<td>Coeff.</td>
<td>t-stat</td>
</tr>
<tr>
<td>Constant</td>
<td>50.599***</td>
<td>(6.044)</td>
<td>51.508***</td>
<td>(4.525)</td>
<td>53.246***</td>
<td>(4.632)</td>
</tr>
<tr>
<td><strong>Holding Company</strong></td>
<td>-7.322***</td>
<td>(-2.86)</td>
<td>-8.732***</td>
<td>(-2.98)</td>
<td>-3.108***</td>
<td>(-2.64)</td>
</tr>
<tr>
<td><strong>Log Subs</strong></td>
<td>-3.108***</td>
<td>(-4.32)</td>
<td>-11.50***</td>
<td>(-3.59)</td>
<td>-11.43***</td>
<td>(-3.67)</td>
</tr>
<tr>
<td><strong>Log Debt Issue</strong></td>
<td>-3.542***</td>
<td>(-4.06)</td>
<td>-2.506**</td>
<td>(-2.16)</td>
<td>-2.501**</td>
<td>(-2.18)</td>
</tr>
<tr>
<td><strong>Senior Debt</strong></td>
<td>16.973***</td>
<td>(5.977)</td>
<td>15.134***</td>
<td>(4.083)</td>
<td>15.074***</td>
<td>(4.118)</td>
</tr>
<tr>
<td><strong>Senior Secured</strong></td>
<td>15.688***</td>
<td>(3.682)</td>
<td>25.662***</td>
<td>(5.230)</td>
<td>25.770***</td>
<td>(5.270)</td>
</tr>
<tr>
<td><strong>Senior Subordinated</strong></td>
<td>-10.53***</td>
<td>(-4.32)</td>
<td>-11.50***</td>
<td>(-3.59)</td>
<td>-11.43***</td>
<td>(-3.67)</td>
</tr>
<tr>
<td><strong>Bank Loan</strong></td>
<td>20.525***</td>
<td>(4.548)</td>
<td>15.063***</td>
<td>(3.021)</td>
<td>14.692***</td>
<td>(2.937)</td>
</tr>
<tr>
<td><strong>Chapter 11</strong></td>
<td>-5.767</td>
<td>(-1.31)</td>
<td>-4.890</td>
<td>(-0.88)</td>
<td>-3.842</td>
<td>(-0.65)</td>
</tr>
<tr>
<td><strong>Missed Interest</strong></td>
<td>-0.713</td>
<td>(-0.17)</td>
<td>1.041</td>
<td>(0.199)</td>
<td>1.932</td>
<td>(0.344)</td>
</tr>
<tr>
<td><strong>Market-to-Book</strong></td>
<td>-0.954</td>
<td>(-0.71)</td>
<td>-0.929</td>
<td>(-0.53)</td>
<td>-1.421</td>
<td>(-0.82)</td>
</tr>
<tr>
<td><strong>Sales Growth</strong></td>
<td>-0.146</td>
<td>(-0.16)</td>
<td>1.431</td>
<td>(1.244)</td>
<td>0.886</td>
<td>(0.730)</td>
</tr>
<tr>
<td><strong>Return on Assets</strong></td>
<td>0.134</td>
<td>(0.021)</td>
<td>-3.816</td>
<td>(-0.41)</td>
<td>-1.025</td>
<td>(-0.12)</td>
</tr>
<tr>
<td><strong>Profit Margin</strong></td>
<td>0.401</td>
<td>(1.391)</td>
<td>0.979</td>
<td>(1.651)</td>
<td>0.978*</td>
<td>(1.663)</td>
</tr>
<tr>
<td><strong>Asset Tangibility</strong></td>
<td>2.777</td>
<td>(0.543)</td>
<td>0.290</td>
<td>(0.048)</td>
<td>-1.549</td>
<td>(-0.26)</td>
</tr>
<tr>
<td><strong>Leverage</strong></td>
<td>-3.025</td>
<td>(-1.38)</td>
<td>-3.262</td>
<td>(-1.07)</td>
<td>-4.201</td>
<td>(-1.41)</td>
</tr>
<tr>
<td><strong>Negative Equity</strong></td>
<td>-0.252</td>
<td>(-0.13)</td>
<td>1.015</td>
<td>(0.384)</td>
<td>0.354</td>
<td>(0.140)</td>
</tr>
<tr>
<td><strong>Log Total Assets</strong></td>
<td>-0.229</td>
<td>(-0.32)</td>
<td>0.804</td>
<td>(0.678)</td>
<td>0.774</td>
<td>(0.682)</td>
</tr>
<tr>
<td><strong>Credit Ratings</strong></td>
<td>15.570**</td>
<td>(2.089)</td>
<td>17.278*</td>
<td>(1.699)</td>
<td>15.554*</td>
<td>(1.731)</td>
</tr>
<tr>
<td><strong>Z-Score</strong></td>
<td>-0.328</td>
<td>(-0.84)</td>
<td>-0.516</td>
<td>(-1.18)</td>
<td>-0.608</td>
<td>(-1.48)</td>
</tr>
<tr>
<td><strong>Ext. Fin. Demand</strong></td>
<td>-2.800</td>
<td>(-1.20)</td>
<td>1.814</td>
<td>(0.648)</td>
<td>2.856</td>
<td>(1.041)</td>
</tr>
<tr>
<td><strong>Recession Year</strong></td>
<td>0.718</td>
<td>(0.144)</td>
<td>0.262</td>
<td>(0.034)</td>
<td>0.981</td>
<td>(0.138)</td>
</tr>
<tr>
<td><strong>Litigation</strong></td>
<td>1.046</td>
<td>(0.264)</td>
<td>2.542</td>
<td>(0.525)</td>
<td>1.923</td>
<td>(0.384)</td>
</tr>
<tr>
<td>Year Indicators</td>
<td>Yes</td>
<td></td>
<td>Yes</td>
<td></td>
<td>Yes</td>
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</tr>
<tr>
<td>Industry Indicators</td>
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<td></td>
<td>Yes</td>
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<td>Yes</td>
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<td>Adjusted R-squared</td>
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<td></td>
<td>0.549</td>
<td></td>
<td>0.561</td>
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</table>

Robust t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 5 presents the results on the relation between recovery prices of debt instruments upon default and legal separation. Industry fixed effects are defined according to Moody’s 11 industry classification. The sample period for this analysis is between 1994 and 2013 and each observation represents an individual debt instrument. The t-statistics, reported in parentheses, are based on standard errors adjusted for clustering at the firm. Variables are as described in Appendix A.
Table 6 – Legal separation in domestic and multinational firms
Dependent variable: Price of debt instruments at default (Default Price, % of par)

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Column (1) Domestic Firms</th>
<th></th>
<th>Column (2) Multinational Firms</th>
<th></th>
</tr>
</thead>
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<tr>
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<td>Coeff.</td>
<td>t-stat</td>
<td>Coeff.</td>
<td>t-stat</td>
</tr>
<tr>
<td>Constant</td>
<td>73.595***</td>
<td>(3.436)</td>
<td>59.761***</td>
<td>(5.079)</td>
</tr>
<tr>
<td><strong>Holding Company</strong></td>
<td>-2.983</td>
<td>(-0.586)</td>
<td>-11.250***</td>
<td>(-3.717)</td>
</tr>
<tr>
<td><strong>Log Dom Subs</strong></td>
<td>-3.182**</td>
<td>(-2.002)</td>
<td>-1.065</td>
<td>(-0.833)</td>
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<tr>
<td><strong>Log Ovrs Subs</strong></td>
<td></td>
<td></td>
<td><strong>-3.284</strong>*</td>
<td>(-2.699)</td>
</tr>
<tr>
<td>Log Debt Issue</td>
<td>0.287</td>
<td>(0.158)</td>
<td>-2.923**</td>
<td>(-2.365)</td>
</tr>
<tr>
<td>Senior Debt</td>
<td>20.299***</td>
<td>(4.044)</td>
<td>14.431***</td>
<td>(3.241)</td>
</tr>
<tr>
<td>Senior Secured</td>
<td>19.650***</td>
<td>(3.180)</td>
<td>28.418***</td>
<td>(4.017)</td>
</tr>
<tr>
<td>Senior Subordinated</td>
<td>-12.438**</td>
<td>(-2.448)</td>
<td>-12.307***</td>
<td>(-3.421)</td>
</tr>
<tr>
<td>Bank Loan</td>
<td>19.644***</td>
<td>(2.968)</td>
<td>11.505</td>
<td>(1.624)</td>
</tr>
<tr>
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<td>-11.346</td>
<td>(-1.419)</td>
<td>-5.636</td>
<td>(-0.948)</td>
</tr>
<tr>
<td>Missed Interest</td>
<td>-15.063**</td>
<td>(-2.140)</td>
<td>3.122</td>
<td>(0.554)</td>
</tr>
<tr>
<td>Distressed Exchange</td>
<td>13.848</td>
<td>(1.627)</td>
<td>23.752***</td>
<td>(3.395)</td>
</tr>
<tr>
<td>Market-to-Book</td>
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<td>(-1.159)</td>
<td>-1.687</td>
<td>(-0.587)</td>
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<tr>
<td>Sales Growth</td>
<td>-10.466*</td>
<td>(-1.686)</td>
<td>2.066*</td>
<td>(1.670)</td>
</tr>
<tr>
<td>Return on Assets</td>
<td>-2.863</td>
<td>(-0.170)</td>
<td>7.208</td>
<td>(0.718)</td>
</tr>
<tr>
<td>Profit Margin</td>
<td>3.204***</td>
<td>(2.824)</td>
<td>0.098</td>
<td>(0.148)</td>
</tr>
<tr>
<td>Asset Tangibility</td>
<td>-1.604</td>
<td>(-0.199)</td>
<td>-0.179</td>
<td>(-0.022)</td>
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<tr>
<td>Leverage</td>
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<tr>
<td>Negative Equity</td>
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<td>(0.311)</td>
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<td>Log Total Assets</td>
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<tr>
<td>Credit Ratings</td>
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<td>22.370**</td>
<td>(2.411)</td>
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<tr>
<td>Z-Score</td>
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<td>(-1.655)</td>
</tr>
<tr>
<td>Ext. Fin. Demand</td>
<td>8.296*</td>
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</tr>
<tr>
<td>Recession Year</td>
<td>-65.026***</td>
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<td>Litigation</td>
<td>3.728</td>
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<td>3.843</td>
<td>(0.591)</td>
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</table>

**Dom Subs = Ovrs Subs:**

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<thead>
<tr>
<th>F-test</th>
<th>p-value</th>
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<tbody>
<tr>
<td>1.430</td>
<td>0.233</td>
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</table>

Robust t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 6 column 1 presents results on recovery upon default of domestic firms (i.e., without overseas subsidiaries). Column 2 presents results on recovery upon default of multinational firms (i.e., with domestic and foreign subsidiaries). Industry is defined according to Moody’s 11 industry classification. The sample period for this analysis is between 1994 and 2013 and each observation represents an individual debt instrument. The t-statistics, reported in parentheses, are based on standard errors adjusted for clustering at the firm. Variables are as described in Appendix A.
Table 7 – Creditor recovery rates by country governance characteristics
Dependent variable: Price of debt instruments at default (\(\text{Default Price, \% of par}\))

<table>
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<tr>
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<th>Column (3)</th>
<th>Chi-Sq.</th>
<th>p-value</th>
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<td>Coeff.</td>
<td>(t)-stat</td>
<td>Weak Governance</td>
<td>Coeff.</td>
<td>(t)-stat</td>
<td>Difference</td>
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<td>107.890***</td>
<td>(5.532)</td>
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<td></td>
</tr>
<tr>
<td><strong>Holding Company</strong></td>
<td>-4.429</td>
<td>(-1.16)</td>
<td>-17.658***</td>
<td>(-4.52)</td>
<td>6.534***</td>
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</tr>
<tr>
<td><strong>Log Subs</strong></td>
<td>-2.737**</td>
<td>(-2.20)</td>
<td>-4.504**</td>
<td>(-2.56)</td>
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<td>0.380</td>
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<td>Log Debt Issue</td>
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<td>-1.176</td>
<td>(-0.10)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Senior Debt</td>
<td>9.384</td>
<td>(1.612)</td>
<td>20.249***</td>
<td>(3.671)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Senior Secured</td>
<td>25.038***</td>
<td>(4.344)</td>
<td>22.232**</td>
<td>(2.387)</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Senior Subordinated</td>
<td>-10.075**</td>
<td>(-2.55)</td>
<td>-17.928***</td>
<td>(-3.62)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Bank Loan</td>
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<td>(2.749)</td>
<td>16.950*</td>
<td>(1.760)</td>
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<td></td>
</tr>
<tr>
<td>Chapter 11</td>
<td>3.558</td>
<td>(0.477)</td>
<td>-22.522***</td>
<td>(-2.76)</td>
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<td></td>
</tr>
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<td>Missed Interest</td>
<td>5.512</td>
<td>(0.817)</td>
<td>-10.469</td>
<td>(-1.30)</td>
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<td></td>
</tr>
<tr>
<td>Distressed Exchange</td>
<td>37.098***</td>
<td>(4.718)</td>
<td>7.396</td>
<td>(0.822)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market-to-Book</td>
<td>-0.561</td>
<td>(-0.27)</td>
<td>1.252</td>
<td>(0.228)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Sales Growth</td>
<td>-2.175</td>
<td>(-0.85)</td>
<td>4.834**</td>
<td>(2.612)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Return on Assets</td>
<td>13.375</td>
<td>(1.178)</td>
<td>15.184</td>
<td>(0.650)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Profit Margin</td>
<td>1.247</td>
<td>(1.560)</td>
<td>0.921</td>
<td>(1.026)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asset Tangibility</td>
<td>0.624</td>
<td>(0.083)</td>
<td>-16.780</td>
<td>(-1.23)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leverage</td>
<td>-6.153</td>
<td>(-1.57)</td>
<td>-8.705</td>
<td>(-1.18)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Equity</td>
<td>1.197</td>
<td>(0.342)</td>
<td>-0.823</td>
<td>(-0.24)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log Total Assets</td>
<td>2.341</td>
<td>(1.432)</td>
<td>-0.759</td>
<td>(-0.39)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Credit Ratings</td>
<td>0.357</td>
<td>(0.103)</td>
<td>-7.589*</td>
<td>(-1.73)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Z-Score</td>
<td>-1.176</td>
<td>(-1.47)</td>
<td>-0.566</td>
<td>(-1.28)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ext. Fin. Demand</td>
<td>8.434**</td>
<td>(2.186)</td>
<td>8.557</td>
<td>(1.563)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recession Year</td>
<td>6.703</td>
<td>(0.578)</td>
<td>-8.165</td>
<td>(-0.80)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Litigation</strong></td>
<td>-1.692</td>
<td>(-0.30)</td>
<td>-4.494</td>
<td>(-0.38)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Observations 572  473
Adjusted R-squared 0.574  0.625

Robust \(t\)-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 7 presents the results on the relation between recovery prices of debt instruments upon default and legal separation by the strength of country governance in the location where subsidiaries are located. Strong governance represents that the firm-years are for firms with at least one subsidiary is a country with a score in the bottom rank for the rule of law as measured in the World Bank Governance Indicators. Industry is defined according to Moody’s 11 industry classification. The \(t\)-statistics, reported in parentheses, are based on standard errors adjusted for clustering at the firm. Variables are as described in Appendix A.
Table 8 – Controlling for geographic diversification
Dependent variable: Price of debt instruments at default (Default Price, % of par)

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Column (1)</th>
<th></th>
<th>Column (2)</th>
<th></th>
<th>Column (3)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coeff.</td>
<td>t-stat</td>
<td>Coeff.</td>
<td>t-stat</td>
<td>Coeff.</td>
<td>t-stat</td>
</tr>
<tr>
<td>Constant</td>
<td>51.406***</td>
<td>(4.215)</td>
<td>51.253***</td>
<td>(4.536)</td>
<td>53.469***</td>
<td>(4.705)</td>
</tr>
<tr>
<td>Holding Company</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-7.966***</td>
<td>(-2.82)</td>
</tr>
<tr>
<td>Log Dom Subs</td>
<td></td>
<td></td>
<td>-1.637</td>
<td>(-1.47)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log Ovrs Subs</td>
<td></td>
<td></td>
<td>-2.317**</td>
<td>(-2.18)</td>
<td>-2.191**</td>
<td>(-2.13)</td>
</tr>
<tr>
<td>Geog. Diversification</td>
<td>127.045**</td>
<td>(2.203)</td>
<td>104.870*</td>
<td>(1.868)</td>
<td>83.159</td>
<td>(1.610)</td>
</tr>
<tr>
<td>Log Debt Issue</td>
<td>-2.316**</td>
<td>(-2.01)</td>
<td>-2.154**</td>
<td>(-1.97)</td>
<td>-2.215**</td>
<td>(-2.01)</td>
</tr>
<tr>
<td>Senior Debt</td>
<td>14.973***</td>
<td>(3.893)</td>
<td>14.031***</td>
<td>(3.703)</td>
<td>14.268***</td>
<td>(3.900)</td>
</tr>
<tr>
<td>Senior Secured</td>
<td>25.905***</td>
<td>(5.285)</td>
<td>25.796***</td>
<td>(5.440)</td>
<td>25.672***</td>
<td>(5.325)</td>
</tr>
<tr>
<td>Senior Subordinated</td>
<td>-10.50***</td>
<td>(-3.31)</td>
<td>-10.56***</td>
<td>(-3.33)</td>
<td>-10.94***</td>
<td>(-3.55)</td>
</tr>
<tr>
<td>Bank Loan</td>
<td>14.452***</td>
<td>(2.884)</td>
<td>14.892***</td>
<td>(2.997)</td>
<td>14.793***</td>
<td>(2.956)</td>
</tr>
<tr>
<td>Chapter 11</td>
<td>-2.808</td>
<td>(-0.47)</td>
<td>-3.606</td>
<td>(-0.59)</td>
<td>-3.865</td>
<td>(-0.64)</td>
</tr>
<tr>
<td>Missed Interest</td>
<td>1.878</td>
<td>(0.330)</td>
<td>1.251</td>
<td>(0.218)</td>
<td>1.585</td>
<td>(0.271)</td>
</tr>
<tr>
<td>Market-to-Book</td>
<td>-1.35</td>
<td>(-0.82)</td>
<td>-0.751</td>
<td>(-0.46)</td>
<td>-1.274</td>
<td>(-0.75)</td>
</tr>
<tr>
<td>Sales Growth</td>
<td>1.268</td>
<td>(1.047)</td>
<td>1.390</td>
<td>(1.061)</td>
<td>0.941</td>
<td>(0.730)</td>
</tr>
<tr>
<td>Return on Assets</td>
<td>-4.582</td>
<td>(-0.49)</td>
<td>-1.416</td>
<td>(-0.16)</td>
<td>0.237</td>
<td>(0.027)</td>
</tr>
<tr>
<td>Profit Margin</td>
<td>0.960*</td>
<td>(1.805)</td>
<td>0.828</td>
<td>(1.554)</td>
<td>0.864</td>
<td>(1.505)</td>
</tr>
<tr>
<td>Asset Tangibility</td>
<td>4.608</td>
<td>(0.699)</td>
<td>4.149</td>
<td>(0.647)</td>
<td>0.860</td>
<td>(0.145)</td>
</tr>
<tr>
<td>Leverage</td>
<td>-3.056</td>
<td>(-1.01)</td>
<td>-4.240</td>
<td>(-1.37)</td>
<td>-4.815</td>
<td>(-1.55)</td>
</tr>
<tr>
<td>Negative Equity</td>
<td>1.618</td>
<td>(0.607)</td>
<td>2.813</td>
<td>(1.053)</td>
<td>1.776</td>
<td>(0.679)</td>
</tr>
<tr>
<td>Log Total Assets</td>
<td>-0.648</td>
<td>(-0.62)</td>
<td>0.098</td>
<td>(0.094)</td>
<td>0.642</td>
<td>(0.572)</td>
</tr>
<tr>
<td>Credit Ratings</td>
<td>13.587</td>
<td>(1.270)</td>
<td>17.220*</td>
<td>(1.701)</td>
<td>17.545**</td>
<td>(2.055)</td>
</tr>
<tr>
<td>Z-Score</td>
<td>-0.628</td>
<td>(-1.63)</td>
<td>-0.615</td>
<td>(-1.61)</td>
<td>-0.670*</td>
<td>(-1.73)</td>
</tr>
<tr>
<td>Ext. Fin. Demand</td>
<td>0.620</td>
<td>(0.204)</td>
<td>-0.083</td>
<td>(-0.03)</td>
<td>2.124</td>
<td>(0.757)</td>
</tr>
<tr>
<td>Recession Year</td>
<td>2.270</td>
<td>(0.332)</td>
<td>3.244</td>
<td>(0.462)</td>
<td>3.600</td>
<td>(0.523)</td>
</tr>
<tr>
<td>Litigation</td>
<td>0.274</td>
<td>(0.055)</td>
<td>0.393</td>
<td>(0.075)</td>
<td>0.467</td>
<td>(0.088)</td>
</tr>
<tr>
<td>Year Indicators</td>
<td>Yes</td>
<td></td>
<td>Yes</td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Industry Indicators</td>
<td>Yes</td>
<td></td>
<td>Yes</td>
<td></td>
<td>Yes</td>
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<tr>
<td>Observations</td>
<td>1,087</td>
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<td>1,087</td>
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<td>1,087</td>
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</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.544</td>
<td></td>
<td>0.552</td>
<td></td>
<td>0.565</td>
<td></td>
</tr>
</tbody>
</table>

Robust t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 8 presents the results on the relation between recovery prices of debt instruments upon default and legal separation while controlling for geographic diversification to document whether subsidiaries, especially overseas, simply proxy for diversification. Industry is defined according to Moody’s 11 industry classification. The t-statistics, reported in parentheses, are based on standard errors adjusted for clustering at the firm. Variables are as described in Appendix A.
Table 9 – Creditor recovery rates when obligation has backing

Dependent variable: Price of debt instruments at default (Default Price, % of par)

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Column (1) No Backing</th>
<th></th>
<th>Column (2) Backing</th>
<th></th>
<th>Column (3) Difference</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Coeff.</td>
<td>t-stat</td>
<td>Coeff.</td>
<td>t-stat</td>
<td>Chi-Sq.</td>
</tr>
<tr>
<td>Constant</td>
<td>68.336***</td>
<td>(5.408)</td>
<td>8.007</td>
<td>(0.377)</td>
<td></td>
</tr>
<tr>
<td>Holding Company</td>
<td>-3.987***</td>
<td>(-1.23)</td>
<td>-26.81***</td>
<td>(-5.68)</td>
<td>20.70***</td>
</tr>
<tr>
<td>Log Subs</td>
<td>-2.633**</td>
<td>(-2.02)</td>
<td>3.21</td>
<td>(1.061)</td>
<td>3.937**</td>
</tr>
<tr>
<td>Log Debt Issue</td>
<td>-3.242***</td>
<td>(-2.85)</td>
<td>-0.413</td>
<td>(-0.16)</td>
<td></td>
</tr>
<tr>
<td>Senior Debt</td>
<td>16.051***</td>
<td>(3.505)</td>
<td>16.540**</td>
<td>(2.247)</td>
<td></td>
</tr>
<tr>
<td>Senior Secured</td>
<td>21.776***</td>
<td>(4.128)</td>
<td>42.883***</td>
<td>(4.103)</td>
<td></td>
</tr>
<tr>
<td>Senior Subordinated</td>
<td>-11.49***</td>
<td>(-3.24)</td>
<td>-11.739</td>
<td>(-1.09)</td>
<td></td>
</tr>
<tr>
<td>Bank Loan</td>
<td>15.709***</td>
<td>(2.834)</td>
<td>15.384</td>
<td>(1.297)</td>
<td></td>
</tr>
<tr>
<td>Chapter 11</td>
<td>-5.524</td>
<td>(-0.90)</td>
<td>-14.868*</td>
<td>(-1.87)</td>
<td></td>
</tr>
<tr>
<td>Missed Interest</td>
<td>0.592</td>
<td>(0.105)</td>
<td>4.129</td>
<td>(0.503)</td>
<td></td>
</tr>
<tr>
<td>Distressed Exchange</td>
<td>21.942***</td>
<td>(3.141)</td>
<td>38.475***</td>
<td>(4.034)</td>
<td></td>
</tr>
<tr>
<td>Market-to-Book</td>
<td>-3.324</td>
<td>(-1.47)</td>
<td>6.919*</td>
<td>(1.888)</td>
<td></td>
</tr>
<tr>
<td>Sales Growth</td>
<td>1.278</td>
<td>(1.074)</td>
<td>11.513</td>
<td>(0.836)</td>
<td></td>
</tr>
<tr>
<td>Return on Assets</td>
<td>-8.805</td>
<td>(-0.89)</td>
<td>69.792**</td>
<td>(2.243)</td>
<td></td>
</tr>
<tr>
<td>Profit Margin</td>
<td>1.438**</td>
<td>(2.142)</td>
<td>-3.104*</td>
<td>(-1.97)</td>
<td></td>
</tr>
<tr>
<td>Asset Tangibility</td>
<td>0.670</td>
<td>(0.098)</td>
<td>-18.234</td>
<td>(-1.13)</td>
<td></td>
</tr>
<tr>
<td>Leverage</td>
<td>-1.633</td>
<td>(-0.49)</td>
<td>-14.63</td>
<td>(-1.64)</td>
<td></td>
</tr>
<tr>
<td>Negative Equity</td>
<td>0.158</td>
<td>(0.057)</td>
<td>-2.272</td>
<td>(-0.53)</td>
<td></td>
</tr>
<tr>
<td>Log Total Assets</td>
<td>0.062</td>
<td>(0.046)</td>
<td>1.116</td>
<td>(0.440)</td>
<td></td>
</tr>
<tr>
<td>Credit Ratings</td>
<td>1.742</td>
<td>(0.550)</td>
<td>-0.517</td>
<td>(-0.06)</td>
<td></td>
</tr>
<tr>
<td>Z-Score</td>
<td>-0.853**</td>
<td>(-2.21)</td>
<td>-1.277</td>
<td>(-0.79)</td>
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</tr>
<tr>
<td>Ext. Fin. Demand</td>
<td>0.385</td>
<td>(0.128)</td>
<td>11.786</td>
<td>(1.501)</td>
<td></td>
</tr>
<tr>
<td>Recession Year</td>
<td>-1.776</td>
<td>(-0.25)</td>
<td>26.810**</td>
<td>(2.448)</td>
<td></td>
</tr>
<tr>
<td>Litigation</td>
<td>5.409</td>
<td>(1.180)</td>
<td>-44.96***</td>
<td>(-2.83)</td>
<td></td>
</tr>
</tbody>
</table>

Robust t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 9 presents the results on the relation between recovery prices of debt instruments upon default and legal separation when the obligation has backing in addition to the direct issuer (Back. Industry is defined according to Moody’s 11 industry classification. The t-statistics, reported in parentheses, are based on standard errors adjusted for clustering at the firm. Variables are as described in Appendix A.
Table 10 – Minority interest as a measure of extent of legal separation
Dependent variable: Price of debt instruments at default (Default Price, % of par)

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Column (1)</th>
<th>Column (2)</th>
<th>Column (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coeff.</td>
<td>t-stat</td>
<td>Coeff.</td>
</tr>
<tr>
<td>Constant</td>
<td>43.429***</td>
<td>(5.236)</td>
<td>48.135***</td>
</tr>
<tr>
<td>Minority Int.</td>
<td>-0.014***</td>
<td>(-3.695)</td>
<td></td>
</tr>
<tr>
<td>Minority Int. (Rank)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Holding Company</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Geog Diversification</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Senior Debt</td>
<td>15.108*** (4.651)</td>
<td>15.794*** (4.919)</td>
<td>15.562*** (4.930)</td>
</tr>
<tr>
<td>Senior Secured</td>
<td>15.314*** (3.421)</td>
<td>15.126*** (3.426)</td>
<td>15.495*** (3.498)</td>
</tr>
<tr>
<td>Chapter 11</td>
<td>-7.441* (-1.735)</td>
<td>-7.131 (-1.646)</td>
<td>-6.930 (-1.583)</td>
</tr>
<tr>
<td>Missed Interest</td>
<td>-1.491 (-0.380)</td>
<td>-1.452 (-0.367)</td>
<td>-1.290 (-0.318)</td>
</tr>
<tr>
<td>Market-to-Book</td>
<td>-0.218 (-0.168)</td>
<td>0.034 (0.026)</td>
<td>-0.574 (-0.449)</td>
</tr>
<tr>
<td>Sales Growth</td>
<td>0.780 (0.927)</td>
<td>0.824 (0.942)</td>
<td>0.542 (0.614)</td>
</tr>
<tr>
<td>Return on Assets</td>
<td>-3.064 (-0.484)</td>
<td>-3.585 (-0.562)</td>
<td>-3.864 (-0.619)</td>
</tr>
<tr>
<td>Profit Margin</td>
<td>0.353 (1.139)</td>
<td>0.355 (1.129)</td>
<td>0.397 (1.335)</td>
</tr>
<tr>
<td>Asset Tangibility</td>
<td>-0.585 (-0.107)</td>
<td>-0.870 (-0.156)</td>
<td>-1.694 (-0.319)</td>
</tr>
<tr>
<td>Leverage</td>
<td>-3.175 (-1.427)</td>
<td>-3.304 (-1.475)</td>
<td>-3.268 (-1.479)</td>
</tr>
<tr>
<td>Negative Equity</td>
<td>1.582 (0.771)</td>
<td>0.984 (0.471)</td>
<td>0.488 (0.233)</td>
</tr>
<tr>
<td>Log Total Assets</td>
<td>0.557 (0.694)</td>
<td>0.501 (0.584)</td>
<td>0.424 (0.513)</td>
</tr>
<tr>
<td>Credit Ratings</td>
<td>26.659*** (3.107)</td>
<td>15.304 (1.452)</td>
<td>13.630 (1.438)</td>
</tr>
<tr>
<td>Z-Score</td>
<td>-0.188 (-0.435)</td>
<td>-0.202 (-0.479)</td>
<td>-0.345 (-0.898)</td>
</tr>
<tr>
<td>Ext. Fin. Demand</td>
<td>-0.815 (-0.347)</td>
<td>-0.086 (-0.036)</td>
<td>0.028 (0.012)</td>
</tr>
<tr>
<td>Recession Year</td>
<td>4.662 (0.931)</td>
<td>4.993 (0.969)</td>
<td>4.888 (0.972)</td>
</tr>
<tr>
<td>Litigation</td>
<td>-0.976 (-0.250)</td>
<td>-0.993 (-0.254)</td>
<td>-1.873 (-0.466)</td>
</tr>
<tr>
<td>Year Indicators</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Industry Indicators</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Observations</td>
<td>1,425</td>
<td>1,425</td>
<td>1,425</td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.489</td>
<td>0.482</td>
<td>0.492</td>
</tr>
</tbody>
</table>

Robust t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 10 presents the results on minority interest ownership in the issuer’s subsidiaries as a measure of the extent of legal separation. Minority interest (MIBT, Compustat) is the total non-controlling interest of a company. Rank represents ranked variable by year and industry. Industry is defined according to Moody’s 11 industry classification. The t-statistics, reported in parentheses, are based on standard errors adjusted for clustering at the firm. All other variables are as described in Appendix A.
Table 11 – Creditor recovery rates for holding companies with minority interest

Dependent variable: Price of debt instruments at default (Default Price, % of par)

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Column (1)</th>
<th>Column (2)</th>
<th>Column (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minority Interest = 0</td>
<td>Minority Interest &gt; 0</td>
<td>Difference</td>
</tr>
<tr>
<td></td>
<td>Coeff.</td>
<td>t-stat</td>
<td>Coeff.</td>
</tr>
<tr>
<td>Constant</td>
<td>42.128***</td>
<td>(4.570)</td>
<td>77.444***</td>
</tr>
<tr>
<td><strong>Holding Company</strong></td>
<td>-1.775</td>
<td>(-0.635)</td>
<td>-13.660***</td>
</tr>
<tr>
<td>Log Debt Issue</td>
<td>-2.279**</td>
<td>(-1.977)</td>
<td>-3.994**</td>
</tr>
<tr>
<td>Senior Debt</td>
<td>11.063***</td>
<td>(2.761)</td>
<td>20.639***</td>
</tr>
<tr>
<td>Senior Secured</td>
<td>18.813***</td>
<td>(4.049)</td>
<td>10.062</td>
</tr>
<tr>
<td>Senior Subordinated</td>
<td>-7.034**</td>
<td>(-2.328)</td>
<td>-13.653***</td>
</tr>
<tr>
<td>Bank Loan</td>
<td>20.225***</td>
<td>(3.909)</td>
<td>23.620***</td>
</tr>
<tr>
<td>Chapter 11</td>
<td>-0.630</td>
<td>(-0.116)</td>
<td>-19.148**</td>
</tr>
<tr>
<td>Missed Interest</td>
<td>4.653</td>
<td>(0.916)</td>
<td>-11.073</td>
</tr>
<tr>
<td>Distressed Exchange</td>
<td>30.005***</td>
<td>(4.561)</td>
<td>4.557</td>
</tr>
<tr>
<td>Market-to-Book</td>
<td>-0.230</td>
<td>(-0.178)</td>
<td>-8.349</td>
</tr>
<tr>
<td>Sales Growth</td>
<td>0.056</td>
<td>(0.056)</td>
<td>2.463*</td>
</tr>
<tr>
<td>Return on Assets</td>
<td>-4.646</td>
<td>(-0.694)</td>
<td>-10.790</td>
</tr>
<tr>
<td>Profit Margin</td>
<td>-0.060</td>
<td>(-0.305)</td>
<td>1.441</td>
</tr>
<tr>
<td>Asset Tangibility</td>
<td>7.363</td>
<td>(1.237)</td>
<td>-18.019*</td>
</tr>
<tr>
<td>Leverage</td>
<td>-3.330</td>
<td>(-1.470)</td>
<td>-0.446</td>
</tr>
<tr>
<td>Negative Equity</td>
<td>-0.967</td>
<td>(-0.381)</td>
<td>6.491</td>
</tr>
<tr>
<td>Log Total Assets</td>
<td>-1.187</td>
<td>(-1.290)</td>
<td>-0.042</td>
</tr>
<tr>
<td>Credit Ratings</td>
<td>30.444***</td>
<td>(5.663)</td>
<td>14.623</td>
</tr>
<tr>
<td>Z-Score</td>
<td>-0.380</td>
<td>(-1.039)</td>
<td>-0.702</td>
</tr>
<tr>
<td>Ext. Fin. Demand</td>
<td>-0.671</td>
<td>(-0.267)</td>
<td>2.433</td>
</tr>
<tr>
<td>Recession Year</td>
<td>6.606</td>
<td>(1.257)</td>
<td>24.760**</td>
</tr>
<tr>
<td>Litigation</td>
<td>1.242</td>
<td>(0.301)</td>
<td>-1.394</td>
</tr>
</tbody>
</table>

Robust t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 11 presents the results on the relation between recovery prices of debt instruments upon default and legal separation in holding companies with minority interest ownership in the subsidiaries. Minority interest (MIBT, Compustat) is the total non-controlling interest of a company. Industry is defined according to Moody’s 11 industry classification. The t-statistics, reported in parentheses, are based on standard errors adjusted for clustering at the firm. All other variables are as described in Appendix A.
Table 12 – The effect of legal separation on resolution duration
Dependent variable: Natural logarithm of the resolution duration (days)

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Column (1) Issuer Resolution</th>
<th></th>
<th>Column (2) Issue Resolution</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coeff. t-stat</td>
<td></td>
<td>Coeff. t-stat</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>5.509*** (7.388)</td>
<td></td>
<td>5.408*** (6.963)</td>
<td></td>
</tr>
<tr>
<td><strong>Holding Company</strong></td>
<td>0.263** (2.029)</td>
<td></td>
<td>0.233* (1.677)</td>
<td></td>
</tr>
<tr>
<td>Log Subs</td>
<td>-0.005 (-0.094)</td>
<td></td>
<td>-0.005 (-0.096)</td>
<td></td>
</tr>
<tr>
<td>Geog Diversification</td>
<td>4.316 (1.349)</td>
<td></td>
<td>3.653 (1.112)</td>
<td></td>
</tr>
<tr>
<td>Log Debt Issue</td>
<td>-0.035 (-1.018)</td>
<td></td>
<td>-0.033 (-0.835)</td>
<td></td>
</tr>
<tr>
<td>Senior Debt</td>
<td>0.026 (0.316)</td>
<td></td>
<td>-0.021 (-0.204)</td>
<td></td>
</tr>
<tr>
<td>Senior Secured</td>
<td>-0.257 (-1.630)</td>
<td></td>
<td>-0.254 (-1.540)</td>
<td></td>
</tr>
<tr>
<td>Senior Subordinated</td>
<td>-0.195* (-1.818)</td>
<td></td>
<td>-0.121 (-1.098)</td>
<td></td>
</tr>
<tr>
<td>Bank Loan</td>
<td>0.189 (1.172)</td>
<td></td>
<td>0.112 (0.672)</td>
<td></td>
</tr>
<tr>
<td>Chapter 11</td>
<td>0.512 (1.541)</td>
<td></td>
<td>0.551* (1.738)</td>
<td></td>
</tr>
<tr>
<td>Missed Interest</td>
<td>0.575* (1.871)</td>
<td></td>
<td>0.530* (1.833)</td>
<td></td>
</tr>
<tr>
<td>Distressed Exchange</td>
<td>0.815 (1.640)</td>
<td></td>
<td>0.640 (1.576)</td>
<td></td>
</tr>
<tr>
<td>Market-to-Book</td>
<td>0.012 (0.088)</td>
<td></td>
<td>0.080 (0.600)</td>
<td></td>
</tr>
<tr>
<td>Sales Growth</td>
<td>-0.024 (-0.265)</td>
<td></td>
<td>-0.002 (-0.025)</td>
<td></td>
</tr>
<tr>
<td>Return on Assets</td>
<td>0.357 (0.913)</td>
<td></td>
<td>0.050 (0.145)</td>
<td></td>
</tr>
<tr>
<td>Profit Margin</td>
<td>0.015 (0.626)</td>
<td></td>
<td>0.021 (0.840)</td>
<td></td>
</tr>
<tr>
<td>Asset Tangibility</td>
<td>-0.178 (-0.538)</td>
<td></td>
<td>-0.047 (-0.141)</td>
<td></td>
</tr>
<tr>
<td>Leverage</td>
<td>-0.210 (-1.048)</td>
<td></td>
<td>-0.275 (-1.387)</td>
<td></td>
</tr>
<tr>
<td>Negative Equity</td>
<td>-0.078 (-0.499)</td>
<td></td>
<td>-0.088 (-0.549)</td>
<td></td>
</tr>
<tr>
<td>Log Total Assets</td>
<td>0.054 (0.695)</td>
<td></td>
<td>0.062 (0.714)</td>
<td></td>
</tr>
<tr>
<td>Credit Ratings</td>
<td>-0.119 (-0.359)</td>
<td></td>
<td>-0.002 (-0.006)</td>
<td></td>
</tr>
<tr>
<td>Z-Score</td>
<td>0.001 (0.111)</td>
<td></td>
<td>0.005 (0.393)</td>
<td></td>
</tr>
<tr>
<td>Ext. Fin. Demand</td>
<td>0.025 (0.130)</td>
<td></td>
<td>-0.057 (-0.288)</td>
<td></td>
</tr>
<tr>
<td>Recession Year</td>
<td>-0.534** (-2.333)</td>
<td></td>
<td>-0.596** (-2.443)</td>
<td></td>
</tr>
<tr>
<td>Litigation</td>
<td>-0.028 (-0.161)</td>
<td></td>
<td>-0.062 (-0.345)</td>
<td></td>
</tr>
<tr>
<td>Year Indicators</td>
<td>Yes</td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Industry Indicators</td>
<td>Yes</td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>1,360</td>
<td></td>
<td>1,208</td>
<td></td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.240</td>
<td></td>
<td>0.227</td>
<td></td>
</tr>
</tbody>
</table>

Robust t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 12 presents the results on the effects of legal separation on the resolution duration, measured as the difference in days between the default date and resolution date. Issuer resolution represents the resolution duration based on date the issuer went into default (RATING_AGENCY_DEF_DATETIME, Moody’s), and Issue resolution represents the resolution duration based on the date an issue went into default (DEF_ISSU_DATE, Moody’s), which is not necessarily the same date as the issuer. Industry is defined according to Moody’s 11 industry classification. The t-statistics, reported in parentheses, are based on standard errors adjusted for clustering at the firm. All other variables are as described in Appendix A.
## Table 13 – Impact threshold for a confounding variable (ITCV)

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Column (1) Partial Correlations with Default Price</th>
<th>Column (2) Partial Correlations with Holding Company</th>
<th>Column (3) Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log Debt Issue</td>
<td>0.098</td>
<td>-0.161</td>
<td>-0.016</td>
</tr>
<tr>
<td>Senior Debt</td>
<td>-0.050</td>
<td>0.243</td>
<td>-0.012</td>
</tr>
<tr>
<td>Senior Secured</td>
<td>-0.020</td>
<td>0.169</td>
<td>-0.003</td>
</tr>
<tr>
<td>Senior Subordinated</td>
<td>0.018</td>
<td>-0.158</td>
<td>-0.003</td>
</tr>
<tr>
<td>Bank Loan</td>
<td>0.052</td>
<td>0.217</td>
<td>0.011</td>
</tr>
<tr>
<td>Chapter 11</td>
<td>0.046</td>
<td>-0.078</td>
<td>-0.004</td>
</tr>
<tr>
<td>Missed Interest</td>
<td>0.043</td>
<td>-0.020</td>
<td>-0.001</td>
</tr>
<tr>
<td>Distressed Exchange</td>
<td>-0.014</td>
<td>0.232</td>
<td>-0.003</td>
</tr>
<tr>
<td>Market-to-Book</td>
<td>-0.093</td>
<td>-0.012</td>
<td>0.001</td>
</tr>
<tr>
<td>Sales Growth</td>
<td>-0.075</td>
<td>0.003</td>
<td>0.000</td>
</tr>
<tr>
<td>Return on Assets</td>
<td>-0.037</td>
<td>-0.003</td>
<td>0.000</td>
</tr>
<tr>
<td>Profit Margin</td>
<td>0.025</td>
<td>0.029</td>
<td>0.001</td>
</tr>
<tr>
<td>Asset Tangibility</td>
<td>-0.055</td>
<td>0.020</td>
<td>-0.001</td>
</tr>
<tr>
<td>Leverage</td>
<td>-0.029</td>
<td>-0.042</td>
<td>0.001</td>
</tr>
<tr>
<td>Negative Equity</td>
<td>-0.067</td>
<td>0.006</td>
<td>0.000</td>
</tr>
<tr>
<td>Log Total Assets</td>
<td>-0.089</td>
<td>0.005</td>
<td>0.000</td>
</tr>
<tr>
<td>Credit Ratings</td>
<td>-0.016</td>
<td>0.135</td>
<td>-0.002</td>
</tr>
<tr>
<td>Z-Score</td>
<td>-0.032</td>
<td>-0.025</td>
<td>0.001</td>
</tr>
<tr>
<td>Ext. Fin. Demand</td>
<td>-0.006</td>
<td>-0.058</td>
<td>0.000</td>
</tr>
<tr>
<td>Recession Year</td>
<td>-0.023</td>
<td>0.013</td>
<td>0.000</td>
</tr>
<tr>
<td>Litigation</td>
<td>-0.061</td>
<td>0.020</td>
<td>-0.001</td>
</tr>
<tr>
<td>Year Indicators</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Industry Indicators</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Largest Impact</td>
<td></td>
<td></td>
<td>-0.016</td>
</tr>
<tr>
<td>Overall ITCV</td>
<td></td>
<td></td>
<td>-0.032</td>
</tr>
<tr>
<td>Replacement of cases</td>
<td></td>
<td></td>
<td>43.2%</td>
</tr>
</tbody>
</table>

Robust t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 13 presents results of the impact threshold analyses to addressing endogeneity concerns. Partial correlations are the correlation between holding company indicator or default price and each individual control variable after controlling for all other covariates. Impact is computed as the product of the partial correlations for each covariate. Overall ITCV is computed from the baseline results in Table 5 using the excel spreadsheet KonFound-it! provided by K. Frank (Frank [2014]). All variables are as described in Appendix A.
Table 14 – Legal separation and cost of debt
Dependent variable: Natural logarithm of bank loan spreads (Log Spread)

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Column (1)</th>
<th>Column (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coeff. t-stat</td>
<td>Coeff. t-stat</td>
</tr>
<tr>
<td>Constant</td>
<td>5.478*** (53.254)</td>
<td>5.465*** (53.039)</td>
</tr>
<tr>
<td>Holding Company</td>
<td>0.037** (2.320)</td>
<td>0.036** (2.262)</td>
</tr>
<tr>
<td>Log Subs</td>
<td>0.012** (1.985)</td>
<td>0.015** (2.379)</td>
</tr>
<tr>
<td>Geog. Diversification</td>
<td>-1.044*** (-3.680)</td>
<td></td>
</tr>
<tr>
<td>Loan Size</td>
<td>-0.059*** (-8.782)</td>
<td>-0.058*** (-8.799)</td>
</tr>
<tr>
<td>Log Maturity</td>
<td>-0.020* (-1.882)</td>
<td>-0.019* (-1.717)</td>
</tr>
<tr>
<td>Secured Loan</td>
<td>0.338*** (18.942)</td>
<td>0.334*** (18.691)</td>
</tr>
<tr>
<td>Number of Lenders</td>
<td>-0.002*** (-2.672)</td>
<td>-0.002** (-2.489)</td>
</tr>
<tr>
<td>Relationship Lending</td>
<td>0.020 (1.498)</td>
<td>0.020 (1.495)</td>
</tr>
<tr>
<td>Revolver</td>
<td>-0.038*** (-3.444)</td>
<td>-0.039*** (-3.565)</td>
</tr>
<tr>
<td>Institutional Investor</td>
<td>0.167*** (8.693)</td>
<td>0.164*** (8.527)</td>
</tr>
<tr>
<td>PP Indicator</td>
<td>-0.152*** (-10.240)</td>
<td>-0.151*** (-10.180)</td>
</tr>
<tr>
<td>Financial Covenants</td>
<td>0.024*** (3.351)</td>
<td>0.024*** (3.326)</td>
</tr>
<tr>
<td>General Covenants</td>
<td>0.073*** (18.156)</td>
<td>0.073*** (18.160)</td>
</tr>
<tr>
<td>Capex Restrictions</td>
<td>0.119*** (7.550)</td>
<td>0.117*** (7.424)</td>
</tr>
<tr>
<td>Market-to-Book</td>
<td>-0.042*** (-6.233)</td>
<td>-0.041*** (-6.205)</td>
</tr>
<tr>
<td>Return on Assets</td>
<td>-0.833*** (-8.355)</td>
<td>-0.799*** (-8.115)</td>
</tr>
<tr>
<td>Asset Tangibility</td>
<td>-0.093* (-1.944)</td>
<td>-0.102** (-2.143)</td>
</tr>
<tr>
<td>Leverage</td>
<td>0.316*** (10.017)</td>
<td>0.313*** (10.008)</td>
</tr>
<tr>
<td>Log Total Assets</td>
<td>-0.129*** (-16.303)</td>
<td>-0.128*** (-16.189)</td>
</tr>
<tr>
<td>Credit Ratings</td>
<td>-0.411*** (-13.153)</td>
<td>-0.411*** (-13.184)</td>
</tr>
<tr>
<td>Z-Score</td>
<td>-0.011** (-2.441)</td>
<td>-0.010** (-2.350)</td>
</tr>
<tr>
<td>Recession Year</td>
<td>0.088** (2.544)</td>
<td>0.090** (2.571)</td>
</tr>
<tr>
<td>Year Indicators</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Industry Indicators</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Observations</td>
<td>10,687</td>
<td>10,687</td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.703</td>
<td>0.703</td>
</tr>
</tbody>
</table>

Robust t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 14 presents results on the relation between legal separation and cost of private debt at the time of contracting. Industry fixed effects are defined according to four-digit Standard Industrial Classification (SIC) Code. The sample period is between 1994 and 2010 and each observation represents an individual loan facility. The t-statistics, reported in parentheses, are based on standard errors adjusted for clustering at the firm level. All variables are as described in Appendix A.
VITA
ANYWHERE SIKOCHI

EDUCATION
Ph.D., Business Administration, Accounting Concentration (2016)
   The Pennsylvania State University, Smeal College of Business – University Park
MBA, General Management & Corporate Finance/Investment Banking (2011)
   University of Virginia, Darden School of Business – Charlottesville, VA
   Middlebury College – Middlebury, VT
   Russian State University for the Humanities – Moscow, Russia
   St. Francis Xavier, Kutama College – Norton, Zimbabwe
General Certificate of Education, Ordinary Level (O’Level) (1998)
   Kuwadzana High School – Banket, Zimbabwe

PROFESSIONAL EXPERIENCE
MBA Infusion Intern, Internal Audit Consulting Group (Summer 2010)
   Humana, Inc. – Louisville, KY
   Charles River Associates – Boston, MA and Washington, D.C.
   Lexecon, an FTI Consulting company – Cambridge, MA

TEACHING EXPERIENCE
The Pennsylvania State University, Smeal College of Business:

1. Executive MBA, Introduction to Financial Accounting (BA 511) – Instructor (Pre-term, Summer 2015), Teaching Assistant (Fall 2015)
2. MBA, Introduction to Financial Accounting (BA511) – Tutor, (Spring 2015)
3. Undergraduate, Managerial Accounting: Economic Perspectives (ACCTG 404) – Instructor (Summer 2013, 2014)
4. Undergraduate, Financial and Managerial Accounting for Decision Making (ACCTG 211) – Instructor (Summer 2012), Teaching Assistant (Fall 2011, Spring 2012)

MEMBERSHIP AND SERVICE
United States Achievers Program (USAP) (2000 – present)
American Accounting Association (2011 – present)
The PhD Project ADSA, President (2014-2015) and Past President (2015-2016)
Smeal College of Business Committee for Diversity, Member (2015-2016)