Corporate families and agency costs of debt*

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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 risk in the parent company. Legal separation can facilitate managers' transfer of assets from the parent company to separate legal entities within the firm and thus make it difficult for creditors to recover their claims upon default of the parent. Using default events from Moody's Default and Recovery Database, I find that legal separation increases recovery risk, as captured by creditor recovery rates upon default of the parent company. Moreover, I investigate whether creditors anticipate and price the recovery risk in the cost of debt at the initiation of debt contracts. Using a sample of bank loans to US parent companies, I find that legal separation manifests in higher cost of debt to the parent company.

Keywords: Agency Costs, Recovery Risk, Cost of debt, Subsidiaries

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 risk in the parent company. I posit and find that the legal separation between the parent and its subsidiaries increases the recovery risk of the parent company's creditors. Given this finding, I investigate whether creditors anticipate and price the recovery risk in the cost of debt at the initiation of the debt contract.

Recovery risk is one of the agency costs of debt in the Jensen and Meckling [1976] agency theory framework. It refers to the risk that creditors to the firm will be unable to recover some or all of their claims upon the firm's default. Borrowing by a parent company can pose higher recovery risk to creditors 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]). Yet, upon default, creditors to the parent company cannot routinely or costlessly obtain recovery from the separate, independent subsidiaries (West and Smeltzer [2011]). For instance, in the event of bankruptcy the adjudication process is costly when multiple legal entities are involved (Cetorelli and Goldberg [2014]). Accordingly, I posit that legal separation between the parent company and its subsidiaries increases the recovery risk of the parent company's creditors.

It is not obvious that legal separation increases recovery risk because creditors can write contracts that mitigate recovery risk. For instance, contracts can include covenants that limit borrowers' ability to transfer assets from the parent companies 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]). As a result, legal separation may not affect recovery risk in the parent company. However, I can expect to find empirical support for my hypothesis because in practice it is difficult to write contracts that are fully contingent and costlessly enforceable (Jensen and Meckling [1976]; Anderson, Mansi, and Reeb [2003]), and covenants to restrict asset transfers may be circumvented (Beaver et al. [2015]).

Using data on default events from Moody's Default and Recovery Database (DRD), I document that legal separation increases recovery risk in the parent company.[1] 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 interest payments, bankruptcy filing). Following Acharya, Bharath, and Srinivasan [2003], I capture recovery risk as the variability in creditor recovery rates across firms as measured by the price of defaulted debt instruments. Lower creditor recovery rates are indicative of higher recovery risk. I measure legal separation using the number of subsidiaries in the firm as reported on Form 10K Exhibit 21 and an indicator for parent companies that identify as holding companies that conduct all their businesses through subsidiaries. I document that creditor recovery rates are negatively related to the proxies for legal separation suggesting that legal separation increases creditors' recovery risk.

To provide further evidence, I perform tests on domestic and overseas legal entities. After separating the subsidiaries by their jurisdiction of incorporation, I find that both domestic and overseas legal entities exhibit a negative relation to creditor recovery rates. Additionally, I find that the results are robust to controlling for geographic diversification. I interpret these findings as evidence that legal separation creates problems regardless of the jurisdiction of the separate entities

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[1] A parent company is identified as the reporting entity, i.e., the entity (or registrant) which files financial statements with the Securities Exchange Commission (SEC).

and that legal separation has a distinct effect than that of geographic diversification.

Next, I investigate whether creditors anticipate and price the recovery risk in the cost of debt to the parent company at initiation of debt contracts. The prediction that legal separation increases recovery risk suggests that this separation also increases the cost of debt. Agency theory (Jensen and Meckling [1976]) suggests that lenders charge higher interest to borrowers with higher recovery risk, and empirical studies show that lower recovery (e.g., Amiram [2011]; Valta [2012]) increases the cost of debt. Accordingly, I expect a higher cost of debt to the parent companies as creditors anticipate and price the recovery risk in the cost of debt.[2]

However, it is not obvious that the recovery risk effect of legal separation increases cost of debt because it is difficult to predict the differential recovery rates of parent companies at default. In particular, Solomon, Emery, and Gates [2009] point out that it is difficult to anticipate what a firm will look like at a far-distant time of default. They also show that even credit ratings, that creditors can rely on at the time of debt contracting, are uncorrelated with creditor recovery rates upon default. As such, recovery risk in the parent company can have no effect on the cost of debt.

Using a sample of bank loans to parent companies in the US, I document an overall positive relation between legal separation and the cost of debt to parent companies. These results are robust to controlling for factors found in prior literature to be determinants of cost of debt. Moreover, the results are robust to controlling for simultaneity problems that arise in regressions involving loan terms. Loan interest spread is simultaneously determined with other loan terms, such as financial covenants, loan security, loan maturity, and loan size (Melnik and Plaut [1986]; Dichev and Skinner [2002]; Graham, Li, and Qiu [2008]; Costello and Wittenberg-Moerman [2011]). At least

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[2] Legal separation can affect cost of debt for other reasons (i.e., its effect on the monitoring costs, information risk, and default risk associated with lending to parent companies), independently of its effect on the recovery rate. I discuss these alternative reasons in the empirical tests.

in part, these findings are consistent with my expectation that creditors would demand higher debt costs in anticipation of lower recoveries at default.

These findings build on, and contribute to, a few streams of accounting research. A 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.[3] 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 recovery risk and cost of debt to the parent company.

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

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[3] 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.

are related to the bonding and monitoring agency costs of debt. I complement these findings by exploring another important agency cost of debt, namely recovery risk, and showing that these agency costs can lead to higher cost of debt.

Moreover, my findings on the cost of debt contribute to literature on the relation between organizational form and cost of debt. Existing studies show how cost of debt is influenced by different organizational forms, such as industrial diversification (i.e., business segments) (Hann, Ogneva, and Ozbas [2013]; Aivazian, Qiu, and Rahaman [2015]; Franco, Urcan, and Vasvari [2015]), and geographic diversification (Allee, Mansi, and Reeb [2001]; Mansi and Reeb [2002]; Li, Qiu, and Wan [2011]). Other studies examine stock ownership type (Lin et al. [2011]), private versus public firms (Saunders and Steffen [2011]; Badertscher et al. [2014]), founding family ownership (Anderson, Mansi, and Reeb [2003]; Bagnoli, Liu, and Watts [2011]), or shareholder rights (Chava, Livdan, and Purnanandam [2009]). I extend these studies by examining the effects of a dominant corporate form (i.e., corporate families). Legal structure of the family of firms is bound to be a consideration lenders make in determining loan terms because, for instance, lenders can only enter into legally enforceable agreements with specific legal entities.

The remainder of the paper proceeds as follows. I describe corporate families and develop my hypotheses in section 2. I describe my sample selection and key variables in Section 3. I discuss empirical tests and results for recovery risk and cost of debt in Section 4 and 5, respectively. I conclude in Section 6.

2. Background and hypotheses development

2.1 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

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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.

2.2 The effect of legal separation within the corporate families on creditors' recovery risk in the parent company

Recovery risk can arise 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]). Specifically, 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

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in order to prevent creditors from laying claim to the assets held by subsidiaries.[4]

Furthermore, other costs may arise even when the lenders can contractually obtain recovery from subsidiaries that are included in the initial contract. For instance, lenders attempting to repossess assets belonging to subsidiaries can be faced with costs from legal actions for fraud on, or oppression of, the minority interests (Rosenberg [1976]; Whittred [1987]). Moreover, recovery attempts often result in bankruptcy adjudication processes, which are costly and have uncertain outcomes (Jensen and Meckling [1976]). In particular, adjudication may be more difficult when multiple separate legal entities are involved (Cetorelli and Goldberg [2014]).

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

Hypothesis 1 (H1): The legal separation between the parent company and its subsidiaries within the corporate family increases the recovery risk of the parent company's creditors.

2.3 The effect of legal separation within the corporate families on the parent's cost of debt

The prediction that legal separation increases recovery risk suggest that this separation also increases the cost of debt. Agency theory in Jensen and Meckling [1976] suggests that lenders are concerned with factors that can reduce payoffs to them. Accordingly they demand higher interest to borrowers with higher recovery risk. Consistent with this notion, recovery rate (or loss given default) is one of the ingredients of the cost of debt (e.g., Amiram [2011]; Valta [2012]). Higher recovery risk (or lower recovery rates) increases the cost of debt.

Consistent with this discussion, I test the proposition that higher recovery risk associated with legal separation between the parent company and its subsidiaries manifests in a higher cost of debt to the parent company. I formulate my second hypothesis in its alternative form.

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[4] "PG&E Seeks Court Protection For Its Wholesale Energy Unit," Rebecca Smith, Wall Street Journal, July 9, 2003; "Ring Around the Subsidiary," Tim Reason, CFO Magazine, October 1, 2001.

Hypothesis 2 (H2): The creditors' recovery risk effect of legal separation between the parent company and its subsidiaries within the corporate family manifests in a higher cost of debt to the parent company.

3.   Research design

3.1 Sample selection

I perform my analyses on two separate samples. The test of H1 is at the time of default, and test of H2 is at the time of debt contract initiation.

First, my initial sample for testing H1 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).[5] 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.

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[5] 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.

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 - 2013. I match each default instrument to the most recent fiscal year in the Compustat annual files prior to the default date.[6] 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.[7] 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.

Second, my initial sample for the test of H2 consists of US firms that entered into debt contracts and have data available in Thomson Reuters LPC DealScan database (DealScan). DealScan contains detailed terms and conditions on private loan transactions made by bank and nonbank lenders to US and foreign corporations (for additional detail see Dichev and Skinner [2002]; Chava and Roberts [2008]). DealScan sources include regulatory filings, contacts within the credit industry, borrowers, lenders, and journalist contributions.

Loan details in DealScan pertain to two levels of observations: the deal (or package) and the loan (or facility). A package is a collection of facilities that are structured and contracted as one transaction. Each facility within a package has its own contractual terms, namely facility amount, maturity, interest rate spread, repayment schedules, collateral, and loan type or purpose.[8] Generally, financial and general covenants are contracted at the package level (i.e., covenants apply to all facilities within a package), but performance pricing provisions as well as lender

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[6] 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.

[7] 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.

[8] "For example, in May of 2001, IBM entered into a $12 billion deal consisting of two loans: a 364-day facility for $4 billion and a 5-year revolving line of credit for $8 billion" (Chava and Roberts [2008]).

allocations of syndicated loan amounts may apply to specific facilities. The analysis in this paper

is performed at the facility level because the cost of loans (i.e., loan spread) is at the facility level.

For the period covering 1994 – 2010, I match each loan facility to the most recent fiscal

year in Compustat annual files prior to the firm entering into a loan contract.[9] This requirement

yields 18,894 packages and 27,155 facilities to 5,315 parent companies, excluding financial and

regulated firms. I identify parent companies in DealScan as firms whose borrower identification

(borrower id) is the same as the ultimate parent company identification (parent id). I then eliminate

firm-years with missing data for the dependent variable of interest and control variables in the

analyses. The final sample used with the holding company indicator has 12,073 packages and

17,907 facilities extended to 4,400 unique entities, and the sample used with the number of

subsidiaries has 6,242 packages and 9,088 facilities extended to 2,483 unique entities.[10]

3.2 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

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[9] I merge Compustat firm-years to loan data using the Compustat-DealScan link made publicly available by Michael Roberts and Wharton Research and Data Services (Chava and Roberts [2008], accessed April 21, 2014 as "DealScan COMPUSTAT Link August 2012.xlsx"). I use the sample period because I am able to get exhibit 21 data starting in 1994, and I am able to fully match loans with Compustat data up to 2010.
[10] I exclude firm-years with significant subsidiaries only in the analysis for H2 because lenders in the private debt markets have access to private information which could include information on all subsidiaries not just significant only subsidiaries. This is not necessarily the case in the secondary debt market.

potential effect of legal separation on the recovery rates of the parent's debt at default. One is the number of separate legal entities within the firm. The second proxy 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. I explain these proxies and comment on their limitations next.

3.2.1 The number of separate legal entities (i.e., subsidiaries)

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

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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.[11]

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[11] 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"

For illustrative purposes, Table 2 presents descriptive statistics of subsidiaries of all US public firms including those not utilized in any of the subsequent analyses. Overall, a public firm has an average of 33 and median of 10 subsidiaries.

3.2.2 Holding parent company

The second proxy for the strength of legal separation in affecting the recovery rate upon default of the parent's creditors 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 subsidiaries. This implies that the parent company, as a separate entity, does not have significant cash flows or assets available to creditors, but relies on the cash distributions and assets from the subsidiaries. This can affect the parent's 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 resources in the subsidiaries.

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.

3.3 Measuring recovery risk

To test for H1 I examine the relation between legal separation and recovery risk. Following Acharya, Bharath, and Srinivasan [2003], I capture recovery risk as the variability in creditor

recovery rates across defaulting firms using the market price of each debt instrument at the time of default.[12] 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 *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*.

3.4 Measuring cost of debt

To test whether debt markets anticipate and price the recovery risk in the parent company (H2), I examine the relation between legal separation and the pricing of debt at contract initiation. I capture pricing of debt using the bank loan interest spread over the London Interbank Offered Rate (LIBOR) or LIBOR equivalent on a loan plus associated loan origination fees. This is reported as the "All-in-Drawn-Spread" in DealScan. I use the natural logarithm of the loan spread (*Log Spread*) to mitigate the effects of skewness in the data (Graham, Li, and Qiu [2008]; Chava and Roberts [2008]; Lin et al. [2011]).

4.   Test of H1: Legal separation and creditor recovery risk

My first hypothesis (H1) states that the legal separation between the parent company and

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[12] 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]).

its subsidiaries within the corporate family increases creditors' recovery risk in the parent company. My empirical tests relate recovery risk, as captured by price at default, to the legal separation between the parent company and its subsidiaries.

4.1 Modeling recovery risk

I perform empirical tests using Ordinary Least Squares (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:

$$Default\ Price_{i,t} = \begin{array}{l} \gamma * Legal\ Separation_{i,t-1} \\ + \beta_1' * Default\ Characteristics(k)_{i,t} \\ + \beta_2' * Firm\ Characteristics(k)_{i,t-1} + \alpha_i + \delta_t + \varepsilon_{i,t} \end{array} \qquad (1)$$

where subscripts i and t represent firm and time, respectively. α_i and δ_i are industry and year dummies, respectively. $\varepsilon_{i,t}$ is the stochastic error term. I describe *Default* and *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 (*Default Price*), measured as a percentage of par, within one month after default. I use the number of subsidiaries (*Subs*) and holding company indicator for the parent (*Holding Company*) to proxy for legal separation (*Legal Separation*), which is the explanatory variable of interest. Consistent with H1, I expect a negative coefficient on *Legal Separation* ($\gamma < 0$) indicating lower creditor recovery rates upon default.

I include default characteristics, namely *Log Debt Issue*, *Senior Debt*, *Senior Secured Debt*, *Senior Subordinated Debt*, *Bank Loan*, *Chapter 11 Bankruptcy*, *Missed Interest*, and *Distressed Exchange*. *Senior debt* is an indicator variable equal to one if the defaulted debt instrument is

senior debt and zero otherwise. *Secured (Subordinated) debt* is an indicator variable equal to one

if the defaulted debt instrument is secured (subordinated) debt and zero otherwise. *Chapter 11*

Bankruptcy, Missed Interest, and *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 (*Log Total Assets*) to proxy for firm size. I include firm credit ratings (*Credit Ratings*), credit worthiness (*Zscore*), and demand for external finance (*Ext. Financing 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 (*Recession Year*) and litigation (*Litigation*) indicators to control for events that may reduce resources available to pay creditors.

4.2 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.

4.3 Results

Table 4 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 *Log Subs* (coeff. = -3.108, *t*-stat = -2.639) and *Holding Company* (coeff. = -7.322, *t*-stat = -2.859). The results are consistent in column 3, when both measures are included in the same regression model. I document negative and significant coefficients on *Log Subs* (coeff. = -3.113, *t*-stat = -2.729) and *Holding Company* (coeff. = -8.732, *t*-stat = -2.981).

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 coefficient in column 1 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)).[13] 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)).[14] The findings in column 2 for

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[13] For interpretation of log transformed variables see *Introduction to SAS*. UCLA: Statistical Consulting Group, http://www.ats.ucla.edu/stat/sas/notes2/ as last accessed November 29, 2014.
[14] [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%).

holding company (coeff. = -7.322) suggests that a holding company receives 7.322 percentage points lower recovery than non-holding company.[15]

Additionally, Table 5 presents results based on domestic (*Dom Subs*) and overseas (*Ovrs Subs*) subsidiaries.[16] The reported results for this analysis are based on two samples. Panel A includes domestic firms (i.e., firms with only domestic subsidiaries). I document a strong negative relation between domestic subsidiaries and creditor recovery rate in both column 1 (coeff. = -3.324, t-stat = -2.131) and column 2 (coeff. = -3.182, t-stat = -2.002). Panel B is limited to multinational firms (i.e., firms with both domestic and overseas subsidiaries). I document a negative but very weakly significant relation between domestic subsidiaries and creditor recovery in column 1 (coeff. = -1.939, t-stat = -1.309), and a stronger negative relation between recoveries and overseas subsidiaries in column 2 (coeff. = -3.824, t-stat = -2.879). In column 3 I include domestic and overseas subsidiaries in the same regression. I document a negative but insignificant coefficient on domestic subsidiaries (coeff. = -1.065, t-stat = -0.833), and a negative and significant coefficient on overseas subsidiaries (coeff. = -3.284, t-stat = -2.699).

Overall, I interpret these findings in both Panel A and Panel B as evidence that legal separation creates recovery problems at home and overseas. In Panel A I show that legal separation affects recovery risk for creditors to parent companies with no foreign subsidiaries. In Panel B, the coefficient on domestic subsidiaries, albeit insignificant in column 3, is not statistically different than the coefficient on overseas subsidiaries (F-test = 1.430, p = 0.233). Moreover, Table 6 shows that the negative relation persists after controlling for geographic diversification in the full sample including the domestic and multinational firms.

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[15] For an average debt issue of $278.99 million, this implies a total loss of $20.43 million (i.e., $278.99 * 7.322%).
[16] 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.

5. Test of H2: Legal separation and cost of debt

My second hypothesis (H2), stated in the alternative, is that the recovery risk effect of legal separation between the parent company and its subsidiaries within the corporate family manifests in a higher cost of debt to the parent company. To test for H2, I model the relation between legal separation and cost of debt using a sample of bank loans to US parent companies. I also address the fact that legal separation can affect cost of debt for reasons other than its effect on recovery rates.

5.1 Modeling cost of debt

I perform OLS regressions at the individual loan (facility) level at the time of loan contract initiation. A firm can obtain multiple facilities in the same contract in a given year. Accordingly, estimates in my tests are based on standard errors corrected for clustering at the firm. I estimate the following OLS regression:

$$Log\ Spread_{i,t} = \begin{matrix} \gamma * Legal\ Separation_{i,t-1} \\ + \beta_1' * Loan\ Characteristics(k)_{i,t} \\ + \beta_2' * Firm\ Characteristics(k)_{i,t-1} + \alpha_i + \delta_t + \varepsilon_{i,t} \end{matrix} \qquad (2)$$

where subscripts i and t represent firm and time, respectively. α_i and δ_i are industry and year dummies, respectively. $\varepsilon_{i,t}$ is the stochastic error term. I describe *Loan* and *Firm Characteristics* below, and I present complete definition and measurement of all the variables in Appendix A. The dependent variable is the natural logarithm of the interest spread over LIBOR (*Log Spread*). The coefficient of interest is γ on *Legal Separation*. I expect γ > 0 in H2.

I include several control variables following prior literature (e.g., Graham, Li, and Qiu [2008]; Costello and Wittenberg-Moerman [2011]; Valta [2012]; Hasan et al. [2014]). First, I control for loan characteristics reported for each facility in DealScan. In general, loan characteristics that are indicative of high risk are associated with higher cost of debt. For example,

larger loans are priced at lower interest rates, and longer maturity loans have higher default risk and thus are associated with higher cost of debt. Further, prior research finds that revolvers are priced at lower interest rates than term loans, and institutional term loans are more risky. Accordingly, I control for the following loan characteristics: facility amount (*Loan Size*), maturity of the loan (*Log Maturity*), whether the loan is secured (*Secured Loan*), number of lenders participating in a loan deal (*Number of Lenders*), repeated lenders within the previous five years (*Relationship Lending*), whether a loan is a revolving facility (*Revolver*), and whether a loan is an institutional term loan (*Institutional Investor*). I also control for whether a loan has performance pricing provisions (*PP Indicator*), the number of financial covenants (*Financial Covenants*), the number of general covenants (*General Covenants*), and whether the loan contains capital expenditure restrictions (*Capex Restrictions*).

Second, I control for firm characteristics measured at the end of the most recent fiscal year prior to the loan contract date. I control for growth opportunities because firms perceived to have promising growth prospects captured by market-to-book ratio (*Market-to-Book*) are likely to have easier access to low cost bank debt. Profitability (*Return on Assets*) control for default risk, which is expected to be low for high profitability firms. Consistent with lenders being able to recover physical assets in the event of default, firms with more tangible assets (*Asset Tangibility*) are likely to have lower borrowing costs. Leverage (*Leverage*) also control for default risk, which is expected to be high for high leverage firms. I control for firm size (*Log Assets*) as larger firms have easier access to external financing and have less information asymmetry. Further, I control for default risk or credit worthiness by including issuer credit ratings (*Credit Rating*) and default probability (*Z-Score*). I also add an indicator for recession period (*Recession Year*) because borrowing costs tend to increase during times of financial crises.

5.2 Descriptive statistics

Table 3 Panel B shows summary statistics for the loan and firm characteristics used in cost of debt analyses. The average and median interest rate spread over LIBOR (*Spread*) are, respectively, 219.20 and 200.0 basis points. The average loan amount is $257.66 million and is issued for an average of 47.13 months. The other loan characteristics show that most loans are secured (71 percent), are revolving loan facilities (63 percent), include performance pricing provisions (64 percent), and have capital expenditure restrictions (27 percent). There are an average of 2.56 financial covenants and 2.34 general covenants in each loan contract.

Results on firm characteristics suggest that 23 percent of firms filing with the SEC (i.e., parent companies) identify as holding companies and an average public firm owns 39.27 subsidiaries, of which 20.75 subsidiaries are incorporated in the US. The median number of total subsidiaries in the sample is 17.00. An average firm has total assets in excess of $2.3 billion. The average long term debt to total assets is 0.30 suggesting that defaulting firms have a relatively high indebtedness. I document average return on assets of 12 percent, and market-to-book ratio of 1.76.

5.3 Results

Table 7 presents the results on the relation between legal separation and cost of debt. I document an overall positive relation between cost of debt to the parent company and the proxies for legal separation. The coefficient on the number of subsidiaries is positive and significant in column 1 (coeff. = 0.023, *t*-stat = 3.294) and in column 3 (coeff. = 0.023, *t*-stat = 3.336). Similarly, the coefficient on holding company indicator is positive and significant in column 2 (coeff. = 0.022, *t*-stat = 1.851) and in column 3 (coeff. = 0.031, *t*-stat = 1.794).

These findings are robust to controlling for loan and firm characteristics, including geographic diversification. I document a negative and significant coefficient on geographic

diversification across all columns suggesting that the effect of legal separation on cost of debt is distinct from that of geographic diversification. The 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. Also, consistent with credit constraints during times of financial crises, I document a positive coefficient on the indicator variable for a recession.

Table 8 presents results controlling for simultaneity problem. My regressions on interest spread involve a variety simultaneity problems because interest spread is simultaneously determined with the other loan terms in the regressions as covariates (Melnik and Plaut [1986], Dichev and Skinner [2002], Graham et al. [2008], Costello and Wittenberg-Moerman [2011]). I address this issue by estimating regressions for loan spread and non-price terms as a system of equations using a seemingly unrelated regression model (SUR). The non-price terms in the SUR model are financial covenants, secured loan, loan size, loan maturity, and capital expenditure restrictions. I document a consistent positive relation between legal separation and loan spreads in column 1 (Subs: coeff. = 0.022, z-stat = 4.442; Holding company: coeff. = 0.030, z-stat = 2.372). I interpret this as evidence that simultaneity problems do not affect my results and conclusions on the relation between legal separation and cost of debt.

The SUR results also provide insights on the effects of legal separation on non-pricing loan terms. I document a negative relation between legal separation as measured by the number of subsidiaries and the use of financial covenants and loan security in debt contracts, but the coefficients on holding company are insignificant across all non-pricing loan terms. The regression of financial covenants on legal separation yields a negative and significant coefficient on the

number of subsidiaries (coeff. = -0.021, z-stat = -2.113) in column 2, the regression of loan security on legal separation also yields a negative and significant coefficient on the number of subsidiaries (coeff. = -0.008, z-stat = -2.127) in column 3. These findings support the notion that if legal separation makes it difficult and costly for lenders to repossess assets owned by the firm through subsidiaries, then loan contracts may contain fewer covenants and loan security because the covenants and security become harder to enforce and can be traded off for a higher interest rate.

At least in part, I interpret these findings as evidence that creditors demand higher debt costs in anticipation of lower recoveries upon default of parent companies.

5.4 Alternative reasons for higher cost of debt

I interpret my findings on the test of H2 as evidence that legal separation increases recovery risk which manifests in a higher cost of debt to the parent company. However, as noted in footnote 2 above, legal separation can affect the cost of debt for other reasons, independently of its effect on the recovery rate.

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 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 recovery risk, 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 my baseline equation (2) with additional control variables and find consistent results (not tabulated). First, I include an indicator for a big four auditor to capture information risk. Recent evidence suggests that corporate groups are more likely to hire a big four auditor in order to mitigate 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 recovery risk of the parent company's creditors documented in my tests of H1.

5.5 Additional robustness tests

In robustness tests (not tabulated), I show that the results on the relation between legal separation and cost of debt are robust to controlling for endogeneity arising from omitted variable bias. Endogeneity arises because firms can create legal separation to insulate business risk that I cannot observe as a researcher, and likewise lenders can charge higher interest because of that underlying risk irrespective of legal separation. I re-estimate my baseline equation (2) with firm fixed-effects to mitigate bias from time invariant omitted factors. I also employ the instrumental variable approach to mitigate bias from confounding variables that vary over time; it is likely that business risks vary over time. Additionally, I examine the impact threshold of a confounding variable using the approach in Frank [2000] (see Larcker and Rusticus [2010]). Overall, the results are robust and increase the likelihood that my estimates have a causal interpretation.

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6. Conclusion

I examine the effects of legal separation between the parent and its subsidiaries within a corporate family on the risk and cost of debt. First, I investigate whether legal separation affects recovery risk of the parent company's creditors. 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 and thus increase recovery risk. Second, I examine whether recovery risk effects of legal separation is priced into the cost of debt to the parent company. Using a sample of bank loans to US parent companies, I document robust evidence that legal separation increases the parent company's cost of debt.

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 agency costs.

Recent global regulatory developments around 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).

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Appendix A: Variable definitions

VARIABLES		DESCRIPTION AND MEASUREMENT
Default Characteristics		
Data in this part obtained from Moody's Default and Recovery Data (DRD)		
Def_Price (% of par)	=	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.
Default Price (% of par)	=	*Def_Price* excluding prices above 100 percent.
Debt Issue ($ million)	=	Face amount of instrument expressed in U.S. Dollars (in millions).
Log Debt Issue	=	Natural logarithm of *Debt Issue ($ million).*
Senior Debt	=	Indicator variable equal to one if the debt instrument is senior debt, and zero otherwise.
Senior Secured	=	Indicator variable equal to one if the debt instrument is senior secured debt, and zero otherwise.
Senior Subordinated	=	Indicator variable equal to one if the debt instrument is senior subordinated debt, and zero otherwise.
Bank Loan	=	Indicator variable equal to one if the debt instrument is bank loan or bank credit facility, and zero otherwise.
Chapter 11 Bankruptcy	=	Indicator variable equal to one if the default type is chapter 11 bankruptcy, and zero otherwise.
Missed Interest	=	Indicator variable equal to one if the default type is missed interest payment, and zero otherwise.
Distressed Exchange	=	Indicator variable equal to one if the default type is distressed exchange, and zero otherwise.
Loan variables – Cost of debt		
Data in this part obtained from Thomson Reuters LPC's DealScan database.		
Spread	=	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	=	The natural logarithm of the interest spread
Loan Size	=	The natural logarithm of the facility (or loan) amount in US dollars ($ millions) scaled by total assets.
Log Maturity	=	The natural logarithm of number of months between the loan's issue date and the date when the loan matures.
Secured Loan	=	Indicator variable equal to one if the loan is secured (has collateral), and zero otherwise.
Number of Lenders	=	The number of banks and other lenders (e.g., insurance companies, institutional investors) participating in the loan syndicate.
Relationship Lending	=	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.
Revolver	=	Indicator variable equal to one if the loan's type is revolver, and zero otherwise.
Institutional Investor	=	Indicator variable equal to one if the loan's type is term loan B, C, or D (institutional term loans), and zero otherwise.
PP Indicator	=	Indicator variable equal to one if the loan contract has performance pricing provisions, and zero otherwise.
Financial Covenants	=	The number of debt covenants included in the loan contract that are based on financial ratios from both the income statement and balance sheet.
General Covenants	=	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.
Capex Restrictions	=	Indicator variable equal to one if the loan contract has capital expenditure restrictions, and zero otherwise.

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

Subs	=	The number of subsidiaries and/or affiliates disclosed on Form 10-K, Exhibit 21.
Dom Subs	=	The number of subsidiaries that are incorporated in the US.
Ovrs Subs	=	The number of subsidiaries that are incorporated overseas.
Holding Company	=	An indicator variable equal to one if the firm is a holding company, and zero otherwise. (See Appendix C).
Geog. Diversification	=	The income from foreign operations, measured as foreign pre-tax income (PIFO) scaled by total assets.
Market-to-Book	=	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).
Sales Growth	=	Change in sales from prior year to the current year [(SALE$_t$ − SALE$_{t-1}$) / SALE$_{t-1}$].
Return on Assets	=	Earnings before interest and depreciation (EBITDA), scaled by total assets.
Profit Margin	=	Earnings before interest and depreciation (EBITDA), scaled by total sales.
Asset Tangibility	=	Net property, plant and equipment (PPENT) scaled by total assets.
Leverage	=	Total long-term debt (DLTT + DLC) scaled by total assets.
Negative Equity	=	An indicator variable equal to one if total assets are less than total liabilities (AT < LT), and zero otherwise.
Total Assets ($ million)	=	Total assets (AT) in US dollars (millions).
Log Total Assets	=	The natural logarithm of total assets.
Credit Ratings	=	Indicator variable equal to one if the issuer long-term credit ratings (SPLTICRM) is above investment grade, and zero otherwise.
Z-Score	=	The probability of default (or creditworthiness) of the firm

		measured as Modified Altman's (1968) Z-score (Graham et al. [2008]). Z-score = (1.2*WCAP + 1.4*RE + 3.3*PI + 0.999* SALE) / AT, where WCAP is working capital, RE is retained earnings, PI is pretax income, SALE is total sales, and AT is total assets.
Ext. Financing Demand	=	An indicator variable equal to one if FREECASH < -0.5, and zero otherwise. FREECASH is cash flows from operations minus average capital expenditure scaled by lagged current assets, $(OANCF_t$ – average $CAPX_t)/ACT_{t-1}$. Capital expenditures are averaged over the preceding three years.
Recession Year	=	Indicator variable equal to one 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
Litigation	=	Indicator variable equal to one if the firm is in a high litigation risk industry, and zero 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].

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**.

Subsidiary Name	Jurisdiction of Incorporation
Hershey Chocolate & Confectionery Corporation	Delaware
Hershey Chocolate of Virginia, Inc.	Delaware
Hershey Canada, Inc.	Canada
Mauna Loa Macadamia Nut Corporation	Hawaii

Example 2 – General Motors

GENERAL MOTORS COMPANY
AND SUBSIDIARIES, JOINT VENTURES AND AFFILIATES OF THE REGISTRANT
AS OF DECEMBER 31, 2013

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

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

TÜV NORD Bildung Opel GmbH	Germany
Union Motors Car Sales S.r.l.	Romania
United States Advanced Battery Consortium, LLC	Michigan
Valentine Buick GMC, Inc.	Delaware
Van Kouwen Automotive I B V	Netherlands
Vauxhall Defined Contribution Pension Plan Trustees Limited	England and Wales
Vauxhall Motors Limited	England
Wheatcroft (Worksop) Limited	England and Wales
Whitehead (Rochdale) Limited	England and Wales
Wilson & Co. (Motor Sales) Limited	England and Wales
Wind Point Partners III, L.P.	Delaware
Woodbridge Buick GMC, Inc.	Delaware
WRE, Inc.	Michigan
Zona Franca Industrial Colmotores SAS	Colombia

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.

TABLES

Table 1 – Distribution of default and creditor recovery for all years

Panel A: Creditor recovery and default distribution by industry (ordered by *Total Issue*)

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

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

Default Type Code	Issuers	Defaults	Issues	Avg. Issue ($ million)	Total Issue ($ million)	Def_Price (% of par)
Distressed exchange	516	557	3,050	522.91	1,344,923	54.90
Chapter 11	967	996	5,779	163.22	682,914	36.88
Missed interest payment	2,606	2,696	6,354	152.83	640,834	37.54
Suspension of payments	82	82	348	1,540.05	335,730	32.58
Prepackaged Chapter 11	133	134	437	465.34	173,107	42.01
Dividend omission	218	227	556	310.32	125,058	36.52
Bank holiday	6	6	97	6,565.32	124,741	
Bankruptcy	236	237	705	178.43	82,612	37.74
Missed principal & interest	432	459	1,100	91.04	69,551	52.69
Seized by regulators	27	27	428	143.21	52,127	12.06
Receivership	326	326	482	135.21	50,298	28.58
Missed principal payment	366	368	658	93.61	49,896	57.20
Grace period default	80	97	184	145.55	22,414	54.78
Payment moratorium	97	98	252	94.08	18,346	59.65
Placed under administration	24	24	48	405.50	14,598	48.59
Deposit Freeze	38	38	73	156.52	5,165	75.33
Indenture modified	223	232	444	13.04	4,278	34.87
Liquidated	17	17	44	147.92	3,846	44.96
Chapter 7	12	12	34	105.63	2,852	15.23
Cross default	8	8	10	233.70	2,337	8.21
[Blank]	438	466	1,460	55.29	1,548	34.90
Chapter 9	13	13	109	9.50	960	88.77

	Issuers	Defaults	Issues	Avg. Issue ($ million)	Total Issue ($ million)	Def_Price (% of par)
Loan forgiven	7	8	10	81.43	570	34.00
Conservatorship	3	3	5	105.00	420	20.88
Bankruptcy, Section 77	30	30	71	16.48	346	27.49
War	1	1	1	3.00	3	
Chapter 10	4	4	5	2.00	2	21.38
Ultra Vires	2	2	3			

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

Debt Class	Issuers	Defaults	Issues	Avg. Issue ($ million)	Total Issue ($ million)	Def_Price (% of par)
Regular Bond/Debenture	1,625	1,810	5,351	331.25	1,673,819	39.81
Bank Loan	1,065	1,110	2,015	392.81	651,666	61.36
Bank Credit Facility	547	575	1,256	309.66	388,937	61.34
Long Term Public Debt	3,134	3,308	6,410	93.12	384,231	37.31
Sovereign Bank Loan	59	97	662	405.13	213,099	50.77
Preferred Stock	368	422	805	309.21	196,351	26.56
Medium-Term Note Program	17	17	23	6,442.10	128,842	
Conv./Exch. Bond/Debenture	281	307	395	237.92	73,992	30.25
Unknown (Missing)	457	486	1,469	197.25	29,785	48.69
Municipal Bond	716	766	3,487	16.65	19,213	49.82
Enhanced Equipment Trust	6	7	91	172.67	15,713	
First Mortgage Bonds	62	64	115	206.19	14,433	55.65
Commercial Paper	65	66	72	435.31	6,965	88.00
Equipment Trust	139	143	495	19.60	6,018	31.52
Pass-Through	4	4	6	523.17	3,139	95.67
Preference Stock	7	7	8	177.14	1,240	57.44
Surplus Notes	2	2	4	200.00	800	23.71
Revenue Bonds	23	23	35	29.10	611	60.50
Sec. Lease Oblig. Bond	2	3	7	86.29	604	74.26
Promissory Note	8	8	10	2.00	18	
Deposit Rating	1	1	1			
SDLT	7	7	7			
Stoke Options	21	22	23			

Panel D: Creditor recovery and default distribution by debt seniority (by descending Total Issue)

Debt Seniority	Issuers	Defaults	Issues	Avg. Issue ($ million)	Total Issue ($ million)	Def_Price (% of par)
Senior Unsecured	1,739	1,892	6,311	355.65	1,971,742	39.87
Senior Secured	2,401	2,536	5,034	154.97	695,956	49.10
Not Applicable	2,506	2,666	6,272	244.83	526,884	46.86
Subordinated	746	802	1,345	172.26	181,048	32.03
Senior Subordinated	449	481	606	188.98	107,905	31.15
Pref. Stock	228	261	433	221.58	77,330	30.81
Pref. Stock Non-cumulative	16	18	83	903.65	75,003	22.96

Multiple Seniority	10	10	11	7,141.44	64,273	70.47
Unknown	187	189	653	91.96	60,053	64.21
Junior Subordinated	77	86	150	289.02	41,330	36.34
Revenue Bonds	27	27	346	14.11	4,883	31.28
Junior Pref. Stock	3	3	6	216.83	1,301	2.30
Preference Stock	7	7	8	177.14	1,240	57.44
Industrial Revenue Bond	20	20	30	27.68	526	60.50
Junior Unsecured	2	2	2	1.00	2	19.92
Equity	132	135	186			
L-term CD rating senr code	3	3	5			
Unknown (missing)	262	291	1,266			48.59

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 numbr (*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

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

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 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 3 – Summary statistics
Panel A: Recovery risk sample

VARIABLES	N	Mean	Stdev	Min	Q1	Median	Q3	Max
Default Characteristics								
Def_Price (% of par)	2,075	43.83	29.38	0.01	17.50	40.00	68.00	122.63
Default Price (% of par)	2,034	42.66	28.48	0.01	17.00	39.72	66.35	100.00
Debt Issue ($ millions)	2,893	278.99	498.82	1.00	75.00	150.00	300.00	13,400
Log Debt Issue	2,893	4.94	1.26	0.69	4.32	5.01	5.70	7.59
Senior Debt	3,637	0.67	0.47	0.00	0.00	1.00	1.00	1.00
Senior Secured	3,637	0.24	0.43	0.00	0.00	0.00	0.00	1.00
Senior Subordinated	3,637	0.10	0.31	0.00	0.00	0.00	0.00	1.00
Bank Loan	3,637	0.21	0.41	0.00	0.00	0.00	0.00	1.00
Chapter 11 Bankruptcy	3,637	0.43	0.49	0.00	0.00	0.00	1.00	1.00
Missed Interest	3,637	0.35	0.48	0.00	0.00	0.00	1.00	1.00
Distressed Exchange	3,637	0.14	0.35	0.00	0.00	0.00	0.00	1.00
Firm Characteristics								
Subs	394	37.79	54.62	1.00	6.00	15.50	47.00	313.00
Dom Subs	394	22.47	34.52	0.00	4.00	10.00	27.00	175.00
Ovrs Subs	394	14.07	30.40	0.00	0.00	2.00	12.00	191.00
Holding Company	729	0.26	0.44	0.00	0.00	0.00	1.00	1.00
Geog. Diversification	729	0.00	0.02	-0.06	0.00	0.00	0.00	0.10
Market-to-Book	716	1.49	2.26	0.35	0.97	1.18	1.54	57.28
Sales Growth	709	0.10	0.91	-0.98	-0.14	-0.01	0.11	8.36
Return on Assets	711	0.05	0.18	-1.66	0.00	0.07	0.12	0.44
Profit Margin	705	-0.20	2.42	-45.30	0.00	0.06	0.14	0.61
Asset Tangibility	715	0.37	0.24	0.00	0.16	0.34	0.56	0.92
Leverage	716	0.41	0.36	0.00	0.06	0.35	0.64	1.37
Negative Equity	729	0.39	0.49	0.00	0.00	0.00	1.00	1.00
Total Assets ($ millions)	717	2,499	10,587	0.00	204.96	579.77	1,687	218,328
Log Total Assets	716	6.32	1.68	-0.85	5.32	6.37	7.43	10.07
Credit Ratings	729	0.02	0.13	0.00	0.00	0.00	0.00	1.00
Z-Score	716	-0.74	7.67	-177.6	-1.19	0.28	1.34	5.66
Ext. Financing Demand	729	0.45	0.50	0.00	0.00	0.00	1.00	1.00
Recession Year	729	0.15	0.36	0.00	0.00	0.00	0.00	1.00
Litigation	729	0.19	0.40	0.00	0.00	0.00	0.00	1.00

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

Panel B: Cost of debt (bank loans) sample

VARIABLES	N	Mean	Stdev	Min	Q1	Median	Q3	Max
Loan Characteristics								
Spread (basis points)	17,907	219.20	136.56	1.50	125.00	200.00	300.00	1,600
Log Spread	17,907	5.16	0.74	0.41	4.83	5.30	5.70	7.38
Loan Size ($ millions)	17,907	257.66	607.44	0.01	25.00	100.00	250.00	25,000
Loan Size	17,907	-1.74	1.03	-7.83	-2.36	-1.68	-1.06	10.13
Maturity (months)	17,907	47.13	23.00	1.00	33.00	50.00	60.00	276.00
Log Maturity	17,907	3.68	0.66	0.00	3.50	3.91	4.09	5.62
Secured Loan	17,907	0.71	0.46	0.00	0.00	1.00	1.00	1.00
Number of Lenders	17,907	7.77	9.05	1.00	1.00	5.00	11.00	176.00
Relationship Lending	17,907	0.59	0.49	0.00	0.00	1.00	1.00	1.00
Revolver	17,907	0.63	0.48	0.00	0.00	1.00	1.00	1.00
Institutional Investor	17,907	0.10	0.30	0.00	0.00	0.00	0.00	1.00
PP Indicator	17,907	0.64	0.48	0.00	0.00	1.00	1.00	1.00
Financial Covenants	17,907	2.56	1.05	1.00	2.00	2.00	3.00	7.00
General Covenants	17,907	2.34	2.06	0.00	1.00	1.00	4.00	6.00
Capex Restrictions	17,907	0.27	0.44	0.00	0.00	0.00	1.00	1.00
Firm Characteristics								
Subs	5,775	39.27	58.12	1.00	7.00	17.00	45.00	313.00
Dom Subs	5,775	20.75	32.71	0.00	4.00	9.00	22.00	175.00
Ovrs Subs	5,775	17.15	33.60	0.00	0.00	3.00	17.00	191.00
Holding Company	11,147	0.23	0.42	0.00	0.00	0.00	0.00	1.00
Geog. Diversification	11,147	0.01	0.02	-0.06	0.00	0.00	0.01	0.10
Market-to-Book	11,147	1.76	1.56	0.21	1.06	1.40	1.98	52.47
Return on Assets	11,147	0.12	0.18	-6.64	0.08	0.13	0.18	0.44
Asset Tangibility	11,147	0.31	0.24	0.00	0.12	0.24	0.45	0.92
Leverage	11,147	0.30	0.26	0.00	0.10	0.26	0.42	4.21
Total Assets ($ millions)	11,147	2,308.9	8,707.7	0.00	116.98	411.6	1,463	275,644
Log Total Assets	11,147	6.01	1.85	-2.40	4.76	6.02	7.29	10.07
Credit Ratings	11,147	0.11	0.32	0.00	0.00	0.00	0.00	1.00
Z-Score	11,147	1.48	3.28	-177.6	0.81	1.70	2.54	5.66
Recession Year	11,147	0.08	0.26	0.00	0.00	0.00	0.00	1.00

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

Table 3 presents summary statistics for the variables in the recovery risk analyses (H1) in Panel A, and cost of debt analyses (H2) in Panel B. In Panel A, default characteristics are summarized at the individual defaulted debt instrument, and firm characteristics are summarized at the individual (unique) firm-year. In Panel B, loan characteristics are summarized at the individual loan (facility), and firm characteristics are summarized at the individual (unique) firm-year. Observations for debt instruments/bank loans differ from the firm-years because a firm-year can have multiple defaulted debt instruments/bank loans. 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 – Baseline results on creditor recovery upon default
Dependent variable: Price of debt instruments at default (*Default Price, % of par*)

VARIABLES	Column (1) Coeff.	*t*-stat	Column (2) Coeff.	*t*-stat	Column (3) Coeff.	*t*-stat
Constant	51.508***	(4.525)	50.599***	(6.044)	53.246***	(4.632)
Log Subs	**-3.108***	**(-2.639)**			**-3.113***	**(-2.729)**
Holding Company			**-7.322***	**(-2.859)**	**-8.732***	**(-2.981)**
Log Debt Issue	-2.506**	(-2.158)	-3.542***	(-4.061)	-2.501**	(-2.180)
Senior Debt	15.134***	(4.083)	16.973***	(5.977)	15.074***	(4.118)
Senior Secured	25.662***	(5.230)	15.688***	(3.682)	25.770***	(5.270)
Senior Subordinated	-11.502***	(-3.593)	-10.534***	(-4.324)	-11.430***	(-3.669)
Bank Loan	15.063***	(3.021)	20.525***	(4.548)	14.692***	(2.937)
Chapter 11 Bankruptcy	-4.890	(-0.878)	-5.767	(-1.305)	-3.842	(-0.653)
Missed Interest	1.041	(0.199)	-0.713	(-0.168)	1.932	(0.344)
Distressed Exchange	26.891***	(4.083)	24.428***	(4.325)	26.998***	(3.951)
Market-to-Book	-0.929	(-0.530)	-0.954	(-0.709)	-1.421	(-0.815)
Sales Growth	1.431	(1.244)	-0.146	(-0.156)	0.886	(0.730)
Return on Assets	-3.816	(-0.411)	0.134	(0.021)	-1.025	(-0.117)
Profit Margin	0.979	(1.651)	0.401	(1.391)	0.978*	(1.663)
Asset Tangibility	0.290	(0.048)	2.777	(0.543)	-1.549	(-0.260)
Leverage	-3.262	(-1.074)	-3.025	(-1.376)	-4.201	(-1.407)
Negative Equity	1.015	(0.384)	-0.252	(-0.126)	0.354	(0.140)
Log Total Assets	0.804	(0.678)	-0.229	(-0.317)	0.774	(0.682)
Credit Ratings	17.278*	(1.699)	15.570**	(2.089)	15.554*	(1.731)
Z-Score	-0.516	(-1.174)	-0.328	(-0.841)	-0.608	(-1.482)
Ext. Financing Demand	1.814	(0.648)	-2.800	(-1.196)	2.856	(1.041)
Recession Year	0.262	(0.034)	0.718	(0.144)	0.981	(0.138)
Litigation	2.542	(0.525)	1.046	(0.264)	1.923	(0.384)
Year Indicators	Yes		Yes		Yes	
Industry Indicators	Yes		Yes		Yes	
Observations	1,087		1,737		1,087	
Adjusted R-squared	0.549		0.484		0.561	

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

Table 4 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 5 – Legal separation in domestic and multinational firms
Panel A: Domestic firms (*Overseas subsidiaries = 0*)

VARIABLES	Column (1) Coeff.	*t*-stat	Column (2) Coeff.	*t*-stat	Column (3) Coeff.	*t*-stat
Constant	73.246***	(3.453)	75.479***	(3.312)	73.595***	(3.436)
Log Dom Subs	**-3.324****	**(-2.131)**			**-3.182****	**(-2.002)**
Holding Company			**-4.668**	**(-0.921)**	**-2.983**	**(-0.586)**
Log Debt Issue	0.444	(0.247)	0.227	(0.129)	0.287	(0.158)
Senior Debt	20.350***	(4.078)	20.758***	(4.201)	20.299***	(4.044)
Senior Secured	19.735***	(3.183)	19.217***	(3.075)	19.650***	(3.180)
Senior Subordinated	-12.450**	(-2.446)	-11.958**	(-2.391)	-12.438**	(-2.448)
Bank Loan	19.643***	(2.971)	19.613***	(2.866)	19.644***	(2.968)
Chapter 11 Bankruptcy	-11.792	(-1.503)	-11.681	(-1.430)	-11.346	(-1.419)
Missed Interest	-15.529**	(-2.234)	-15.942**	(-2.252)	-15.063**	(-2.140)
Distressed Exchange	14.205*	(1.670)	12.574	(1.463)	13.848	(1.627)
Market-to-Book	-2.420	(-1.131)	-2.119	(-0.987)	-2.504	(-1.159)
Sales Growth	-10.944*	(-1.724)	-11.987**	(-2.037)	-10.466*	(-1.686)
Return on Assets	-3.886	(-0.235)	0.549	(0.032)	-2.863	(-0.170)
Profit Margin	3.238***	(2.865)	3.291***	(2.774)	3.204***	(2.824)
Asset Tangibility	-1.119	(-0.141)	2.774	(0.346)	-1.604	(-0.199)
Leverage	-5.474	(-0.844)	-9.491	(-1.386)	-6.212	(-0.937)
Negative Equity	1.492	(0.281)	2.702	(0.501)	1.296	(0.241)
Log Total Assets	1.185	(0.650)	0.071	(0.039)	1.289	(0.694)
Z-Score	-1.506	(-1.283)	-1.905	(-1.532)	-1.646	(-1.336)
Ext. Financing Demand	7.751*	(1.811)	7.093	(1.618)	8.296*	(1.874)
Recession Year	-65.148***	(-4.252)	-64.880***	(-3.768)	-65.026***	(-4.133)
Litigation	3.862	(0.580)	2.693	(0.380)	3.728	(0.550)
Year Indicators	Yes		Yes		Yes	
Industry Indicators	Yes		Yes		Yes	
Observations	327		327		327	
Adjusted R-squared	0.661		0.652		0.660	

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

Panel B: Multinational firms (*Overseas subsidiaries > 0*)

VARIABLES	Column (1) Coeff.	Column (1) *t*-stat	Column (2) Coeff.	Column (2) *t*-stat	Column (3) Coeff.	Column (3) *t*-stat
Constant	60.602***	(4.852)	57.123***	(4.971)	59.761***	(5.079)
Log Dom Subs	**-1.939**	**(-1.309)**			**-1.065**	**(-0.833)**
Log Ovrs Subs			**-3.824***	**(-2.879)**	**-3.284***	**(-2.699)**
Holding Company					**-11.250***	**(-3.717)**
Log Debt Issue	-3.396***	(-2.607)	-3.108**	(-2.510)	-2.923**	(-2.365)
Senior Debt	15.079***	(3.309)	13.971***	(3.036)	14.431***	(3.241)
Senior Secured	26.385***	(3.492)	29.176***	(4.277)	28.418***	(4.017)
Senior Subordinated	-12.724***	(-3.423)	-12.139***	(-3.255)	-12.307***	(-3.421)
Bank Loan	13.382*	(1.774)	11.199	(1.609)	11.505	(1.624)
Chapter 11 Bankruptcy	-6.953	(-1.209)	-5.506	(-0.920)	-5.636	(-0.948)
Missed Interest	1.975	(0.368)	3.679	(0.644)	3.122	(0.554)
Distressed Exchange	24.775***	(3.547)	24.554***	(3.498)	23.752***	(3.395)
Market-to-Book	-0.275	(-0.095)	-0.822	(-0.288)	-1.687	(-0.587)
Sales Growth	2.689**	(2.582)	3.067**	(2.530)	2.066*	(1.670)
Return on Assets	-3.354	(-0.283)	4.473	(0.433)	7.208	(0.718)
Profit Margin	0.339	(0.558)	0.229	(0.415)	0.098	(0.148)
Asset Tangibility	1.395	(0.144)	5.084	(0.556)	-0.179	(-0.022)
Leverage	-6.080	(-1.512)	-5.987	(-1.540)	-7.388*	(-1.881)
Negative Equity	0.164	(0.054)	1.598	(0.528)	0.845	(0.311)
Log Total Assets	-0.549	(-0.380)	0.284	(0.218)	0.328	(0.244)
Credit Ratings	22.560**	(1.982)	22.503**	(2.090)	22.370**	(2.411)
Z-Score	-0.534	(-1.166)	-0.681*	(-1.693)	-0.679*	(-1.655)
Ext. Financing Demand	-1.905	(-0.537)	-4.613	(-1.352)	-2.036	(-0.653)
Recession Year	-0.182	(-0.022)	-0.541	(-0.068)	1.047	(0.138)
Litigation	1.729	(0.266)	3.599	(0.568)	3.843	(0.591)
Year Indicators	Yes		Yes		Yes	
Industry Indicators	Yes		Yes		Yes	
Observations	760		760		760	
Adjusted R-squared	0.528		0.542		0.564	
Dom Subs = Ovrs Subs:						
F-test					**1.430**	
p-value					**0.233**	

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

Table 5 Panel A presents results on recovery upon default of domestic firms (i.e., without overseas subsidiaries). Panel B 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 6 – Controlling for geographic diversification

VARIABLES	Column (1) Coeff.	Column (1) t-stat	Column (2) Coeff.	Column (2) t-stat	Column (3) Coeff.	Column (3) t-stat
Constant	51.406***	(4.215)	51.253***	(4.536)	53.469***	(4.705)
Log Dom Subs					**-1.637**	**(-1.470)**
Log Ovrs Subs			**-2.317****	**(-2.179)**	**-2.191****	**(-2.132)**
Holding Company					**-7.966*****	**(-2.821)**
Geog. Diversification	**127.045****	**(2.203)**	**104.870***	**(1.868)**	**83.159**	**(1.610)**
Log Debt Issue	-2.316**	(-2.005)	-2.154**	(-1.971)	-2.215**	(-2.014)
Senior Debt	14.973***	(3.893)	14.031***	(3.703)	14.268***	(3.900)
Senior Secured	25.905***	(5.285)	25.796***	(5.440)	25.672***	(5.325)
Senior Subordinated	-10.504***	(-3.305)	-10.557***	(-3.327)	-10.935***	(-3.549)
Bank Loan	14.452***	(2.884)	14.892***	(2.997)	14.793***	(2.956)
Chapter 11 Bankruptcy	-2.808	(-0.466)	-3.606	(-0.594)	-3.865	(-0.636)
Missed Interest	1.878	(0.330)	1.251	(0.218)	1.585	(0.271)
Distressed Exchange	28.395***	(3.778)	26.208***	(3.640)	25.305***	(3.564)
Market-to-Book	-1.350	(-0.818)	-0.751	(-0.455)	-1.274	(-0.750)
Sales Growth	1.268	(1.047)	1.390	(1.061)	0.941	(0.730)
Return on Assets	-4.582	(-0.491)	-1.416	(-0.157)	0.237	(0.027)
Profit Margin	0.960*	(1.805)	0.828	(1.554)	0.864	(1.505)
Asset Tangibility	4.608	(0.699)	4.149	(0.647)	0.860	(0.145)
Leverage	-3.056	(-1.008)	-4.240	(-1.372)	-4.815	(-1.547)
Negative Equity	1.618	(0.607)	2.813	(1.053)	1.776	(0.679)
Log Total Assets	-0.648	(-0.617)	0.098	(0.094)	0.642	(0.572)
Credit Ratings	13.587	(1.270)	17.220*	(1.701)	17.545**	(2.055)
Z-Score	-0.628	(-1.628)	-0.615	(-1.608)	-0.670*	(-1.733)
Ext. Financing Demand	0.620	(0.204)	-0.083	(-0.028)	2.124	(0.757)
Recession Year	2.270	(0.332)	3.244	(0.462)	3.600	(0.523)
Litigation	0.274	(0.055)	0.393	(0.075)	0.467	(0.088)
Year Indicators	Yes		Yes		Yes	
Industry Indicators	Yes		Yes		Yes	
Observations	1,087		1,087		1,087	
Adjusted R-squared	0.544		0.552		0.565	
Dom Subs = Ovrs Subs:						
F-test					**0.128**	
p-value					**0.721**	

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

Table 6 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 7 – Legal separation and cost of debt
Dependent variable: Natural logarithm of bank loan spreads (*Log Spread*)

VARIABLES	Column (1) Coeff.	Column (1) *t*-stat	Column (2) Coeff.	Column (2) *t*-stat	Column (3) Coeff.	Column (3) *t*-stat
Constant	5.539***	(50.397)	5.525***	(109.765)	5.521***	(49.713)
Log Subs	**0.023***	**(3.294)**			**0.023***	**(3.336)**
Holding Company			**0.022***	**(1.851)**	**0.031***	**(1.794)**
Geog. Diversification	**-1.107***	**(-3.638)**	**-1.405***	**(-5.725)**	**-1.093***	**(-3.591)**
Loan Size	-0.060***	(-8.500)	-0.078***	(-15.717)	-0.059***	(-8.480)
Log Maturity	-0.029**	(-2.467)	-0.030***	(-3.911)	-0.029**	(-2.467)
Secured Loan	0.333***	(17.913)	0.384***	(26.677)	0.333***	(17.932)
Number of Lenders	-0.002**	(-2.095)	-0.002**	(-2.488)	-0.002**	(-2.083)
Relationship Lending	0.020	(1.387)	0.025**	(2.437)	0.020	(1.406)
Revolver	-0.053***	(-4.535)	-0.051***	(-6.044)	-0.053***	(-4.526)
Institutional Investor	0.167***	(8.279)	0.157***	(10.554)	0.168***	(8.299)
PP Indicator	-0.153***	(-9.789)	-0.157***	(-13.854)	-0.153***	(-9.828)
Financial Covenants	0.021***	(2.809)	0.011**	(2.029)	0.021***	(2.811)
General Covenants	0.071***	(17.193)	0.072***	(23.272)	0.071***	(17.215)
Capex Restrictions	0.109***	(6.986)	0.096***	(7.748)	0.109***	(7.003)
Market-to-Book	-0.039***	(-6.162)	-0.034***	(-6.861)	-0.039***	(-6.163)
Return on Assets	-0.749***	(-7.486)	-0.329***	(-5.560)	-0.746***	(-7.476)
Asset Tangibility	-0.119**	(-2.371)	-0.126***	(-3.614)	-0.117**	(-2.353)
Leverage	0.320***	(10.066)	0.273***	(12.092)	0.320***	(10.124)
Log Total Assets	-0.131***	(-15.726)	-0.136***	(-25.577)	-0.131***	(-15.687)
Credit Ratings	-0.400***	(-11.214)	-0.420***	(-15.082)	-0.399***	(-11.210)
Z-Score	-0.009**	(-2.248)	-0.004	(-1.490)	-0.009**	(-2.235)
Recession Year	0.106***	(2.786)	0.071**	(2.405)	0.105***	(2.768)
Year Indicators	Yes		Yes		Yes	
Industry Indicators	Yes		Yes		Yes	
Observations	9,088		17,907		9,088	
Adjusted R-squared	0.686		0.666		0.686	

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

Table 7 presents results on the relation between legal separation and cost of debt. 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.

Table 8 – Simultaneity of pricing and non-pricing loan terms
Model: Seemingly Unrelated Regressions (SUR)

VARIABLES	Column (1) Log Spread Coeff.	*t*-stat	Column (2) Fin. Covenants Coeff.	*t*-stat	Column (3) Secured Loan Coeff.	*t*-stat
Constant	5.407***	(24.969)	0.728*	(1.653)	-1.514***	(-8.496)
Log Subs	**0.022***	**(4.442)**	**-0.021**	**(-2.113)**	**-0.008**	**(-2.127)**
Holding Company	**0.030**	**(2.372)**	**0.000**	**(0.012)**	**-0.012**	**(-1.255)**
Geog. Diversification	**-0.628***	**(-2.889)**	**-0.347**	**(-0.813)**	**-0.656***	**(-3.796)**
Loan Size	-0.108***	(-18.918)	-0.023**	(-2.042)	0.006	(1.218)
Log Maturity	-0.063***	(-7.418)	0.225***	(13.488)	0.097***	(14.324)
Secured Loan	0.611***	(49.677)	-0.144***	(-5.567)		
Number of Lenders	-0.001*	(-1.764)	0.002*	(1.708)	0.002***	(3.927)
Relationship Lending	0.030***	(2.777)	0.192***	(8.949)	-0.004	(-0.418)
Revolver	-0.037***	(-3.336)	-0.058***	(-2.666)	0.032***	(3.630)
Institutional Investor	0.188***	(10.401)	-0.004	(-0.105)	-0.041***	(-2.824)
PP Indicator	-0.126***	(-11.351)	0.207***	(9.445)	0.033***	(3.647)
Financial Covenants	0.044***	(8.198)			-0.024***	(-5.567)
General Covenants	0.049***	(16.537)	0.068***	(11.430)	0.021***	(8.840)
Capex Restrictions	0.189***	(16.044)	-0.030	(-1.277)	0.067***	(7.095)
Market-to-Book	-0.029***	(-8.015)	-0.023***	(-3.184)	-0.003	(-0.913)
Return on Assets	-0.569***	(-10.006)	0.740***	(6.581)	-0.067	(-1.478)
Asset Tangibility	-0.080**	(-2.189)	0.045	(0.619)	-0.061**	(-2.089)
Leverage	0.256***	(11.398)	-0.185***	(-4.164)	0.001	(0.032)
Log Total Assets	-0.121***	(-20.067)	-0.120***	(-9.941)	-0.023***	(-4.649)
Credit Ratings	-0.301***	(-16.623)	-0.382***	(-10.544)	-0.098***	(-6.674)
Z-Score	-0.010***	(-3.128)	0.045***	(6.986)	0.003	(1.125)
Recession Year	0.108***	(3.888)	-0.107*	(-1.954)	-0.045**	(-2.011)
Log Spread			0.168***	(8.198)	0.386***	(49.677)
Year Indicators	Yes		Yes		Yes	
Industry Indicators	Yes		Yes		Yes	
Observations	9,088		17,907		9,088	
Adjusted R-squared	0.678		0.372		0.482	

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

VARIABLES	Column (4) Log Maturity		Column (5) Loan Size		Column (6) Capex Restrictions	
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
Constant	3.327***	(12.163)	0.808**	(1.980)	-0.747***	(-3.769)
Log Subs	**0.011***	**(1.767)**	**0.004**	**(0.395)**	**0.007**	**(1.487)**
Holding Company	**-0.001**	**(-0.069)**	**-0.008**	**(-0.352)**	**-0.005**	**(-0.488)**
Geog. Diversification	**0.775***	**(2.904)**	**-0.044**	**(-0.111)**	**-0.232**	**(-1.209)**
Loan Size	0.127***	(18.094)			-0.025***	(-4.842)
Log Maturity			0.278***	(18.094)	-0.011	(-1.454)
Secured Loan	0.230***	(14.324)	0.029	(1.218)	0.082***	(7.096)
Number of Lenders	0.004***	(4.396)	0.022***	(18.056)	0.001**	(2.299)
Relationship Lending	-0.057***	(-4.206)	0.163***	(8.230)	-0.054***	(-5.633)
Revolver	0.202***	(15.118)	0.280***	(14.182)	0.046***	(4.692)
Institutional Investor	0.466***	(21.515)	0.517***	(15.924)	0.054***	(3.367)
PP Indicator	0.168***	(12.341)	0.178***	(8.782)	0.003	(0.346)
Financial Covenants	0.088***	(13.488)	-0.020**	(-2.042)	-0.006	(-1.277)
General Covenants	0.042***	(11.408)	0.059***	(10.725)	0.051***	(19.374)
Capex Restrictions	-0.021	(-1.453)	-0.104***	(-4.841)		
Market-to-Book	-0.022***	(-4.930)	0.021***	(3.143)	-0.004	(-1.192)
Return on Assets	0.105	(1.488)	0.779***	(7.511)	0.133***	(2.625)
Asset Tangibility	0.103**	(2.278)	0.001	(0.014)	0.047	(1.448)
Leverage	0.126***	(4.515)	0.084**	(2.031)	0.142***	(7.138)
Log Total Assets	0.054***	(7.169)	-0.416***	(-39.950)	-0.019***	(-3.584)
Credit Ratings	-0.138***	(-6.076)	-0.116***	(-3.441)	0.015	(0.883)
Z-Score	0.003	(0.784)	-0.007	(-1.172)	0.004	(1.382)
Recession Year	-0.076**	(-2.216)	0.064	(1.276)	-0.016	(-0.654)
Log Spread	-0.095***	(-7.418)	-0.356***	(-18.918)	0.147***	(16.046)
Year Indicators	Yes		Yes		Yes	
Industry Indicators	Yes		Yes		Yes	
Observations	9,088		17,907		9,088	
Adjusted R-squared	0.346		0.406		0.369	

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

Table 8 presents results from seemingly unrelated regressions of *Log Spread, Financial Covenants, Secured Loan, Log Maturity*, *Loan Size*, and *CAPEX Restrictions*. 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 *z*-statistics, reported in parentheses, are based on standard errors adjusted for clustering at the firm level. All variables are as described in Appendix A.